AGENDA
SHAKOPEE PUBLIC UTILITIES COMMISSION
REGULAR MEETING
September 9, 2024
at 5:00 PM

1. **Call to Order** at 5:00pm in the SPU Service Center, 255 Sarazin Street
   1a) Roll Call

2. **Communications**
   2a) Customer Communications, re: Backflow Testing and Penalties Appeal response (GD)

3. **Consent Agenda**
   C=> 3a) Approval of August 3, 2024 Minutes (GD)
   C=> 3b) Approval of September 9, 2024 Agenda (JK)
   C=> 3c) September 9, 2024 Warrant List (KW)
   C=> 3d) Monthly Water Dashboard for July 2024 (LS)
   C=> 3e) Reservoir Structure Inspections (LS)
   C=> 3f) July 31, 2024 Financials Reports (KW)
   C=> 3g) 2025 Budget Timeline (KW)
   C=> 3h) Statement of Work – Audit Services: Clifton, Larson Allen LLP (CLA) (KW)
   C=> 3i) MMPA August 2024 Meeting Update (GD)
   C=> 3j) Res #2024-27 Resolution of Appreciation to Gregory Triplett (GD)
   C=> 3k) Res #2024-28 Resolution of Appreciation to Cynthia Nickolay (GD)
   C=> 3l) Controlled Substance and Alcohol Testing Policy (GD)

   * Motion to approve the Consent Agenda

4. **Public Comment Period.** Please step up to the table and state your name and address for the record.

5. **Reports: Water Items**
   5a) Customer Appeal of Backflow Penalties (GD)
   5b) 2024 Comprehensive Water Plan Update by SEH, Inc. (JA) *

   * Motion to accept the report and the recommendations contained within, request more information or direct revisions to the report.

   5c) Water System Operations Report – Verbal (LS)
   5d) AMI Water Meter Installations – Actions for Failure to Install (SW)
   5e) Jackson Township Park Water Service Request by the City of Shakopee (JA) *

   * Motion to approve the water service consistent with the provision in Resolution #814

   5f) Request to Authorize Use of Reclaimed Water in Car Wash (JA) *

   * Motion to Authorize the General Manager to proceed as described and direct staff to update the Water Policy Manual to incorporate the requirements to allow reclaimed water to use in certain acceptable situations.

6. **Liaison Report** (JD)

7. **Reports: Electric Items**

7a) Electric System Operations Report – Verbal (BC)

8. **Reports: General**

8a) Marketing/Key Accounts Report – Verbal (SW)

8b) Organization Chart Changes 2024 - 2025 (GD) *

* Motion to accept the changes to the Organizational Chart 2024 - 2025

8c) General Manager Report – Verbal (GD)

8d) NES WTP Site Search Update: Shakopee Gravel/Hawkins potential site plans (GD) **

** A portion of this meeting may be closed under Minnesota Statutes, Section 13D.05, subdivision 3(c) to review confidential or protected nonpublic appraisal data and to develop or consider offers or counteroffers for the purchase of property at 1776 Mystic Lake Drive S

9. **Items for Future Agendas**

10. **Tentative Dates for Upcoming Meetings**

- September 23, 2024 Workshop
- October 7, 2024
- November 4, 2024

11. **Adjournment**

Shakopee Public Utilities

PO Box 470 • 255 Sarazin Street
Shakopee, Minnesota 55379
Main 952.445-1988 • Fax 952.445-7767
www.shakopeeutilities.com

August 8, 2024

Re: Request to Remove $150 charge

This letter responds to your recent communication dated July 30, 2024, requesting Shakopee Public Utilities (SPU) remove the $150 charge regarding backflow prevention testing from the above account. In following SPU's Backflow Prevention and Cross-Connection Control Policy, SPU respectfully denies this request. I will respond specifically to the items you noted.

First, your letter stated that "Minnesota law 603.5. that was passed in 2015 was designated and refer to **Fire sprinklers systems but not to garden sprinklers systems."** Please note the current regulations and Minnesota Plumbing Code are not limited to fire sprinkler systems. The 2020 Minnesota Plumbing Code addresses "water-operated equipment or mechanism" and Section 603.5.6 specifically references "lawn sprinklers and irrigation systems."

Second, your letter states "there is no law in Minnesota that requires testing garden backflow devices installed before 2016." We respectfully direct you to Minnesota Administrative Rule 4714.0603, subpart 1, which requires devices for protection against backflow and testing "at the time of installation, report, or relocation and not less than on an annual schedule thereafter...", and the 2020 Minnesota Plumbing Code, Chapter 6. Neither regulation limits the backflow prevention requirements to 2016 or earlier.

Finally, your letter states "there is no way for water to come to the city water through pipes from garden sprinklers since there is no back pressure in the sprinklers system after sprinklers is turned off." SPU acknowledges that the risk for an individual resident's lawn sprinkler system to contaminate the public water system may be low, but it also notes there are over 6,000 devices connected to Shakopee's water system and the protections of the regulations benefit everyone. SPU is mindful of the need to protect the public water supply for the community as a whole.

We understand that this is a new policy and a change in practice. SPU is focused on doing everything in its power to provide the safest drinking water we can to our customers.

Following SPU's appeal policy, if you accept this response, please acknowledge it with an email or other written response. If you are not in agreement, you have the right to request an audience with the Commission, by contacting me and requesting to be added to an upcoming agenda on this issue for public discussion.

Sincerely,

Gregory L Drent

Greg Drent
General Manager

MINUTES OF THE
SHAKOPEE PUBLIC UTILITIES COMMISSION
August 5, 2024
Regular Meeting

1. Call to Order. President Krieg called the August 5, 2024 meeting of the Shakopee Public Utilities Commission to order at 5:00 P.M. President Krieg, Vice President Letourneau, Commissioner DuLaney, Commissioner Fox, and Commissioner Mocol were present.

2. Communications. Greg Drent, General Manager, noted communications from customers appealing the backflow testing and charges.

3. Consent Agenda. Commissioner Mocol moved approval of the consent agenda items:
(a) July 1, 2024 minutes;
(b) August 5, 2024 Agenda;
(c) August 5, 2024 Warrant List;
(d) Monthly Water Dashboard of June 2024;
(e) 2024 Flush Program Progress Map;
(f) MMPA June Meeting Update;
(g) MMPA July Meeting Update;
(h) Guidance for Commissioners on Direct Communications with Employees;
(i) June 2024 Financial Report
(j) Res #2024-25 Resolution Setting the Amount of the Trunk Water Charge, Approving of Its Collection, and Authorizing Water Service to Certain Property Described as: Highview Park 3rd Addition and;
(k) Res# 2024-26 Resolution Approving All Matters Required for Completing Plat Filing and Development of Property
Commissioner Fox seconded the motion. Ayes: Krieg, Letourneau, DuLaney, Fox, and Mocol. Nays: None.

4. Public Comment Period. No public comments were offered.

5. 2024 Comprehensive Water Plan Update. Joseph Adams, Planning and Engineering Director, introduced Chad Katzenberger and Chris Larson from SEH, Inc. to present the draft comprehensive water plan update to the 2018 plan, supplemented in 2019. In considering projections through 2045, the Commission discussed the parameters of the report, including potential future changes to the City limits. Commissioner Mocol moved to direct staff and SEH, Inc. to consider scenarios of including in whole, in part, or not including future annexations regarding Louisville Township and potential future growth. Vice President Letourneau seconded the motion. Ayes: Krieg, Letourneau, DuLaney, Fox, and Mocol. Nays: None.

6. Water Report. Lon Schemel, Water Superintendent, reported that Pumphouse 3 continues to be on schedule, with start-up expected the first week of December. He also noted that although the Tank #9 RFP information was sent to the paper for publication, the paper erred in failing to print it. The bids are expected to be presented at the October Commission meeting.

7. Combined Minnesota Department of Health/SPU PFAS Results. Mr. Schemel provided an update on PFAS sampling, including SPU sending the results of its internal testing to the Minnesota Department of Health to be included with the State testing data. Mr. Schemel also explained SPU's compliance with the State's health risk index (well below one) and federal EPA standards (with SPU currently categorized at zero).

8. 11th Ave Watermain Improvement Bid Award. Ryan Halverson, Engineering Supervisor – Water, presented an update on the Lion's Park/ Sand Venture Pool project. SPU opened bids regarding the upgrade to the water main along 11th Avenue to the entrance to Lion's Park, on July 12, 2024. One bid was received from Minger Construction Co. Inc in the amount of $163,131.07. Although this bid exceeded the engineer's estimate of $126,703.50, Mr. Halverson explained that staff recommends accepting the response because the project involved horizontal directional drilling, a specialized construction process to preserve the existing roadway, as well as an unusually short timeframe to allow the pool to stay open during the summer. He also noted that staff recommends funding from the SPU Reconstruction Fund. Vice President Letourneau moved to award the construction contract for the 11th Avenue Water Main Improvement to Minger Construction Co. Inc., in the amount of $163,131.07, with a 10% construction contingency budget, and to authorize reimbursement to the City of Shakopee in the amount of $68,010.01 for the 100-foot portion of the public water main constructed as part of the park project. Commissioner Fox seconded the motion. Ayes: Krieg, Letourneau, DuLaney, Fox, and Mocol. Nays: None.

9. Liaison Report. Commissioner DuLaney noted that he attended the Minnesota Municipal Power Agency annual meeting, which was informative. He reminded everyone that August 6th is Night to Unite. Commissioner DuLaney asked about potential solar projects, including Sand Venture.

10. Electric Report. Brad Carlson, Electric Superintendent, welcomed Dylan Richards, a third-year apprentice, to SPU. He expects an update for the Commission meeting room project in early October. Mr. Carlson provided project updates, including relocated pole for Co Rd 78 underpass; Whispering Waters 2nd Addition is complete; relocation completed at Co Rd 78 and Co Rd 69 roundabout; and extended 3-phase down Zumbro Avenue. He noted that a contractor hit circuit 44 by Canterbury, which then accelerated SPU's undergrounding project. Mr. Calrson reported 11 outages since the last Commission meeting, mostly from storms and some animal-related, including a squirrel affecting circuit 9 downtown.

11. Xcel Energy Notice of Blue Lake Substation. Mr. Adams reported that Xcel Energy notified SPU that Xcel will replace the 25 MVA transformer with a 50 MVA unit. The notice did not discuss costs or request any payment from SPU. Kevin Favero of Leidos is analyzing potential fault current protection, with recommendations to be presented at a future Commission meeting. Mr. Adams noted the importance of the East Shakopee Substation in this area.

12. Marketing/Key Accounts Report. Sharon Walsh, Director of Key Accounts/Marketing/Special Projects, reported that SPU has installed approximately 6,592 automated meter infrastructure (AMI) electric meters and 3,057 AMI water meters. She noted

that a small percentage of water meters are leaking; they are being retired and returned. Ms. Walsh also noted the rescheduled (due to rain) Rhythm on the Rails event for August 7, 2024.

13. General Manager Report. Mr. Drent noted discussion of potential revisions to the Organization Chart due to AMI, and that the informal working group will consider analysis and options. He reported that some updates to the Employee Handbook are being drafted and will be brought back to the Commission. Mr. Drent noted the addition of a new Engineering Project Coordinator. He also noted that FRSecure is meeting with all SPU Directors to evaluate security measures.

14. NES WTP Site Search Update. Vice President Letourneau moved to go into closed session under Minnesota 13D.05, subdivision 3(c) to review confidential or protected nonpublic appraisal data and to develop or consider offers or counteroffers for the purchase of property located at 1776 Mystic Lake Drive S., Shakopee. Commissioner Fox seconded the motion. Ayes: Krieg, Letourneau, DuLaney, Fox, and Mocol. Nays: None. In open session, Mr. Drent noted that SPU is waiting on additional information to help develop a potential offer for the site.

15. Adjourn. Motion by Commissioner Mocol, seconded by Commissioner Fox, to adjourn. Ayes: Krieg, Letourneau, DuLaney, Fox, and Mocol. Nays: None.

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Greg Drent, Commission Secretary

Proposed As Consent Item

3b

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Proposed As Consent Item **3c**

SHAKOPEE PUBLIC UTILITIES COMMISSION

WARRANT LISTING

September 9, 2024

By direction of the Shakopee Public Utilities Commission, the Secretary does hereby authorize the following warrants drawn upon the Treasury of Shakopee Public Utilities Commission:

WEEK OF 08/02/2024

AAR BUILDING SERVICE CO.	$4,298.63	AUGUST SPU BLDG CLEANING
AGILEBITS INC.	$4,745.95	1PASSWORD BUSINESS ANNUAL/USERS
APPLE FORD OF SHAKOPEE	$132.66	OIL CHG/RPLC AIR FILTER WATER TRK#634
ARAMARK REFRESHMENT SERVICES INC	$251.46	REPLENISH COFFEE
ARROW ACE HARDWARE	$73.83	8" CABLE TIES(W)
B & B TRANSFORMER INC	$39,790.00	2-300 PAD RM 3 PHASE TRANSFORMERS
BOB'S LAWN & LANDSCAPING INC	$36.30	BLACK DIRT(W)
BORDER STATES ELECTRIC SUPPLY	$135,920.07	CT 200/5 BAR MULTI-RANGE HIGH ACCUR(E)
CDW GOVERNMENT LLC	$518.22	HP USB C DOCKS
CHOICE ELECTRIC INC	$218.12	DISCONN SMART SWITCHS 14226 ASH CIR P.L.
CORE & MAIN LP	$11,880.00	OMNI WATER METERS
JACKLYN CUMMINS	$50.00	ENERGY STAR CLOTHESWASHER REBATE
DSI/LSI	$445.11	AUGUST GARBAGE SERVICE
FRSECURE LLC	$660.00	AGENT SCANNING ADJUSTMENT
MARTIN GLYNN	$181.98	REIMBURSE FOR SAFETY BOOTS
GRAINGER INC	$205.74	PUSH BROOM(E)
GRAYBAR ELECTRIC COMPANY INC	$468.86	BALL MARKER
HAWKINS INC	$350.00	CHLORINE CYLINDERS
INNOVATIVE OFFICE SOLUTIONS	$523.26	OFFICE SUPPLIES
INT'L UNION OF OPER ENGINEERS LOCAL 49	$885.00	JULY UNION DUES
IRBY - STUART C IRBY CO	$2,474.59	16X18 WOOD BRACE SET(E)
SHAWN KROHN	$500.00	ENERGY STAR COOLING/HEATING REBATE
LLOYD'S CONSTRUCTION SERVICES	$464.25	RENTAL PD 6.27.24-7.16.24 20YD DEMO/CONS
LOFFLER COMPANIES - 131511	$1,425.16	WO#2718 AMI WATER METER INSTALL
MINN VALLEY TESTING LABS INC	$166.00	WATER TESTING COLIFORM
VOID	$0.00	
MPOWER TECHNOLOGIES, INC.	$1,031.25	AMI #2718&#2472 SUPPORT SERVICES
MRA-THE MANAGEMENT ASSOCIATION	$122.00	BACKGROUND CHECKS
TONY MYERS	$744.14	REIMB. 2022 10 STATE WATER STANDARDS BK
NCPERS GROUP LIFE INS.	$384.00	APRIL PREMIUMS
SON NGO	$105.00	BACKFLOW TEST REFUND
CINDY NICKOLAY	$82.41	REIMBURSE 123 MILES
ONE TECH ENGINEERING INC.	$2,100.00	WEEKLY PAY 7/22-7/26/24
POWERPLAN BF	$381.00	REPAIR HYDRAULIC LEAK
RAMY TURF PRODUCTS, LLC	$335.96	HARTPGENXR-25P PAIL€
RESCO	$126,698.88	500KVA 3PH TRANSFORMER
RICE LAKE CONSTRUCTION GROUP	$227,616.39	WO#2581 APPLICATION PYMT #6
JACK SCHINTZ	$490.15	SAFETY BOOT REIMB.
SCOTT COUNTY LAW ENFORCEMENT CTR	$4,848.00	REFRIGERATION IMPROVEMENT REBATE
SCOTT COUNTY RECORDERS	$46.00	RECORDING OF WCC CHG FOR OG ZAZA LLC
TRACY SMITH	$175.00	ENERGY STAR CLOTHES WASHER REBATE
TEST GAUGE & BACKFLOW SUPPLY INC	$463.52	REPAIR KITS(W)
GREG TRIPLETT	$89.78	REIMBURSE 134 MILES
TWIN CITY GARAGE DOOR CO.	$294.50	GARAGE DOOR SERVICE
UPS STORE # 4009	$26.14	ELECTRIC DEPT SHIPMENT
VERIZON WIRELESS	$3,952.46	CELL PHONE BILL 6/24-7/23 2024
JAMIE VON BANK	$37.53	REIMB. MEALS
WESCO RECEIVABLES CORP.	$795.75	3POLY PIN(E)
WILDERNESS ATHLETE LLC	$595.09	HYDRATE & RECOVERY PACKETS
WSB & ASSOCIATES INC.	$2,370.00	GIS CONSULTING JUNE 2024
CENTERPOINT ENERGY - ACH	$653.90	GAS USAGE 6/7-7/8 2024 255 SARAZIN ST
FURTHER - ACH	$304.82	FURTHER ADM. FEES
MINNESOTA LIFE	$1,130.94	LIFE INS. PREMIUMS
PRINCIPAL LIFE INS. COMPANY	$4,695.52	L.T.D. PREMIUMS
DELTA DENTAL PLAN OF MN	$5,560.76	DENTAL INS PREMIUMS
HEALTHPARTNERS	$70,005.61	HEALTH PREMIUMS
Total Week of 08/02/2024	**$662,801.69**	

WEEK OF 08/09/2024

CREDIT REFUNDS	$6,531.10	CREDIT REFUNDS
ABDO LLP	$6,235.00	JULY FS ACCOUNTING
ALTEC INDUSTRIES INC	$921.01	RATCHETING BOX WRENCH(E)
AMARIL UNIFORM COMPANY	$550.65	SPU UNIFORM CLOTHING FOR DYLAN
BG MINNESOTA, INC.	$385.51	ENGINE DEGREASER/LUBRICANT SPRAY
BIRDS LAWN CARE LLC	$3,843.99	JULY LAWN CARE
BORDER STATES ELECTRIC SUPPLY	$1,022,780.81	WO#2718 WATER METERS INSTALL
JASON BUSS	$155.00	ENERGY STAR REFRIGERATOR REBATE
CANTERBURY PARK	$8,342.00	EXTERIOR LIGHTING REBATE
CDW GOVERNMENT LLC	$334.64	2 CURVED MONITORS
CITY OF SHAKOPEE	$7,360.00	JULY FUEL BILL
CITY OF SHAKOPEE	$541,234.94	JULY SW $419,034.54 & SD $122,200.40
CITY OF SHAKOPEE	$338,400.00	JULY PILOT TRANSFER FEE
CITY OF SHAKOPEE	$1,080.04	JULY STORM DRAINAGE/SPU PROPERTIES
DITCHWITCH OF MINNESOTA	$629.44	HOSE(E)
BRITTANY DUNBAR	$150.00	ENERGY STAR DISHWASHER REBATE
BILL EASTMAN	$50.00	ENERGY STAR COOLING/HEATING REBATE
FASTENAL IND & CONST SUPPLIES	$32.71	HCS3/8-16X3/4 Z 5(E)
FLYTE HCM LLC	$50.50	JULY COBRA/SPECIFIC RIGHTS NOTICE
FRANZ REPROGRAPHICS, INC.	$170.33	36X300'RL 731_24# IJ BOND 2"
GENERAL SECURITY SERVICES CORP	$447.05	8/1-10/31 2024 3RD QTR VIDEO SYSTEM MAIN
GOPHER STATE ONE-CALL	$1,131.30	JULY TICKETS
GRAINGER INC	$85.54	RESTRICTION SIGNS
EMILY GROBY	$159.71	IRRIGATION CONTROLLERS REBATE
SHUKRI HASSAN	$105.00	REFUND BACKFLOW TEST
HENNEN'S AUTO SERVICE INC.	$822.06	WATER TRUCK #652 NEW TIRES
HIGH FIVE ERECTORS II, INC.	$501.00	WO#2801 HOIST TRFMR TRIA SHAKOPEE
RENAE HODGSON	$125.09	IRRIGATION CONTROLLERS REBATE
HREXPERTISEBP LLC	$175.00	JULY HR CONSULTING
INTERSTATE ALL BATTERY CTR	$46.06	BATTERY I.T. DEPT
IRBY - STUART C IRBY CO	$2,210.61	STAND ROPE REEL
JT SERVICES	$6,680.00	PIPE 3" INNERDUCT
KATAMA TECHNOLOGIES, INC.	$468.75	WO#2472 AMI GEN CONSULTING JULY
KWANNY KEOMALAYTHONG	$175.00	ENERGY STAR CLOTHES WASHER REBATE
LEAGUE OF MINN CITIES INS TRUST	$170,716.00	7/31/24-7/31/25 PROP/CASUALTY COV PREM
MICHAEL MACBRIDE	$500.00	ENERGY STAR COOLING/HEATING REBATE
MGX EQUIPMENT SERVICES, LLC	$460.62	RAM MONT/POLE RISER(E)
MID-COUNTY FABRICATING INC.	$140.89	REPAIR RIPPER(E)
MINN VALLEY TESTING LABS INC	$444.00	WATER TESTING NITRATES
MN OCCUPATIONAL HEALTH - LOCKBOX 135054	$222.00	JULY DRUG TESTING
JACQUELINE MYERS	$75.00	ENERGY STAR REFRIGERATOR REBATE
NAGEL COMPANIES LLC	$3,185.00	WO2798 10" BORE ZUMBRO AVE/MARCH TERR
NAPA AUTO PARTS	$142.35	ANTIFREEZE
GERRY NEVILLE	$63.05	REIMBURSE 97 MILES
CINDY NICKOLAY	$152.76	REIMBURSE 228 MILES
NORTHERN TOOL & EQUIP CATALOG HOLD INC	$469.94	ELECTRIC OIL PUMP
POWERPLAN BF	$285.99	MOUNTING BRACKET,CLAMP,FILTER(E)
PRECISION UTILITIES	$4,960.00	EXCAVATE/INSTALL NEW FIRE HYDRANT
JEFF RAMNARACE	$175.00	ENERGY STAR CLOTHES WASHER REBATE
RESCO	$122,140.86	225/300 KVA 3PH TRANSFORMERS
RESERVE ACCOUNT	$2,000.00	REPLENISH POSTAGE MACHINE
RW BECK GROUP, INC, LEIDOS ENG. LL	$20,275.50	JULY 2024 SPU LONG RANGE PLANNING STUDY
SANMAR CORPORATION	$39,673.00	LIGHTING CONTROLS REBATE
ADAM SCHROEDER	$125.09	IRRIGATION CONTROLLERS REBATE
SMSC	$638.75	WO2858 DOCKENDORF PROJ REFUND
SPENCER FANE LLP	$10,539.00	JULY LEGAL FEES
SRF CONSULTING GROUP, INC.	$1,288.97	WO#2885 MAY CONSULTING FEES
TOM KRAEMER, INC	$628.59	AMI WO2472 AUG MONTHLY RENT METERS
GREG TRIPLETT	$105.19	REIMBURSE 157 MILES
VOID	$0.00	
VERIZON	$592.30	JULY TRUCK TRACKING
VIVID IMAGE, INC.	$650.00	ESSENTIAL+PLAN RETAINER 8/1-8/31 2024
JAMIE VON BANK	$55.66	REIMBURSE MEAL NEW EMPLOYEE DYLAN
WESCO RECEIVABLES CORP.	$1,981.00	GROUND ROD(E)
XCEL ENERGY	$4,520.74	GAS USAGE AMBERGLEN CIR 6/25-7/24 2024
AMERICAN NATL BANK_MASTERCARD_ACH	$5,499.18	JULY 2024 CC STATEMENT
FURTHER - ACH	$192.31	FUTHER CLAIM REIMB.
MMPA C/O AVANT ENERGY	$4,612,490.52	JULY POWER BILL
MN DEPT OF REVENUE ACH PAYMENTS	$369,883.00	JULY SALES & USE TAX PAYABLE
PAYROLL DIRECT DEPOSIT 08.09.24	$138,431.15	
BENEFITS & TAXES FOR 08.09.24	$139,776.83	
Total Week of 08/09/2024	**$7,605,850.08**	

WEEK OF 08/16/2024

MATTHEW ANDERSON	$75.00	ENERGY STAR REFRIGERATOR REBATE
BARNA GUZY & STEFFEN LTD	$6,625.00	WO#2844 JULY SERVICES/E SUB STATION
ADANE BEREKA	$500.00	ENERGY STAR COOLING/HEATING REBATE
DITCHWITCH OF MINNESOTA	$2,277.78	24" DITCH BUCKET(E)
DIVERSIFIED ADJUSTMENT SERVICES INC	$83.26	JULY DUE TO COLLECTION AGENCY
BILL EASTMAN	$450.00	BALANCE DUE ORIG PYMT WAS SHORT $450
MIKE ENRIGHT	$275.00	REIMBURSE SAFETY BOOTS
EUROFINS EATON ANALYTICAL, LLC	$675.00	PFAS 533
FRONTIER ENERGY, INC	$10,143.00	JULY C&I IMPLENTATION/PROG MGMT
TIFFANY GORDAN	$500.00	ENERGY STAR COOLING/HEATING REBATE
HAWKINS INC	$13,636.38	HYDROFLUOSILIC ACID/CHLORINE
INNOVATIVE OFFICE SOLUTIONS	$814.59	OFFICE SUPPLIES
IRBY - STUART C IRBY CO	$1,463.06	SALISBURY AS1200 PRISMSHIELD PLUS
LOCATORS & SUPPLIES INC	$496.76	RED CONSTRUCTION MARKING PAINT
BINYAM MEHARI	$105.00	BACKFLOW TEST REFUND
MINN VALLEY TESTING LABS INC	$550.50	WATER TESTING COLIFORM
MMUA	$1,605.00	O.H. SCHOOL 9/10/24 4 ELEC EE'S
ZAINAB MOHAMED	$105.00	BACKFLOW TESTING REFUND
MPOWER TECHNOLOGIES, INC	$350.00	MPOWER CLOUD HOSTING SERVER
NAPA AUTO PARTS	$6.38	PX BLUE THREADLOCKER(E)
GERRY NEVILLE	$143.38	REIMBURSE 214 MILES
NISC	$33,676.99	JULY PRINT SERVICES
NORTHERN STATES POWER CO	$3,397.10	JULY POWER BILL
OFFICE OF MNIT SERVICES	$734.01	JULY (WAN) MONTHLY SERVICE
OLSEN CHAIN & CABLE, INC	$301.06	3/8 TWIN CLEV LINK(E)
POWERPLAN BF	$299.53	MISC PARTS(E)
HEATHER SAROS	$105.00	BACKFLOW TEST REFUND
LON SCHEMEL	$340.00	REIMBURSE MN AWWA CONFERENCE
SHAKOPEE CHAMBER OF COMMERCE	$2,300.00	STUD CAREER/SHAKO LANTERN/HOLID FEST
TRUE NORTH CONTROLS	$1,879.00	REPAIR GE MDS MCR(W)
ULINE, INC	$32.06	2"HD GREEN DISPENSER(E)
DAVID VANDERSCOFF	$500.00	REISSUE REBATE CHK TO CORRECT ADDRESS
VERIZON WIRELESS	$106.87	BILLING PERIOD 7/6-8/5 2024
JAMIE VON BANK	$49.00	REIMB DRIVERS LIC RENEWAL
JOSEPH WOHNOUTKA	$30.00	APPLIANCE RECYCLING REBATE
MARY WOLF	$54.19	TEMP ELECTRIC FEE REFUND
DEANNA GABRIEL	$101.18	Credit Balance Refund
ANTHONY J SMITH	$300.23	Credit Balance Refund
FIRST DATA CORPORATION	$6,911.58	JULY 2024 CC FEES
FURTHER - ACH	$435.60	MEDICAL FLEX CLAIM REIMB
Total Week of 08/16/2024	**$92,433.49**	

WEEK OF 08/23/2024

AMARIL UNIFORM COMPANY	$823.70	SPU UNIFORM CLOTHING FOR DYLAN
APPLE FORD OF SHAKOPEE	$1,513.48	ELECTRIC TRK#611 MAINTENANCE
B & B TRANSFORMER INC	$19,895.00	1 - 300 PAD 3PH TRANSFORMER
BORDER STATES ELECTRIC SUPPLY	$14,701.39	AMI WO#2718 WATER METER INSTALL
CAMFIL USA INC	$2,146.84	402995001 12 RFCMV11PH-A 24X24X12
CAPP INDUSTRIES L.P.	$525.00	REFUND PRIVATE HYDRANT INSPECTION FEES
BRADLEY CARLSON	$505.28	REIMB MILEAGE/PER DIEM FARGO ND CONF
PRESTON COLEMAN	$130.00	DOT HEALTH CARD REIMBURSEMENT
COMCAST CABLE COMM INC.	$2.30	CABLE FOR BREAKROOMS
CUSTOMER CONTACT SERVICES	$650.61	ANSWERING SERVICE 8/20-9/16 2024
GREG DRENT	$206.50	PRE DIEM CONF FARGO ND AUGUST
JAMES DULANEY	$534.80	REIMB MILEAGE/PER DIEM FARDO ND CONF AUG
MIKE ENRIGHT	$49.00	DRIVERS LIC REWEAL REIMBURSMENT
GRAINGER INC	$687.12	MARKING FLAG(E)
GRAYBAR ELECTRIC COMPANY INC	$16,538.38	PVC PIPE
HIGH POINT NETWORKS, LLC	$1,840.00	VMWARE UPGRADE
KATHLEEN HOFER-MOCOL	$534.80	REIMB MILEAGE/PER DIEM FARGO ND CONF
LA MARCHE MFG CO	$5,590.00	FERRORESANT CHARGER
LLOYD'S CONSTRUCTION SERVICES	$514.25	DEMO&CONSTR 7/16-8/6 2024 803 CANTERBURY
LMC EMBLEM SHAKOPEE HOLDINGS	$2,847.75	WO#2602 EMBLEM SHAKO PROJ CLOSED REFUND
LOCATORS & SUPPLIES INC	$366.59	RED MARKING PAINT
CINDY MENKE	$20.00	NOTARY REGISTRATION REIMBURSEMENT
MID-COUNTY FABRICATING INC.	$1,246.31	SPOOL HOLDERS & RETAINERS(E)
TONY MYERS	$229.99	REIMBURSE SAFETY BOOTS
NAGEL COMPANIES LLC	$9,440.00	WO#2869 BORE 2"PIPE PIKE LAKE RD
GERRY NEVILLE	$159.46	REIMBURSE 238 MILES
CINDY NICKOLAY	$110.55	REIMBURSE 165 MILES
PLUNKETT'S PEST CONT, INC.	$1,526.85	8/1/24-7/31/25 ANNUAL PEST CONTROL
RESCO	$184,542.30	CONNECTORS
SCOTT COUNTY TREASURER	$2,100.00	AUGUST FIBER
GRADY SHUCK	$500.00	ENERGY STAR COOLING/HEATING REBATE
SLACK PAINTING	$8,000.00	WATER TOWER 2 WASHING
STAPLES OIL COMPANY, INC.	$1,327.34	DIESEL MOTOR OIL(E)
STINSON LLP	$1,139.00	PROF SVCS JULY LABOR MATTERS
UPS STORE # 4009	$18.24	ELECTRIC SHIPMENT
USABLUEBOOK	$122.69	POCKET THERMOMETER(W)
KHAM VU	$500.00	ENERFY STAR COOLING/HEATING REBATE
KERRI L RAVEN	$227.28	UCP CREDIT BALANCE REFUND
SCOTT CARVER DAKOTA CAP AGENCY	$156.01	UCP CREDIT BALANCE REFUND
FURTHER - ACH	$1,115.38	DAYCARE FLEX CLAIM REIMB'S
PAYROLL DIRECT DEPOSIT 08.23.24	$139,743.83	
BENEFITS & TAXES FOR 08.23.24	$130,022.85	
Total Week of 08/23/2024	**$552,850.87**	

WEEK OF 08/30/2024

APPLE FORD OF SHAKOPEE	$477.06	ELECTRIC TRK#611 OIL CHG/CHECK UP
ARAMARK REFRESHMENT SERVICES INC	$161.88	COFFEE BREAKROOMS
BERGERSON-CASWELL INC	$11,750.00	SHAKO GRAVEL PIT WELL INVESTIGATION
BIRDS LAWN CARE LLC	$3,843.99	JUNE 2024 LAWNCARE SERVICE
BORDER STATES ELECTRIC SUPPLY	$12,457.58	AUTO SPLICE
CHOICE ELECTRIC INC	$177.41	REPLACE BALLAST IN CHLORINE ROOM PH
ALAN CLARK	$175.00	ENERGY STAR CLOTHESWASHER REBATE
CORE & MAIN LP	$5,536.58	WATER METERS
ENERGY MANAGEMENT COLLABORATIVE, LLC	$2,377.00	EXTERIOR LIGHTING REBATE PROJ#1521
FERGUSON US HOLDINGS, INC.	$4,200.34	FLG MTR KIT SETS
FRSECURE LLC	$7,230.00	RISK ASSESSMENT 50%PYMT YR 2 OF 5
GRAINGER INC	$211.40	SAFETY HARD HATS
GRAYBAR ELECTRIC COMPANY INC	$3,273.60	PVC PIPE
DAVID HAGEN	$240.00	SAFETY BOOT REIMBURSEMENT
TYLER HANSON	$147.50	UCP PER DIEM REIMB SUB SCHOOL BRAINERD MN
INTERSTATE ALL BATTERY CTR	$356.88	BATTERY(E)
IRBY - STUART C IRBY CO	$282.00	4 CONDUCTOR PDSTL CONN
NICOLE KLINGER	$500.00	ENERGY STAR HEATING/COOLING REBATE
JAKE LUCE	$175.00	ENERGY STAR CLOTHWASHER REBATE
MATHESON TRI-GAS INC	$610.89	NITROGEN IND 200 EXCHANGE
FRANK MCDONALD	$500.00	ENERGY STAR COOLING/HEATING REBATE
MICHELS UTILITY SERVICES	$6,202.59	WO2806 TRENCHING HIGHVIEW PARK 1C
MINN VALLEY TESTING LABS INC	$166.00	WATER TESTING COLIFORM
NAGEL COMPANIES LLC	$10,535.00	WO2778 BORING @ VALLEYVIEW/INDEPEND
GERRY NEVILLE	$86.43	REIMBURSE 129 MILES
CINDY NICKOLAY	$205.64	SAFETY BOOT REIMBURSEMENT
JOE NORD	$30.00	RECYCLING REBATE
OLSEN CHAIN & CABLE, INC.	$83.57	POLY SLING
POWERPLAN BF	$30,512.97	BACKHOE TRANSMISSION REPAIR(E)
JEFF RAMNARACE	$75.00	ENERGY STAR REFRIGERATOR REBATE
RESCO	$140,321.25	FUSE LINK(E)
SARBESWAR SAHOO	$105.00	REFUND OF BACK FLOW TEST FEE
WADE A SCHERER	$105.00	REFUND OF BACKFLOW INSPECTION FEE
BRANDON SCHWARTZ	$60.00	BOOT ALLOWANCE BAL LEFT TO USE
SHORT ELLIOTT HENDRICKSON INC	$3,657.56	WO#2868 11TH AVE W WM IMPROVEMENTS
STAPLES OIL COMPANY, INC.	$214.49	DEF-BULK
PEAK PROPERTY MANAGEMENT	$145.47	UCP CREDIT BALANCE REFUND
FURTHER - ACH	$76.93	DAYCARE FLEX CLAIM REIMB.
ZAYO GROUP, LLC	$4,970.12	AUGUST T1 LINE,S SUB,PIKE LAKE

Total Week of 08/30/2024	**$252,237.13**
Grand Total	**$9,166,173.26**

Kelley Williamson

Presented for approval by: Director of Finance & Administration

Approved by General Manager

Approved by Commission President

Monthly Water Dashboard

As of: July 2024

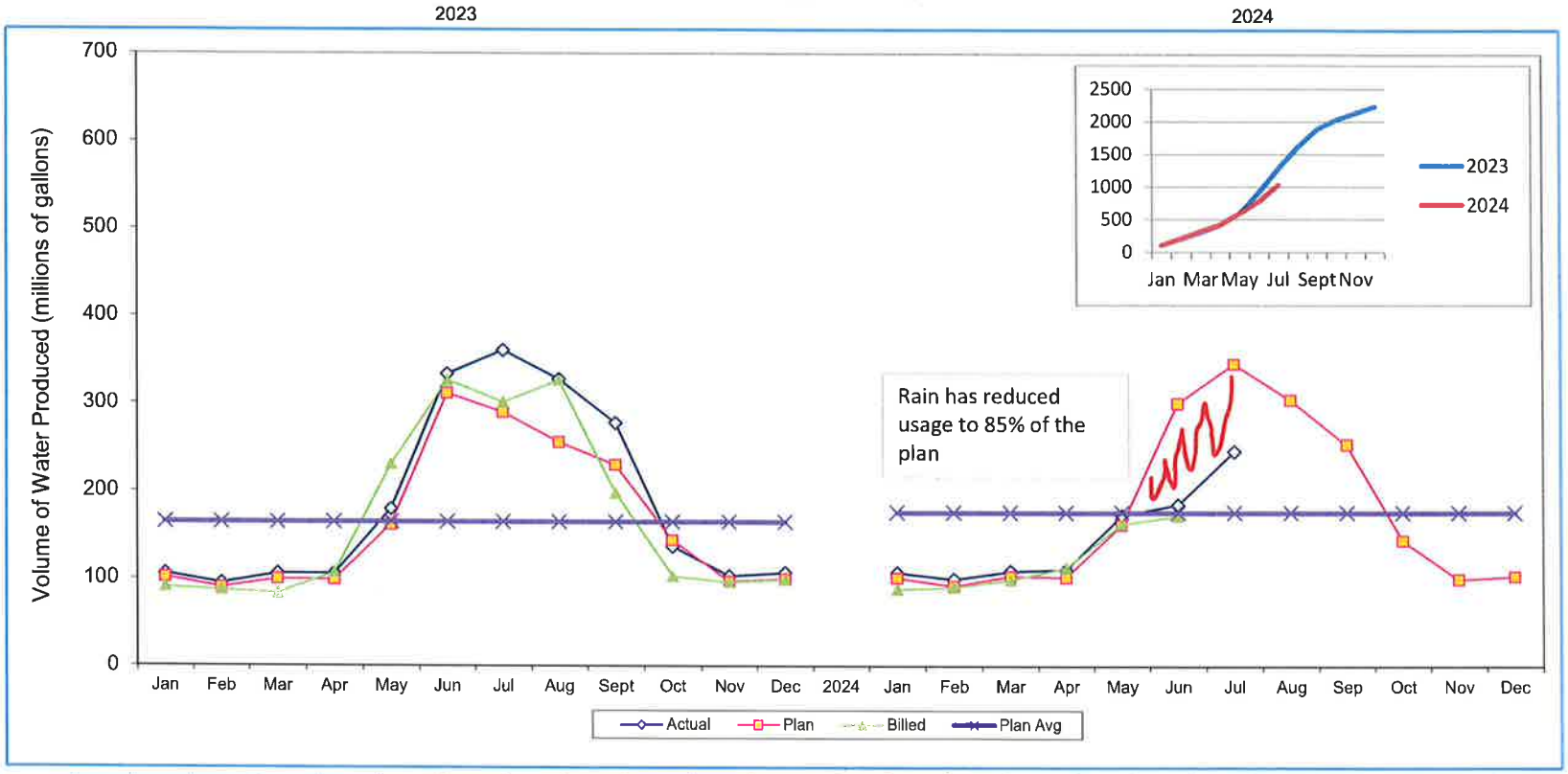
Shakopee Public Utilities Commission

ALL VALUES IN MILLIONS OF GALLONS

Element/Measure — Water Pumped/Metered

Last 6 months actuals	100	109	111	173	185	246

Monthly Avg	
2021	173
2022	167
2023	187



2023	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Actual	106	95	106	106	180	334	361	328	278	137	103	107
Plan	102	90	100	99	162	312	290	256	230	144	97	100
YTD % *												
Billed	91	87	84	107	231	327	302	327	198	103	96	99

2024	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	107	100	109	111	173	185	246					
	101	92	103	102	162	301	346	305	254	144	100	103
	106%	107%	107%	107%	107%	91%	85%					
	88	91	99	113	163	172						

* Actual gallons pumped vs. Plan

Proposed As Consent Item 3e

Shakopee Public Utilities
PO Box 470 • 255 Sarazin Str
Shakopee, Minnesota 55379
Main 952.445-1988 • Fax 952.445-7767
www.shakopeeutilities.com

TO: Greg Drent, General Manager

FROM: Lon R. Schemel, Water Superintendent

SUBJECT: Reservoir Structure Inspections

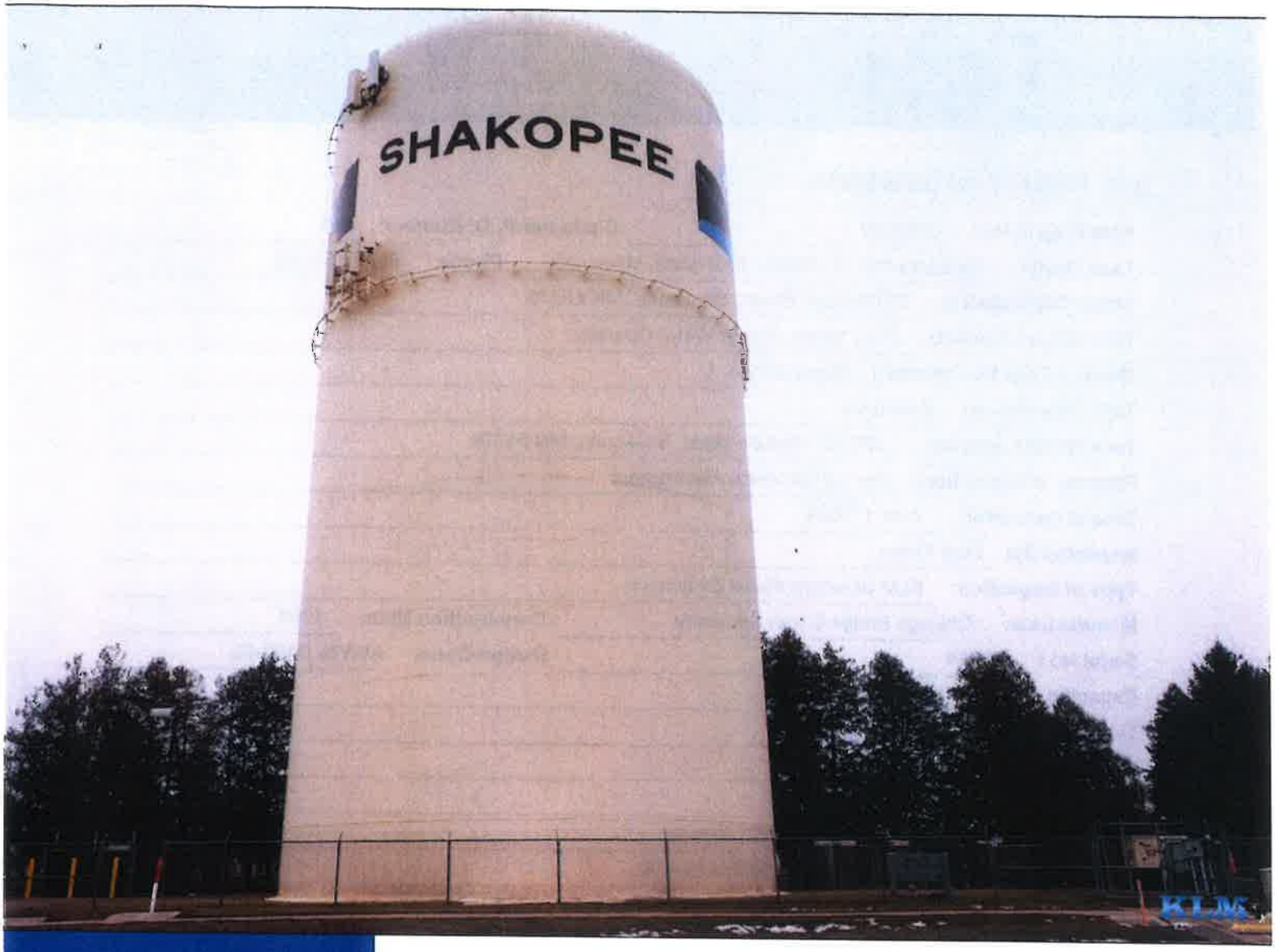
DATE: August 26, 2024

Attached is the annual Evaluation Report for our reservoir tanks and towers, provided by KLM Engineering in Woodbury, MN.

The report recommends reconditioning Tank 3 on Canterbury Road in 2025 and Tank 4 on Dominion Avenue in 2026. Tank 3 is not included in this report as it will be reconditioned. Staff will propose the necessary budget allocations in the 2025–2029 preliminary Water budget.

Notes:

Reservoir No. 1	Photo No. 14	Has been repaired
Tank No. 5	Photo No. 13	Discoloration has been removed
	Photo No. 17	Overflow reconditioned
Tower No. 8	Photo No. 12	Pinholes to be repaired this year under warranty



Shakopee Public Utilities, Shakopee, Minnesota

Inspection Report:
2,000,000-Gallon Capacity
Reservoir No. 1
Prepared by:

KLM Engineering, Inc.
1976 Wooddale Drive, Suite 4 | Woodbury, MN 55125
651.773.5111 | www.klmengineering.com

April 2024

Project No.: 2598-22

1.0| PROJECT INFORMATION

KLM Project No.: 2598-22 **Customer P. O. Number:** N/A

Tank Owner: Shakopee Public Utilities, Shakopee, Minnesota **Phone:** 952-445-1988

Street/City/State/Zip: 255 Sarazin Street, Shakopee, MN 55379

Tank Owner Contact: Tony Myers, Senior Water Operator

Owner's Tank Designation: Reservoir No. 1

Tank Description: Standpipe

Tank Street Location: 870 10th Avenue West, Shakopee, MN 55379

Purpose of Inspection: Annual Condition Assessment

Date of Inspection: April 1, 2024

Inspected By: Matt Finley

Type of Inspection: KLM Standard Visual Evaluation

Manufacturer: Chicago Bridge & Iron Company **Construction Date:** 1966

Serial No.: 9-3694 **Design Code:** AWWA D100-65

Capacity: 2,000,000 gallons

Type of Construction: Welded

Tank Diameter: 55'-2"

Height to: Overall ~125 feet

Height to: HWL 115'-0" LWL Grade

Tank Construction Drawings: Unavailable to KLM

Previous Inspection Records: KLM 2020 - 2023 reports

EXISTING COATING INFORMATION

	Interior Wet	Exterior
Date Last Coated	~2005	~2005
Full or Spot Repair	Full	Full
Coating Contractor	Classic Protective Coatings	Classic Protective Coatings
Surface Preparation	SSPC-SP 10	Verta-blaster
Paint System	Epoxy	Epoxy/Urethane
Paint Manufacturer	Tnemec	Tnemec
Paint Chip Samples	N/A	N/A

April 8, 2024

by E-Mail

Tony Myers
Senior Water Operator
255 Sarazin Street
Shakopee, MN 55379

RE: In-Service Visual Inspection of the 2,000,000-Gallon Standpipe (Reservoir No. 1) for Shakopee Public Utilities in the City of Shakopee, MN. KLM Project No. 2598-22.

Mr. Myers,

On April 1, 2024, KLM performed an in-service visual inspection of the 2,000,000-gallon standpipe (Reservoir No. 1) and offers the following comments.

Analysis:

The reservoir was constructed and originally painted in 1966 by Chicago Bridge and Iron Company (CB&I). The interior and exterior coatings were last fully reconditioned around 2005 by Classic Protective Coatings.

The interior wet coating remains in similar condition to the 2023 visual report with approximately ten percent visible coating failures above the high-water line (HWL). Failures consist of surface corrosion on the roof stiffeners and along unwelded roof seams. Surfaces below the HWL were not observed as part of this inspection. See attached photos.

The exterior coating remains in good to fair condition with less than five percent visible coating failures. Failures consist of topcoat delamination on the shell and randomly located pinhole corrosion throughout the reservoir. See attached photos.

Summary:

The interior and exterior coatings remain in similar condition to the 2023 report. There are no repairs required at this time.

KLM recommends inspecting the interior and exterior coatings again in one year per the service agreement to monitor conditions.

Sincerely,

KLM Engineering, Inc.

