

*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***MONITORING AND RESEARCH  
DEPARTMENT***

***REPORT NO. 24-21***

***TUNNEL AND RESERVOIR PLAN***

***GLORIA ALITTO MAJEWSKI***

***CHICAGO UNDERFLOW PLAN RESERVOIR***

***WATER QUALITY MONITORING WELLS***

***ANNUAL GROUNDWATER MONITORING REPORT***

***FOR 2023***

***July 2024***

*Protecting Our Water Environment*

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July 11, 2024

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Ms. Joey Logan-Pugh  
Chief  
Bureau of Water  
Illinois Environmental Protection Agency  
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 2023

The report entitled "Tunnel and Reservoir Plan Gloria Alitto Majewski Chicago Underflow  
Plan Reservoir Water Quality Monitoring Wells Annual Groundwater Monitoring Report for 2023"  
is attached.

Very truly yours,



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

AC:EE:lf  
Attachment  
cc: Mr. Ryan Bahr (USEPA Region 5 - WC15J)  
Mr. E. Podczewski  
Dr. H. Zhang  
cc w/o att: Mr. J. Murray  
Mr. A. Gronski

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**TUNNEL AND RESERVOIR PLAN  
GLORIA ALITTO MAJEWSKI  
CHICAGO UNDERFLOW PLAN RESERVOIR  
WATER QUALITY MONITORING WELLS  
ANNUAL GROUNDWATER MONITORING REPORT  
FOR 2023**

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## LIST OF ABBREVIATIONS

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Abbreviation	Definition
°C	degrees Celsius
CFU	colony forming units
Cl <sup>-</sup>	chloride
Coeff. of Var.	coefficient variation
EC	electrical conductivity
FC	fecal coliform
L	liter
m	meter
mL	milliliter
mS	millisiemens
NH <sub>3</sub> -N	ammonia nitrogen
SO <sub>4</sub> <sup>2-</sup>	sulfate
Std. Dev.	standard deviation
TDS	total dissolved solids
Temp.	temperature
TOC	total organic carbon

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# 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 memorandum dated October 14, 1997). 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 are no observation wells associated with this site.

In 2023, five fill events occurred on the following dates: February 23, February 27, April 1, April 5, and July 2, 2023. Sampling was conducted for six consecutive weeks following fill events 4 and 5. The sampling was conducted for only one week for fill events 1 and 3 and four weeks for fill event 2 due to occurrence of a new fill event. Additionally, quarterly sampling of monitoring wells was done during the first and fourth quarters of 2023.

## Summary of Data

**Monitoring Wells.** The analytical data for groundwater sampled during 2023 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 NH<sub>3</sub>-N results below reporting limit, the reported limits were used in the summary statistics calculations.



