

# **SEALED WELLS**

Minnesota Unique Well No.

**129227**

County Scott  
 Quad Belle Plaine South  
 Quad ID 91D

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING  
 RECORD**

Entry Date 02/23/1989  
 Update Date 06/02/2014  
 Received Date

Minnesota Statutes Chapter 103I

<b>Well Name</b> O'BRIEN, KEVIN <b>Township Range Dir Section Subsections Elevation</b> 858 ft. 113 24 W 7 BACD <b>Elevation Method</b> 7.5 minute topographic map (+/- 5 feet)		<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;"><b>Well Depth</b></td> <td style="width:33%;"><b>Depth Completed</b></td> <td colspan="2"><b>Date Well Completed</b></td> </tr> <tr> <td>330 ft.</td> <td>330 ft.</td> <td colspan="2">08/06/1976</td> </tr> <tr> <td colspan="4"><b>Drilling Method</b> Cable Tool</td> </tr> </table>			<b>Well Depth</b>	<b>Depth Completed</b>	<b>Date Well Completed</b>		330 ft.	330 ft.	08/06/1976		<b>Drilling Method</b> Cable Tool																																																																																																																											
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<b>REMARKS</b> SCREEN SLOT 60TO125 WELL SEALED 11-17-1999 BY 10318 ORIGINAL USE IR - IRRIGATION  <b>Located by:</b> Minnesota Geological Survey <b>Method:</b> Digitized - scale 1:24,000 or larger (Digitizing Table) <b>Unique Number Verification:</b> N/A <b>Input Date:</b> 03/25/1996 <b>System:</b> UTM - Nad83, Zone15, Meters <b>X:</b> 439592 <b>Y:</b> 4940178		<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><b>First Bedrock</b></td> <td style="width:50%;"><b>Aquifer</b> Quat. Water Table Aquifer</td> </tr> <tr> <td><b>Last Strat</b> sand-gray</td> <td><b>Depth to Bedrock</b> ft.</td> </tr> </table>			<b>First Bedrock</b>	<b>Aquifer</b> Quat. Water Table Aquifer	<b>Last Strat</b> sand-gray	<b>Depth to Bedrock</b> ft.																																																																																																																																
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Minnesota Unique Well No.

**235768**

County Scott  
 Quad Belle Plaine South  
 Quad ID 91D

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING  
 RECORD**

Entry Date 09/21/1989  
 Update Date 03/10/2014  
 Received Date

Minnesota Statutes Chapter 103I

<b>Well Name</b> EXECLSIOR PLASTICS <b>Township Range Dir Section Subsections Elevation</b> 863 ft. 113 24 W 6 DBAABD <b>Elevation Method</b> 7.5 minute topographic map (+/- 5 feet)		<b>Well Depth</b> 258 ft. <b>Depth Completed</b> 258 ft. <b>Date Well Completed</b> 07/11/1963																																				
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<b>REMARKS</b> SEALED 06-12-2006 BY 1815; PREVIOUS USE: IN  Located by: Minnesota Department of Health <b>Method:</b> Digitization (Screen) - Map (1:24,000) <b>Unique Number Verification:</b> Information from owner <b>Input Date:</b> 11/26/2001 <b>System:</b> UTM - Nad83, Zone15, Meters <b>X:</b> 440176 <b>Y:</b> 4941294		<b>Grouting Information</b> Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified																																				
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		<b>Pump</b> <input checked="" type="checkbox"/> Not Installed Date Installed Manufacturer's name <u>RAPIDAYTON</u> Model number <u>B 63</u> HP <u>15</u> Volts <u>220</u> Length of drop Pipe _ft. Capacity _g.p.m Type <u>Submersible</u> Material																																				
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Minnesota Unique Well No.

**477920**

County Scott  
 Quad Belle Plaine South  
 Quad ID 91D

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING  
 RECORD**

Entry Date 10/16/1992  
 Update Date 03/12/2014  
 Received Date

Minnesota Statutes Chapter 103I

Well Name FINA SERVE INC.				Well Depth	Depth Completed	Date Well Completed	
Township Range Dir Section Subsections Elevation ft.				143 ft.	139 ft.	05/21/1991	
113 24 W 6 DBB Elevation Method				Drilling Method Power Auger			
Well Address 913 MAIN E BELLE PLAINE MN				Drilling Fluid	Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No		
				-	From Ft. to Ft.		
				Use Abandoned Status Sealed			
Geological Material				Casing Type	Joint	Threaded	Drive Shoe? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
SAND				No Above/Below 2 ft.			
Color	Hardness	From	To	Casing Diameter	Weight	Hole Diameter	
BROWN		0	143	2 in. to	129 ft.	lbs./ft.	8 in. to 143 ft.
				Open Hole from ft. to ft.			
				Screen YES	Make WESCO	Type stainless steel	
				Diameter	Slot/Gauze	Length	Set Between
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WELL GMMW1							
WELL SEALED 08-02-2002 BY 34625							
ORIGINAL USE MW - MONITOR WELL							
WELL WAS GROUTED FROM 0-60', 110-123' OUTSIDE LAST AUGER AND FROM 0-123' INSIDE				Grout Material: from to 123 ft.			
NOTE: LOST AUGER IN HOLE FROM 28'-123'				Grout Material: Neat Cement from to 60 ft.			
				Nearest Known Source of Contamination			
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				Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
				Pump <input type="checkbox"/> Not Installed Date Installed			
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				Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No			
				Well Contractor Certification			
First Bedrock				Barrick Well Co.		27017	
Last Strat				Lic. Or Reg. No.		DEAHENSEN.P.	
Aquifer				Name of Driller			
Depth to Bedrock ft.							
County Well Index Online Report				477920		Printed 3/18/2015	
						HE-01205-07	



Minnesota Unique Well No.

**477922**

County Scott  
 Quad Belle Plaine South  
 Quad ID 91D

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING  
 RECORD**

Entry Date 10/16/1992  
 Update Date 03/12/2014  
 Received Date

Minnesota Statutes Chapter 103I

<b>Well Name</b> FINA SERVE <b>Township Range Dir Section Subsections Elevation</b> ft. 113 24 W 6 DBB <b>Elevation Method</b>				<b>Well Depth</b> 145 ft.	<b>Depth Completed</b> 140 ft.	<b>Date Well Completed</b> 07/18/1991	
<b>Drilling Method</b> Multiple methods used							
<b>Well Address</b> 913 MAIN ST E BELLE PLAINE MN				<b>Drilling Fluid</b> Bentonite	<b>Well Hydrofractured?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No From Ft. to Ft.		
				<b>Use</b> Abandoned <b>Status</b> Sealed			
<b>Geological Material</b>				<b>Casing Type</b> Steel (black or low carbon) <b>Joint</b> Welded <b>Drive Shoe?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>Above/Below</b> 2.5 ft.		
SAND BROWN MEDIUM 0 37 SAND GRAY MEDIUM 37 76 SANDY CLAY BLACK MEDIUM 76 80 SAND BROWN MEDIUM 80 90 VF SAND BROWN MEDIUM 90 95 CLAYEY SAND GRY/BRN MEDIUM 95 105 FINE SAND, DENSE BROWN 105 145	<b>Color</b> BROWN GRAY BLACK BROWN BROWN GRY/BRN BROWN	<b>Hardness</b> MEDIUM MEDIUM MEDIUM MEDIUM MEDIUM MEDIUM	<b>From</b> 0 37 76 80 90 95 105	<b>To</b> 37 76 80 90 95 105 145	<b>Casing Diameter</b> <b>Weight</b> <b>Hole Diameter</b> 2 in. to 130 ft.      lbs./ft.      8 in. to 100 ft.		
<b>Open Hole</b> from ft. to ft.							
<b>Screen</b> YES <b>Make</b> <b>Type</b> stainless steel							
<b>Diameter</b> <b>Slot/Gauze</b> <b>Length</b> <b>Set Between</b> 2                      10                      10                      130 ft. and 140 ft.							
<b>Static Water Level</b> ft. from    Date Measured							
<b>PUMPING LEVEL (below land surface)</b> ft. after    hrs. pumping    g.p.m.							
<b>Well Head Completion</b> Pitless adapter manufacturer      Model <input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)							
<b>REMARKS</b> MW 3 WELL SEALED 08-02-2002 BY 34625 ORIGINAL USE MW - MONITOR WELL				<b>Grouting Information</b> Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified  Grout Material: Neat Cement                      from    to 115 ft.			
<b>Nearest Known Source of Contamination</b> _feet _direction _type  Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No							
<b>Pump</b> <input type="checkbox"/> Not Installed    Date Installed Manufacturer's name      Model number    HP    Volts Length of drop Pipe _ft.    Capacity _g.p.m    Type    Material							
<b>Abandoned Wells</b> Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No							
<b>Variance</b> Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No							
<b>Well Contractor Certification</b> Barrick Well Co.                      27017                      MATTMILLER.G. License Business Name                      Lic. Or Reg. No.                      Name of Driller							
<b>First Bedrock</b> <b>Aquifer</b> <b>Last Strat</b> <b>Depth to Bedrock</b> ft.				<b>County Well Index Online Report</b>			
				<b>477922</b>		Printed 3/18/2015 HE-01205-07	

Minnesota Unique Well No.

**522960**

County Scott  
 Quad  
 Quad ID

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING  
 RECORD**

Entry Date 03/31/1995  
 Update Date 02/14/2014  
 Received Date

Minnesota Statutes Chapter 103I

<p><b>Well Name</b> MW-4  <b>Township Range Dir Section Subsections Elevation</b> ft.                  113 24 W 6 DBB Elevation Method</p>	<p><b>Well Depth</b> 141 ft.      <b>Depth Completed</b> 139 ft.      <b>Date Well Completed</b> 04/06/1993</p>
<p><b>Drilling Method</b> Auger (non-specified)</p>	
<p><b>Well Address</b>                  913 MAIN ST E                  MN</p>	<p><b>Drilling Fluid</b>                  -</p> <p><b>Well Hydrofractured?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No                  From Ft. to Ft.</p>
<p><b>Use</b> Abandoned <b>Status</b> Sealed</p>	
<p><b>Geological Material</b>                  SAND</p>	<p><b>Color</b> BROWN      <b>Hardness</b> MEDIUM      <b>From</b> 0      <b>To</b> 141</p> <p><b>Casing Type</b> Steel (black or low carbon) <b>Joint</b> Threaded <b>Drive Shoe?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                  Above/Below ft.</p>
<p><b>Casing Diameter</b> 2 in. to 129 ft.      <b>Weight</b> lbs./ft.      <b>Hole Diameter</b> 8 in. to 141 ft.</p>	
<p><b>Open Hole</b> from ft. to ft.</p>	
<p><b>Screen</b> YES      <b>Make</b> JOHNSON      <b>Type</b> stainless steel</p>	
<p><b>Diameter</b> 2      <b>Slot/Gauze</b> 10      <b>Length</b> 10      <b>Set Between</b> 129 ft. and 139 ft.</p>	
<p><b>Static Water Level</b>                  132 ft. from Land surface      Date Measured 04/05/1993</p>	
<p><b>PUMPING LEVEL (below land surface)</b>                  ft. after hrs. pumping g.p.m.</p>	
<p><b>Well Head Completion</b>                  Pitless adapter manufacturer Model  <input checked="" type="checkbox"/> Casing Protection Y      <input checked="" type="checkbox"/> 12 in. above grade  <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)</p>	
<p><b>REMARKS</b>                  WELL SEALED 08-02-2002 BY 34625                  ORIGINAL USE MW - MONITOR WELL                  WELL HEAD COMPLETION - FLUSH GRADE</p>	<p><b>Grouting Information</b> Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified</p> <p>Grout Material: Neat Cement      from      to 125 ft.      1.5 yds.</p>
<p><b>Nearest Known Source of Contamination</b>                  _feet _direction _type                  Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	
<p><b>Pump</b> <input type="checkbox"/> Not Installed Date Installed                  Manufacturer's name Model number __ HP _ Volts                  Length of drop Pipe _ft. Capacity _g.p.m Type Material</p>	
<p><b>Abandoned Wells</b> Does property have any not in use and not sealed well(s)? <input type="checkbox"/>                  Yes <input checked="" type="checkbox"/> No</p>	
<p><b>Variance</b> Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	
<p><b>First Bedrock</b>  <b>Last Strat</b></p>	<p><b>Well Contractor Certification</b>                  W.t.d. Environmental 27653 MATTMILLER.G.                  License Business Name Lic. Or Reg. No. Name of Driller</p>
<p><b>County Well Index Online Report</b></p>	
<p><b>522960</b></p>	
<p>Printed 3/18/2015                  HE-01205-07</p>	

Minnesota Unique Well No.

**657348**

County Scott  
 Quad Belle Plaine South  
 Quad ID 91D

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING  
 RECORD**

Entry Date 02/15/2001  
 Update Date 03/10/2014  
 Received Date

Minnesota Statutes Chapter 103I

<b>Well Name</b> BELLE PLAINE TW <b>Township Range Dir Section Subsections Elevation</b> 858 ft. 113 24 W 6 DCDBAC <b>Elevation Method</b> 7.5 minute topographic map (+/- 5 feet)		<b>Well Depth</b> 350 ft. <b>Depth Completed</b> 280 ft. <b>Date Well Completed</b> 01/23/2001
<b>Well Address</b> BELLE PLAINE MN 56011		<b>Drilling Method</b> Non-specified Rotary <b>Drilling Fluid</b> Bentonite <b>Well Hydrofractured?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No From Ft. to Ft.
<b>Geological Material</b> GRAVEL BROWN SOFT 0 75 CLAY GRAY MEDIUM 75 95 SANDY CLAY BROWN MEDIUM 95 110 SAND BROWN MEDIUM 110 284 CLAY GRAY MEDIUM 284 286 SAND BROWN MED-HRD 286 309 CLAY GREEN LIME MEDIUM 309 310 SAND WHT/BRN HARD 310 311 STREAKS WHT/GRN HARD 311 315 SAND WHITE HARD 315 339 STREAKS WHITE HARD 339 341 SAND WHITE HARD 341 350		<b>Use Abandoned Status</b> Sealed <b>Casing Type</b> Plastic <b>Joint</b> No Information <b>Drive Shoe?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Above/Below ft. <b>Casing Diameter</b> 4 in. to 220 ft. <b>Weight</b> lbs./ft. <b>Hole Diameter</b> 8.75 in. to 282 ft. <b>Open Hole</b> from ft. to ft. <b>Screen</b> YES <b>Make</b> JOHNSON <b>Type</b> plastic <b>Diameter</b> 4 <b>Slot/Gauze</b> 35 <b>Length</b> 60 <b>Set Between</b> 220 ft. and 280 ft.
<b>REMARKS</b> M.G.S. NO. 4078. WELL SEALED 04-09-2001 BY 71536. ORIGINAL USE: TW - TEST WELL. WELL DRILLED BY STEFFL DRILLING.  <b>Located by:</b> Minnesota Department of Health <b>Method:</b> GPS SA Off (averaged) <b>Unique Number Verification:</b> N/A <b>Input Date:</b> 01/09/2007 <b>System:</b> UTM - Nad83, Zone15, Meters <b>X:</b> 440248 <b>Y:</b> 4940667		<b>Static Water Level</b> 124 ft. from Land surface Date Measured 01/23/2001 <b>PUMPING LEVEL (below land surface)</b> 315 ft. after 2 hrs. pumping 100 g.p.m. <b>Well Head Completion</b> Pitless adapter manufacturer Model <input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)
<b>Cuttings</b> Yes <b>First Bedrock</b> Mt.Simon Sandstone <b>Aquifer</b> Quat. Buried Unconf. Aquife <b>Last Strat</b> Mt.Simon Sandstone <b>Depth to Bedrock</b> 309 ft.		<b>Grouting Information</b> Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified Grout Material: Other from 0 to 210 ft. 26 bags Grout Material: Pearock from 210 to 282 ft. 0.8 yds. Grout Material: Neat Cement from 283 to 350 ft. 12 bags <b>Nearest Known Source of Contamination</b> _feet _direction _type Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Pump</b> <input type="checkbox"/> Not Installed Date Installed Manufacturer's name Model number __ HP __ Volts Length of drop Pipe __ft. Capacity __g.p.m Type Material
<b>County Well Index Online Report</b>		<b>Abandoned Wells</b> Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Variance</b> Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Well Contractor Certification</b> Traut M.J. Well Co. 71536 License Business Name Lic. Or Reg. No. Name of Driller
<b>657348</b>		Printed 3/18/2015 HE-01205-07



## Minnesota Department of Health Environmental Health in Minnesota

### MDH Public Water Supply Sources Report

PWSID: **1700001**  
PWS Name: **Belle Plaine**  
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 Unverified 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)
S02	#1 - West Well	GW	Emergency	Out Long Term	<a href="#">201245</a> <b>O*</b>	<a href="#">06/27/1994</a> (M. Sweers)	1949	280	261	16	00-00-1949	280.00	261.00	16.00
S03	Well #3	GW	Primary	Active	<a href="#">538038</a>	<a href="#">01/25/1995</a> (B. Banat)	1994	330	<b>240</b>	18	06-10-1994	330.00	<b>239.00</b>	18.00
S04	Well #4	GW	Primary	Active	<a href="#">651697</a>	<a href="#">11/26/2001</a> (S. Robertson)	2001	331	245	18	10-09-2001	331.00	245.00	18.00

MNDWIS PWS SOURCES REMOVED FROM 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	#2 - East Well	GW	Sealed	Inactive	<a href="#">226757</a> <b>O*</b>	<a href="#">06/27/1994</a> (M. Sweers)	1955	287	257	0	00-00-1955	287.00	257.00	12.00

MNDWIS and CWI data value discrepancies in preceding tables are shown in **RED** (0 or null values excepted).

#### Unverified Wells

The following tables show information on wells whose existence (or previous existence) has not yet been confirmed.

UNVERIFIED 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
A	Driven Well		30.0	30.0			Before 1924	Cable Tool/Bored	1948			Bet. RR tracks & Beaver St., at Willow St.	Ref.: MGS City Well files. See 1942 map.
B	Driven Well		30.0	30.0	30.0	6.0	Before 1924	Cable Tool/Bored	1948			Bet. RR tracks & Beaver St., at Willow St.	Ref.: MGS City Well files. 1942 map.

UNVERIFIED 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
C	Driven Well		30.0	30.0	30.0	6.0	Before 1924	Cable Tool/Bored	1948			Bet. RR tracks & Beaver St., at Willow St.	Ref.: MGS City Well files. 1942 map.
D	Driven Well		30.0	30.0	30.0	6.0	Before 1924	Cable Tool/Bored	1948			Bet. RR tracks & Beaver St., at Willow St.	Ref.: MGS City Well files. 1942 map.
E	Driven Well		30.0	30.0	30.0	6.0	Before 1924	Cable Tool/Bored	1948			Bet. RR tracks & Beaver St., at Willow St.	Ref.: MGS City Well files. 1942 map.
F	160-foot Well		160.0	160.0	144.0	10.0	Before 1947	Cable Tool/Bored				N. part of town.	Ref.: 1947 MDH San. Rpt.
G	No. 1 West Well; Test Well	<a href="#">201245</a> S*	280.0	280.0	280.0	20.0	1946	Cable Tool/Bored				In Prairie Park, S 1/2-block of Block 150.	Ref.: 1949 MDH San. Rpt. CWI states 282' depth, 16" csg.
H	Old Well-Farmers Creamery; H71848	<a href="#">207137</a>							1950	Y	1995	State and Meridian Sts.	Ref.: 1950 MDH San. Rpt. Inter-comm'd w/city supply. Is this 207137? Was it sealed by H71848 (242' deep, 8" csg to 228')? CWI: year drilled was 1935, depth was 248', 8" csg to 225'.
I	New Well-Farmers Creamery						Before 1950					State and Meridian Sts.	Ref.: 1950 MDH San. Rpt. Inter-comm'd w/city supply.
J	Minnesota Valley Milk Processing Plant Well; H43406	<a href="#">213578</a>	87.0	87.0		36.0	1942			Y	1993		Ref.: 1951 MDH San. Rpt. Inter-comm'd w/city supply. Const. details/date drilled fm CWI.

UNVERIFIED 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
K	No. 2 East Well	<a href="#">226757</a> R*	282.0	282.0	250.0	12.0	1955						Ref.: 1955 MDH San. Rpt.
L	213-foot Well		213.0	213.0		8.0	Before 1944	Cable Tool/Bored				Water Works plant, SW corner Prairie & Willow Sts.	Ref.: 1944 MGS Bulletin 31. 1909 Sanborn, Sheet 3.
M	310-ft. Well		310.0	310.0		8.0	Before 1944	Cable Tool/Bored					Ref.: 1944 MGS Bulletin 31.
N	1894 Well											Intersection of Main & Meridian Sts.	Ref.: 1894 & 1900 Sanborn maps.
Databases Searched					Remarks								
County Well Index (1-mile radius); MDH DWP Microfiche; MDH 1988-2002 Muni Well Inventory; 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); MNBrew.com (breweries); MDH DWP MNDWIS; Past and Present MN Railroad Stations; MN Historical Soc.- 1951 Underwriters Insp. Bureau historical map ; Sanborn Fire Insurance Maps; MDH WELLS					This Unverified Municipal Well Inventory is as complete and thorough as possible, given available documentation. However, MDH Planners and Hydrologists, as well as City representatives, should feel free to add or subtract from this report as necessary. BELLE PLAINE was incorporated in 1868. No creameries are noted in 1907 operating in the town. It is unclear if the "Farmers Creamery" is the same as the Milton Creamery. It appears that Farmers Creamery at NE corner of State & Meridian had two wells (H & I, on this list). Both appear to have been inter-connected with the city supply. One was sealed, likely Old Creamery Well (H). There appears to be one unverified creamery well still unsealed (H or I). It appears that the city not only had cross connections with the creamery, but later purchased the property and installed the five driven wells there. Two test wells (651696 & 657348) are documented as sealed. References L & M, on this list do not match any other well. Can city help? A brewery reportedly operated under various names (Birk & Schmitt, etc.) in the town from 1876 to 1916. Sanborn historical maps from 1894, 1900, 1909, 1930 & 1937 were reviewed for this report. Several public & private wells were found on these maps. It appears that the Milton Dairy may be the same facility as "Farmers Creamery". There may be a well at the brewery, since a fire pump is shown on the 1894 Sanborn. Three Minnesota Valley Milk Assoc. wells have been sealed, including one (213579) likely to have been inter-connected with the city supply. The other two sealed MN Valley Milk wells were 213580 & 213581. The 1894 & 1900 Sanborns list a city well at the intersection of Main and Meridian. The 1900 Sanborn shows a likely well near the railroad water tank. A private well is also shown on Sheet 3 of the 1900 Sanborns, at the corner of Prairie and Elm streets. 1909 Sanborn map shows water tower north of City Hall. 1910 historical photo shows windmill north of Soehholz Stable building. These could be same well. Both bldgs were apparently razed for Keupp Motors. Can city help determine well locations? An historic "Old Salt Well" 221445 is shown on the map. No well sealing record was found for this well.								
Unverified Well Data Compiled By: <b>Geoffery Nash</b> Compiled Date: <b>11/18/2013 1:05:28 PM</b>													

Source: MN Dep't. of Health - 11/19/2013

### 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)
- **Unverified Wells (unused wells with no documented location, unique ID number, and/or well sealing record)**

Unverified 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 Unverified 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 unverified wells and your input will be critical in successfully finding and sealing these potential sources of contamination.

