

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 25-26

TUNNEL AND RESERVOIR PLAN

GLORIA ALITTO MAJEWSKI

CHICAGO UNDERFLOW PLAN RESERVOIR

WATER QUALITY MONITORING WELLS

ANNUAL GROUNDWATER MONITORING REPORT

FOR 2024

July 2025

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

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July 8, 2025

Ms. Joey Logan-Pugh
Chief
Bureau of Water
Illinois Environmental Protection Agency
2520 W. Iles Ave.
P. O. Box 19276
Springfield, IL 62794-9276

Dear Ms. Logan-Pugh:

Subject: Tunnel and Reservoir Plan Gloria Alitto Majewski Chicago Underflow Plan
Reservoir Water Quality Monitoring Wells Annual Groundwater Monitoring
Report for 2024

The report entitled “Tunnel and Reservoir Plan Gloria Alitto Majewski Chicago Underflow Plan Reservoir Water Quality Monitoring Wells Annual Groundwater Monitoring Report for 2024” is attached.

Very truly yours,

Albert Cox, Ph.D.
Environmental Monitoring and Research Manager
Monitoring and Research Department

AC:lf
Attachment
cc: Mr. Ryan Bahr (USEPA Region 5 - WC15J)
Mr. E. Podczerwinski
Dr. H. Zhang
cc w/o att: Mr. P. Desai
Mr. E. Staudacher

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WATER QUALITY MONITORING WELLS
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FOR 2024**

By

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TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	ii
LIST OF FIGURES	iii
LIST OF ABBREVIATIONS	iv
ANNUAL DATA FOR MONITORING WELLS	1
Introduction	1
Summary of Data	1
Monitoring Wells	1

LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
1	Analysis of Chemical and Physical Parameters and Fecal Coliform in Groundwater from Monitoring Wells Adjacent to the Gloria Alitto Majewski Chicagoland Underflow Plan Reservoir of the Tunnel and Reservoir Plan During 2024	3

LIST OF FIGURES

<u>Figure No.</u>		<u>Page</u>
1	Map of Four Water Quality Monitoring Wells and Nine Private Wells Surrounding the Gloria Alitto Majewski Chicago Underflow Plan Reservoir of the Tunnel and Reservoir Plan	2

LIST OF ABBREVIATIONS

Abbreviation	Definition
°C	degrees Celsius
CCD	Chicago City Datum
CFU	colony forming units
Cl ⁻	chloride
Coeff. of Var.	coefficient of variation
EC	electrical conductivity
FC	fecal coliform
IEPA	Illinois Environmental Protection Agency
L	liter
m	meter
mg	milligram
mS	millisiemens
NH ₃ -N	ammonia nitrogen
Std. Dev.	standard deviation
SO ₄ ²⁻	sulfate
TDS	total dissolved solids
Temp.	temperature
TOC	total organic carbon

ANNUAL DATA FOR MONITORING WELLS

Introduction

Four monitoring wells, QK-1 through QK-4, are located on the perimeter of the Gloria Alitto Majewski Chicagoland Underflow Plan Reservoir (Reservoir). Well QK-1 is located at the northwest corner of the Reservoir, with QK-2, QK-3, and QK-4 at the northeast, southeast, and southwest corners, respectively ([Figure 1](#)). In addition, there are nine privately owned water supply wells, W1X through W9X, which are located within 1,000 feet of the Reservoir. The four monitoring wells are sampled quarterly and for at least six consecutive weeks following each Reservoir fill event in which the Reservoir is used to store combined sewer flow from the Metropolitan Water Reclamation District of Greater Chicago's Tunnel and Reservoir Plan system (Illinois Environmental Protection Agency [IEPA] memorandum dated October 14, 1997). Based on the findings of 10-year monitoring from 2013 to 2023 and communication with the IEPA (March 22, 2024), the number of sampling events following a fill event was reduced to two (the first sampling at week 1 to capture peak fecal coliform (FC) levels and the second sampling at week 6, when FC levels are expected to be at their lowest). Fill-event samples may substitute for quarterly samples, depending on the occurrence of fill events. Groundwater elevations are also measured during each sampling event. There is no observation wells associated with this site.

In 2024, two fill events occurred on January 26 and July 14. Sampling was conducted for six consecutive weeks following the first fill event and two weeks following the second fill event. The sampling conducted on August 15, 2024, approximately six weeks past the second fill event of July 14, served as the third quarterly sampling. Routine quarterly sampling of the monitoring wells was also conducted during the second and fourth quarters of 2024.