Report prepared by:

Perry Seidel

Perry Seidel
Project Manager
NACE Coating Inspector No. 106688

Report reviewed by:

Rodney Ellis

Rodney Ellis
Vice President/COO
NACE Coating Inspector No. 1686
AWS/CWI 04040311

Attached: Photos

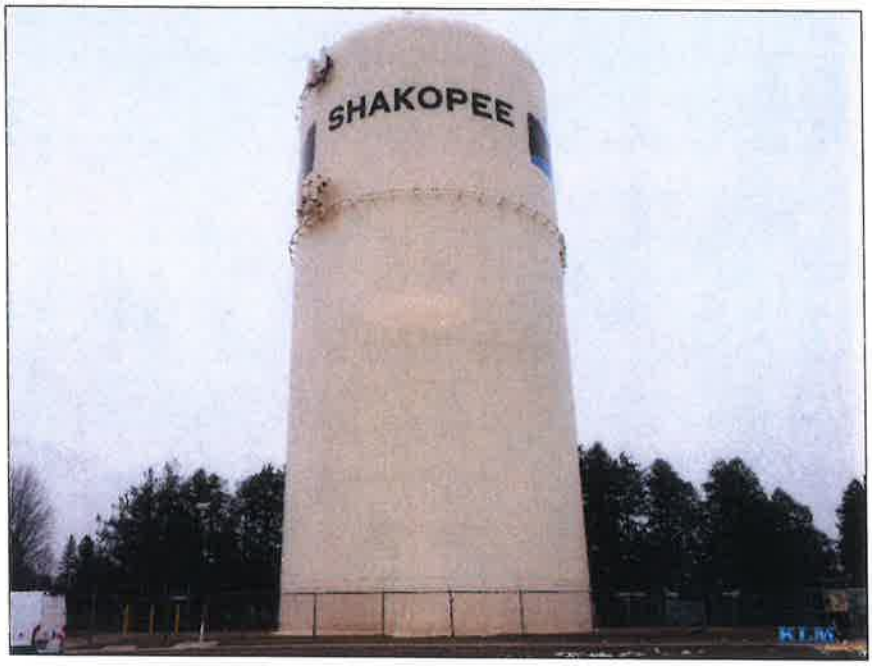


Photo No. 1
Overall view of the reservoir

Photo No. 2
Interior roof conditions

Photo No. 3
Interior roof conditions

Photo No. 4
Condition of roof and upper shell

Photo No. 5
Condition of roof and upper shell

Photo No. 6
Condition of roof and upper shell
Overflow pipe inlet visible

Photo No. 7
Overall conditions on roof

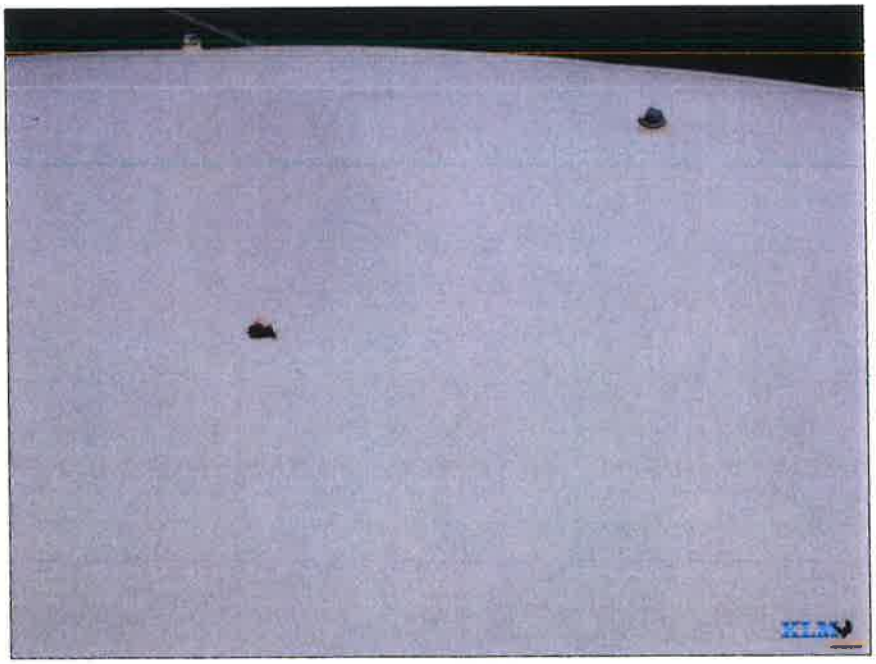


Photo No. 8
Coating conditions on roof

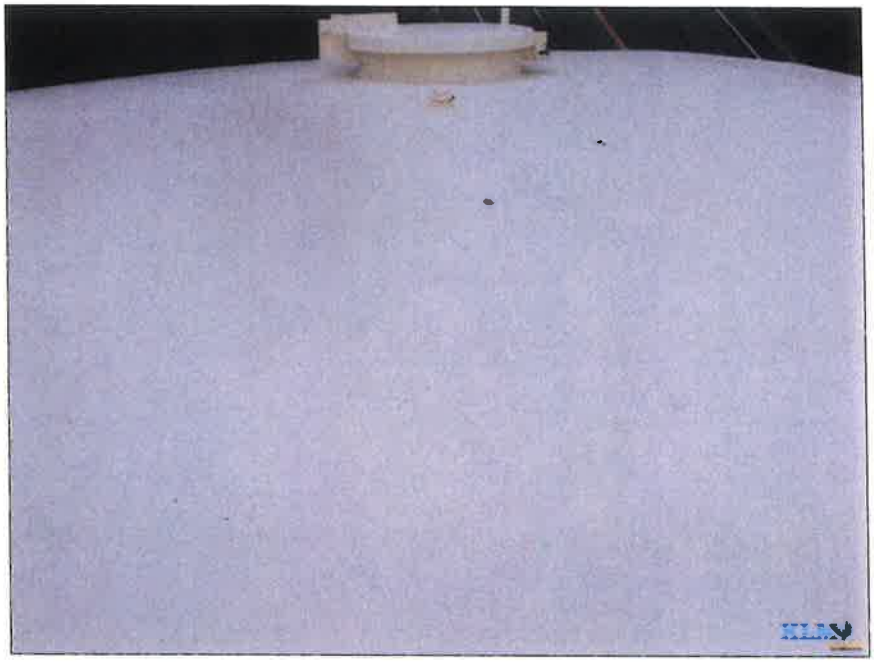


Photo No. 9
Coating conditions on roof

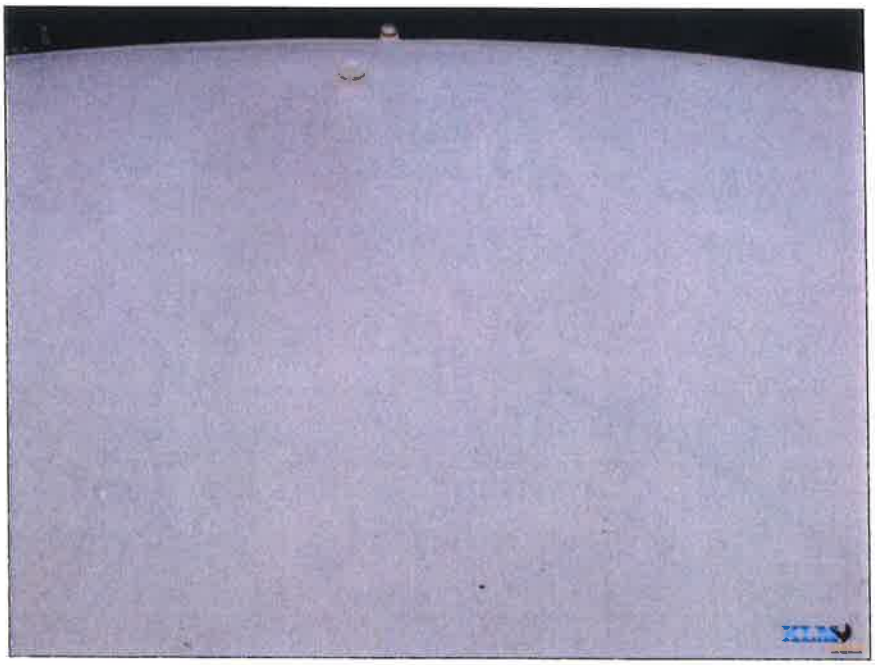


Photo No. 10
Coating conditions on roof

Photo No. 11
Coating conditions on roof

Photo No. 12
Roof handrail and access

Photo No. 13
Upper torus and overflow pipe penetration

Photo No. 14
Antenna attachment to shell

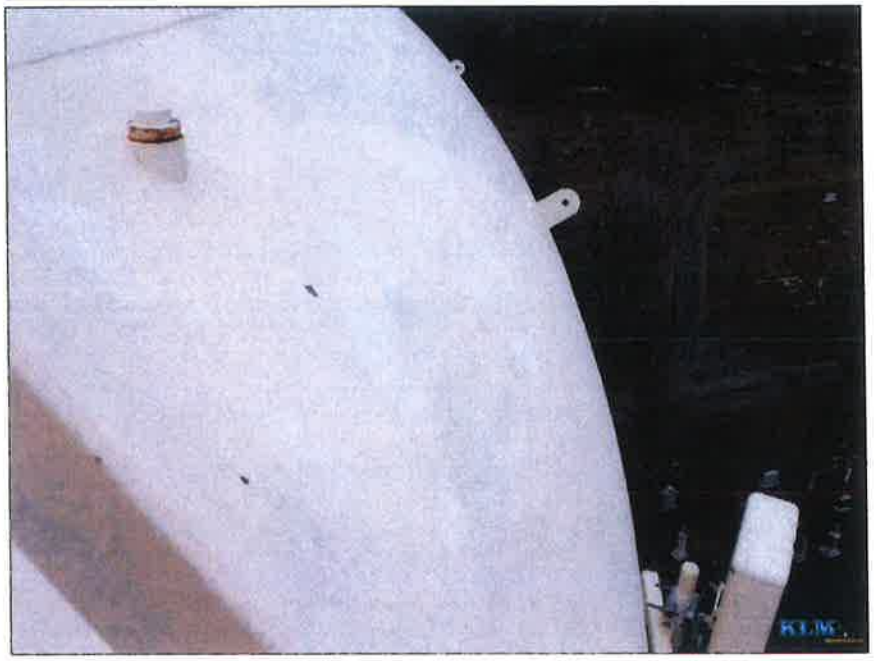


Photo No. 15
Typical condition of upper torus

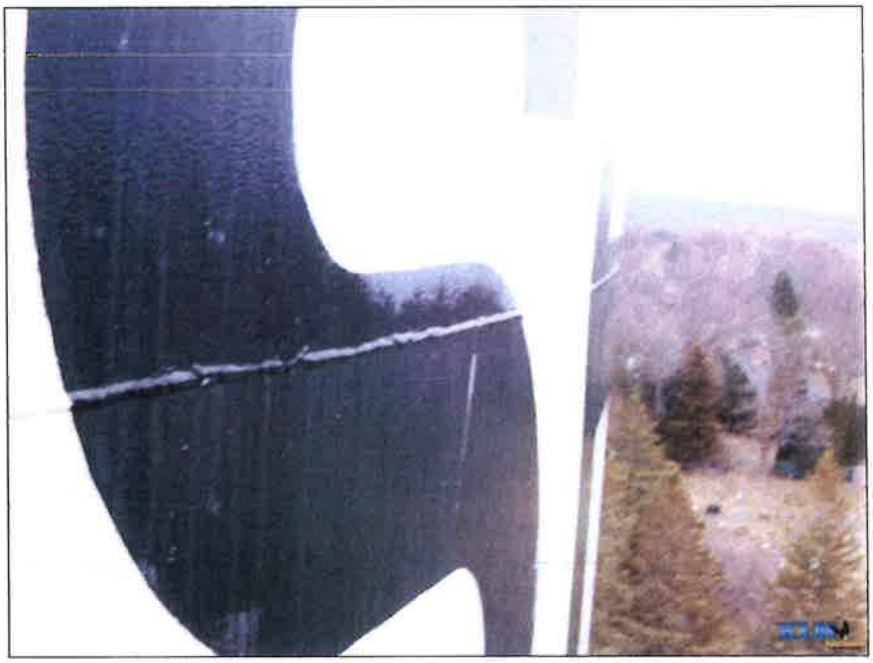


Photo No. 16
Coating condition of shell

Photo No. 17
Ladder and condition of shell

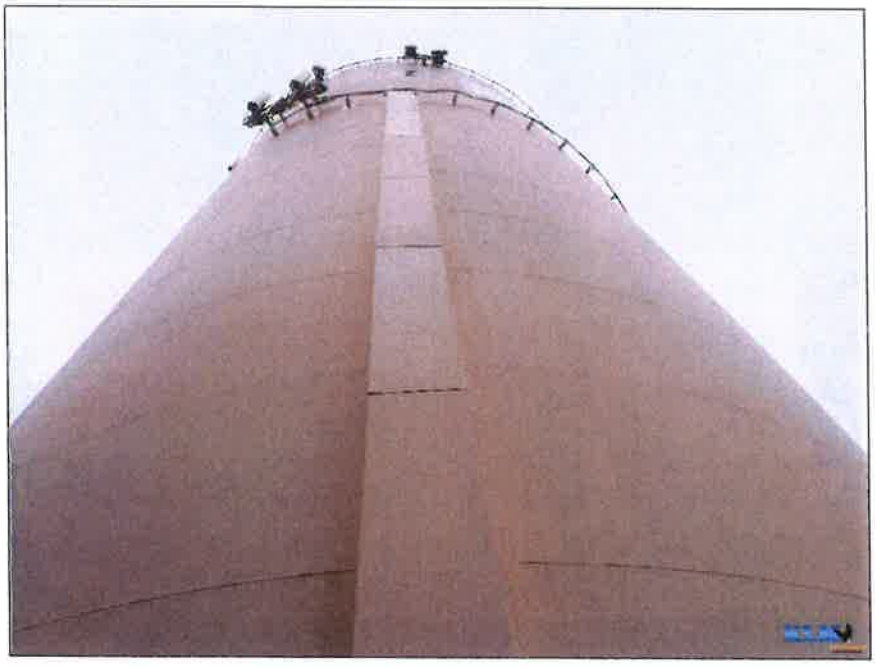


Photo No. 18
Coating condition of shell

Photo No. 19
Overflow discharge

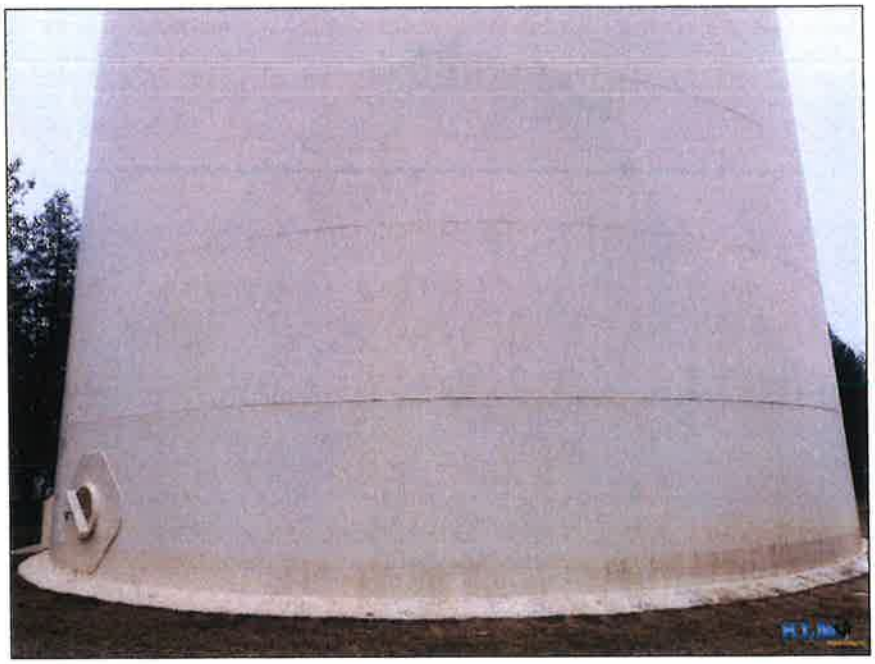


Photo No. 20
Coating condition of shell at base

Photo No. 21
Shell manway

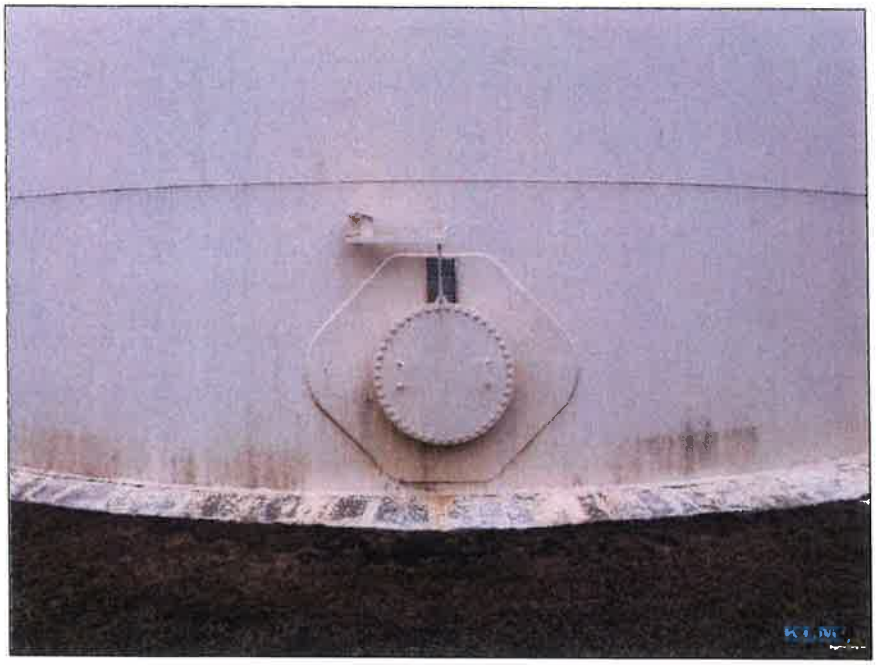


Photo No. 22
Shell manway

Shakopee Public Utilities, Shakopee, Minnesota

Inspection Report:
250,000-Gallon Capacity
Tank No. 2

Prepared by:

KLM Engineering, Inc.
1976 Wooddale Drive, Suite 4 | Woodbury, MN 55125
651.773.5111 | www.klmengineering.com

April 2024

Project No.: 2086-22

1.0| PROJECT INFORMATION

KLM Project No.: 2086-22 **Customer P. O. Number:** N/A

Tank Owner: Shakopee Public Utilities, Shakopee, Minnesota **Phone:** 952-445-1988

Street/City/State/Zip: 255 Sarazin Street, Shakopee, MN 55379

Tank Owner Contact: Tony Myers, Senior Water Operator

Owner's Tank Designation: Tank No. 2

Tank Description: Single Pedestal

Tank Street Location: 162 10th Avenue West, Shakopee, MN 55379

Purpose of Inspection: Annual Condition Assessment

Date of Inspection: April 5, 2024

Inspected By: Matt Finley

Type of Inspection: KLM Standard Visual Evaluation

Manufacturer: Chicago Bridge & Iron Company **Construction Date:** 1940

Serial No.: Unknown **Design Code:** AWWA

Capacity: 250,000 gallons

Type of Construction: Welded

Tank Diameter: ~44 feet

Height to: Overall ~128 feet

Height to: HWL ~117 feet LWL ~86 feet

Tank Construction Drawings: Unavailable to KLM

Previous Inspection Records: KLM 2020 - 2023 reports

EXISTING COATING INFORMATION

	Interior Wet	Interior Dry	Exterior
Date Last Coated	2004	2004	2004
Full or Spot Repair	Full	Full	Full
Coating Contractor	Classic Protective Coatings	Classic Protective Coatings	Classic Protective Coatings
Surface Preparation	SSPC-SP 10	SSPC-SP 6	SSPC-SP 6
Paint System	Epoxy	Epoxy	Zinc/Epoxy/Urethane
Paint Manufacturer	Tnemec	Tnemec	Tnemec
Paint Chip Samples	N/A	N/A	N/A

April 8, 2024

by E-Mail

Tony Myers
Senior Water Operator
255 Sarazin Street
Shakopee, MN 55379

RE: Visual Inspection of the 250,000-Gallon Elevated Reservoir (Tank No. 2) for Shakopee Public Utilities in the City of Shakopee, MN. KLM Project No. 2086-22.

Mr. Myers,

On April 5, 2024, KLM performed a visual inspection of the 250,000-gallon elevated reservoir (Tank No. 2) and offers the following comments.

Analysis:

The tower was constructed and originally painted in 1940 by Chicago Bridge & Iron Company (CB&I). The interior wet coating, the coating in the interior dry sweating areas, and the exterior coating were last replaced in 2004 by Classic Protective Coatings.

The interior wet coating remains in good condition with less than two percent visible coating failures above and below the high-water line (HWL). The rate of corrosion is similar to the 2023 inspection with minimal changes visible. See attached photos.

The interior dry coating remains in good condition with minor micro cracking on the base cone to wet riser transition platform. No changes are evident from the 2023 inspection. See attached photos.

The exterior coating also remains in good condition with minimal visible coating failures throughout the tower. See attached photos.

Summary:

The interior and exterior coatings remain in good condition with negligible changes from the 2023 inspection.

KLM recommends inspecting and evaluating the coatings again in one year per the service agreement to monitor conditions.

Sincerely,

KLM Engineering, Inc.

Report prepared by:

Perry Seidel

Perry Seidel
Project Manager
NACE Coating Inspector No. 106688

Report reviewed by:

Rodney Ellis

Rodney Ellis
Vice President/COO
NACE Certified Coatings Inspector No. 1686
AWS/CWI 0404031

Photo No. 1
Overall view of the tower

Photo No. 2
Condition of the interior wet roof

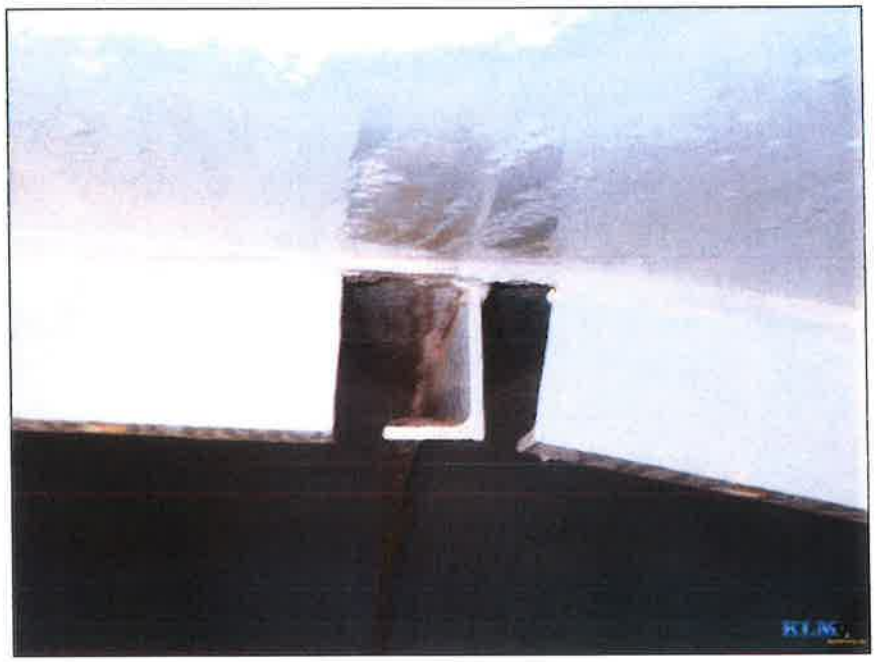


Photo No. 3
Condition of the interior wet roof

Photo No. 4
Upper torus and shell condition

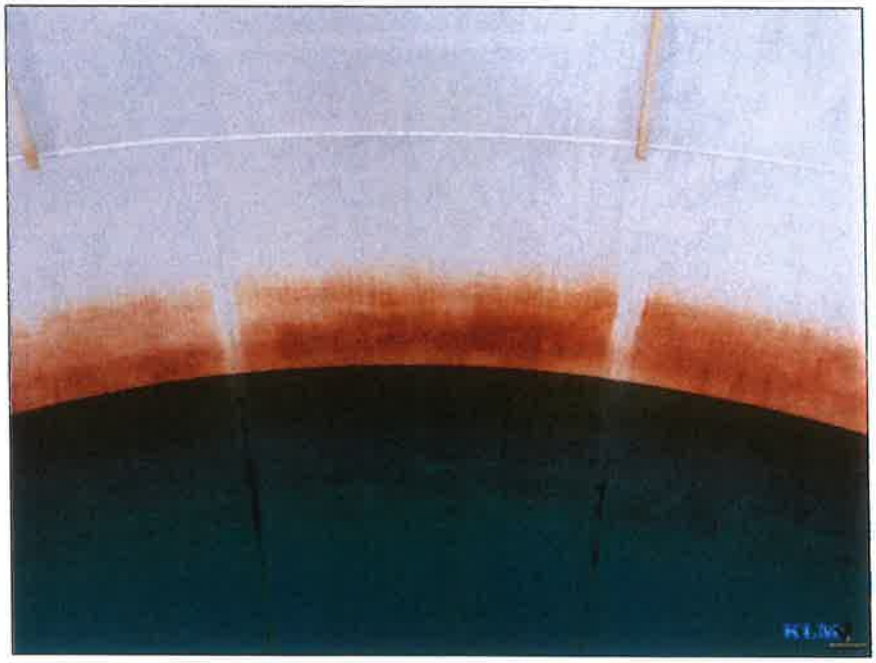


Photo No. 5
Upper torus and shell conditions

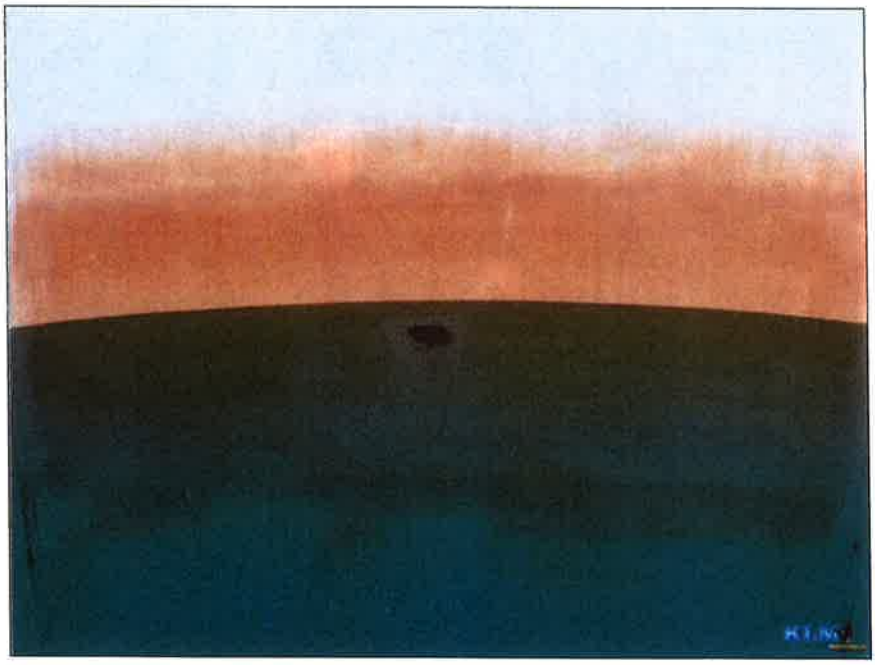


Photo No. 6
Staining and coating failure on shell

Photo No. 7
Inspection platform

Photo No. 8
Water clarity and grating on top of pedestal

Photo No. 9
Base cone to wet riser transition

Photo No. 10
Control room and base cone

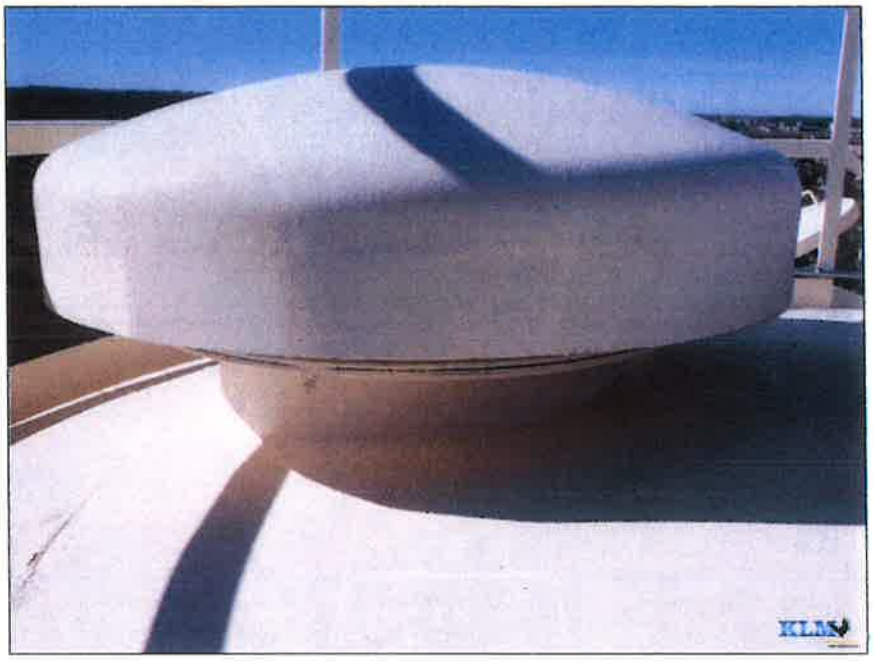


Photo No. 11
Finial vent

Photo No. 12
Conditions on roof

Photo No. 13
Conditions on roof

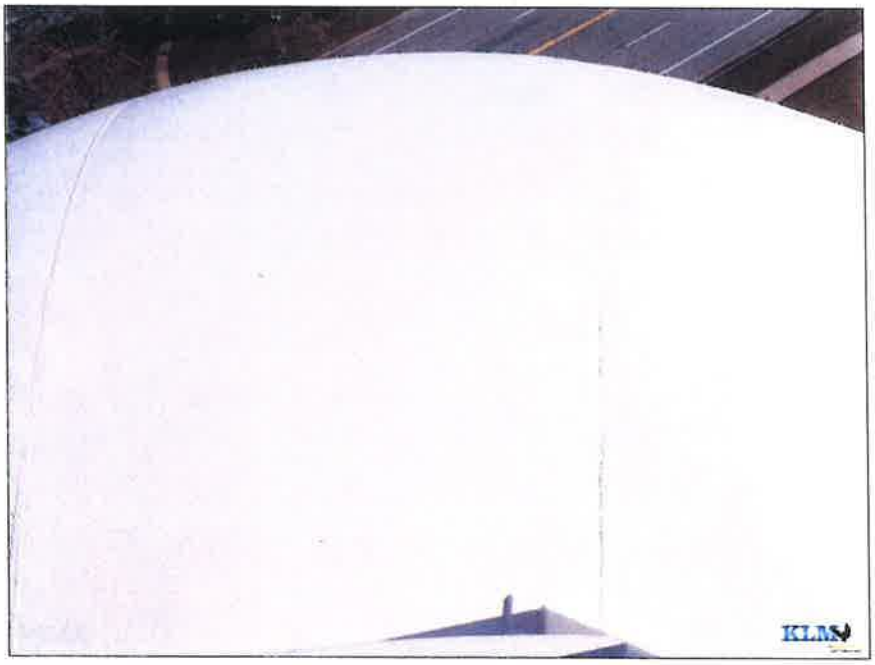


Photo No. 14
Roof coating conditions

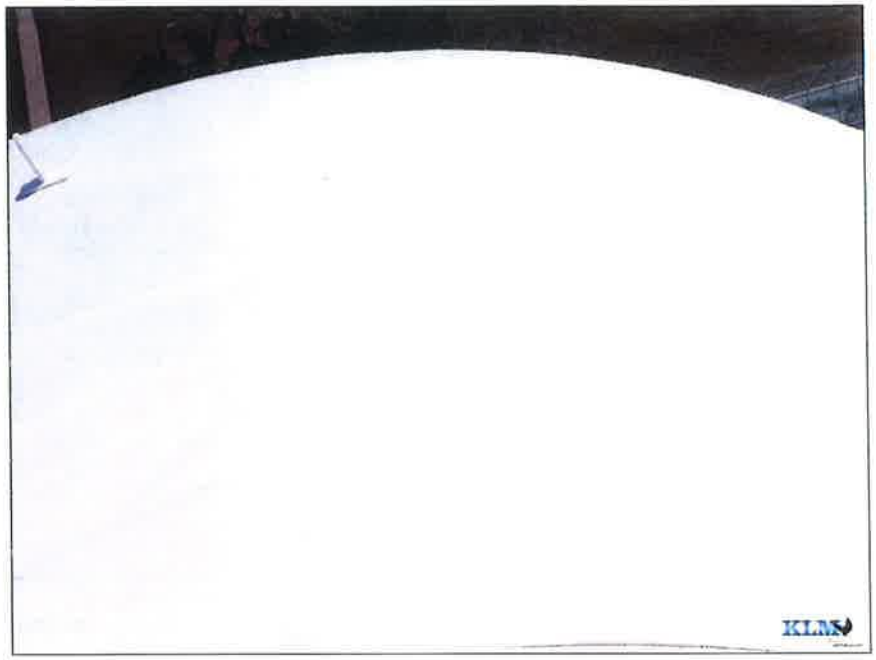


Photo No. 15
Roof coating conditions

Photo No. 16
Roof coating conditions

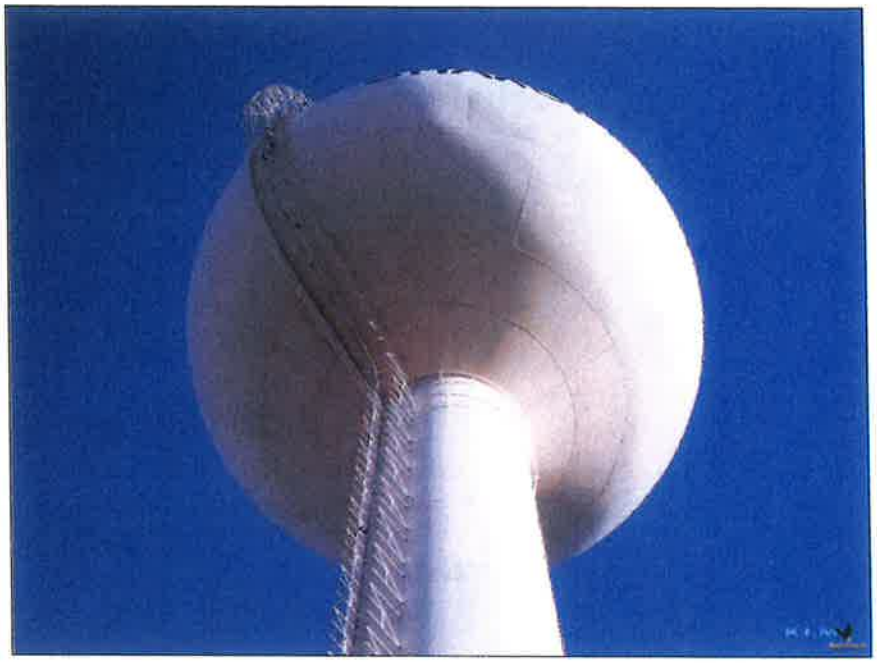


Photo No. 17
Overall condition of water compartment

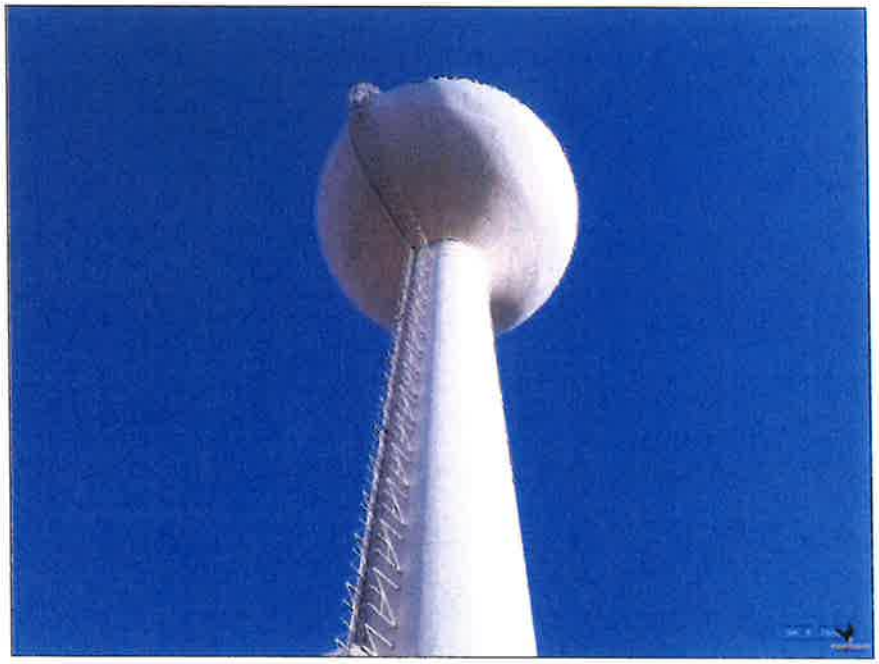
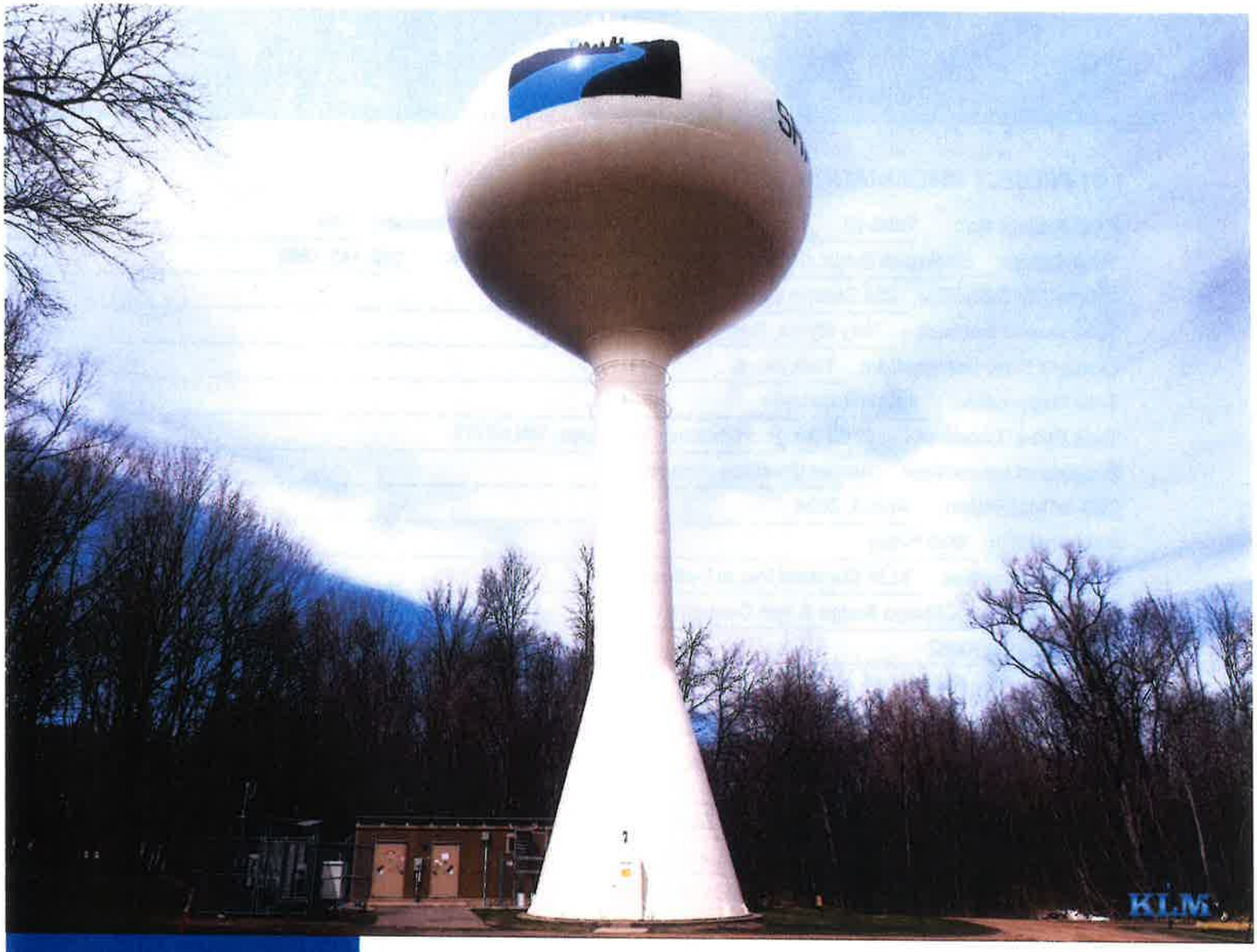


Photo No. 18
Wet pedestal, water compartment, and exterior ladder

Photo No. 19
Base cone with view of door

Photo No. 20
Base cone with view of overflow pipe



Shakopee Public Utilities, Shakopee, Minnesota

Inspection Report:
500,000-Gallon Capacity
Tank No. 4

Prepared by:

KLM Engineering, Inc.
1976 Wooddale Drive, Suite 4 | Woodbury, MN 55125
651.773.5111 | www.klmengineering.com

April 2024

Project No.: 2490-22

1.0| PROJECT INFORMATION

KLM Project No.: 2490-22 **Customer P. O. Number:** N/A

Tank Owner: Shakopee Public Utilities, Shakopee, Minnesota **Phone:** 952-445-1988

Street/City/State/Zip: 255 Sarazin Street, Shakopee, MN 55379

Tank Owner Contact: Tony Myers, Senior Water Operator

Owner's Tank Designation: Tank No. 4

Tank Description: Single Pedestal

Tank Street Location: 2065 Dominion Avenue, Shakopee, MN 55379

Purpose of Inspection: Annual Condition Assessment

Date of Inspection: April 4, 2024

Inspected By: Matt Finley

Type of Inspection: KLM Standard Visual Evaluation

Manufacturer: Chicago Bridge & Iron Company **Construction Date:** 2002

Serial No.: 130962 **Design Code:** AWWA D100-96

Capacity: 500,000 gallons

Type of Construction: Welded

Tank Diameter: ~55 feet

Height to: Overall ~117 feet

Height to: HWL ~110 feet LWL 74'-6"

Tank Construction Drawings: Unavailable to KLM

Previous Inspection Records: KLM 2020 - 2023 reports

EXISTING COATING INFORMATION

	Interior Wet	Interior Dry	Exterior
Date Last Coated	2002	2002	2002
Full or Spot Repair	New	New	New
Coating Contractor	CB&I	CB&I	CB&I
Surface Preparation	SSPC-SP 10	SSPC-SP 10	SSPC-SP 10
Paint System	Epoxy	Epoxy	Epoxy/Urethane
Paint Manufacturer	Tnemec	Tnemec	Tnemec
Paint Chip Samples	N/A	N/A	N/A

April 8, 2024

by E-Mail

Tony Myers
Senior Water Operator
255 Sarazin Street
Shakopee, MN 55379

RE: In-Service Visual Inspection of the 500,000-Gallon Elevated Reservoir (Tank No. 4) for Shakopee Public Utilities in the City of Shakopee, MN. KLM Project No. 2490-22.

Mr. Myers,

On April 4, 2024, KLM performed an in-service visual inspection of the 500,000-gallon elevated reservoir (Tank No. 4) and offers the following comments.

Analysis:

The tower was constructed and originally painted in 2002 by Chicago Bridge & Iron Company (CB&I).

The interior wet coating remains in similar condition to the 2023 visual report with less than ten percent visible coating failures above the high-water line (HWL). Failures consist of pinhole corrosion primarily along weld seams and spot corrosion on roof plates. Surfaces below the HWL were not observed as part of this inspection. See attached photos.

The interior dry coating remains in good to fair overall condition with coating failures in the areas susceptible to condensation. Failures consist of pinhole corrosion on the drywell tube ladder, drywell tube manway, and the overflow pipe. See attached photos.

The exterior coating remains in similar good to fair condition with between five and ten percent visible coating failures. Failures consist of UV deterioration and pinhole corrosion primarily on the roof. A protective rain guard is required on the finial vent. See attached photos.

Summary:

The interior and exterior coatings remain in similar condition to the 2023 report.

KLM recommends fully reconditioning the tower within the next one to two years to maximize the life of the structure, maintain a uniform life cycle of the coatings, and lower overall costs.

Sincerely,

KLM Engineering, Inc.

Report prepared by:

Perry Seidel

Perry Seidel
Project Manager
NACE Coating Inspector No. 106688

Report reviewed by:

Rodney Ellis

Rodney Ellis
Vice President/COO
NACE Certified Coatings Inspector No. 1686
AWS/CWI 0404031

Photo No. 1
Overall view of tower

Photo No. 2
Interior wet ladder

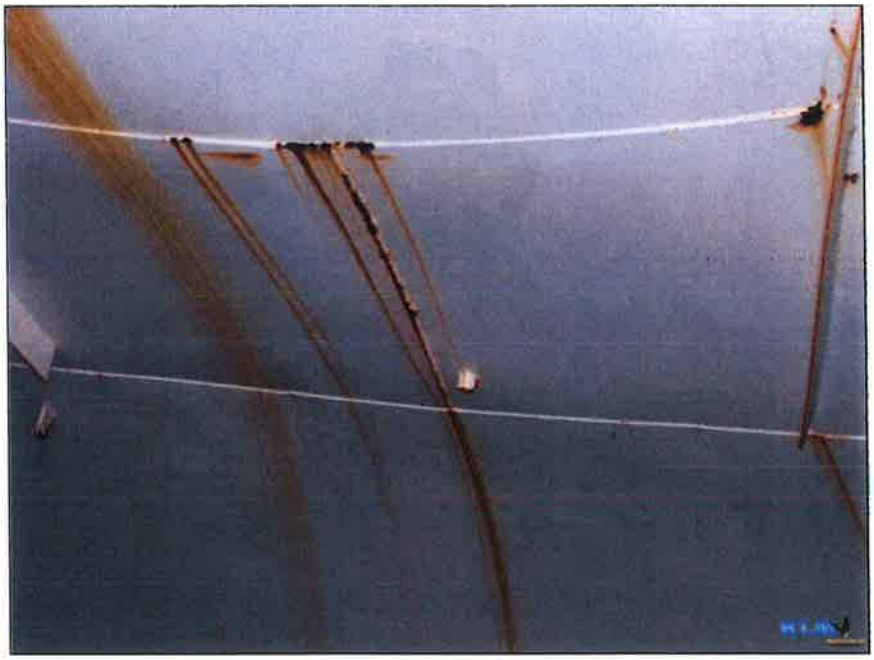


Photo No. 3
Overall condition of roof

Photo No. 4
Overall condition of roof

Photo No. 5
Condition of roof and upper torus

Photo No. 6
Condition of roof and upper torus

Photo No. 7
Coating failures and corrosion on finial vent collar

Photo No. 8
Coating failures and corrosion on ladder and drywell tube

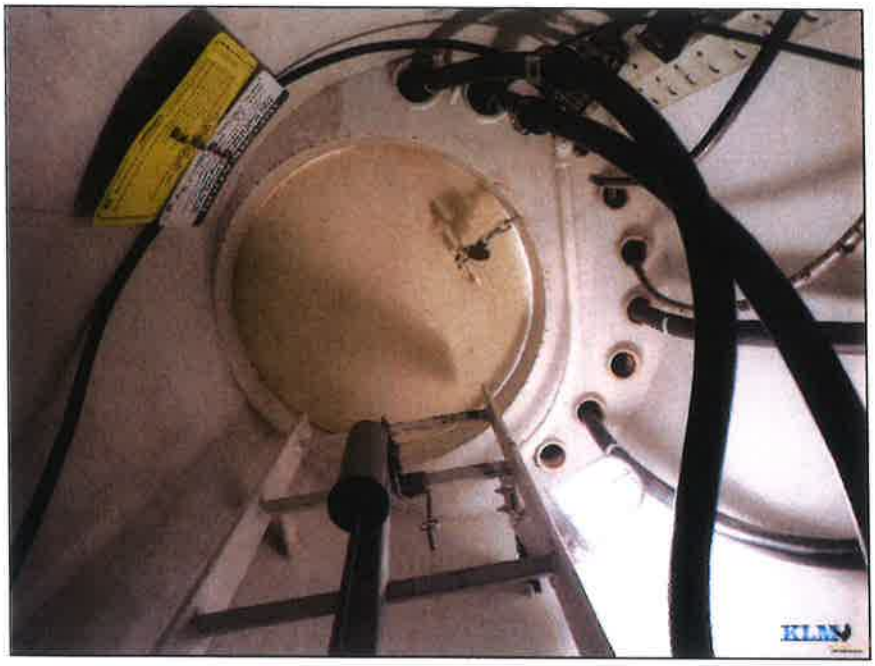


Photo No. 9
Top of drywell tube (looking up)

Photo No. 10
Overall conditions in drywell tube

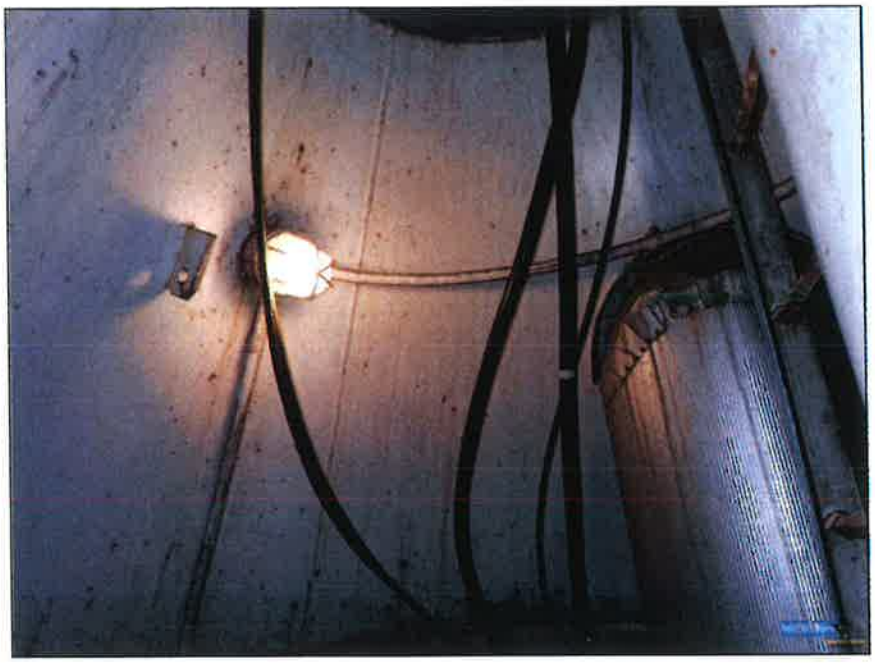


Photo No. 11
Bowl conditions

Photo No. 12
Bowl conditions

Photo No. 13
Conditions of top landing

Photo No. 14
Overall conditions in riser

Photo No. 15
Overall conditions in riser

Photo No. 16
Base cone conditions

Photo No. 17
Overall conditions in base of tank

Photo No. 18
Conditions in base cone

Photo No. 19
Overall conditions on roof
Note: finial vent

Photo No. 20
Conditions on roof

Photo No. 21
Overall condition of water compartment

Photo No. 22
Bowl and riser

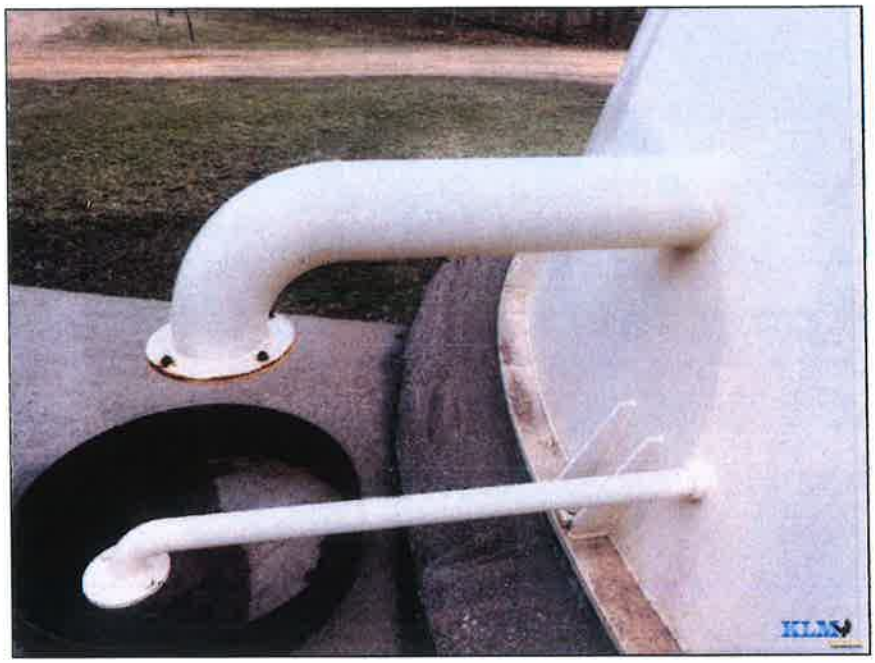


Photo No. 23
Overflow discharge

Photo No. 24
Base plate and foundation conditions

Shakopee Public Utilities, Shakopee, Minnesota

Inspection Report:
2,500,000-Gallon Capacity
Tank No. 5

Prepared by:

KLM Engineering, Inc.
1976 Wooddale Drive, Suite 4 | Woodbury, MN 55125
651.773.5111 | www.klmengineering.com

April 2024

Project No.: 2515-22

1.0| PROJECT INFORMATION

KLM Project No.: 2515-22 **Customer P. O. Number:** N/A

Tank Owner: Shakopee Public Utilities, Shakopee, Minnesota **Phone:** 952-445-1988

Street/City/State/Zip: 255 Sarazin Street, Shakopee, MN 55379

Tank Owner Contact: Tony Myers, Senior Water Operator

Owner's Tank Designation: Tank No. 5

Tank Description: Mostly Buried GSR

Tank Street Location: 2168 Kelly Circle, Shakopee, MN 55379

Purpose of Inspection: Annual Condition Assessment

Date of Inspection: April 1, 2024

Inspected By: Matt Finley

Type of Inspection: KLM Standard Visual Evaluation

Manufacturer: Natgun **Construction Date:** 2004

Serial No.: Unknown **Design Code:** AWWA D115 & ACI

Capacity: 2,500,000 gallons

Type of Construction: Reinforced cast-in-place roof & floor, prestressed concrete walls

Tank Diameter: ~110 feet

Height to: Overall ~35 feet

Height to: HWL ~30 feet LWL Bottom of reservoir

Tank Construction Drawings: Available at owner

Previous Inspection Records: KLM 2020 - 2023 reports

EXISTING COATING INFORMATION

	Interior Wet	Exterior
Date Last Coated	Uncoated	2004
Full or Spot Repair	N/A	Roof & exposed wall
Coating Contractor	N/A	Unknown
Surface Preparation	N/A	Unknown
Paint System	N/A	Unknown
Paint Manufacturer	N/A	Unknown

April 8, 2024

by E-Mail

Tony Myers
Senior Water Operator
255 Sarazin Street
Shakopee, MN 55379

RE: In-Service Visual Inspection of the 2,500,000-Gallon Ground Storage Reservoir (Tank No. 5) for Shakopee Public Utilities in the City of Shakopee, MN. KLM Project No. 2515-22.