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

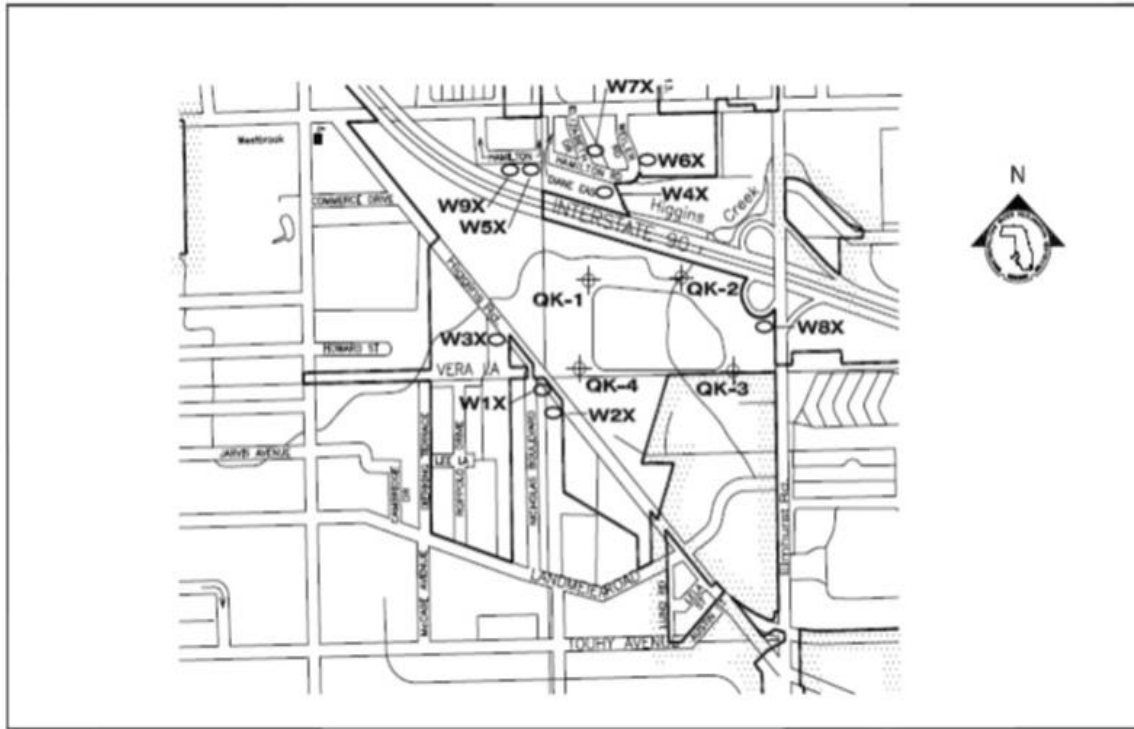


TABLE 1: ANALYSIS OF CHEMICAL AND PHYSICAL PARAMETERS AND FECAL COLIFORM IN GROUNDWATER FROM MONITORING WELLS ADJACENT TO THE GLORIA ALITTO MAJEWSKI CHICAGOLAND UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN DURING 2023

Event	Sample Date	pH	EC <sup>1</sup> mS/m	TDS <sup>1</sup>	TOC <sup>1</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NH <sub>3</sub> -N	Hardness	Fecal Coliform CFU/100 mL	Temp. °C	Water Elevation <sup>2</sup> feet	Recharge Time hours
-----Well QK-1-----													
1 <sup>st</sup> Quarter	02/08/23	7.1	133	1,352	<5.0	60.4	734	<0.30	877	<1	11.6	-76	<4
1 <sup>st</sup> Fill	02/27/23	7.1	131	1,362	<5.0	64.1	777	0.30	905	<1	12.3	-76	<4
2 <sup>nd</sup> Fill	03/08/23	7.1	131	1404	<5.0	61.8	755	<0.30	862	<1	10.1	-76	<4
	03/14/23	7.1	132	1382	<5.0	61.1	747	<0.30	896	<1	11.2	-76	<4
	03/22/23	7.1	136	1428	<5.0	62.1	759	<0.30	955	<1	11.5	-76	<4
	03/29/23	7.0	131	1424	<5.0	60.7	741	<0.30	882	<1	12.1	-78	
	Minimum	7.0	131	1382	<5.0	60.7	741	<0.30	862	<1	10.1	-78	
	Median	7.1	132	1414	<5.0	61.4	751	<0.30	889	<1	11.4	-76	
	Mean	7.1	133	1410	<5.0	61.4	750	<0.30	899	<1	11.2	-76	
	Maximum	7.1	136	1428	<5.0	62.1	759	<0.30	955	<1	12.1	-76	
	Std. Dev.	0.1	3	21	0	0.6	8.1	0	40	0	0.8	1	
	Coeff. of Var. %	0.8	2	2	0	1.0	1.1	0	5	0	7.5	1	
3 <sup>rd</sup> Fill	04/04/23	7.0	132	1,444	<5.0	62.3	760	<0.30	929	<1	12.0	-75	<4
4 <sup>th</sup> Fill	04/06/23	7.1	66	1418	<5.0	62.3	759	<0.30	879	<1	11.4	-76	<4
	04/11/23	7.0	137	1,412	6.3	62.3	766	<0.30	968	<1	14.3	-75	<4
	04/18/23	7.1	134	1,448	<5.0	62.6	770	0.39	871	<1	12.3	-76	<4
	04/24/23	7.0	135	1,422	<5.0	62.6	768	<0.30	968	<1	13.3	-75	<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 2023