Restart

213582 MINNVALLEY MILK

J. 213578 MINVALLEY MILK PROCESSIN

221445 BELLE PLAINE SALT WELL 1

A-E. Five Driven Wells

213579 MINVALLEY MILK ASSN.

213580 MINVALLEY MILK ASSN.

213581 MINVALLEY MILK ASSN.

I. NEW WELL-BELLE PLAINE CREAMERY  
Approx. area

H. 207137 BELLE PLAINE CREAMERY

651696 BELLE PLAINE TW

N. 1894 Well  
Main & Meridian

651697 BELLE PLAINE 4

G. 201245 BELLE PLAINE 1 WEST WELL

L. 213-ft. Well  
SE com. Willow & Prairie

538038 BELLE PLAINE 3

K. 226757 BELLE PLAINE 2

657348 BELLE PLAINE TW

Well Sequence # (in record)	Well Name	Unique #	Casing Diameter	Well Depth	Depth Cased	Year Constructed	Well Type	Year Out of Service	Sealing Record	Location
1			6 inch	30 feet		Pre-1924	Driven	1948- inoperative and not used		*On the bank of the Mississippi
2			6 inch	30 feet		Pre-1924	Driven	1948- inoperative and not used		*On the bank of the Mississippi
3			6 inch	30 feet		Pre-1924	Driven	1948- inoperative and not used		*On the bank of the Mississippi
4			6 inch	30 feet		Pre-1924	Driven	1948- inoperative and not used		*On the bank of the Mississippi
5			6 inch	30 feet		Pre-1924	Driven	1948- inoperative and not used		*On the bank of the Mississippi
6			10 inch	160 feet	0-144 feet	Pre-1947	Gravel-Packed			*North part of town
8	Cross Connection with the Old Well at Farmer's Creamery							Abandoned 1950		
9	Cross Connection with the Minnesota Valley Milk Processing Plant									
10	Well No. 2 1973: East Well	226757	12 inch	287 feet	0-250 feet	1955		Sealed		* Near the water tower

		DEPTH (feet)	THICKNESS (feet)
Jordan	Sandstone	39-146	107
St. Lawrence	Gray shale	146-161	
	Limestone	161-185	
	Green shale	185-330	184
Franconia Dresbach	Sandstone	330-390	60
	Gray shale	390-400	
	Brown shale	400-418	
	Green shale	418-440	
	Brown shale	440-470	
	Gray sand	470-485	
	White sand	485-605	215
Hinckley	Light brown sand	605-630	
	Pink sand	630-650	
	Red shale	650-662.5	57.5+

BELLE PLAINE

The village of Belle Plaine is located on one of the higher, prairielike terraces characteristic of the Minnesota River Valley. Its public water supply is taken from several wells; one, 8 inches in diameter, is 213 feet deep, and another of the same diameter is 310 feet deep. The latter now furnishes most of the water. These wells do not reach solid rock but draw water from gravel beds in the glacial drift. This great thickness of glacial drift suggests that a deep preglacial valley existed prior to the glacial River Warren.

L  
M

A new well at the milk dehydrating plant is 24 inches in diameter and 90 feet deep. It is finished with a wall of gravel surrounding a shutter screen. When pumped at the rate of 450 gallons per minute the well has a drawdown of 21 feet.

The following log of the old salt well is included because of its historic value, rather than as an aid to correlation. This well is in the valley, at an elevation of 750 feet. The new city well is at an elevation of 850 feet.

See historical explanation

Belle Plaine Salt Well \*

	DEPTH (feet)	THICKNESS (feet)
Alluvium and drift (?)	216	216
Sandstone (basal Cambrian)	232	16
Red ocherous sand and shale	242	10
Purple shale mottled with white	282	40
Red to greenish shale, as above	390	108
Red shale or marl	396	6
Purple and mottled shale	420	24
Red quartzite and shale	440	20
Ocherous shale	450	10
Dark-brown micaceous quartzite	460	10
Dark greenish-brown micaceous quartzite	470	10
Red clastic series		
Dark reddish brown quartzite and greenish shale	520	50
Iron-stained light green	530	10
Red sandy shale	550	20

\* Upham, Warren, Final Rept., Minnesota Geol. and Nat. Hist. Survey, vol. 2, pp. 117-119, 1885.

## SCOTT COUNTY

411

	DEPTH (feet)	THICKNESS (feet)
Red, brown, and green shale.....	590	40
Brown, red, and green shale.....	614	24
Sioux quartzite Shale and quartzite (entered).....	710	96

## NEW MARKET

This village is in the extreme southeastern township of the county, where the drift is locally more than 300 feet thick. Most water supplies are taken from the drift, but the supply for the public waterworks is taken from a rock well that reaches the Jordan sandstone.

## Well at New Market. Elevation 1145 ft.

		DEPTH (feet)	THICKNESS (feet)
Drift	Unclassified .....	0-327	327
Oneota	Massive pinkish limestone.....	327-392	65
Jordan	White sandstone .....	392-412	20

Three wells about one mile southwest of the village (N 1/2, Sec. 32, T. 113 N., R. 21 W.) entered the Platteville limestone at 130 feet below the surface.

A short distance northwest of the village the St. Peter sandstone lies below about 250 feet of drift.

## SAVAGE

In the village of Savage wells penetrate about 10 feet of alluvium where they enter the upper part of the Shakopce-Oneota dolomites to a depth of 10 to 30 feet. At that depth fractures and joints in the dolomite yield moderate supplies of hard water.

At a camp for transients three-fourths of a mile west of the village (Sec. 8, T. 115 N., R. 21 W.) a flowing well was obtained from the Jordan sandstone. (See accompanying log.)

## Flowing Well near Savage. Elevation 730 ft.

		DEPTH (feet)	THICKNESS (feet)
Oneota-Shakopce	Limestone .....	0-135	135
Jordan	White sandstone .....	135-225	90
St. Lawrence	Bluish sandstone .....	225-226	1

## PRIOR LAKE

The railroad station well near the village of Prior Lake is 210 feet deep and terminates in the glacial drift. It is at an elevation of 945 feet. A section of a well at Prior Lake given by Meinzer\* does not correlate with data for nearby wells.

A well at Conroy's summer resort is the deepest drilled in the east-central part of the county. (See accompanying log.)

\* *Op. cit.*, Plate V.



MGS City Well files

Belle Plaine

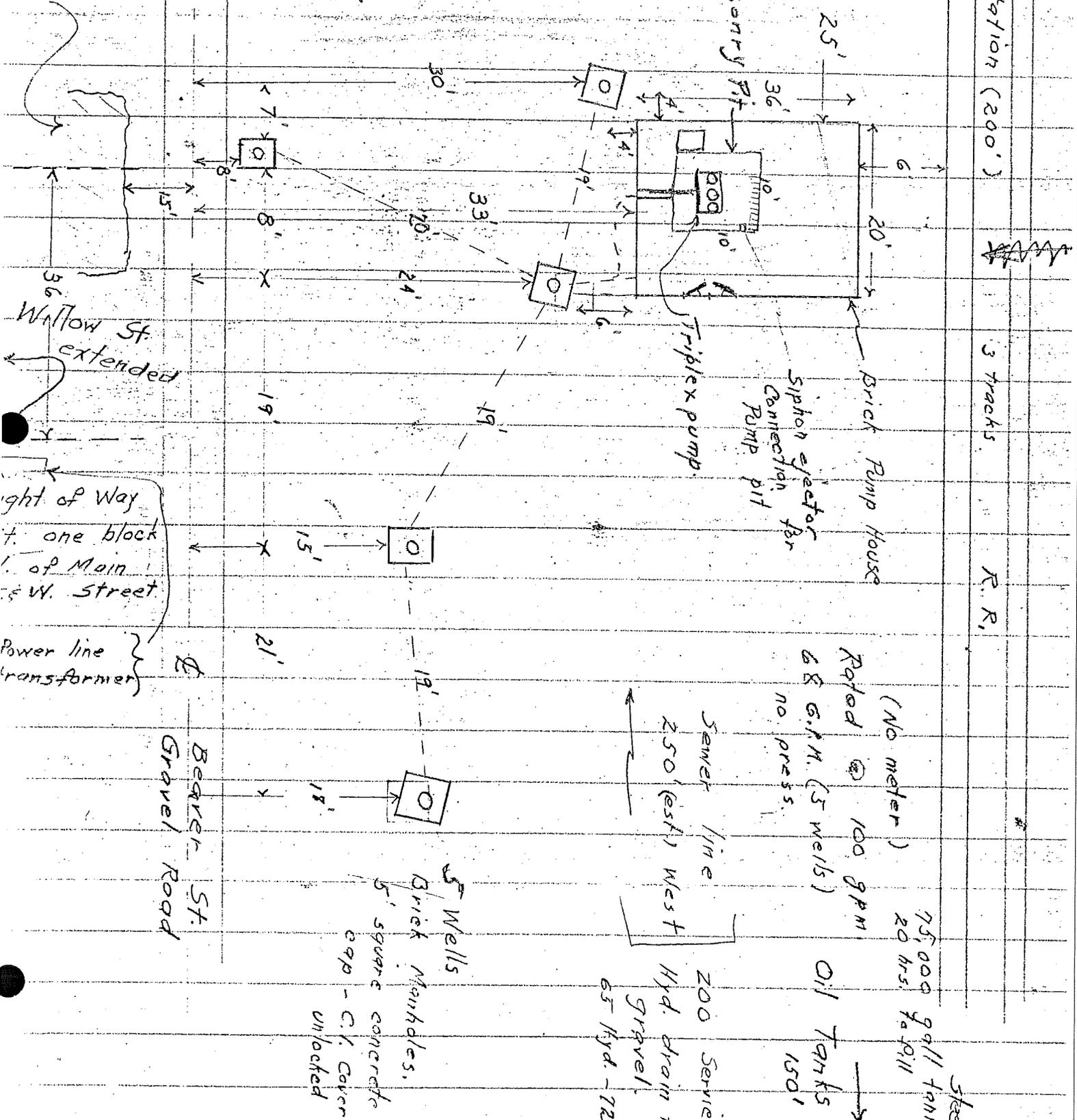
5 driven wells (A - E, on this list)

6-16-42

Handled by Council Committee

excavation for New Pump House

Drainage



Wallow St extended

right of way to one block of Main St & W. Street

Power line transformer

Bearing St  
Gravel Road

5 Wells  
Brick Manholes.  
5' square concrete exp - C.I. Cover unlocked

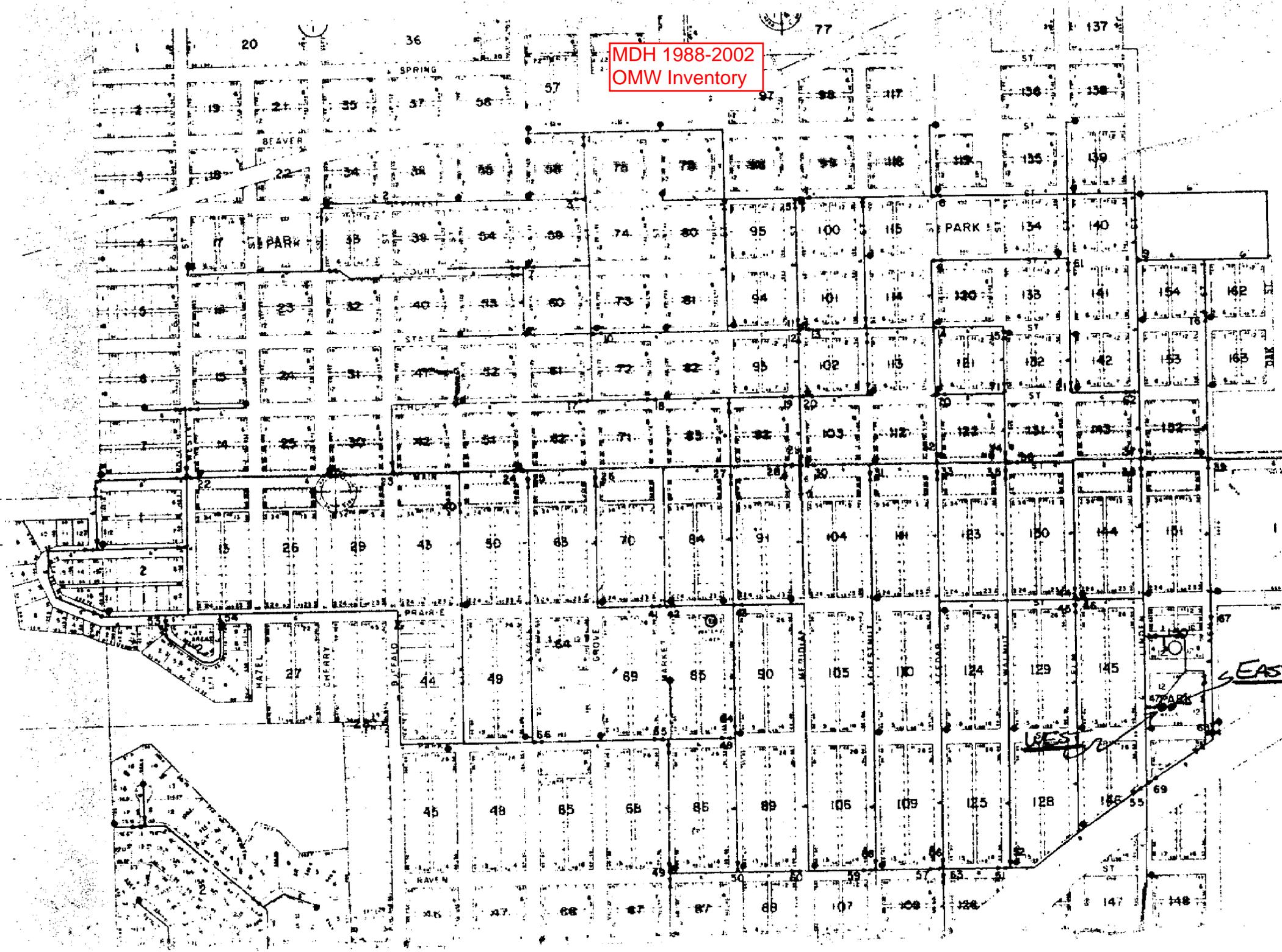
Sewer line 250 (est) West  
200 Service Hyd. drain + gravel 65 Hyd. - 72  
Rated @ 100 gpm 68 G.P.M. (5 wells) Oil Tanks 1500'  
(No meter) 75,000 gal tank 20 hrs. to fill  
Sleeve

To Station (200')

3 tracks

R.R.

MDH 1988-2002  
OMW Inventory



201245

WELL RECORD

KEYS WELL DRILLING COMPANY  
WATER PRODUCERS  
SAINT PAUL, MINNESOTA

#1

Owner BELLE PLAINE, MINNESOTA 1-873-5553 Date Completed 1968  
Location \_\_\_\_\_ Driller Rayon Johnson  
Well No. #1 Size 16" Total Depth 280' Type Screen

DRILLERS LOG

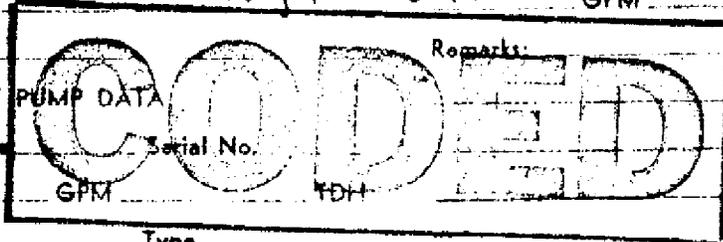
WELL MATERIALS

22' to 58'	Hardpan	L-1	HDPN	261'	of	16 3/4"	diameter of Outer Casing
58' to 64'	Sand & gravel		SAND, GRVL		of		" diameter of Open Hole
64' to 110'	Hardpan & boulders		HDPN, BLDN		of		" diameter of Inner Casing
110' to 115'	Clay	L-5			of		" diameter of Open Hole
115' to 185'	Fine sand & clay		PLTS		to		Mix grout (yds.) (Sacks)
185' to 201'	Hardpan & boulders	L-7		20'	16"	diameter	20' Screen
201' to 218'	Very fine sand						
218' to 241'	Sand						
241' to 280'	Hardpan	L-2					
	Sand & gravel						

RECORD OF TEST PUMPING

Static Water Level	134'	ft. from	
663 GPM	12 1/2"	D.D.	20 Hours
708 GPM	14"	D.D.	4 Hours
GPM		D.D.	Hours
GPM		D.D.	Hours
GPM		D.D.	Hours

Agifer QBAM  
Very low L-15



Remarks:

113-25-1  
DACAAA  
elev. 860 ± 5'  
91-D

PERMANENT PUMP DATA

Mfg. \_\_\_\_\_ Type \_\_\_\_\_ Serial No. \_\_\_\_\_

Capacity \_\_\_\_\_ GPM \_\_\_\_\_ TDH \_\_\_\_\_

Motor Make \_\_\_\_\_ Type \_\_\_\_\_

H. P. \_\_\_\_\_ Volts \_\_\_\_\_ Ph. \_\_\_\_\_ RPM \_\_\_\_\_

ft. \_\_\_\_\_ in Col. pipe \_\_\_\_\_ in. Shaft \_\_\_\_\_

ft. \_\_\_\_\_ in Bowls \_\_\_\_\_ Stages \_\_\_\_\_ Type \_\_\_\_\_

ft. \_\_\_\_\_ in suction pipe & \_\_\_\_\_

ft. Total Length of Pump \_\_\_\_\_

ft. \_\_\_\_\_ in. drop pipe & \_\_\_\_\_ No. Cable \_\_\_\_\_

ft. \_\_\_\_\_ in. air line \_\_\_\_\_

in. Pitless \_\_\_\_\_ ft. bury \_\_\_\_\_ in outlet \_\_\_\_\_



Minnesota Unique Well No.

**201245**

County Scott  
 Quad Belle Plaine South  
 Quad ID 91D

MINNESOTA DEPARTMENT OF HEALTH

**WELL AND BORING RECORD**

Entry Date 05/05/1989  
 Update Date 04/12/2007  
 Received Date

Minnesota Statutes Chapter 103I

Well Name BELLE PLAINE 1 WEST WELL		Well Depth	Depth Completed	Date Well Completed	
Township Range Dir Section Subsections Elevation		280 ft.	280 ft.	00/00/1949	
113	24 W 6 CACDCA	Elevation Method (USGS 7.5 min or equiv.)			
Drilling Method --					
Well Address		Drilling Fluid	Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No		
BELLE PLAINE MN		--	From Ft. to Ft.		
Geological Material		Use	Community Supply	PWS ID	Source
HARDPAN	Color	Casing Type	Joint	No Information	Drive Shoe? <input type="checkbox"/> Yes <input type="checkbox"/> No
SAND & GRAVEL	Hardness	No Above/Below 0 ft.			
HARDPAN & BOULDERS	From	Casing Diameter	Weight	Hole Diameter	
CLAY	To	16 in. to	261 ft.	lbs./ft.	
FINE SAND & CLAY		Open Hole from ft. to ft.			
HARDPAN & BOULDERS		Screen YES Make JOHNSON EVERDUR Type			
VERY FINE SAND		Diameter	Slot/Gauze	Length	Set Between
SAND		16		20	260 ft. and 280 ft.
HARDPAN		Static Water Level			
SAND & GRAVEL		134 ft. from Land surface Date Measured 1949			
PUMPING LEVEL (below land surface)					
146.5 ft. after hrs.pumping 663 g.p.m.					
Well Head Completion					
Pitless adapter manufacturer Model					
<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade					
<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)					
Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No					
NO REMARKS					
Nearest Known Source of Contamination					
_feet _direction _type					
Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Pump <input type="checkbox"/> Not Installed Date Installed					
Manufacturer's name Model number __ HP _ Volts					
Length of drop Pipe _ft. Capacity _g.p.m Type Material					
Abandoned Wells Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Well Contractor Certification					
First Bedrock		Keys Well Co.	62012	KEYS WELL	
Last Strat sand +larger		License Business Name	Lic. Or Reg. No.	Name of Driller	
Aquifer Quat. Buried Artes. Aquifer					
Depth to Bedrock ft.					
County Well Index Online Report			201245		Printed 11/18/2013
					HE-01205-07



Minnesota Unique Well No.

**207137**

County Scott  
 Quad Belle Plaine North  
 Quad ID 91A

MINNESOTA DEPARTMENT OF HEALTH

**WELL AND BORING RECORD**

Entry Date 02/11/1988  
 Update Date 05/06/2005  
 Received Date

Minnesota Statutes Chapter 103I

<p>Well Name BELLE PLAINE CREAMERY</p> <p>Township Range Dir Section Subsections Elevation 845 ft.</p> <p>113 24 W 6 BCBCAB Elevation Method topographic map (+/- 5 feet)</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">Well Depth</td> <td style="width:33%;">Depth Completed</td> <td style="width:33%;">Date Well Completed</td> </tr> <tr> <td>248 ft.</td> <td>245 ft.</td> <td>12/04/1935</td> </tr> <tr> <td colspan="3">Drilling Method --</td> </tr> <tr> <td>Drilling Fluid</td> <td colspan="2">Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> <tr> <td>--</td> <td colspan="2">From Ft. to Ft.</td> </tr> <tr> <td colspan="3">Use Abandoned Status Sealed</td> </tr> <tr> <td>Casing Type</td> <td>Steel (black or low carbon)</td> <td>Joint No Information Drive Shoe? <input type="checkbox"/> Yes</td> </tr> <tr> <td colspan="3"><input type="checkbox"/> No Above/Below 0 ft.</td> </tr> <tr> <td>Casing Diameter</td> <td>Weight</td> <td>Hole Diameter</td> </tr> <tr> <td>8 in. to 225 ft.</td> <td>lbs./ft.</td> <td></td> </tr> <tr> <td colspan="3">Open Hole from ft. to ft.</td> </tr> <tr> <td>Screen YES</td> <td>Make JOHNSON EVERDUR</td> <td>Type</td> </tr> <tr> <td>Diameter</td> <td>Slot/Gauze</td> <td>Length</td> <td>Set Between</td> </tr> <tr> <td>8</td> <td></td> <td>20</td> <td>225 ft. and 245 ft.</td> </tr> <tr> <td colspan="3">Static Water Level</td> </tr> <tr> <td colspan="3">120 ft. from Land surface Date Measured 07/10/1978</td> </tr> <tr> <td colspan="3">PUMPING LEVEL (below land surface)</td> </tr> <tr> <td colspan="3">132 ft. after hrs.pumping 125 g.p.m.</td> </tr> <tr> <td colspan="3">Well Head Completion</td> </tr> <tr> <td colspan="3">Pitless adapter manufacturer Model</td> </tr> <tr> <td colspan="3"><input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade</td> </tr> <tr> <td colspan="3"><input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)</td> </tr> <tr> <td colspan="3">Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> <tr> <td colspan="3">Nearest Known Source of Contamination</td> </tr> <tr> <td colspan="3">_feet _direction _type</td> </tr> <tr> <td colspan="3">Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> <tr> <td colspan="3">Pump <input checked="" type="checkbox"/> Not Installed Date Installed</td> </tr> <tr> <td colspan="3">Manufacturer's name POMONA Model number __ HP 0 Volts</td> </tr> <tr> <td colspan="3">Length of drop Pipe _ft. Capacity _g.p.m Type Turbine Material</td> </tr> <tr> <td colspan="3">Abandoned Wells Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> <tr> <td colspan="3">Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> <tr> <td colspan="3">Well Contractor Certification</td> </tr> <tr> <td colspan="3">Keys Well Co. 62012</td> </tr> <tr> <td colspan="3">License Business Name Lic. Or Reg. No. Name of Driller</td> </tr> </table>	Well Depth	Depth Completed	Date Well Completed	248 ft.	245 ft.	12/04/1935	Drilling Method --			Drilling Fluid	Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No		--	From Ft. to Ft.		Use Abandoned Status Sealed			Casing Type	Steel (black or low carbon)	Joint No Information Drive Shoe? <input type="checkbox"/> Yes	<input type="checkbox"/> No Above/Below 0 ft.			Casing Diameter	Weight	Hole Diameter	8 in. to 225 ft.	lbs./ft.		Open Hole from ft. to ft.			Screen YES	Make JOHNSON EVERDUR	Type	Diameter	Slot/Gauze	Length	Set Between	8		20	225 ft. and 245 ft.	Static Water Level			120 ft. from Land surface Date Measured 07/10/1978			PUMPING LEVEL (below land surface)			132 ft. after hrs.pumping 125 g.p.m.			Well Head Completion			Pitless adapter manufacturer Model			<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade			<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)			Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No			Nearest Known Source of Contamination			_feet _direction _type			Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No			Pump <input checked="" type="checkbox"/> Not Installed Date Installed			Manufacturer's name POMONA Model number __ HP 0 Volts			Length of drop Pipe _ft. Capacity _g.p.m Type Turbine Material			Abandoned Wells Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No			Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No			Well Contractor Certification			Keys Well Co. 62012			License Business Name Lic. Or Reg. No. Name of Driller		
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<p><b>REMARKS</b></p> <p>NOW MARSHALL GULLITON CREATIVE TOOL CO                  WELL SEALED 10-03-1995 BY 27058                  ORIGINAL USE IN - INDUSTRIAL</p> <p>Located by: Minnesota Geological Survey Method: Digitized - scale 1:24,000 or larger (Digitizing Table)</p> <p>Unique Number Verification: N/A Input Date: 01/01/1990</p> <p>System: UTM - Nad83, Zone15, Meters X: 439115 Y: 4941614</p>	<p>First Bedrock Aquifer Quat. Buried Artes. Aquifer</p> <p>Last Strat sand Depth to Bedrock ft.</p>																																																																																																								
<p><b>County Well Index Online Report</b></p>	<p><b>207137</b></p>	<p>Printed 11/19/2013 HE-01205-07</p>																																																																																																							



71848  
207137

# WELL AND BORING SEALING RECORD

Minnesota Unique No. or W-Series No. (Leave blank if not known)

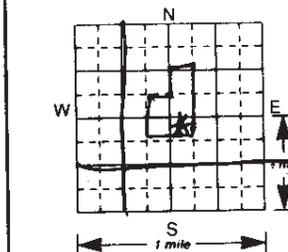
Minnesota Statutes, Chapter 1031

WELL OR BORING LOCATION  
County Name  
**SCOTT**

Township Name **BELLE PLAINE** Township No. **113** Range No. **24** Section No. **6** Fraction (sm. lg.)  $\frac{1}{4} \frac{1}{4} \frac{1}{4}$  Date Sealed **10/3/95**

Numerical Street Address or Fire Number and City of Well or Boring Location  
**100 E. STATE ST.**

Show exact location of well or boring in section grid with "X". Sketch map of well or boring location, showing property lines, roads, and buildings.