Mr. Myers,

On April 1, 2024, KLM performed an in-service visual inspection of the 2,500,000-gallon ground storage reservoir (Tank No. 5) and offers the following comments.

Analysis:

Records indicate the reservoir was constructed by Natgun in 2004.

The interior of the reservoir currently has no coating and has presumably never been coated. Interior coating is likely unnecessary due to the good overall condition of the existing concrete. Concrete potable water tanks are typically not recommended to be coated unless there are concerns of degradation of the structure, water infiltration, biofilm accumulation, or difficult to clean surfaces. The interior ladder is constructed of fiberglass and is in excellent condition. See attached photos.

The interior structure of the concrete remains the same and in good visible condition since the 2023 report. Minor hairline cracking with efflorescence is present on the roof, but this is not a structural concern. Surfaces below the water level were not observed as part of this inspection. See attached photos.

The reservoir is partially buried with exterior coatings on the roof and exposed wall. The coating remains in fair to poor condition on the roof and good condition on the wall. Failures on the roof consist of topcoat deterioration with overlap roller marks evident and small areas where the coating has delaminated, exposing the concrete. The roof hatches are stainless-steel Bilco style and remain in excellent condition. The coatings on the J-vent and on the overflow pipe have changed slightly and are still in fair condition with surface corrosion due to topcoat delamination and rust-colored staining on bolted connections. See attached photos.

The exterior structure of the concrete also remains in good visible condition since the 2023 report. Hairline shrinkage cracks are present on the roof and walls, with many of the cracks on construction joints and others at random locations. These failures are not a structural concern, so no repairs are required.

Summary:

The interior and exterior coatings and the overall structure of the concrete remain in similar condition to the 2023 report.

KLM recommends inspecting and evaluating the coatings and structure of the reservoir again in one year per the service agreement to monitor conditions.

Sincerely,

KLM Engineering, Inc.

Report prepared by:

Perry Seidel

Perry Seidel
Project Manager
NACE Coating Inspector No. 106688

Report reviewed by:

Rodney Ellis

Rodney Ellis
Vice President/COO
NACE Coating Inspector No. 1686
AWS/CWI 04040311

Attached: Photos

Photo No. 1
Overall view of reservoir

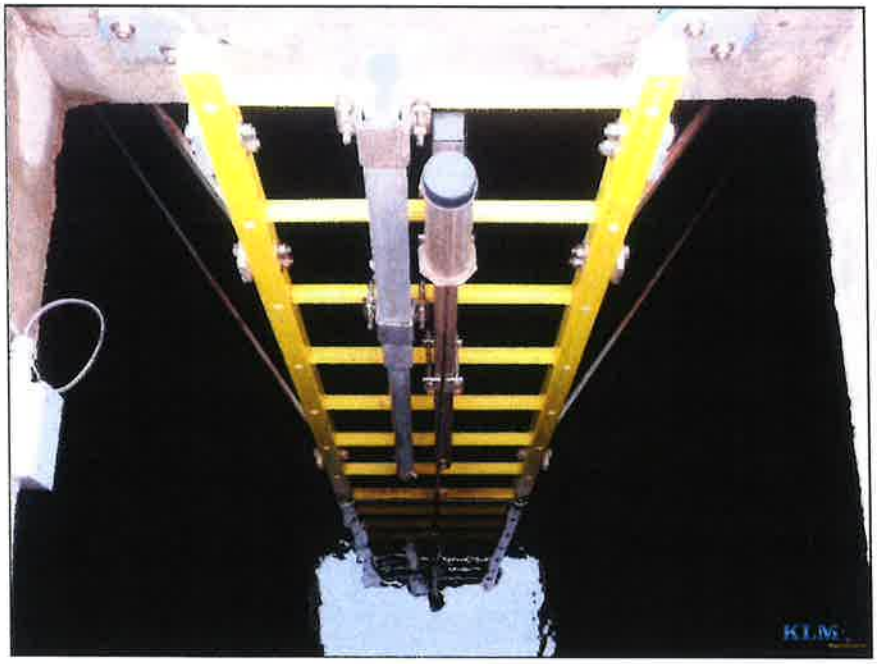


Photo No. 2
Interior wet ladder conditions

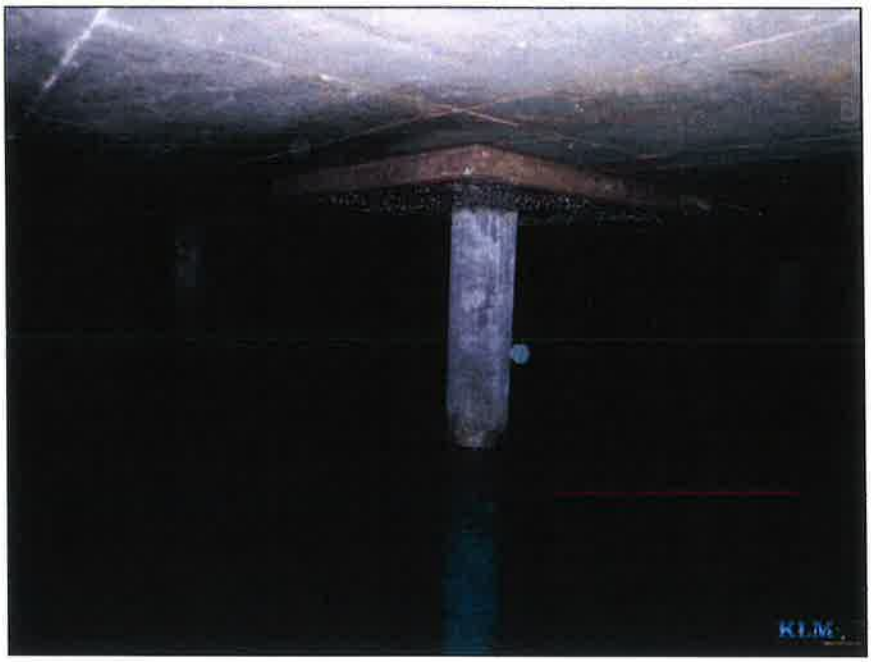


Photo No. 3
View of interior roof and column

Photo No. 4
Condition of roof

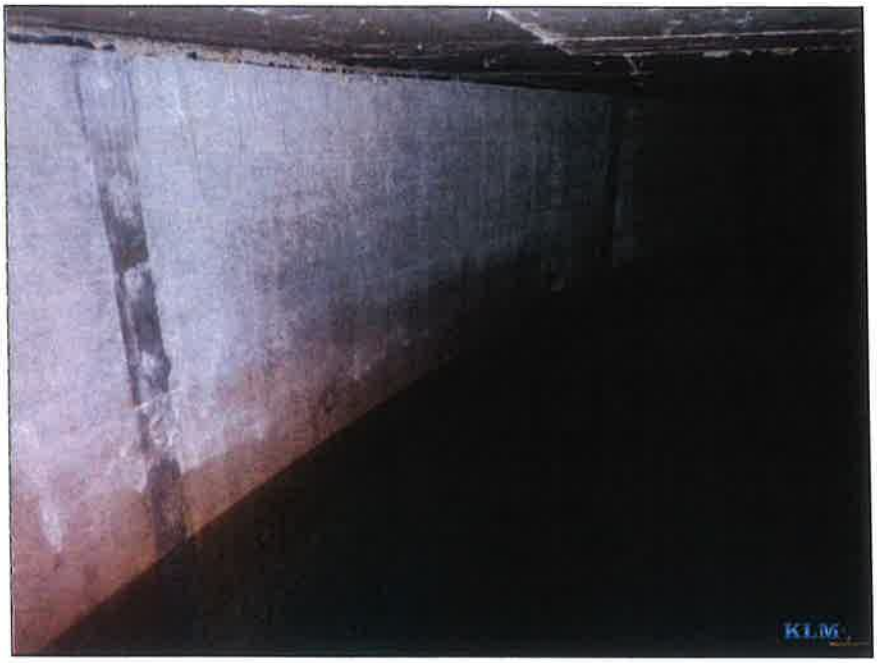


Photo No. 5
Condition of roof and wall

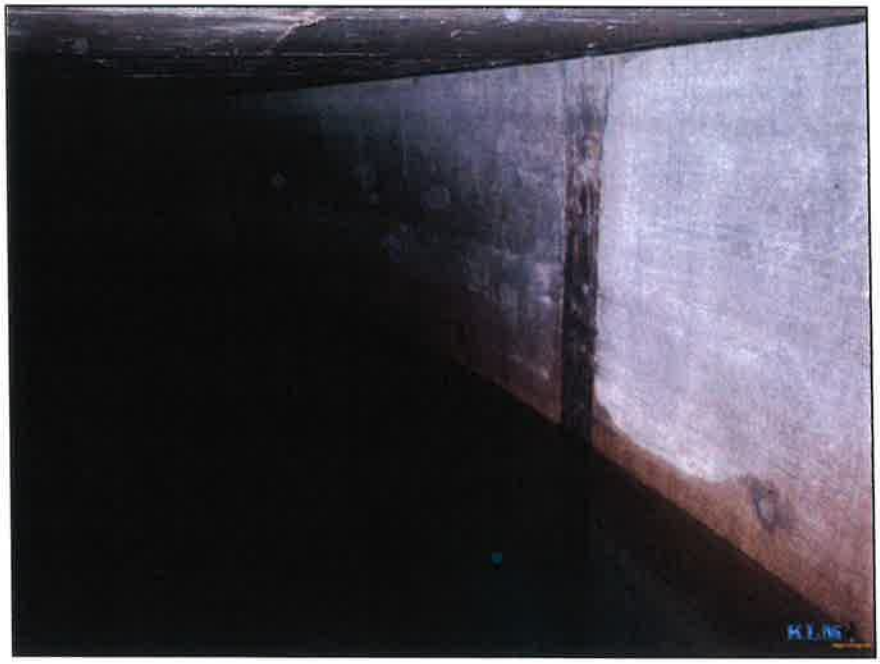


Photo No. 6
Condition of wall

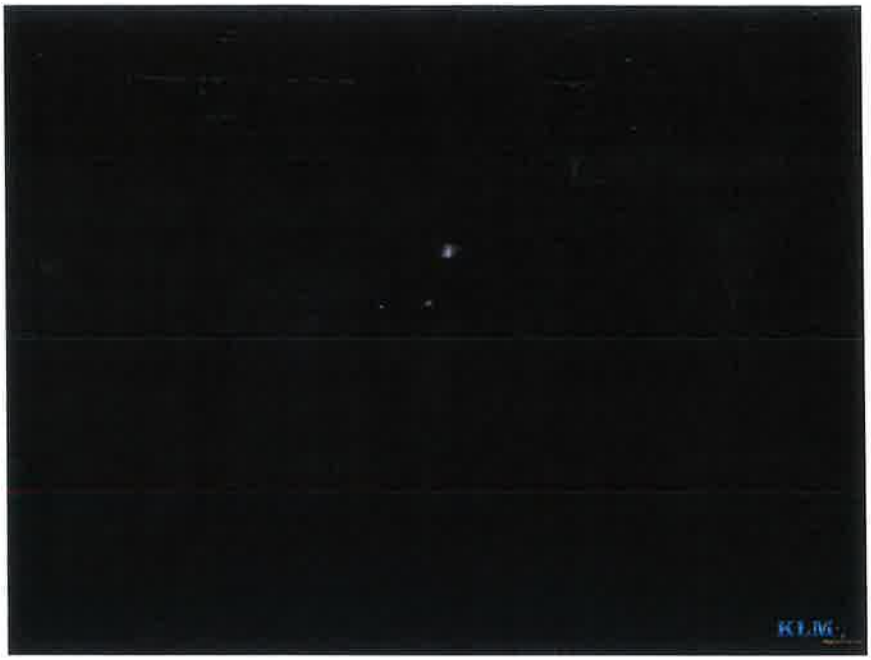


Photo No. 7
Conditions of roof, wall, and column with overflow in background

Photo No. 8
Condition of J-vent

Photo No. 9
Condition of J-vent screen

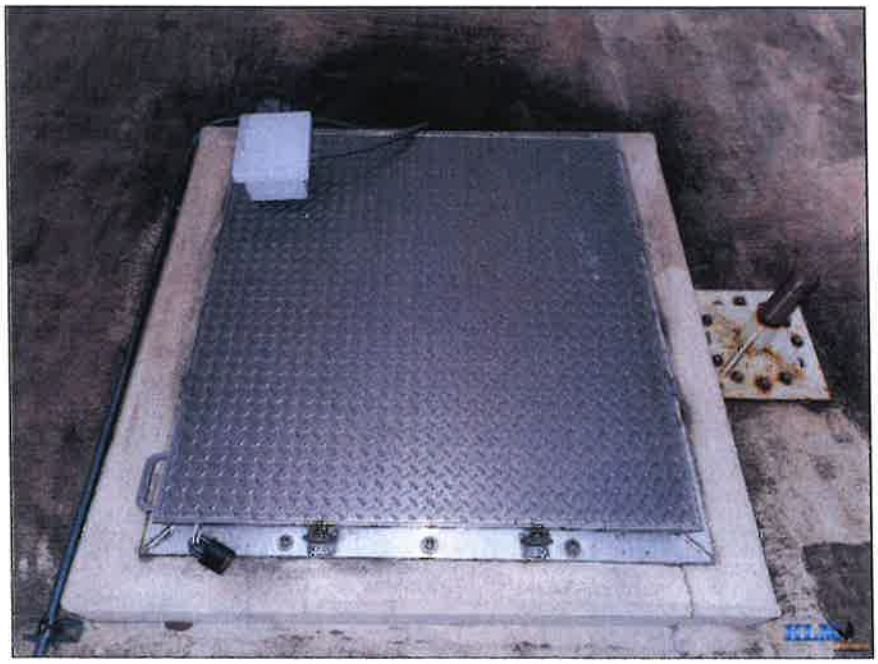


Photo No. 10
Condition of roof hatch

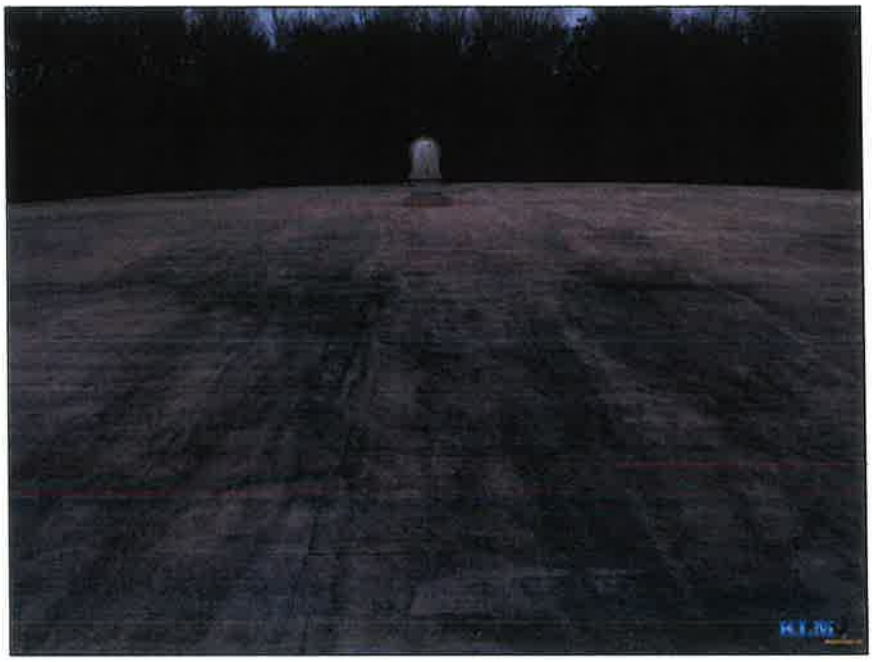


Photo No. 11
Condition of roof coating

Photo No. 12
Typical wall condition

Photo No. 13
Typical wall condition

Photo No. 14
View of exposed wall

Photo No. 15
Overflow pipe and catch basin

Photo No. 16
Condition of overflow pipe and grating

Photo No. 17
Condition of overflow pipe screen

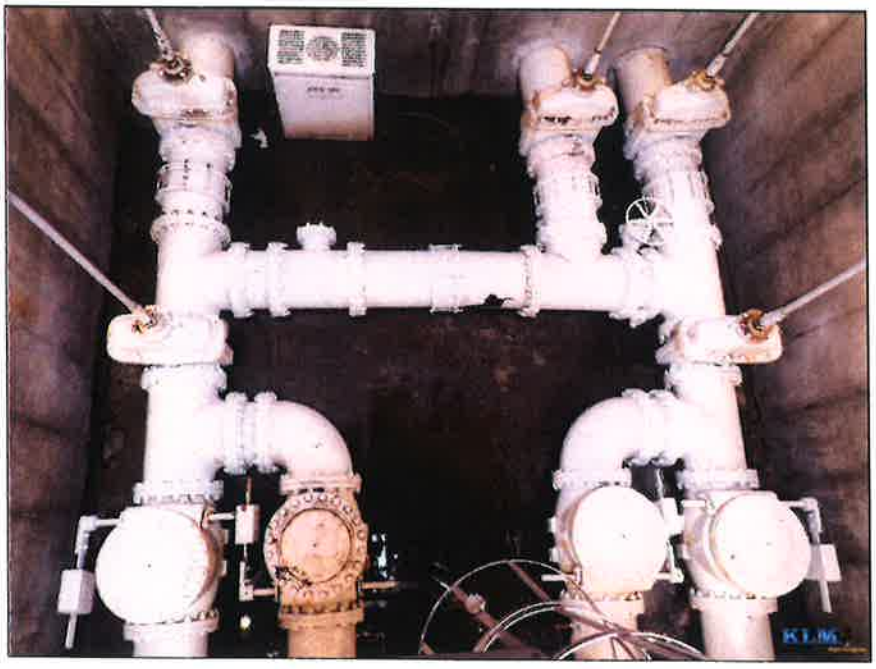


Photo No. 18
View of valve pit

Shakopee Public Utilities, Shakopee, Minnesota

Inspection Report:
2,500,000-Gallon Capacity
Tank No. 6

Prepared by:

KLM Engineering, Inc.
1976 Wooddale Drive, Suite 4 | Woodbury, MN 55125
651.773.5111 | www.klmengineering.com

April 2024

Project No.: 2516-22

1.0| PROJECT INFORMATION

KLM Project No.: 2516-22 **Customer P. O. Number:** N/A
Tank Owner: Shakopee Public Utilities, Shakopee, Minnesota **Phone:** 952-445-1988
Street/City/State/Zip: 255 Sarazin Street, Shakopee, MN 55379
Tank Owner Contact: Tony Myers, Senior Water Operator
Owner's Tank Designation: Tank No. 6
Tank Description: Mostly Buried GSR
Tank Street Location: 2168 Kelly Circle, Shakopee, MN 55379
Purpose of Inspection: Annual Condition Assessment
Date of Inspection: April 1, 2024
Inspected By: Devin Severson, NACE #78234
Type of Inspection: KLM Standard Visual Evaluation
Manufacturer: Natgun **Construction Date:** 2004
Serial No.: Unknown **Design Code:** AWWA D115 & ACI
Capacity: 2,500,000 gallons
Type of Construction: Reinforced cast-in-place roof & floor, prestressed concrete walls
Tank Diameter: ~110 feet
Height to: Overall ~35 feet
Height to: HWL ~30 feet LWL Bottom of reservoir
Tank Construction Drawings: Available at owner
Previous Inspection Records: KLM 2020 - 2023 reports

EXISTING COATING INFORMATION

	Interior Wet	Exterior
Date Last Coated	Uncoated	2004
Full or Spot Repair	N/A	Roof & exposed wall
Coating Contractor	N/A	Unknown
Surface Preparation	N/A	Unknown
Paint System	N/A	Unknown
Paint Manufacturer	N/A	N/A

April 8, 2024

by E-Mail

Tony Myers
Senior Water Operator
255 Sarazin Street
Shakopee, MN 55379

RE: In-Service Visual Inspection of the 2,500,000-Gallon Ground Storage Reservoir (Tank No. 6) for Shakopee Public Utilities in the City of Shakopee, MN. KLM Project No. 2516-22.

Mr. Myers,

On April 1, 2024, KLM performed an in-service visual inspection of the 2,500,000-gallon ground storage reservoir (Tank No. 6) and offers the following comments.

Analysis:

Records indicate the reservoir was constructed by Natgun in 2004.

The interior of the reservoir currently has no coating and has presumably never been coated. Interior coating is likely unnecessary due to the good overall condition of the existing concrete. Concrete potable water tanks are typically not recommended to be coated unless there are concerns of degradation of the structure, water infiltration, biofilm accumulation, or difficult to clean surfaces. See attached photos.

The interior structure of the concrete remains the same and in good visible condition since the 2023 report. Minor hairline cracking with efflorescence is present on the roof, but this is not a structural concern. Surfaces below the water level were not observed as part of this inspection. See attached photos.

The reservoir is partially buried with exterior coatings on the roof and exposed wall. The coating remains in fair to poor condition on the roof and good condition on the wall. Failures on the roof consist of topcoat deterioration with overlap roller marks evident and small areas where the coating has delaminated, exposing the concrete. The roof hatches are stainless-steel Bilco style and remain in excellent condition. The coatings on the J-vent and on the overflow pipe have changed slightly and are still in fair condition with surface corrosion due to topcoat delamination and rust-colored staining on bolted connections. See attached photos.

The exterior structure of the concrete also remains in good visible condition since the 2023 report. Hairline shrinkage cracks are present on the roof and walls, with many of the cracks on construction joints and others at random locations. These failures are not a structural concern, so no repairs are required.

Summary:

The interior and exterior coatings and the overall structure of the concrete remain in similar condition to the 2023 report.

KLM recommends inspecting and evaluating the coatings and structure of the reservoir again in one year per the service agreement to monitor conditions.

Sincerely,

KLM Engineering, Inc.

Report prepared by:

Perry Seidel

Perry Seidel
Project Manager
NACE Coating Inspector No. 106688

Report reviewed by:

Rodney Ellis

Rodney Ellis
Vice President/COO
NACE Coating Inspector No. 1686
AWS/CWI 04040311

Attached: Photos

Photo No. 1
Overall view of reservoir

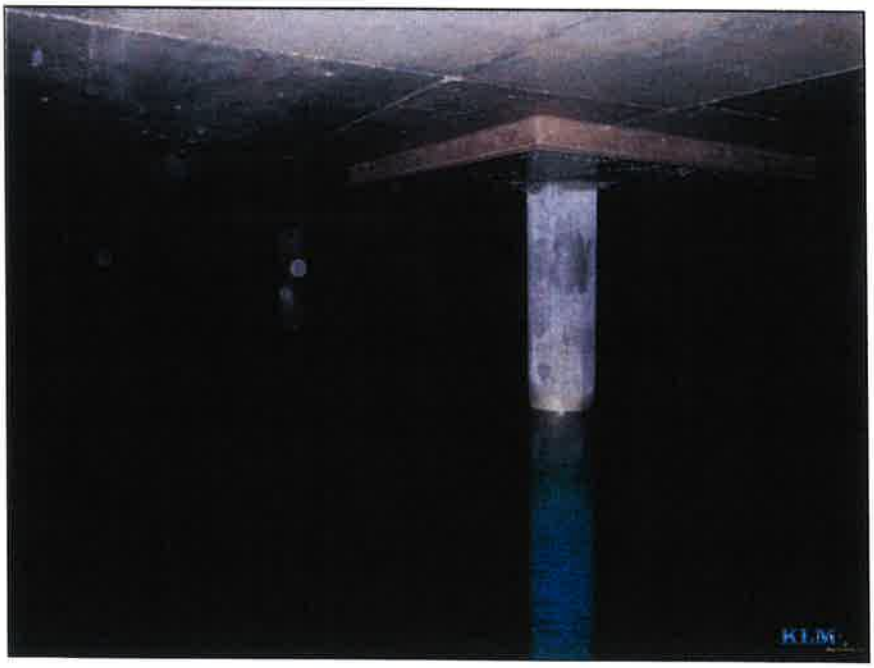


Photo No. 2
View of interior roof and column

Photo No. 3
Typical condition of roof

Photo No. 4
Condition of roof and wall

Photo No. 5
Condition of roof and wall

Photo No. 6
Condition of wall

Photo No. 7
Condition of column with overflow in background

Photo No. 8
Condition of J-vent

Photo No. 9
Condition of roof coating

Photo No. 10
Condition of roof coating

Photo No. 11
Condition of roof coating

Photo No. 12
Bilco access hatch

Photo No. 13
Typical wall condition

Photo No. 14
Typical wall condition

Photo No. 15
View of exposed wall

Photo No. 16
Overflow pipe and catch basin

Photo No. 17
Condition of overflow pipe and grating

Photo No. 18
Exterior view of valve pit

Shakopee Public Utilities, Shakopee, Minnesota

Inspection Report:
2,000,000-Gallon Capacity
Tank No. 7

Prepared by:

KLM Engineering, Inc.
1976 Wooddale Drive, Suite 4 | Woodbury, MN 55125
651.773.5111 | www.klmengineering.com

April 2024

Project No.: 4065-22

1.0| PROJECT INFORMATION

KLM Project No.: 4065-22 **Customer P. O. Number:** N/A

Tank Owner: Shakopee Public Utilities, Shakopee, Minnesota **Phone:** 952-445-1988

Street/City/State/Zip: 255 Sarazin Street, Shakopee, MN 55379

Tank Owner Contact: Tony Myers, Senior Water Operator

Owner's Tank Designation: Tank No. 7

Tank Description: Partially buried concrete reservoir

Tank Street Location: 1415 Wood Duck Trail, Shakopee, MN 55379

Purpose of Inspection: Annual Condition Assessment

Date of Inspection: April 5, 2024

Inspected By: Matt Finley

Type of Inspection: KLM Standard Visual Evaluation

Manufacturer: Unknown **Construction Date:** 2014

Serial No.: N/A **Design Code:** AWWA D115 & ACI

Capacity: 2,000,000 gallons

Type of Construction: Prestressed & precast walls & roof, poured in place concrete floor

Tank Diameter: ~100 feet

Height to: Overall ~35 feet

Height to: HWL ~30 feet LWL Bottom of reservoir

Tank Construction Drawings: Unavailable to KLM

Previous Inspection Records: KLM 2020 - 2023 reports

EXISTING COATING INFORMATION

	Interior Wet	Exterior
Date Last Coated	Uncoated	2014
Full or Spot Repair	N/A	Roof & walls
Coating Contractor	N/A	Unknown
Surface Preparation	N/A	Unknown
Paint System	N/A	Acrylic
Paint Manufacturer	N/A	Unknown
Paint Chip Samples	N/A	N/A

April 8, 2024

by E-Mail

Tony Myers
Senior Water Operator
255 Sarazin Street
Shakopee, MN 55379

RE: In-Service Visual Inspection of the 2,000,000-Gallon Ground Storage Reservoir (Tank No. 7) for Shakopee Public Utilities in the City of Shakopee, MN. KLM Project No. 4065-22.

Mr. Myers,

On April 5, 2024, KLM performed an in-service visual inspection of the 2,000,000-gallon ground storage reservoir (Tank No. 7) and offers the following comments.

Analysis:

Records indicate the reservoir was constructed in 2014 by an unknown manufacturer.

The interior of the reservoir currently has no coating and has presumably never been coated. Interior coating is likely unnecessary due to the good overall condition of the existing concrete. Concrete potable water tanks are typically not recommended to be coated unless there are concerns of degradation of the structure, water infiltration, biofilm accumulation, or difficult to clean surfaces. See attached photos.

The interior structure of the concrete remains in excellent visible condition since the 2023 report. No evident cracking or spalling is occurring on the roof and walls. Surfaces below the water level were not observed as part of this inspection. See attached photos.

The reservoir is partially buried with exterior coatings on the roof and exposed wall. The coating remains in excellent condition with less than one percent visible coating failures. Failures consist of minor delamination or holidays (missed spots) on the roof. The roof hatches, pressure manway, handrails, ladders, and finial vent are stainless-steel or aluminum and are in excellent condition. The overflow pipe discharge is ductile iron and painted with minor surface corrosion on the screen retainer. See attached photos.

The exterior structure of the concrete also remains in excellent visible condition since the 2023 report. Minor hairline cracking is present on the roof and walls, efflorescence emanating from the masonry grout, and some spalling on the foundation. These failures are not a structural concern, so no repairs are required. See attached photos.

Summary:

The exterior coatings and the overall structure of the concrete remain in similar condition to the 2023 report.

KLM recommends inspecting and evaluating the coatings and structure of the reservoir again in one year per the service agreement to monitor conditions.

Sincerely,

KLM Engineering, Inc.

Report prepared by:

Perry Seidel

Perry Seidel
Project Manager
NACE Coating Inspector No. 106688

Report reviewed by:

Rodney Ellis

Rodney Ellis
Vice President/COO
NACE Certified Coatings Inspector No. 1686
AWS/CWI 0404031

Photo No. 1
Overall view of reservoir

Photo No. 2
View of interior roof

Photo No. 3
Typical condition of roof and wall

Photo No. 4
Roof, wall, and ladder conditions

Photo No. 5
Condition of wall
Overflow weir box visible

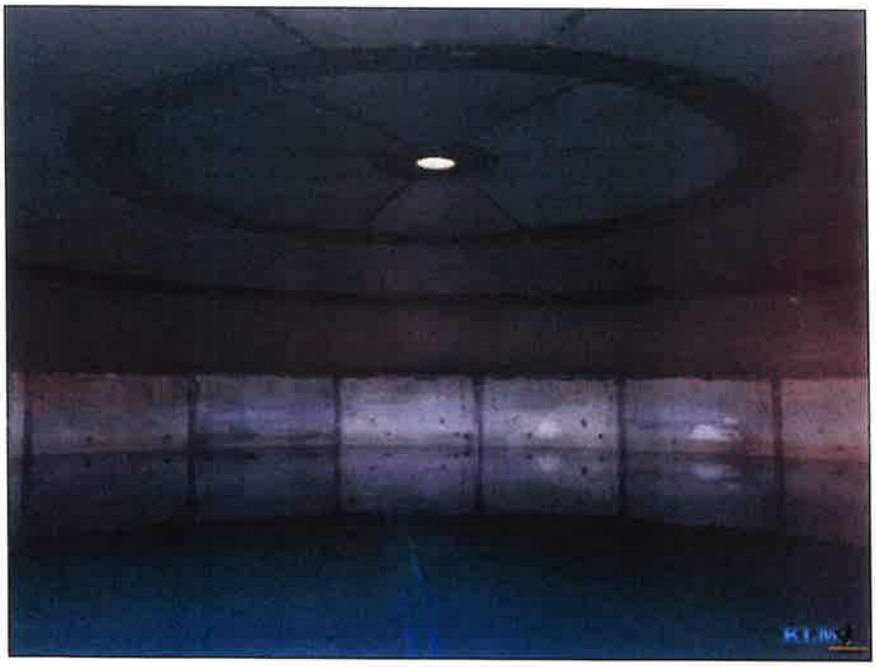


Photo No. 6
View of roof and wall

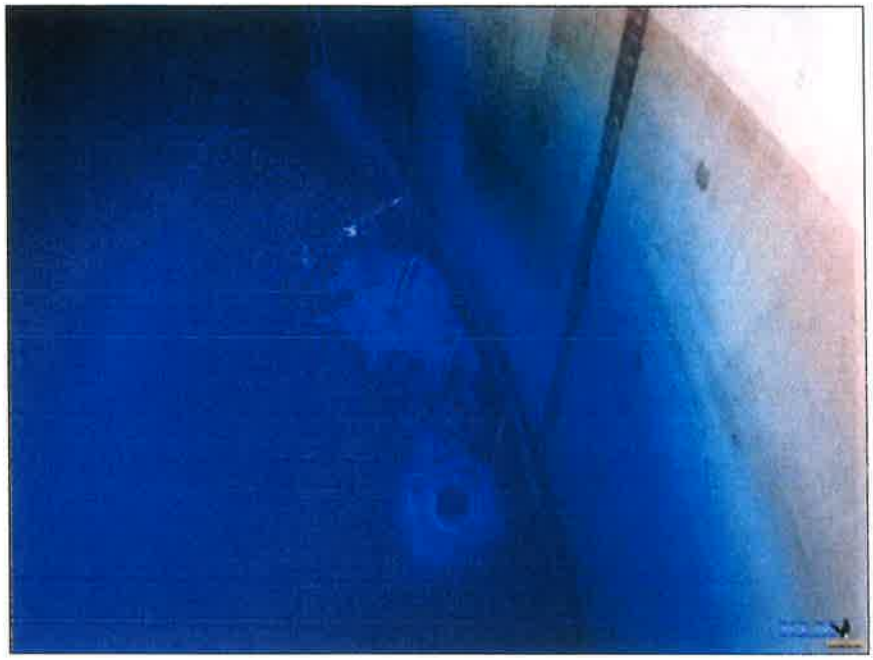


Photo No. 7
View of water compartment
Inlet pipe visible

Photo No. 8
Finial vent

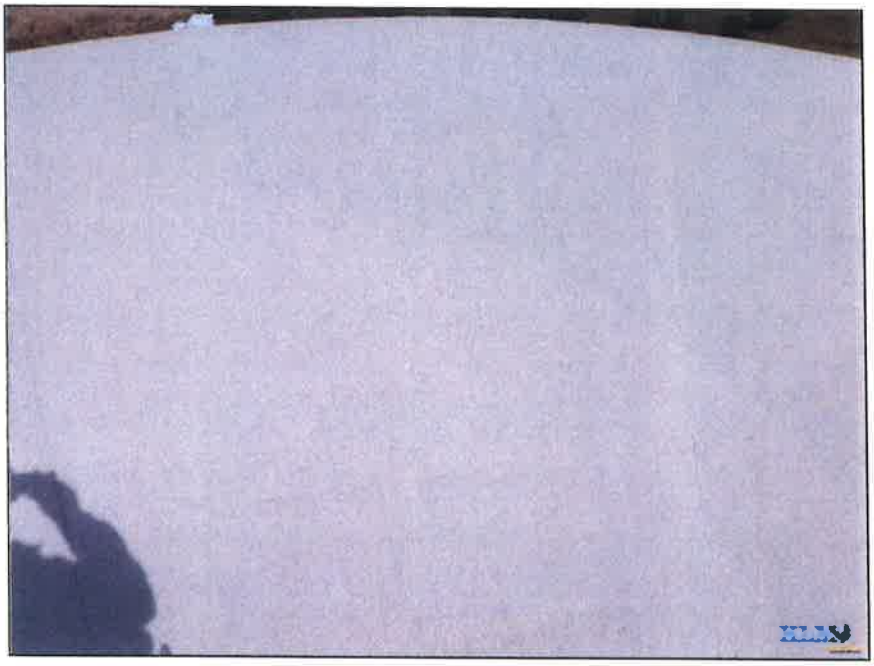


Photo No. 9
Overall conditions of roof

Photo No. 10
Typical condition of roof coating

Photo No. 11
Condition of roof coating

Photo No. 12
Roof handrailing

Photo No. 13
Roof hatch

Photo No. 14
Roof hatch and interior ladder

Photo No. 15
Access ladder with anti-climb plate

Photo No. 16
Condition of wall

Photo No. 17
Condition of wall

Photo No. 18
Pressure style manway

Photo No. 19
Overflow pipe discharge and catch basin

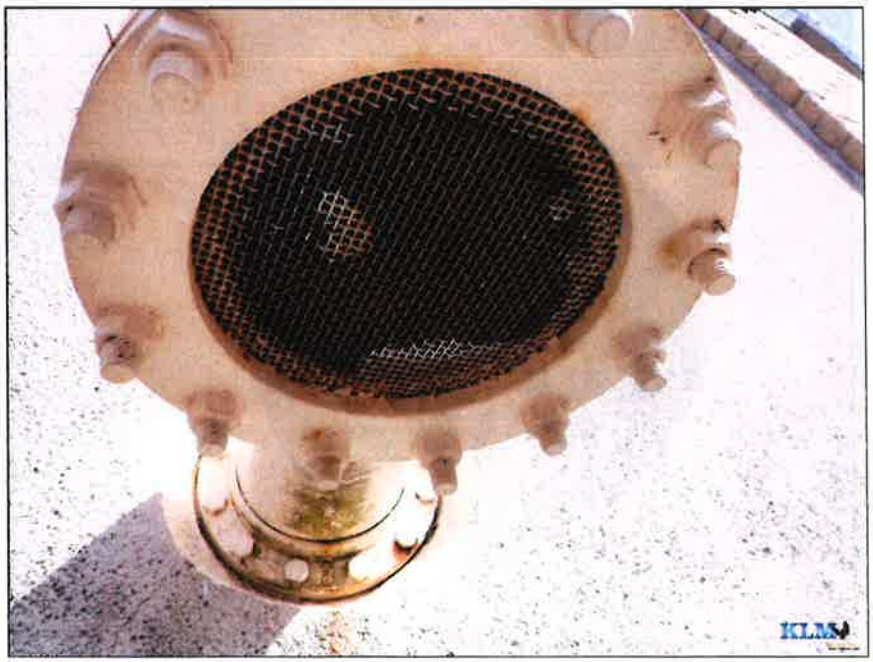
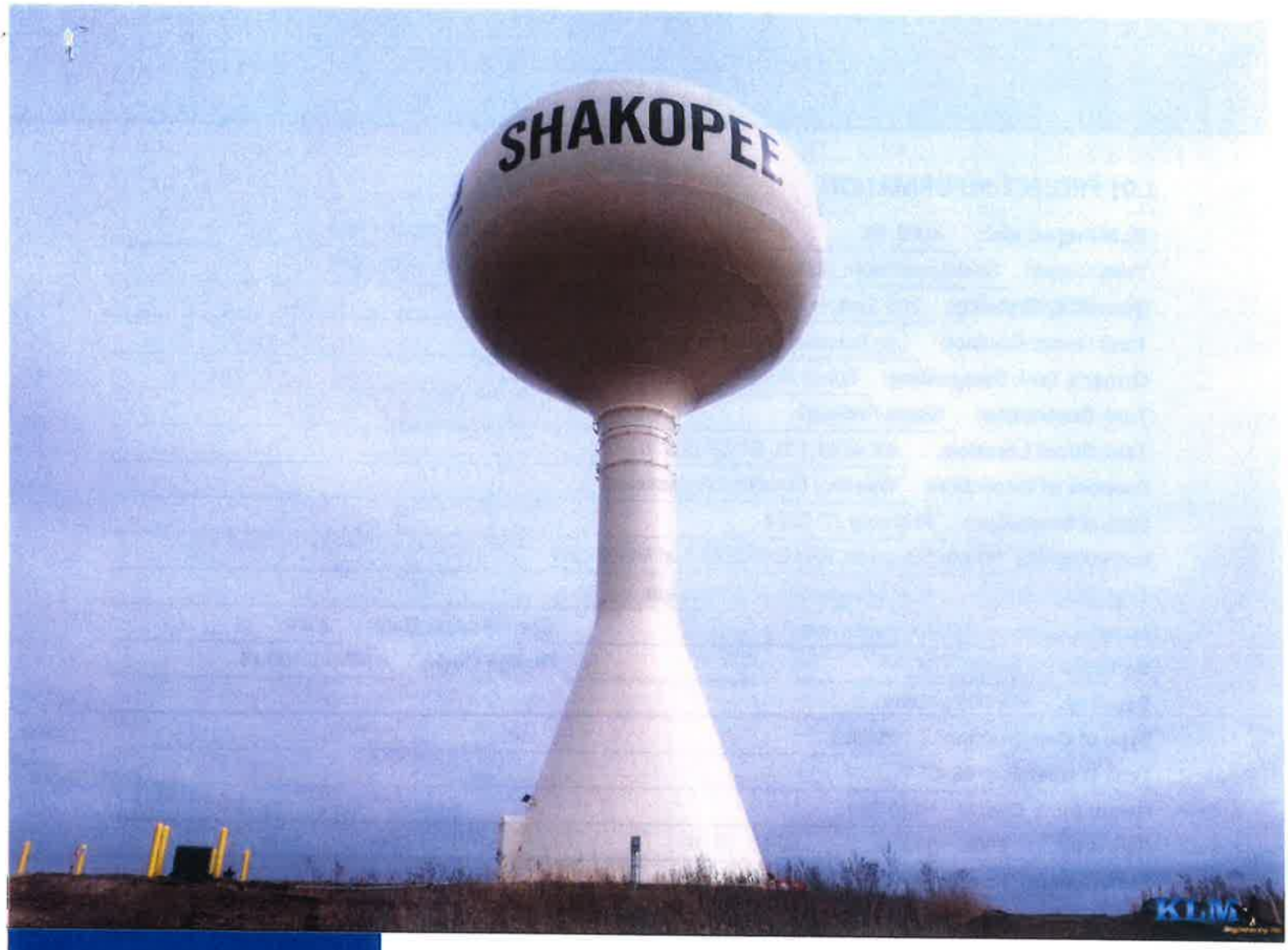


Photo No. 20
Condition of overflow pipe screen



Shakopee Public Utilities

Warranty Report:
750,000-Gallon Capacity
Tower No. 8

Prepared by:

KLM Engineering, Inc.
1976 Wooddale Drive, Suite 4 | Woodbury, MN 55125
651.773.5111 | www.klmengineering.com

March 2024

Project No.: 4062-19

1.0| PROJECT INFORMATION

KLM Project No.: 4062-19 **Customer P. O. Number:** N/A
Tank Owner: Shakopee Public Utilities **Phone:** 952-445-1988
Street/City/State/Zip: 255 Sarazin Street, Shakopee, MN 55379
Tank Owner Contact: Lon Schemel, Water Superintendent
Owner's Tank Designation: Tower No. 8
Tank Description: Single Pedestal
Tank Street Location: 44°45'54.1"N, 93°33'18.6"W
Purpose of Inspection: Warranty Condition Assessment
Date of Inspection: February 27, 2024
Inspected By: Devin Severson, NACE #78234 and Matt Finley
Type of Inspection: KLM Standard ROV Evaluation
Manufacturer: Caldwell Tanks, Inc. **Construction Date:** 2020
Serial No.: E-8982 **Design Code:** AWWA D100-11
Capacity: 750,000 gallons
Type of Construction: Welded
Tank Diameter: 66'-0"
Height to: Overall ~120 feet
Height to: HWL 113'-0" LWL 73'-0"
Tank Construction Drawings: Available to KLM
Previous Inspection Records: N/A

EXISTING COATING INFORMATION

	Interior Wet	Interior Dry	Exterior
Date Last Coated	2022	2022	2022
Full or Spot Repair	Full/New	Full/New	Full/New
Coating Contractor	Caldwell Tanks, Inc.	Caldwell Tanks, Inc.	Caldwell Tanks, Inc.
Surface Preparation	SSPC-SP 10	SSPC-SP 6	SSPC-SP 6
Paint System	Zinc/Epoxy	Zinc/Epoxy	Zinc/Urethane/Fluoropolymer
Paint Manufacturer	Tnemec	Tnemec	Tnemec

March 14, 2024

by E-Mail

Lon Schemel
Water Superintendent
255 Sarazin Street
Shakopee, MN 55379

RE: ROV Warranty Evaluation of the 750,000-Gallon Elevated Reservoir (Tower No. 8) in Shakopee, MN. KLM Project No. 4062-19.

Mr. Schemel,

On February 27, 2024, KLM performed a remote operated vehicle (ROV) warranty evaluation of the 750,000-gallon elevated reservoir (Tower No. 8) and offers the following comments.

Analysis:

The tower was constructed in 2020 and painted in 2022 by Caldwell Tanks, Inc.

The interior wet coating is in excellent condition with minimal visible coating failures. Failures consist of minor surface corrosion between the roof and upper torus plates, and pinhole corrosion along a shell weld seam and at an isolated location on a shell plate. See attached photos.

The interior dry coating is in excellent condition with no visible coating failures observed. See attached photos.

The exterior coating is in excellent condition with no visible coating failures observed. See attached photos.

Summary:

KLM will provide this evaluation report to Caldwell for their review. The coating failures observed on the interior wet surfaces shall be addressed by the contractor in accordance with the conditions of the project warranty and Division 09 – Coatings, in reference to. Repairs shall be performed according to the specifications and paint manufacturer's recommendations at a time coordinated with the Owner, KLM, and Sambatek. With the proper crew and equipment, the contractor should be able to complete the repairs in less than two days.

KLM will perform full-time inspection of the repair process, at no cost, once a schedule and repair method have been found agreeable to the coating manufacturer, contractor, and City.

The tower should be inspected and evaluated in five years after warranty repairs are performed and per AWWA recommendations, to monitor conditions.

Sincerely,

KLM Engineering, Inc.