Event	Sample Date	pH	EC <sup>1</sup> mS/m	TDS <sup>1</sup>	TOC <sup>1</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NH <sub>3</sub> -N	Hardness	Fecal Coliform CFU/100 mL	Temp. °C	Water Elevation <sup>2</sup> feet	Recharge Time hours	
						mg/L								
	05/03/23	7.2	133	1,408	<5.0	61.1	754	0.40	640	<1	12.2	-76	<4	
	05/10/23	6.9	144	1,380	<5.0	61.9	755	<0.30	873	<1	13.6	-76	<4	
	Minimum	6.9	66	1,380	<5.0	61.1	754	<0.30	640	<1	11.4	-76		
	Median	7.0	134	1,415	5.0	62.3	762	0.30	876	<1	12.8	-76		
	Mean	7.0	124	1,415	5.2	62.1	762	0.33	867	<1	12.9	-75		
	Maximum	7.2	144	1,448	6.3	62.6	770	0.40	968	<1	14.3	-75		
	Std. Dev.	0.1	29	22	0.5	0.6	6.9	0.05	120	0	1.1	0.5		
	Coeff. of Var. %	1.2	23	2	10.0	0.9	0.9	14.8	14	0	8.3	0.7		
4	5 <sup>th</sup> Fill	07/06/23	7.1	183	1,454	<5.0	60.5	738	0.59	958	<1	13.5	-76	<4
		07/13/23	7.0	143	1,474	<5.0	59.8	718	0.79	894	1	12.9	-60	<4
		07/18/23	7.0	140	1,502	<5.0	59.5	713	0.68	570	<1	15.6	-75	<4
		07/26/23	7.0	145	1,408	<5.0	59.1	677	0.66	864	<1	13.1	-90	<4
		08/01/23	7.0	140	1,434	<5.0	60.7	738	0.69	914	<1	13.1	-75	<4
		08/09/23	7.0	144	1,436	<5.0	61.3	729	1.16	903	<1	13.5	-75	<4
	Minimum	7.0	140	1,408	<5.0	59.1	677	0.59	570	<1	12.9	-90		
	Median	7.0	143	1,445	<5.0	60.1	724	0.68	899	<1	13.3	-75		
	Mean	7.0	149	1,451	<5.0	60.1	719	0.76	850	<1	13.6	-75		
	Maximum	7.1	183	1,502	<5.0	61.3	738	1.16	958	1	15.6	-60		
	Std. Dev.	0.03	17	33	0.0	0.8	23	0.21	141	0.0	1.0	9.5		
	Coeff. of Var. %	0.4	11	2	0.0	1.4	3	27.2	17	0.0	7.4	13		
	4 <sup>th</sup> Quarter	10/25/23	7.0	136	1,374	<5.0	62.3	702	0.57	891	23	12.8	-75	<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 2023

Event	Sample Date	pH	EC <sup>1</sup> mS/m	TDS <sup>1</sup>	TOC <sup>1</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NH <sub>3</sub> -N	Hardness	Fecal Coliform CFU/100 mL	Temp. °C	Water Elevation <sup>2</sup> feet	Recharge Time hours
-----Well QK-2-----													
1 <sup>st</sup> Quarter	02/08/23	8.0	88	822	<5.0	5.1	542	<0.30	472	<1	12.4	-82	<4
1 <sup>st</sup> Fill	02/27/23	7.7	86	856	<5.0	5.1	530	0.32	491	<1	12.7	-82	<4
2 <sup>nd</sup> Fill	03/08/23	7.8	86	854	<5.0	5.2	532	<0.30	498	<1	11.9	-83	<4
	03/14/23	7.5	83	852	<5.0	5.2	531	<0.30	473	500	11.8	-82	<4
	03/22/23	7.9	88	836	<5.0	5.1	524	<0.30	483	<1	12.0	-81	<4
	03/29/23	7.8	84	832	<5.0	5.1	517	0.32	462	<1	11.8	-84	
	Minimum	7.5	83	832	<5.0	5.1	517	<0.30	462	<1	11.8	-84	
	Median	7.8	85	844	<5.0	5.2	528	<0.30	478	1	11.9	-82	
	Mean	7.8	85	844	<5.0	5.2	526	0.31	479	126	11.9	-82	
	Maximum	7.9	88	854	<5.0	5.2	532	0.32	498	500	12.0	-81	
	Std. Dev.	0.2	2	11	0.0	0.0	7	0.01	15	250	0.1	1	
	Coeff. of Var. %	2.3	3	1	0.0	0.9	1.3	3.44	3	198	0.8	2	
3 <sup>rd</sup> Fill	04/04/23	7.8	84	858	<5.0	6.2	521	<0.30	462	<1	12.1	-81	<4
4 <sup>th</sup> Fill	04/06/23	7.8	85	848	<5.0	6.3	528	<0.30	467	<1	12.8	-88	<4
	04/11/23	7.8	86	848	6.3	6.1	526	0.30	497	<1	13.5	-77	<4
	04/18/23	7.8	83	856	<5.0	7.4	533	<0.30	451	<1	12.4	-81	<4
	04/24/23	7.7	85	816	<5.0	7.4	533	<0.30	510	<1	12.2	-81	<4
	05/03/23	7.8	96	838	<5.0	7.3	515	0.32	475	<1	12.2	-81	<4
	05/10/23	7.7	91	812	<5.0	4.9	520	<0.30	455	<1	13.6	-81	<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 2023