**126' EAST OF NORTH MERIDIAN STREET + 36' NORTH OF EAST STATE STREET**

Depth Before Sealing **242** ft. Original Depth \_\_\_\_\_ ft.

Static Water Level  Accurate  Approximate  
**120** ft.  below \_\_\_\_\_ above land surface

CASING TYPE  
 Steel  Plastic  Tile  Other \_\_\_\_\_

Screen from **228** to **242** ft. Open Hole from \_\_\_\_\_ to \_\_\_\_\_ ft.

OBSTRUCTION/DEBRIS/FILL  
 Obstruction  Debris  Fill  
Type of debris/obstruction \_\_\_\_\_  
Obstruction/Debris/Fill removed?  Yes  No

PUMP  
 Removed  Not Present  Other \_\_\_\_\_

GEOLOGICAL MATERIAL		COLOR	HARDNESS OF FORMATION	FROM	TO	Diameter	Depth	Set in oversize hole?	Annular space initially grouted?
If not known, indicate estimated formation log from nearby well or boring.						<b>8</b> in.	from <b>0</b> to <b>228</b> ft.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
						_____ in.	from _____ to _____ ft.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
						_____ in.	from _____ to _____ ft.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:  
 No Annular Space Exists  
 Annular space grouted with tremie pipe  
 Casing Perforation/Removal  
\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed  
\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed  
Type of perforator \_\_\_\_\_  
 Other \_\_\_\_\_

GROUTING MATERIAL  
Grouting material **NEAT CEMENT** from **0** to **242** ft. **4** yards \_\_\_\_\_ bags  
\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags  
\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags  
\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

UNSEALED WELLS AND BORINGS  
Other unsealed well or boring on property?  Yes  No

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION  
This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

**BERGERSON-CASWELL** **27058**  
Contractor Business Name License or Registration No.  
**John W. Henrich**  
Authorized Representative Signature Date **10/11/95**  
**THOMAS DVORAK**  
Name of Person Sealing Well or Boring



**795-5306**

MINN. DEPT. OF HEALTH COPY **H 71848**

K

2

# MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING SEALING RECORD

Minnesota Statutes, Chapter 103I

Minnesota Well and Boring Sealing No.  
Minnesota Unique No.  
or W-series No.  
(Leave blank if not known)

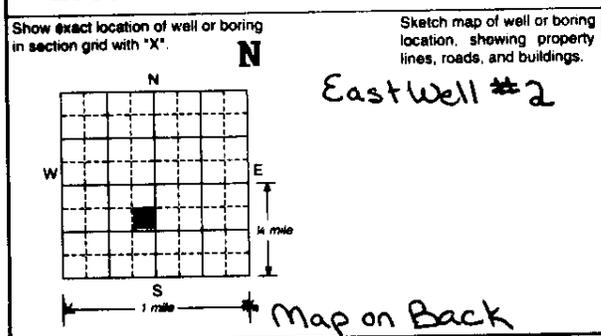
H 158804  
226757

WELL OR BORING LOCATION  
County Name

SCOTT  
Township Name Township No. Range No. Section No. Fraction (sm. → lg.) Date Sealed Date Well or Boring Constructed

BELLE PLAINNE 113 24 06 NE NE NE  
Numerical Street Address or Fire Number and City of Well or Boring Location

AUG 25, 1999  
Depth Before Sealing 287 ft Original Depth 287 ft



AQUIFER(S)  Single Aquifer  Multiaquifer  
WELL/BORING  Water Supply Well  Monit. Well  Env. Bore Hole  Other  
STATIC WATER LEVEL  Measured  Estimated  
138 ft  below  above land surface

PROPERTY OWNER'S NAME  
CITY OF BELLE PLAINNE  
Property owner's mailing address if different than well location address indicated above.

CASING TYPE(S)  Steel  Plastic  Tile  Other  
CASING Diameter 12 in. from 0 to 265 ft. Depth Set in oversize hole? Annual space initially grouted?  
 Yes  No  Yes  No  Unknown  
 Yes  No  Yes  No  Unknown  
 Yes  No  Yes  No  Unknown

420 E MAIN STREET P.O. BOX 6  
BELLE PLAINNE, MN 56011

SCREEN/OPEN HOLE  
Screen from 241 to 287 ft. Open Hole from \_\_\_\_\_ to \_\_\_\_\_ ft.

WELL OWNER'S NAME  
SAME  
Well owner's mailing address if different than property owner's address indicated above.

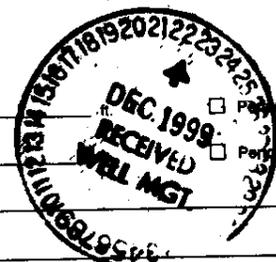
OBSTRUCTIONS  
 Rod/Drop Pipe  Check Valve(s)  Debris  Fill  No Obstruction  
Type of Obstructions (Describe) \_\_\_\_\_  
Obstructions removed?  Yes  No Describe \_\_\_\_\_

REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING

PUMP  
Type LST  
 Removed  Not Present  Other \_\_\_\_\_

GEOLOGICAL MATERIAL	COLOR	HARDNESS OF FORMATION	FROM	TO
HARD PAN			0	22
SAND/GRVL			22	58
HARD PAN			58	64
CLAY			64	110
SAND/CLAY			110	115
HARD PAN			115	185
FINE SAND			185	201
SAND			201	218
HARD PAN			218	241
SAND/GRVL			241	287

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:  
 No Annular Space Exists  
 Annular space grouted with tremie pipe  
 Casing Perforation/Removal  
\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed  
\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed  
Type of perforator \_\_\_\_\_  
 Other \_\_\_\_\_



GROUTING MATERIAL(S)  
CEMENT  
Grouting Material \_\_\_\_\_ from 0 to 287 ft. 8.5 yards \_\_\_\_\_ bags  
\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags  
\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags  
\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING  
GEOLOGY FROM: UN #226757  
WATER LEVEL IN ABOVE WELL: 138  
DATE WATER LEVEL TAKEN: 1955  
**SEALED**  
According to MN State Regulations  
158804

OTHER WELLS AND BORINGS  
Other unsealed and unused well or boring on property?  Yes  No How many? \_\_\_\_\_  
LICENSED OR REGISTERED CONTRACTOR CERTIFICATION  
This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.  
E.H. RENNER & SONS, INC. 71015  
Contractor Business Name License or Registration No.  
9/7/99  
Authorized Representative Signature  
KEVIN SCHEITLERLEIN/KEVIN HOPPE  
Date  
Name of Person Sealed Well or Boring  
5

00226757





Minnesota Unique Well No.

**213578**

County Scott  
 Quad Belle Plaine North  
 Quad ID 91A

MINNESOTA DEPARTMENT OF HEALTH

**WELL AND BORING RECORD**

Entry Date 02/11/1988  
 Update Date 05/06/2005  
 Received Date

Minnesota Statutes Chapter 103I

Well Name MINVALLEYMILK PROCESSIN		Well Depth	Depth Completed	Date Well Completed								
Township Range Dir Section Subsections Elevation 740 ft.		87 ft.	87 ft.	00/00/1943								
113 25 W 1 ABDAAC	Elevation Method topographic map (+/- 5 feet)	Drilling Method --										
<b>Geological Material</b> DRIFT  <table border="1"> <thead> <tr> <th>Color</th> <th>Hardness</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>0</td> <td>87</td> </tr> </tbody> </table>		Color	Hardness	From	To			0	87	Drilling Fluid --	Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No From Ft. to Ft.	
		Color	Hardness	From	To							
				0	87							
		Use Abandoned Status Sealed										
		Casing Type Joint No Information Drive Shoe? <input type="checkbox"/> Yes <input type="checkbox"/> No Above/Below 0 ft.										
		Casing Diameter 36 in. to 87 ft.		Weight lbs./ft.	Hole Diameter							
		Open Hole from 87 ft. to 87 ft.										
		Screen NO Make Type										
		Diameter		Slot/Gauze	Length	Set Between						
		Static Water Level 17 ft. from Land surface Date Measured 1943										
PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.												
Well Head Completion Pitless adapter manufacturer Model <input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)												
<b>REMARKS</b> GRAVEL PACKED WELL SEALED 10-19-1993 BY 27022  Located by: Minnesota Geological Survey Method: Digitized - scale 1:24,000 or larger (Digitizing Table) Unique Number Verification: N/A Input Date: 01/01/1990 System: UTM - Nad83, Zone15, Meters X: 438614 Y: 4941951		Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No										
		Nearest Known Source of Contamination _feet _direction _type										
		Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No										
		Pump <input type="checkbox"/> Not Installed Date Installed Manufacturer's name Model number __ HP 0 Volts Length of drop Pipe _ft. Capacity _g.p.m Type Material										
		Abandoned Wells Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No										
		Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No										
First Bedrock Last Strat Quaternary deposit		Well Contractor Certification Layne Well Co. 27010 License Business Name Lic. Or Reg. No. Name of Driller										
<b>County Well Index Online Report</b>		<b>213578</b>		Printed 11/19/2013 HE-01205-07								

J

Minnesota Well and Boring Sealing No.

H 43406  
213578

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING SEALING RECORD  
Minnesota Statutes, Chapter 103I

Minnesota Unique No. or W-series No. (Leave blank if not known)

WELL OR BORING LOCATION  
County Name *Scott*

Township Name *113* Township No. *25* Range No. *1* Section No. *1* Fraction (sm. - lg.) *1/4 1/4 1/4*

Date Sealed *10-19-93*

Approximate Date Well or Boring Constructed *1942*

Numerical Street Address or Fire Number and City of Well or Boring Location  
*W. end of Beaver St. W., S of RR tracks*

Depth Before Sealing *Open to 132 ft. in 1961*

Original Depth *902* ft.

Show exact location of well or boring in section grid with "X".

Sketch map of well or boring location, showing property lines, roads, and buildings.

Static Water Level  Accurate  Approximate

Single Aquifer  Multiaquifer

*14* ft.  below  above land surface

CASING TYPE

Steel  Plastic  Tile  Other

Screen from *12" (80' to 70')* to *10" (119' to 132')* ft. Open Hole from \_\_\_\_\_ to \_\_\_\_\_ ft.

OBSTRUCTION/DEBRIS/FILL

Obstruction  Debris  Fill

Type of debris/obstruction \_\_\_\_\_

Obstruction/Debris/Fill removed?  Yes  No

PUMP

Removed  Not Present  Other

CASING

Diameter \_\_\_\_\_ Depth *27'* Set in oversize hole?  Yes  No Annular space initially grouted?  Yes  No

*12* in. from *27'* to *90'* ft.  Yes  No  Yes  No *Hand packed*

*10* in. from *70'* to *132'* ft.  Yes  No  Yes  No *Hand packed*

\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Yes  No  Yes  No  Unknown

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:

No Annular Space Exists

Annular space grouted with tremie pipe *NA*

Casing Perforation/Removal

\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed

\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed

Type of perforator \_\_\_\_\_

Other \_\_\_\_\_

GROUTING MATERIAL

Grouting material *Neat Cement* from *0* to *132* ft. *4* yards \_\_\_\_\_ bags

\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

UNSEALED WELLS AND BORINGS

Other unsealed well or boring on property?  Yes  No

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

*McCarthy Well Co.* *27022*  
Contractor Business Name License or Registration No.

*Milam E. McCarthy* *11-10-93*  
Authorized Representative Signature Date

*MEM, KAA*  
Name of Person Sealing Well or Boring

PROPERTY OWNER'S NAME

*Scott County Environmental Health Dept*

Mailing Address if different than property address indicated above.

*428 S. Holmes St. - Courthouse A102*

*Shakopee, MN. 55379*

GEOLOGICAL MATERIAL COLOR HARDNESS OF FORMATION FROM TO

If not known, indicate estimated formation log from nearby well or boring.

*Clay* *0' 27'*

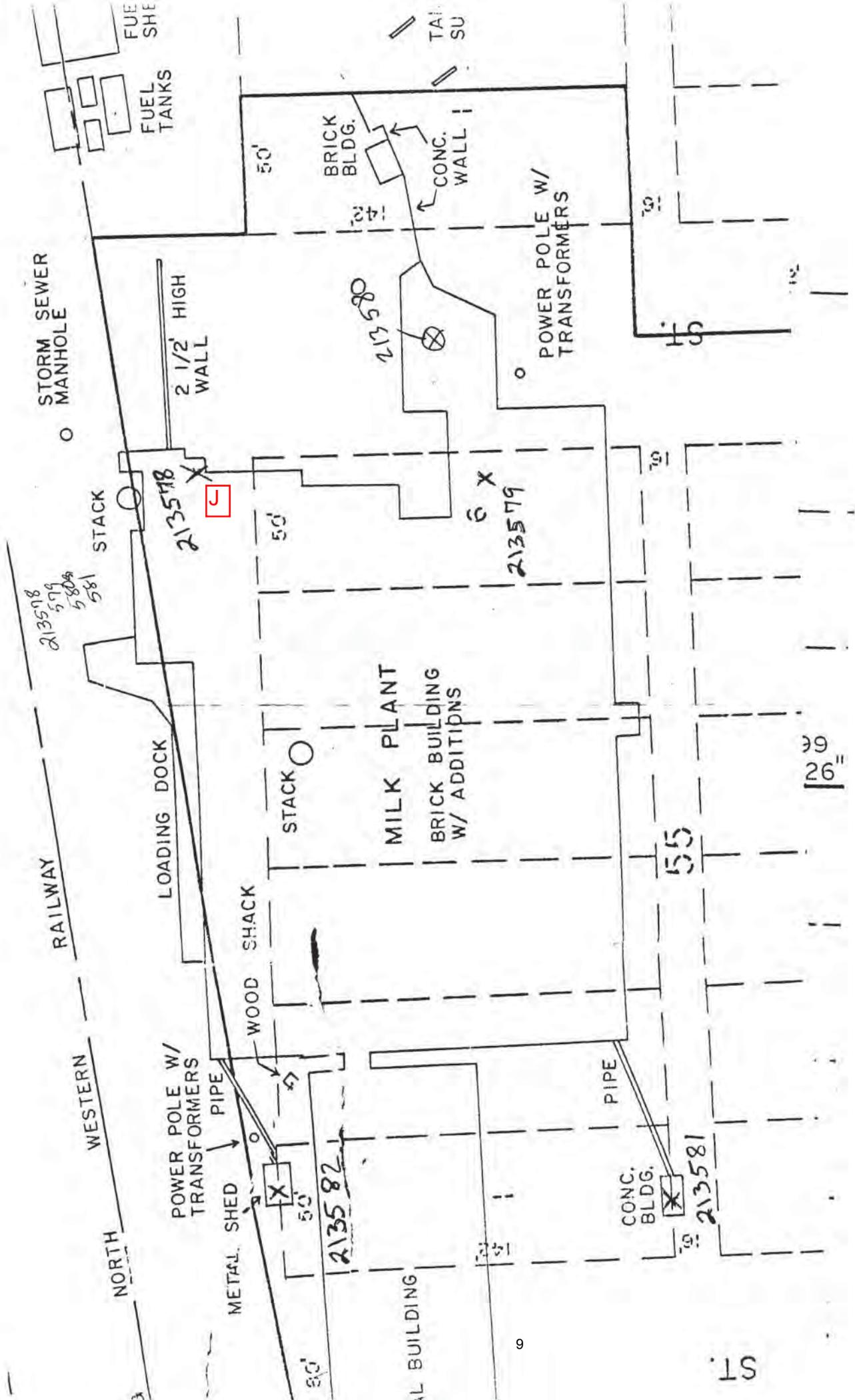
*Drift* *27' 132'*

REMARKS. SOURCE OF DATA, DIFFICULTIES IN SEALING



MINN. DEPT OF HEALTH COPY

H 43406





**MN Valley Milk Plant Well**

Minnesota Well and Boring Sealing No.

H 43407 &  
213579 P

MINNESOTA DEPARTMENT OF HEALTH

**WELL AND BORING SEALING RECORD**  
Minnesota Statutes, Chapter 103I

Minnesota Unique No. or W-series No. (Leave blank if not known)

**WELL OR BORING LOCATION**

County Name Scott  
Township Name \_\_\_\_\_ Township No. 113 Range No. 25 Section No. 1 Fraction (sm. - lg.) 1/4 1/4 1/4 Date Sealed 10-27-93 Approximate Date Well or Boring Constructed 1944

Numerical Street Address or Fire Number and City of Well or Boring Location  
W. end of Beaver St. W., S. of RR tracks.

Show exact location of well or boring in section grid with "X". Sketch map of well or boring location, showing property lines, roads, and buildings.

Depth Before Sealing 74 ft. Original Depth 74 ft.

Static Water Level  Accurate  Approximate  
14 ft.  below  above land surface

Single Aquifer  Multiaquifer

**CASING TYPE**  
 Steel  Plastic  Tile  Other \_\_\_\_\_

Screen from 12" 55 to 74 ft. Open Hole from \_\_\_\_\_ to \_\_\_\_\_ ft.

**OBSTRUCTION/DEBRIS/FILL**  
 Obstruction  Debris  Fill

Type of debris/obstruction \_\_\_\_\_

Obstruction/Debris/Fill removed?  Yes  No

**PUMP**  
 Removed  Not Present  Other \_\_\_\_\_

**CASING**

Diameter \_\_\_\_\_ Depth \_\_\_\_\_ Set in oversize hole?  Yes  No Annular space initially grouted?  Yes  No  Unknown

12 in. from 0 to 55 ft.  Yes  No  Yes  No  Unknown

\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Yes  No  Yes  No  Unknown

\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Yes  No  Yes  No  Unknown

**METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:**

No Annular Space Exists

Annular space grouted with tremie pipe  Casing Perforation/Removal \*

12 in. from 30' to 25' ft.  Perforated  Removed

\_\_\_\_\_ in. from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed

Type of perforator Directional Charge

Other \_\_\_\_\_

**GROUTING MATERIAL** \*

Grouting material Neat Cement from 0 to 74 ft. 11.25 yards \_\_\_\_\_ bags

\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

\_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

**UNSEALED WELLS AND BORINGS**  
Other unsealed well or boring on property?  Yes  No

**LICENSED OR REGISTERED CONTRACTOR CERTIFICATION**  
This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Contractor Business Name McCarthy Well Co. License or Registration No. 27022  
Authorized Representative Signature Milvan E. McCarthy Date 11-10-93  
Name of Person Sealing Well or Boring MEM, KAA

PROPERTY OWNER'S NAME  
Scott County Environmental Health Dept.

Mailing Address if different than property address indicated above.  
428 Holmes St. S. - Court House A102

Shakopee, MN. 55379

**GEOLOGICAL MATERIAL** **COLOR** **HARDNESS OF FORMATION** **FROM** **TO**

If not known, indicate estimated formation log from nearby well or boring.

Clay \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ 0' 27'

Drift \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ 27 74'

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

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\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

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\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

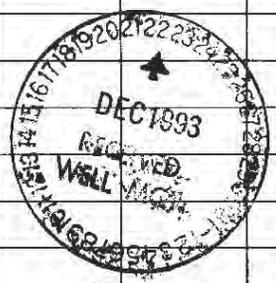
\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

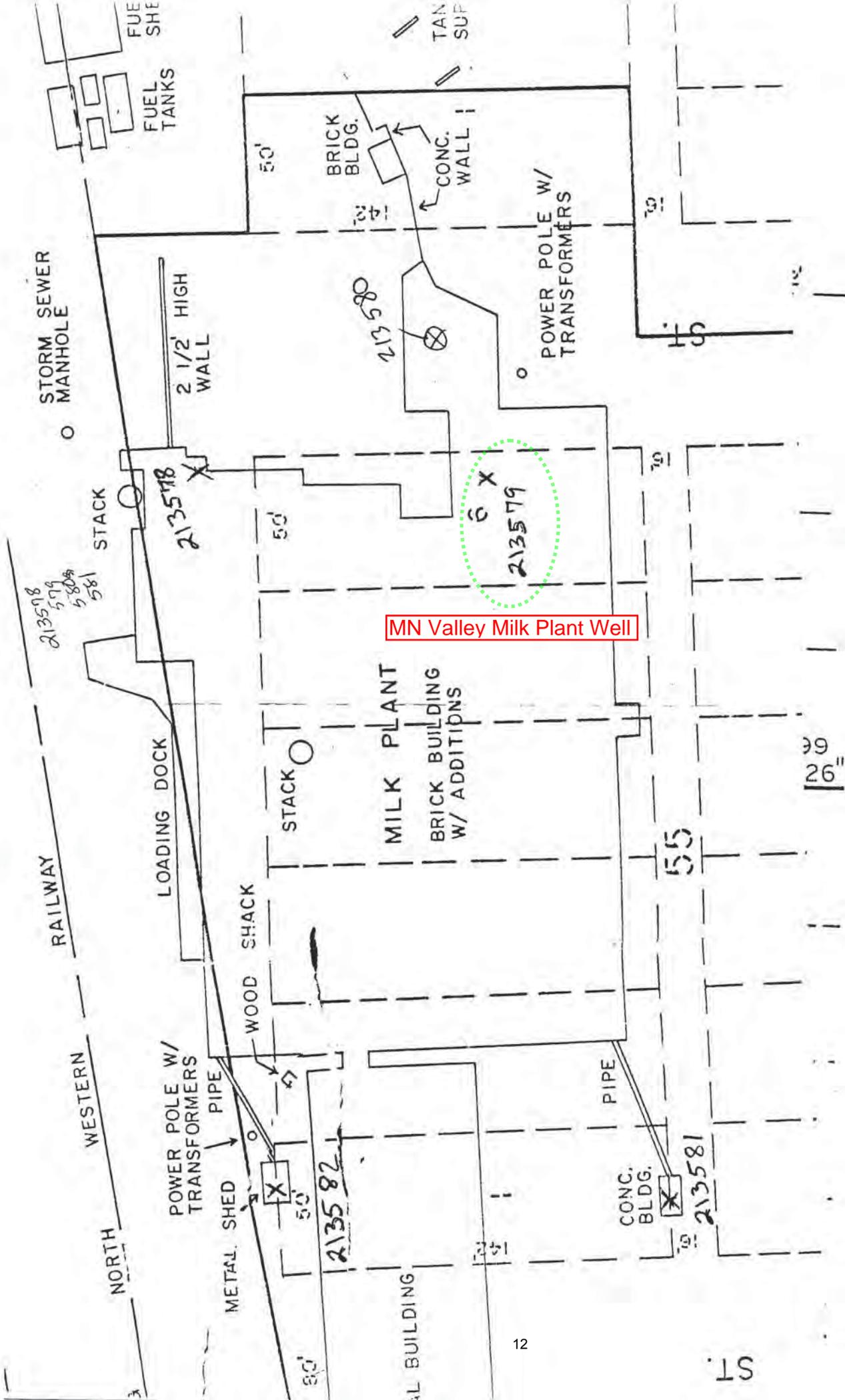
\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

MINN. DEPT OF HEALTH COPY

H 43407



**REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING**  
\*The well was grouted from 74' to 30', the 12" casing was perforated w/4 shots per foot from 30' to 25' at 90° phasing, 7cuyds of annulus gravel pack was bailed out of the 12" casing thru the perforation, the well was then grouted from 30' to the surface w/tremie pipe installed into the casing + annulus.