Report prepared by:

Joseph Clasemann

Joseph Clasemann, E.I.T.
Civil Engineer-In-Training
EIT Certification No. 157889

Report reviewed by:

Rodney Ellis

Rodney Ellis
Vice President/COO
NACE Certified Coatings Inspector No. 1686
AWS/CWI 0404031

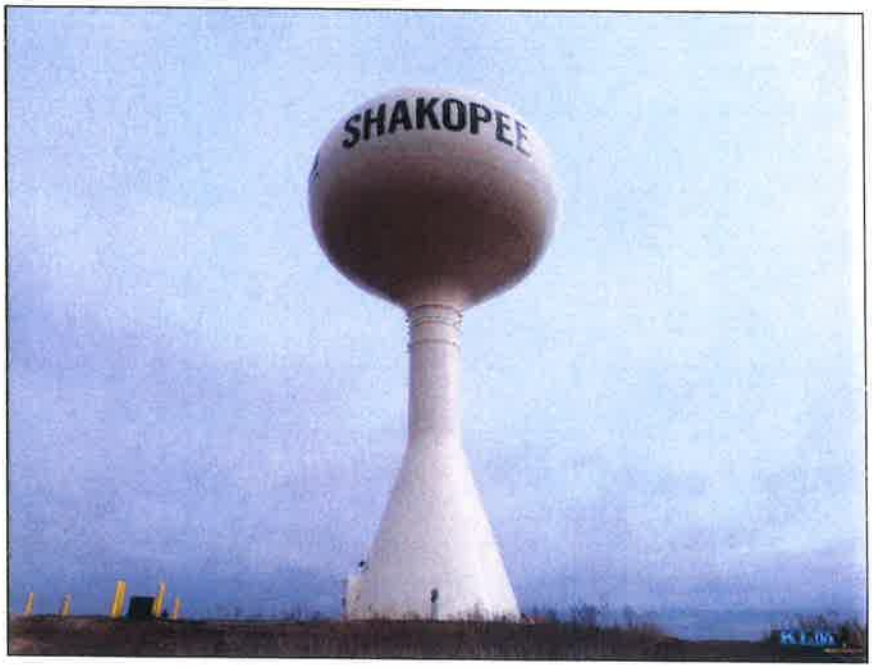


Photo No. 1
Overall view of tower

Photo No. 2
View of dollar plate and top of wet access ladder

Photo No. 3
View of interior wet roof

Photo No. 4
View of interior wet roof

Photo No. 5
Roof coating conditions

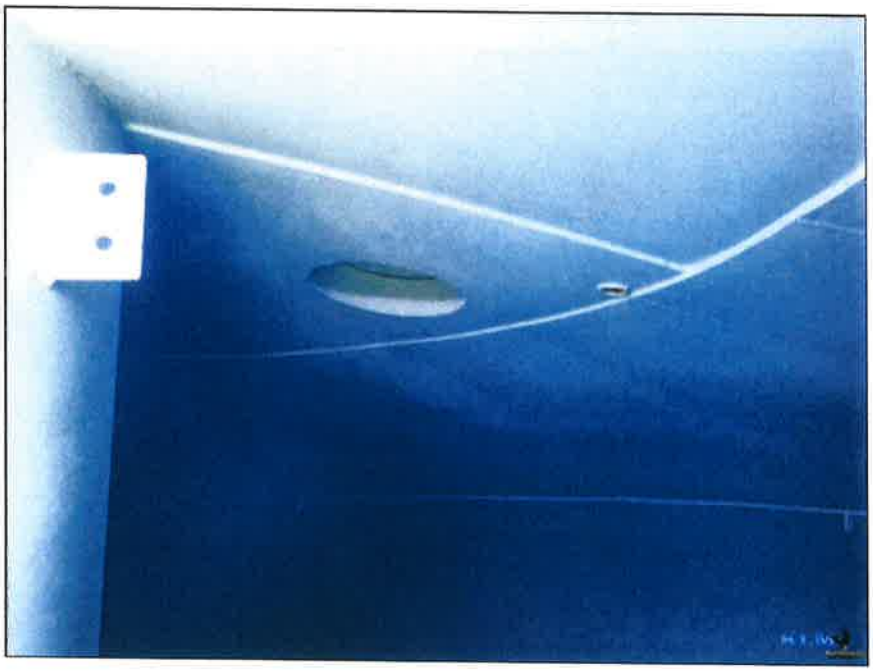


Photo No. 6
Roof coating conditions

Photo No. 7
Roof and upper torus coating conditions
Surface corrosion visible along weld seam

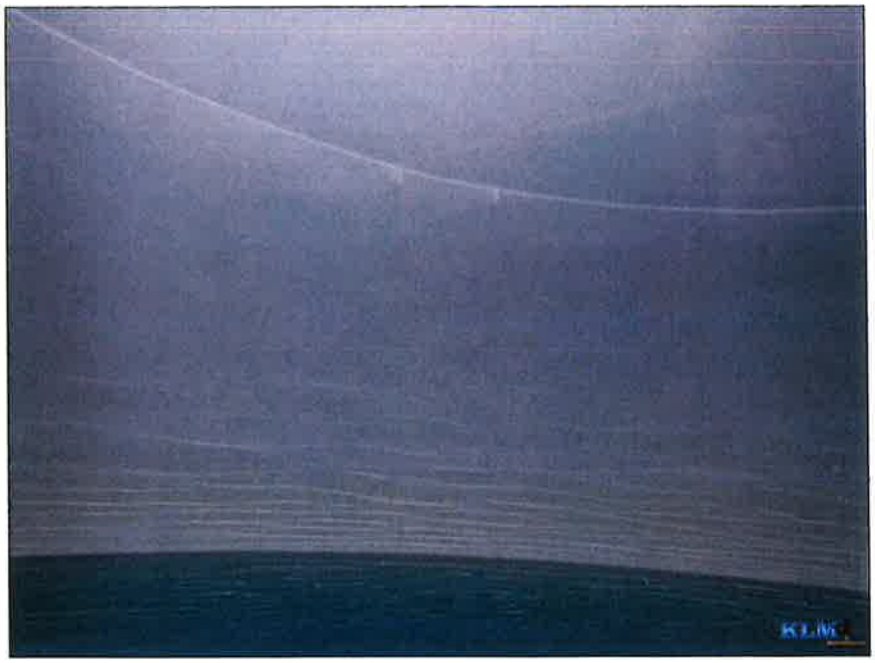


Photo No. 8
Upper torus coating conditions

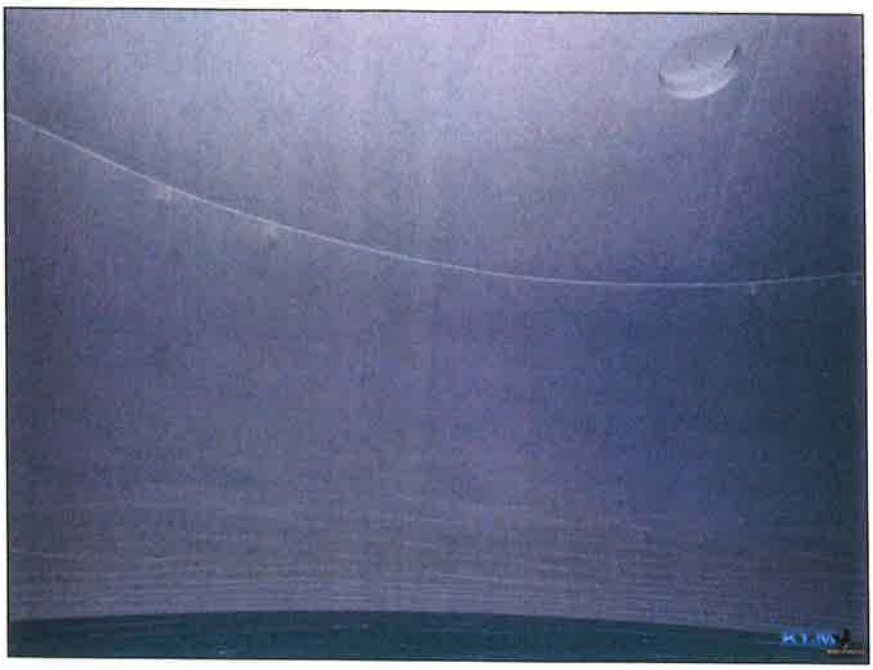


Photo No. 9
Upper torus coating conditions

Photo No. 10
Overflow weir box

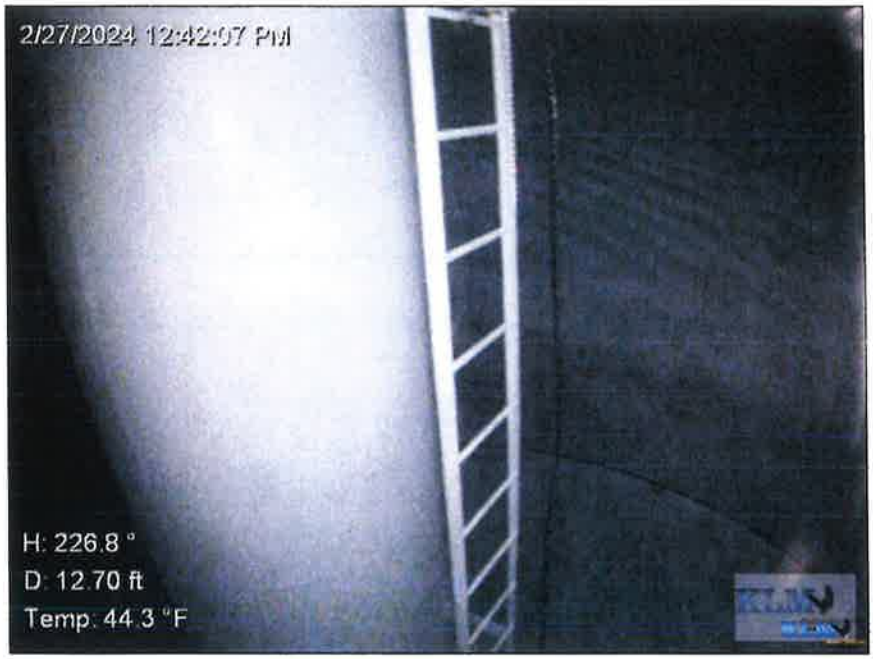


Photo No. 11
Drywell tube and ladder

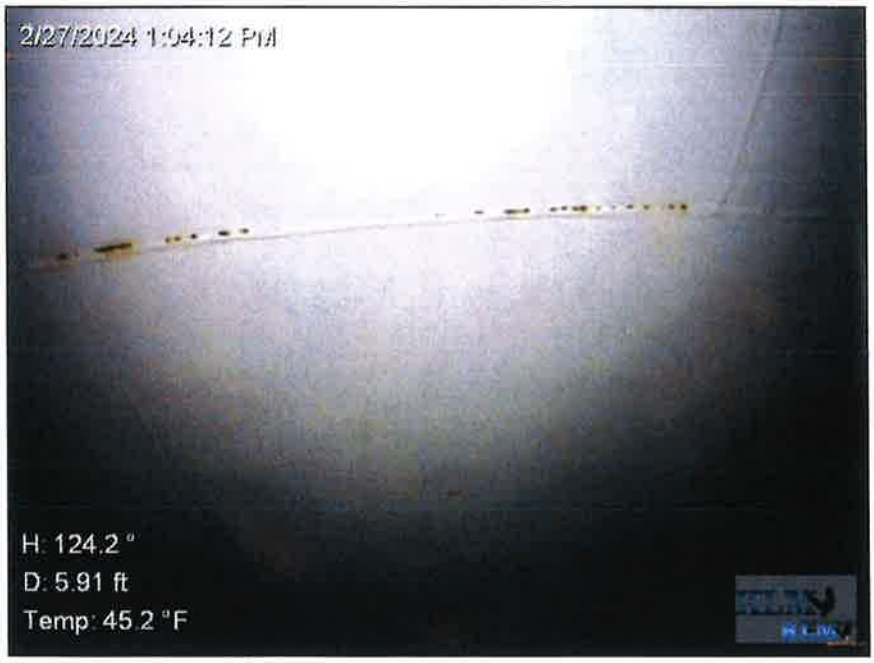


Photo No. 12
Shell coating conditions
Pinhole corrosion visible along weld seam

Photo No. 13
Shell coating conditions
Pinhole corrosion visible

Photo No. 14
Shell coating conditions

Photo No. 15
Shell coating conditions

Photo No. 16
Lower torus coating conditions
Sediment accumulation visible

Photo No. 17
Lower torus coating conditions

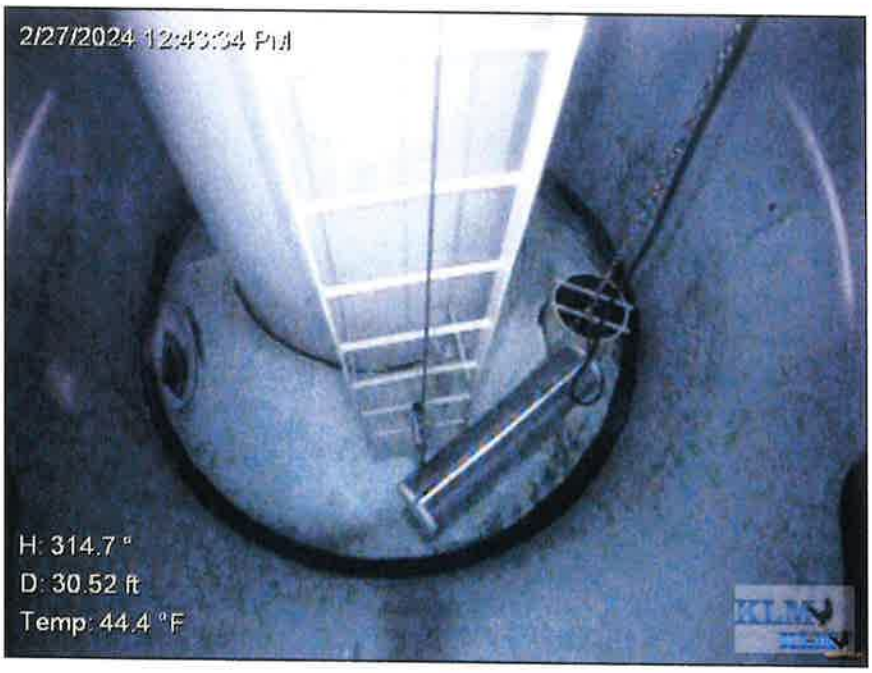


Photo No. 18
Bottom of drywell tube and ladder
Submersible mixer visible

Photo No. 19
Bowl coating conditions
Manway visible

Photo No. 20
Fill pipe

Photo No. 21
Bowl coating conditions

Photo No. 22
Bowl coating conditions
Bowl drain coupling visible

Photo No. 23
Top of drywell tube (looking up)

Photo No. 24
Top of drywell tube (looking down)

Photo No. 25
Bottom of drywell tube (looking up)

Photo No. 26
Bowl coating conditions

Photo No. 27
Bowl drain valve

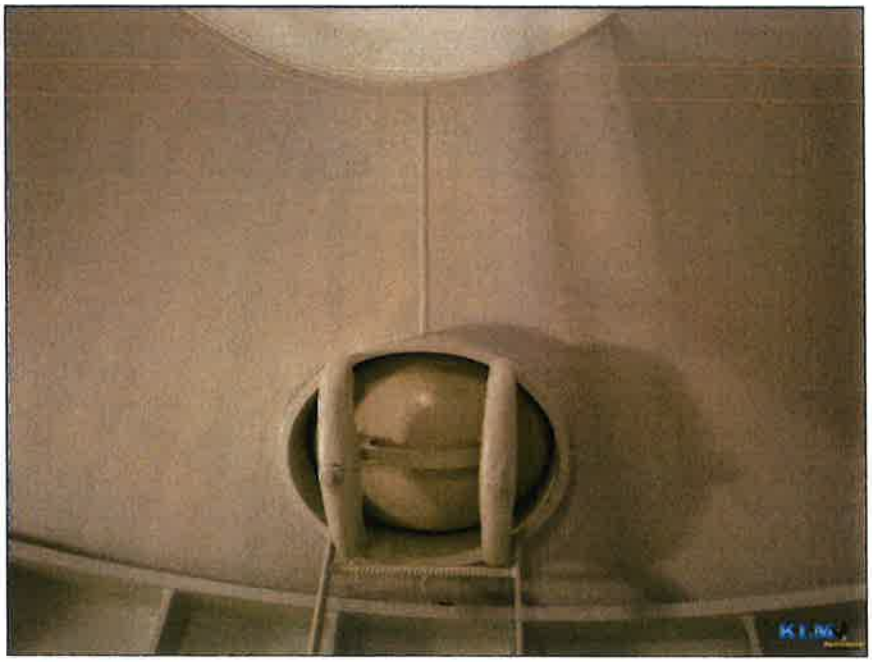


Photo No. 28
Bowl manway

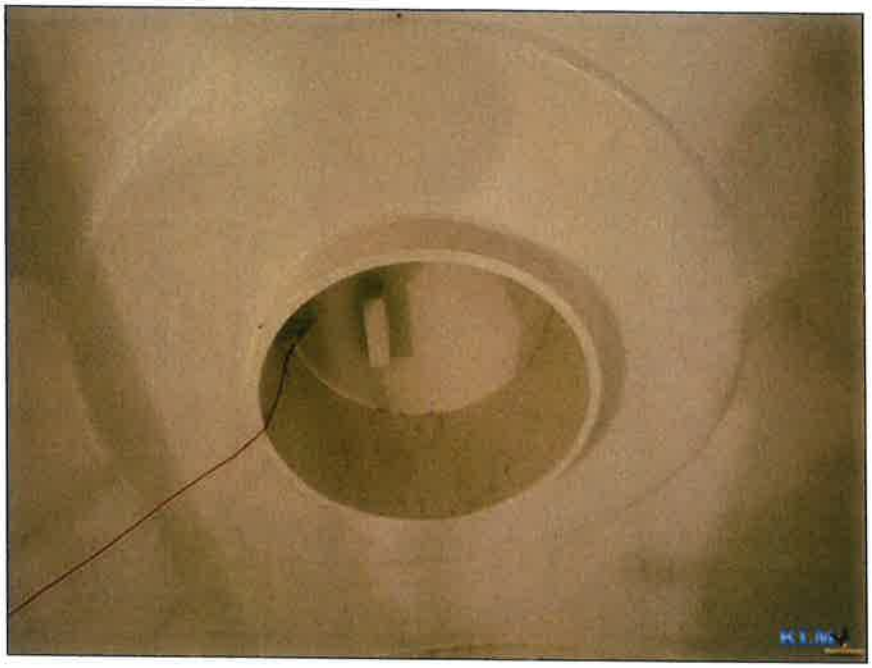


Photo No. 29
Painter's hatch

Photo No. 30
Top landing conditions

Photo No. 31
Top landing conditions

Photo No. 32
Underside of top landing

Photo No. 33
View of bottom landing

Photo No. 34
Base cone conditions

Photo No. 35
Base cone conditions

Photo No. 36
Base cone conditions

Photo No. 37
Drywell tube manway

Photo No. 38
Finial vent

Photo No. 39
Roof conditions
Aviation light visible

Photo No. 40
Roof conditions

Photo No. 41
Handrail coating conditions

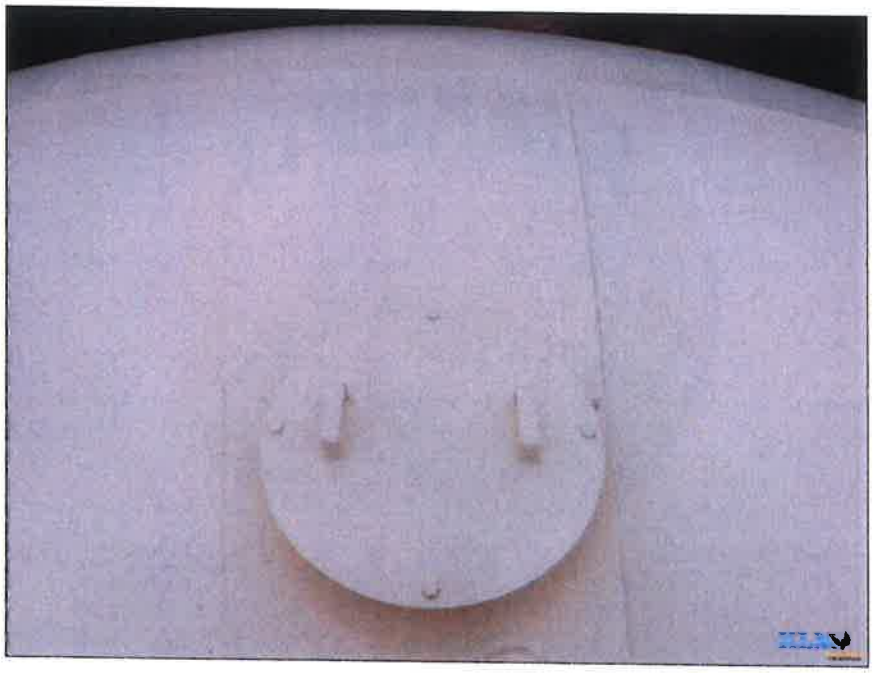


Photo No. 42
Roof plate coating conditions
Ventilation manway visible

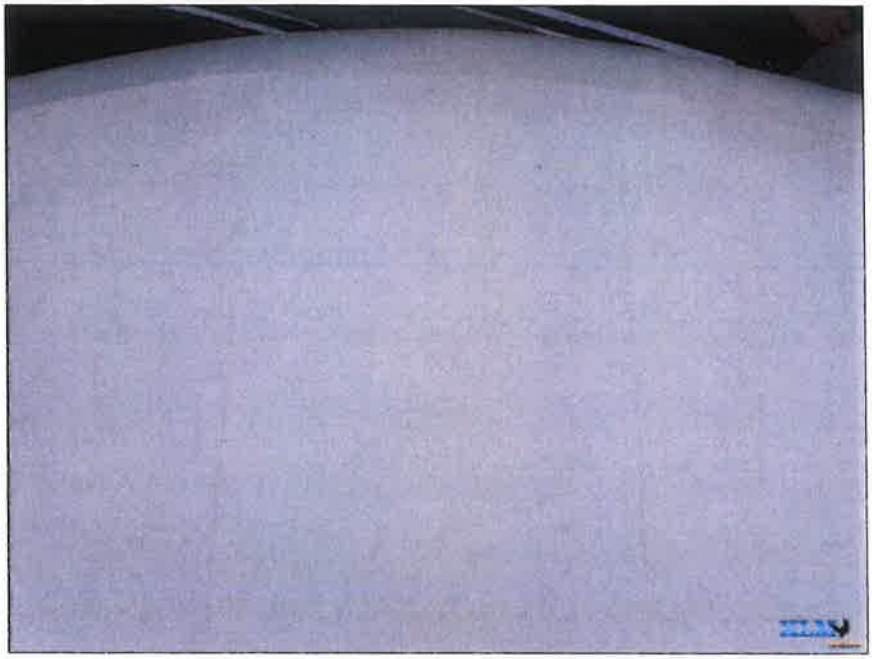


Photo No. 43
Roof plate coating conditions

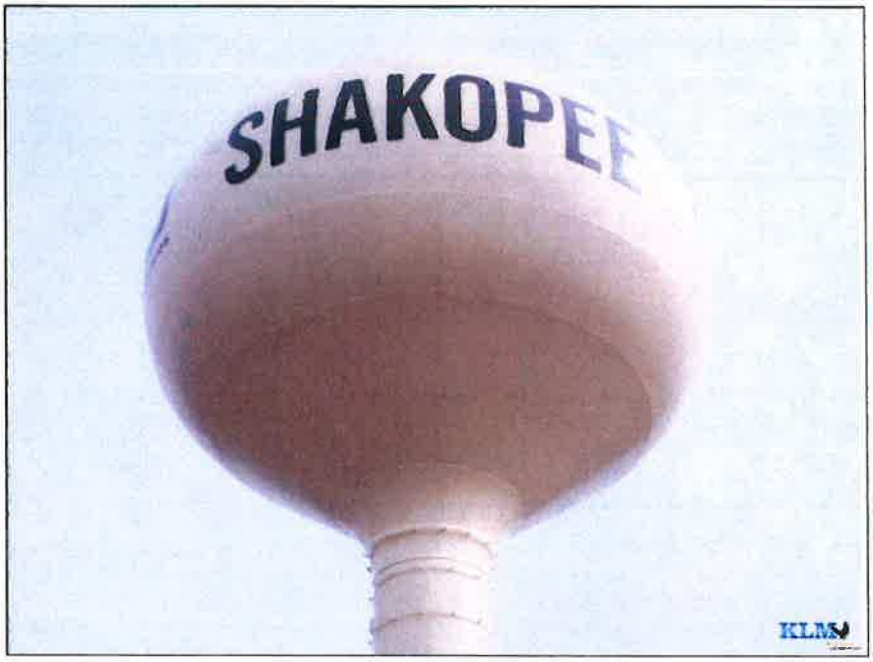


Photo No. 44
View of shell with lettering

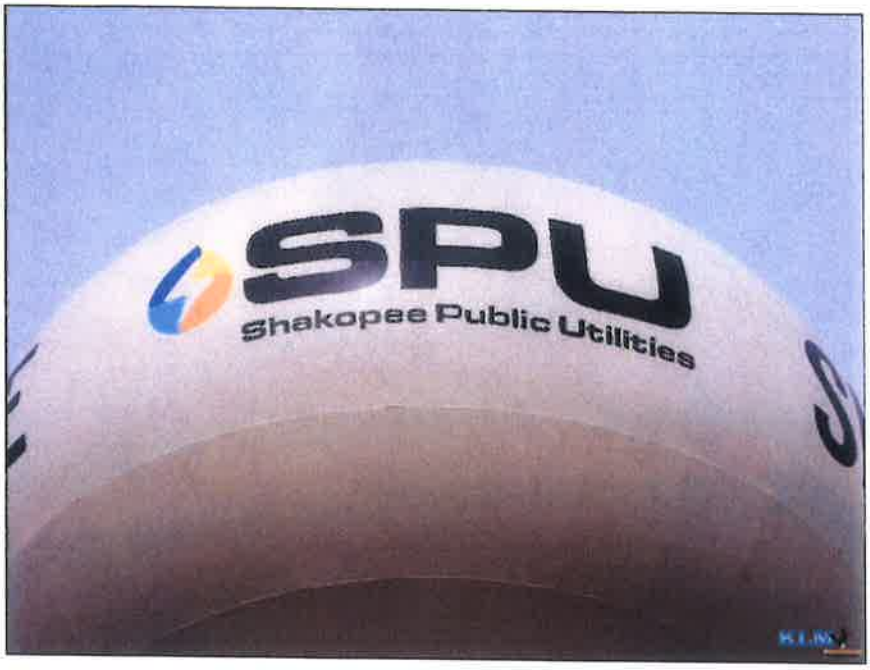


Photo No. 45
View of shell with lettering and logo

Photo No. 46
View of bowl and pedestal

Photo No. 47
Base cone

Photo No. 48
Base cone

Photo No. 49
Overflow pipe outlet and splash pad

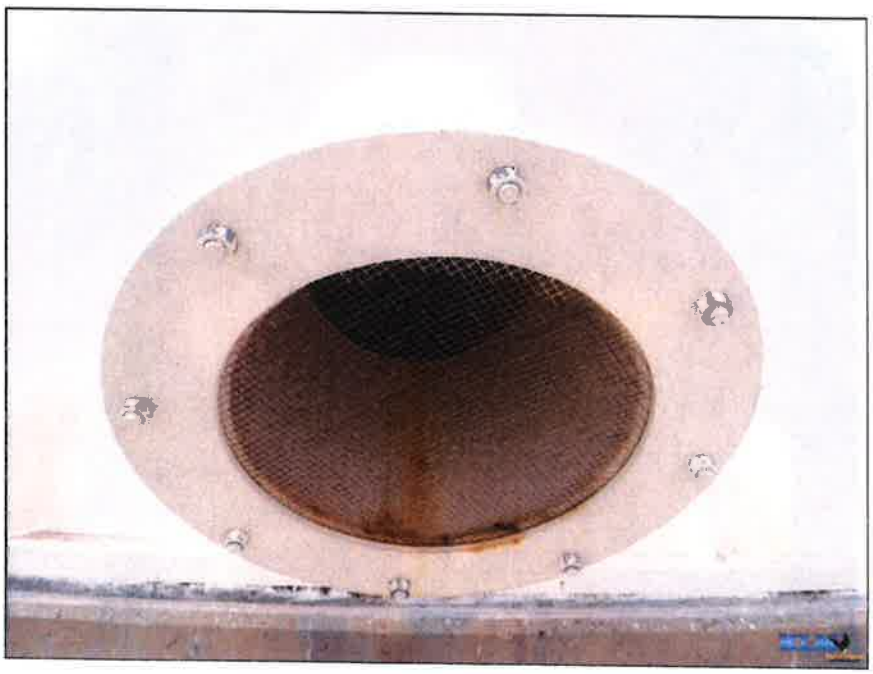


Photo No. 50
Condition of overflow pipe screen

Photo No. 51
Valve pit manway

Photo No. 52
Valve pit conditions

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Savage
Louisville
Prior Lake
Blue Lake
Fisher Lake
Deans Lake
O'Dowd Lake
Lower Prior Lake
Minnesota River
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 20
Well 21
Well 9
Well 11
Well 16
Well 17
Well 15
Well 18
Well 19
Well 22
Well 24
Well 23
Well 13
Well 14
Well 12
101
212
812C
169
41
301B
13

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

0 4,000 8,000 Feet

N

Index Map

169 61 810A 94 694 35W 35E 12 394 Minneapolis St. Paul 952A 52 494 212 Study Area Minnesota River Mississippi River

Distribution System

Aquifer Sustainability
Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 1

Path: X:\PT\SI\SHPUC\177653-env-stdy-regst\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Savage
Louisville
Prior Lake
Shakopee
Minnesota River
Blue Lake
Fisher Lake
Deans Lake
O'Dowd Lake
Lower Prior Lake
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 20
Well 21
Well 9
Well 11
Well 16
Well 17
Well 15
Well 18
Well 19
Well 22
Well 24
Well 23
Well 13
Well 12
Well 14
101
212
812C
41
169
13
301B

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Minnesota Geologic Survey (Plate 4, Scott County)

Quaternary Stratigraphy

- Sand and/or gravel
- Till (Confining Unit)
- Bedrock at Surface

0 4,000 8,000 Feet

N

Index Map

Surficial Geology

Aquifer Sustainability
Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 2

Path: X:\PT\SSH\PUC\177653\3-env-stdy-regs\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Savage
Louisville
Prior Lake
Shakopee
Blue Lake
Fisher Lake
Deans Lake
O'Dowd Lake
Lower Prior Lake
Minnesota River
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 9
Well 15
Well 16
Well 11
Well 17
Well 18
Well 19
Well 22
Well 20
Well 21
Well 24
Well 23
Well 13
Well 14
Well 12
101
212
812C
169
41
801B
13

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surficial Thickness / Depth to Bedrock (MGS, 2008)

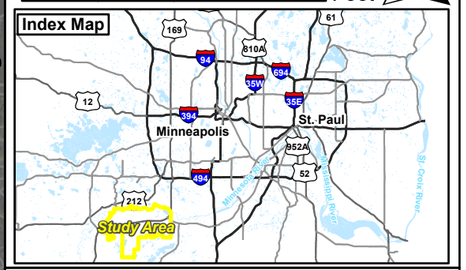
Feet Below Ground Surface

- 392 - 433
- 434 - 485
- 486 - 532
- 533 - 579
- 580 - 633
- 634 - 682
- 683 - 725
- 726 - 774
- 775 - 818
- 819 - 852

0 4,000 8,000 Feet

N

Index Map



Depth to Bedrock

Aquifer Sustainability
Study Update
Shakopee, Minnesota

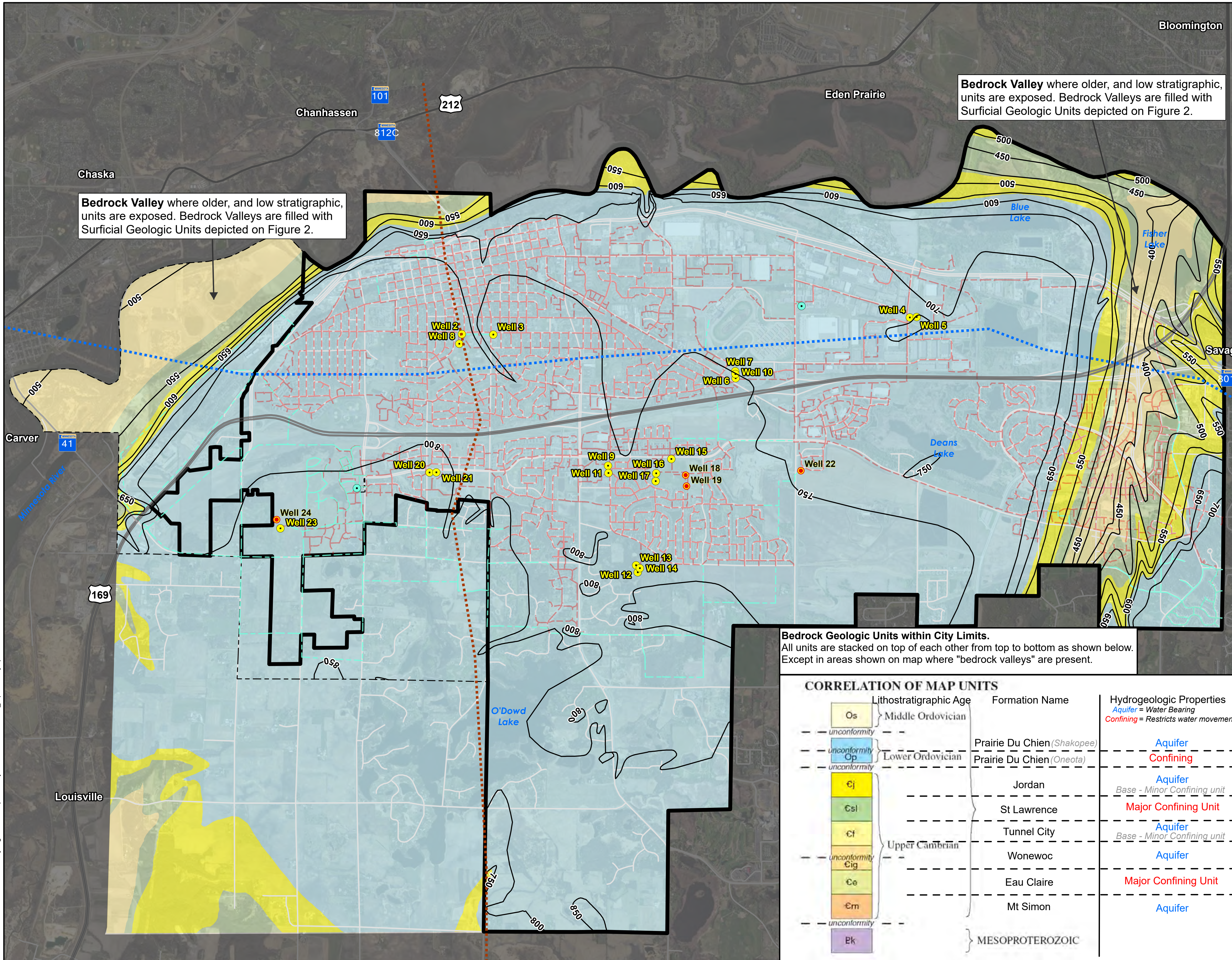
SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 3

Path: X:\PT\S\SHPUC\177653\3-env-stdy-regs\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



CORRELATION OF MAP UNITS

Map Unit	Lithostratigraphic Age	Formation Name	Hydrogeologic Properties (Aquifer = Water Bearing; Confining = Restricts water movement)
Os	Middle Ordovician		
unconformity			
Op	Lower Ordovician	Prairie Du Chien *(Shakopee)*	Aquifer
		Prairie Du Chien *(Oneota)*	Confining
unconformity			
Єj	Upper Cambrian	Jordan	Aquifer; Base - Minor Confining unit
Єsl		St Lawrence	Major Confining Unit
Єf		Tunnel City	Aquifer; Base - Minor Confining unit
unconformity Єig		Wonewoc	Aquifer
Єe		Eau Claire	Major Confining Unit
Єm		Mt Simon	Aquifer
unconformity			
Ƥk	MESOPROTEROZOIC		

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township
- Cross Section A to A' (Figure 5)
- Cross Section B to B' (Figure 6)

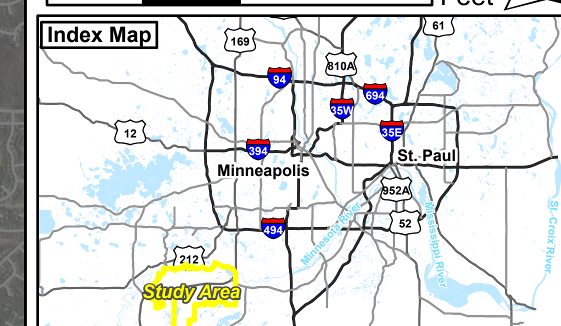
Scott County Minnesota Geologic Survey (Plate 2)

Bedrock Formation Name

- Prairie du Chien Group (Aquifer/confining)
- Jordan Sandstone (Aquifer)
- St Lawrence Formation (Confining Unit)
- Tunnel City Group (Aquifer)

Tunnel City Group was formerly referred to as the Franconia Formation

0 4,000 8,000 Feet



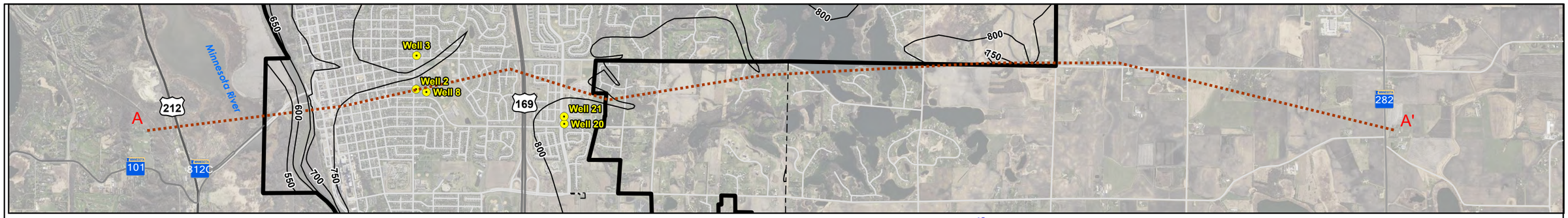
Bedrock Geology

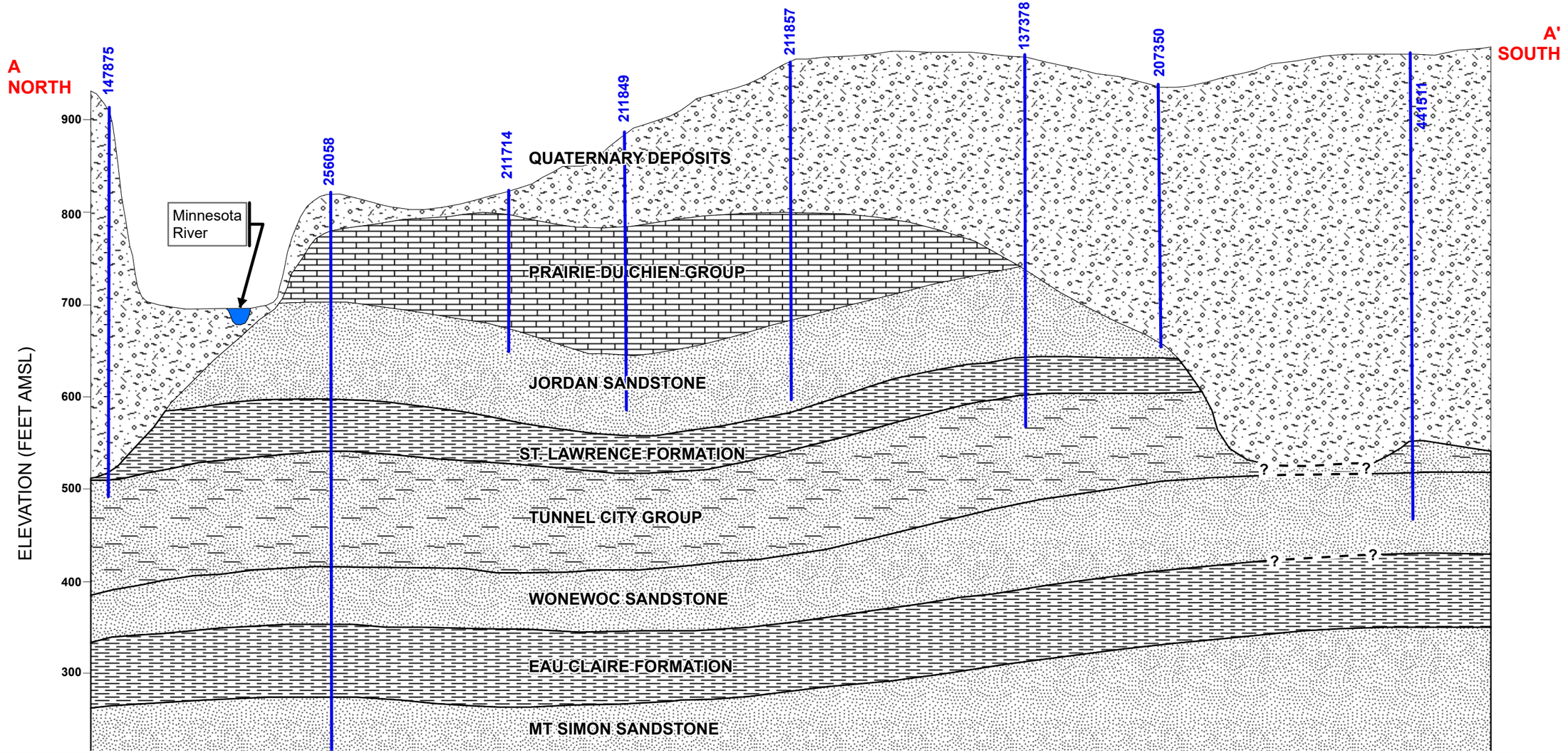
Aquifer Sustainability Study Update
Shakopee, Minnesota

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 4





AQUIFER SUSTAINABILITY STUDY

Aquifer Sustainability Study Update
Shakopee, Minnesota

Typical Geologic Cross-section A - A'

Figure 5

Map Document: (V:\PTshpuc\050100\GIS\FigX3_CrossSection_N_S.mxd)
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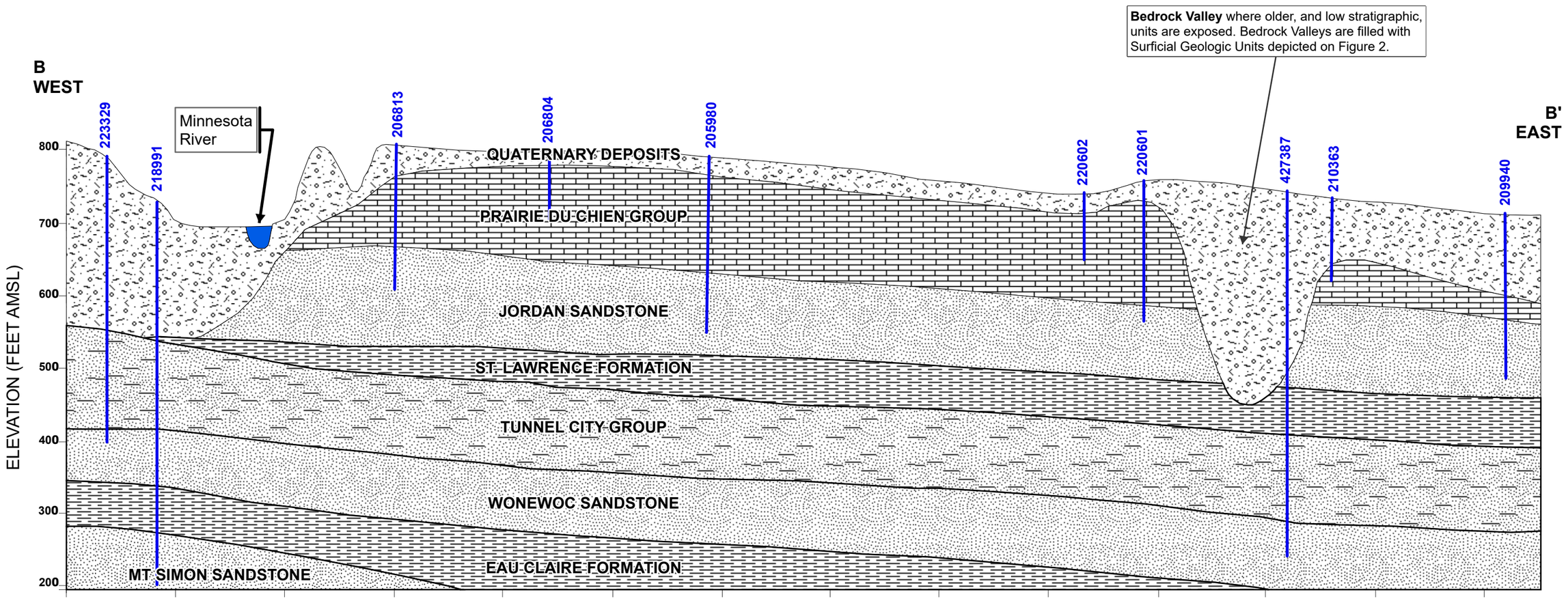

AQUIFER SUSTAINABILITY STUDY

Aquifer Sustainability Study Update
Shakopee, Minnesota

Typical Geologic Cross-section B - B'

Figure 6

Map Document: (V:\PT\shpuc\050100\GIS\Fig05_CrossSection_W_E.mxd)
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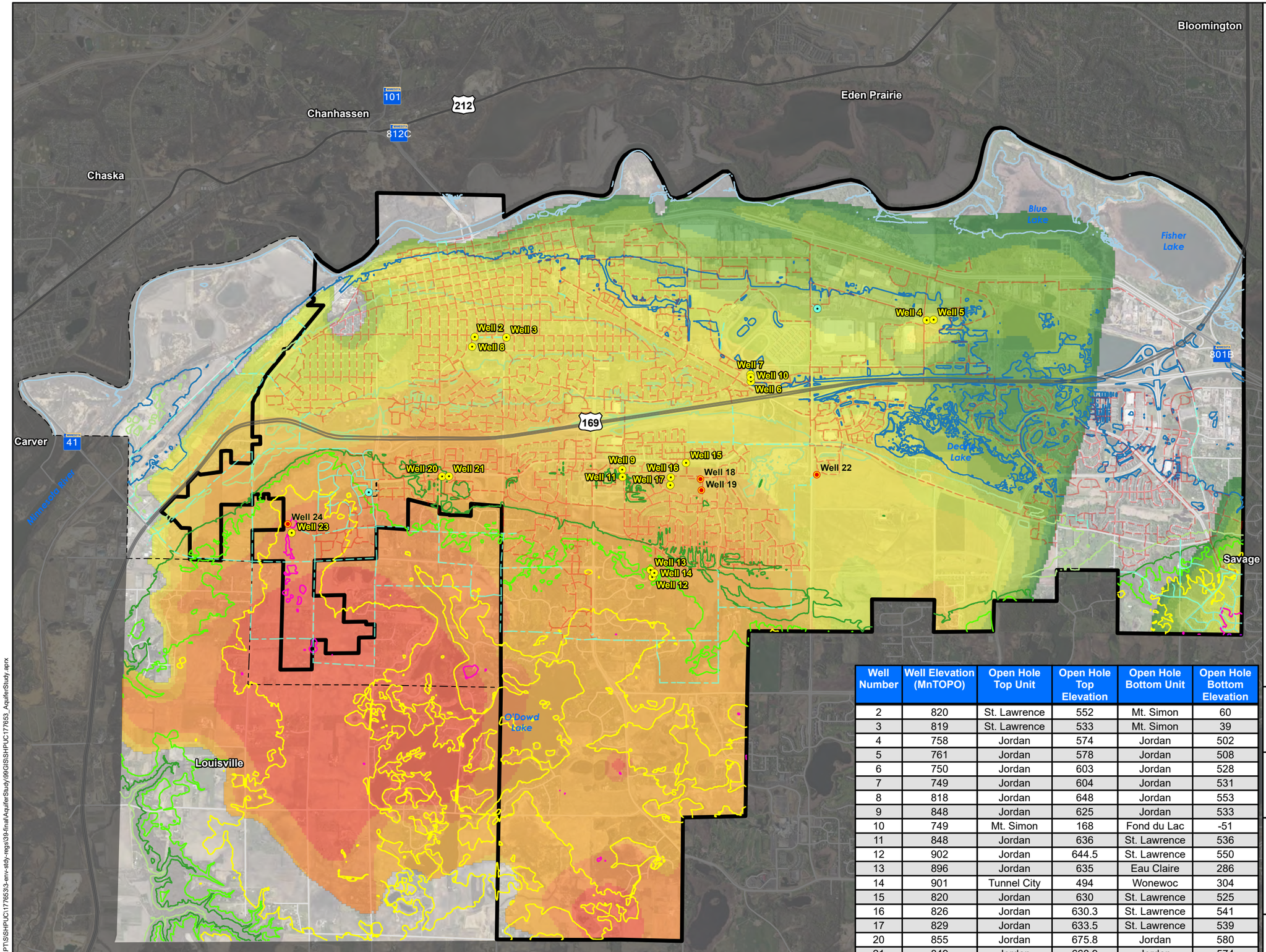


Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

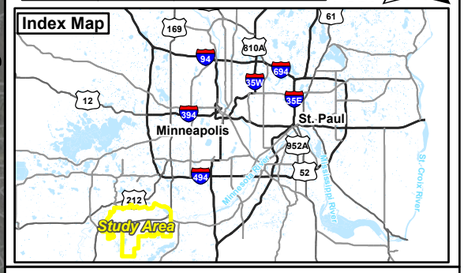
- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Prairie Du Chien (Shakopee) Aquifer top elevation (MnDNR Part B Atlas for Scott County)

Feet Above Mean Sea Level

- 634 - 671
- 672 - 692
- 693 - 709
- 710 - 727
- 728 - 743
- 744 - 762
- 763 - 786
- 787 - 808
- 809 - 828
- 829 - 851

0 4,000 8,000 Feet



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
4	758	Jordan	574	Jordan	502
5	761	Jordan	578	Jordan	508
6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
13	896	Jordan	635	Eau Claire	286
14	901	Tunnel City	494	Wonewoc	304
15	820	Jordan	630	St. Lawrence	525
16	826	Jordan	630.3	St. Lawrence	541
17	829	Jordan	633.5	St. Lawrence	539
20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Prairie Du Chien (Shakopee) Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

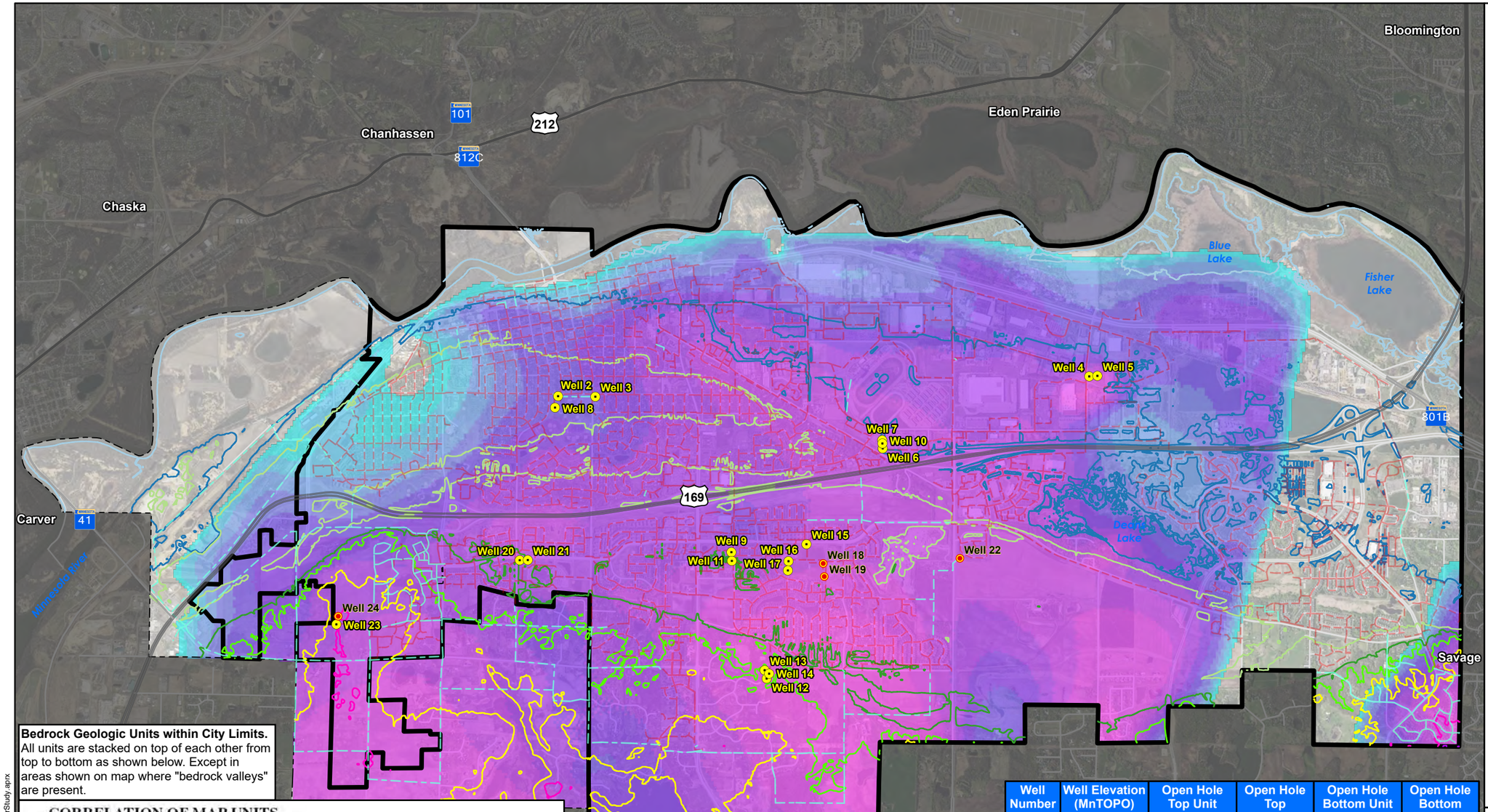
SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 7

Path: X:\PTIS\SHPUC\177653-env-stdy-regl\339-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



Bedrock Geologic Units within City Limits.
All units are stacked on top of each other from top to bottom as shown below. Except in areas shown on map where "bedrock valleys" are present.