Event	Sample Date	pH	EC <sup>1</sup> mS/m	TDS <sup>1</sup>	TOC <sup>1</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NH <sub>3</sub> -N	Hardness	Fecal Coliform CFU/100 mL	Temp. °C	Water Elevation <sup>2</sup> feet	Recharge Time hours	
	Minimum	7.7	83	812	<5.0	4.9	515	<0.30	451	<1	12.2	-88		
	Median	7.8	85	843	5.0	6.8	527	0.30	471	<1	12.6	-81		
	Mean	7.8	88	836	5.2	6.6	526	0.30	476	<1	12.8	-81		
	Maximum	7.8	96	856	6.3	7.4	533	0.32	510	<1	13.6	-77		
	Std. Dev.	0.1	5	18	0.5	1.0	7.0	0.01	23	0	0.6	4		
	Coeff. of Var. %	0.9	6	2	9.9	15.0	1	2.38	5	0	5.0	4		
9	5 <sup>th</sup> Fill	07/06/23	7.8	121	864	<5.0	5.1	518	<0.30	482	<1	14.1	-82	<4
		07/13/23	7.7	93	864	<5.0	7.1	500	0.33	475	20	13.1	-81	<4
		07/18/23	7.7	89	876	<5.0	4.9	494	<0.30	297	<1	14.7	-81	<4
		07/26/23	7.7	92	826	<5.0	5.3	481	<0.30	465	<1	13.2	-85	<4
		08/01/23	7.8	91	850	<5.0	5.1	503	<0.30	469	<1	14.0	-84	<4
		08/09/23	7.6	91	838	<5.0	5.3	507	0.74	438	<1	13.4	-81	<4
		Minimum	7.6	89	826	<5.0	4.9	481	<0.30	297	<1	13.1	-85	
	Median	7.7	92	857	<5.0	5.2	501	<0.30	467	1	13.7	-81		
	Mean	7.7	96	853	<5.0	5.5	501	0.38	438	4	13.8	-82		
	Maximum	7.8	121	876	<5.0	7.1	518	0.74	482	20	14.7	-81		
	Std. Dev.	0.1	12	19	0.0	0.8	13	0.18	71	8	0.6	2		
	Coeff. of Var. %	1.2	13	2	0.0	15.2	3	46.9	16	186	4.5	2		
	4 <sup>th</sup> Quarter	10/25/23	7.8	89	848	<5.0	4.8	520	<0.30	456	<1	13.2	-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 2023

Event	Sample Date	pH	EC <sup>1</sup> mS/m	TDS <sup>1</sup>	TOC <sup>1</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NH <sub>3</sub> -N	Hardness	Fecal Coliform CFU/100 mL	Temp. °C	Water Elevation <sup>2</sup> feet	Recharge Time hours
-----Well QK-3-----													
1 <sup>st</sup> Quarter	02/08/23	7.6	82	694	<5.0	73.9	279	0.53	440	<1	12.3	-88	<4
1 <sup>st</sup> Fill	02/27/23	7.4	83	664	<5.0	74.0	284	0.68	446	650	13.0	-89	<4
2 <sup>nd</sup> Fill	03/08/23	7.5	80	684	<5.0	76.3	264	0.41	432	780	11.9	-89	<4
	03/14/23	7.5	78	714	<5.0	75.8	269	0.59	424	<1	11.1	-89	<4
	03/22/23	7.6	87	710	<5.0	76.7	268	0.56	451	230	12.6	-89	<4
	03/29/23	7.7	81	690	<5.0	71.9	299	0.56	440	54	11.8	-91	
	Minimum	7.0	136	684	<5.0	71.9	264	0.41	424	<1	11.1	-91	
	Median	7.1	139	700	<5.0	76.0	269	0.56	436	142	11.9	-89	
	Mean	7.0	139	700	<5.0	75.2	275	0.53	437	266	11.9	-89	
	Maximum	7.1	141	714	<5.0	76.7	299	0.59	451	780	12.6	-89	
	Std. Dev.	0.1	2	15	0.0	2.2	16	0.08	12	356	0.6	1.0	
	Coeff. of Var. %	0.8	2	2	0.0	2.9	6	15.86	3	134	5.2	1	
3 <sup>rd</sup> Fill	04/04/23	7.6	80	724	<5.0	75.7	263	0.59	423	6	11.7	-88	<4
4 <sup>th</sup> Fill	04/06/23	7.7	80	712	<5.0	76.7	264	0.63	415	9	11.6	-86	<4
	04/11/23	7.5	84	738	<5.0	73.9	304	0.60	450	39	12.4	-88	<4
	04/18/23	7.6	108	724	<5.0	75.6	275	0.61	437	8	12.4	-88	<4
	04/24/23	7.5	82	728	<5.0	76.5	270	0.53	446	5	12.3	-88	<4
	05/03/23	7.6	83	702	<5.0	71.8	290	0.64	423	2	12.4	-88	<4
	05/10/23	7.5	88	670	<5.0	78.6	266	0.64	405	<1	13.3	-88	<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 2023