Summary of Data

Monitoring Wells. The analytical data for groundwater sampled during 2024 from monitoring wells QK-1 through QK-4 are presented in [Table 1](#). Physical characteristics, such as elevation, groundwater temperature, and estimated time of recharge for each well between initial pump-down and sampling, are also included along with summary statistics for the fill event data. For TOC and NH₃-N results below the reporting limit, the reporting limits were used in summary statistics calculations.

FIGURE 1: MAP OF FOUR WATER QUALITY MONITORING WELLS AND NINE PRIVATE WELLS SURROUNDING THE GLORIA ALITTO MAJEWSKI CHICAGO UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN

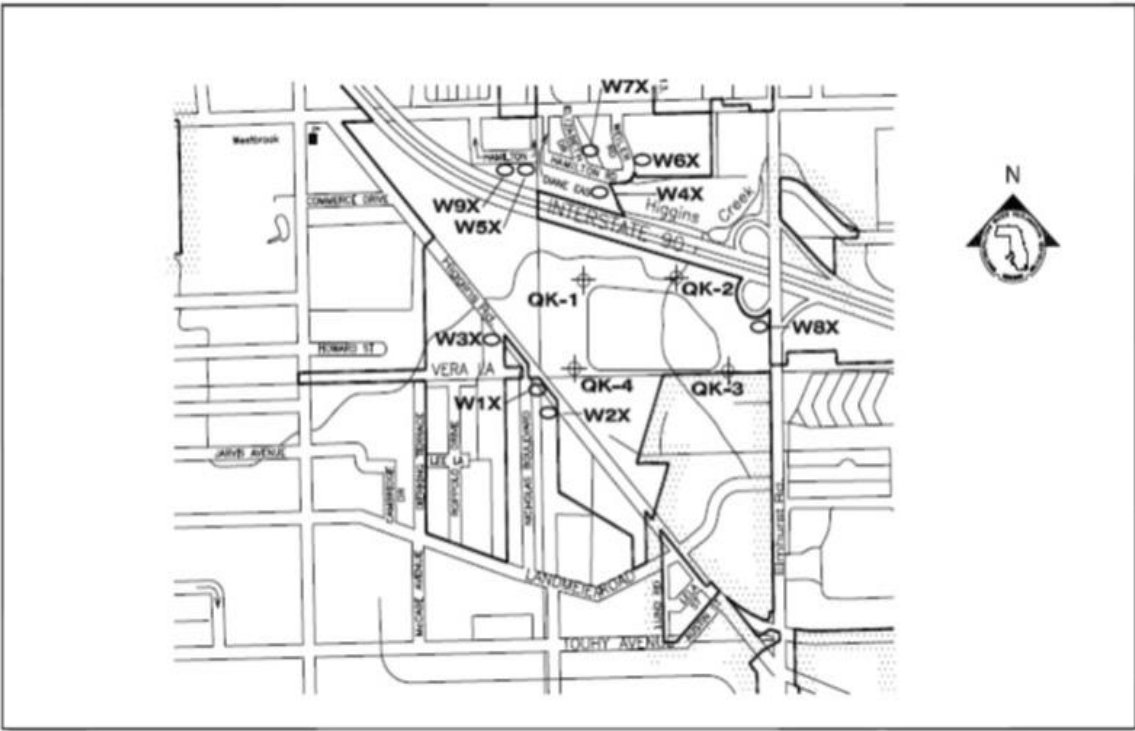


TABLE 1: ANALYSIS OF CHEMICAL AND PHYSICAL PARAMETERS AND FECAL COLIFORM IN GROUNDWATER FROM MONITORING WELLS ADJACENT TO THE GLORIA ALITTO MAJEWSKI CHICAGOLAND UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN DURING 2024