CORRELATION OF MAP UNITS

Lithostratigraphic Age		Formation Name	Hydrogeologic Properties (*Aquifer* = Water Bearing; *Confining* = Restricts water movement)
Middle Ordovician	Os		
unconformity			
Lower Ordovician	Op	Prairie Du Chien *(Shakopee)*	Aquifer
		Prairie Du Chien *(Oneota)*	Confining
unconformity			
Upper Cambrian	€j	Jordan	Aquifer *Base - Minor Confining unit*
	€sl	St Lawrence	Major Confining Unit
	€t	Tunnel City	Aquifer *Base - Minor Confining unit*
unconformity		Wonewoc	Aquifer
	€ig		
	€e	Eau Claire	Major Confining Unit
	€rn	Mt Simon	Aquifer
unconformity			
MESOPROTEROZOIC	Pk		

Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
4	758	Jordan	574	Jordan	502
5	761	Jordan	578	Jordan	508
6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
13	896	Jordan	635	Eau Claire	286
14	901	Tunnel City	494	Wonewoc	304
15	820	Jordan	630	St. Lawrence	525
16	826	Jordan	630.3	St. Lawrence	541
17	829	Jordan	633.5	St. Lawrence	539
20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Legend

- Municipal Well
- Planned Future Municipal Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

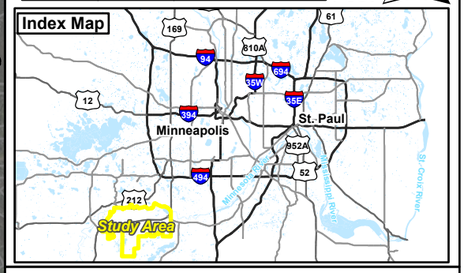
- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Prairie Du Chien (Shakopee) Aquifer Thickness

Aquifer Thickness in Feet

- 1 - 13
- 14 - 25
- 26 - 37
- 38 - 47
- 48 - 57
- 58 - 66
- 67 - 75
- 76 - 84
- 85 - 95
- 96 - 110

0 4,000 8,000 Feet



Prairie Du Chien (Shakopee) Thickness

Aquifer Sustainability Study Update
Shakopee, Minnesota

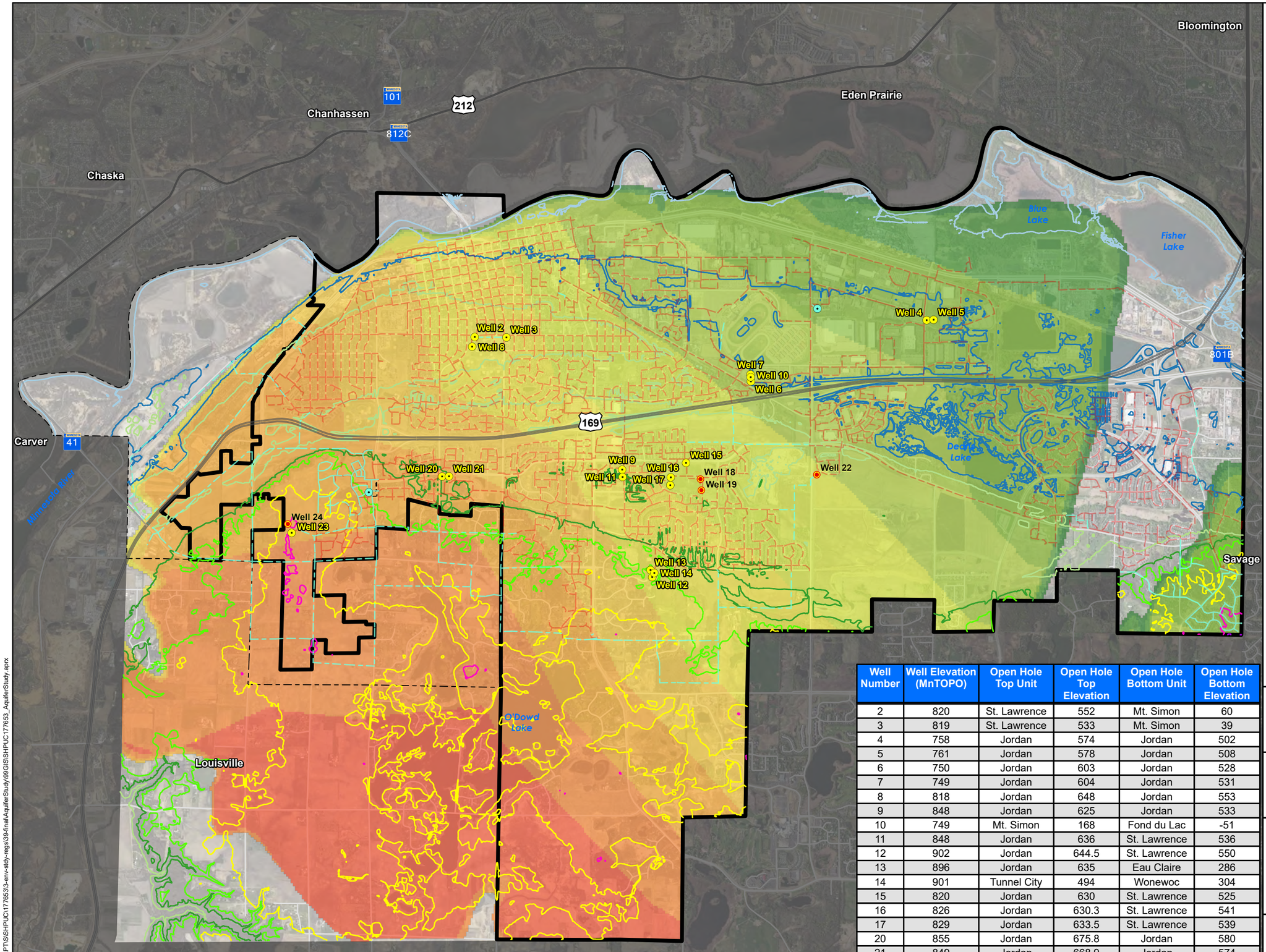
SEH

Print Date: 4/2/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 8

Path: X:\PTIS\SHPUC\177653-env-sty-regis\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
4	758	Jordan	574	Jordan	502
5	761	Jordan	578	Jordan	508
6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
13	896	Jordan	635	Eau Claire	286
14	901	Tunnel City	494	Wonewoc	304
15	820	Jordan	630	St. Lawrence	525
16	826	Jordan	630.3	St. Lawrence	541
17	829	Jordan	633.5	St. Lawrence	539
20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Prairie Du Chien (Oneota) Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 9

Path: X:\PTIS\SHPUC\177653-env-stdy-regnl\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Savage
Louisville
Blue Lake
Fisher Lake
Dean Lake
O'Dowd Lake
Minnesota River
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 20
Well 21
Well 9
Well 11
Well 16
Well 17
Well 15
Well 18
Well 19
Well 22
Well 24
Well 23
Well 13
Well 14
Well 12
101
212
812C
169
41
801B

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Jordan Aquifer top elevation (MnDNR Part B Atlas for Scott County)

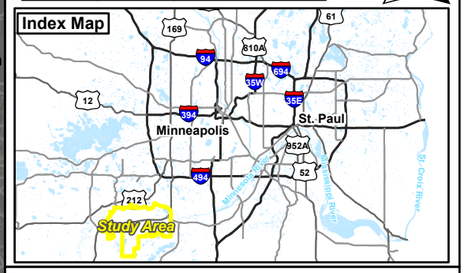
Feet Above Mean Sea Level

- 500 - 539
- 540 - 571
- 572 - 594
- 595 - 610
- 611 - 628
- 629 - 648
- 649 - 668
- 669 - 688
- 689 - 710
- 711 - 744

0 4,000 8,000 Feet

N

Index Map



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
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5	761	Jordan	578	Jordan	508
6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
13	896	Jordan	635	Eau Claire	286
14	901	Tunnel City	494	Wonewoc	304
15	820	Jordan	630	St. Lawrence	525
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17	829	Jordan	633.5	St. Lawrence	539
20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Jordan Aquifer Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

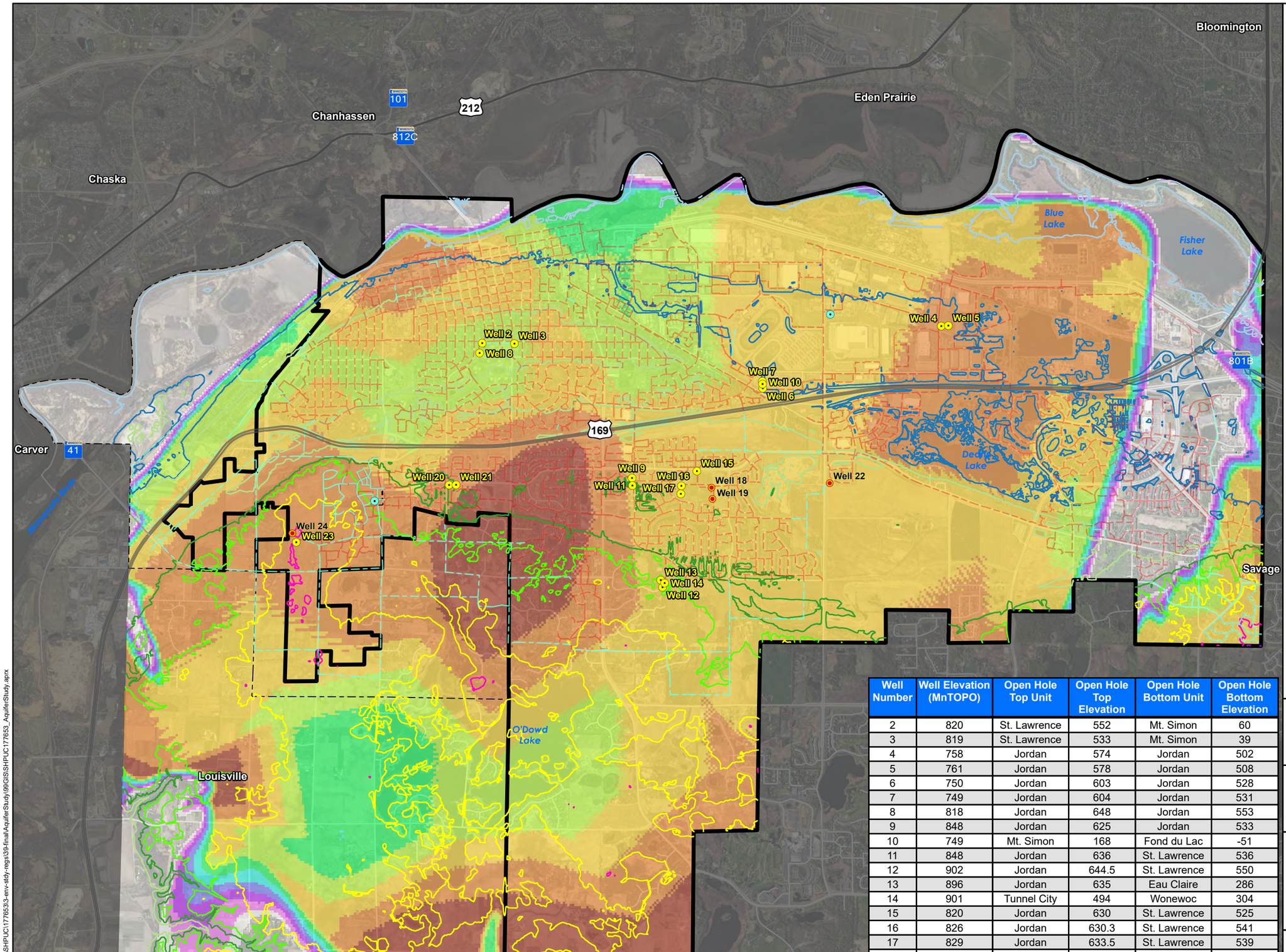
SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 10

Path: X:\PTIS\SHPUC\177653-env-stdy-regsl\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

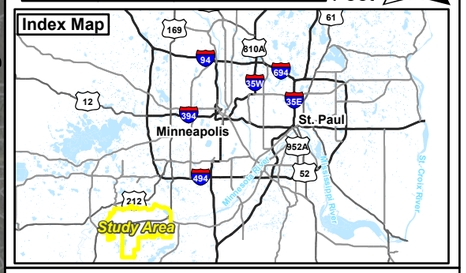
- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Jordan Aquifer Thickness between confining units

Aquifer Thickness in Feet

- 1 - 9
- 10 - 19
- 20 - 30
- 31 - 41
- 42 - 53
- 54 - 63
- 64 - 70
- 71 - 76
- 77 - 83
- 84 - 96

0 4,000 8,000 Feet



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
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9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
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12	902	Jordan	644.5	St. Lawrence	550
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20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Jordan Aquifer Thickness

Aquifer Sustainability Study Update
Shakopee, Minnesota

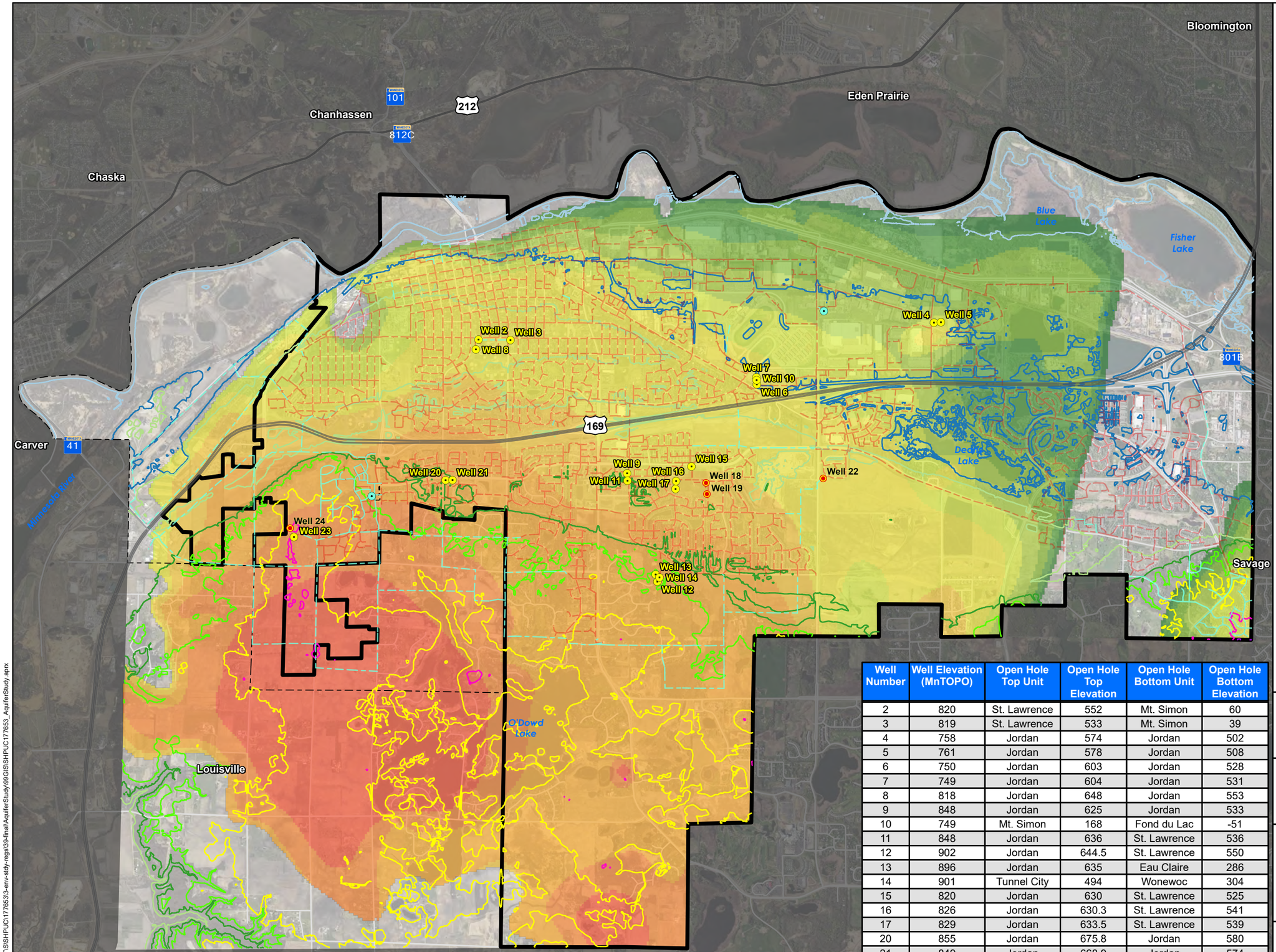
SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 11

Path: X:\PT\SS\HPUC\177653\3-env-stdy-regs\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

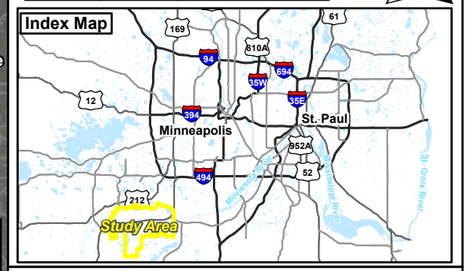
- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Jordan Confining Unit top elevation (MnDNR Part B Atlas for Scott County)

Feet Above Mean Sea Level

- 481 - 510
- 511 - 521
- 522 - 533
- 534 - 548
- 549 - 563
- 564 - 578
- 579 - 595
- 596 - 612
- 613 - 629
- 630 - 655

0 4,000 8,000 Feet



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
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6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
13	896	Jordan	635	Eau Claire	286
14	901	Tunnel City	494	Wonewoc	304
15	820	Jordan	630	St. Lawrence	525
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17	829	Jordan	633.5	St. Lawrence	539
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21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Jordan Confining Unit Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 12

Path: X:\PTIS\SHPUC\177653-env-stdy-regis\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Savage
Louisville
Shakopee
Minnesota River
Blue Lake
Fisher Lake
Dean Lake
O'Dowd Lake
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 9
Well 11
Well 16
Well 17
Well 15
Well 18
Well 19
Well 22
Well 20
Well 21
Well 24
Well 23
Well 13
Well 14
Well 12
101
212
812C
169
41
801B

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

St. Lawrence Congining Unit top elevation (MnDNR Part B Atlas for Scott County)

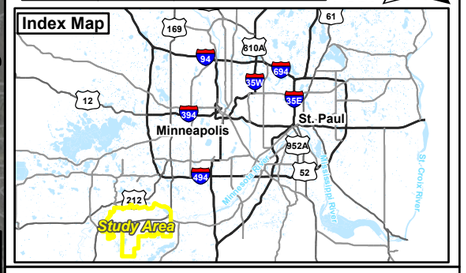
Feet Above Mean Sea Level

- 429 - 466
- 467 - 487
- 488 - 500
- 501 - 514
- 515 - 531
- 532 - 550
- 551 - 569
- 570 - 587
- 588 - 605
- 606 - 635

0 4,000 8,000 Feet

N

Index Map



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
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5	761	Jordan	578	Jordan	508
6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
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20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

St. Lawrence Confining Unit Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 13

Path: X:\PTIS\SHPUC\177653-env-stdy-regl\t39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Savage
Louisville
Blue Lake
Fisher Lake
Dean Lake
O'Dowd Lake
Minnesota River
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 22
Well 9
Well 15
Well 11
Well 16
Well 17
Well 18
Well 19
Well 20
Well 21
Well 24
Well 23
Well 13
Well 14
Well 12
101
212
812C
169
41
801B

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Tunnel City Aquifer top elevation (MnDNR Part B Atlas for Scott County)

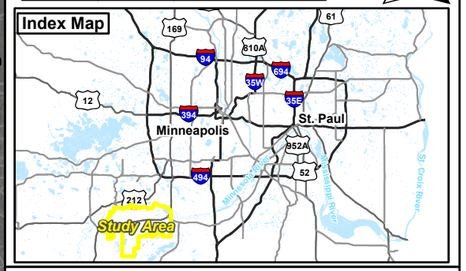
Feet Above Mean Sea Level

- 392 - 419
- 420 - 441
- 442 - 454
- 455 - 468
- 469 - 485
- 486 - 503
- 504 - 519
- 520 - 535
- 536 - 550
- 551 - 577

0 4,000 8,000 Feet

N

Index Map



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
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5	761	Jordan	578	Jordan	508
6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
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20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Tunnel City Aquifer Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 14

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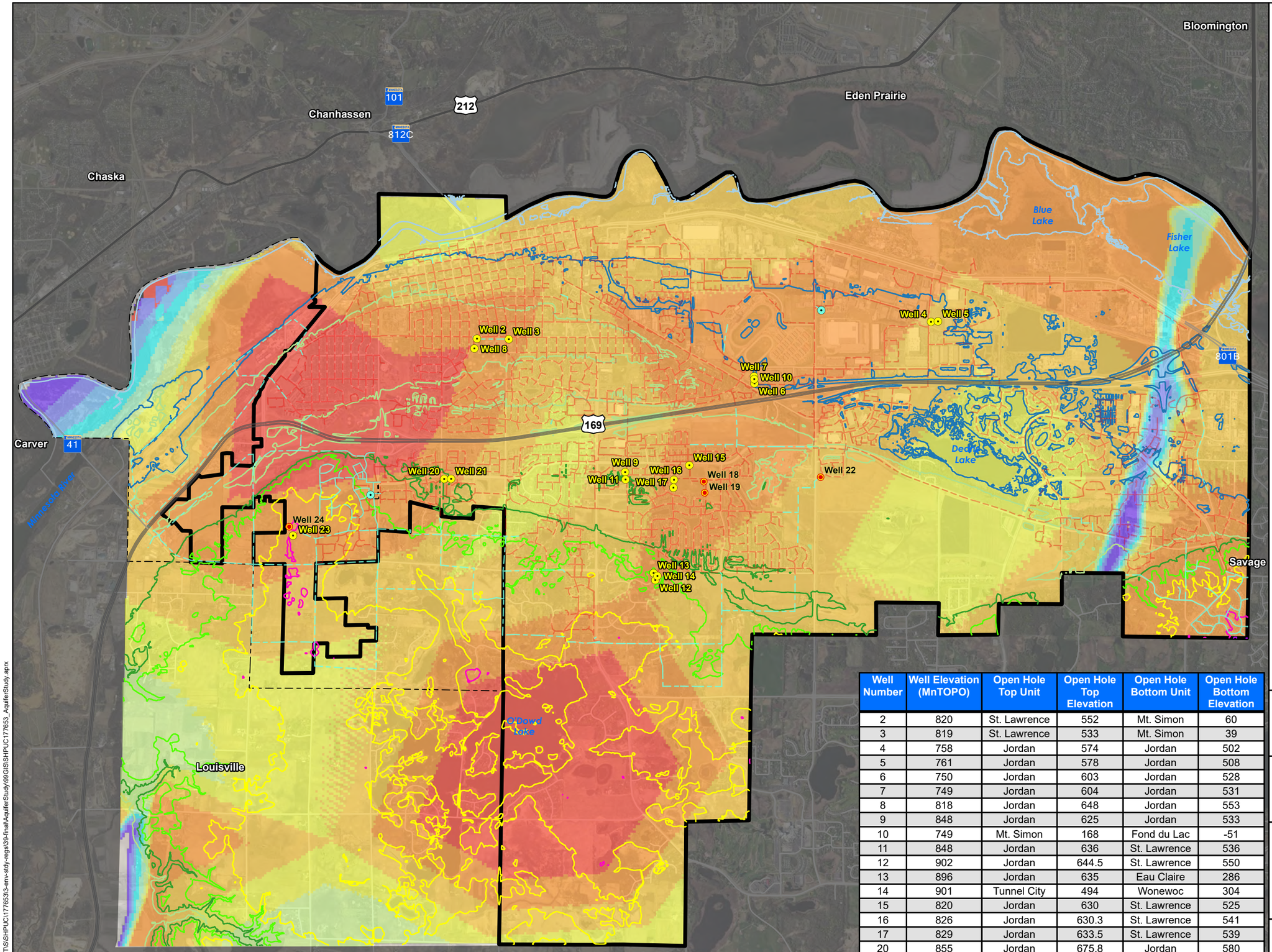


Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

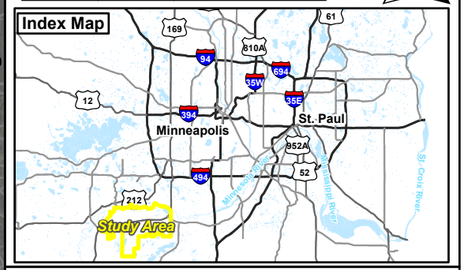
- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Tunnel City Aquifer Thickness between confining layers

Aquifer Thickness in Feet

- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 52
- 53 - 61
- 62 - 66
- 67 - 70
- 71 - 76
- 77 - 92

0 4,000 8,000 Feet



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
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21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Tunnel City Aquifer Thickness

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 15

Path: X:\PTIS\SHPUC\177653-env-stdy-regstr\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Savage
Louisville
Blue Lake
Fisher Lake
Dean Lake
O'Dowd Lake
Minnesota River
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 22
Well 9
Well 11
Well 16
Well 17
Well 15
Well 18
Well 19
Well 20
Well 21
Well 24
Well 23
Well 13
Well 14
Well 12
101
212
812C
169
41
801B

Legend

- Observation Well
- Municipal Well
- Planned Future Municipal Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Tunnel City Confining Unit top elevation (MnDNR Part B Atlas for Scott County)

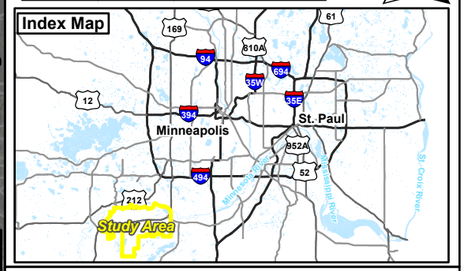
Feet Above Mean Sea Level

- 353 - 371
- 372 - 385
- 386 - 400
- 401 - 416
- 417 - 432
- 433 - 446
- 447 - 459
- 460 - 471
- 472 - 484
- 485 - 506

0 4,000 8,000 Feet

N

Index Map



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
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23	991	Jordan	670	Jordan	588

Tunnel City Confining Unit Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 16

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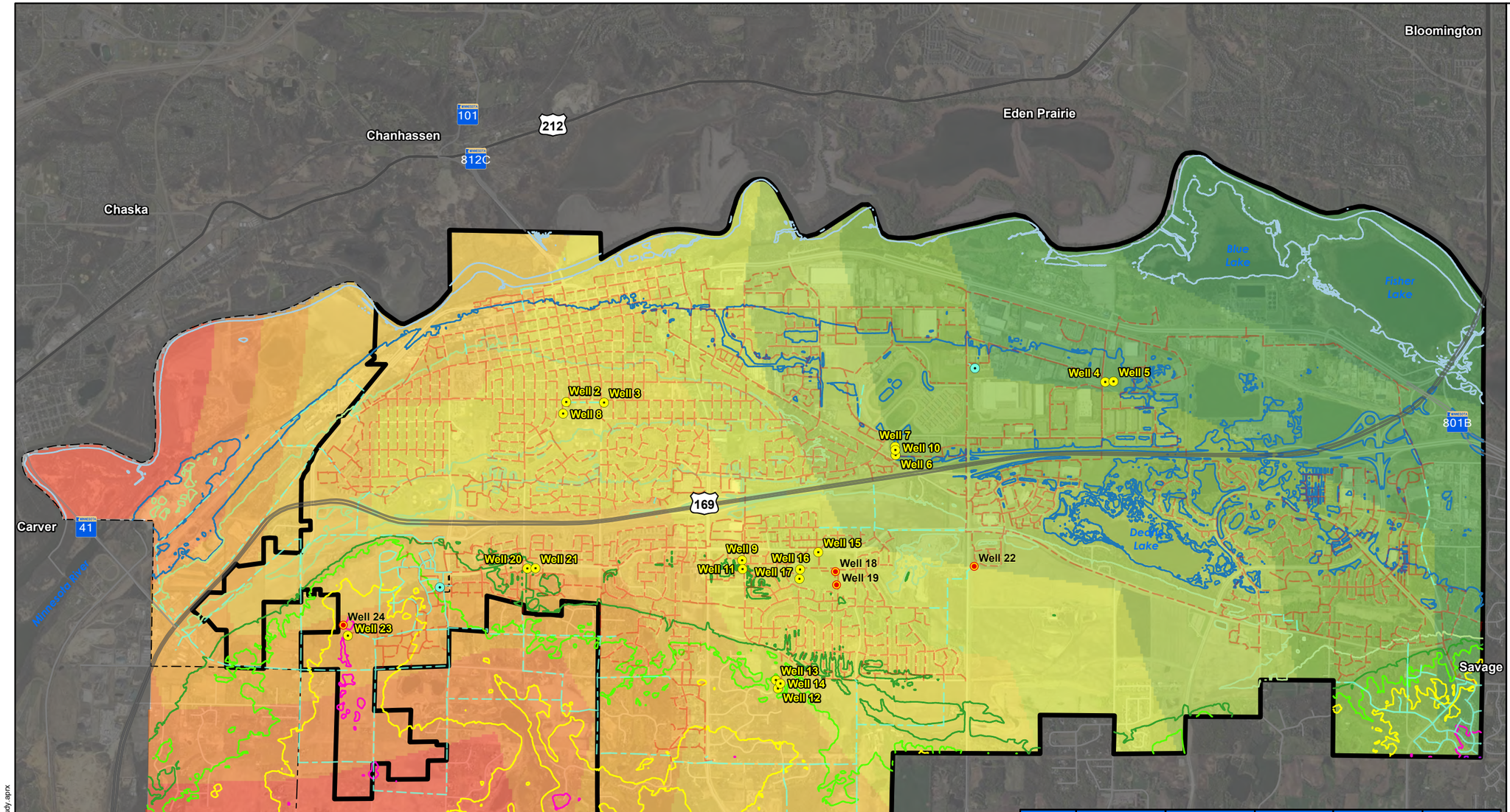


Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

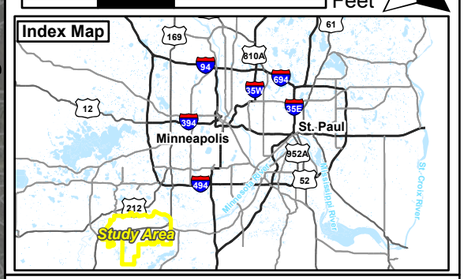
- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Wonewoc Aquifer top elevation (MnDNR Part B Atlas for Scott County)

Feet Above Mean Sea Level

- 278 - 298
- 299 - 314
- 315 - 328
- 329 - 343
- 344 - 358
- 359 - 372
- 373 - 385
- 386 - 402
- 403 - 419
- 420 - 443

0 4,000 8,000 Feet



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
4	758	Jordan	574	Jordan	502
5	761	Jordan	578	Jordan	508
6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
13	896	Jordan	635	Eau Claire	286
14	901	Tunnel City	494	Wonewoc	304
15	820	Jordan	630	St. Lawrence	525
16	826	Jordan	630.3	St. Lawrence	541
17	829	Jordan	633.5	St. Lawrence	539
20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574

Wonewoc Aquifer Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

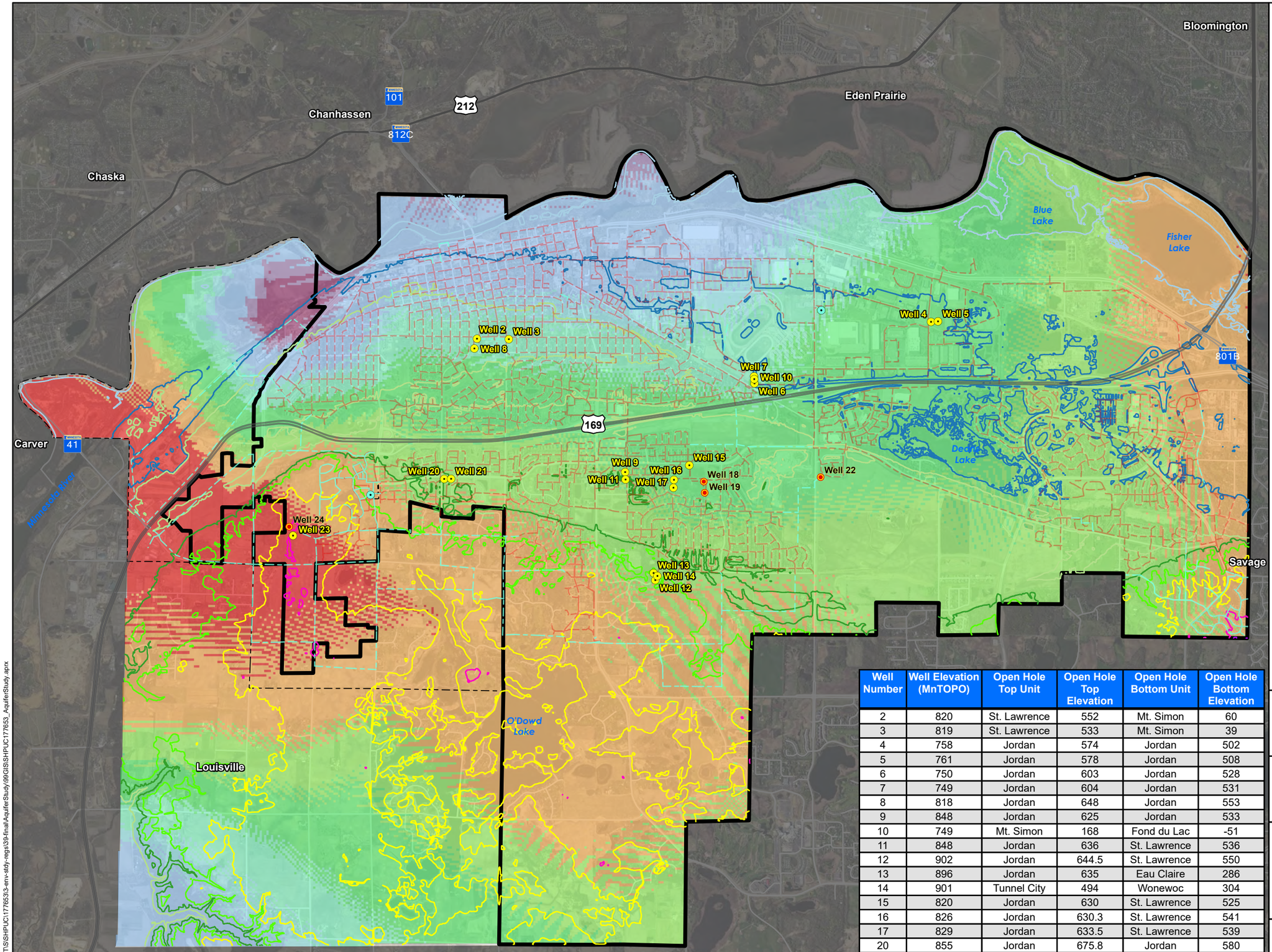
SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 17

Path: X:\PTIS\SHPUC\177653-env-stdy-regsl\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

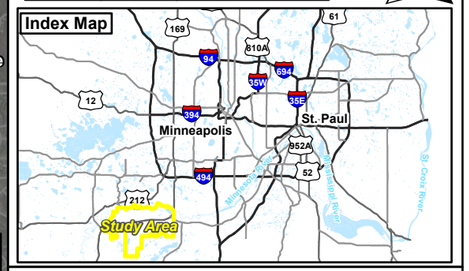
- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Wonewoc Aquifer Thickness between confining layers

Aquifer Thickness in Feet

- 52 - 54
- 55 - 55
- 56 - 57
- 58 - 59
- 60 - 61
- 62 - 63
- 64 - 65
- 66 - 66
- 67 - 68
- 69 - 72

0 4,000 8,000 Feet



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
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5	761	Jordan	578	Jordan	508
6	750	Jordan	603	Jordan	528
7	749	Jordan	604	Jordan	531
8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
13	896	Jordan	635	Eau Claire	286
14	901	Tunnel City	494	Wonewoc	304
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16	826	Jordan	630.3	St. Lawrence	541
17	829	Jordan	633.5	St. Lawrence	539
20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Wonewoc Aquifer Thickness

Aquifer Sustainability Study Update
Shakopee, Minnesota

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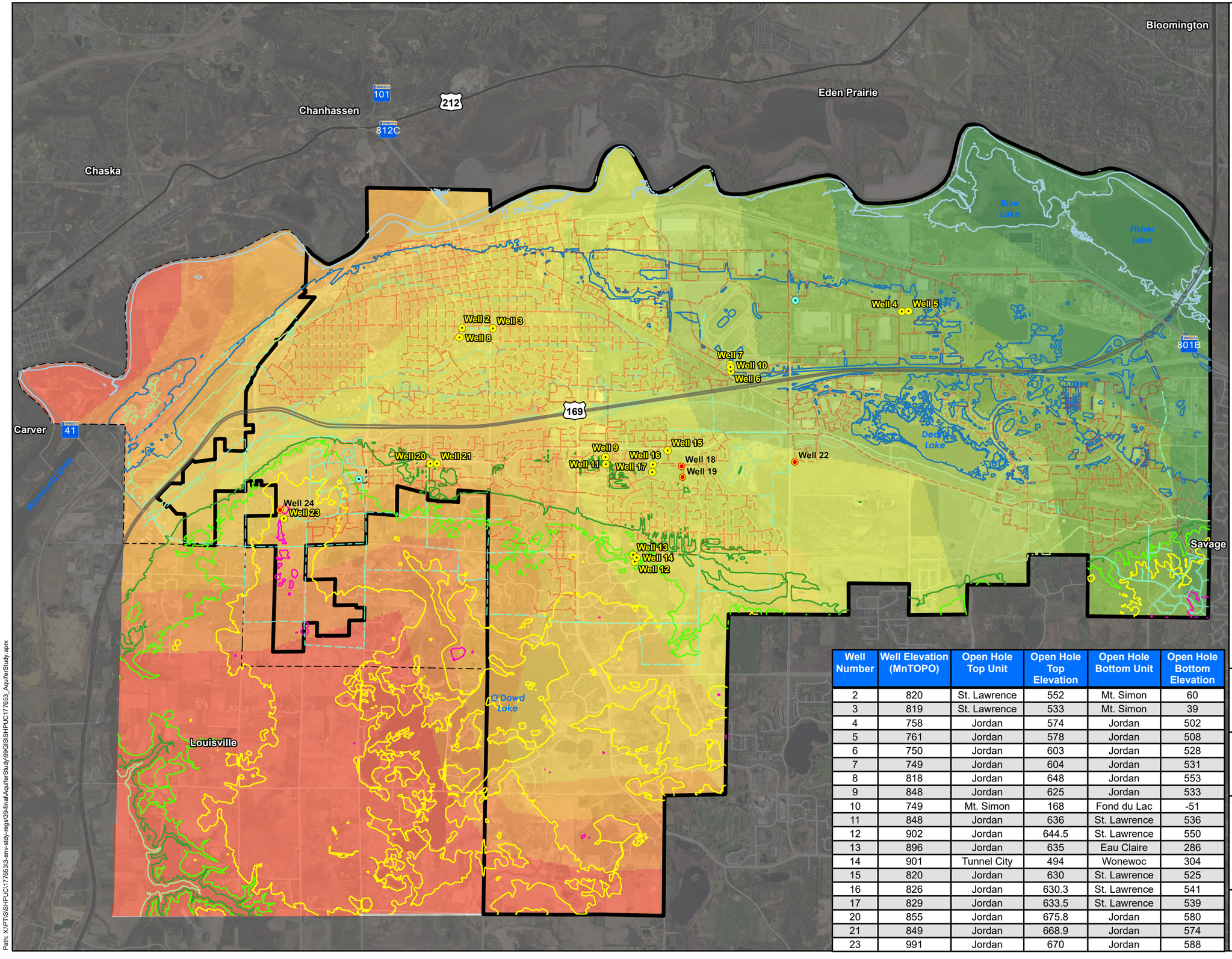
Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 18

Path: X:\PTIS\SHPUC\177653-env-stdy-regl\939-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

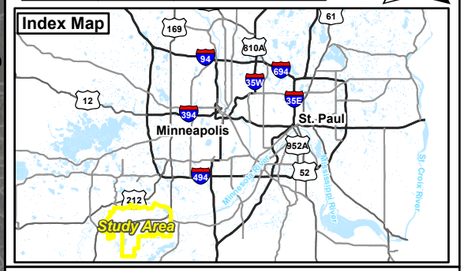
- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

Eau Claire confining unit top elevation (MnDNR Part B Atlas for Scott County)

Feet Above Mean Sea Level

- 212 - 232
- 233 - 249
- 250 - 263
- 264 - 278
- 279 - 295
- 296 - 310
- 311 - 323
- 324 - 337
- 338 - 354
- 355 - 380

0 4,000 8,000 Feet



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
3	819	St. Lawrence	533	Mt. Simon	39
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8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
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11	848	Jordan	636	St. Lawrence	536
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20	855	Jordan	675.8	Jordan	580
21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Eau Claire Confining Unit Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

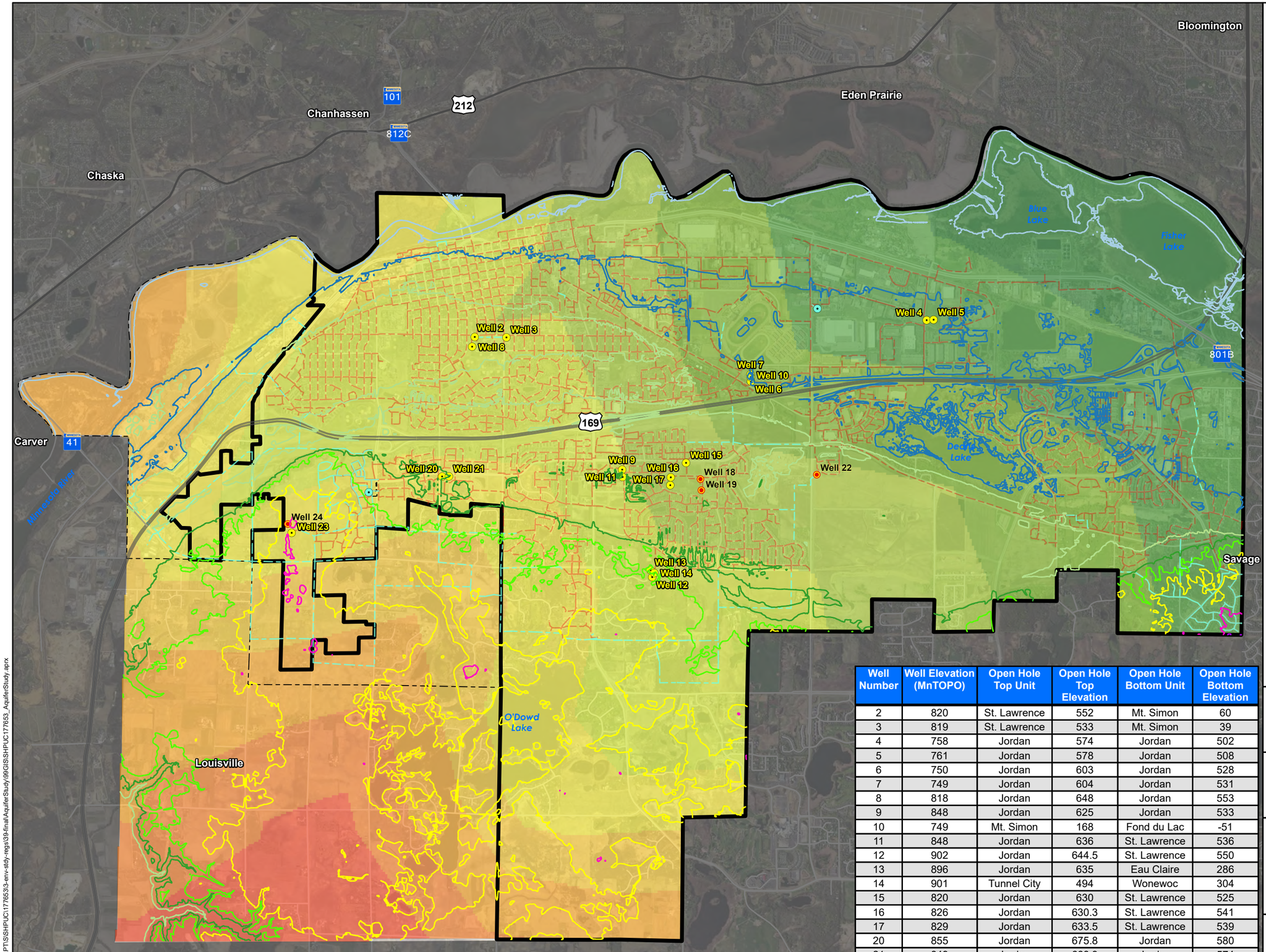
SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 19

Path: X:\PTIS\SHPUC\177653-env-stdy-regl\939-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Surface Elevation (MnTOPO)

Feet Above Mean Sea Level

- 700
- 750
- 800
- 850
- 900
- 950
- 1000
- 1030

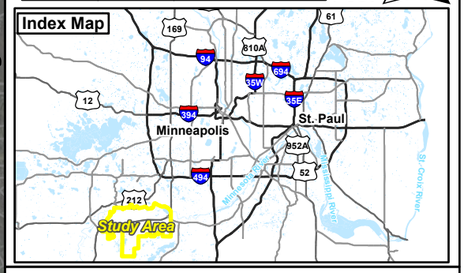
Mt Simon Aquifer top elevation (MnDNR Part B Atlas for Scott County)

Feet Above Mean Sea Level

- 134 - 159
- 160 - 181
- 182 - 201
- 202 - 224
- 225 - 243
- 244 - 261
- 262 - 280
- 281 - 302
- 303 - 327
- 328 - 364

0 4,000 8,000 Feet

N



Well Number	Well Elevation (MnTOPO)	Open Hole Top Unit	Open Hole Top Elevation	Open Hole Bottom Unit	Open Hole Bottom Elevation
2	820	St. Lawrence	552	Mt. Simon	60
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8	818	Jordan	648	Jordan	553
9	848	Jordan	625	Jordan	533
10	749	Mt. Simon	168	Fond du Lac	-51
11	848	Jordan	636	St. Lawrence	536
12	902	Jordan	644.5	St. Lawrence	550
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21	849	Jordan	668.9	Jordan	574
23	991	Jordan	670	Jordan	588

Mt. Simon Aquifer Top Elevation

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/13/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 20

Path: X:\PTIS\SHPUC\177653-env-stdy-regnl\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Chanhassen
Eden Prairie
Chaska
Carver
Louisville
Prior Lake
Minnesota River
Blue Lake
Fisher Lake
Deans Lake
O'Dowd Lake
Lower Prior Lake
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 20
Well 21
Well 9
Well 15
Well 16
Well 11
Well 17
Well 18
Well 19
Well 22
Well 24
Well 23
Well 13
Well 14
Well 12
101
212
312C
41
169
301B
13

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Minnesota Department of Natural Resources Appropriation Permit for Larger Scale Water Use

Appropriation Resource Category

- Groundwater User
- Surface Water User

Minnesota Well Index (MDH)

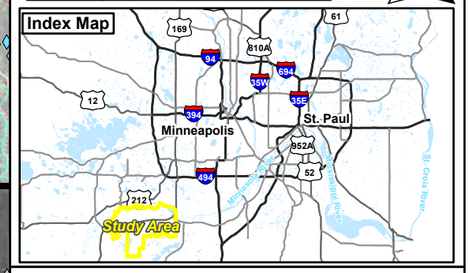
Well Location and Listed Aquifer

- Surficial Aquifer
- Prairie Du Chien Group
- Jordan Aquifer
- Tunnel City Aquifer
- Mt Simon Aquifer
- Multi-Bedrock Aquifer Wells

0 4,000 8,000 Feet

N

Index Map



Other Water Users

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

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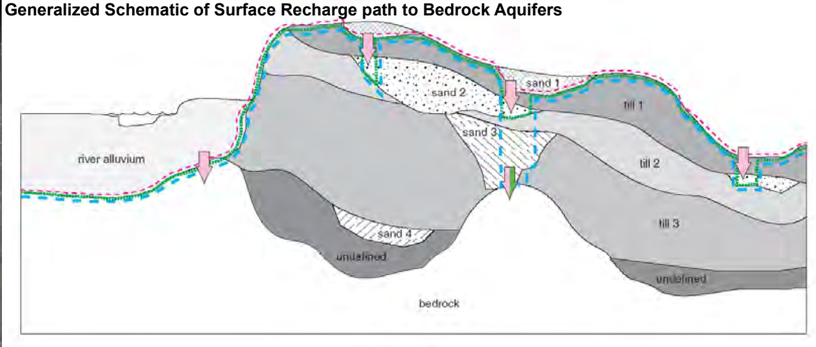
Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 21

Path: X:\PTIS\SHPUC\177653-env-stdy-regst\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Savage
Louisville
Blue Lake
Fisher Lake
Deans Lake
O'Dowd Lake
Minnesota River
101
212
812C
41
169
801B
Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 20
Well 21
Well 9
Well 11
Well 16
Well 17
Well 15
Well 18
Well 19
Well 22
Well 24
Well 23
Well 13
Well 14
Well 12

Generalized Schematic of Surface Recharge path to Bedrock Aquifers



Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Pollution Sensitivity (Plate 6, Scott County Geologic Atlas)

Speed of Surface Recahrge to Bedrock Aquifer

- Very Fast (Hours to Months)
- Fast (Weeks to Years)
- Moderate (Years to Decardes)
- Slow (Decades to a Century or more)
- Very Slow (Century or more)

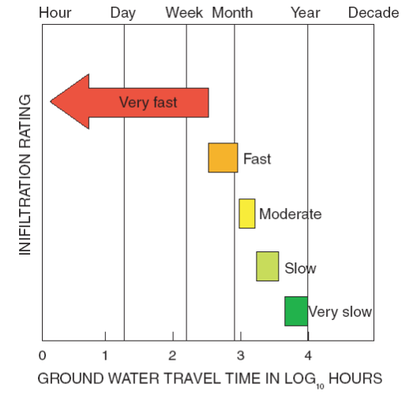


Figure 8. Infiltration ratings as defined by vertical travel time. Ratings are calculated from minimum estimated transmission rates for soil hydrologic groups (Natural Resources Conservation Service, 2006b) applied over a distance of 10 feet (3 meters).

Pollution Sensitivity

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/13/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 22

Path: X:\PT\SS\HPUC\177653\3-env-sty-regs\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Flying Cloud Sanitary Landfill
Known Groundwater Plume
Contaminants include PFAS, 1,4-Dioxane, metals, and chlorinated solvents

Pollution Controls Inc.
Superfund Site
Contaminants include PFAS, chlorinated solvents, metals

Louisville Landfill
Known Groundwater Plume
Contaminants include PFAS, 1,4-Dioxane, and Vinyl Chloride

Bloomington
Eden Prairie
Chanhassen
Chaska
Carver
Louisville
Savage
Prior Lake
Blue Lake
Fisher Lake
Deans Lake
O'Dowd Lake
Lower Prior Lake
Minnesota River

Well 2
Well 3
Well 8
Well 4
Well 5
Well 7
Well 10
Well 6
Well 20
Well 21
Well 9
Well 16
Well 15
Well 11
Well 17
Well 18
Well 19
Well 22
Well 24
Well 23
Well 13
Well 14
Well 12

Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township

Minnesota Groundwater Contamination Atlas

- Known Groundwater Plume
- Well with HBG Exceedance

Minnesota Pollution Control Agency's What's In My Neighborhood

Desktop Level Review of Contamination Risk to Bedrock Aquifers

- Potential High Risk Ranking
- Potential Medium Risk Ranking
- Potential Low Risk Ranking

Minnesota Departmetn of Agriculture Known Contamination Sites

- Contigency/Investigation Area
- Spill/Incident Location

0 4,000 8,000 Feet

Index Map

Study Area

Potential Contamination Sources

Aquifer Sustainability Study Update
Shakopee, Minnesota

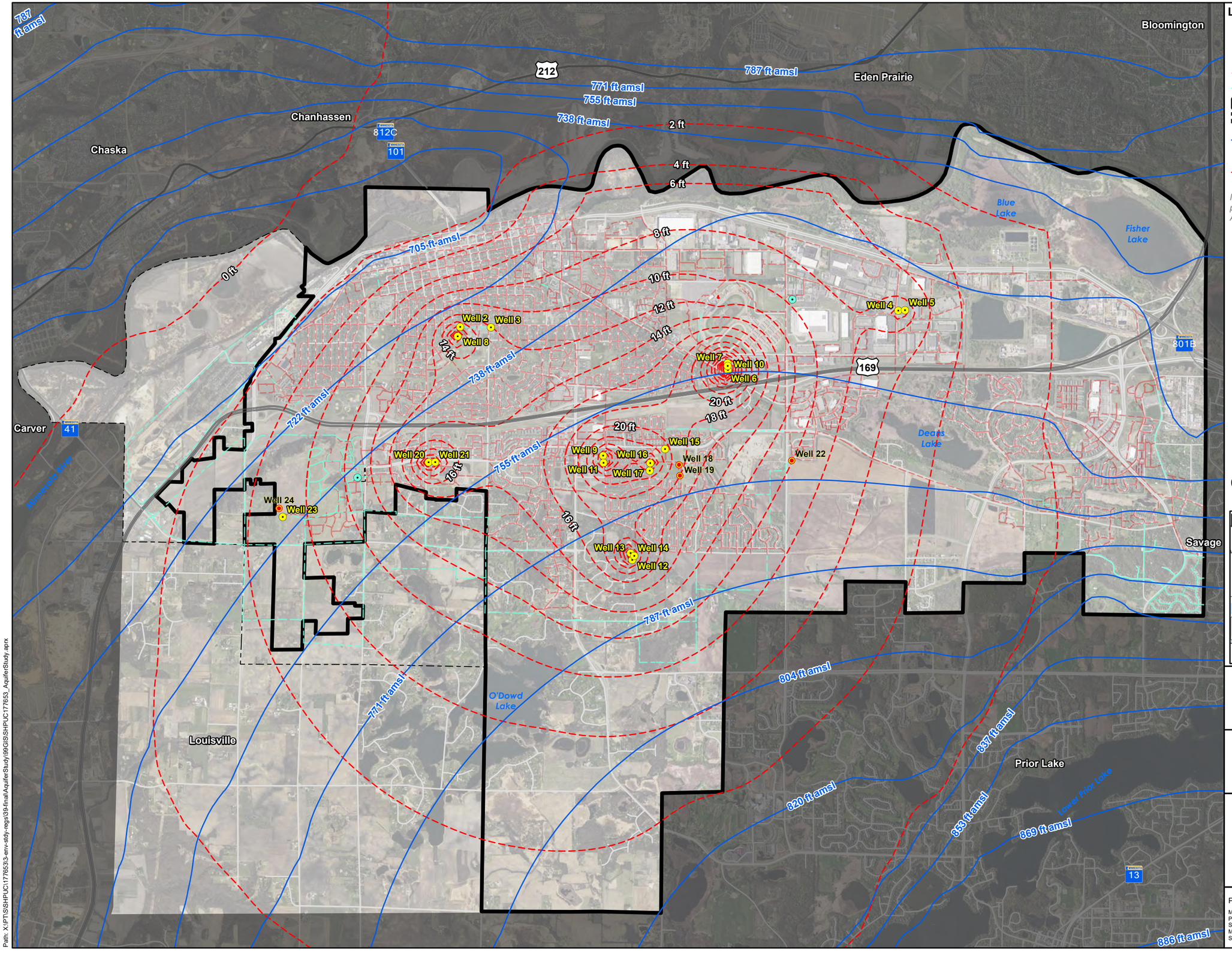
SEH

Print Date: 6/13/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 23

Path: X:\PT\SI\SHPUC\177653-env-stdy-regst\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

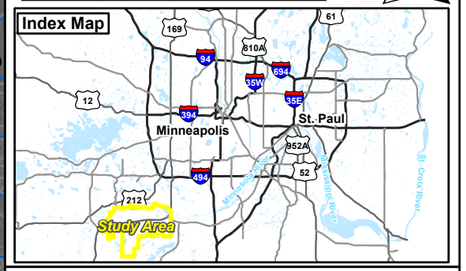


Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township
- Modeled Steady State Jordan Aquifer Water Level with no City Wells Pumping
- Feet of Modeled Drawdown from average day demand in 2023 for a 3 day stress period with all wells pumping.