Event	Sample Date	pH	EC <sup>1</sup> mS/m	TDS <sup>1</sup>	TOC <sup>1</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NH <sub>3</sub> -N	Hardness	Fecal Coliform CFU/100 mL	Temp. °C	Water Elevation <sup>2</sup> feet	Recharge Time hours	
				-----mg/L-----										
	Minimum	7.5	80	670	<5.0	71.8	264	0.53	405	<1	11.6	-88		
	Median	7.6	84	718	<5.0	76.0	272	0.62	430	7	12.4	-88		
	Mean	7.6	88	712	<5.0	75.5	278	0.61	429	11	12.4	-88		
	Maximum	7.7	108	738	<5.0	78.6	304	0.64	450	39	13.3	-86		
	Std. Dev.	0.1	10	24	0	2.4	16	0.04	18	14	0.5	0.8		
	Coeff. of Var. %	0.9	12	3	0	3.2	6	7.1	4	134	4.4	1		
∞	5 <sup>th</sup> Fill	07/06/23	7.5	115	740	<5.0	74.7	296	0.71	439	<1	13.2	-89	<4
		07/13/23	7.5	88	744	<5.0	77.0	255	0.68	433	<1	12.9	-88	<4
		07/18/23	7.6	86	750	<5.0	76.5	257	0.58	265	<1	13.6	-88	<4
		07/26/23	7.3	89	722	<5.0	78.9	264	0.45	436	<1	13.1	-89	<4
		08/01/23	7.6	86	716	<5.0	78.2	258	0.55	415	<1	13.6	-88	<4
		08/09/23	7.4	87	738	<5.0	79.9	260	1.17	419	<1	13.4	-88	<4
		Minimum	7.3	86	716	<5.0	74.7	255	0.45	265	<1	12.9	-89	
	Median	7.5	88	739	<5.0	77.6	259	0.63	426	<1	13.3	-88		
	Mean	7.5	92	735	<5.0	77.5	265	0.69	401	<1	13.3	-88		
	Maximum	7.6	115	750	<5.0	79.9	296	1.17	439	<1	13.6	-88		
	Std. Dev.	0.1	11	13	0	1.9	15	0.25	67	0	0.3	0.5		
	Coeff. of Var. %	1.5	12	2	0	2.4	6	36.7	17	0	2.1	1		
	4 <sup>th</sup> Quarter	10/25/23	7.4	86	740	<5.0	79.5	261	0.52	433	<1	13.6	-88	<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 2023