**MN Valley Milk Plant Well**

MINNESOTA DEPARTMENT OF HEALTH

Sealing No

H

4341-L  
213580

**WELL BORING SEALING RECORD**  
Minnesota Statutes, Chapter 103I

Minneapolis Unique No  
or W-series No

**WELL OR BORING LOCATION**

County Name: Scott

Township Name: Belle Plaine Township No: 113 Range No: 25 Section No: 1 Fraction (S, M, N, E, W, NE, SE, SW, NW, etc.): SE, NW, NE

Date Sealed: 12-17-93

Approximate Date Well or Boring Constructed: 1953

Numerical Street Address or Fire Number and City of Well or Boring Location: W end of Beaver St. W, S. of RR tracks

Depth Before Sealing: 132 ft. Original Depth: 132 ft.

Static Water Level:  Accurate  Approximate  
14 ft  below  above land surface

Single Aquifer  Multi-aquifer

CASING TYPE: + Concrete  
 Steel  Plastic  Tile  Other

Screen from 13' 10" x 17' 10" to 132' ft. Open Hole from \_\_\_\_\_ to \_\_\_\_\_ ft.

OBSTRUCTION/DEBRIS/FILL:  Obstruction  Debris  Fill  
Type of debris-obstruction: Poured concrete + gravel pack  
Obstruction/Debris/Fill removed?  Yes  No peacock + sand.

PUMP:  Removed  Not Present  Other

CASING: Diameter \_\_\_\_\_ Depth \_\_\_\_\_ Set in oversize hole?  Yes  No Annular space initially grouted?  Yes  No thru pack

GEOLOGICAL MATERIAL	COLOR	HARDNESS OF FORMATION	FROM	TO
<u>Clay</u>			<u>0' 10'</u>	<u>10'</u>
<u>Drift</u>			<u>10'</u>	<u>132'</u>

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:  
 No Annular Space Exists  
 Annular space grouted with tremie pipe  
 Casing Perforation/Removal  
Steel 10" in. from 0' to 105' ft.  Perforated  Removed  
Concrete 13" x 17" in. from 20' to 25' ft.  Perforated  Removed  
Type of perforator: Directional Chauger  
 Other

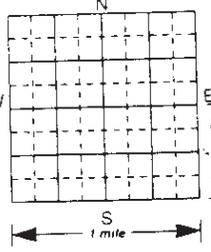
GROUTING MATERIAL:  
Grouting material: Neat Cement from 0' to 10' ft. \_\_\_\_\_ yards \_\_\_\_\_ bags  
" " from 25' to 132' ft. \_\_\_\_\_ yards \_\_\_\_\_ bags  
Total 7.5 yards \_\_\_\_\_ bags

UNSEALED WELLS AND BORINGS: Other unsealed well or boring on property?  Yes  No

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION: This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Contractor Business Name: McCarthy Well Co. License or Registration No: 270222  
Authorized Representative Signature: Melan E. McCarthy Date: 10-20-93  
Name of Person Sealing Well or Boring: MEM, KAA

See attached Maps.

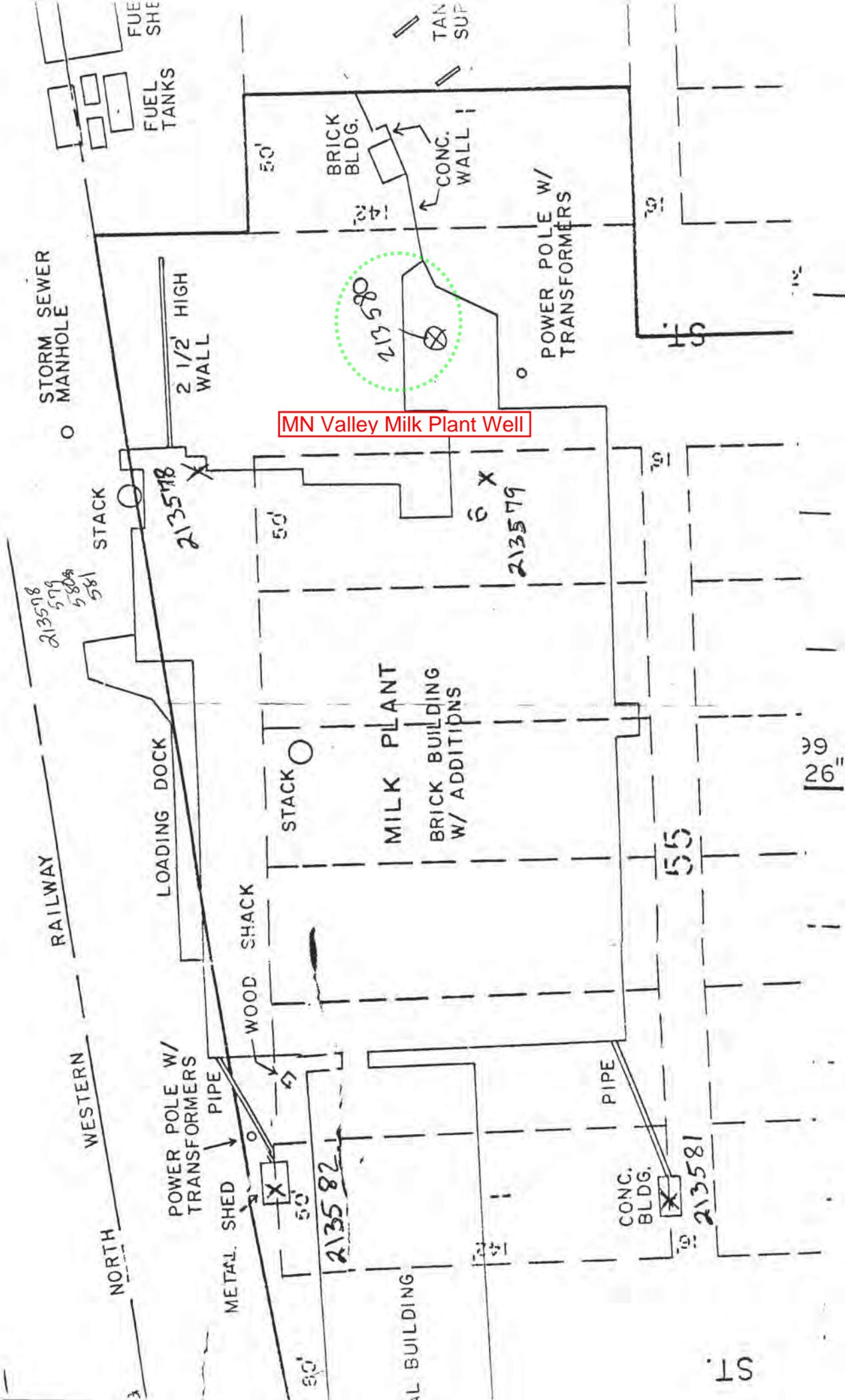


PROPERTY OWNER'S NAME: Scott County Environmental Health Dept  
Mailing Address if different than property address indicated above:  
428 Holmes St. Court House. A102  
Shakopee, MN. 55379

ADDITIONAL DATA ADDED TO THIS DOCUMENT  
MAR 17 1994  
DATA RECEIVED  
From: \_\_\_\_\_ By: \_\_\_\_\_

REMARKS. SOURCE OF DATA, DIFFICULTIES IN SEALING  
\* After considerable bailing to remove the gravel pack peacock + sand from 25' to the surface, the well was grouted from 10' to the surface per approval of Jim Stevens at the MOH.

H 43412



MN Valley Milk Plant Well

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING SEALING RECORD**  
 Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No.

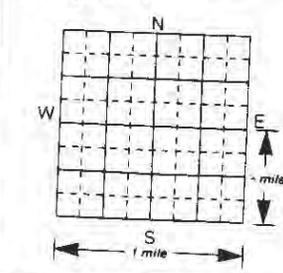
Minnesota Unique No or W-series No (Use a blank line if shown)

H ~~43405~~ E  
**213581**

**WELL OR BORING LOCATION**

County Name Scott  
 Township Name Belle Plaine Township No 113 Range No 25 Section No 1 Fraction (sm - lg) SE - NW - NE  
 Date Sealed 10-19-93

Numerical Street Address or Fire Number and City of Well or Boring Location  
Head of Bauer St. W., S of RR tracks



See attached map.

Approximate Date Well or Boring Constructed 1957  
 Depth Before Sealing 175 ft Original Depth 175 ft

Static Water Level  Accurate  Approximate  
30 ft  below  above land surface

CASING TYPE  
 Steel  Plastic  Tile  Other

Screen from 147 to 175 13" 10 x 17" 00 concrete ft Open Hole from \_\_\_\_\_ to \_\_\_\_\_ ft

OBSTRUCTION/DEBRIS/FILL  
 Obstruction  Debris  Fill  
 Type of debris/obstruction Sand + pea gravel pack 128' to 175'  
 Obstruction/Debris/Fill removed?  Yes  No

PUMP  
 Removed  Not Present  Other

PROPERTY OWNER'S NAME  
Scott County Environmental Health Dept.  
 Mailing Address if different than property address indicated above  
428 Holmes St. - Court House A102  
Shakopee, MN. 55379

GEOLOGICAL MATERIAL COLOR HARDNESS OF FORMATION FROM TO

GEOLOGICAL MATERIAL	COLOR	HARDNESS OF FORMATION	FROM	TO
<u>Clay</u>			<u>0' 35'</u>	
<u>Drift</u>			<u>35' 175'</u>	

CASING  
 Diameter 12" TC Depth 13'  
12 in. from 13' to 147 ft.  Yes  No  
 Set in oversized hole?  Yes  No  
 Annular space initially grouted?  Yes  No  Unknown

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:  
 No Annular Space Exists  
 Annular space grouted with tremie pipe NA  
 Casing Perforation/Removal  
 \_\_\_\_\_ in from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed  
 \_\_\_\_\_ in from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed  
 Type of perforator: \_\_\_\_\_  
 Other \_\_\_\_\_

GROUTING MATERIAL  
 Grouting material Neat Cement from 0 to 175 ft 6 yards \_\_\_\_\_ bags  
 \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags  
 \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags  
 \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ yards \_\_\_\_\_ bags

UNSEALED WELLS AND BORINGS  
 Other unsealed well or boring on property?  Yes  No

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION  
 This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.  
McCarthy Well Co. 27022  
 Contractor Business Name License or Registration No.  
Milan E. McCarthy 11-10-93  
 Authorized Representative Signature Date  
MEM KAA  
 Name of Person Sealing Well or Boring

ADDITIONAL DATA ADDED TO THIS DOCUMENT  
**MAR 17 1994**  
 DATA RECEIVED  
 From: \_\_\_\_\_ By: \_\_\_\_\_

REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING



226757

226757 [K]

U. S. DEPT. OF THE INTERIOR

WELL SCHEDULE  
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION CA

MASTER CARD

Record by D. M. DARON Source of data Mueller Well Co Date 1955 Map B Plain land #2

State MINNESOTA County SCOTT #2

Latitude: 45° 13' 00" N Longitude: 92° 24' 00" W

Lat-long at center: 1130° 24' 00" S

Well number: 113 N 24 W 06 NE SE

Local name: MUELLER WELL CO Other number: #2 West Well

Owner or name: BELLE PLATINE Owner or name: P. A. 80-6176

Ownership: (C) County, Fed Gov't, City, Corp or Co, Private, State Agency, Water Dist

Use of water: (A) Air cond, (B) Bottling, (C) Comm, (D) De-water, (E) Power, (F) Fire, (G) Dom, (H) Irr, (I) Mad, (J) Ind, (K) P S, (L) Rec, (M) Stock, (N) Inact, (O) Unused, (P) Re-charge, (Q) Recharge, (R) Dual-P S, (S) Dual-other, (T) Other

Use of well: (A) Anode, (B) Drain, (C) Seismic, (D) Heat Res, (E) Obs, (F) Oil-gas, (G) Recharge, (H) Test, (I) Unused, (J) Withdraw, (K) Waste, (L) Destroyed

DATA AVAILABLE: Well data  Freq. W/L meas.:  Field aquifer char.

Hyd. lab. data:

Qual. water data; type:

Freq. sampling:  Pumpage inventory:  yes  no  period:

Aperture cards:  yes  no

Log data:

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD

Depth well: 280 ft Meas. 6

Depth cased; (filtr perf.): 254 ft Casing type: steel accuracy 1/2

Finish: (C) porous concrete, (D) gravel w. (perf.), (E) gravel w. (screen), (F) horiz. gallery, (G) horiz. open end, (H) open perf., (I) screen, (J) sd. pt., (K) shored, (L) open hole, (M) other

Method drilled: (A) air rot., (B) bored, (C) cable dug, (D) hyd jetted, (E) air rot., (F) percussion, (G) reverse, (H) rotary, (I) trenching, (J) driven, (K) drive wash, (L) other

Date drilled: 9.5.55 Pump intake setting: 50 ft

Driller: A. T. ... name Gaylord address 50

Lift (type): (A) air, (B) bucket, (C) cent, (D) jar, (E) multiple, (F) multiple (cent.), (G) none, (H) piston, (I) rot, (J) submerg, (K) turb, (L) other

Power (type): (A) diesel, (B) gas, (C) gasoline, (D) hand, (E) gas, (F) wind, (G) H.P.

Descrip. MP 50 ft above LSD, Alt. MP 50

Alt. LSD: 50 ft above MP; 50 ft below LSD

Water Level: 50 ft above MP; 50 ft below LSD

Data meas: 50 Accuracy: 50

Drawdown: 50 ft Accuracy: 50 Method determined: 50

QUALITY OF WATER DATA: Iron, Sulfate, Chloride, Hard, Sp. Conduct, Taste, color, etc.

very low from well #1

QBAA

Well No. 113-24-6-02

11180  
SW. A.S.  
11173  
check  
well #1  
11173  
11179

Minnesota Unique Well No.

**221445**

County Scott  
 Quad Belle Plaine North  
 Quad ID 91A

MINNESOTA DEPARTMENT OF HEALTH

**WELL AND BORING RECORD**

Entry Date 02/11/1988  
 Update Date 06/09/2010  
 Received Date

Minnesota Statutes Chapter 103I

Well Name BELLE PLAINE SALT WELL 1		Well Depth	Depth Completed	Date Well Completed
Township Range Dir Section Subsections Elevation		710 ft.	710 ft.	1873
113	25 W 1 BBAD	Elevation Method	topographic map (+/- 5 feet)	
<b>Geological Material</b> SOIL & GRAVEL CLAY & GRAVEL SAND & GRAVEL QUICKSAND COARSE SAND CLAY SAND GRAVEL & QUICKSAND CLAY ROCK FRAGMENTS GRAVEL SHELLY ROCK SANDSTONE CLAY GRANULES OF CHIPS FRAGMENTS OF CLAY ROCK FRAGMENT FRAGMENTS OF CLAY & CALCITE WEATHERED BASALT FRESH BASALT		Color	Hardness	From To
		BLUE		0 9 9 18 18 36 36 90 90 91 91 97 97 135 135 180 180 187 187 200 200 202 202 210 210 242 242 368 368 380 380 385 385 390 390 420 420 430 430 710
		PUR/WHT		
		RED/WHT		
		WHITE		
<b>REMARKS</b>		111 WINCHELL 1873 & SAMPLES DESCRIBE 210-710 FEET LOG TO 210 FEET FROM WINCHELL 1872 SAMPLES FROM 420-620 FEET MGS NO.		
Located by: Minnesota Geological Survey Unique Number Verification: Other, note in remarks System: UTM - Nad83, Zone15, Meters		Method: Digitized - scale 1:24,000 or larger (Digitizing Table) Input Date: 01/01/1990 X: 438209 Y: 4941956		
Cuttings Yes First Bedrock Mt.Simon Sandstone Last Strat Chengwatana Volcanic Grp.		Aquifer Depth to Bedrock 202 ft.		
<b>County Well Index Online Report</b>		<b>221445</b>		
		Printed 11/18/2013 HE-01205-07		

## Salt Well History

# Exploring Minnesota's Natural History

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## Results tagged "Belle Plaine"

### The Survey, Year II: It could use a little salt...

 +1 0

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By wils0952 on November 4, 2013 3:19 PM

In our [previous post](#) regarding the initial evaluation of the progress made by State Geologist Newton Horace Winchell in the first year of the implementation of the Minnesota Geological and Natural History Survey, we ended with the following question and prompt:

*"With added responsibility, greater authority, a higher budget, and a full season available to conduct fieldwork--a significant improvement to his "means at disposal"-- how would the reconnaissance of the second year of the Geological and Natural History Survey of Minnesota be described? Hasty and incomplete, or concise and comprehensive?"*

*Access [The Second Annual Report for the year 1873 on the Digital Conservancy](#) to find out."*

For those of you who didn't read ahead, the work conducted during the second year of the Survey could be described as a concise and comprehensive effort at *course-correction*. Prior to the formal establishment of the state geological survey in 1872, the state legislature made investments to develop the potential economic output of Minnesota's natural resources. One measure, a 1870 land grant to aid the Belle Spring Salt Company in the development of a salt spring, would later influence the work of the State Geologist, as well as have direct financial impact upon the progression of the Survey.

In 1857, when incorporated as a state, Minnesota was granted 72 sections of land (containing 12 salt springs and six sections of land adjacent to each) by the U.S. government. In 1870, a large tract of the designated "salt lands" was granted by the state legislature to the Belle Plaine Salt Company to aid in the development of a salt springs at the company's site in [Belle Plaine](#), Scott County, Minnesota. "*An Act to aid the Belle Plaine Salt Company in the development of a Salt Springs at Belle Plaine*," outlined the stipulations of the grant. The land was to be awarded on the basis of the expenditures the company made for machinery, material, and labor in the development of the spring to produce salt for manufacture. The act stipulated the state legislature's rights to the development and realization of the springs in Section 4, which stated that if the Belle Plaine Salt Company was successful in the production of brines, the state would impose "*a duty of one cent per bushel of fifty-six pounds on all salt manufactured*" to be collected by "*whatever rules and regulations deemed necessary*."

To place added scrutiny to the arrangement, "*An Act to aid the Belle Plaine Salt Company*" was amended by the state legislature on March 4, 1871 in "*An Act to further aid the Belle Plaine Salt Company...*". The further aid came with further stipulation. In order to obtain additional lands under the act, the company's site and surrounding area would have to be evaluated by a qualified geologist, who after identifying and studying the geological composition of the vicinity of Belle Plaine, would produce a favorable report:

*"Provided, That before said company shall receive any benefits from the foregoing provisions or do any act or thing which shall entitle said company to receive the title to any of the lands therein mentioned, or to any lien thereon, or rights thereto, they shall employ a competent and practical geologist to be named and selected by the governor of the state, to make a thorough geological survey of the grounds where the works of the said company are located, and of the adjacent territory, and procure the opinion of such geologist as to the probabilities of a deposit of salt being ground in paying quantities in that neighborhood, and as to its definite location, if any. Such opinion shall be in writing and filed with the governor. If in the opinion of such geologist there is a deposit of salt at the point where said company are now boring for the same, or in that vicinity, which is accessible to mining in quantities that may be profitably worked, and that such deposit can be located with reasonable certainty. If such opinion shall not be procured, or be*

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*adverse, then, and in such case, that part of this act preceeding this proviso shall have no force or effect. "*

In the summer of 1871, [Governor Horace A. Austin](#) appointed [Alexander Winchell](#), director of the Geological Survey of Michigan, to make an evaluation of the Belle Plaine site. Alexander Winchell surveyed the Belle Plaine well and surrounding area in June of that year and sent an official report to Governor Austin titled "[Report of a geological survey of the vicinity of Belle Plaine, Scott County, Minn](#)" on June 17, 1871. Alexander Winchell stated the purpose of his work in the report, which was to "*form an opinion of the prospect of obtaining brine at Belle Plaine, or in its vicinity, of sufficient strength to sustain the manufacture of salt.*" After several pages of a description of salt, brine, and the circumstances related to the composition and presence of [saliferous](#) geological formations, Alexander Winchell described the various samples that he identified at Belle Plaine and came to the following determination: "*Although I am unable, for reasons already stated, to report favorably in reference to the prospect of obtaining brine at Belle Plaine, I entertain a decided conviction that it would be judicious to make a further expenditure at that place.*" Alexander Winchell recommended that the well at Belle Plaine be drilled deeper - to the point that it reached the bottom of the layer of [Potsdam sandstone](#). He outlined his reasons in the report:

*"The results are of public utility. Even if possessing no positive value, mere negative results are valuable, as indicating in what formations, and under what circumstances to expect nothing. Negative results, systematically and reliably attained, may save many ventures and expenditures hereafter... it is a public, more than a private interest, which is concerned in exploring this sand stone; and it would be good public policy if the State would provide for the expense. This locality is the proper one for the experiment, since by far the most expensive portion of the undertaking has now been completed, in sinking a substantial six-inch pipe through the boulder drift two hundred feet, to the surface of the friable sand rock."*

According to the [Second Annual Report](#) of the Minnesota Geological and Natural History Survey, the Belle Plaine well was drilled to a greater depth in 1872 following Alexander Winchell's recommendation. In July of 1872, samples of soil and rock procured from drillings between the depths of 242 to 411 feet were prepared and sent to Alexander Winchell to be examined. In a letter to Governor Horace Austin dated August 12, 1872, Alexander Winchell relayed that he "*made a pretty thorough physical examination of the specimens and reviewed all that has been published on the question of their identification and their relationship to the geology of Belle Plaine.*" Following a description of the specimens, classifications and observations, Alexander Winchell reported to the governor, "***there is no hope, either of salt or a well of fresh water, by boring deeper, and not another dollar ought to be expended in this hope.***" He concluded, "***The fault committed here as in so many other cases, was an attempt to proceed independently of geological knowledge in the beginning, and to call for scientific aid, not so much to guide an important enterprise, as to help it out of difficulty.***"

Alexander Winchell's letter to Governor Austin, which included the second assessment of the Belle Plaine well, came just one month after Alexander's younger brother, Newton Horace Winchell, appeared in front of the University of Minnesota's Board of Regents on July 15 1872 and accepted the assignment of implementing the Minnesota Geological and Natural History Survey as the State Geologist for Minnesota.

Following the [general reconnaissance](#) that Newton Winchell made in his first year of the Minnesota survey, his second year at the helm would begin by following up on his older brother Alexander's observations of the Belle Plaine well. In February of 1873, Governor Austin ordered Newton Winchell to make an assessment of the well, which by then had reached a depth of 700 feet. After examination, Newton Winchell submitted a report to the governor that corroborated his brother's earlier conclusions, "***I have no hesitation in saying that in the rocks of that age there is almost a certainty that no salt would be obtained, and that no lower formation would offer better inducement to sink the well deeper.***"

So what would become of the Belle Plaine Salt Company? Apparently, the opinions of the brother geologists proved to be adverse towards the presence of salt in the geological structure at Belle Plaine, casting "*An act to aid the Belle Plaine Salt Company*" to have "*no force or effect.*" One month after Newton Winchell's conclusion was turned over to the governor, on March 10, 1873, the state legislature passed "*An act to aid the Geological and Natural History Survey of the State...*," an amendment to the original March 1, 1872 act that created the Survey. Section 1 reveals the effect of the amendment:

*"Section 1. The state lands known as "state salt lands," donated by the general government to aid in the development of the brines in the state of Minnesota, shall be transferred to the custody and control of the board of regents of the [U]niversity of*

*Minnesota. By said board of regents these lands may be sold in such manner, or in such amounts, consistent with the laws of the state of Minnesota, as they may see fit, the proceeds thereof being held in trust by them, and only disbursed in accordance with the law ordering a geological and natural history survey of the state."*

In addition to an annual appropriation of \$2000, proceeds from the sale of the salt lands were granted to the Survey, thus making amends for previous ill-informed geological endeavors by providing a base of support to fund further explorations of the natural resources of the state.

The 1873 act to aid the Survey also came with a stipulation that ultimately guided how Newton Winchell would spend the remainder of his second year of Survey work:

*"Sec. 3. The board of regents of the [U]niversity of Minnesota, shall cause the immediate survey and investigation of the peat deposits of the state of Minnesota, accompanied by such tests and chemical examination as may be necessary to show their economical value, and their usefulness for the purposes of common fuel, a full report thereon to be presented to the legislature as soon as practicable."*

Stay tuned for part 2 of The Survey - Year II, where Winchell, by then *well-seasoned* in his Survey experience, launched a full investigation on the presence of peat in Minnesota.

**Tags:** Alexander Winchell, Belle Plaine, brine, drill, Governor Horace Austin, Michigan, Newton Horace Winchell, peat, Potsdam sandstone, saliferous, salt, Scott County, well

Belle Plaine

3/24/24

to

~~7/7/87~~

2/13/84

MINNESOTA STATE BOARD OF HEALTH  
Division of Sanitation  
REPORT ON WATER SUPPLY OF BELLE PLAINE  
March 24, 1924.