Note: Within the model well pumping for each well was set as a percentage of total yearly use of the well over the 3 day stress test. All City wells were set as active during this model test period

0 4,000 8,000 Feet



Modeled 2023 Drawdown within Jordan Aquifer

Aquifer Sustainability Study Update
Shakopee, Minnesota

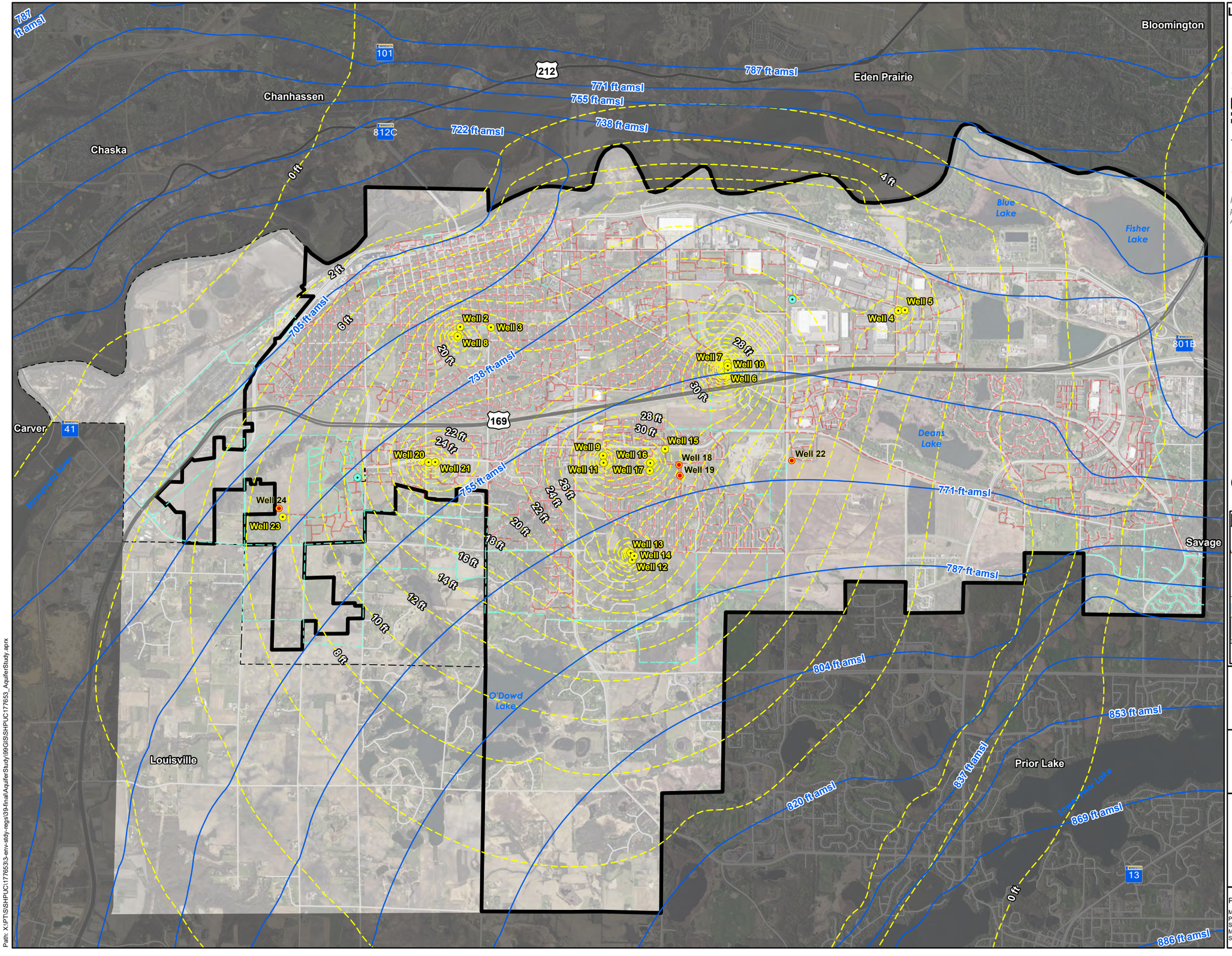
SEH

Print Date: 6/13/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 24

Path: X:\PT\SI\SHPUC\177653-env-stdy-regsl\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

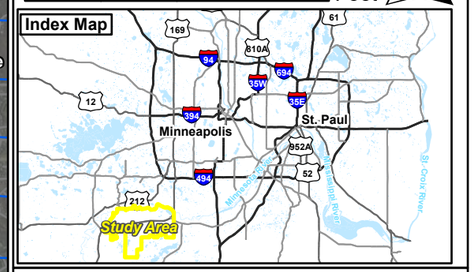


Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township
- Modeled Steady State Jordan Aquifer Water Level with no City Wells Pumping
- Feet of Modeled Drawdown from 2040 projected demand for a 3 day stress test period with only existing wells pumped.

Note: Within the model well pumping for each well was set as a percentage of total yearly use of the well over the 3 day stress test. All City wells were set as active during this model test period

0 4,000 8,000 Feet



Modeled 2040 Drawdown within Jordan Aquifer for Existing Wells

Aquifer Sustainability Study Update
Shakopee, Minnesota

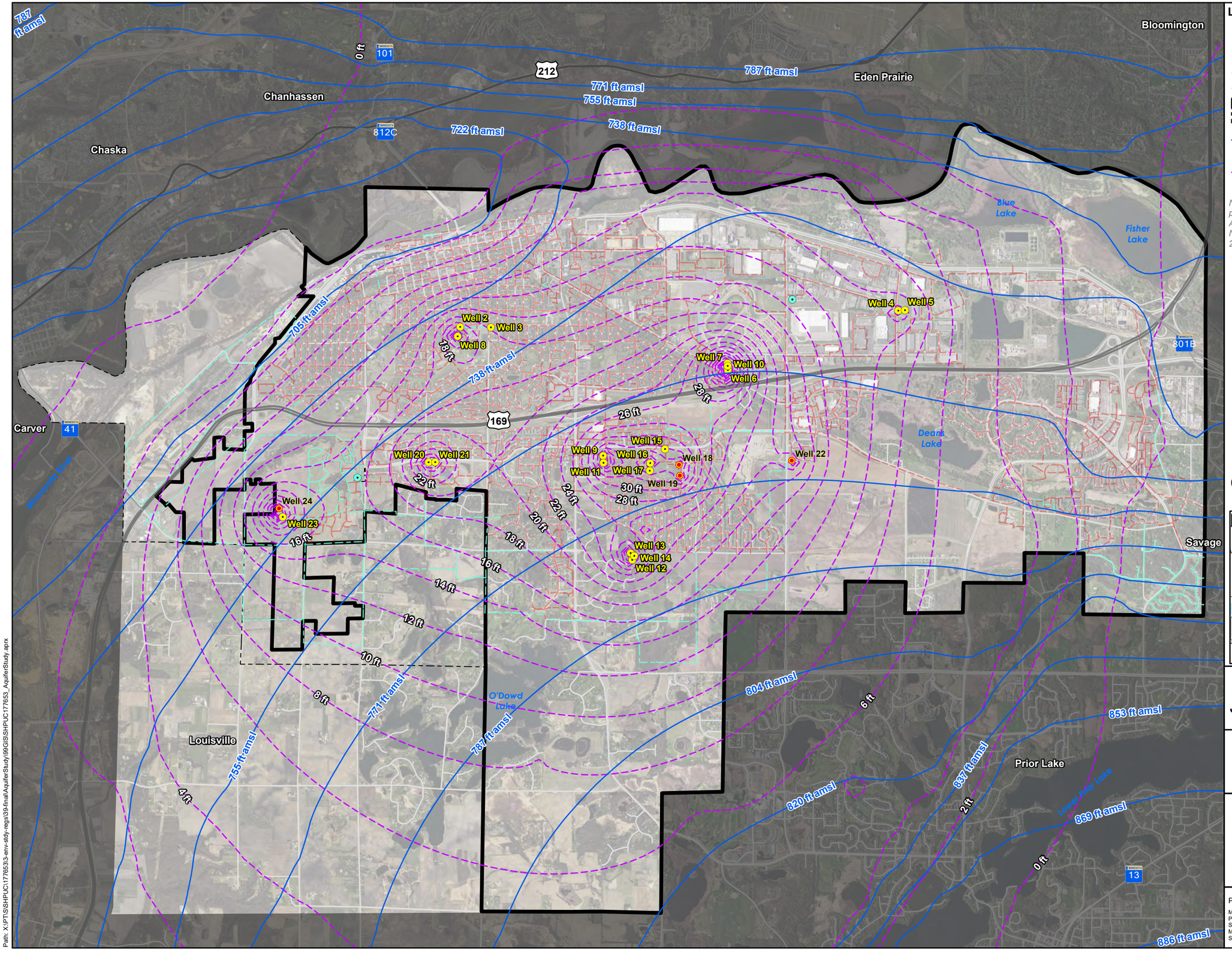
SEH

Print Date: 6/13/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 25

Path: X:\PTIS\SHPUC\177653-env-sty-regl\339-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

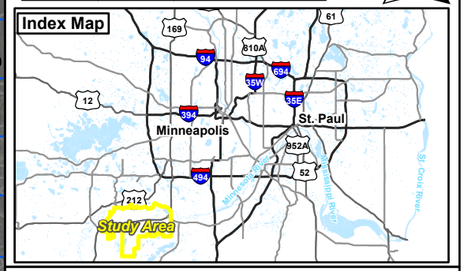


Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township
- Modeled Steady State Jordan Aquifer Water Level with no City Wells Pumping
- Feet of Modeled Drawdown from 2040 projected demand for a 3 day stress test period with new and existing wells pumped.

Note: Within the model well pumping for each well was set as a percentage of total yearly use of the well over the 3 day stress test. All City wells were set as active during this model test period. New Wells were assigned average pumping rates of 250 - 500 gpm over the 3 day period.

0 4,000 8,000 Feet



Modeled 2040 Drawdown within Jordan Aquifer w/ Proposed Wells

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/13/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 26

Path: X:\PT\SI\SHPUC\177653-env-sty-regsl\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

705 ft amsl

722 ft amsl

738 ft amsl

755 ft amsl

169

Well 24

Well 23

Localized flow direction caused from drawdown from pumping

4 ft

3 ft

2 ft

1 ft

Regional Groundwater Flow Direction within Jordan Aquifer

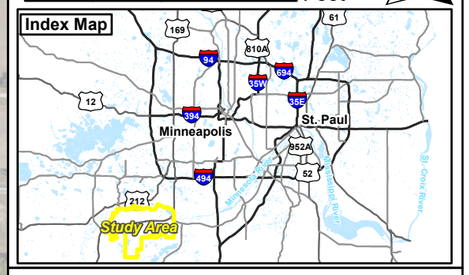
Louisville

Legend

- Municipal Well
- Planned Future Municipal Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township
- Modeled Steady State Jordan Aquifer Water Level with no City Wells Pumping
- Feet of Modeled Drawdown with Well 23 pumping at 800 gpm for 3 days.

0 600 1,200 Feet

N



Drawdown in Well 23 Pumping at 800 gpm

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/13/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi. MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 27

Path: X:\PTS\SH\PUC\177653\3-env-stdy-regs\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Carver

0 ft

41

705 ft amsl

169

722 ft amsl

Louisville

Regional Groundwater Flow Direction within Jordan Aquifer

738 ft amsl

755 ft amsl

Well 24

Well 23

Localized flow direction caused from drawdown from pumping

4 ft

3 ft

2 ft

1 ft

Louisville Landfill
Known Groundwater Plume within Jordan Aquifer
Contaminants include PFAS, 1,4-Dioxane, and Vinyl Chloride. Groundwater Plume is downgradient from the future well field, and additionally regional flow is away from the well field (towards the Minnesota River). Modeled drawdown is not expected to draw contamination toward the well field; However, because of many variables such as plume extent, actual future water use, pumping rates, etc. is uncertain, some aquifer monitoring (water level and water quality) would provide long-term peace of mind and a strategy for wellhead protection.

Legend

- Municipal Well
- Planned Future Municipal Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township
- Modeled Steady State Jordan Aquifer Water Level with no City Wells Pumping
- Feet of Modeled Drawdown with Well 23 pumping at 800 gpm for 3 days.

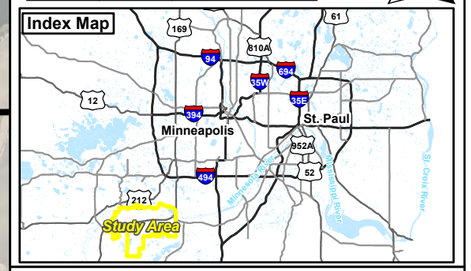
Minnesota Groundwater Contamination Atlas

- Known Groundwater Plume
- Well with HBG Exceedance

0 1,000 2,000 Feet

N

Index Map



Well 23 Wellfield and Louisville Landfill

Aquifer Sustainability Study Update
Shakopee, Minnesota

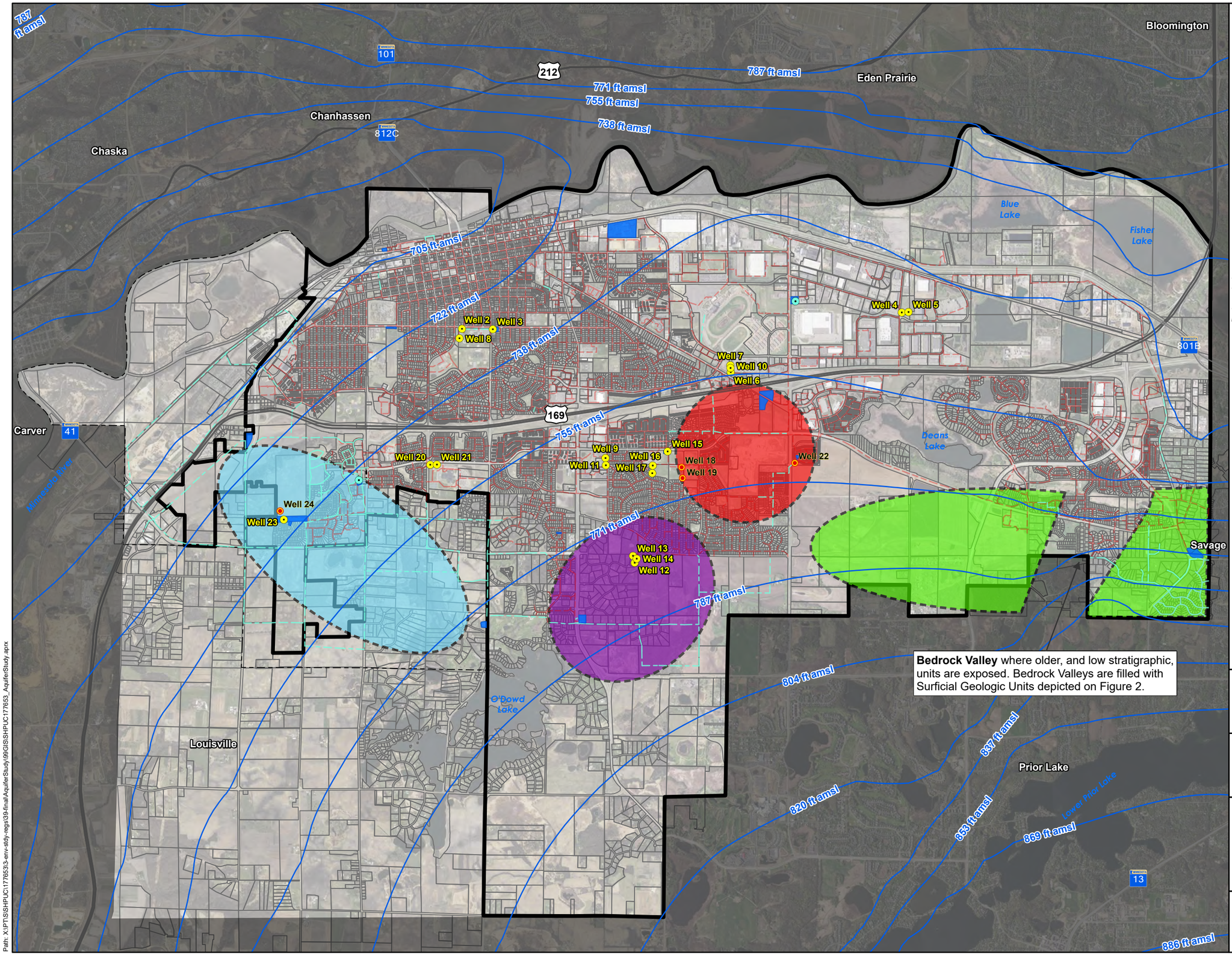
SEH

Print Date: 6/13/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 28

Path: X:\PT\SI\SHPUC\177653-env-stdy-regstr\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx



Legend

- Municipal Well
- Planned Future Municipal Well
- Observation Well
- Municipal Watermain
- Future Municipal Watermain
- Shakopee Municipal Boundary
- Jackson Township
- Modeled Steady State Jordan Aquifer Water Level with no City Wells Pumping
- Shakopee Public Utility Owned Parcel

Priority Areas

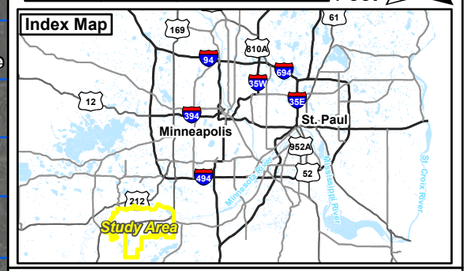
- Site A
- Site B

Potential Secondary Areas

- Site C
- Site D

Potential Well Siting Area D is in the proximity of the Savage Fen and Potential Well Siting Area C is in the proximity of O'Dowd Lake where DNR water use restrictions will likely apply now and in the future. SPUC should work with the DNR prior to assessing these locations for future well sites.

0 4,000 8,000 Feet



Potential Well Feasibility Areas

Aquifer Sustainability Study Update
Shakopee, Minnesota

SEH

Print Date: 6/14/2024

Map by: Mark Sherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 29

Path: X:\PT\SS\HPUC\177653\3-env-stdy-regs\39-final\AquiferStudy\99GIS\SHPUC177653_AquiferStudy.aprx

Appendix A

United States Geologic Survey Age Dating

Program USGS-CFC2008xls -- **Major revision --Change from the SIO 1998 to the SIO 2005 Scale**
Please send comments or suggestions to: USGS Chlorofluorocarbon Laboratory --cfc@usgs.gov

Air data SIO 2005 Scale

NOAA 2002 air-SIO 2005 scale (F-12=548.39; F-11=260.84; F-113=79.98
Enrichment factor of 1.00 = Niwot Ridge, CO air (CMDL, NOAA).
Factors other than 1.00 can be used to model local variations of CFCs in air
CAUTION: Use a factors of 1.00 if no enrichment data is available
Factors other than 1.00 will change the air curves and results obtained with this worksheet!
Yellow background cells are INPUT locations through out this worksheet

You can calculate the sensitivity of of recharge ages to temperature and to temperature and elevation uncertainties.

Temperature add or subtract uncertainty in tempt. (C) =
Elevation add or subtract uncertainty in elevation =
MAKE ABSOLUTELY SURE TO SET THE CELL BACK TO 0.0
++++++++++++ CAUTION ! ++++++++++++++++
"0.0" is required in cells "X15 & X16" for the correct calculation of the correct recharge ages.
Use below feature to evaluate the sensitivity of all well together.
Use "Sensitivity sheet" to evaluate individual wells.
MAKE ABSOLUTELY SURE TO SET THE CELL BACK TO 0.0

	INPUT	
CFC-11 enrichment	1.00	Local CFC-11 enrichment factor
CFC-12 enrichment	1.00	Local CFC-11 enrichment factor
CFC-113 enrichment	1.00	Local CFC-113 enrichment factor
Meters =0; feet =1	1	Select units of elevation
pMol/kg =0; pg/kg =1	0	Select units of concentration

INPUT		
0.0	degrees C	
0.0	feet	

Sample Number (Do not alter cells A22 through A252)	Sample Name	No.	(Format Column) Sampling Date (m/d/y)	Time	Corrected concentrations IN SOLUTION CFC-12 pmol/kg	CFC-11 pmol/kg	CFC-113 pmol/kg	Percent error in concentrations IN SOLUTION CFC-12 %	CFC-11 %	CFC-113 %	Excess Air cc/kg	Recharge Temp C	Recharge Elevation feet	Salinity o\oo	Recommended Age Based on	Comments
	INPUT	INPUT	INPUT	INPUT				INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT		
1	Well #11	2	07/26/22	1245	2.677	3.012	13.127	0.667	0.697	0.514	3.0	6.1	750	0.000	SF6	Early 2000s
2	Well #11	4	07/26/22	1245	2.676	3.019	12.921	0.702	0.724	0.534	3.0	6.1	750	0.000	CFCs	
3	Well #9	2	07/26/22	1335	3.243	4.216	19.007	0.629	0.624	0.467	2.5	6.6	750	0.000	SF6	Early 2000s
4	Well #9	4	07/26/22	1335	3.240	4.379	17.738	0.677	0.647	0.487	2.5	6.6	750	0.000	CFCs	
5	Well #2	3	07/27/22	815	5.249	10.835	0.173	0.547	0.471	1.307	4.1	4.1	750	0.000	SF6	Around 1990
6	Well #2	4	07/27/22	815	5.230	10.524	0.168	0.585	0.496	1.334	4.1	4.1	750	0.000		
7	Well #8	2	07/27/22	855	7.629	11.331	0.357	0.649	0.526	0.879	2.4	8.0	750	0.000	SF6	Around 2010
8	Well #8	4	07/27/22	855	7.713	11.463	0.366	0.687	0.553	0.887	2.4	8.0	750	0.000		
9	Well #16	1	07/27/22	1010	2.308	3.729	66.367	0.724	0.736	0.535	3.1	7.6	750	0.000	SF6	Early 2000s
10	Well #16	4	07/27/22	1010	2.336	3.558	61.486	0.750	0.766	0.556	3.1	7.6	750	0.000	CFCs	
11	Well #17	3	07/27/22	1040	2.240	4.422	7.290	0.776	0.781	0.607	3.0	7.5	750	0.000	SF6	Early 2000s
12	Well #17	4	07/27/22	1040	2.267	4.302	6.881	0.817	0.809	0.629	3.0	7.5	750	0.000	CFCs	
13	Berkeley Spr.	18	12/16/21	1200	0.351	0.283	0.020	1.993	0.864	11.211	2.0	12.0	800	0.000	Berkeley Spr.	
14	Lewis Spr	16	11/18/21	1400	2.555	3.915	0.378	0.215	0.104	0.651	0.0	9.0	3000	0.000	Lewis Spr	

Changing the recharge temperatures, elevations or excess air will change the model ages. You can alter temperature and elevation in cells AN15 and AN16 and the spreadsheet will calculate new ages. The recharge temperatures, elevations and excess air values in the above report were derived from dissolved gas data when available or from the estimated mean annual temperatures.

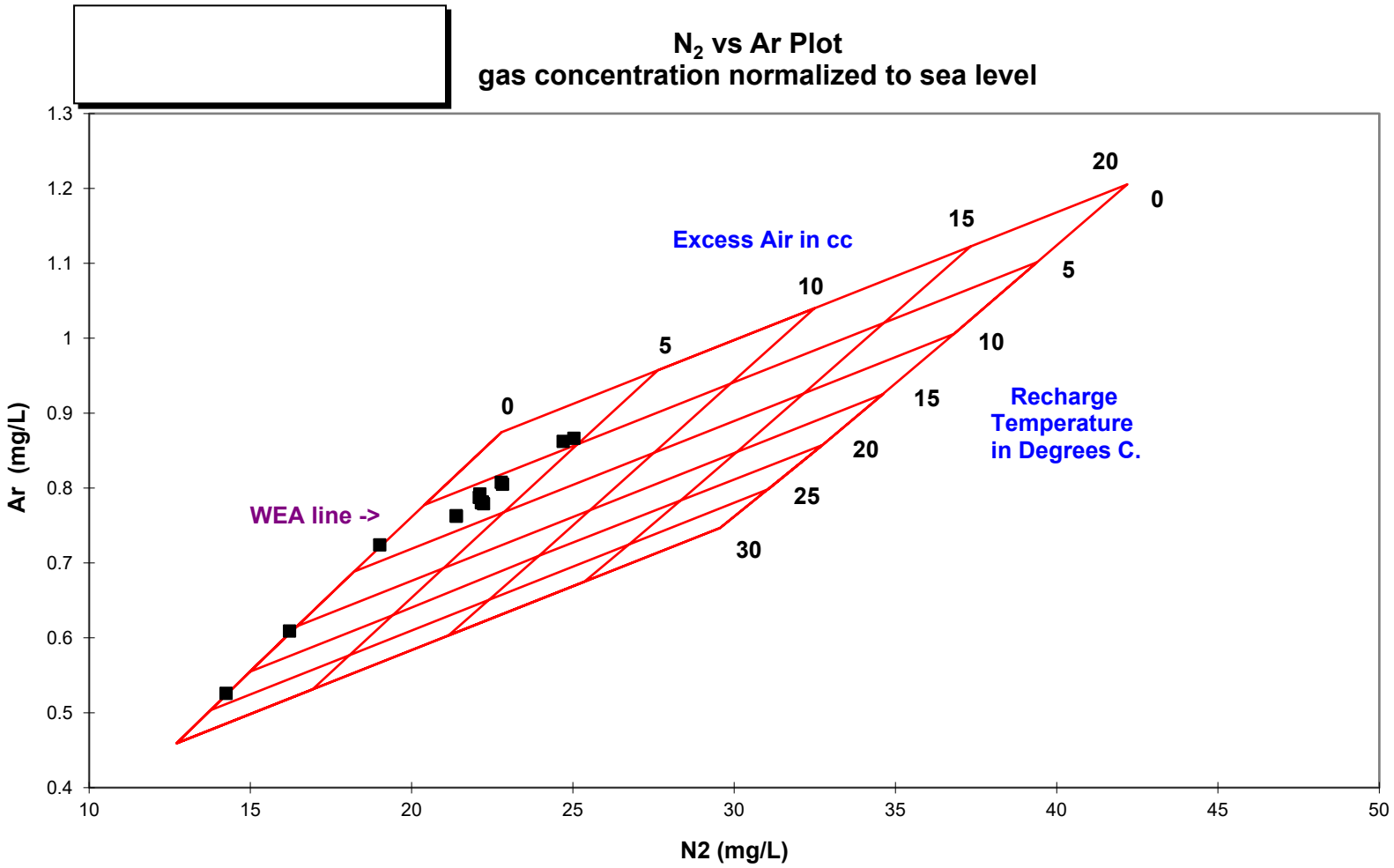
Since small changes in the above variables can significantly change the model ages, it is important to input the best available data. In the comments column, the indicated ages were determined assuming piston flow, unless noted, and do not account for mixing scenarios that can occur in wells with large open intervals or multiple producing fractures. For this reason the reported ages are referred to as "apparent ages" or "model ages". The mixing information provided may or may not be valid for a particular sample.

In anoxic environments, CFC-11 degrades first, followed by CFC-113 and CFC-12. Under these conditions some or all of the model ages will appear older than they actually are. In the interpretation of CFC ages, the ages are considered reliable when all CFC tracers give similar model ages. If the model ages differ, CFC-12 has proved to be the most reliable tracer followed by CFC-113 and CFC-11.

The analytical equipment calibration is not reliable past these concentrations 1200pg/kg for CFC-11, 2500pg/kg for CFC-12 and 900pg/kg for CFC-113. Any concentrations above these values are estimates. If you have any questions please call

Samples submitted by:	T. Meyers	**Revised 2/1/2011**	**Program written by E. Busenberg, USGS, (8-30-1994), Revised (4/19/2006), Revised (6/16/2009), Revised (01/19/2011), Revised (2/1/2012)**
Project:		Version: 7.0	This program calculates the dissolved gas composition of waters, and the volume percent composition in a gas sample (revised 2/2/2012).
Geographic location:	MN		{N2, Ar} R.F. Weiss, 1970, Deep-Sea Res., vol. 17, 721-735. R.F. {CO2} Weiss, 1974, Marine Chem. 2, 203-215.[Bunsen Coef.]
Date received:	8/3/2022		{O2} B. B Beson and D. Krause,1980, Limnol. Oceanogr. 25(4) 662-671; 1984, Limnol. Oceanogr. 29(3), 620-632.
Dated analyzed:	9/7/2022		{CH4} D.A. Wiesenburg and N.L. Guinasso, 1979, J. Chem. Eng. Data Vol. 24, 356-360.
Analyzed by:	JC		
Comments:		Land surface elevation used for estimated recharge elevation	0.7808 0.2094 0.00934

***** SAMPLES *****	Site	Date	Time	Field		Recharge			Concentration in mg/L					Concentration in mmol/L					Partial pressures at Field Temperatures in atm.					Measured	Tot Press	Elevation	Barometric
Well Name	Number	Collected	Collected	Temp	Salinity	Elevation	Lab ID #	Bottle #	CH4	CO2	N2	O2	Ar	CH4	CO2	N2	O2	Ar	CH4	CO2	N2	O2	Ar	Pressure	Corrected		pressure
Well #11		7/26/2022	1311	10.56		750		22Y4008	0.0000	41.6339	22.1959	4.3223	0.7832	0.0000	0.9460	0.7923	0.1351	0.0196	0.000000	0.017968	0.9552	0.0803	0.01063	1.06407	1.09378	750	0.972834
Well #11		7/26/2022	1311	10.56		750		22Y4022	0.0000	40.7370	22.1572	4.4506	0.7858	0.0000	0.9256	0.7910	0.1391	0.0197	0.000000	0.017581	0.9536	0.0826	0.01067	1.06443	1.09416	750	0.972834
Well #9		7/26/2022	1343	10.56		750		22Y4003	0.0000	39.3302	21.4951	4.2796	0.7663	0.0000	0.8937	0.7673	0.1337	0.0192	0.000000	0.016974	0.9251	0.0795	0.01041	1.03190	1.06071	750	0.972834
Well #9		7/26/2022	1343	10.56		750		22Y4010	0.0000	39.6315	21.5122	4.6415	0.7707	0.0000	0.9005	0.7679	0.1451	0.0193	0.000000	0.017104	0.9258	0.0862	0.01046	1.03954	1.06857	750	0.972834
Well #2		7/27/2022	846	11.66		750		22Y4013	0.0047	26.3770	24.3487	0.9080	0.8430	0.0003	0.5993	0.8692	0.0284	0.0211	0.000157	0.011812	1.0717	0.0173	0.01173	1.11263	1.14370	750	0.972834
Well #2		7/27/2022	846	11.66		750		22Y4018	0.0047	28.2090	24.0270	1.1447	0.8389	0.0003	0.6410	0.8577	0.0358	0.0210	0.000156	0.012632	1.0575	0.0218	0.01167	1.10374	1.13456	750	0.972834
Well #8		7/27/2022	915	12.22		750		22Y4017	0.0000	24.1379	20.8009	4.9620	0.7417	0.0000	0.5485	0.7425	0.1551	0.0186	0.000000	0.011012	0.9258	0.0956	0.01044	1.04287	1.07199	750	0.972834
Well #8		7/27/2022	915	12.22		750		22Y4023	0.0000	22.9069	20.7996	5.5123	0.7425	0.0000	0.5205	0.7425	0.1723	0.0186	0.000000	0.010450	0.9258	0.1062	0.01046	1.05286	1.08226	750	0.972834
Well 16		7/27/2022	1035	11.11		750		22Y4002	0.0000	31.0983	21.5910	3.6639	0.7603	0.0000	0.7066	0.7707	0.1145	0.0190	0.000000	0.013673	0.9397	0.0689	0.01045	1.03273	1.06157	750	0.972834
Well 16		7/27/2022	1035	11.11		750		22Y4011	0.0000	31.8860	21.6231	3.7254	0.7580	0.0000	0.7245	0.7719	0.1164	0.0190	0.000000	0.014019	0.9411	0.0700	0.01042	1.03560	1.06452	750	0.972834
Well #17		7/27/2022	1100	10.56		750		22Y4009	0.0005	28.9808	21.5588	3.5432	0.7594	0.0000	0.6585	0.7696	0.1107	0.0190	0.000018	0.012507	0.9278	0.0658	0.01031	1.01642	1.04480	750	0.972834
Well #17		7/27/2022	1100	10.56		750		22Y4019	0.0000	28.8443	21.5766	3.7980	0.7599	0.0000	0.6554	0.7702	0.1187	0.0190	0.000000	0.012449	0.9286	0.0705	0.01032	1.02185	1.05038	750	0.972834
21Q1118		8/17/2022		23.06				21Q1118	0.0000	0.0852	14.0771	8.3336	0.5198	0.0000	0.0019	0.5025	0.2604	0.0130	0.000000	0.000054	0.7587	0.1981	0.00903	0.96582	0.96582		1
21Q1101		7/26/2022		8.52				21Q1101	0.0000	0.4667	18.7709	10.7692	0.7151	0.0000	0.0106	0.6701	0.3365	0.0179	0.000000	0.000188	0.7738	0.1908	0.00927	0.97400	0.97400		1
21Q1088		7/6/2022		16.10				21Q1088	0.0000	0.1005	15.9524	9.5202	0.5993	0.0000	0.0023	0.5695	0.2975	0.0150	0.000000	0.000052	0.7646	0.1988	0.00915	0.97262	0.97262		1


N2 vs Ar Plot
gas concentration normalized to sea level
Excess Air in cc
Recharge Temperature in Degrees C.
WEA line ->
0
5
10
15
20
0
5
10
15
20
25
30
Ar (mg/L)
N2 (mg/L)
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
10
15
20
25
30
35
40
45
50

K(Henry) from Bullister et al., 2002, Deep-Sea Reseach, v. 49, 175-187.
In older version K(Henry) was from Wilhelm et al., 1977, Chemical Reviews, v. 77, 219-262.
Bullister et al., 2002, salting out effect was added.
Units of concentration fMol/L fMol = 10E-15 Moles.
Revised 02/26/14

Worksheet Name: MN Meyers

Standard used for calibration.
Scott tank SF6 in N2 104 pptv
CMDL/NOAA tank Air 5.12 ppt

Lab Temperature in °C 21.0
K_{Henry} 0.0002649 **Headspace Correction**
Lab Pressure in mm mercury 750.0
Salinity 0.0

You can change:
1) Excess air in cc at STP
2) Temperature in C
3) Elevation
4) Salinity in o/oo

Samples should be collected without headspace (HS). If a HS forms, the HS volume (column "H") is measured and a correction is applied. Since the total pressure of the HS bubble cannot be measured, the HS SF_6 concentration cannot be exactly calculated. The MAXIMUM PERCENT UNCERTAINTY in the water concentration that may be introduced by the HS bubble is given in column "AO". The uncertainty is significantly smaller in most cases.

	INPUT	
Enrichment	1.00	**Local SF6 enrichment factor (1.00= Northern Hemisphere)**
Meters =0; feet =1	1	**Select units of elevation**
fMol/L=0; pg/kg =1	0	**Select units of concentration**

Corrected Age Date Results

	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	*SF6 Concentration in water*		*SF6 in pptv corrected for Excess air*	*SF6 Excess air*	*SF6 Excess air*		(see abovecomment)	
USGS ID No.	**Sample No.**	**Sample Name**	**Sampling Date (Mo/day/year)**	**Time**	**Bottle Headspace in cc**	**Excess Air (mL)**	**Recharge Temperature (C)**	**Elevation feet**	**Salinity in (o/oo) parts per thousand**	***SF6 FemtoMol/kg With HS corr.***	***Excess air cc/kg at STP***	***Calculated SF6 (pptv) partial pressure***	***Piston flow model SF6 recharge year***	***Piston flow model SF6 recharge age, years***	**Sample Name**	**Maximum % headspace uncertainty**	**Comments**
	1	Well #11	07/26/22	1300	2.80	**3.0**	**6.1**	**750**		3.25	3	**5.55**	**2004.0**	**18.6**	Well #11	3.06	
	2	Well #11	07/26/22	1300	1.10	**3.0**	**6.1**	**750**		3.30	3	**5.64**	**2004.5**	**18.1**	Well #11	1.20	
	1	Well #9	07/26/22	1325	2.00	**2.5**	**6.6**	**750**		2.90	2.5	**5.24**	**2002.5**	**20.1**	Well #9	2.19	
	2	Well #9	07/26/22	1325	0.30	**2.5**	**6.6**	**750**		3.29	2.5	**5.95**	**2006.0**	**16.6**	Well #9	0.33	
	1	Well #2	07/27/22	830	2.00	**4.1**	**4.1**	**750**		1.82	4.1	**2.69**	**1991.5**	**31.1**	Well #2	2.19	
	2	Well #2	07/27/22	830	0.90	**4.1**	**4.1**	**750**		1.84	4.1	**2.72**	**1991.5**	**31.1**	Well #2	0.98	
	1	Well #8	07/27/22	900	1.60	**2.4**	**8.0**	**750**		3.85	2.4	**7.36**	**2010.5**	**12.1**	Well #8	1.75	
	2	Well #8	07/27/22	900	1.10	**2.4**	**8.0**	**750**		3.95	2.4	**7.56**	**2011.5**	**11.1**	Well #8	1.20	
	1	Well #16	07/27/22	1025	2.00	**3.1**	**7.6**	**750**		2.55	3.1	**4.55**	**1999.5**	**23.1**	Well #16	2.19	
	2	Well #16	07/27/22	1025	1.30	**3.1**	**7.6**	**750**		2.70	3.1	**4.81**	**2001.0**	**21.6**	Well #16	1.42	
	1	Well #17	07/27/22	1050	2.00	**3.0**	**7.5**	**750**		2.61	3	**4.68**	**2000.5**	**22.1**	Well #17	2.19	
	2	Well #17	07/27/22	1050	1.60	**3.0**	**7.5**	**750**		2.73	3	**4.89**	**2001.0**	**21.6**	Well #17	1.75	
		Aerated Water 21.9 degrees C	09/14/22	1040	0.00	**0.0**	**21.9**	**450**		2.47	0	**10.03**	**2019.0**	**3.7**	Aerated Water 21.9 degrees C	0.00	Lab Air 11.38 ppt

Building a Better World for All of Us®

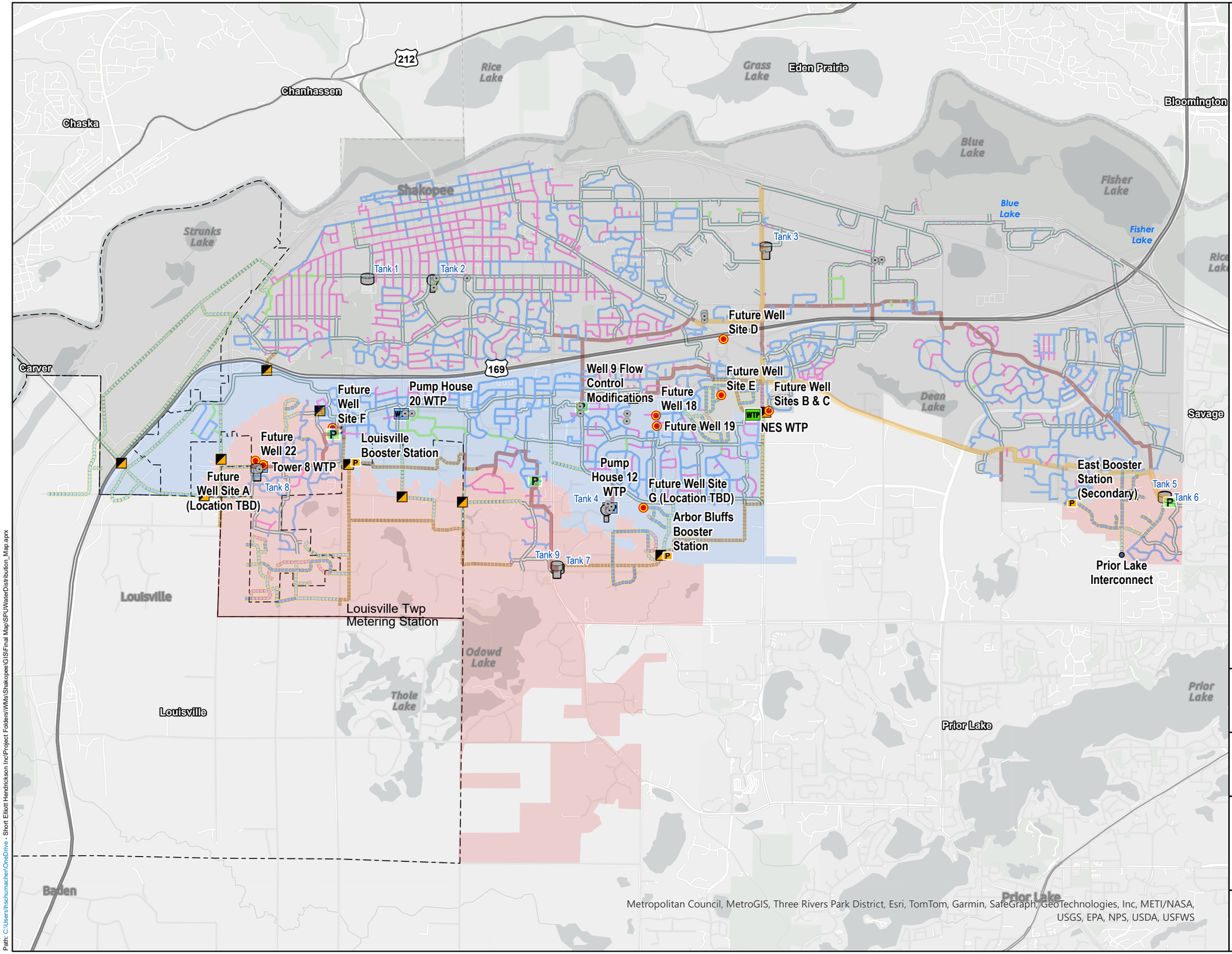
Sustainable buildings, sound infrastructure, safe transportation systems, clean water, renewable energy, and a balanced environment. Building a Better World for All of Us communicates a company-wide commitment to act in the best interests of our clients and the world around us.

We're confident in our ability to balance these requirements.

JOIN OUR SOCIAL COMMUNITIES

Appendix B

Wholesale Water Service to Louisville Township



Legend

- NES WTP Location
- Future Well
- 2045 Proposed Booster Stations
- 2024 Proposed Flow Control Stations
- 2024 Proposed Pump House WTPS
- PRVs

Existing Watermain

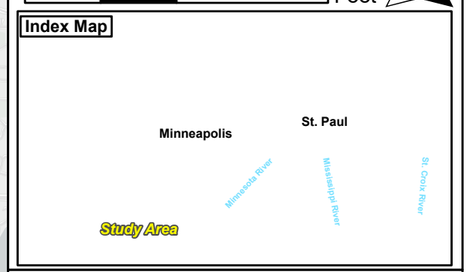
- 4-inch
- 6-inch
- 8-inch
- 10-inch
- 12-inch
- 16-inch
- 18-inch

Ultimate System Watermain (inches)

- 6
- 8
- 12
- 16
- 18
- 24

0 4,000 8,000 Feet

Index Map



Proposed 2045 Water System & Wholesale Service

2024 Comprehensive Water Plan Update
Shakopee, Minnesota

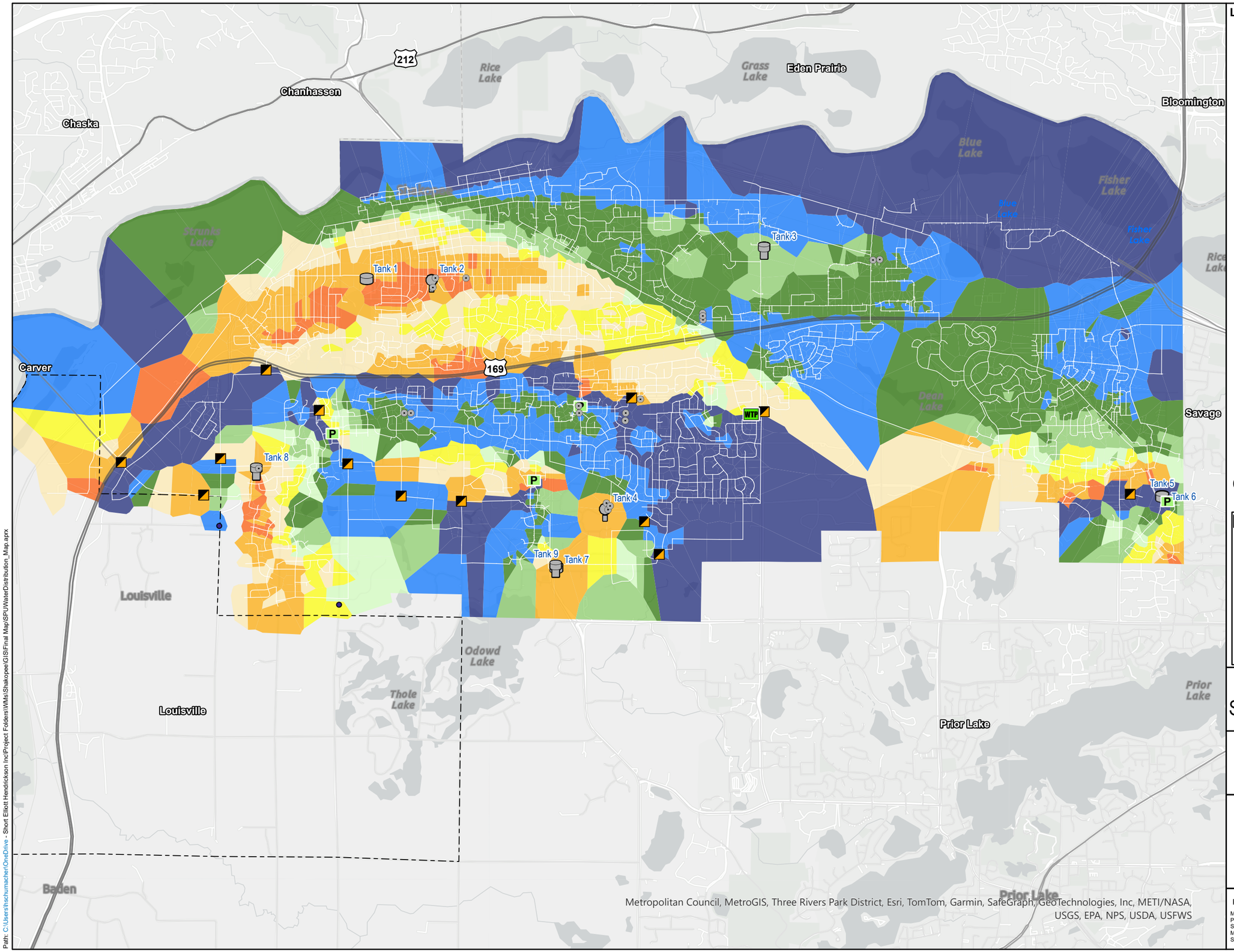
SEH

Print Date: 9/4/2024

Map by: hschumacher
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 6-1 B

Path: C:\Users\hschumacher\OneDrive - Short Elliott Hendrickson Inc\Project Folders\Wtrs\Shakopee\GIS\Final Map\SPUWaterDistribution_Map.aprx



Legend

- Junctions_Ult_AD
- NES WTP Location
- Future Well
- 2045 Proposed Booster Stations
- 2024 Proposed Flow Control Stations
- 2024 Proposed Pump House WTPS
- PRVs
- Wholesale Service Locations

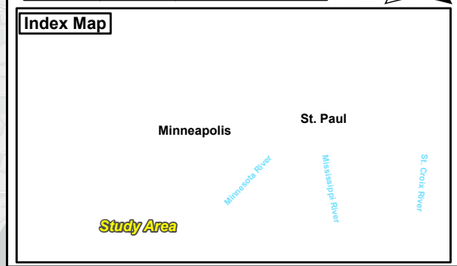
Existing Watermain
- 4-inch
- 6-inch
- 8-inch
- 10-inch
- 12-inch
- 16-inch
- 18-inch

Ultimate System Watermain (inches)
- 6
- 8
- 12
- 16
- 18
- 24

0 4,000 8,000 Feet

N

Index Map



2045 Water System AD Ultimate System & Louisville Static Pressure

2024 Comprehensive Water Plan Update Shakopee, Minnesota

SEH

Print Date: 9/4/2024

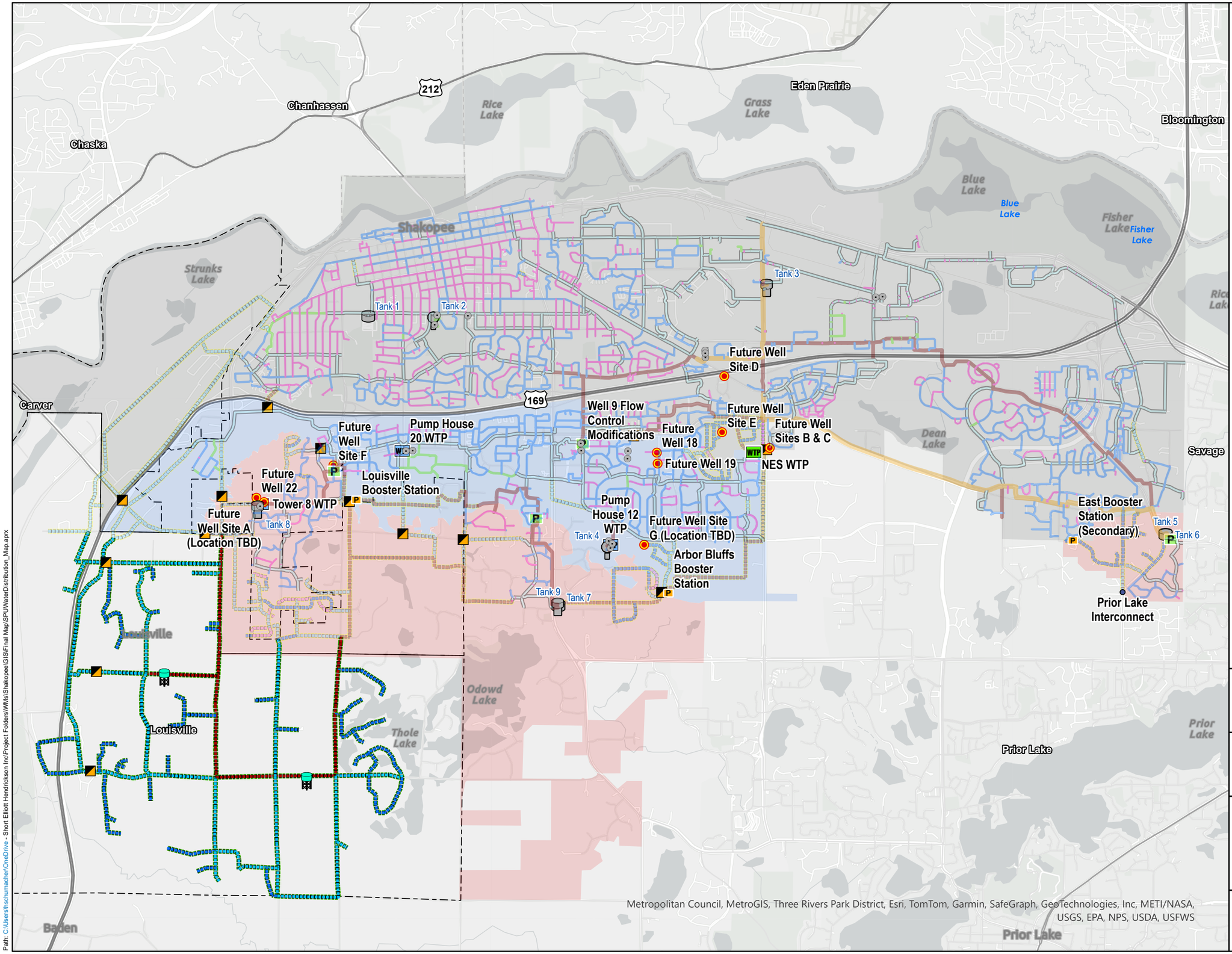
Map by: hschumacher
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 6-6

Path: C:\Users\hschumacher\OneDrive - Short Elliott Hendrickson Inc\Project Folders\WMs\Shakopee\GIS\Final Map\SPUWaterDistribution_Map.aprx

Appendix C

SPU Water Service Provided to Louisville Township



Legend

- NES WTP Location
- Future Well
- 2045 Proposed Booster Stations
- 2024 Proposed Flow Control Stations
- 2024 Proposed Pump House WTPS
- PRVs

Ultimate System Watermain (inches)

- 6
- 8
- 12
- 16
- 18
- 24

Louisville System Watermain Diameter (inches)

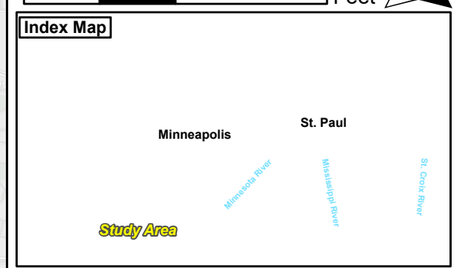
- 6
- 8
- 10
- 12
- 16

Pressure Zone

- 1st High Pressure Zone
- 2nd High Pressure Zone
- Normal Pressure Zone

0 4,000 8,000 Feet

Index Map



Proposed Louisville System Improvements

2024 Comprehensive Water Plan Update
Shakopee, Minnesota

SEH

Print Date: 9/4/2024

Map by: hschumacher
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 6-1 C

Path: C:\Users\hschumacher\OneDrive - Short Elliott Hendrickson Inc\Project Folders\WMs\Shakopee\GIS\Final Map\SPUWaterDistribution_Map.aprx

Table B1

Projected Water Consumption By Land Use - Louisville Township

Land Use[1]	Full Buildout Units/Parc	Full Buildout Units or Acres[1]	Estimated AD Water Use (gpd/acre or Unit)	Projected Full Buildout AD Water Use (MGD)	MD/AD Ratio	Projected Full Buildout MD Water Use (gpd)
Future Service to Existing Development						
Commercial	441	1,405	675	0.76	2.0	1.52
Industrial	6	152	500	0.06	1.3	0.08
Residential	441	1,405	245	0.11	2.5	0.27
Subtotal	**447**	**1,557**	**--**	**0.9**		**1.9**
Future Service to Developing Areas						
Commercial	25	116	675	0.06	2.0	0.13
Industrial	73	1,648	675	0.89	1.3	1.11
Public Lands	51	2,425	0	0.00	0.0	0.00
Rural Business Reserve	4	129	675	0.07	2.0	0.14
Transition Area (Low Density Res.)	55	1,437	245	0.28	2.5	0.70
Urban Expansion (Res.)	373	1,013	490	0.40	2.5	0.99
Subtotal	**581**	**6,769**	**--**	**1.7**		**3.1**
All Land Use	**1,028**	**8,326**		**2.63**		**4.9**

*Estimates based on typical historical usage

1. 20 percent of future areas assumed to be streets and open areas. Calculated by [(Future - Existing) x 0.8] + Existing.