Event	Sample Date	pH	EC <sup>1</sup> mS/m	TDS <sup>1</sup>	TOC <sup>1</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NH <sub>3</sub> -N	Hardness	Fecal Coliform CFU/100 mL	Temp. °C	Water Elevation <sup>2</sup> feet	Recharge Time hours
-----Well QK-4-----													
1 <sup>st</sup> Quarter	02/08/23	7.6	81	712	5.2	85.7	326	0.59	445	<1	10.8	-78	<4
1 <sup>st</sup> Fill	02/27/23	7.6	80	716	<5.0	82.1	332	0.61	448	2	12.1	-82	<4
2 <sup>nd</sup> Fill	03/08/23	7.6	80	732	<5.0	82.2	334	<0.30	439	2	11.0	-76	<4
	03/14/23	7.5	80	762	<5.0	85.7	330	0.38	462	<1	11.0	-78	<4
	03/22/23	7.5	86	744	<5.0	85.3	334	0.41	416	<1	11.5	-79	<4
	03/29/23	7.6	80	752	<5.0	82.0	330	0.39	432	<1	11.2	-80	<4
	Minimum	7.5	80	732	<5.0	82.0	330	<0.30	416	<1	11.0	-80	
	Median	7.6	80	748	<5.0	83.7	332	0.39	436	<1	11.1	-78	
	Mean	7.6	82	748	<5.0	83.8	332	0.40	437	1	11.2	-78	
	Maximum	7.6	86	762	<5.0	85.7	334	0.41	462	2	11.5	-76	
	Std. Dev.	0.1	3	13	0.0	2.0	2.2	0.01	19	0.5	0.2	2	
	Coeff. of Var. %	0.9	4	2	0.0	2.4	0.7	3.61	4	40	2.1	2	
3 <sup>rd</sup> Fill	04/04/23	7.5	81	758	<5.0	84.9	325	0.42	442	<1	11.5	-78	<4
4 <sup>th</sup> Fill	04/06/23	7.6	82	750	<5.0	84.3	327	0.36	453	<1	11.6	-77	<4
	04/11/23	7.7	83	734	<5.0	85.7	327	0.39	447	<1	12.6	-77	<4
	04/18/23	7.5	110	744	<5.0	82.3	332	0.41	448	<1	11.7	-78	<4
	04/24/23	NS <sup>3</sup>	NS	NS	NS	NS	NS	NS	NS	NS	NS	-77	<4
	05/03/23	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-77	<4
	05/10/23	7.5	89	740	<5.0	88.2	325	0.37	405	<1	13.7	-78	<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 2023

Event	Sample Date	pH	EC <sup>1</sup> mS/m	TDS <sup>1</sup>	TOC <sup>1</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NH <sub>3</sub> -N	Hardness	Fecal Coliform CFU/100 mL	Temp. °C	Water Elevation <sup>2</sup> feet	Recharge Time hours	
				-----mg/L-----										
	Minimum	7.5	82	734	<5.0	82.3	325	0.36	405	<1	11.6	-78		
	Median	7.6	86	742	<5.0	85.0	327	0.38	448	<1	12.2	-77		
	Mean	7.6	91	742	<5.0	85.1	328	0.38	438	<1	12.4	-77		
	Maximum	7.7	110	750	<5.0	88.2	332	0.41	453	<1	13.7	-77		
	Std. Dev.	0.1	13	7	0.0	2.5	2.9	0.02	22	0.0	1.0	0.5		
	Coeff. of Var. %	0.8	15	1	0.0	2.9	0.9	5.56	5	0.0	7.9	1		
10	5 <sup>th</sup> Fill	07/06/23	7.5	117	766	<5.0	82.8	321	0.66	448	<1	13.5	-79	<4
		07/13/23	7.4	99	784	<5.0	82.1	311	0.43	416	<1	13.2	-64	<4
		07/18/23	7.4	99	822	<5.0	82.0	313	0.36	326	<1	13.2	-64	<4
		07/26/23	7.5	90	804	<5.0	84.4	323	0.41	406	<1	13.6	-80	<4
		08/01/23	7.4	89	782	<5.0	82.7	323	0.35	437	<1	14.0	-78	<4
		08/09/23	7.4	88	792	<5.0	84.2	320	0.71	432	<1	13.3	-69	<4
		Minimum	7.4	88	766	<5.0	82.0	311	0.35	326	<1	13.2	-80	
		Median	7.4	95	788	<5.0	82.8	320	0.42	424	<1	13.4	-73	
		Mean	7.4	97	792	<5.0	83.0	319	0.48	411	<1	13.5	-72	
		Maximum	7.5	117	822	<5.0	84.4	323	0.71	448	<1	14.0	-64	
		Std. Dev.	0.0	11	19	0.0	1.0	5	0.16	44	0.0	0.3	8	
		Coeff. of Var. %	0.5	11	3	0.0	1.3	2	33	11	0.0	2.3	1	
	4 <sup>th</sup> Quarter	10/25/23	7.4	85	770	<5.0	86.1	315	<0.30	458	<1	12.9	-65	<4

<sup>1</sup>EC = electrical conductivity; TDS = total dissolved solids; TOC = total organic carbon.

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

<sup>3</sup>NS: No sample was collected due to well pump malfunction.