Event	Sample Date	pH	EC ¹ mS/m	TDS ¹	TOC ¹	Cl ⁻	SO ₄ ²⁻	NH ₃ -N	Hardness	Temp. °C	Fecal Coliform CFU/100 mL	Water Elevation ² feet	Recharge Time hours
-----Well QK-1-----													
1 st Fill	01/30/24	6.8	113	1,350	<5.0	62	728	0.58	846	12.6	<1	-75	<4
	02/07/24	7.0	128	1,274	<5.0	57	671	0.60	821	11.5	<1	-75	<4
	02/14/24	6.9	132	1,286	<5.0	59	707	0.75	821	11.9	<1	-75	<4
	02/21/24	6.9	133	1,306	<5.0	57	686	0.84	791	12.9	<1	-72	<4
	03/28/24	7.1	130	1,344	<5.0	57	711	0.81	860	11.4	<1	-75	<4
	03/06/24	7.0	134	1,336	<5.0	56	715	0.78	818	12.6	<1	-75	<4
	Minimum	6.8	113	1,274	<5.0	56	671	0.58	791	11.4	<1	-75	
2 nd Quarter	Median	6.9	131	1,321	5.0	57	709	0.76	821	12.3	<1	-75	
	Mean	6.9	128	1,316	5.0	58	703	0.73	826	12.2	<1	-74	
	Maximum	7.1	134	1,350	5.0	62	728	0.84	860	12.9	<1	-72	
	Std. Dev.	0.1	8	32	0.0	2	21	0.11	24	0.6	0.0	1	
	Coeff. of Var. %	1.6	6	2	0.0	3	3	15.07	3	5.2	0.0	-2	
	05/29/24	7.0	143	1,510	<5.0	59	754	0.50	894	13.5	1	-75	<4
2 nd Fill	07/17/24	7.1	142	1,426	<5.0	54	711	0.76	846	14.2	<1	-64	<4
	07/24/24	6.9	182	1,546	<5.0	56	724	0.77	871	14.7	14	-75	<4
3 rd Quarter	08/15/24	6.9	145	1,472	<5.0	56	723	0.61	1,006	13.5	17	-70	<4
4 th Quarter	10/30/24	7.0	144	1,438	<5.0	60	739	0.77	923	13.6	<1	-67	<4

TABLE 1 (Continued): ANALYSIS OF CHEMICAL AND PHYSICAL PARAMETERS AND FECAL COLIFORM IN GROUNDWATER FROM MONITORING WELLS ADJACENT TO THE GLORIA ALITTO MAJEWSKI CHICAGOLAND UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN DURING 2024

Event	Sample Date	pH	EC ¹ mS/m	TDS ¹	TOC ¹	Cl ⁻	SO ₄ ²⁻	NH ₃ -N	Hardness	Temp. °C	Fecal Coliform CFU/100 mL	Water Elevation ² feet	Recharge Time hours
-----Well QK-2-----													
1 st Fill	01/30/24	7.9	87	832	<5.0	5.7	541	<0.30	476	12.1	<1	-80	<4
	02/07/24	7.9	88	798	<5.0	5.4	519	<0.30	438	12.1	<1	-81	<4
	02/14/24	7.6	89	850	<5.0	5.2	521	<0.30	436	12.0	<1	-81	<4
	02/21/24	7.7	94	852	<5.0	5.7	511	<0.30	407	15.3	<1	-80	<4
	03/28/24	7.8	90	850	<5.0	5.5	509	0.34	461	12.0	<1	-80	<4
	03/06/24	7.7	88	836	<5.0	5.6	517	0.34	482	13.0	<1	-80	<4
	Minimum	7.6	87	798	<5.0	5.2	509	<0.30	407	12.0	<1	-81	
	Median	7.8	89	843	<5.0	5.5	518	0.30	450	12.1	<1	-80	
	Mean	7.8	89	836	<5.0	5.5	520	0.31	450	12.8	<1	-80	
	Maximum	7.9	94	852	<5.0	5.7	541	0.34	482	15.3	<1	-80	
	Std. Dev.	0.2	3	21	0.0	0.2	11.4	0.02	28	1.3	0.0	1	
	Coeff. of Var. %	1.4	3	2	0.0	3.9	2.2	6.31	6	10.2	0.0	1	
2 nd Quarter	05/29/24	7.8	91	920	<5.0	5.6	531	0.31	491	13.3	<1	-88	<4
2 nd Fill	07/17/24	7.9	94	832	<5.0	5.4	505	0.32	447	14.9	<1	-76	<4
	07/24/24	7.7	118	918	<5.0	5.4	499	<0.30	451	14.2	<1	-79	<4
3 rd Quarter	08/15/24	7.8	94	876	<5.0	5.4	503	<0.30	493	13.6	<1	-80	<4
4 th Quarter	10/30/24	7.8	92	826	<5.0	5.3	492	<0.30	464	13.6	<1	-80	<4

TABLE 1 (Continued): ANALYSIS OF CHEMICAL AND PHYSICAL PARAMETERS AND FECAL COLIFORM IN GROUNDWATER FROM MONITORING WELLS ADJACENT TO THE GLORIA ALITTO MAJEWSKI CHICAGOLAND UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN DURING 2024