2. 20 percent of Township areas assumed to be streets and open areas and 80 percent as 1/2 acre single-family lots; water not included; (2.9 persons per household x 2 households per acre x 84 gpcd = 490 gpd/acre).

Table B - C-9
Supply & Storage Analysis for 2nd High West Zone + Louisville

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Combined Maximum Day Demand (mgd)[1]	1.14	4.10	8.9
Combined Average Day Demand (mgd)	0.41	1.64	3.7
Existing Firm Supply Capacity (mgd)[2]	2.59	3.74	4.32
Firm Supply and/or Interzone Transfer Capacity Mass Balance (mgd)[3]	**1.45**	**-0.35**	**-4.59**
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	170,000	610,000	1,340,000
Reserve Storage (1/2 AD)	205,000	818,000	1,844,000
Fire Protection Volume (gallons)[5]	300,000	300,000	300,000
Recommended Total Volume (gallons)	*495,000*	*1,526,000*	*3,321,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[6]	180,000	202,000	163,000
No Storage			
Total Existing Volume Available (gallons)	*750,000*	*750,000*	*750,000*
Storage or Pumping Volume Mass Balance (gallons)[3]	**255,000**	**-776,000**	**-2,571,000**

1. See Table 4-6
2. Assumes addition of booster stations and supply wells
3. A positive value represents a surplus. A negative valve represents a deficiency.
4. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential diurnal curves were assumed with a peaking factor of 1.65.
5. Fire Protection storage was calculated based on one fire of 2,500 gpm for 2 hours.
6. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

X:\PT\S\SHPUC\177653\4-prelim-dsgn-rpts\[2024 Supply & Storage_Add Louisville.xlsx]C-9 2ndHWStg

Table B-10.2
Supply & Storage Analysis for 2nd High West + Central Zones +Louisville

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Combined Maximum Day Demand (mgd)[1]	1.41	4.50	9.42
Combined Average Day Demand (mgd)	0.51	1.78	3.87
Existing Firm Supply Capacity (mgd)[2]	5.47	5.47	5.47
Firm Supply and/or Interzone Transfer Capacity Mass Balance (mgd)[3]	**4.06**	**0.98**	**-3.95**
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	210,000	670,000	1,410,000
Reserve Storage (1/2 AD)	255,000	890,000	1,935,000
Fire Protection Volume (gallons)[5]	300,000	240,000	240,000
Recommended Total Volume (gallons)	*255,000*	*1,678,000*	*3,585,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[6] No Storage	510,000	122,000	(493,000)
Total Existing Volume Available (gallons)	*1,250,000*	*1,250,000*	*1,250,000*
Storage or Pumping Volume Mass Balance (gallons)[3]	**995,000**	**-428,000**	**-2,335,000**

1. See Table 4-6
2. Assumes addition of booster stations and supply wells
3. A positive value represents a surplus. A negative valve represents a deficiency.
4. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential diurnal curves were assumed with a peaking factor of 1.65.
5. Fire Protection storage was calculated based on one fire of 2,500 gpm for 2 hours.
6. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

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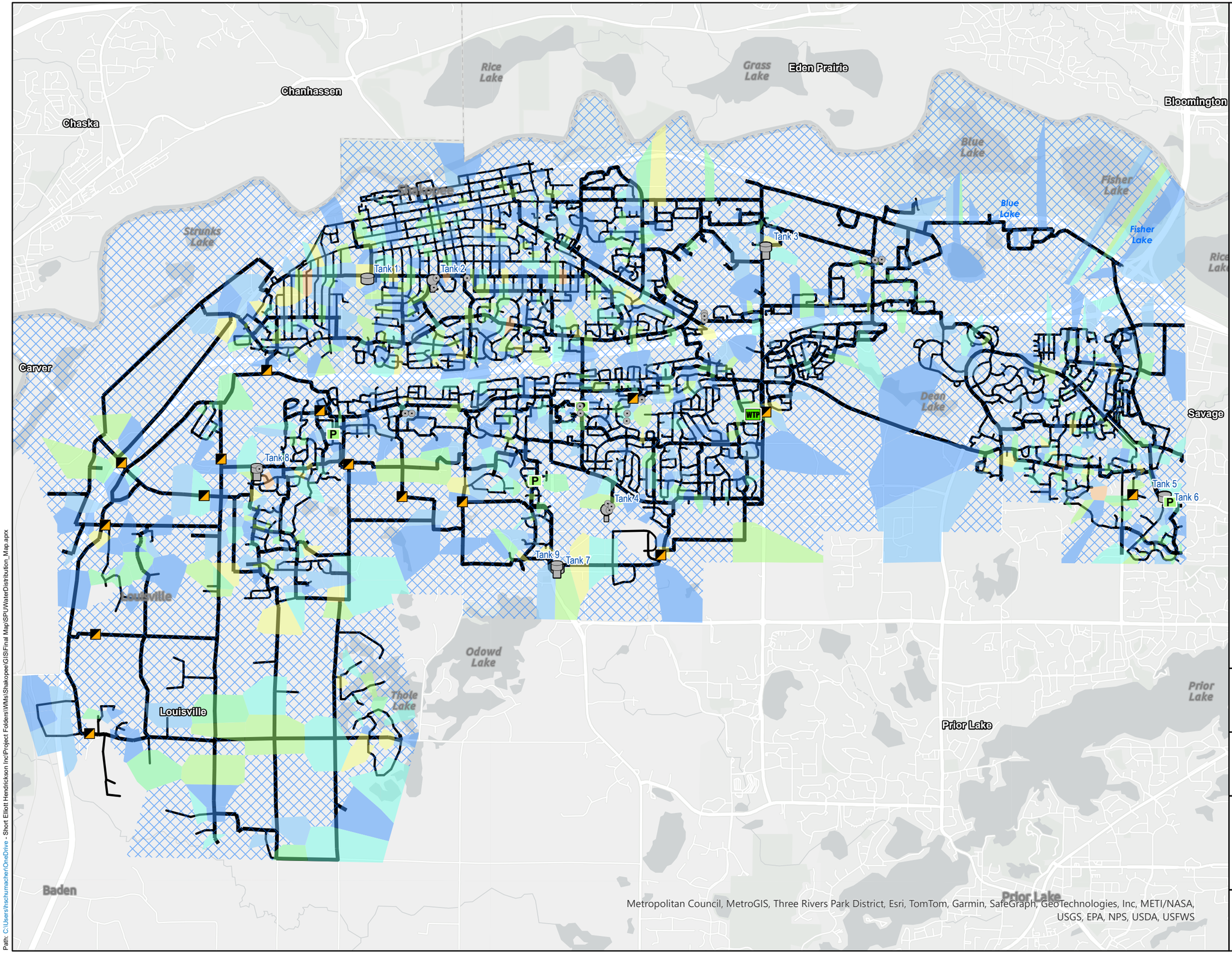


Legend

- PRVs

Diameter (inches)

- 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 18
- 19 - 24

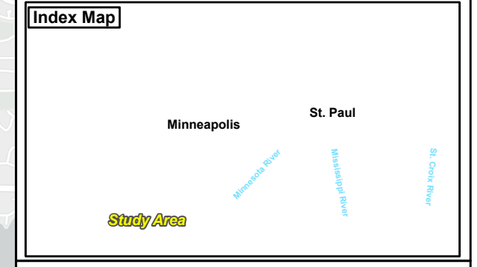
Fire Flow (gpm)

- 0 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 2000
- 2001 - 2500
- 2501 - 3000
- 3001 - 4000
- 4001 - 5000
- 5001+

0 4,000 8,000 Feet

N

Index Map



2045 System Fire Flows Ultimate System & Louisville Fire Flow

2024 Comprehensive Water Plan Update Shakopee, Minnesota

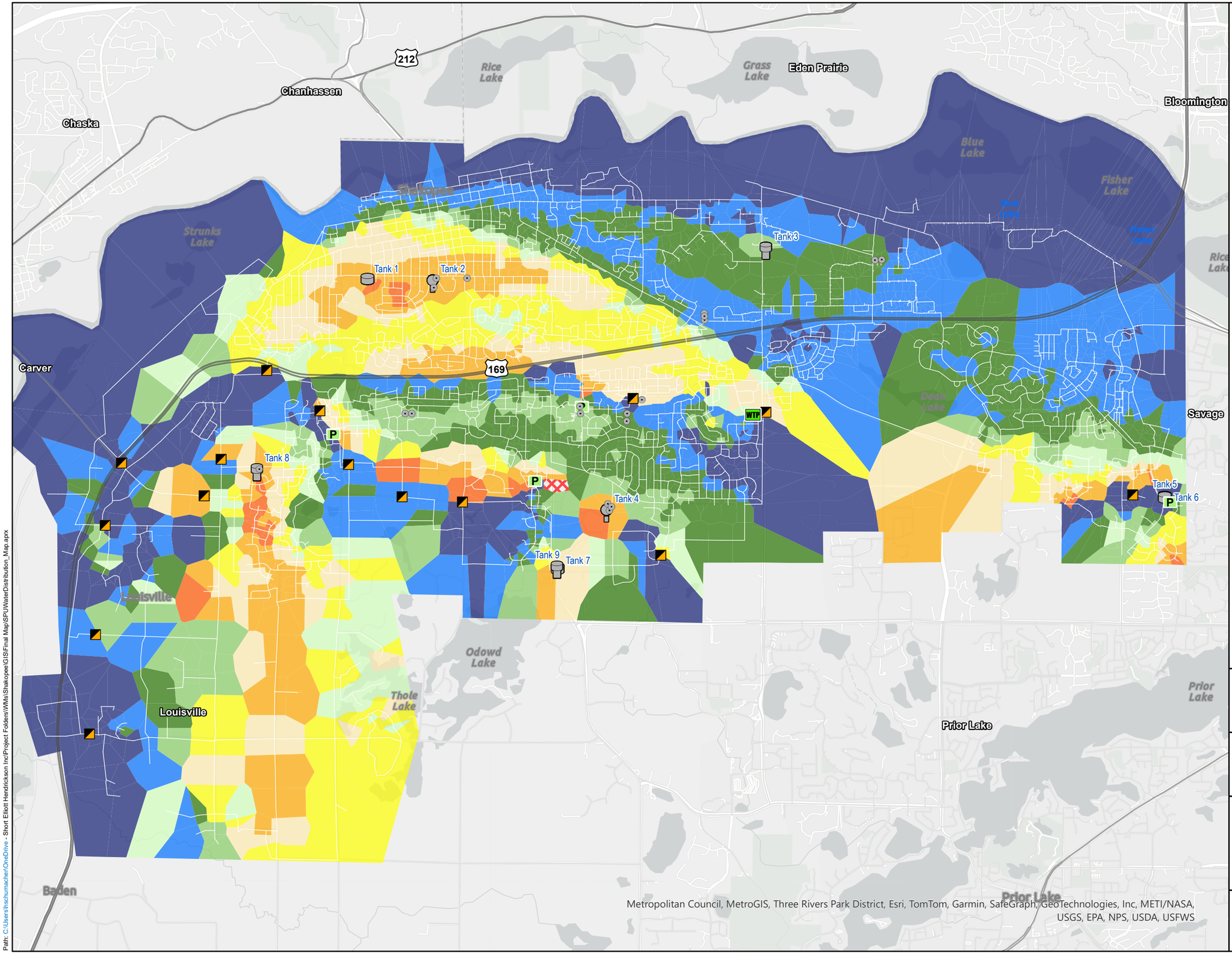
SEH

Print Date: 9/4/2024

Map by: hschumacher
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 6-4

Path: C:\Users\hschumacher\OneDrive - Short Elliott Hendrickson Inc\Project Folders\Wtrs\Shakopee\GIS\Final Map\SPUWaterDistribution_Map.aprx



Legend

- NES WTP Location
- PRVs

Existing Water Towers

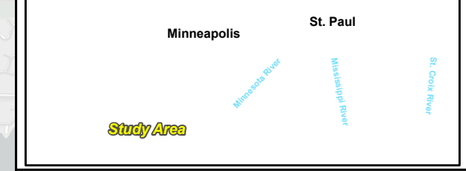
- Ground Stg Res.
- Hydropillar
- Hydrosphere

Pressure (psi)

- <40
- 40 - 45
- 46 - 50
- 51 - 55
- 56 - 60
- 61 - 65
- 66 - 70
- 71 - 75
- 76 - 80
- 80+

0 4,000 8,000 Feet

Index Map



2045 Water System AD Ultimate System & Louisville Static Pressure

2024 Comprehensive Water Plan Update
Shakopee, Minnesota

SEH

Print Date: 9/4/2024

Map by: hschumacher
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

Figure 6-6

Path: C:\Users\hschumacher\OneDrive - Short Elliott Hendrickson Inc\Project Folders\WMs\Shakopee\GIS\Final Map\SPUWaterDistribution_Map.aprx

Appendix D

Capital Improvement Planning

Cost Per Foot Water Main

Item		6	8	10	12	16	20	24	30	36
Diameter			0.9	0.95	1.05	1.07	1.1	1.15	1.2	1.25
Water Main										
Water Main - Cement-Lined Class 52 DIP w/ Push-On Locking Gasket Joints + Bonding Straps		$ 32	$ 38	$ 46	$ 57	$ 82	$ 113	$ 156	$ 233	$ 350
Fittings - Full Body Gray Cast Iron w/ MegaLug Gasket Joints + Thrust Blocks - Every 150 feet		$ 5	$ 6	$ 8	$ 10	$ 14	$ 19	$ 26	$ 39	$ 58
Polyethythene Encasement - 8 mil thickness		$ 1	$ 1	$ 1	$ 2	$ 3	$ 4	$ 5	$ 7	$ 11
Gate Valves w/ Megalug Gasket Joints + Thrust Block - Every 300 feet		$ 4	$ 5	$ 6	$ 7	$ 10	$ 14	$ 19	$ 29	$ 44
Hydrant w/ Megalug Gasket Joints + 30' 6" Lead + Thrust Block - Every 300 feet		$ 20	$ 21	$ 22	$ 23	$ 25	$ 26	$ 28	$ 31	$ 34
Curb Stop, Box, copper service - Every 50 feet		$ 31	$ 31	$ 31	$ 31	$ 31	$ 31	$ 31	$ 31	$ 31
Pipe Trench										
Pipe Bedding - 6" thick		$ 4	$ 4	$ 4	$ 4	$ 4	$ 5	$ 5	$ 5	$ 6
Trench Excavation - 8 foot bury depth		$ 32	$ 33	$ 34	$ 35	$ 38	$ 40	$ 43	$ 47	$ 52
Pavement										
Saw Cut Asphalt Pavement - Full Depth		$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4
Lower Layer Asphalt Pavement - 2-3/4" 58-28S		$ 33	$ 33	$ 33	$ 33	$ 33	$ 33	$ 33	$ 33	$ 33
Tack Coat		$ 9	$ 9	$ 9	$ 9	$ 9	$ 9	$ 9	$ 9	$ 9
Upper Layer Asphalt Pavement - 2-3/4" 58-28S		$ 33	$ 33	$ 33	$ 33	$ 33	$ 33	$ 33	$ 33	$ 33
12" 1-1/4" CABC		$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30
Traffic Control		$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10
Base Total Price Per Foot		$ 336	$ 349	$ 365	$ 389	$ 439	$ 500	$ 583	$ 732	$ 950
					Al Provided $24 per inch-foot for 12-inch					
Price with Continegency + Engineering based on project size										
Contingency Scale Factor Based on Project Size		**6**	**8**	**10**	**12**	**16**	**20**	**24**	**30**	**36**
100	1.75	$ 587	$ 611	$ 639	$ 681	$ 768	$ 875	$ 1,020	$ 1,281	$ 1,663
120	1.73	$ 581	$ 605	$ 633	$ 674	$ 761	$ 867	$ 1,010	$ 1,268	$ 1,647
144	1.72	$ 576	$ 599	$ 626	$ 668	$ 753	$ 858	$ 1,000	$ 1,255	$ 1,630
173	1.70	$ 570	$ 593	$ 620	$ 661	$ 746	$ 850	$ 990	$ 1,243	$ 1,614
207	1.68	$ 564	$ 587	$ 614	$ 655	$ 738	$ 841	$ 980	$ 1,231	$ 1,598
249	1.67	$ 559	$ 582	$ 608	$ 648	$ 731	$ 833	$ 971	$ 1,218	$ 1,582
299	1.65	$ 553	$ 576	$ 602	$ 642	$ 724	$ 825	$ 961	$ 1,206	$ 1,567
358	1.63	$ 548	$ 570	$ 596	$ 635	$ 717	$ 816	$ 952	$ 1,194	$ 1,551
430	1.62	$ 542	$ 565	$ 590	$ 629	$ 710	$ 808	$ 942	$ 1,183	$ 1,536
516	1.60	$ 537	$ 559	$ 584	$ 623	$ 703	$ 800	$ 933	$ 1,171	$ 1,521
619	1.58	$ 532	$ 553	$ 578	$ 617	$ 696	$ 792	$ 924	$ 1,159	$ 1,506
743	1.57	$ 526	$ 548	$ 573	$ 611	$ 689	$ 785	$ 915	$ 1,148	$ 1,491
892	1.55	$ 521	$ 542	$ 567	$ 604	$ 682	$ 777	$ 905	$ 1,136	$ 1,476
1,070	1.54	$ 516	$ 537	$ 561	$ 598	$ 675	$ 769	$ 896	$ 1,125	$ 1,461
1,284	1.52	$ 511	$ 532	$ 556	$ 593	$ 668	$ 761	$ 888	$ 1,114	$ 1,447
1,541	1.51	$ 506	$ 527	$ 550	$ 587	$ 662	$ 754	$ 879	$ 1,103	$ 1,433
1,849	1.49	$ 501	$ 521	$ 545	$ 581	$ 655	$ 746	$ 870	$ 1,092	$ 1,418
2,219	1.48	$ 496	$ 516	$ 539	$ 575	$ 649	$ 739	$ 862	$ 1,081	$ 1,404
2,662	1.46	$ 491	$ 511	$ 534	$ 569	$ 642	$ 732	$ 853	$ 1,071	$ 1,390
3,195	1.45	$ 486	$ 506	$ 529	$ 564	$ 636	$ 724	$ 845	$ 1,060	$ 1,377
3,834	1.43	$ 481	$ 501	$ 524	$ 558	$ 630	$ 717	$ 836	$ 1,050	$ 1,363
4,601	1.42	$ 476	$ 496	$ 518	$ 553	$ 623	$ 710	$ 828	$ 1,039	$ 1,350
5,521	1.41	$ 472	$ 491	$ 513	$ 547	$ 617	$ 703	$ 820	$ 1,029	$ 1,336
6,625	1.39	$ 467	$ 486	$ 508	$ 542	$ 611	$ 696	$ 812	$ 1,019	$ 1,323
7,950	1.38	$ 462	$ 481	$ 503	$ 536	$ 605	$ 689	$ 804	$ 1,009	$ 1,310
9,540	1.36	$ 458	$ 477	$ 498	$ 531	$ 599	$ 683	$ 796	$ 999	$ 1,297
11,448	1.20	$ 403	$ 419	$ 438	$ 467	$ 527	$ 600	$ 700	$ 878	$ 1,140
13,737	1.19	$ 399	$ 415	$ 434	$ 462	$ 522	$ 594	$ 693	$ 869	$ 1,129
16,484	1.18	$ 395	$ 411	$ 429	$ 458	$ 516	$ 588	$ 686	$ 861	$ 1,118
19,781	1.16	$ 391	$ 407	$ 425	$ 453	$ 511	$ 583	$ 679	$ 852	$ 1,107
23,738	1.15	$ 387	$ 403	$ 421	$ 449	$ 506	$ 577	$ 672	$ 844	$ 1,096
28,485	1.14	$ 383	$ 399	$ 417	$ 444	$ 501	$ 571	$ 666	$ 836	$ 1,085
34,182	1.13	$ 379	$ 395	$ 413	$ 440	$ 496	$ 565	$ 659	$ 827	$ 1,074
41,019	1.12	$ 376	$ 391	$ 409	$ 436	$ 491	$ 560	$ 653	$ 819	$ 1,064
49,222	1.11	$ 372	$ 387	$ 405	$ 431	$ 487	$ 554	$ 646	$ 811	$ 1,053

Appendix E

Water Quality Data

DEPARTMENT OF HEALTH

Shakopee PFAS Summary

Jessie Kolar | District Engineer

Todd Johnson | District Engineer Supervisor

January 18, 2022

Per- and Polyfluoroalkyl Substances (PFAS)

- Family of many synthetic chemicals
- Developed and used since the 1940s
  - resist heat, stains, water, oil, grease
  - “non-stick”
- Production increased rapidly in the 1970s
- Persist in the environment, found everywhere
- Not regulated under the SDWA

Source: open access images – bing.com

SAMPLING OF SHAKOPEE FOR PFAS

- Shakopee initially sampled for PFAS in 2014 & 2015
  - UCMR3
  - Not every well sampled
  - No PFAS compounds detected.
- Current sampling conducted as part of MDH's Statewide PFAS Sampling
  - MDH goal of sampling all PWSs for PFAS (started in 2021)
  - 'Voluntary', or not required.

Minnesota PFAS Guidance- How low can we go?

- MDH develops health-based guidance values (HBVs) at concentrations likely to pose little or no risk to human health
- Not enforceable
- Do not consider cost and treatability
- Health Risk Index (HRI): additive risk assessment of co-contaminants with similar health effects
  - HRI > 1 considered an exceedance

	PFOA	PFOS	PFBA	PFBS	PFHxS
2002	7	1			
2006	1	0.6	1		
2007	0.5	0.3	7		
2009	0.3	0.3	7	7	
2013	0.3	0.3	7	7	0.3
2016	0.07	0.07	7	7	0.07
2017	0.035	0.027	7	3/2	0.027
2019	0.035	0.015	7	3/2	0.047

Blue = HRL; Red = HBV; Green = Surrogate units = µg/L

$$HRI = \frac{PFOA_{[conc]}}{0.035} + \frac{PFOS_{[conc]}}{0.015} + \frac{PFBA_{[conc]}}{7} + \frac{PFBS_{[conc]}}{2} + \frac{PFHxS_{[conc]}}{0.047}$$

Well	PFOA	PFOS	PFBA	PFBS	PFHxS	PFHxA	HRI
Well #2	0.0008	0.0016	0.011	0.0015	0	0.0019	0.14
Well #4	0.002	0.0012	0.03	0.0026	0.0009	0.02	0.26
Well #5	0.0027	0.0018	0.036	0.0031	0.001	0.021	0.33
(Wells 6, 7 & 10)	0.0017	0.0028	0.017	0.0017	0	0.0024	0.25
Well #8	0.0012	0.0027	0.017	0.0015	0.002	0.0029	0.27
Well #9	0	0	0.01	0.0009	0	0	0.00
Well #11	0	0	0.005	0	0	0	0.00
Well #12	0	0	0.002	0	0	0	0.00
Well #15	0	0	0.009	0.0012	0	0.0011	0.01
Well #16	0	0	0.011	0.0015	0	0	0.00
Well #17	0	0	0.011	0.0016	0	0	0.00
Well #20	0.0011	0	0.011	0.001	0	0.0014	0.04
Well #21	0.0017	0	0.014	0.0015	0	0.0043	0.07

WHAT'S NEXT?

- MDH has no plans for immediate follow up sampling at Shakopee.
- EPA preliminary draft MCLs for PFOS & PFOA scheduled for release in fall of this year. (Final MCLs in fall 2023).
- Shakopee will be sampled by MDH for PFAS in December 2024 and June 2025 (UCMR5).

COMMUNICATIONS

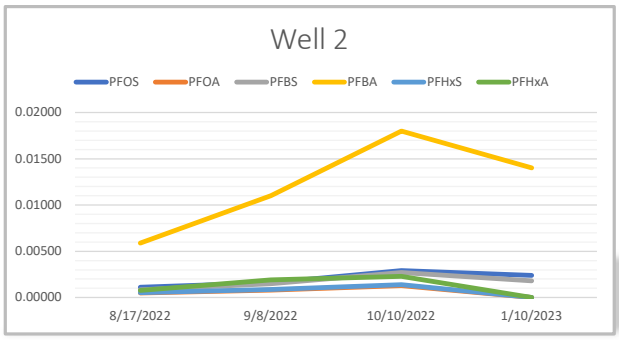
- PFAS results not required to be included in CCR.
- MDH recommends that you include them in your next CCR and can provide resources to help you give context about what these results mean.
- Results will be included in MDH's PFAS Dashboard.
- Perfluoroalkyl Substances (PFAS) - EH: Minnesota Department of Health (state.mn.us)

Thank you

jessie.kolar@state.mn.us

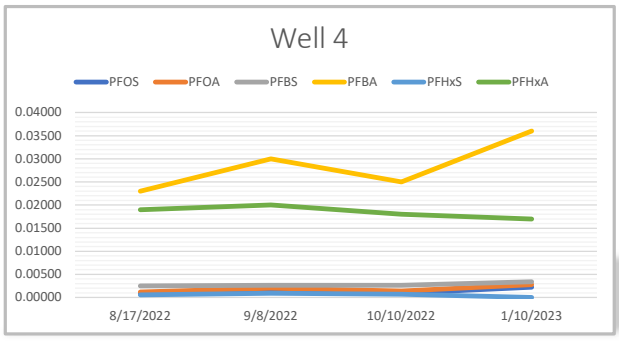
MDH - (651) 201-4562

Minnesota Department of Health
PFAS HRI Testing Results



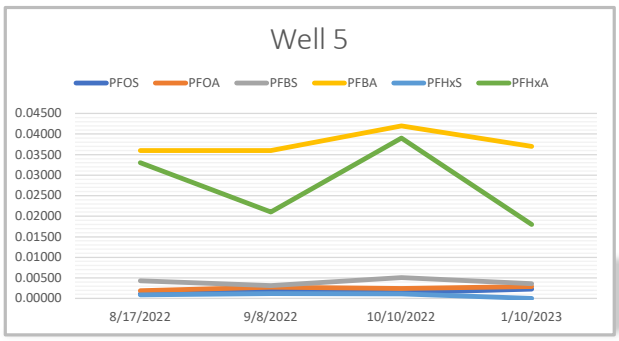
HRI Average
0.19

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00110	0.00049	0.00083	0.00590	0.00054	0.00075	0.11
9/8/2022	0.00160	0.00079	0.00150	0.01100	0.00088	0.00190	0.17
10/10/2022	0.00290	0.00130	0.00270	0.01800	0.00140	0.00230	0.30
1/10/2023	0.00240	0.00000	0.00180	0.01400	0.00000	0.00000	0.18



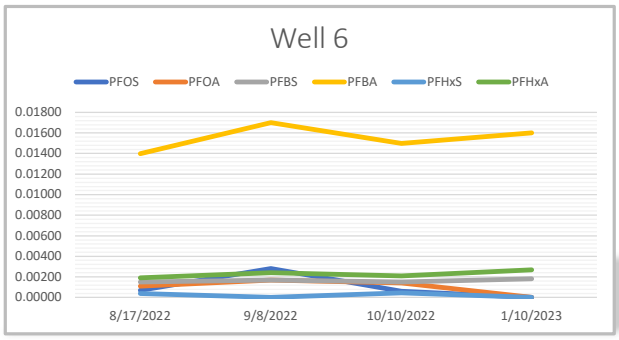
HRI Average
0.27

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00077	0.00120	0.00250	0.02300	0.00058	0.01900	0.22
9/8/2022	0.00120	0.00200	0.00260	0.03000	0.00090	0.02000	0.29
10/10/2022	0.00095	0.00140	0.00260	0.02500	0.00074	0.01800	0.24
1/10/2023	0.00220	0.00280	0.00340	0.03600	0.00000	0.01700	0.35



HRI Average
0.38

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00110	0.00190	0.00430	0.03600	0.00085	0.03300	0.36
9/8/2022	0.00180	0.00270	0.00310	0.03600	0.00120	0.02100	0.36
10/10/2022	0.00140	0.00240	0.00510	0.04200	0.00110	0.03900	0.44
1/10/2023	0.00230	0.00290	0.00360	0.03700	0.00000	0.01800	0.37



HRI Average
0.13

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00068	0.00110	0.00150	0.01400	0.00040	0.00190	0.11
9/8/2022	0.00280	0.00170	0.00170	0.01700	0.00000	0.00240	0.27
10/10/2022	0.00061	0.00140	0.00150	0.01500	0.00045	0.00210	0.12
1/10/2023	0.00000	0.00000	0.00180	0.01600	0.00000	0.00270	0.03

All values are in µg/L
A value of 0.00000 indicates that a compound is below detection.

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MDH - (651) 201-4562

Minnesota Department of Health
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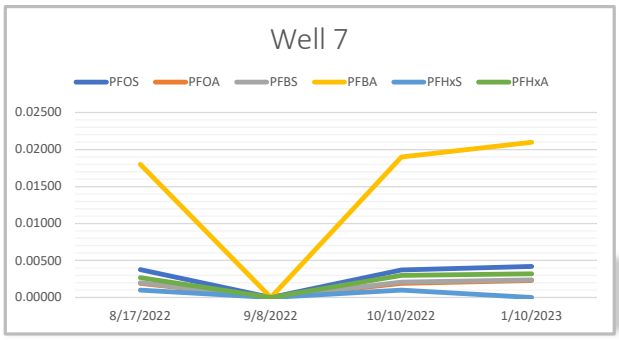
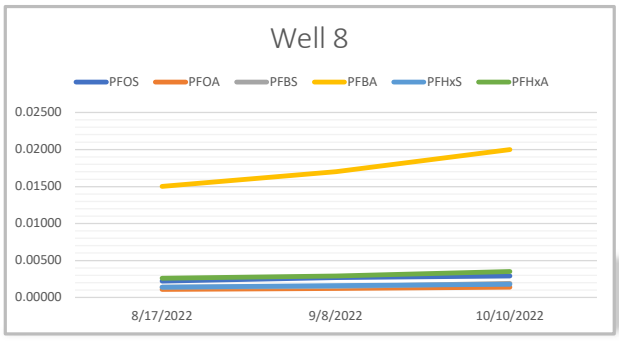


Sampled w/Well 6

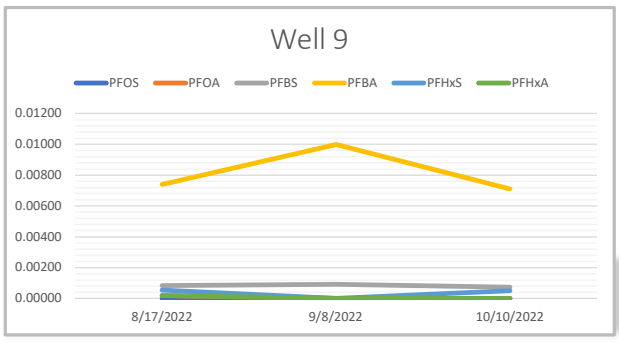
HRI Average
0.37

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00380	0.00190	0.00200	0.01800	0.00100	0.00270	0.36
9/8/2022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00
10/10/2022	0.00370	0.00190	0.00210	0.01900	0.00100	0.00300	0.36
1/10/2023	0.00420	0.00230	0.00240	0.02100	0.00000	0.00320	0.39



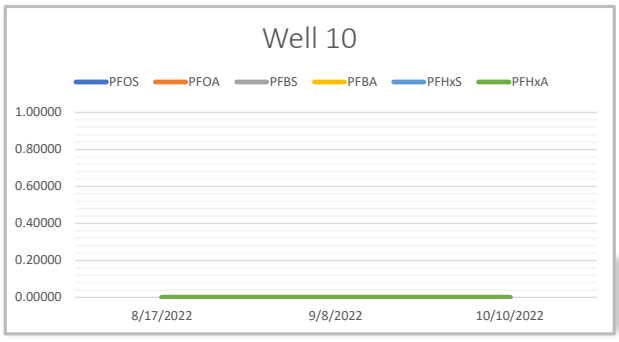
HRI Average
0.28

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00220	0.00110	0.00140	0.01500	0.00140	0.00260	0.24
9/8/2022	0.00270	0.00120	0.00150	0.01700	0.00160	0.00290	0.28
10/10/2022	0.00290	0.00140	0.00190	0.02000	0.00180	0.00350	0.31



HRI Average
0.02

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00000	0.00020	0.00083	0.00740	0.00054	0.00019	0.03
9/8/2022	0.00000	0.00000	0.00092	0.01000	0.00000	0.00000	0.01
10/10/2022	0.00000	0.00000	0.00073	0.00710	0.00051	0.00000	0.02



HRI Average
0.00

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00
9/8/2022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00
10/10/2022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00

All values are in µg/L
A value of 0.00000 indicates that a compound is below detection.

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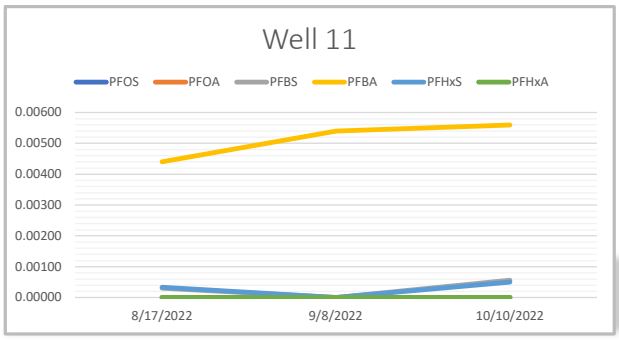
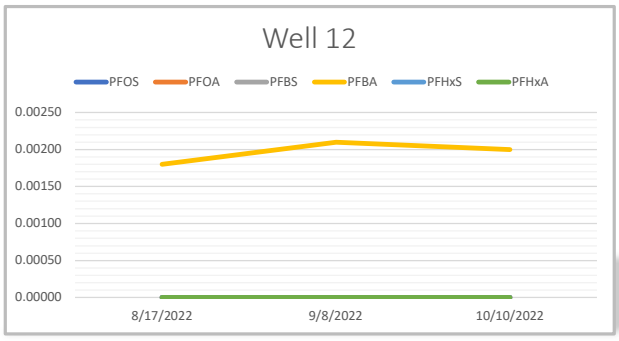


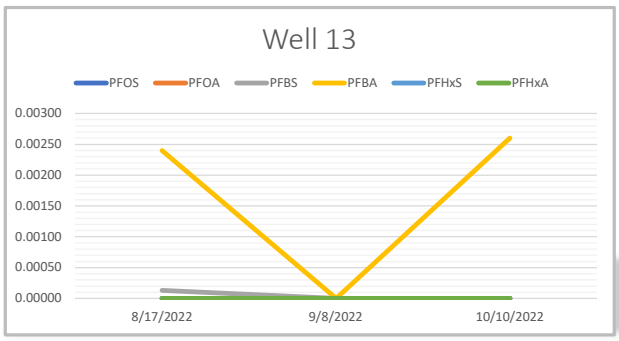
HRI Average
0.01

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00000	0.00000	0.00030	0.00440	0.00033	0.00000	0.01
9/8/2022	0.00000	0.00000	0.00000	0.00540	0.00000	0.00000	0.00
10/10/2022	0.00000	0.00000	0.00056	0.00560	0.00050	0.00000	0.02



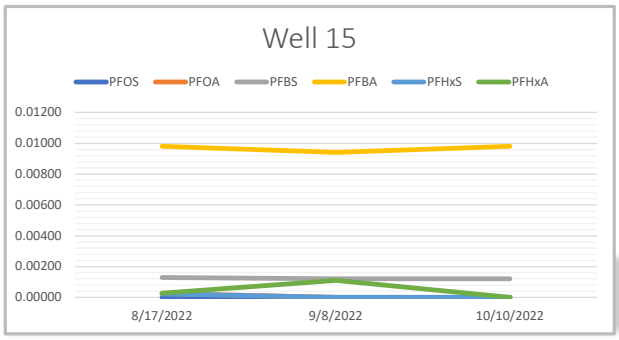
HRI Average
0.00

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00000	0.00000	0.00000	0.00180	0.00000	0.00000	0.00
9/8/2022	0.00000	0.00000	0.00000	0.00210	0.00000	0.00000	0.00
10/10/2022	0.00000	0.00000	0.00000	0.00200	0.00000	0.00000	0.00



HRI Average
0.00

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00000	0.00000	0.00013	0.00240	0.00000	0.00000	0.00
9/8/2022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00
10/10/2022	0.00000	0.00000	0.00000	0.00260	0.00000	0.00000	0.00



HRI Average
0.02

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00000	0.00026	0.00130	0.00980	0.00023	0.00027	0.03
9/8/2022	0.00000	0.00000	0.00120	0.00940	0.00000	0.00110	0.02
10/10/2022	0.00000	0.00000	0.00120	0.00980	0.00000	0.00000	0.01

All values are in µg/L
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PFAS Testing of Minnesota Community Water Systems

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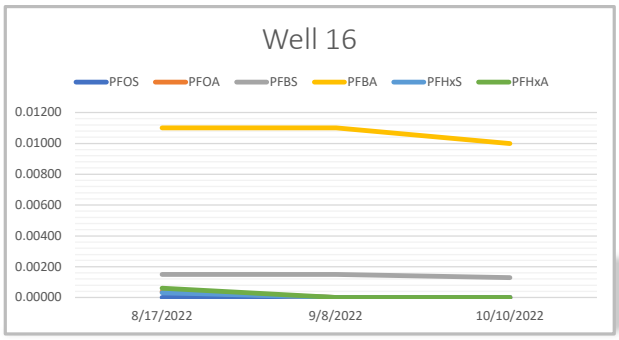
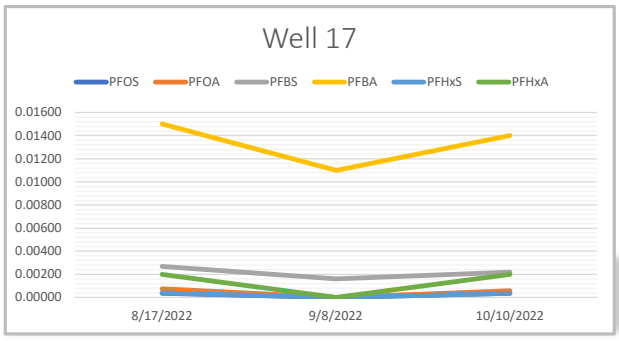


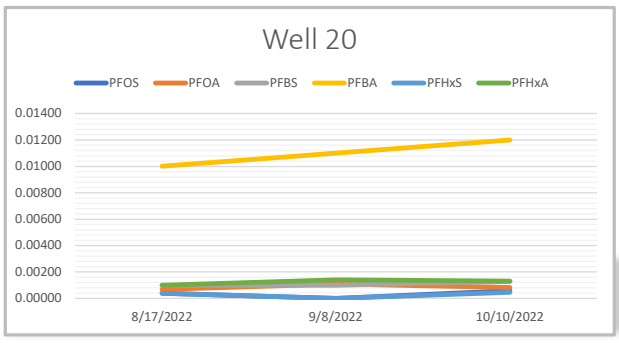
HRI Average
0.02

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00000	0.00037	0.00150	0.01100	0.00031	0.00061	0.04
9/8/2022	0.00000	0.00000	0.00150	0.01100	0.00000	0.00000	0.02
10/10/2022	0.00000	0.00000	0.00130	0.01000	0.00000	0.00000	0.01



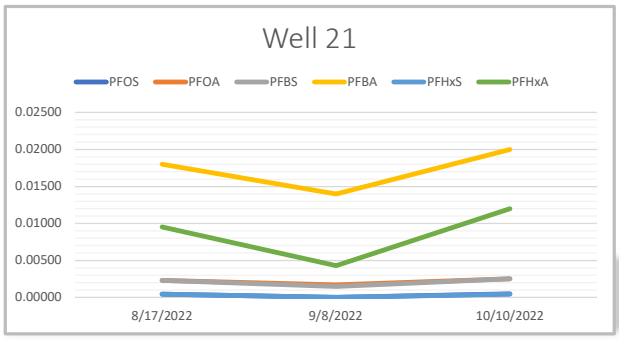
HRI Average
0.06

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00038	0.00076	0.00270	0.01500	0.00039	0.00200	0.09
9/8/2022	0.00000	0.00000	0.00160	0.01100	0.00000	0.00000	0.02
10/10/2022	0.00036	0.00059	0.00220	0.01400	0.00037	0.00200	0.08



HRI Average
0.07

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00039	0.00069	0.00100	0.01000	0.00039	0.00100	0.07
9/8/2022	0.00000	0.00110	0.00100	0.01100	0.00000	0.00140	0.05
10/10/2022	0.00058	0.00084	0.00130	0.01200	0.00046	0.00130	0.09



HRI Average
0.16

	PFOS	PFOA	PFBS	PFBA	PFHxS	PFHxA	HRI
8/17/2022	0.00043	0.00230	0.00230	0.01800	0.00041	0.00950	0.18
9/8/2022	0.00000	0.00170	0.00150	0.01400	0.00000	0.00430	0.09
10/10/2022	0.00050	0.00250	0.00250	0.02000	0.00043	0.01200	0.20

All values are in µg/L
A value of 0.00000 indicates that a compound is below detection.

PFAS Testing of Minnesota Community Water Systems

https://tinyurl.com/PFAS-MDH

Appendix F

Supply + Storage Needs Calculations

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HYDRAULIC DESIGN GUIDELINE

BACKGROUND

This memo has been developed to document criteria for evaluating the performance of existing facilities and for designing future facilities. This criteria is a combination of criteria established by Ten States Standards, Minnesota Department of Health (DOH), Minnesota Rules Chapter 4720, Minnesota Statues Chapter 144 and the Shakopee Public Utilities Commission Water Policy Manual. Planning and Design Criteria are the general guidelines and provide a framework in which to evaluate the performance of the existing system and evaluate recommended facilities to serve future growth or changes in the distribution system.

WELLS

Criteria established for the wells include well capacity and emergency power/pumping. They are summarized in Table 1.

Table 1

Well Planning and Design Criteria

Criteria	Guideline
Well Capacity	**For the Shakopee water system, the well capacity must meet all of the following:** • Average run time on wells less than 12 hours during the average day demand (ADD). • Firm capacity (two largest wells out of service) of wells at least 100% of MDD.
Emergency Operation	Emergency power generation (or engine powered pump capacity) to meet at least the ADD.
Footnote:	

PRESSURE

Pressure criteria are established for low, high and emergency operations. The low pressure criterion is established to provide customers with adequate pressures for normal operation of residential and commercial fixtures including irrigation systems. The high pressure criterion is established to protect fixtures and pipelines from undue stress. Customers with normal operating pressures over 80 psi may consider installing a pressure reducing valve (PRV) on their service to protect indoor fixtures. The emergency operating criterion is established to prevent negative system pressures during emergency and fire flow events. Table 2 summarizes the pressure criteria.

Table 2
Pressure Planning and Design Criteria

Criteria	Guideline
Pressure Requirements	
Non-Emergency Demand Conditions	> 35 psi
Emergency High Flow Conditions	> 20 psi
Preferred Operating Pressure	50 to 80 psi
Maximum Operating Pressure	< 115 psi

PRESSURE MANAGEMENT

Shakopee may implement limited pressure management strategies to reduce system leakage and encourage conservation during specific periods of low customer demand. However, Shakopee will always operate water supply pumps to meet the Ten States Standards minimum system pressure under all normal operating conditions (35 psi), and above 20 psi under emergency and fire flow conditions within the distribution system.

PIPELINES

Pipeline criteria are established for velocity, pipe roughness, minimum sizing, and pipe material. Velocity criteria are used to minimize system headlosses due to pipe size or roughness and to minimize the impact of transients in the distribution system. A roughness criterion is generally assumed or measured and is used for hydraulic model calibration and evaluation. Minimum sizing is used to ensure adequate capacity for fire protection. Table 3 summarizes planning and design criteria for pipelines.

Table 3
Pipeline Planning and Design Criteria

Criteria	Guideline
Maximum Velocity	
Maximum Hour During MDD	< 5 fps
Fire During MDD	< 10 fps
Hazen-Williams Roughness Coefficient (C-Factor)	
Existing Pipes	Varies up to 130
High Density Polyethylene (HDPE) (new)	150
Ductile Iron (new, cement lined)	130
Pipe Diameter[3]	
General Grid Considerations	12-inch minimum diameter on 3,000 foot grid (Larger diameter or closer spacing may be required based on use or zoning).
The minimum diameter for lateral water mains shall be as follows:	
Zoning: R-1A, R-1B, R-1C, R-2	6-inch minimum diameter
Zoning: R-3, B1, B-2, B-3, BP	8-inch minimum diameter, or as modeling results require for increased fire flow.
Zoning: I-1, I-2, E	12-inch minimum diameter, or as modeling results require for increased fire flow.

SUPPLY AND STORAGE

Supply and storage criteria are designed to ensure adequate capacity for maximum hour, fireflow, or emergency demands. Table 4 summarizes planning and design guidelines supply pumping and storage.

Table 4
Supply and Storage
Planning and Design Criteria

Criteria	Guideline
Supply	
Capacity	Firm Capacity (largest two pumps out of service) able to meet either: • MDD with equalization storage
Storage volume (sum of the following)	
Emergency Storage Volume	Volume of water held in reserve in case that supply is lost. • 12 hour supply at ADD(1)
Equalization Storage Volume	Volume required to deliver difference between peak hour demand (PHD) and MDD for each pressure zone (normally 15 – 30% of MDD)
Fire Storage Volume	Fire flow goal x fire duration (see Table 5 for fire flow and duration recommendations)

Footnotes:
(1) Provides a temporary emergency reserve source.

FIRE FIGHTING CRITERIA

Projected water demands are developed from existing water demands and the anticipated impact of growth and conservation on the demand. Table 5 summarizes the fire flow goals and durations.