This water supply is obtained from five driven wells. The water is pumped to an elevated steel tank from which it is distributed by gravity for public consumption. **A, B, C, D, E** The wells are 30 feet in depth and located on the bank of the Minnesota River. The wells are cased with 6 inch iron pipe and enclosed in manholes extending about one foot above the ground surface. The covers on these manholes are of the flush type and not provided with locks. The pump is located on the floor of the pump pit about 8 feet below the surface of the ground. Drainage from this pit is maintained by means of an automatic ejector which discharges the waste water from a sump in which it collects. Water is drawn from the wells by means of a motor driven triplex pump having a rated capacity of 100 gallons per minute. The surface drainage around the pump station is not good and it is stated that it times surface water has entered the door and flowed into the pit. The pump discharges into the distribution system while the overflow collects in an elevated steel tank having a capacity of 50,000 gallons. The hatchway to the tank was open. The sanitary aspect of this supply is satisfactory.

Analytical data: See analytical sheet attached. Samples Nos. 22307, 22308 and 22309 represent water collected from the pump 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 absence of the B. coli group in 100 c.c. amounts in all cases. The physical examination of sample No. 22307 shows a water with very low turbidity, low color and a faint earthy odor. The

MINNESOTA DEPARTMENT OF HEALTH  
Division of Sanitation

Report on the Water Supply of Belle Plaine

January 14, 1928

**A, B, C, D, E**

The public water supply for the city of Belle Plaine is obtained from five driven wells about 30 feet in depth located at the pump station near the railway station. The water is pumped directly into the distribution system for public consumption, while the overflow collects in an elevated steel tank of 50,000 gallons capacity. The wells are cased with six-inch iron pipe and enclosed in manholes extending about one foot above the ground surface. The covers on these manholes are of the flush type and not provided with locks. The pump is located on the floor of the pump pit about eight feet below the surface of the ground. Drainage from this pit is maintained by means of a manual-controlled ejector which discharges the waste water from a sump in which it collects to the surface of the ground. Water is drawn from the wells by means of a motor driven triplex pump having a rated capacity of 100 gallons per minute. The surface drainage around the pump station is not good and it is stated that at times surface water has entered the door and flowed into the pit. The pit is not large enough to provide for proper working space around the pump. Grease and waste water which accumulate on the floor of the pit create an unsatisfactory condition. The field work shows that the construction of the supply was such that improvements should be made, while the analytical results showed that Pump pits and subground level pump rooms require special drainage systems, which often get out of order. On account of the difficulty of maintaining such pits or pump rooms in a dry, sanitary condition at all times, they are not considered as satisfactory as pump rooms located above ground. New improvements in pumping machinery make it unnecessary to construct sub-ground level pump stations. As soon as it is feasible to do so, this station should be reconstructed so as to locate the pump room entirely above the ground surface.

MINNESOTA DEPARTMENT OF HEALTH  
Division of Sanitation

Report on the Water Supply of Belle Plaine  
April 20th, 1931

A, B, C, D, E

This water supply is obtained from five driven wells about 30 feet in depth located at the pump station near the railway station. Water is pumped directly into the distribution system while the overflow collects in a 50,000 gallon elevated steel tank. The wells are cased with 6-inch iron pipe and enclosed in manholes extending about one foot above the ground surface. The covers on these manholes are of the flush type and are not provided with any locks. The pump is located on the floor of the pump pit about eight feet below the surface of the ground. Drainage from this pit is provided by means of a manually-controlled ejector which discharges the waste water from a sump in which it collects, to the surface of the ground. Water is drawn from the wells by means of a motor-driven triplex pump having a rated capacity of 100 gallons per minute. The surface drainage around the pump station is not good and it is stated that at times surface water has entered the door and flowed into the pit. The pit is not large enough to provide for proper working space around the pump. Grease and waste water which accumulate on the floor of the pit create an unsatisfactory condition. The distribution system consists of 16,700 feet of water main which distribute to 300 service connections and 29 fire hydrants. The average and daily consumption of water is 20,000 gallons with a maximum of 30,000 gallons. Pump pits and sub-ground level pump rooms require special drainage systems, which often get out of order, and leaks sometimes develop in well casings after a period of service. The pit may become flooded at a time when there are leaks in the well casing, thus creating a dangerous condition. On account of the difficulty of maintaining such pits or pump rooms in a dry, sanitary condition at all times, they are not considered as satisfactory

MINNESOTA DEPARTMENT OF HEALTH  
Division of Sanitation

Report on the Investigation of the Water Supply  
Belle Plaine, Minnesota  
June 16, 1942

A, B, C, D, E

This water supply is obtained from five driven wells located on the slopes along the Minnesota River bottom. The wells are about thirty feet deep and set in brick manholes about twelve feet deep which also contain the valves. The water from these wells is pumped into the distribution system by a motor-driven triplex pump set in a pump pit below ground level.

This investigation showed that the supply complied with the water supply standards of this Department except for the following sanitary defects:

1. The manhole covers over the valves are of the flush type and are not kept locked. The suction pipes are exposed in the bottom of the manhole and are subject to flooding.
2. The pumphouse floor and the pump pit are below the level of the adjacent ground surface and are subject to flooding. Waste water was observed on the floor of the pump pit. The pit is about ten feet below the pumphouse floor.
3. The suction pipe in the pump pit is exposed and subject to flooding.
4. The pumphouse door opens inward.
5. It was observed during the course of the investigation that there were plumbing fixtures which were designed and installed in such a way that they constitute a hazard to the water supply.

Water supply outlets which can be submerged will permit water to be back-siphoned or drained into the water piping system. It is known that partial vacuums occur occasionally on water distribution systems when the system is drained and the normal pressure is relieved by breaks in the mains,

MINNESOTA DEPARTMENT OF HEALTH  
Division of Municipal Water Supply and Plumbing

Report on Water Supply of  
Belle Plaine, Minnesota  
September 13, 1947

The water supply for the borough of Belle Plaine is obtained from a gravel packed well located in the north part of town. The well is 160 feet in depth, the outer casing being 20 inches in diameter and the inner casing 10 inches in diameter. A 16-foot screen is provided. Water is drawn from the well by means of a vertical turbine pump with a capacity of 135 gallons per minute. The old wells serve now as standby units. 1600 feet of 6-inch cast-iron water main has been installed during the last summer. Plans for this project were not submitted to this Department for examination as required by Regulation 200 of the State Board of Health.

F

A, B, C, D, E

Sanitary Defects

1. New Well

- a. The pump installation has not been completed in accordance with the plans approved by this Department. The pump is shimmed with U-irons and does not form a water-tight connection with the casing.
- b. The discharge air relief vent is not screened.
- c. Floor drainage is discharged to a pit located only 3 feet from the well.
- d. The floor of the pumphouse is cracked and has settled badly.

2. Old Wells

- a. The manhole covers over the valves are of the flush type and are not kept locked. The suction pipes are exposed in the bottom of the manhole and are subject to flooding.
- b. The pumphouse floor and the pump pit are below the level of the adjacent ground surface and are subject to flooding. Waste water was observed on the floor of the pump pit. The pit is about ten feet below the pumphouse floor.

# MINNESOTA DEPARTMENT OF HEALTH

## SECTION OF ENVIRONMENTAL SANITATION

Analytical Examination of Water

F

NO.	TOWN, ETC.	MAP LOCATION	SPECIFIC LOCATION	SOURCE
88336	Belle Plaine	Pumphouse	Discharge tap	Municipal well
3337	" "	Hespi Toxaco Service	Garage tap	"
88338	" "	Borough Hall	Lav. tap	Public supply

	88336	88337	88338		
Specimen Number	88336	88337	88338		
Station Number					
Collected by	AJS	AJS	WRL		
Date Collected	9/19/47	9/19/47	9/19/47		
Date Rec'd by Lab.	9/19/47	9/19/47	9/19/47		
BACTERIAL: Exam. by	RHP	RHP	RHP		
Bacteria per c.c. 37° C. 24 hours					
Coliform group } 100 ml. organisms } M.P.N. per 100 ml.	5.1	0	0		
PHYSICAL: Exam. by					
Turbidity	24.				
Color	17.				
Total Solids					
Total suspended solids					
Settleable solids c.c. per liter					
CHEMICAL: Exam. by (parts per million except as noted)					
Total hardness	560.				
Alkalinity (M. O.)	330.				
pH value	8.				
Iron	6.				
Manganese	1.3				
Chlorides	220.				
Residual Chlorine					
Sulphates	110.				
Fluorides	.05				
Dissolved Oxygen					
Biochemical Oxygen Demand } Five-day					
Nitrate Nitrogen	.12				

6

MINNESOTA DEPARTMENT OF HEALTH  
Division of Municipal Water Supply

Report on Water Supply of  
Belle Plaine, Minnesota  
December 23, 1948

1. Date of Last Investigation - September 19, 1947.
2. Changes Since Last Investigation -
  - a. The floor of the pumphouse has been repaired.
  - b. The mounting of the pump has been improved, but further sealing is necessary.
  - c. The old wells no longer can be considered a part of the supply since the equipment is inoperative.

A, B, C, D, E

3. Analytical Data (see attached sheet) -

Samples Nos. 94743 and 94745 represent water collected from the well and from a point 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.

Sample No. 94744 represents water collected from 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 100 ml. portions of the sample examined. These indications of contamination may be interpreted as being due to local conditions and probably have no sanitary significance.

4. Recommendations -

- a. The pump mounting should be further improved by grout or by welding or bolting a steel plate under the base plate on the discharge side of the pump.
- b. The floor of the pumphouse should be repaired and a satisfactory floor drain should be installed. (See the approved plans dated August 21, 1942, and Paragraph 810, Section VIII of the Manual of Water Supply Sanitation.)

MINNESOTA DEPARTMENT OF HEALTH  
District No. 2  
Mankato, Minnesota

Report on Investigation of Water Supply  
Belle Plaine, Minnesota  
Nov. 16, 1949

I. Ownership: Municipal

II. Date of Last Previous Investigation: Dec. 23, 1948

III. Rating of Supply at Last Previous Investigation: 77

IV. Changes Since Last Investigation:

1. A floor drain and new concrete floor has been provided at the pumphouse. The floor drain discharges to the ground surface at a point over thirty feet from the well.

No. 1 West Well,  
201245

2. A test well has been drilled at the proposed site for the new  
municipal well in Prairie Park, which consists of the south one-  
half of Block 150. The site has been approved by this Department in a letter dated September 23, 1949.

3. The system has become coliform free.

V. Analytical Results ( See attached sheet)

Samples Nos. 252-255, inclusive, represent water collected at the well and at various points on the distribution system. The bacteriological examination of these samples showed the water to be of a good sanitary quality as evidenced by the fact that organisms of the coliform group were not found in the 100 ml. portions of the samples examined.

VI. Defects Remaining on the System:

1. The pump base overhangs the pump mounting channels on two sides, providing an opening to the well casing.
2. The discharge air relief vent is not screened.
3. Cross-connections exist between the municipal water supply and the water supplies at the Minnesota Valley Milk Processing Plant and the Farmers' Creamery. The supplies at these two plants do not conform to the standards of this Department for safe water supplies. Such cross-connections are prohibited under Regulation

MINNESOTA DEPARTMENT OF HEALTH  
District No. 2  
Mankato, Minnesota

Report on Investigation of Water Supply,  
Belle Plaine, Minnesota,  
October 10, 1950

- I. Ownership: Municipal
- II. Date of Last Previous Investigation: Nov. 16, 1950
- III. Rating of Supply at Last Previous Investigation: B2
- IV. Changes Since Last Investigation:

G

No. 1 West Well,  
201245

1. The new well in Prairie Park is completed and is now in operation. It is 280 feet in depth and cased the entire depth with 20-inch diameter steel pipe. The static water level is 145 feet from the surface and the draw-down is 7 feet when pumped at 450 g.p.m. The construction of the pump-house, pump, and pump setting conform with the standards of this Department with the exception that the well has not been provided with a casing vent.

Note: City supply cross-conn'd with both old and new creamery supply wells.

H. Old Creamery Well

2. The old well at the Farmer's Creamery has been abandoned and cut off the creamery water supply. The creamery supply now conforms to the standards of this Department for a safe water supply; therefore, the cross-connection between it and the municipal supply no longer presents a sanitary hazard.

I. New Creamery Well

3. The openings under the pump base of the old well have been sealed, and the discharge air relief vent screened.

V. Analytical Results (See attached sheet)

Samples Nos. 4745-4748, inclusive, represent water collected at the new well, and at various points on the distribution system. The bacteriological examination of Samples Nos. 4746, 4747, and 4748 showed the water to be of a good sanitary quality as evidenced by the fact that organisms of the coliform group were not found in the 100 ml. portions of the samples examined. The examination of Sample No. 4745 showed indications of slight contamination which may have been due

MINNESOTA DEPARTMENT OF HEALTH  
District No. 2  
Mankato, Minnesota

Report on Investigation of Water Supply,  
Belle Plaine, Minnesota,  
August 17, 1951

I. Ownership: Municipal

II. Date of Last Previous Investigation: October 10, 1950

III. Rating of Supply at Last Previous Investigation: 85

IV. Changes Since Last Investigation:

1. The new well has been provided with a satisfactory type casing vent.
2. The system is coliform free.

V. Analytical Results (See attached sheet)

Samples Nos. 9172-9174, inclusive, represent water collected at the new well and at two points on the distribution system. The bacteriological examination of these samples showed the water to be of a good sanitary quality as evidenced by the fact that organisms of the coliform group were not found in the 100 ml. portions of the samples examined.

VI. Defects Remaining on the System:

- J 1. A cross-connection exists between the municipal water supply and the water supply at the Minnesota Valley Milk Processing Plant. The water supply at this plant does not conform to the standards of this Department for a safe water supply. Such a cross-connection is prohibited under Regulation 201 of the Minnesota State Board of Health.
2. Water services and building sewers are being laid in the same trench without adequate protection against leakage.
3. There are plumbing fixtures that are faulty in design and installation.

Recommendations

1. The cross-connection at the Minnesota Valley Milk Processing Plant should be broken by removing a section of pipe; a closed valve is not considered adequate protection between a safe supply and an unsafe supply. If the plant desires municipal water for emergencies, water can be supplied by means of a

MINNESOTA DEPARTMENT OF HEALTH  
District No. 2  
Mankato Minnesota

Report on Water Supply  
Belle Plaine, Minnesota  
August 17, 1955

- 1. Date of Last Investigation: August 10, 1954
- 2. Rating at Last Investigation: 90
- 3. Changes Since Last Investigation:

K. No. 1 West Well  
201245

The new well has been completed but is not yet in operation. The well is cased with twelve inch pipe. It is 282 feet in depth with 32 feet of screen. A vertical turbine pipe with water lubricated bearing is installed over the well. The rated capacity of the pump is 300 gallons per minute.

4. Analytical Data (See attached sheet)

Samples Nos. 2504-2506, inclusive, represent water obtained from the older well and from two points on the distribution system. The bacteriological examination of these samples showed the water to be of a good sanitary quality as evidenced by the fact that organisms of the coliform group were not found in the portions of the samples examined. However, Sample No. 2707, which represents another point on the distribution system did show indications of contamination. These results may have been due to faulty sterilization of the tap from which the sample was obtained, and probably has no sanitary significance.

5. Recommendations:

Consideration should be given to the adoption and enforcement of the Minnesota Plumbing Code as a local ordinance. The proper enforcement of such a code would safeguard the supply from contamination which may result from improperly designed or installed plumbing fixtures.

6. Conclusion:

The field survey showed that this supply conformed with the sanitary standards of this Department in most respects. Computed on a basis of 100 points for complete compliance with the standards of water supply of the Minnesota Department of Health, the present status of this supply is estimated at 90. As indicated, the rating may

MINNESOTA DEPARTMENT OF HEALTH  
Division of Environmental Sanitation  
Municipal Water Supply Section

Report on Water Supply  
Belle Plaine, Minnesota  
November 29, 1956

1. Date of Last Investigation: August 17, 1955
2. Rating at Last Investigation: 90
3. Changes Since Last Investigation:

The new Well No. 2 has been placed in operation. The installation of the pump and pumphouse appears to conform to plans and specifications approved by this Department.

4. Analytical Data (See attached sheet)

Samples Nos. 8657-8660, inclusive, represent water obtained from the two wells and from two 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 the portions of the samples examined. Chemical analysis of a sample of water from the new well indicates a hard water high in iron and manganese but very low in chlorides, sulphates, fluorides and nitrate nitrogen.

5. Recommendations:

- a. Consideration should be given to the adoption and enforcement of the Minnesota Plumbing Code as a local ordinance. The proper enforcement of such a code would safeguard the supply from contamination which may result from improperly designed or installed plumbing fixtures.
- b. The water works operator should be given an opportunity to gain additional training and experience by attending the annual water works operators' short course. This is usually held at the University of Minnesota Center of Continuation Study in March.
- c. The presence of "iron" and "sulfur reducing" bacteria is indicated by reports of tastes and odors in the water characteristic of these organisms. These bacteria, though harmless to health, accentuate the

**MINNESOTA DEPARTMENT OF HEALTH**  
**DIVISION OF ENVIRONMENTAL SANITATION**

Analytical Examination of Water

NO.	TOWN, ETC.	MAP LOCATION	SPECIFIC LOCATION	SOURCE
8657	Belle Plaine	Well #1	Pump discharge	
8658	"	Well #2 (new)	Pump discharge	
8659	"	High School	Lav. tap	
8660	"	Fire House	Hose tap	

Specimen Number	8657	8658	8659	8660		
Station Number						
Collected by	MTS					
Date Collected	11-29-56					
Date Rec'd by Lab.	11-30-56					
BACTERIAL: Exam. by	HGO					
Bacteria per c.c. 37° C. 24 hours						
Coliform group } 100 ml.						
organisms } M.P.N. per 100 ml.	0	0	0	0		
PHYSICAL: Exam. by						
Turbidity						
Color						
Total Solids						
Total suspended solids						
Settleable solids c.c. per liter						
CHEMICAL: Exam. by						
(parts per million except as noted)						
Total hardness		370.				
Alkalinity		350.				
pH value		7.5				
Iron		1.7				
Manganese		.47				
Chlorides		13.				
Residual Chlorine						
Sulphates		120.				
Fluorides		.2				
Dissolved Oxygen						
Biochemical Oxygen Demand } five-day						
Nitrate Nitrogen		< 1				
		(10) 201745				

60 and lower - very dangerous condition. Emergency measures necessary.

3-24-61

Report on Investigation of Municipal Water Supply  
Helle Plaine, Minnesota  
February 16, 1961

Date of last investigation - April 12, 1959

Rating at last investigation - 91

Changes since last investigation -

Gas chlorination equipment has been installed and the controls are set so that one chlorinator will feed both wells. At the time of the investigation, the chlorinator was temporarily out of service.

Analytical data - (See attached sheet)

Samples Nos. 555 - 558 inclusive, represent water obtained from the two wells, and from two points on the distribution system. The bacteriological examination of these samples showed the water to be of satisfactory sanitary quality as evidenced by the fact that organisms of the coliform group were not found in the samples examined.

Recommendations -

1. Consideration should be given to the adoption and enforcement of the Minnesota Plumbing Code as a local ordinance. The proper enforcement of such a code would safeguard the supply from contamination which may result from improperly designed or installed plumbing fixtures.

2. The opportunity for additional training in water supply work should be provided for the water superintendent. Attendance at the annual waterworks operators' short course held in March each year at the Center for Continuation Study, University of Minnesota, is suggested.

3. The rate of chlorine application should be increased to provide a chlorine residual of at least 0.5 parts per million in all parts of the distribution system. Consideration may be given to the addition of ammonia in conjunction with chlorine to form chloramines. A chloramine residual of



MINNESOTA DEPARTMENT OF HEALTH  
 District VI  
Minneapolis, Minnesota

Report on Investigation of Municipal Water Supply  
Belle Plaine, Minnesota

1. Name of Water Supply System Belle Plaine Municipal Water Supply		2. Plant Classification D	
3. Telephone Number			
Clerk (office) <u>873-6106</u>		Water Supt. (office) <u>873-6106</u>	
Clerk (home) <u>873-2773</u>		Water Supt. (home) <u>873-2773</u>	
4. Location (city, county) Belle Plaine Scott County		5. Person Contacted Mr. Pat Fogarty	
6. Water Superintendent and Classification Mr. Pat Fogarty		7. Population 2481	8. Date of Survey 7/2/73
9. Date of Previous Survey March 12, 1963	10. Population Served 2481	11. Service Connections 750	12. Ownership Municipal
13. Source Groundwater	14. Plumbing Code		
	<input type="checkbox"/> Adopted <input checked="" type="checkbox"/> Adopted with permits and inspections <input type="checkbox"/> Not adopted		
15. Storage (list separately, indicating capacity of each) 120,000 GALLONS			

16. Maximum Daily Consumption 600,000 gallons	17. Average Daily Consumption 220,000 gallons
18. Treatment Used	
<input checked="" type="checkbox"/> Disinfection-gas chlorination	<input type="checkbox"/> Ammoniation
<input type="checkbox"/> Aeration	<input type="checkbox"/> Softening
<input type="checkbox"/> Filtration	<input type="checkbox"/> Sedimentation
<input type="checkbox"/> Coagulation	<input checked="" type="checkbox"/> Fluoridation
<input type="checkbox"/> Taste and Odor	<input type="checkbox"/> Corrosion Control and Stabilization
<input type="checkbox"/> Recarbonation	<input type="checkbox"/> Other (describe)

19. Well Data*	Stand- by East	West																	
a) Well Number																			
b) Year Installed		1946																	
c) Casing Diameter	12"	10"																	
d) Casing Depth		257																	
e) Well Depth	287	287																	
f) Screen Length	30	30																	
g) Static Level	70	70																	
h) Drawdown		650																	
i) Pump (type & cap.)	VT 400	VT 700																	

\*Report well logs on separate sheet, if available.

Neither well reportedly grouted

MINNESOTA DEPARTMENT OF HEALTH  
DIVISION OF ENVIRONMENTAL HEALTH

ANALYTICAL DATA

Samples Collected By Roman Koch

Report To District VI

Field Number	Town, County, Etc.	Sampling Point and Source of Sample			
a	Belk Plaine, Scott County	West Well	P.D.	M.W.S.	G
b	"	East Well	P.D.	M.W.S.	K
c	"	Sinclair Station	S.T.	M.W.S.	
d	"	Village Shop	S.T.	M.W.S.	
e	"	Ball Park	S.T.	M.W.S.	
f					

This line for Lab. use only.		a	b	c	d	e	f
Sample Number		3023	3024	3025	3026	3027	
Date Collected		7/2/73	- - - -	- - - -	- - - -	- - - -	
Time Collected							
Temperature of							
Date Received by Lab.		7/2/73	- - - -	- - - -	- - - -	- - - -	
Coliform group	M.P.N. per 100 ml.	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	
	Con. <input type="checkbox"/> Comp. <input type="checkbox"/>						
Organisms	M.F.C. per 100 ml.						
Total Solids		620	620				
Turbidity		19	32				
Color		15	50				
Alkalinity as CaCO <sub>3</sub>		410	410				
Hardness as CaCO <sub>3</sub>		400	420				
pH value		7.7	7.9				
Iron							
Manganese							
Chloride		29	32				
Residual Chlorine							
Sulfate		72	110				
Iodide		0.3	0.4	0.67			
Total Phosphorus		0.05	0.17				
Nitrite Nitrogen		0.02	0.06				
Nitrate Nitrogen		< 1	< 1				
Thylene Blue Active Sub. as ABS			< .1				
Calcium as CaCO <sub>3</sub>		210	200				
Strontium		79	100				
Potassium		3	3				
Ac. Cond. $\mu$ mhos/cm @ 25 °C		980	1000				
at 50 °F							
Benols			0.018				
Metals	Cu	< 10	140				
	Cd	< 10	< 10				
	Ni	< 10	< 10				
	Zn	20	24				
	Mn	400	200				
	Pb	< 10	< 10				
	Fe	1800	6200				

Its are in milligrams per liter except as noted.