Event	Sample Date	pH	EC ¹ mS/m	TDS ¹	TOC ¹	Cl ⁻	SO ₄ ²⁻	NH ₃ -N	Hardness	Temp. °C	Fecal Coliform CFU/100 mL	Water Elevation ² feet	Recharge Time hours
Well QK-3													
1 st Fill	01/30/24	7.4	82	724	<5.0	80.1	274	0.47	426	11.4	<1	-88	<4
	02/07/24	7.6	84	702	<5.0	76.4	256	0.55	431	12.0	<1	-88	<4
	02/14/24	7.3	86	714	<5.0	78.6	259	0.62	409	12.2	<1	-88	<4
	02/21/24	7.3	86	728	<5.0	78.0	258	0.75	391	12.9	<1	-88	<4
	02/28/24	7.3	83	718	<5.0	76.7	264	0.71	439	11.9	<1	-88	<4
	03/06/24	7.4	85	688	<5.0	76.5	259	0.70	427	12.9	<1	-88	<4
	Minimum	7.3	82	688	<5.0	76.4	256	0.47	391	11.4	<1	-88	
	Median	7.4	84	716	<5.0	77.4	259	0.66	427	12.1	<1	-88	
	Mean	7.4	84	712	<5.0	77.7	262	0.63	421	12.2	<1	-88	
	Maximum	7.6	86	728	<5.0	80.1	274	0.75	439	12.9	<1	-88	
	Std. Dev.	0.1	1	15	0.0	1.5	6.6	0.11	17	0.6	0.0	0	
	Coeff. of Var. %	1.4	2	2	0.0	1.9	2.5	17.09	4	4.8	0.0	0	
2 nd Quarter	05/29/24	7.3	86	726	<5.0	79.8	258	0.73	447	13.6	<1	-88	<4
2 nd Fill	07/17/24	7.2	103	890	<5.0	81.6	368	<0.30	534	13.7	13,000	-79	<4
	07/24/24	7.3	114	808	<5.0	74.8	270	0.60	455	14.1	910	-87	<4
3 rd Quarter	08/15/24	7.4	88	750	<5.0	76.5	253	0.50	448	13.5	20	-87	<4
4 th Quarter	10/30/24	7.4	88	676	<5.0	80.4	253	0.57	445	13.7	<1	-89	<4

TABLE 1 (Continued): ANALYSIS OF CHEMICAL AND PHYSICAL PARAMETERS AND FECAL COLIFORM IN GROUNDWATER FROM MONITORING WELLS ADJACENT TO THE GLORIA ALITTO MAJEWSKI CHICAGOLAND UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN DURING 2024

Event	Sample Date	pH	EC ¹ mS/m	TDS ¹	TOC ¹	Cl ⁻	SO ₄ ²⁻	NH ₃ -N	Hardness	Temp. °C	Fecal Coliform CFU/100 mL	Water Elevation ² feet	Recharge Time hours
Well QK-4													
1 st Fill	01/30/24	7.4	82	732	<5.0	83.7	316	<0.30	420	11.1	<1	-76	<4
	02/07/24	7.4	83	732	<5.0	82.5	309	<0.30	413	11.8	<1	-77	<4
	02/14/24	7.4	84	722	<5.0	86.9	306	<0.30	388	11.5	<1	-77	<4
	02/21/24	7.4	86	728	<5.0	85.4	304	<0.30	389	13.0	<1	-65	<4
	02/28/24	7.5	80	746	<5.0	82.8	306	0.37	449	10.9	<1	-77	<4
	03/06/24	7.4	83	702	<5.0	78.3	296	0.40	399	12.0	<1	-77	<4
	Minimum	7.4	80	702	<5.0	78.3	296	<0.30	388	10.9	<1	-77	
	Median	7.4	83	730	<5.0	83.3	306	0.30	406	11.7	<1	-77	
	Mean	7.4	83	727	<5.0	83.3	306	0.33	410	11.7	<1	-75	
	Maximum	7.5	86	746	<5.0	86.9	316	0.40	449	13.0	<1	-65	
	Std. Dev.	0.0	2	15	0.0	3.0	6.8	0.04	23	0.8	0.0	5	
	Coeff. of Var. %	0.7	3	2	0.0	3.5	2.2	13.23	6	6.4	0.0	6	
2 nd Quarter	05/29/24	7.5	85	682	<5.0	85.4	300	0.39	426	13.7	<1	-63	<4
2 nd Fill	07/17/24	7.6	88	424	<5.0	80.2	295	0.61	426	14.6	25	-63	<4
	07/24/24	7.2	112	802	<5.0	83.4	287	<0.30	395	15.2	<1	-62	<4
3 rd Quarter	08/15/24	7.4	87	750	<5.0	82.0	289	<0.30	411	14.1	1	-63	<4
4 th Quarter	10/30/24	7.4	85	682	<5.0	87.3	291	<0.30	403	13.2	<1	-61	<4

¹EC = electrical conductivity; TDS = total dissolved solids; TOC = total organic carbon.

²Relative to Chicago City Datum (579.48 feet above mean sea level) at the intersection of State and Madison Streets.