Table 5
Fire Fighting Planning and Design Criteria[1]

Land Use	Fire Flow Goal (gpm)[1,2]	Fire Duration[2] (hours)
Zoning: R-1A, R-1B, R-1C, R-2	1,500	2
Zoning: R-3, B1, B-2, B-3, BP	2,000	2
Zoning: I-1, I-2, E	3,500	3

Footnotes:
[1] Fire flow in addition to MDD.
[2] *Distribution System Requirements for Fire Protection*, AWWA M31, 2008
[3] *2015 Minnesota State Plumbing Code*

SYSTEM PLANNING

Shakopee's Master Plan will be regularly reviewed and updated as necessary to efficiently and cost-effectively respond to the long-term needs of system and all Utility customers. In addition, Shakopee planning for future service area growth will incorporate the following:

- Shakopee's long range master planning will be consistent with the City's adopted current and future Land Use Planning documents.
- Considerations will be included for sizing future transmission mains for areas outside of the current adopted Land Use Plan.
- Acquire adequate land for future water supply, treatment or storage facilities based on Shakopee's master plan recommendations.
- Provide adequate space for Shakopee building additions or expansions to supply, treatment, and/or storage facilities. Consider providing building space in new designs for anticipated future facility expansion.
- Plan to support future population growth with a sustainable, quality water source, utilizing treatment when necessary.

SYSTEM REDUNDANCY AND RELIABILITY

For Shakopee to serve its customers and protect the public welfare, the Shakopee system facilities, equipment and distribution systems must be reliable under all operating conditions. Reliability of water utility service comprises a large part of Shakopee's investment in plant and equipment. Several basic conditions that Shakopee follows to enhance service reliability include the following:

- Provide backup power generation installed at critical supply wells to provide at least firm average day demand.
- Provide backup proper generation at large capacity wells.
- Provide adequate ground and elevated storage:
    - To meet peak hour demands in excess of supply pumping capacity
    - For fire protection needs
    - For other emergencies or facility and/or power outages
    - To take advantage of off-peak purchased power costs
- Require looping of water mains wherever possible to improve customer service reliability, fire protection and water quality.
- Provide latest technology supervisory control and data acquisition (SCADA) system to enhance control and monitoring of critical Shakopee functions and operations, and minimize emergency response times.
- Additional SCADA improvements may be pursued to streamline existing system reporting efforts.

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Table F-1
Pumping Capacity & Storage Analysis for Entire System

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Maximum Day Demand (mgd)[1]	18.4	21.3	24.0
Average Day Demand	6.6	7.7	8.7
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	2,750,000	3,200,000	3,600,000
Fire Protection Volume (gallons)[5]	630,000	630,000	630,000
Reserve Volume (1/2 of Average Day)	3,316,000	3,854,000	4,333,000
Recommended Total Volume (gallons)	*6,696,000*	*7,684,000*	*8,563,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[7]	550,000	180,000	(150,000)
Tank 1	1,000,000	1,000,000	1,000,000
Tank 2	250,000	250,000	250,000
Tank 3	1,500,000	1,500,000	1,500,000
Tank 4	500,000	500,000	500,000
Tank 5	2,000,000	2,000,000	2,000,000
Tank 6	2,000,000	2,000,000	2,000,000
Tank 7	2,000,000	2,000,000	2,000,000
Total Existing Volume Available (gallons)	*9,250,000*	*9,250,000*	*9,250,000*
Water Storage Mass Balance	2,554,000	1,566,000	687,000
Additional Storage Recommended (gallons)	**None**	**None**	**None**

1. Additional firm pumping capacity may be recommended if the maximum day demand exceeds the existing firm pumping capacity.
2. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential dirunal curves were assumed with a peaking factor of 1.65.
3. Fire Protection storage was calcuated based on one fire of 3,500 gpm for 3 hours.
4. Reserve Volume is recommended to provide supply in event of a power outage
5. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

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Table F-2
Supply Capacity into Normal Zone

Well Name	Pressure Zone	Unique Well Number	Depth (ft)	Rated Capacity (gpm)	Normal Operational Capacity (gpm)	Daily Capacity (MGD)
Well 2	Normal	206803	0.43228	300	300	0.43
Well 3	Normal	205978	1.29683	900	900	1.30
Well 4	Normal	206854	1.0317	716	716	1.03
Well 5	Normal	206855	1.22478	850	850	1.22
Well 6	Normal	180922	1.69308	1175	1175	1.69
Well 7	Normal	415975	1.58501	1100	1100	1.59
Well 8	Normal	500657	1.58501	1100	1100	1.59
Well 10	Normal	578948	1.62104	1125	1125	1.62
Well 15	Normal	694921	1.65706	1150	1150	1.66
Well 16	Normal	731139	2.08934	1450	1450	2.09
Well 17	Normal	731140	2.01729	1400	1400	2.02
				Total	**11,266**	**16.2**
					Highest Yielding Well (Well No. 16)	**2.1**
					Firm Capacity (Minus Well No. 16)	**14.1**

Table Notes:

Source: City Records

Table F-3
Supply & Storage Analysis for Main Zone Dependencies

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Maximum Day Demand (mgd)[1]	12.77	13.93	14.97
Average Day Demand (mgd)	4.62	5.04	5.41
Existing Firm Supply Capacity (mgd)[2]	14.14	14.14	14.14
Firm Supply and/or Interzone Transfer Capacity Mass Balance (mgd)[3]	**1.37**	**0.21**	**-0.82**
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	1,920,000	2,090,000	2,250,000
Reserve Storage (1/2 AD)	2,308,000	2,518,000	2,704,000
Fire Protection Volume (gallons)[5]	630,000	630,000	630,000
Preliminary Recommended Total Volume (gallons)	*4,858,000*	*5,238,000*	*5,584,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[7]	170,000	30,000	(100,000)
Tank 1	1,000,000	1,000,000	1,000,000
Tank 2	250,000	250,000	250,000
Tank 3	1,500,000	1,500,000	1,500,000
Tank 5	2,000,000	2,000,000	2,000,000
Tank 6	2,000,000	2,000,000	2,000,000
Total Existing Volume Available (gallons)	*6,750,000*	*6,750,000*	*6,750,000*
Storage or Pumping Volume Mass Balance (gallons)[3]	**1,892,000**	**1,512,000**	**1,166,000**
Additional Storage Recommended (gallons)	**None**	**None**	**None**

1. Includes Normal Zone and East Zone
2. See Table 5-1
3. A positive value represents a surplus. A negative valve represents a deficiency.
4. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential diurnal curves were assumed with a peaking factor of 1.65.
5. Fire Protection storage was calculated based on one fire of 3,500 gpm for 3 hours.
6. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

Table F-4
Supply Capacity into First High Zone

Well/Supply Name	Unique Well Number	Normal Operational Capacity (gpm)	Allowed Pumping Time per Day (Hours)	Daily Capacity (MGD)
Well No.12	626775	810	24	1.17
Well No.13	674456	1,036	24	1.49
Well No.14	694904	381	24	0.55
Well No.20	722624	1,142	24	1.64
Well No.21	722625	1,175	24	1.69
VC Booster		1,000	24	1.69
W9 Booster		1,000	24	1.69
Total		**6,544**	**--**	**9.93**
Highest Yielding Well (Well No. 21)				**1.69**
Firm Capacity (Minus Well No. 21)				**8.24**

Table Notes:

Source: City Records

Table F-5
Supply & Storage Analysis for 1st High Zone Dependencies

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Maximum Day Demand (mgd)[1]	4.36	4.99	5.54
Average Day Demand (mgd)	1.58	1.80	2.00
Existing Firm Supply Capacity (mgd)[2]	8.24	8.24	8.24
Firm Supply and/or Interzone Transfer Capacity Mass Balance (mgd)[3]	**3.87**	**3.25**	**2.69**
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	650,000	750,000	830,000
Reserve Storage (1/2 AD)	788,000	901,000	1,002,000
Fire Protection Volume (gallons)[5]	630,000	630,000	630,000
Recommended Total Volume (gallons)	*1,588,000*	*1,871,000*	*2,122,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[6]	480,000	410,000	340,000
Tank 4	500,000	500,000	500,000
Tank 7	2,000,000	2,000,000	2,000,000
Total Existing Volume Available (gallons)	*2,500,000*	*2,500,000*	*2,500,000*
Storage or Pumping Volume Mass Balance (gallons)[3]	**912,000**	**629,000**	**378,000**

1. Includes First High and both Second High Zones.
2. See Table 5-1.
3. A positive value represents a surplus. A negative valve represents a deficiency.
4. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential diurnal curves were assumed with a peaking factor of 1.65.
5. Fire Protection storage was calculated based on one fire of 3,500 gpm for 3 hours.
6. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

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Table F-6
Pumping Capacity into 2nd High Central Zone

Pump Name	Normal Operational Capacity (gpm)	Daily Capacity (MGD)
Valley Creek 1	1,000	1.44
Valley Creek 2	1,000	1.44
Total	**2,000**	**2.88**
	Largest Pump	**1.44**
	Firm Capacity (Largest Pump)	**1.44**

Table Notes: Shakopee does not have any water treatment.

Source: City Records

Table F-7
Supply & Storage Analysis for 2nd High Central Zone

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Maximum Day Demand (mgd)[1]	0.27	0.40	0.50
Average Day Demand (mgd)	0.10	0.14	0.18
Existing Firm Supply Capacity (mgd)[2]	1.44	1.44	1.44
Firm Supply and/or Interzone Transfer Capacity Mass Balance (mgd)[3]	**1.17**	**1.04**	**0.94**
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	40,000	60,000	80,000
Reserve Storage (1/2 AD)	50,000	72,000	91,000
Fire Protection Volume (gallons)[5]	300,000	300,000	300,000
Recommended Total Volume (gallons)	*240,000*	*302,000*	*351,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[6]	150,000	130,000	120,000
No Storage			
Total Existing Volume Available (gallons)	*500,000*	*500,000*	*500,000*
Storage or Pumping Volume Mass Balance (gallons)[3]	**260,000**	**198,000**	**149,000**

1. See Table 4-6
2. See Table 5-1.
3. A positive value represents a surplus. A negative valve represents a deficiency.
4. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential diurnal curves were assumed with a peaking factor of 1.65.
5. Fire Protection storage was calculated based on one fire of 2,500 gpm for 2 hours.
6. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

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Table F-8
Pumping Capacity into 2nd High West Zone

Pump Name	Normal Operational Capacity (gpm)	Daily Capacity (MGD)
Windermere 1	1,000	1.44
Windermere 2	1,000	1.44
Well No. 23	800	1.15
Total	**2,800**	**4.03**
	Largest Pump	**1.44**
	Firm Capacity (Largest Pump)	**2.59**

Table Notes:

Source: City Records

Table F-9
Supply & Storage Analysis for 2nd High West Zone

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Maximum Day Demand (mgd)[1]	1.14	2.13	3.02
Average Day Demand (mgd)	0.41	0.77	1.09
Existing Firm Supply Capacity (mgd)[2]	2.59	3.74	4.32
Firm Supply and/or Interzone Transfer Capacity Mass Balance (mgd)[3]	**1.45**	**1.61**	**1.31**
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	170,000	320,000	450,000
Reserve Storage (1/2 AD)	205,000	385,000	544,000
Fire Protection Volume (gallons)[5]	300,000	300,000	300,000
Recommended Total Volume (gallons)	*495,000*	*803,000*	*1,131,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[6]	180,000	202,000	163,000
No Storage			
Total Existing Volume Available (gallons)	*750,000*	*750,000*	*750,000*
Storage or Pumping Volume Mass Balance (gallons)[3]	**255,000**	**-53,000**	**-381,000**

1. See Table 4-6
2. Assumes addition of booster stations and supply wells
3. A positive value represents a surplus. A negative valve represents a deficiency.
4. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential diurnal curves were assumed with a peaking factor of 1.65.
5. Fire Protection storage was calculated based on one fire of 2,500 gpm for 2 hours.
6. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

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Table F-10

Pumping Capacity into 2nd High West + Central Zone

Pump Name	Normal Operational Capacity (gpm)	Daily Capacity (MGD)
Windermere 1	1,000	1.44
Windermere 2	1,000	1.44
Well No. 23	800	1.15
Valley Creek 1	1000	1.44
Valley Creek 2	1000	1.44
Total	**4,800**	**6.91**
	Largest Pump	**1.44**
	Firm Capacity (Largest Pump)	**5.47**

Table Notes:

Source: City Records

Table F11
Supply & Storage Analysis for 2nd High West + Central Zones

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Maximum Day Demand (mgd)[1]	1.41	2.53	3.52
Average Day Demand (mgd)	0.51	0.91	1.27
Existing Firm Supply Capacity (mgd)[2]	5.47	5.47	5.47
Firm Supply and/or Interzone Transfer Capacity Mass Balance (mgd)[3]	**4.06**	**2.94**	**1.95**
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	210,000	380,000	530,000
Reserve Storage (1/2 AD)	255,000	456,000	635,000
Fire Protection Volume (gallons)[5]	300,000	240,000	240,000
Recommended Total Volume (gallons)	*255,000*	*708,000*	*1,161,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[6] No Storage	510,000	368,000	244,000
Total Existing Volume Available (gallons)	*1,250,000*	*1,250,000*	*1,250,000*
Storage or Pumping Volume Mass Balance (gallons)[3]	**995,000**	**542,000**	**89,000**

1. See Table 4-6
2. Assumes addition of booster stations and supply wells
3. A positive value represents a surplus. A negative valve represents a deficiency.
4. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential diurnal curves were assumed with a peaking factor of 1.65.
5. Fire Protection storage was calculated based on one fire of 2,500 gpm for 2 hours.
6. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

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Table F-12
Pumping Capacity into East Zone

Pump Name	Normal Operational Capacity (gpm)	Daily Capacity (MGD)
River View 1	1,000	1.44
River View 2	1,000	1.44
Total	**2,000**	**2.88**
	Largest Pump	**1.44**
	Firm Capacity (Largest Pump)	**1.44**

Table Notes:

Source: City Records

Table F-13
Supply & Storage Analysis for East Zone

	Design Demand Year		
Pumping Capacity Analysis	**2025**	**2035**	**2045**
Maximum Day Demand (mgd)[1]	0.23	0.30	0.37
Existing Firm Supply Capacity (mgd)[2]	1.44	1.44	1.44
Firm Supply and/or Interzone Transfer Capacity Mass Balance (mgd)[3]	**1.21**	**1.14**	**1.07**
Recommended Storage Volume			
Maximum Day Equalization Volume (gallons)[4]	30,000	50,000	60,000
Fire Protection Volume (gallons)[5]	180,000	180,000	180,000
Recommended Total Volume (gallons)	*60,000*	*90,000*	*110,000*
Existing Storage & Pumping Volume			
Surplus Firm Pump Volume (gallons)[7] No Storage	150,000	140,000	130,000
Total Existing Volume Available (gallons)	*150,000*	*140,000*	*130,000*
Storage or Pumping Volume Mass Balance (gallons)[3]	**90,000**	**50,000**	**20,000**

1. See Table 4-6
2. One pump offline
3. A positive value represents a surplus. A negative valve represents a deficiency.
4. Maximum Day Equalization Volume is the projected maximum volume depletion during the peak hours of the maximum day assuming the pumping rate into the service zone is equal to the maximum day demand rate. Typical residential diurnal curves were assumed with a peaking factor of 1.65.
5. Fire Protection storage was calculated based on one fire of 1,500 gpm for 2 hours.
6. Surplus Firm Pump Volume is the difference between maximum day demand and Firm Pumping Capacity which is available to supplement fire protection for 3 hours.

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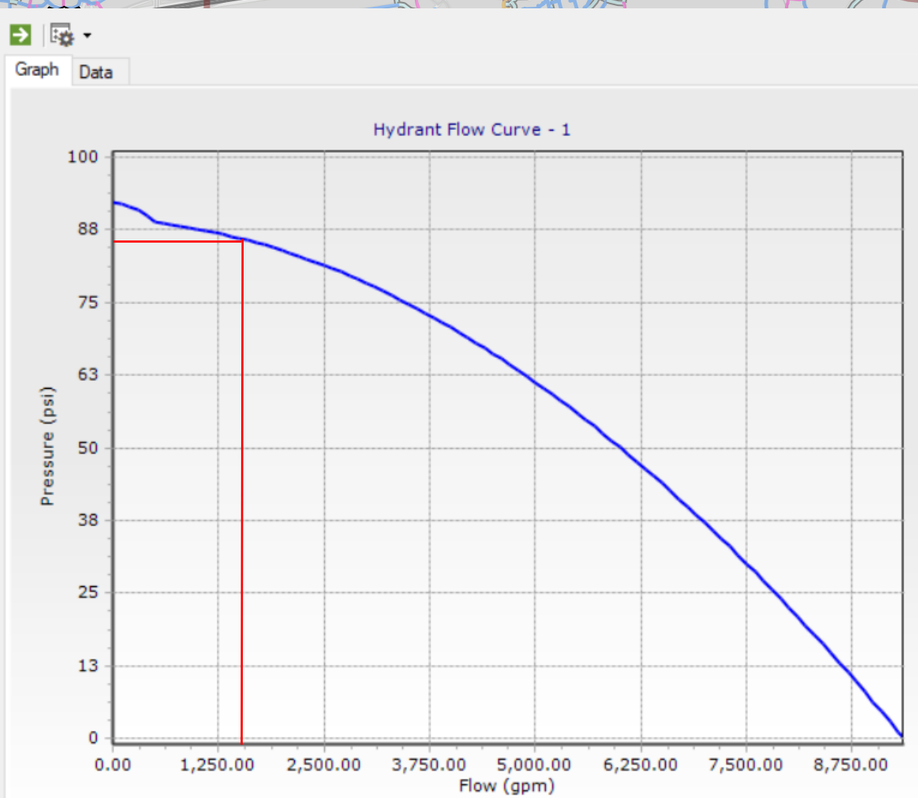
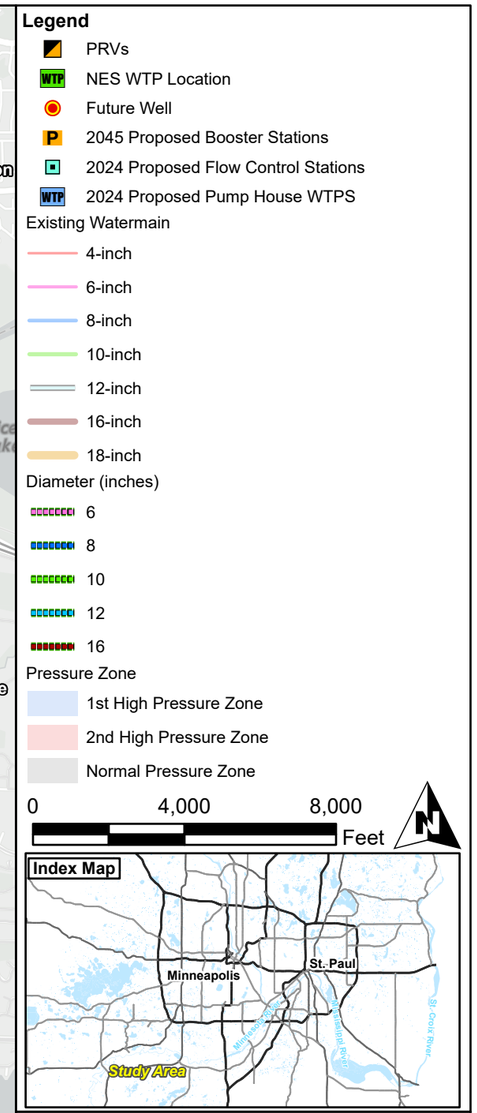
Appendix G

Large Water User Modeling and Planning

Simulated 2 MGD Demand Location





Large Format Water User Impacts

2024 Comprehensive Water Plan Update Shakopee, Minnesota

SEH

Print Date: 7/31/2024

Map by: hschumacher
Projection: UTM Zone 15N
Source: ESRI, SEH Digi, MnDOT, Minnesota Geologic Survey (MGS), Scott County

C1

Path: X:\PTS\SH\PUC\177653\4-prelim-dsgn-rpts\Data from Client\SPUWaterDistribution\SPUWaterDistribution_Map\SPUWaterDistribution_Map.aprx

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September 3, 2024

TO: Greg Drent, General Manager

FROM: Sharon Walsh, Director of Marketing, Key Accounts and Special Projects

SUBJECT: AMI Water Meter Installations – Actions for Failure to Install

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Overview

In February 2023 the Commission approved the **Access to SPU-Owned Equipment Policy** (see attached). This policy addressed customers who refuse SPU access to their property for the maintenance, removal, exchange, reading and/or repair of SPU-owned equipment. After several months of meter installations, we have had very few formal refusals, but are experiencing customers who have failed to respond to requests for scheduling appointments for various reasons.

- Three notices have been mailed to service addresses, addressed to 'Current SPU Customer'. This was to aid in postal delivery should occupancy at a service address change.
- Most recently, door hangers were given to those customers who did not respond to the three mailings. Staff is working through this process as resources are available. *This was an added step before making phone calls.*
- Prior to the door hangers being distributed a facebook post was published to generate awareness for the door hangers and gain community support and understanding of our process (see attached). This post explained why we needed customers to schedule the changeout and what would happen if they didn't within 14 days of receiving the door hanger. We attempted to appeal to a sense of neighborhood and responsibility to peers.
- Auto-generated phone calls will begin 14 days after the door hanger was distributed if no appointment has been made.
- Customers failing to make scheduled appointments after this step will be assessed a $100/month penalty according to policy.

As of August 28th, there were 370 residential customers identified from Phases I-IV that are non-compliant. This is a non-compliance rate of approximately 10%. Notices for these four phases were mailed between the end of March and the beginning of July.

Action Requested

No further action is requested, unless the Commission is requesting any change in policy based on the information supplied above.

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ATTACHMENT #1

February 23, 2023

TO: Greg Drent, General Manager

FROM: Sharon Walsh, Director of Marketing, Key Accounts and Special Projects

SUBJECT: Access to SPU-Owned Equipment – Policy Violation Penalty Process

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Overview

The following defines SPU's penalty policy for customers who refuse SPU access to their property for the maintenance, removal, exchange, reading and/or repair of SPU-owned equipment. Refusal to grant access is in violation of SPU's electric and water policies. Policy manuals will be updated with verbiage that communicates a consequence for violation of policy, including penalty and possible disconnection of service.

- Prior to assessing a penalty, multiple communications* will be made in writing to the customer in violation. If customer is still in violation of policy following written communications, efforts will be made to contact the customer by phone. Following two attempts without successful compliance, a final written document will be sent to the customer indicating the start date of a monthly penalty to their billing statement and possible disconnection of service.
- The penalty will be assessed for three consecutive monthly billings or until the customer is in compliance with SPU policy. (If the customer schedules access, the penalty will pause/stop unless access is not granted at the scheduled time.)
    - One month of penalties will be waived if customer is compliant within three months.
- If the customer does not comply within the three-month penalty period (which would end on the due date of the third billing statement with the penalty assessed), the customer's service will be disconnected.
    - Inclement weather conditions will be considered before disconnection occurs.
- The proposed penalty is $100 per month. This penalty will be added to SPU's fee schedule for annual publication and staff review.

*For AMI meter exchange purposes, attached are the three notices that will be sent to SPU water meter customers. If customers do not respond to these notices (i.e., schedule an appointment) over the course of approximately 30 days, this information will be supplied to SPU for future phone call attempts.

Action Requested

Staff is requesting commission approve this Access to SPU-Owned Equipment Policy.

SPU
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Shakopee, Minnesota 55379
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ATTACHMENT #2

Facebook Post – Wednesday, August 28th

Check Your Front Door - there may be a door hanger for you!

If you have not responded to the mailings sent to you regarding your water meter exchange*, please help us complete this project in your neighborhood.

Most customers have made appointments and we are able to utilize the new meter technology - thank you!

However, if even a few customers don't complete the meter exchange we need to send meter readers out to obtain readings. Due to time, resources and costs, we will not be able to sustain this and will need to estimate usage rather than manually read your meter. This could affect your billing, including monthly penalties.

If you receive a door hanger, please call the number indicated within 14 days of receipt. Thank you for your attention to this matter.

View the installation progress on our website. There is a slider on the home page (below the large photo).

Click there and select Water Meter Exchange Maps for this application. If you are a random red box in a sea of blue stars you need to make an appointment.

*If you have not received a mailing it means we have not yet reached your neighborhood or specific reading route. It will be coming!

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SHAKOPEE PUBLIC UTILITIES
MEMORANDUM

TO: Greg Drent, General Manager

FROM: Joseph D. Adams, Planning & Engineering Director

SUBJECT: Jackson Township Park Water Service Request by City of Shakopee

DATE: September 5, 2024

ISSUE

The City of Shakopee is requesting a water service be installed in Jackson Township on the site of the Jackson Town Hall parcel for the purpose of providing drinking water in a park facility to be owned and maintained by the City of Shakopee.

BACKGROUND

To date the municipal water system has not yet provided service outside the city limits save for a few interconnections with the City of Savage to facilitate exchanging water under emergencies.

The Commission has previously adopted a special policy with the adoption of the attached Resolution #814 concerning City of Shakopee parks requesting water service.

The existing water main on the town hall parcel was installed with construction of the adjacent residential development of Highview Park 1st Addition by the developer DR Horton for the purpose of providing a second source of the water (looping) to Highview Park 1st Addition in addition to the trunk water main installed in Zumbro Avenue. At the time of plan approval there was no mention of plans to request water service within the Jackson Township town hall property.

DISCUSSION

There is nothing known to staff preventing SPU from providing water service outside city limits. The existing interconnections with the City of Savage were arranged through a joint powers'

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agreement. This service would be to the City of Shakopee but be located outside the city limits. Given the existence of the orderly annexation agreement between the city and township it is presumed eventually the parcel will be annexed into the city.

The Commission may choose to direct staff to follow the policy established for all City of Shakopee parks water service requests while noting an exception is being made since the location is not within city limits. The policy in place would treat a single drinking fountain without any irrigation as a "minimal and seasonal" use that is exempt from both a Trunk Water Charge and a Water Capacity Charge.

The only other issue to discuss is what if any effect this request has on the adjacent development's Trunk Water Oversizing credit? When initially calculating the trunk watermain oversizing credit staff included the portion of the township parcel area that the water main passed through (the west half which measures approximately ¼ mile east to west) when determining the north to south flow requirements for the residential development. The developer's representative objected since that area is not included in their plat since they do not own that parcel. Staff then recalculated the estimated oversizing credit without the town hall area but with credit to the developer for the 8-inch watermain flow through the parcel.

Now that water service is being requested within the town hall parcel staff believes that either the parcel area the water main passes through should be included in the oversizing credit calculation or the flow benefit from the 8-inch water main should not be. In either case it affects the amount of trunk water main oversizing SPU would credit to the developer. The difference in the credit amount is approximately $10,000 out of the previously approved estimated amount of $265,378.95 by Resolution #2023-24.

One option would be to reduce the trunk watermain oversizing credit to the developer as described above.

A second option would be to require the city park project to absorb the difference in the credit, but that would mean having the City of Shakopee reimburse SPU for a credit paid to the developer of the adjacent plat.

A third option would be to allow the park water service and decide there is no effect on the trunk watermain oversizing credit to the developer leaving the town hall parcel out of the calculation but continue to include the 8-inch watermain flow across the parcel.

RECOMMENDATIONS

Staff recommends the Commission approve the water service consistent with the provisions in Resolution #814.

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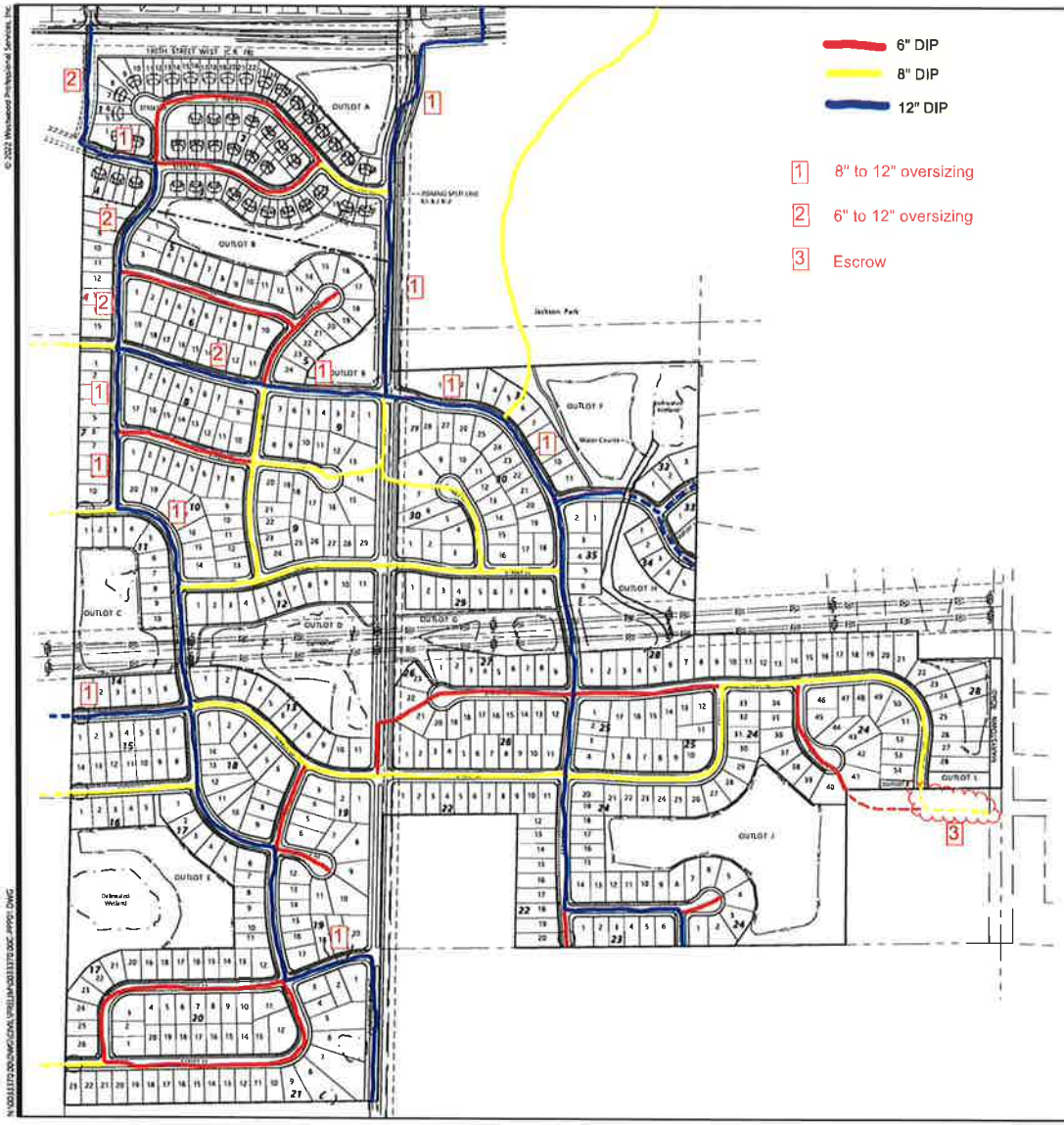
Staff recommends that the ultimate amount of trunk water oversizing to be paid for Highview Park 1st Addition be adjusted to either include the parcel area of the west half of the Jackson town hall parcel or the watermain passing through the park land not be credited for flow when doing the oversizing calculation. The practical effect would be the same and the credit paid would be that much less.

REQUESTED ACTIONS

1. Staff requests the Commission approve the requested water service to the City of Shakopee park facilities on the Jackson Township property consistent with other city parks per Resolution #814.

2. Staff requests the Commission provide direction to staff on resolving the issue of trunk water oversizing credit for Highview Park 1st Addition.



PROPERTY DESCRIPTION

SEE EXISTING CONDITIONS SHEET FOR PROPERTY DESCRIPTIONS

SITE DEVELOPMENT DATA

• EXISTING GUIDING	SUBURBAN RES & SUBURBAN EDGE RES
• EXISTING ZONING	UER (JACKSON TWSHP)
• PROPOSED ZONING	R1-B & R-2

NET SITE AREA TABLE	R1-B AREA	R-2 AREA	OVERALL
• GROSS SITE AREA	210.14± AC	26.75± AC	236.89± AC
MAJOR R/W (CSAH 78)	N/A	4.71 AC	4.71 AC
MAJOR R/W (ZUMBRO AVE)	6.12 AC	0.76 AC	6.88 AC
EXISTING WETLANDS TO REMAIN	4.42 AC	N/A	4.42 AC
PONDING HWL	23.20 AC	3.80 AC	27.00 AC
• NET SITE AREA	175.40AC	17.48 AC	193.88 AC
• HOUSING PRODUCT BREAKDOWN:			
60' SINGLE FAMILY LOTS	178 LOTS	N/A	
65' SINGLE FAMILY LOTS	331 LOTS	N/A	
TWINHOMES	N/A	92 UN	
TOTAL HOMES	509 LOTS	92 UN	601 UN
• DENSITY BREAKDOWN:			
NET DENSITY (LOTS / NET SITE AC)	2.89 UN/AC	5.26 UN/AC	3.10 UN/AC
• STREET R/W	49.75 AC		

(INCLUDES ZUMBRO, MARYSTOWN, 130TH STREET & INTERIOR R/W)

LOT STANDARDS

STANDARD	R-1B ZONING DISTRICT	60' & 65' SF	R-2 ZONING TWINHOMES
MINIMUM LOT AREA	none listed	7,449 SF	4,126 SF PROVIDED
AVERAGE LOT AREA	-	10,411 SF	5,063 SF PROVIDED
MINIMUM LOT WIDTH	60' @ 30' SBS	60'/65' @ 30' SBS	31' PER UN / 70' TOT
MINIMUM CORNER WIDTH	80	70'/75' @ 30' SBS	54' @ 30' SBS
MINIMUM LOT DEPTH	100'	125'	100'
SETBACKS			
FRONT	25'	25'	15'
SIDE INTERIOR LOT	5'/15' TOTAL	5'/15' TOTAL	10'/30' TOTAL
SIDE CORNER LOT	25'	25'	25'
REAR	30'	30'	AS SHOWN

OUTLOT TABLE

OUTLOT	USE	OWNERSHIP	GROSS AREA
A	PONDING	HOA	2.97 AC
B	PONDING	HOA	5.55 AC
C	PONDING	HOA	4.13 AC
D	WETLAND / OPEN SPACE	HOA	8.46 AC
E	WETLAND / PONDING	HOA	7.85 AC
F	WETLAND / PONDING	HOA	6.89 AC
G	PONDING	HOA	3.54 AC
H	PONDING	HOA	4.15 AC
I	FUTURE DEVELOPMENT	DEVELOPER	9.21 AC
J	PONDING	HOA	9.58 AC
K	FUTURE DEVELOPMENT	DEVELOPER	0.11 AC
L	FUTURE DEVELOPMENT	DEVELOPER	0.42 AC

SITE LEGEND

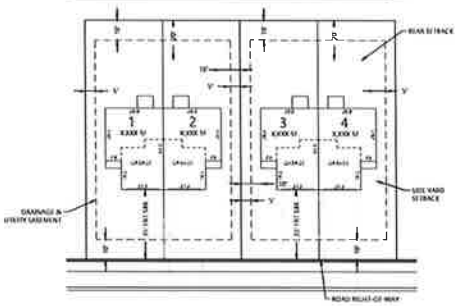
EXISTING	PROPOSED	
		PROPERTY LINE
		LOT LINE
		SETBACK LINE
		EASEMENT LINE
		CURB AND GUTTER
		POND HIGH WATER LEVEL
		RETAINING WALL
		DELINEATED WETLAND

DEVELOPMENT NOTES

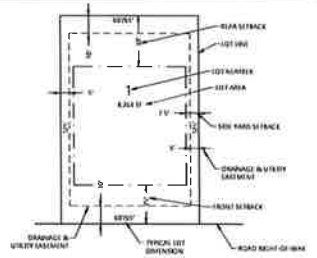
Call 48 Hours before digging
811 or call811.com
Common Ground Alliance

1. ALL LOT DIMENSIONS ARE ROUNDED TO THE NEAREST FOOT.
2. ALL AREAS ARE ROUNDED TO THE NEAREST SQUARE FOOT.
3. STREET NAMES ARE SUBJECT TO APPROVAL BY THE CITY.
4. DRAINAGE AND UTILITY EASEMENTS SHALL BE PROVIDED AS REQUIRED. DRAINAGE AND UTILITY EASEMENTS WILL BE PROVIDED OVER ALL PUBLIC UTILITIES AND UP TO 1 FOOT ABOVE THE HIGH WATER LEVEL OF ALL PONDS.
5. STREET WIDTHS ARE SHOWN FROM BACK OF CURB TO BACK OF CURB.

TYPICAL TWINHOME LOT DETAIL



TYPICAL SINGLE FAMILY (SF) LOT DETAIL



1" = 250'
0' 250' 500' 750'

PRELIMINARY PLANS

HIGHVIEW PARK

DESIGNED
CHECKED
DRAWN
HORIZONTAL SCALE: AS SHOWN
VERTICAL SCALE: N/A

INITIAL ISSUE 01/30/23

REVISIONS		
△	INITIALS	CITY COMMENTS
△		
△		
△		

PREPARED FOR:
DR HORTON, INC. - MINNESOTA
20880 KENRIDGE COURT, SUITE 100
LAKEVILLE, MINNESOTA 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA

CORY MEYER
DATE 03/13/23 LICENSE NO. 26971

HIGHVIEW PARK
SHAKOPEE, MINNESOTA

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

OVERALL PRELIMINARY PLAT

PROJECT NUMBER: 0033370.00

SHEET NUMBER 7 OF 119

DATE 03/13/23

RESOLUTION #814

A RESOLUTION CLARIFYING THE APPLICATION OF EXISTING STANDARD WATER CHARGES AND POLICIES TO CITY PARKS

WHEREAS, the Shakopee Public Utilities Commission has previously adopted its Water Policy Manual containing the standard charges and requirements that shall apply to all water service requests, and

WHEREAS, the standard charges and requirements, whose purpose is to ensure an equitable sharing among water users of the costs to construct and extend the water system, include (among other items) payment of a Trunk Water Charge (TWC), payment of a Water Connection Charge (WCC), and adherence to certain Lateral Water Main (LWM) design criteria, and

WHEREAS, the Shakopee Public Utilities Commission is determined to clarify the application of the existing standard water charges and policies to requests for water service within city parks, specifically the TWC, WCC, and the LWM design criteria, and

WHEREAS, after carefully considering the need to balance the impact on water system components brought on by water service requests within city parks and the varying levels and characteristics of water service requests within city parks which are due in part to the unique nature of city parks, and

WHEREAS, after due consideration of the unique relationship that exists between the Shakopee Public Utilities Commission and the City of Shakopee,

NOW THEREFORE, BE IT RESOLVED, that all standard water charges and policies shall apply to water service requests within city parks with specific clarification and modification as follows:

WCC

1. The standard WCC shall apply to all new water service requests within city parks.

TWC

2. The Commission hereby exempts city parks with only minimal and seasonal water use from the TWC. For the purpose of this exemption only, drinking fountains and cooling "misters" shall be deemed to fall under the definition of minimal and seasonal use.
3. The standard TWC shall apply where park facilities consist of more intensive uses such as the Community Center.
4. A modified TWC shall apply when city park facilities are a mix of large open spaces and a structure or structures housing rest rooms or concessions. The TWC shall apply to a portion of the park area, defined by the Commission on a case-by-case basis that equates to the minimum size parcel that would be necessary to support the proposed structure under the city code requirements, plus any and all areas that are irrigated via the water service from the public water system.

LWM

5. The LWM requirements for city parks shall be met as necessary to receive service using the same design criteria as for other developments, unless specifically exempted in whole or in part by the Commission, and

BE IT FURTHER RESOLVED, that all things necessary to carry out the terms and purpose of this Resolution are hereby authorized and performed.

Passed in regular session of the Shakopee Public Utilities Commission, this 1st day of August, 2005.

John Engler

Commission President: John Engler

ATTEST:

Kent Archerd

Commission Secretary: Kent Archerd

Shakopee Public Utilities

PO Box 470 • 255 Sarazin Street
Shakopee, Minnesota 55379
Main 952.445-1988 • Fax 952.445-7767
www.shakopeeutilities.com

SHAKOPEE PUBLIC UTILITIES
MEMORANDUM

TO: Greg Drent, General Manager

FROM: Joseph D. Adams, Planning & Engineering Director

SUBJECT: Request to Authorize Use of Reclaimed Water in Car Wash

DATE: September 5, 2024

ISSUE

Take Five Car Wash is requesting permission to utilize reclaimed water in their new automated car wash in the Southbridge area.

BACKGROUND

Reclaimed water use is not currently prevalent in Shakopee. There are contamination concerns like cross connections and backflow, but there are controls that properly employed and maintained will protect the water supply.

DISCUSSION

Attached is an application form that can be submitted with the required attachments for the Met Council to consider. If approved the applicant would save on their SAC unit determination for their SAC and WCC fees. Also, their water use would be less and that promotes conservation.

One of the required attachments is a letter from the community supporting the application and that necessary inspections and record keeping will be maintained.

Staff will work with City staff to create the letter described in the Met Councl application and make the necessary commitments.

REQUESTED ACTION

Staff requests the Commission authorize the General Manager to proceed as described above and direct staff to update the Water Policy Manual to incorporate the requirements to allow reclaimed water to use in certain acceptable situations.

Metropolitan Council | Environmental Services
390 Robert Street North
St. Paul, Minnesota 55101-1805
651.602.1770 | 651.602.1030 fax

Sewer Availability Charge (SAC)
2024 RECLAIM CAR WASH SYSTEMS

Business Name: _____

Business Site Address: _____

Community Name: _____

Car Wash Type: ☐ Rollover -or- ☐ Conveyor/Tunnel

PLEASE SUBMIT ALL ITEMS LISTED BELOW IN ORDER TO BE CONSIDERED FOR RECLAIM.

A) Letter from the Community stating:

1. The community is willing to do an initial inspection of the facility to ensure the equipment is installed so that no cross-connections or bypass feature exists that would allow the wash system to function without the use of reclaim water.
2. The community will periodically inspect the facility or hire an independent plumber at the owner's expense, to ensure the reclaim equipment is being utilized properly and no bypass or cross-connections exist between the fresh water line and the reclaim water lines.
3. The community will provide water usage records to MCES upon request.

B) Letter from the Business Owner stating:

1. The business owner is committed to continued use of the reclaim process.
2. The facility will not, and cannot, operate without the reclaim system.
3. The business owner will, if asked by the city, pay for an independent plumber to inspect the facility.

C) Detailed plumbing plans that show/highlight **(PLEASE LABEL EACH ITEM ON PLAN)**:

1. Reclaim tanks
2. Method of connection to sanitary sewer
3. Location and size of reclaim supply line
4. Location, elevation, and size of interconnection(s) between tanks
5. Freshwater supply line from the entrance into building to equipment connections
6. Size of freshwater supply line (should be sized so that it is insufficient to deliver adequate water pressure to operate wash system without reclaim system)
7. Freshwater supply line showing connection to a separate manifold that feeds fresh water only during appropriate cycles
8. Plan must include sufficient detail to show that no cross-connections or bypass features exist which would allow the wash system to function without reclaim water.

D) Water specification sheet showing:

1. Water delivered (gallons per minute) for each piece of equipment and operation cycle (prewash, wash, rinse, etc.) **for each wash type** (e.g. Basic, Deluxe, Super, Super Deluxe, etc.)
2. Identify equipment that uses reclaim water
3. Calculations or specification that give duration (seconds) of each piece of equipment cycle time per vehicle (e.g. undercarriage spray = 10 seconds)

E) Detailed floor plan of wash area that shows and identifies each piece of equipment in wash bay

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DATE: September 3, 2024

TO: Commissioners

FROM: Greg Drent, General Manager

Subject: Organization chart

Software advances through implementing NISC and AMI have influenced a strategic review of SPU's current organizational structure. I am excited to propose a new structure that enhances customer service support and increases operational efficiencies. These changes reflect our commitment to staying agile, responsive, and customer-focused as we continue to grow and evolve.

Key Changes in the New Organizational Chart:

1. **Creation of a Technical Service Supervisor**

   We have established a dedicated technical service supervisor position. The Technical Services area will oversee data analytics, reporting functions, and technical/customer support tickets from an AMI perspective. Technical services will streamline the communication channels and act as the liaison between the service and finance departments. They will ensure that data is effectively analyzed to provide actionable insights and support decision-making processes. The supervisor will facilitate creating and maintaining a centralized knowledge base that includes customer service representatives with quick access to information and solutions—this helps resolve customer issues more efficiently and consistently. Technical services will monitor technical issues like high usage alarms and create service tickets to resolve technical problems promptly and efficiently. By leveraging predictive analytics through the new systems that have been implemented this year, the technical service area can anticipate customer needs and potential problems before they arise, allowing for proactive support and improved customer satisfaction.

2. **Relocation of an operational function – Dispatch/CSR**

   Relocating an operational function to a different department involves transferring job responsibilities and tasks. By moving the SPU dispatch/CSR position out of the electric department and into the customer service/billing area in the finance department, we aim to enhance operational efficiency and customer satisfaction. Having dispatch within customer service allows for centralized knowledge and resource management. CSBR's

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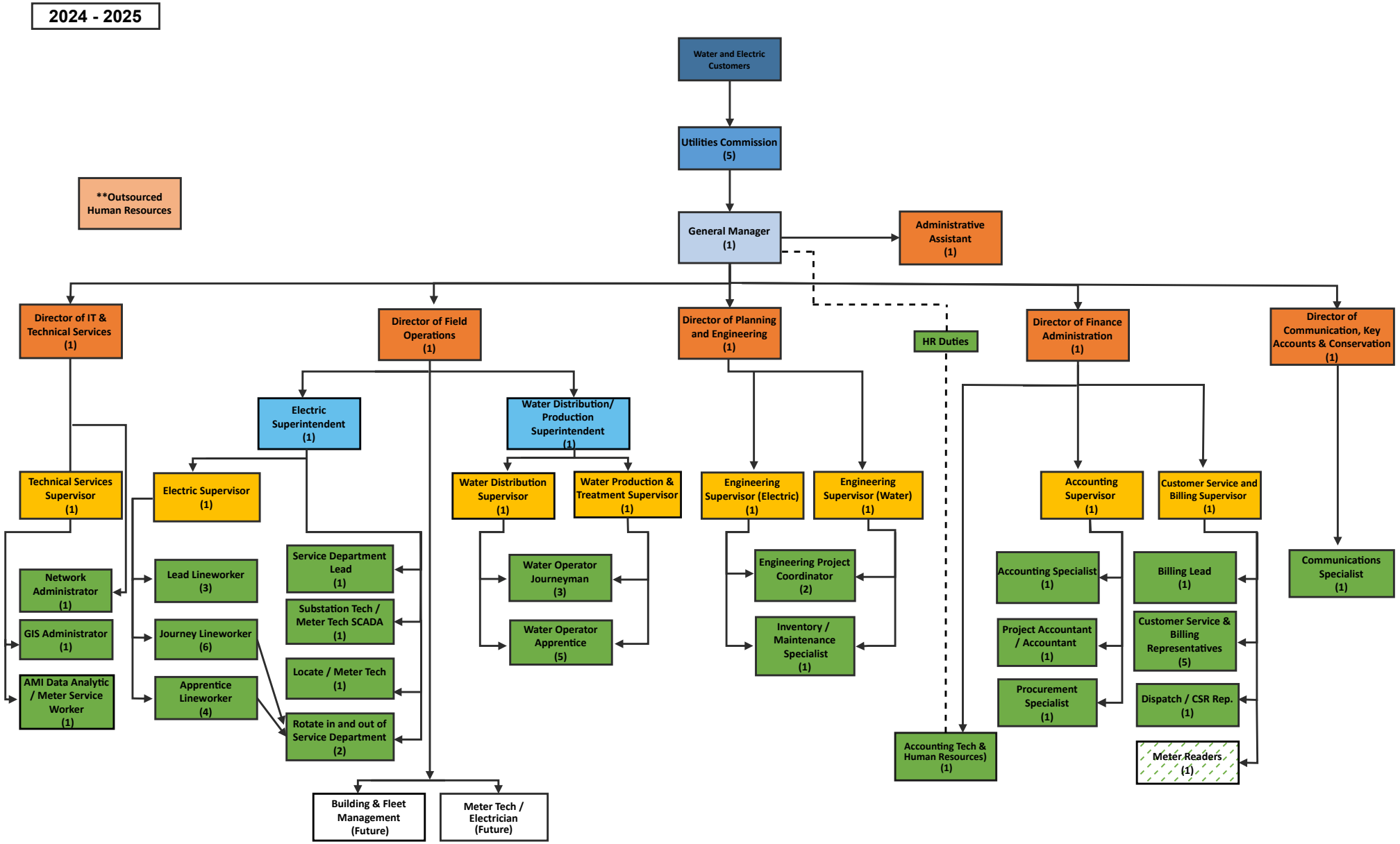
can access dispatch information and vice versa, making it easier to manage schedules, track service requests, and allocate resources effectively. Staff in a combined dispatch and customer service role can be cross-trained, allowing them to handle various tasks and functions. This flexibility improves overall efficiency and reduces the need for specialized roles.

3. Communication Specialist

Reviewing the organizational structure, we discussed our continued challenges with finding dedicated time and resources for our communication processes, focused attention on key accounts, and dedicated oversight of marketing activities. Despite the dedication and efforts of our current structure, these challenges have led to some gaps. To address these gaps, we propose creating a communication specialist position. The addition of this position will deliver several key benefits: Enhanced communication processes to ensure that customers are informed and engaged, focused attention on key account meetings so businesses are informed and supported and dedicated oversight of marketing activities so that we are consistent with our efforts and visible to the community.

If the proposed organizational chart is approved, we will begin rolling out these changes over the next few months. There will be no financial impact on the 2024 budget. The chart includes one additional staff member that will be added in 2025. The 2025 budget will include the associated costs for this new position and be brought to the commission for approval in December. SPU will provide the necessary resources and training to adapt to the new structure.

Action: Approve the attached org chart 2024-2025


2024 - 2025
Water and Electric Customers
Utilities Commission (5)
**Outsourced Human Resources
General Manager (1)
Administrative Assistant (1)
Director of IT & Technical Services (1)
Director of Field Operations (1)
Director of Planning and Engineering (1)
HR Duties
Director of Finance Administration (1)
Director of Communication, Key Accounts & Conservation (1)
Electric Superintendent (1)
Water Distribution/ Production Superintendent (1)
Technical Services Supervisor (1)
Electric Supervisor (1)
Water Distribution Supervisor (1)
Water Production & Treatment Supervisor (1)
Engineering Supervisor (Electric) (1)
Engineering Supervisor (Water) (1)
Accounting Supervisor (1)
Customer Service and Billing Supervisor (1)
Network Administrator (1)
GIS Administrator (1)
AMI Data Analytic / Meter Service Worker (1)
Lead Lineworker (3)
Journey Lineworker (6)
Apprentice Lineworker (4)
Service Department Lead (1)
Substation Tech / Meter Tech SCADA (1)
Locate / Meter Tech (1)
Rotate in and out of Service Department (2)
Water Operator Journeyman (3)
Water Operator Apprentice (5)
Engineering Project Coordinator (2)
Inventory / Maintenance Specialist (1)
Accounting Specialist (1)
Project Accountant / Accountant (1)
Procurement Specialist (1)
Billing Lead (1)
Customer Service & Billing Representatives (5)
Dispatch / CSR Rep. (1)
Meter Readers (1)
Communications Specialist (1)
Accounting Tech & Human Resources) (1)
Building & Fleet Management (Future)
Meter Tech / Electrician (Future)