MINNESOTA DEPARTMENT OF HEALTH  
 District Metropolitan  
Minneapolis, Minnesota

Report on Investigation of Municipal Water Supply  
Belle Plaine, Minnesota

1. Name of Water Supply System <u>Belle Plaine Municipal Water Supply</u>		2. Plant Classification <u>D</u>	
3. Telephone Number Clerk (office) <u>873-5553</u> Water Supt. (office) <u>873-5553</u> Clerk (home) <u>873-6914</u> Water Supt. (home) <u>873-2273</u>			
4. Location (city, county) <u>420 East Main</u> <u>Belle Plaine, Scott County</u>		5. Person Contacted <u>Brad Krick</u>	
6. Water Superintendent and Classification <u>Pat Fogerty</u> " <u>C</u> "		7. Population <u>2,600</u>	8. Date of Survey <u>February 10, 1976</u>
9. Date of Previous Survey <u>July 17, 1974</u>	10. Population Served <u>2,600</u>	11. Service Connections <u>780</u>	12. Ownership <u>Municipal</u>
13. Source <u>2 Wells</u>	14. Plumbing Code <input type="checkbox"/> Adopted <input checked="" type="checkbox"/> Adopted with permits and inspections <input type="checkbox"/> Not adopted		
15. Storage (list separately, indicating capacity of each) <u>Elevated 120,000</u>			

16. Maximum Daily Consumption <u>760,000</u>	17. Average Daily Consumption <u>250,000</u>
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8. Treatment Used
- Disinfection
  - Ammoniation
  - Aeration
  - Softening
  - Filtration
  - Sedimentation
  - Coagulation
  - Fluoridation
  - Taste and Odor
  - Corrosion Control and Stabilization
  - Recarbonation
  - Other (describe)

K    G

19. Well Data*	E	W												
a) Well Number														
b) Year Installed		<u>1946</u>												
c) Casing Diameter	<u>12</u>	<u>10</u>												
d) Casing Depth		<u>257</u>												
e) Well Depth	<u>287</u>	<u>287</u>												
f) Screen Length	<u>30</u>	<u>30</u>												
g) Static Level	<u>70</u>	<u>70</u>												
h) Drawdown		<u>40</u>												
i) Pump (type & cap.)	<u>V.T. 400</u>	<u>V.T. 550</u>												

\*Report well logs on separate sheet, if available.

MINNESOTA DEPARTMENT OF HEALTH  
DIVISION OF ENVIRONMENTAL HEALTH

ANALYTICAL DATA

Samples Collected By R. Majerle

Report To Metropolitan District

Field Number	Town, County, Etc.	Sampling Point and Source of Sample
a	Belle Plaine, Scott County	East Well, P.D., N.W.S. <b>K</b>
b	Belle Plaine, Scott County	West Well, P.D., N.W.S. <b>G</b>
c	Belle Plaine, Scott County	Texaco Station, M.W.S.
d	Belle Plaine, Scott County	Skelly Station, M.W.S.
e		
f		

This line for Lab. use only.	7382 <sup>a</sup>	7383 <sup>b</sup>	7384 <sup>c</sup>	7385 <sup>d</sup>		
Sample Number						
Date Collected	2/10/76	2/10/76	2/10/76	2/10/76		
Time Collected						
Temperature of						
Date Received by Lab.	2/10/76	2/10/76	2/10/76	2/10/76		
Coliform group organisms	M.P.N. per 100 ml.					
	Con. <input type="checkbox"/> Comp. <input type="checkbox"/>					
	<2.2	<2.2	<2.2	<2.2		
	M.F.C. per 100 ml.					
Total Solids	64	61				
Turbidity	8.7	22				
Color	35	45				
Total hardness as CaCO <sub>3</sub>	370	390				
Alkalinity as CaCO <sub>3</sub>	400	390				
pH value	7.8	7.6				
Iron	1100	1200				
Manganese	350	260				
Chloride	29	27				
Residual Chlorine field test						
Sulphate	130	120				
Fluoride	.30	.43				
Total Phosphorus	0.118	0.050				
Nitrite Nitrogen	0.02	<0.01				
Nitrate Nitrogen	<1.0	<1.0				
Methylene Blue Active Sub. as ABS	<0.1	<0.1				
Calcium as CaCO <sub>3</sub>	210	220				
Sodium	99	82				
Potassium	3.9	3.7				
Spec. Cond. $\mu$ mhos/cm @ 25 °C	910	940				
@ 50 °F						
Phenols	6.2	<2.0				
Oil & Grease	<0.5	<0.5				
Mg	160	170				
NH <sub>3</sub>	0.52	0.58				
Metals						
	Cu	34	<10			
	Cd	<10	<10			
	Ni	<10	<10			
	Zn	<10	12			
	Pb	<10	<10			

Results are in milligrams per liter except as noted.

MINNESOTA DEPARTMENT OF HEALTH  
 District Metropolitan  
Minneapolis, Minnesota

Report on Investigation of Municipal Water Supply  
Belle Plaine, Minnesota

270  
 270

1. Name of Water Supply System <b>Belle Plaine Municipal Water Supply</b>		2. Plant Classification <b>C</b>	
3. Telephone Number Clerk (office) <b>873-5553</b> Water Supt. (office) <b>873-5553</b> Clerk (home) <b>873-6914</b> Water Supt. (home) <b>873-2273</b>			
4. Location (city, county) <b>Belle Plaine, Scott County</b>		5. Person Contacted <b>Brad Krick</b> <b>D</b>	
6. Water Superintendent and Classification <b>Pat Fogarty</b> <b>C</b>		7. Population <b>2,600</b>	8. Date of Survey <b>12/29/77</b>
9. Date of Previous Survey <b>2/10/76</b>	10. Population Served <b>2,600</b>	11. Service Connections <b>780</b>	12. Ownership <b>Municipal</b>
13. Source <b>2 Wells</b>	14. Plumbing Code <input type="checkbox"/> Adopted <input checked="" type="checkbox"/> Adopted with permits and inspections <input type="checkbox"/> Not adopted		
15. Storage (list separately, indicating capacity of each) <b>75,000 gallons - elevated</b> <b>400,000 gallons - elevated</b>			

16. Maximum Daily Consumption <b>760,000</b>	17. Average Daily Consumption <b>250,000</b>
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18. Treatment Used

<input checked="" type="checkbox"/> Disinfection - gas chlorine	<input type="checkbox"/> Ammoniation
<input type="checkbox"/> Aeration	<input type="checkbox"/> Softening
<input type="checkbox"/> Filtration	<input type="checkbox"/> Sedimentation
<input type="checkbox"/> Coagulation	<input checked="" type="checkbox"/> Fluoridation - acid
<input type="checkbox"/> Taste and Odor	<input checked="" type="checkbox"/> Corrosion Control - polyphosphate - Aquadine and Stabilization
<input type="checkbox"/> Recarbonation	<input type="checkbox"/> Other (describe)

**K**    **G**

19. Well Data\*

	E	W								
a) Well Number										
b) Year Installed		1946								
c) Casing Diameter	12	10								
d) Casing Depth	257	257								
e) Well Depth	287	287								
f) Screen Length	30	30								
g) Static Level	70	70								
h) Drawdown	40	40								
i) Pump (type & cap.)	V.T. 400	V.T. 550								

\*Report well logs on separate sheet, if available.

MINNESOTA DEPARTMENT OF HEALTH  
DIVISION OF ENVIRONMENTAL HEALTH

ANALYTICAL DATA

Samples Collected by David Engstrom

Report To Metropolitan District

Field Number	Town, County, Etc.	Sampling Point and Source of Sample
a	Belle Plaine, Scott County	East Well, P.D., M.W.S. <span style="border: 1px solid red; padding: 2px;">K</span>
b	Belle Plaine, Scott County	West Well, P.D., M.W.S. <span style="border: 1px solid red; padding: 2px;">G</span>
c	Belle Plaine, Scott County	Municipal Garage, S.T., M.W.S.
d	Belle Plaine, Scott County	Cafe, S.T., M.W.S.
e	Belle Plaine, Scott County	Krick Residence, ST., M.W.S.
f		

This line for Lab. use only.		a	b	c	d	e	f
Sample Number		7193	7194				
Date Collected		12/29/77	12/29/77	12/29/77	12/29/77	12/29/77	
Time Collected							
Temperature °F							
Date Received by Lab.		12/29/77	12/29/77	12/29/77	12/29/77	12/29/77	
Coliform group	M.P.N. per 100 ml.						
	Col. D Comp. 1						
	M.F.C. per 100 ml. *	0	0	0	0	0	
Total Solids							
Turbidity							
Color							
Hardness as CaCO <sub>3</sub>							
Alkalinity as CaCO <sub>3</sub>							
pH value							
Iron							
Manganese							
Chloride							
Residual Chlorine Free (Field)				0.0	0.0	0.9	
Sulphate		96	116				
Fluoride							
Total Phosphorus							
Nitrite Nitrogen							
Nitrate Nitrogen							
Methylene Blue Active Sub. as ABS							
Calcium as CaCO <sub>3</sub>							
Sodium							
Potassium							
Spec. Cond. umhos/cm @ 25 °C.							
Chlorides @ 50 °F							
Phenols <i>ug/l</i>		≤2.0					

\* Results are in milligrams per liter except as noted.

\* = Field Test

MINNESOTA DEPARTMENT OF HEALTH  
 District **Metro**  
**Minneapolis**, Minnesota

31 Jan 1979 / 20

Report on the Installation of Municipal Water Supply  
**Belle Plaine**, Minnesota

1. Name of Water Supply System: **Belle Plaine Municipal Water Supply** 2. Plant Classification: **C D Z**

3. Telephone Number: Clerk (office) **873-5553** Water Supt. (office) **873-5553**  
 Clerk (home) **873-6914** Water Supt. (home) **873-2273-6742**

4. Location (city, county): **Belle Plaine, Scott County** 5. Person Contacted: **Pat Fogarty**

6. Water Superintendent and Classification: **Pat Fogarty C** 7. Population: **2,600** 8. Date of Survey: **2-27-79 12-17-80**

9. Date of Previous Survey: **12-29-77** 10. Population Served: **2,600 2750** 11. Service Connections: **800 750** 12. Ownership: **Municipal**

13. Source: **Wells** 14. Plumbing Code:  Adopted  Adopted with permits and inspections  Not adopted

15. Storage (list separately, indicating capacity of each)  
**1 - 75,000 gallon elevated**  
**1 - 400,000 gallon elevated**

16. Maximum Daily Consumption: **300,000 gallons** 17. Average Daily Consumption: **200,000 gallons**

18. Treatment Used  
 Disinfection gas chlorine  Ammoniation  
 Aeration  Softening  
 Filtration  Sedimentation  
 Coagulation  Fluoridation acid  
 Taste and Odor  Corrosion Control and Stabilization **polyphosphates - Aquadine**  
 Recarbonation  Other (describe)

19. Well Data<sup>#</sup>

	E	W												
a) Well Number														
b) Year Installed		1946												
c) Casing Diameter	12	10												
d) Casing Depth	257	257												
e) Well Depth	287	287												
f) Screen Length	30	30												
g) Static Level	70	70												
h) Drawdown	40	40												
i) Pump (type & cap.)	VT 400	VT 550												

\*Report well logs on separate sheet, if available.

MINNESOTA DEPARTMENT OF HEALTH  
DIVISION OF ENVIRONMENTAL HEALTH

ANALYTICAL DATA

Samples Collected By David Goff Report To Metropolitan

Field Number	Town, County, Etc.	Sampling Point and Source of Sample
a	Bella Plaine, Scott Co.	East Well, Tap
b	" " " "	West Well, Tap
c	" " " "	City Garage, Tap
d	" " " "	Rucks Meats, Tap
e	" " " "	Vets Club, Tap
f		

This line for Lab. use only.		a	b	c	d	e	f
Sample Number		14876	14877	14878	14879	14880	
Date Collected	12-17-80						
Time Collected	10:00 a.m.						
Temperature of							
Date Received by Lab.	12-17-80	12-17-80	12-17-80	12-17-80	12-17-80	12-17-80	12-17-80
Coliform group organisms	M. P. N. per 100 ml.	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	
	Con. <input checked="" type="checkbox"/> Comp. <input type="checkbox"/>						
	M. F. C. per 100 ml.						
Total Solids							
Turbidity							
Color							
Total hardness as CaCO <sub>3</sub>							
Alkalinity as CaCO <sub>3</sub>							
pH value							
Iron							
Manganese							
Chloride							
Residual Chlorine							
Sulphate							
Fluoride					1.10	1.10	
Total Phosphorus							
Nitrite Nitrogen							
Nitrate Nitrogen							
Methylene Blue Active Sub. as ARS							
Calcium as CaCO <sub>3</sub>							
Sodium							
Potassium							
Spec. Cond. $\mu$ mhos/cm @ 25°C.							
pH @ 50°C.							
Phenol		< 2.0					

\* Results are in milligrams per liter except as noted.

















213582 MINNVALLEY MILK

J. 213578 MINVALLEY MILK PROCESSIN

221445 BELLE PLAINE SALT WELL 1

A-E. Five Driven Wells

213579 MINVALLEY MILK ASSN.

213580 MINVALLEY MILK ASSN.

213581 MINVALLEY MILK ASSN.

I. NEW WELL-BELLE PLAINE CREAMERY  
Approx. area

H. 207137 BELLE PLAINE CREAMERY

651696 BELLE PLAINE TW

N. 1894 Well  
Main & Meridian

651697 BELLE PLAINE 4

G. 201245 BELLE PLAINE 1 WEST WELL

L. 213-ft. Well  
SE com. Willow & Prairie

538038 BELLE PLAINE 3

K. 226757 BELLE PLAINE 2

657348 BELLE PLAINE TW

## Soils Data

The soils map is included as Figure 8.

### AaA—Alluvial land, 0 to 2 percent slopes

#### Map Unit Setting

- *National map unit symbol:* gc90
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Prime farmland if protected from flooding or not frequently flooded during the growing season

#### Map Unit Composition

- *Alluvial land, occasionally flooded, and similar soils:* 90 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Alluvial Land, Occasionally Flooded

- **Setting**
- *Landform:* Flood plains
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Alluvium
- **Typical profile**
- *Ap - 0 to 10 inches:* loam
- *A1 - 10 to 60 inches:* stratified silt loam to sand
- **Properties and qualities**
- *Slope:* 0 to 2 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Moderately well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
- *Depth to water table:* About 30 inches
- *Frequency of flooding:* Occasional
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 20 percent

- *Available water storage in profile:* High (about 10.1 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 2w
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Sloping Upland, Calcareous (G103XS010MN)

## **AaB—Alluvial land, 2 to 6 percent slopes**

### **Map Unit Setting**

- *National map unit symbol:* gc91
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Prime farmland if protected from flooding or not frequently flooded during the growing season

### **Map Unit Composition**

- *Alluvial land, occasionally flooded, and similar soils:* 90 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Alluvial Land, Occasionally Flooded**

- **Setting**
- *Landform:* Flood plains
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Alluvium
- **Typical profile**
- *Ap - 0 to 10 inches:* loam
- *A1 - 10 to 60 inches:* stratified silt loam to sand
- **Properties and qualities**
- *Slope:* 2 to 6 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Moderately well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
- *Depth to water table:* About 30 inches
- *Frequency of flooding:* Occasional

- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 20 percent
- *Available water storage in profile:* High (about 10.1 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 2w
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Sloping Upland, Calcareous (G103XS010MN)

## **Ab—Alluvial land, frequent overflow, 0 to 6 percent slopes**

### **Map Unit Setting**

- *National map unit symbol:* gc92
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Prime farmland if protected from flooding or not frequently flooded during the growing season

### **Map Unit Composition**

- *Alluvial land, frequent overflow, and similar soils:* 90 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Alluvial Land, Frequent Overflow**

- **Setting**
- *Landform:* Flood plains
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Alluvium
- **Typical profile**
- *A1 - 0 to 10 inches:* loam
- *A2 - 10 to 60 inches:* stratified silt loam to sand
- **Properties and qualities**
- *Slope:* 0 to 6 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Moderately well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)

- *Depth to water table:* About 6 to 18 inches
- *Frequency of flooding:* Frequent
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 20 percent
- *Available water storage in profile:* High (about 10.1 inches)
- **Interpretive groups**
  - *Land capability classification (irrigated):* None specified
  - *Land capability classification (nonirrigated):* 5w
  - *Hydrologic Soil Group:* A/D
  - *Other vegetative classification:* Wet Frequently Flooded (G103XS015MN)

### **DaA—Dakota loam, 0 to 2 percent slopes**

#### **Map Unit Setting**

- *National map unit symbol:* gc9t
- *Elevation:* 340 to 1,950 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* All areas are prime farmland

#### **Map Unit Composition**

- *Dakota and similar soils:* 90 percent
- *Minor components:* 10 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Dakota**

- **Setting**
  - *Landform:* Stream terraces, moraines, outwash plains
  - *Down-slope shape:* Linear
  - *Across-slope shape:* Linear
  - *Parent material:* Outwash
- **Typical profile**
  - *Ap - 0 to 14 inches:* loam
  - *Bt - 14 to 24 inches:* loam
  - *2C - 24 to 60 inches:* sand
- **Properties and qualities**

- *Slope:* 0 to 2 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 15 percent
- *Available water storage in profile:* Moderate (about 6.8 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 2s
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Sloping Upland, Acid (G103XS006MN)

### **Minor Components**

- **Hanska**
- *Percent of map unit:* 10 percent
- *Landform:* Stream terraces

### **DbA—Dickman sandy loam, 0 to 2 percent slopes**

#### **Map Unit Setting**

- *National map unit symbol:* gc9y
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Farmland of statewide importance

#### **Map Unit Composition**

- *Dickman and similar soils:* 90 percent
- *Minor components:* 10 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Dickman**

- **Setting**
- *Landform:* Stream terraces

- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Outwash
  
- **Typical profile**
  
- *Ap - 0 to 12 inches:* sandy loam
- *Bw - 12 to 21 inches:* sandy loam
- *2C - 21 to 60 inches:* sand
  
- **Properties and qualities**
  
- *Slope:* 0 to 2 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Somewhat excessively drained
- *Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 5 percent
- *Available water storage in profile:* Low (about 4.8 inches)
  
- **Interpretive groups**
  
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 3s
- *Hydrologic Soil Group:* A
- *Other vegetative classification:* Sandy (G103XS022MN)

### Minor Components

- **Dickinson**
  
- *Percent of map unit:* 5 percent
  
- **Sparta**
  
- *Percent of map unit:* 5 percent

### DbB—Dickman sandy loam, 2 to 6 percent slopes

#### Map Unit Setting

- *National map unit symbol:* gc9z
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F

- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Farmland of statewide importance

### **Map Unit Composition**

- *Dickman and similar soils:* 90 percent
- *Minor components:* 10 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Dickman**

- **Setting**
  - *Landform:* Stream terraces
  - *Landform position (two-dimensional):* Backslope
  - *Down-slope shape:* Linear
  - *Across-slope shape:* Linear
  - *Parent material:* Outwash
- **Typical profile**
  - *Ap - 0 to 12 inches:* sandy loam
  - *Bw - 12 to 20 inches:* sandy loam
  - *2C - 20 to 60 inches:* sand
- **Properties and qualities**
  - *Slope:* 2 to 6 percent
  - *Depth to restrictive feature:* More than 80 inches
  - *Natural drainage class:* Somewhat excessively drained
  - *Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
  - *Depth to water table:* More than 80 inches
  - *Frequency of flooding:* None
  - *Frequency of ponding:* None
  - *Calcium carbonate, maximum in profile:* 5 percent
  - *Available water storage in profile:* Low (about 4.7 inches)
- **Interpretive groups**
  - *Land capability classification (irrigated):* None specified
  - *Land capability classification (nonirrigated):* 3e
  - *Hydrologic Soil Group:* A
  - *Other vegetative classification:* Sandy (G103XS022MN)

### **Minor Components**

- **Dickinson**

- *Percent of map unit: 5 percent*
- **Sparta**
- *Percent of map unit: 5 percent*

## **EaB—Estherville loam and sandy loam, 2 to 6 percent slopes**

### **Map Unit Setting**

- *National map unit symbol: gcb8*
- *Elevation: 700 to 1,600 feet*
- *Mean annual precipitation: 23 to 35 inches*
- *Mean annual air temperature: 43 to 50 degrees F*
- *Frost-free period: 155 to 200 days*
- *Farmland classification: Farmland of statewide importance*

### **Map Unit Composition**

- *Estherville and similar soils: 90 percent*
- *Minor components: 10 percent*
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Estherville**

- **Setting**
- *Landform: Stream terraces, outwash plains, moraines*
- *Landform position (two-dimensional): Backslope*
- *Down-slope shape: Linear*
- *Across-slope shape: Linear*
- *Parent material: Outwash*
- **Typical profile**
- *Ap - 0 to 12 inches: loam*
- *Bw - 12 to 20 inches: loam*
- *2C - 20 to 60 inches: gravelly coarse sand*
- **Properties and qualities**
- *Slope: 2 to 6 percent*
- *Depth to restrictive feature: More than 80 inches*
- *Natural drainage class: Somewhat excessively drained*
- *Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)*
- *Depth to water table: More than 80 inches*
- *Frequency of flooding: None*

- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 15 percent
- *Available water storage in profile:* Low (about 5.0 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 3s
- *Hydrologic Soil Group:* A
- *Other vegetative classification:* Sandy (G103XS022MN)

### **Minor Components**

- **Wadena**
- *Percent of map unit:* 10 percent

### **EaB2—Estherville loam and sandy loam, 2 to 6 percent slopes, moderately eroded**

#### **Map Unit Setting**

- *National map unit symbol:* gcb9
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Farmland of statewide importance

#### **Map Unit Composition**

- *Estherville, moderately eroded, and similar soils:* 90 percent
- *Minor components:* 10 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Estherville, Moderately Eroded**

- **Setting**
- *Landform:* Outwash plains, moraines, stream terraces
- *Landform position (two-dimensional):* Backslope
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Outwash
- **Typical profile**
- *Ap - 0 to 10 inches:* loam
- *Bw - 10 to 18 inches:* loam

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- *2C - 18 to 60 inches: gravelly coarse sand*
- **Properties and qualities**
- *Slope: 2 to 6 percent*
- *Depth to restrictive feature: More than 80 inches*
- *Natural drainage class: Somewhat excessively drained*
- *Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)*
- *Depth to water table: More than 80 inches*
- *Frequency of flooding: None*
- *Frequency of ponding: None*
- *Calcium carbonate, maximum in profile: 15 percent*
- *Available water storage in profile: Low (about 4.6 inches)*
- **Interpretive groups**
- *Land capability classification (irrigated): None specified*
- *Land capability classification (nonirrigated): 3s*
- *Hydrologic Soil Group: A*
- *Other vegetative classification: Sandy (G103XS022MN)*

#### **Minor Components**

- **Wadena**
- *Percent of map unit: 10 percent*

#### **EbC2—Salida gravelly sandy loam, 6 to 12 percent slopes, moderately eroded**

##### **Map Unit Setting**

- *National map unit symbol: gcbh*
- *Elevation: 1,000 to 1,800 feet*
- *Mean annual precipitation: 23 to 35 inches*
- *Mean annual air temperature: 43 to 50 degrees F*
- *Frost-free period: 155 to 200 days*
- *Farmland classification: Not prime farmland*

##### **Map Unit Composition**

- *Salida, moderately eroded, and similar soils: 90 percent*
- *Minor components: 10 percent*
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

##### **Description of Salida, Moderately Eroded**

- **Setting**

- *Landform*: Outwash plains, moraines, stream terraces
- *Landform position (two-dimensional)*: Backslope
- *Down-slope shape*: Linear
- *Across-slope shape*: Linear
- *Parent material*: Outwash
  
- **Typical profile**
- *Ap - 0 to 9 inches*: gravelly sandy loam
- *Bw - 9 to 15 inches*: gravelly loamy coarse sand
- *C - 15 to 60 inches*: very gravelly coarse sand
  
- **Properties and qualities**
- *Slope*: 6 to 12 percent
- *Depth to restrictive feature*: More than 80 inches
- *Natural drainage class*: Excessively drained
- *Capacity of the most limiting layer to transmit water (Ksat)*: High (1.98 to 5.95 in/hr)
- *Depth to water table*: More than 80 inches
- *Frequency of flooding*: None
- *Frequency of ponding*: None
- *Calcium carbonate, maximum in profile*: 10 percent
- *Available water storage in profile*: Very low (about 2.5 inches)
  
- **Interpretive groups**
- *Land capability classification (irrigated)*: None specified
- *Land capability classification (nonirrigated)*: 6s
- *Hydrologic Soil Group*: A
- *Other vegetative classification*: Sandy (G103XS022MN)

### **Minor Components**

- **Hawick**
- *Percent of map unit*: 10 percent

### **Ga—Glencoe silty clay loam**

#### **Map Unit Setting**

- *National map unit symbol*: gcbk
- *Elevation*: 700 to 1,600 feet
- *Mean annual precipitation*: 23 to 35 inches
- *Mean annual air temperature*: 43 to 50 degrees F
- *Frost-free period*: 155 to 200 days
- *Farmland classification*: Prime farmland if drained

## Map Unit Composition

- *Glencoe and similar soils:* 90 percent
- *Minor components:* 10 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Glencoe

- **Setting**
- *Landform:* Depressions on moraines
- *Down-slope shape:* Concave
- *Across-slope shape:* Concave
- *Parent material:* Till
- **Typical profile**
- *Ap,A1 - 0 to 19 inches:* silty clay loam
- *Bg - 19 to 33 inches:* clay loam
- *Cg - 33 to 60 inches:* clay loam
- **Properties and qualities**
- *Slope:* 0 to 1 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Very poorly drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 1.98 in/hr)
- *Depth to water table:* About 0 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* Frequent
- *Calcium carbonate, maximum in profile:* 20 percent
- *Available water storage in profile:* High (about 10.7 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 3w
- *Hydrologic Soil Group:* B/D
- *Other vegetative classification:* Poned If Not Drained (G103XS013MN)

## Minor Components

- **Webster**
- *Percent of map unit:* 10 percent
- *Landform:* Swales

## **HaB—Hayden loam, 0 to 6 percent slopes**

### **Map Unit Setting**

- *National map unit symbol:* gcbl
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* All areas are prime farmland

### **Map Unit Composition**

- *Hayden and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Hayden**

- **Setting**
- *Landform:* Moraines
- *Landform position (two-dimensional):* Backslope
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Till
- **Typical profile**
- *Ap - 0 to 9 inches:* loam
- *Bt - 9 to 45 inches:* clay loam
- *C - 45 to 60 inches:* loam
- **Properties and qualities**
- *Slope:* 0 to 6 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
- *Depth to water table:* About 43 to 60 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 25 percent
- *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 2e
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Sloping Upland, Acid (G103XS006MN)

### **Minor Components**

- **Dundas**
- *Percent of map unit:* 8 percent
- **Le sueur**
- *Percent of map unit:* 7 percent

### **HaB2—Hayden loam, 2 to 6 percent slopes, moderately eroded**

#### **Map Unit Setting**

- *National map unit symbol:* gcbm
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* All areas are prime farmland

#### **Map Unit Composition**

- *Hayden, moderately eroded, and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Hayden, Moderately Eroded**

- **Setting**
- *Landform:* Moraines
- *Landform position (two-dimensional):* Backslope
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Till
- **Typical profile**
- *Ap - 0 to 9 inches:* loam
- *Bt - 9 to 45 inches:* clay loam
- *C - 45 to 60 inches:* loam

- **Properties and qualities**
- *Slope:* 2 to 6 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
- *Depth to water table:* About 43 to 60 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 25 percent
- *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 2e
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Sloping Upland, Acid (G103XS006MN)

### **Minor Components**

- **Dundas**
- *Percent of map unit:* 8 percent
- **Le sueur**
- *Percent of map unit:* 7 percent

### **HaC—Hayden loam, 6 to 12 percent slopes**

#### **Map Unit Setting**

- *National map unit symbol:* gcbn
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Farmland of statewide importance

#### **Map Unit Composition**

- *Hayden and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Hayden**

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- **Setting**
- *Landform:* Moraines
- *Landform position (two-dimensional):* Backslope
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Till
- **Typical profile**
- *Ap - 0 to 9 inches:* loam
- *Bt - 9 to 45 inches:* clay loam
- *C - 45 to 60 inches:* loam
- **Properties and qualities**
- *Slope:* 6 to 12 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 25 percent
- *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 3e
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Sloping Upland, Acid (G103XS006MN)

### Minor Components

- **Dundas**
- *Percent of map unit:* 8 percent
- **Le sueur**
- *Percent of map unit:* 7 percent

### HaC2—Hayden loam, 6 to 12 percent slopes, moderately eroded

#### Map Unit Setting

- *National map unit symbol:* gcbp
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Farmland of statewide importance

### **Map Unit Composition**

- *Hayden, moderately eroded, and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Hayden, Moderately Eroded**

- **Setting**
  - *Landform:* Moraines
  - *Landform position (two-dimensional):* Backslope
  - *Down-slope shape:* Linear
  - *Across-slope shape:* Linear
  - *Parent material:* Till
- **Typical profile**
  - *Ap - 0 to 9 inches:* loam
  - *Bt - 9 to 45 inches:* clay loam
  - *C - 45 to 60 inches:* loam
- **Properties and qualities**
  - *Slope:* 6 to 12 percent
  - *Depth to restrictive feature:* More than 80 inches
  - *Natural drainage class:* Well drained
  - *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
  - *Depth to water table:* More than 80 inches
  - *Frequency of flooding:* None
  - *Frequency of ponding:* None
  - *Calcium carbonate, maximum in profile:* 25 percent
  - *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**
  - *Land capability classification (irrigated):* None specified
  - *Land capability classification (nonirrigated):* 3e
  - *Hydrologic Soil Group:* B

- *Other vegetative classification:* Sloping Upland, Acid (G103XS006MN)

### **Minor Components**

- **Dundas**
- *Percent of map unit:* 8 percent
- **Le sueur**
- *Percent of map unit:* 7 percent

### **HaD—Hayden loam, 12 to 18 percent slopes**

#### **Map Unit Setting**

- *National map unit symbol:* gcbq
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Not prime farmland

#### **Map Unit Composition**

- *Hayden and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Hayden**

- **Setting**
- *Landform:* Moraines
- *Landform position (two-dimensional):* Shoulder
- *Down-slope shape:* Convex
- *Across-slope shape:* Convex
- *Parent material:* Till
- **Typical profile**
- *Ap - 0 to 9 inches:* loam
- *Bt - 9 to 45 inches:* clay loam
- *C - 45 to 60 inches:* loam
- **Properties and qualities**
- *Slope:* 12 to 18 percent

- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 25 percent
- *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 4e
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Sloping; Fine Texture (G103XS023MN)

### **Minor Components**

- **Dundas**
- *Percent of map unit:* 8 percent
- **Le sueur**
- *Percent of map unit:* 7 percent

### **HaD2—Hayden loam, 12 to 18 percent slopes, moderately eroded**

#### **Map Unit Setting**

- *National map unit symbol:* gcb
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Not prime farmland

#### **Map Unit Composition**

- *Hayden, moderately eroded, and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Hayden, Moderately Eroded**

- **Setting**

- *Landform: Moraines*
- *Landform position (two-dimensional): Shoulder*
- *Down-slope shape: Convex*
- *Across-slope shape: Convex*
- *Parent material: Till*
  
- **Typical profile**
- *Ap - 0 to 9 inches: loam*
- *Bt - 9 to 45 inches: clay loam*
- *C - 45 to 60 inches: loam*
  
- **Properties and qualities**
- *Slope: 12 to 18 percent*
- *Depth to restrictive feature: More than 80 inches*
- *Natural drainage class: Well drained*
- *Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)*
- *Depth to water table: More than 80 inches*
- *Frequency of flooding: None*
- *Frequency of ponding: None*
- *Calcium carbonate, maximum in profile: 25 percent*
- *Available water storage in profile: High (about 10.5 inches)*
  
- **Interpretive groups**
- *Land capability classification (irrigated): None specified*
- *Land capability classification (nonirrigated): 4e*
- *Hydrologic Soil Group: B*
- *Other vegetative classification: Sloping; Fine Texture (G103XS023MN)*

### **Minor Components**

- **Dundas**
- *Percent of map unit: 8 percent*
- **Le sueur**
- *Percent of map unit: 7 percent*

### **HaE2—Hayden loam, 18 to 25 percent slopes**

#### **Map Unit Setting**

- *National map unit symbol: gcbs*
- *Elevation: 700 to 1,600 feet*

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- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Not prime farmland

### **Map Unit Composition**

- *Hayden, moderately eroded, and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Hayden, Moderately Eroded**

- **Setting**
  - *Landform:* Moraines
  - *Landform position (two-dimensional):* Shoulder
  - *Down-slope shape:* Convex
  - *Across-slope shape:* Convex
  - *Parent material:* Till
- **Typical profile**
  - *Ap - 0 to 9 inches:* loam
  - *Bt - 9 to 45 inches:* clay loam
  - *C - 45 to 60 inches:* loam
- **Properties and qualities**
  - *Slope:* 18 to 25 percent
  - *Depth to restrictive feature:* More than 80 inches
  - *Natural drainage class:* Well drained
  - *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
  - *Depth to water table:* More than 80 inches
  - *Frequency of flooding:* None
  - *Frequency of ponding:* None
  - *Calcium carbonate, maximum in profile:* 25 percent
  - *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**
  - *Land capability classification (irrigated):* None specified
  - *Land capability classification (nonirrigated):* 6e
  - *Hydrologic Soil Group:* B
  - *Other vegetative classification:* Steep; Fine Texture (G103XS017MN)

## Minor Components

- **Dundas**
- *Percent of map unit: 8 percent*
- **Le sueur**
- *Percent of map unit: 7 percent*

## HaF2—Hayden loam, 25 to 35 percent slopes

### Map Unit Setting

- *National map unit symbol: gcbt*
- *Elevation: 700 to 1,600 feet*
- *Mean annual precipitation: 23 to 35 inches*
- *Mean annual air temperature: 43 to 50 degrees F*
- *Frost-free period: 155 to 200 days*
- *Farmland classification: Not prime farmland*

### Map Unit Composition

- *Hayden and similar soils: 85 percent*
- *Minor components: 15 percent*
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Hayden

- **Setting**
- *Landform: Moraines*
- *Landform position (two-dimensional): Shoulder*
- *Down-slope shape: Convex*
- *Across-slope shape: Convex*
- *Parent material: Till*
- **Typical profile**
- *A - 0 to 9 inches: loam*
- *Bt - 9 to 45 inches: clay loam*
- *C - 45 to 60 inches: loam*
- **Properties and qualities**
- *Slope: 25 to 35 percent*
- *Depth to restrictive feature: More than 80 inches*
- *Natural drainage class: Well drained*

- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 25 percent
- *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 7e
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Not Suited (G103XS024MN)

### **Minor Components**

- **Dundas**
- *Percent of map unit:* 8 percent
- **Le sueur**
- *Percent of map unit:* 7 percent

### **HcD3—Hayden soils, 12 to 18 percent slopes, severely eroded**

#### **Map Unit Setting**

- *National map unit symbol:* gcc6
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Not prime farmland

#### **Map Unit Composition**

- *Hayden, severely eroded, and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Hayden, Severely Eroded**

- **Setting**
- *Landform:* Moraines
- *Landform position (two-dimensional):* Shoulder

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- *Down-slope shape:* Convex
- *Across-slope shape:* Convex
- *Parent material:* Till
- **Typical profile**
- *Ap - 0 to 8 inches:* clay loam
- *Bt - 8 to 24 inches:* clay loam
- *C - 24 to 60 inches:* loam
- **Properties and qualities**
- *Slope:* 12 to 18 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 25 percent
- *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 4e
- *Hydrologic Soil Group:* B
- *Other vegetative classification:* Sloping; Fine Texture (G103XS023MN)

### Minor Components

- **Dundas**
- *Percent of map unit:* 8 percent
- **Le sueur**
- *Percent of map unit:* 7 percent

### HcE3—Hayden soils, 18 to 25 percent slopes

#### Map Unit Setting

- *National map unit symbol:* gcc7
- *Elevation:* 700 to 1,600 feet
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F

Prepared by: Bolton & Menk, Inc.

Updated Belle Plaine Wellhead Protection Plan 2015

- *Frost-free period:* 155 to 200 days
- *Farmland classification:* Not prime farmland

### **Map Unit Composition**

- *Hayden, severely eroded, and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Hayden, Severely Eroded**

- **Setting**
  - *Landform:* Moraines
  - *Landform position (two-dimensional):* Shoulder
  - *Down-slope shape:* Convex
  - *Across-slope shape:* Convex
  - *Parent material:* Till
- **Typical profile**
  - *Ap - 0 to 8 inches:* clay loam
  - *Bt - 8 to 24 inches:* clay loam
  - *C - 24 to 60 inches:* loam
- **Properties and qualities**
  - *Slope:* 18 to 25 percent
  - *Depth to restrictive feature:* More than 80 inches
  - *Natural drainage class:* Well drained
  - *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
  - *Depth to water table:* More than 80 inches
  - *Frequency of flooding:* None
  - *Frequency of ponding:* None
  - *Calcium carbonate, maximum in profile:* 25 percent
  - *Available water storage in profile:* High (about 10.5 inches)
- **Interpretive groups**
  - *Land capability classification (irrigated):* None specified
  - *Land capability classification (nonirrigated):* 6e
  - *Hydrologic Soil Group:* B
  - *Other vegetative classification:* Steep; Fine Texture (G103XS017MN)

### **Minor Components**

- **Dundas**
- *Percent of map unit: 8 percent*
- **Le sueur**
- *Percent of map unit: 7 percent*

#### **HdB—Sparta fine sand, 2 to 6 percent slopes**

##### **Map Unit Setting**

- *National map unit symbol: gcc9*
- *Elevation: 700 to 1,200 feet*
- *Mean annual precipitation: 23 to 35 inches*
- *Mean annual air temperature: 43 to 50 degrees F*
- *Frost-free period: 155 to 200 days*
- *Farmland classification: Not prime farmland*

##### **Map Unit Composition**

- *Sparta and similar soils: 90 percent*
- *Minor components: 10 percent*
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

##### **Description of Sparta**

- **Setting**
- *Landform: Stream terraces*
- *Landform position (two-dimensional): Backslope*
- *Down-slope shape: Linear*
- *Across-slope shape: Linear*
- *Parent material: Outwash*
- **Typical profile**
- *Ap - 0 to 12 inches: fine sand*
- *Bw - 12 to 38 inches: fine sand*
- *C - 38 to 60 inches: fine sand*
- **Properties and qualities**
- *Slope: 2 to 6 percent*
- *Depth to restrictive feature: More than 80 inches*
- *Natural drainage class: Excessively drained*
- *Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)*

- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water storage in profile:* Low (about 4.3 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* 2e
- *Land capability classification (nonirrigated):* 4s
- *Hydrologic Soil Group:* A
- *Other vegetative classification:* Sandy (G103XS022MN)

### Minor Components

- **Dickinson**
- *Percent of map unit:* 10 percent

### KaA—Kasota silt loam, 0 to 2 percent slopes

#### Map Unit Setting

- *National map unit symbol:* gccm
- *Mean annual precipitation:* 23 to 35 inches
- *Mean annual air temperature:* 43 to 50 degrees F
- *Frost-free period:* 155 to 200 days
- *Farmland classification:* All areas are prime farmland

#### Map Unit Composition

- *Kasota and similar soils:* 85 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Kasota

- **Setting**
- *Landform:* Stream terraces
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Glaciofluvial sediments over outwash
- **Typical profile**
- *Ap - 0 to 14 inches:* silt loam
- *Bt - 14 to 27 inches:* clay loam
- *2C - 27 to 60 inches:* gravelly sand

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- **Properties and qualities**
- *Slope:* 0 to 2 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.14 to 0.57 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 20 percent
- *Available water storage in profile:* Moderate (about 6.3 inches)
- **Interpretive groups**
- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 2s
- *Hydrologic Soil Group:* C
- *Other vegetative classification:* Sloping Upland, Neutral (G103XS002MN)

#### **Minor Components**

- **Esterville**
- *Percent of map unit:* 8 percent
- **Dickinson**
- *Percent of map unit:* 7 percent

#### **LcB—Lester loam, 2 to 6 percent slopes**

##### **Map Unit Setting**

- *National map unit symbol:* 2ttbx
- *Elevation:* 690 to 1,840 feet
- *Mean annual precipitation:* 24 to 37 inches
- *Mean annual air temperature:* 43 to 52 degrees F
- *Frost-free period:* 140 to 180 days
- *Farmland classification:* All areas are prime farmland

##### **Map Unit Composition**

- *Lester and similar soils:* 80 percent
- *Minor components:* 20 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

##### **Description of Lester**

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- *Slope:* 1 to 3 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Moderately well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
- *Depth to water table:* About 18 to 30 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 30 percent
- *Available water storage in profile:* High (about 10.4 inches)
- **Interpretive groups**
  - *Land capability classification (irrigated):* None specified
  - *Land capability classification (nonirrigated):* 1
  - *Hydrologic Soil Group:* B/D
  - *Other vegetative classification:* Sloping Upland, Neutral (G103XS002MN)

#### Hydrologic Soil Group

The hydrologic soil group map is included as Figure 9.

<b>Symbol</b>	<b>Soil Name</b>	<b>HYDGRP</b>	<b>ACRES</b>
AaA	Alluvial land, 0 to 2 percent slopes	B	8.7
AaB	Alluvial land, 2 to 6 percent slopes	B	20.8
Ab	Alluvial land, frequent overflow, 0 to 6 percent slopes	A/D	11.7
DaA	Dakota loam, 0 to 2 percent slopes	B	6.5
DbA	Dickman sandy loam, 0 to 2 percent slopes	A	7.1
DbB	Dickman sandy loam, 2 to 6 percent slopes	A	3.0
EaA	Estherville loam and sandy loam, 0 to 2 percent slopes	A	3.5
EaB	Estherville loam and sandy loam, 2 to 6 percent slopes	A	4.4
EaB2	Estherville loam and sandy loam, 2 to 6 percent slopes, moderately eroded	A	35.6
EbC2	Salida gravelly sandy loam, 6 to 12 percent slopes, moderately eroded	A	7.0
Ga	Glencoe silty clay loam	B/D	13.2
Gp	Pits, gravel		0.7
HaB	Hayden loam, 0 to 6 percent slopes	B	4.2
HaB2	Hayden loam, 2 to 6 percent slopes, moderately eroded	B	13.6
HaC	Hayden loam, 6 to 12 percent slopes	B	4.1
HaC2	Hayden loam, 6 to 12 percent slopes, moderately eroded	B	30.3
HaD	Hayden loam, 12 to 18 percent slopes	B	4.9
HaD2	Hayden loam, 12 to 18 percent slopes, moderately eroded	B	27.1
HaE2	Hayden loam, 18 to 25 percent slopes	B	41.9
HaF2	Hayden loam, 25 to 35 percent slopes	B	22.8

HcD3	Hayden soils, 12 to 18 percent slopes, severely eroded	B	6.8
HcE3	Hayden soils, 18 to 25 percent slopes	B	7.5
HdB	Sparta fine sand, 2 to 6 percent slopes	A	10.6
KaA	Kasota silt loam, 0 to 2 percent slopes	C	679.0
KaB	Kasota silt loam, 2 to 6 percent slopes	C	0.3
LcB	Lester loam, 2 to 6 percent slopes	B	17.2
LcB2	Lester loam, 2 to 6 percent slopes, moderately eroded	B	89.3
LcC	Lester loam, 6 to 12 percent slopes	B	7.7
LcC2	Lester loam, 6 to 12 percent slopes, moderately eroded	B	87.5
LcD	Lester loam, 12 to 18 percent slopes	B	4.5
LcD2	Lester loam, 12 to 18 percent slopes, moderately eroded	B	19.5
LcE2	Lester loam, 18 to 25 percent slopes	B	15.7
LdC3	Lester soils, 6 to 12 percent slopes, severely eroded	B	5.4
LdE3	Lester soils, 18 to 25 percent slopes	B	6.7
Lf	Le Sueur-Lester complex	B/D	23.0
PaA	Klossner muck, 0 to 1 percent slopes	C/D	7.3
PbA	Houghton muck, 0 to 2 percent slopes	A/D	22.0
Sb	Steep land, Hayden-Lester materials		100.2
Ta	Terrace escarpments		3.2
TcB	Terril loam, 2 to 6 percent slopes	B	46.6
TcC	Terril loam, 6 to 12 percent slopes	B	4.8
WaA	Waukegan silt loam, 0 to 2 percent slopes	B	2.7
WaB	Waukegan silt loam, 2 to 6 percent slopes	B	13.1
Wb	Webster-Glencoe silty clay loams	B/D	174.6
Wc	Webster-Le Sueur silty clay loams	B/D	216.2

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) 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.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

### Eroding Lands

There are no known areas of eroding lands causing sedimentation problems. The soils' K factor is medium, indicating a medium likelihood of erosion problems.

### K Factor, Whole Soil

<b>Symbol</b>	<b>Soil Name</b>	<b>K Factor, Whole Soil</b>	<b>ACRES</b>
AaA	Alluvial land, 0 to 2 percent slopes	0.28	8.7
AaB	Alluvial land, 2 to 6 percent slopes	0.28	20.8
Ab	Alluvial land, frequent overflow, 0 to 6 percent slopes	0.28	11.7
DaA	Dakota loam, 0 to 2 percent slopes	0.28	6.5
DbA	Dickman sandy loam, 0 to 2 percent slopes	0.20	7.1
DbB	Dickman sandy loam, 2 to 6 percent slopes	0.20	3.0
EaA	Estherville loam and sandy loam, 0 to 2 percent slopes	0.32	3.5
EaB	Estherville loam and sandy loam, 2 to 6 percent slopes	0.32	4.4
EaB2	Estherville loam and sandy loam, 2 to 6 percent slopes, moderately eroded	0.32	35.6
EbC2	Salida gravelly sandy loam, 6 to 12 percent slopes, moderately eroded	0.17	7.0
Ga	Glencoe silty clay loam	0.28	13.2
Gp	Pits, gravel		0.7
HaB	Hayden loam, 0 to 6 percent slopes	0.32	4.2
HaB2	Hayden loam, 2 to 6 percent slopes, moderately eroded	0.32	13.6
HaC	Hayden loam, 6 to 12 percent slopes	0.32	4.1
HaC2	Hayden loam, 6 to 12 percent slopes, moderately eroded	0.32	30.3
HaD	Hayden loam, 12 to 18 percent slopes	0.32	4.9
HaD2	Hayden loam, 12 to 18 percent slopes, moderately eroded	0.32	27.1
HaE2	Hayden loam, 18 to 25 percent slopes	0.32	41.9
HaF2	Hayden loam, 25 to 35 percent slopes	0.32	22.8
HcD3	Hayden soils, 12 to 18 percent slopes, severely eroded	0.32	6.8
HcE3	Hayden soils, 18 to 25 percent slopes	0.32	7.5
HdB	Sparta fine sand, 2 to 6 percent slopes	0.10	10.6
KaA	Kasota silt loam, 0 to 2 percent slopes	0.37	679.0
KaB	Kasota silt loam, 2 to 6 percent slopes	0.37	0.3

LcB	Lester loam, 2 to 6 percent slopes	0.28	17.2
LcB2	Lester loam, 2 to 6 percent slopes, moderately eroded	0.32	89.3
LcC	Lester loam, 6 to 12 percent slopes	0.28	7.7
LcC2	Lester loam, 6 to 12 percent slopes, moderately eroded	0.32	87.5
LcD	Lester loam, 12 to 18 percent slopes	0.28	4.5
LcD2	Lester loam, 12 to 18 percent slopes, moderately eroded	0.32	19.5
LcE2	Lester loam, 18 to 25 percent slopes	0.32	15.7
LdC3	Lester soils, 6 to 12 percent slopes, severely eroded		5.4
LdE3	Lester soils, 18 to 25 percent slopes	0.28	6.7
Lf	Le Sueur-Lester complex	0.28	23.0
PaA	Klossner muck, 0 to 1 percent slopes		7.3
PbA	Houghton muck, 0 to 2 percent slopes		22.0
Sb	Steep land, Hayden-Lester materials		100.2
Ta	Terrace escarpments		3.2
TcB	Terril loam, 2 to 6 percent slopes	0.28	46.6
TcC	Terril loam, 6 to 12 percent slopes	0.28	4.8
WaA	Waukegan silt loam, 0 to 2 percent slopes	0.37	2.7
WaB	Waukegan silt loam, 2 to 6 percent slopes	0.37	13.1
Wb	Webster-Glencoe silty clay loams	0.28	174.6
Wc	Webster-Le Sueur silty clay loams	0.28	216.2

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

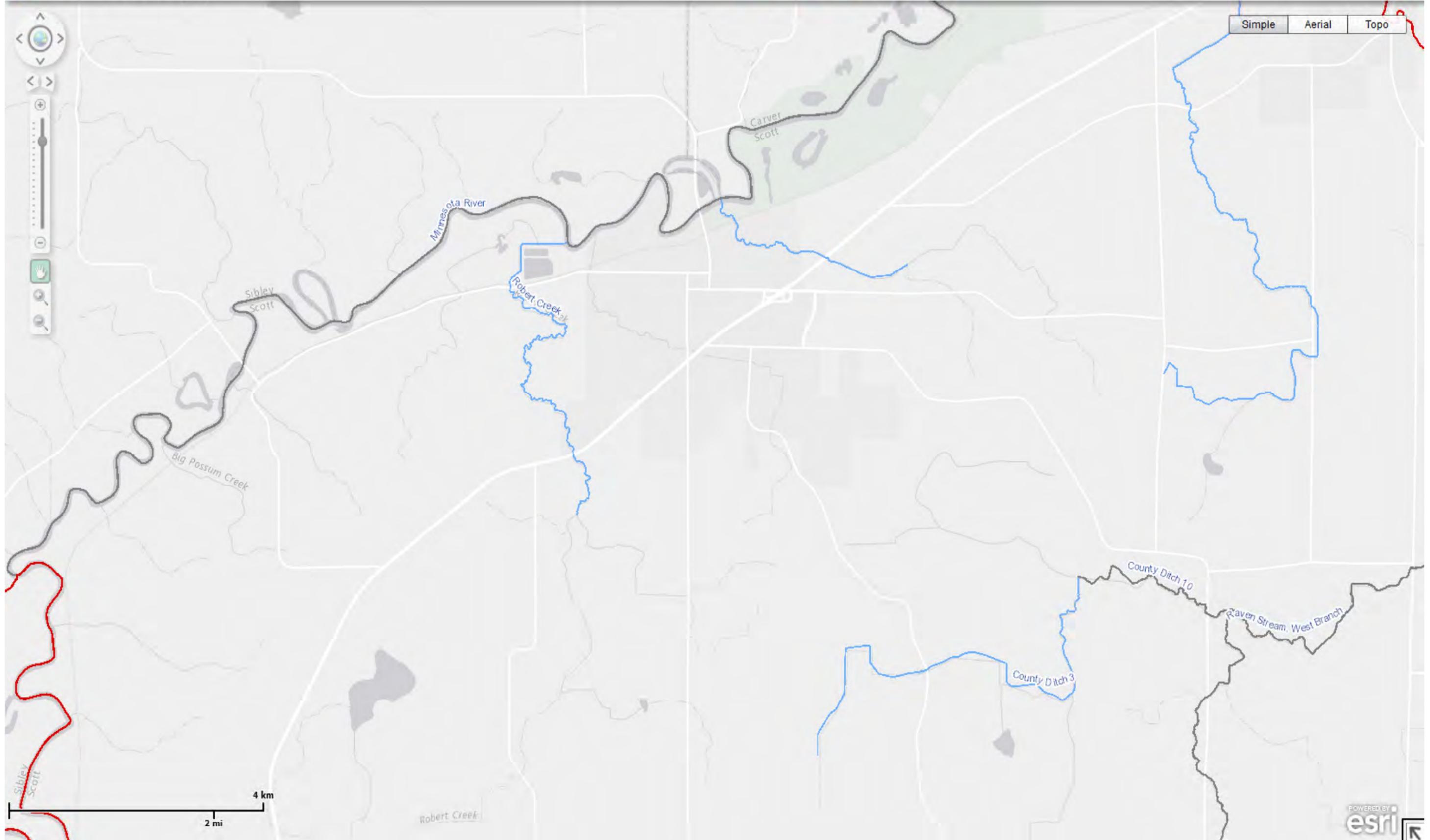
"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

## Water Resources Data

Figure 17 shows the water resources in the vicinity of the DWSMA.

The City of Belle Plaine and the DWSMA are in the lower Minnesota River major watershed (Hydrologic Unit Code 07020012). There are several areas that are a National Wetlands Inventory (NWI) wetland, and there is a protected water watercourse in the DWSMA. There are no streams or lakes that are special waters or are impaired, nor are there calcareous fens, in the DWSMA.

The City of Belle Plaine has a Storm Water Management Plan.

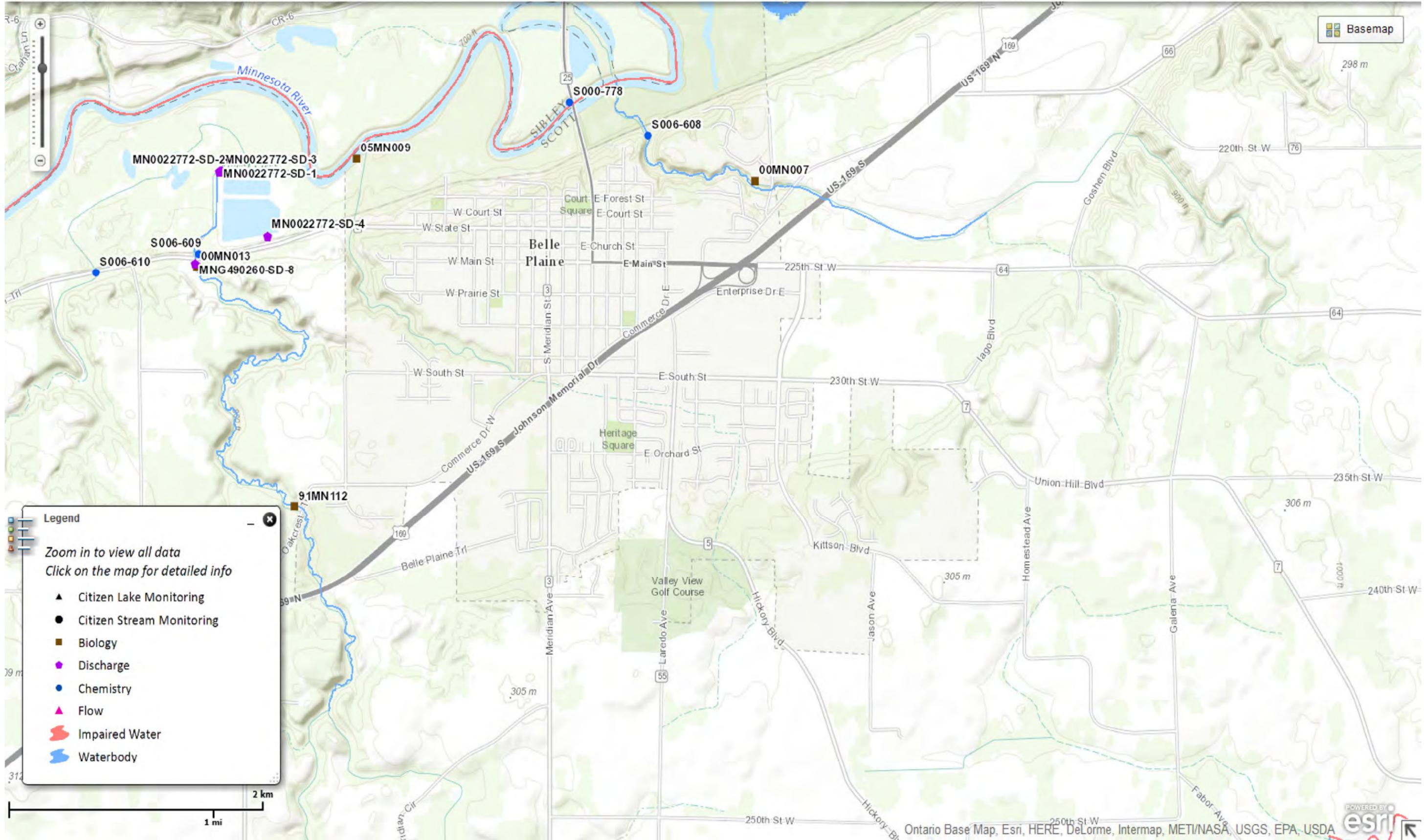


# Surface water data access

Minnesota Pollution Control Agency



Enter Minnesota city or address



The NRCS has done a Rapid Watershed Assessment for the lower Minnesota River watershed (HUC 07020012). It is available on the NRCS website. The Lower Minnesota River watershed is largely agricultural.

The Belle Plaine DWSMA is located within CRA 103.1 resource area.

103.1 – Iowa and Minnesota Till Prairies: Primarily loamy glacial till soils with scattered lacustrine areas, potholes, outwash and flood plains. Nearly level to gently undulating with relatively short slopes. Most of the wet soils have been artificially drained to maximize crop production. Primary land use is cropland. Corn, soybeans, sugar beets, peas and sweet corn are the major crops. Native vegetation was dominantly tall grass prairie. Resource concerns are water and wind erosion, nutrient management, and water quality.

Resource concerns include excessive sheet and rill erosion, excessive wind erosion, water quality impacts from new development and land disturbing activities and nutrient and chemical contamination, groundwater quality and quantity, management of runoff from development and redevelopment activities, and retaining water on the landscape through wetland management.

Glacial deposits ranging in thickness from zero to slightly over five hundred feet cover the Lower Minnesota River watershed. The thickest drift deposits are localized in two deep buried bedrock valleys, one east and one west of the Minnesota River. The glacial deposits are predominantly till, an unsorted, unstratified mixture of clay, silt, sand, and gravel (Anderson et. al 1974). Bedrock geology of the Lower Minnesota River watershed consists of poorly consolidated marine and continental shales of Cretaceous age.

The eastern quarter of the watershed is found within Steep Wetter Moraine. This region includes the rapidly expanding suburban areas of the Twin Cities. Much of the land next to streams is very steep, with a large potential for sediment delivery to streams. Soil textures in this region range from sandy loam to loam, and landscapes are primarily well drained with a high water erosion potential.

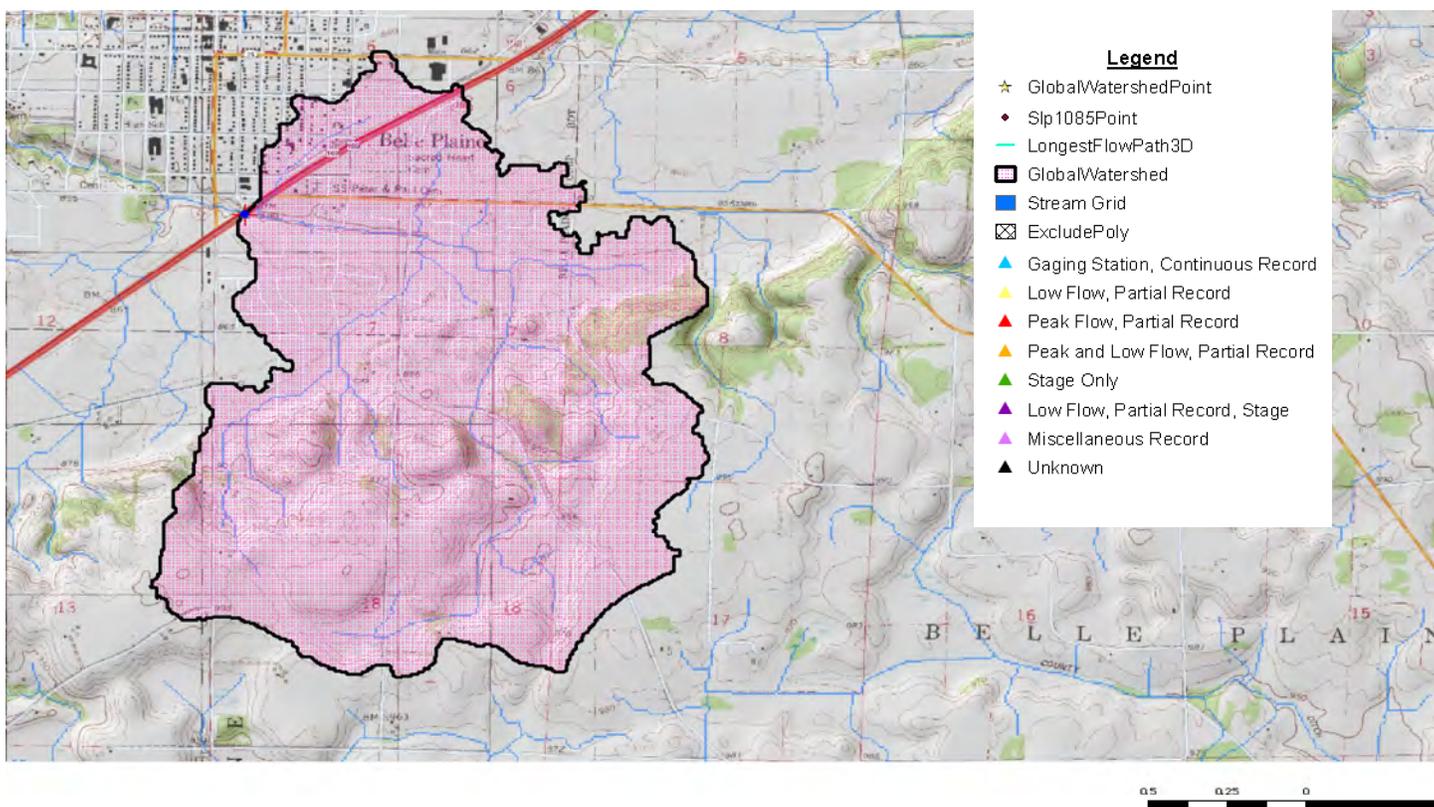
- **Surface Water Quality:** Water quality impacts from new development and land disturbing activities, flooding and erosion from surface flows, and nutrient and chemical contamination from agricultural and commercial practices.
- **Ground Water Quality and Quantity:** Impacts on groundwater from feedlots, landfills, mining operations, and other land disturbing activities. Groundwater aquifers are highly susceptible in the river valley, and changing land use is affecting water quantity and recharge rates.
- **Storm water management:** Runoff from development and redevelopment activities, loss and alteration of floodplains, rate and volume control, impact of stormwater discharge on downstream conveyance systems.
- **Wetland Management:** Buffers in new development projects or areas undergoing redevelopment, and the preservation and protection of all agricultural wetland areas. Retaining water on the landscape through wetland creation and restoration will help address the concerns of erosion control, water quality and quantity.

The following maps are showing the watersheds that the DWSMA is in. A majority of the DWSMA flows either to an unnamed creek on the west side of the DWSMA or to Brewery Creek on the north side of the DWSMA before it reaches the Minnesota River, so watershed maps of Brewery Creek and the unnamed creek are included. The watershed maps were created using the USGS Minnesota Stream Stats website (<http://water.usgs.gov/osw/streamstats/minnesota.html>). This website also calculates basin characteristics and these are included below.



### StreamStats Print Page

## Unnamed Creek (west)



1/21/2015 1:43:24 PM

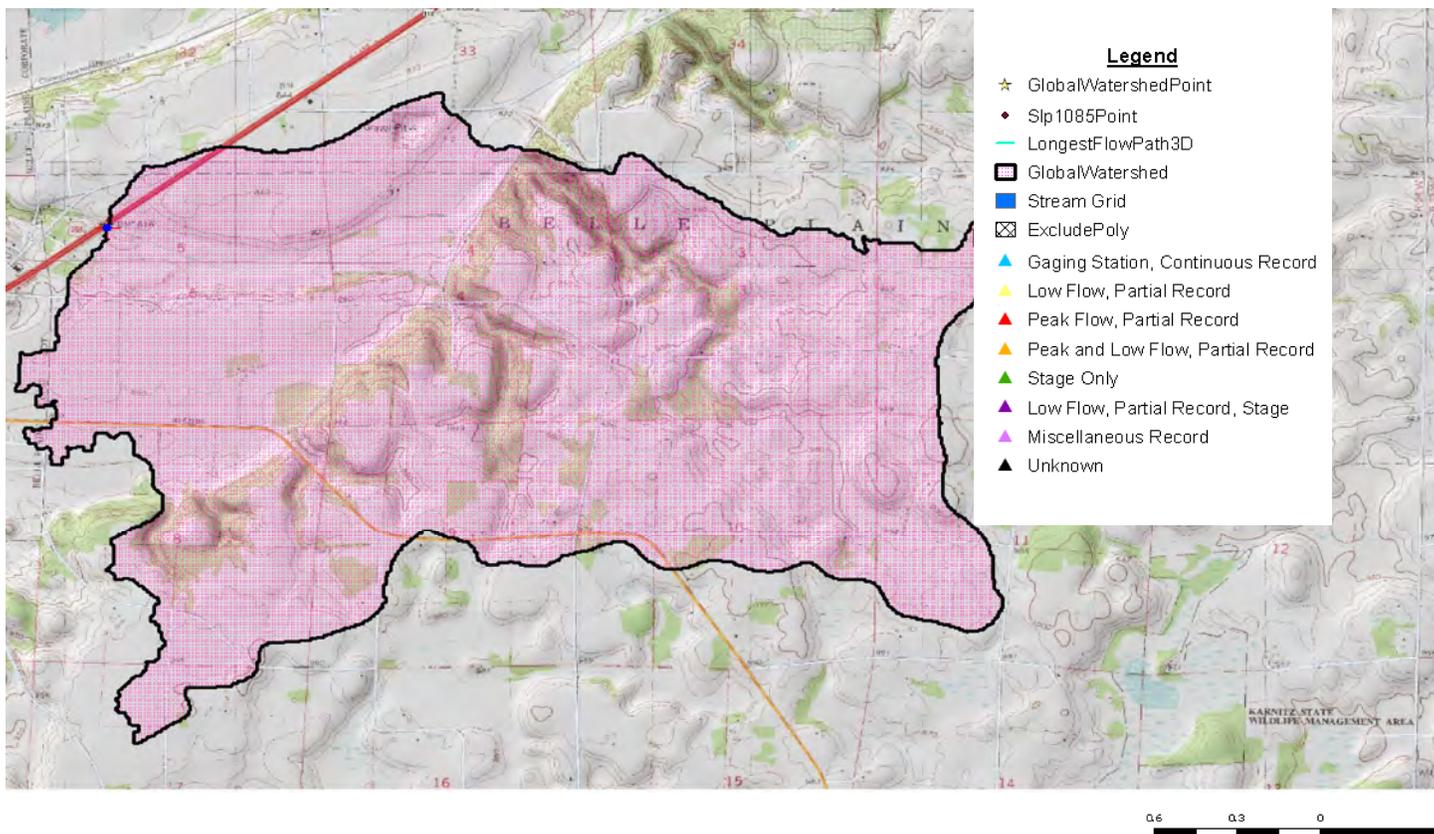
**Minnesota StreamStats****Basin Characteristics Report****Date: Wed Jan 21 2015 13:44:17 Mountain Standard Time****NAD27 Latitude: 44.6148 (44 36 53)****NAD27 Longitude: -93.7661 (-93 45 58)****NAD83 Latitude: 44.6147 (44 36 53)****NAD83 Longitude: -93.7663 (-93 45 59)**

<b>Parameter</b>	<b>Value</b>
Channel 10-85 slope in feet per mile	46
Percent area covered by soil type A	29.75
Log of drainage area in square miles	0.42
Percent area covered by lakes and ponds	0.00
Drainage Area in square miles	2.63
Generalized mean annual runoff in Minnesota 1951-85	5.39



### StreamStats Print Page

## Brewery Creek



1/21/2015 3:19:20 PM

**Minnesota StreamStats****Basin Characteristics Report****Date: Wed Jan 21 2015 15:20:53 Mountain Standard Time****NAD27 Latitude: 44.6271 (44 37 38)****NAD27 Longitude: -93.7406 (-93 44 26)****NAD83 Latitude: 44.6271 (44 37 37)****NAD83 Longitude: -93.7409 (-93 44 27)**

Parameter	Value
Channel 10-85 slope in feet per mile	36.1
Percent area covered by soil type A	20.99
Log of drainage area in square miles	0.74
Percent area covered by lakes and ponds	0.00
Drainage Area in square miles	5.5
Generalized mean annual runoff in Minnesota 1951-85	5.45

## Land Use Data

Figure 7 shows parcel boundaries; city and township boundaries; and township-range-section. Figure 10 shows the zoning. Figure 11 shows land use. Potential contaminant sources are shown on Figure 15. Land use on a watershed-wide basis is discussed in the NRCS's Lower Minnesota River Rapid Watershed Assessment, available on the NRCS website.

Land Use	Acres	% of Total
100 Res 1 unit	364.0746	17.00
140 Res V Land	30.35111	1.42
200 Agricultural	799.1162	37.32
200 Agricultural/211	407.3445	19.02
211 Rural Vacant Lan	228.2631	10.66
300 Commercial	32.05737	1.50
305 Industrial	52.16692	2.44
320 Q Golf Course	83.78436	3.91
320 Q Golf Course/30	60.74374	2.84
365 Pub Util Mach/30	0.02811	0.00
912 Cemetery-Private	17.07354	0.80
958 Muni Srvc Other	45.68193	2.13
<b>Total</b>	<b>2141.363</b>	<b>100.00</b>

## Public Utility Data

Figure 7 shows transportation routes. Figure 12 shows the sanitary sewer system. Figure 13 shows water system. Figure 14 shows storm water system. A natural gas pipeline is known to exist in the DWSMA. The public drainage system is shown on Figure 17.

## Surface Water Quantity Data

As stated above, Brewery Creek flows north of the DWSMA and receives runoff from the eastern side of the DWSMA, and an unnamed creek is near the center of Belle Plaine and receives runoff from the western side of the DWSMA. The Minnesota River is in the vicinity, but there are no stream gages in this area that would provide flow data (the closest one is near Jordan). There are NWI wetlands within the DWSMA, but none show up on the DNR's Lake Finder website. There are no known state-protected levels or flows for any nearby water bodies. The City does not withdraw any water from any lakes or streams. There are no known water-use conflicts.

## Groundwater Quantity Data

Below is an existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.

Unique Number	Well Name	Permittee	DNR Permit Number	Use	Aquifer	Average withdrawal (2007-2011) million gallons/year
161323	Phillip A Morris		1991-6121	Non-Crop Irrigation	QBAA	3.5
469306	Valley View Golf Club LLC		1992-6125	Non-Crop Irrigation	QBUA	15.1
212293	Eugene Korninder		1977-6401	Major Crop Irrigation	CSTL-CIGL	1.4

There are no known well interference problems or water use conflicts. No state environmental bore holes exist within the DWSMA.

### Surface Water Quality Data

No water quality data is available for the west unnamed creek that receives runoff from the DWSMA. A majority of the DWSMA flows either to an unnamed creek on the west side of the DWSMA or to Brewery Creek on the north side of the DWSMA before it reaches the Minnesota River, so data for Brewery Creek are included. There is some surface water quality data available for the Minnesota River, taken from the SH 25 bridge to the north of the DWSMA. The station was last sampled in 1998.

#### Stream Station Information

**Station Name:** MINNESOTA R., SH-25 BY BELLE PLAINE  
**Waterbody Name:**  
**Data Steward Org:** MPCA  
**Station ID:** S000-778  
**Hydrologic Unit Code (HUC):** 07020012  
**Assessment Unit:**  
**Period of Record:** 1980 through 1998  
**Lat/Lon** 44.633333, -93.766111

#### Station Data

Sample Date	Type	Temp	BOD	Chl-a	Stream Trans	DO	TKN	NO2NO3	pH	Pheo	TP	TSS	Turb	FC	Ecoli
08-06-98	Routine		3.8	55.1			1.47			7.47	0.212	39	39		
07-28-98	Routine														33
07-23-98	Routine		2.1	35.6			1.68			3.68	0.279	130	73		1300
07-20-98	Routine														1000
07-13-98	Routine		2.1	22.2						<2.29	0.303	130	76		950
07-07-98	Routine														230
06-30-98	Routine		2.3	10.6						<3.2	0.421	260	150		800
06-24-98	Routine														540
06-18-98	Routine														120

06-16-98	Routine							140
06-02-98	Routine							180
05-28-98	Routine							350
05-21-98	Routine							76
05-18-98	Routine							180
05-14-98	Routine							8
05-04-98	Routine							18

There is some surface water quality data available for Brewery Creek to the north of the DWSMA. The station was last sampled in 2000.

Stream Station Information

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**Stream Name:** BREWERY CREEK  
**Waterbody Name:**  
**Data Steward Org:** MPCA  
**Station ID:** 00MN007  
**Hydrologic Unit Code (HUC):** 07020012  
**Assessment Unit:** 07020012-577  
**Period of Record:** 2000 through 2000  
**Lat/Lon** 44.62819723, -93.74763577

Data collected from September 11, 2000

Site Visit Date	11-SEP-00
Water Temperature C	17.5
Conductivity umhos/cm	667
Field Turbidity NTU	0.94
Dissolved Oxygen mg/L	9.25
pH	8.33
Flow m3/sec	
Nitrogen mg/L	
Total Phosphorus mg/L	
Total Suspended Solids mg/L	
Ammonia mg/L	
Fish Rating	

### Groundwater Quality Data

The City sends out a Drinking Water Report to its citizens on an annual basis. The annual reports have water quality data for the drinking water. The 2013 report is included in Appendix V, Supporting Information.