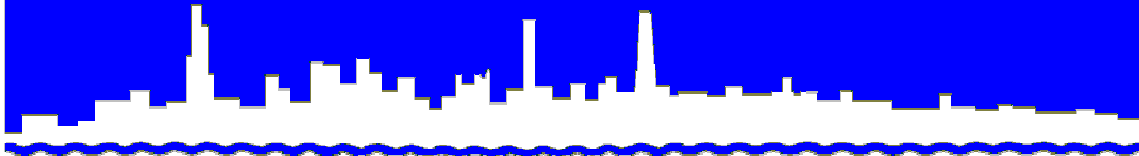


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 07-42

TUNNEL AND RESERVOIR PLAN

DES PLAINES TUNNEL SYSTEM

2006 ANNUAL GROUNDWATER MONITORING REPORT

July 2007

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July 27, 2007

Ms. Marcia Willhite, Chief
Bureau of Water
Illinois Environmental Protection Agency
P. O. Box 19276
Springfield, IL 62794-9276

Dear Ms. Willhite:

Subject: Tunnel and Reservoir Plan, Des Plaines Tunnel System, 2006 Annual
Groundwater Monitoring Report

Enclosed are three copies of the "Tunnel and Reservoir Plan, Des Plaines Tunnel System,
2006 Annual Groundwater Monitoring Report."

Very truly yours,

Louis Kollias
Director
Research and Development

LK:JSJ:lmf

Enclosures

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TUNNEL AND RESERVOIR PLAN
DES PLAINES TUNNEL SYSTEM
2006 ANNUAL GROUNDWATER MONITORING REPORT

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INTRODUCTION

This report contains 2006 data for the TARP Des Plaines Tunnel System compiled from the monitoring of the 40 groundwater quality wells QD-21 through QD-60 located along the Des Plaines Tunnel alignment. The water quality monitoring wells are located along the 13A Extension, south leg, middle leg, and north leg of the Des Plaines Tunnel System. These water quality wells were sampled either three times per year or six times per year. Water quality wells QD-21 through QD-26, QD-28 through QD-32, QD-35, QD-36, and QD-38 through QD-60 were sampled three times per year (Illinois Environmental Protection Agency [IEPA] memoranda July 9, 2004, and February 23, 2006). Water quality monitoring wells QD-27, QD-33, QD-34, and QD-37 were sampled six times per year (IEPA memorandum July 9, 2004, and February 23, 2006).

Monitoring Data. Appendix AI contains a map showing all 40 water quality wells along the 13A extension, south leg, middle leg, and north leg of the Des Plaines Tunnel System.

Tables AII-1 and AII-2 in Appendix AII contain groundwater quality data for 2006 pertaining to the 40 water quality monitoring wells QD-21 through QD-60 in the Des Plaines Tunnel System.

All of the wells in Des Plaines System were visited for the required number of samples. However, in one instance the well could not be sampled. Water quality monitoring well QD-49 could not be sampled on June 8, 2006, because there was insufficient water in the well to collect a sample.

Summary of Data. Tables 1 through 8 contain summary statistics of the water quality parameters for 2006 for all 40 water quality wells QD-21 through QD-60 in the Des Plaines Tunnel System. These statistics are computed from the data collected from each well in 2006. The summary statistics include minimum, mean, maximum, standard deviation (Std. Dev.), median, and coefficient of variation (Coeff. Var.) for all nine water quality parameters analyzed during 2006. The nine water quality parameters are: chloride (Cl), conductivity (Cond.), fecal coliform (FC), hardness as CaCO₃ (Hard.), ammonia as NH₄⁺-N, pH, sulfate (SO₄), total dissolved solids (TDS), and total organic carbon (TOC).

TABLE 1: SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-21 THROUGH QD-25

Parameter		Well Number				
		QD-21	QD-22	QD-23	QD-24	QD-25
Cl, mg/L	Minimum	103	141	138	87	353
	Mean	253	148	139	94	362
	Maximum	355	157	141	101	375
	Std. Dev.	133	8	2	7	11
	Median	302	147	138	95	359
	Coeff. Var.	52	5	1	7	3
Cond., µmhos/cm	Minimum	851	680	726	732	899
	Mean	1661	1186	1286	1179	1685
	Maximum	2627	1573	1727	1562	2179
	Std. Dev.	898	458	511	419	688
	Median	1505	1305	1406	1242	1977
	Coeff. Var.	54	39	40	36	41
FC, ¹ cfu/100 mL	Minimum	1	1	1	1	1
	Geo. Mean	1	1	1	1	1
	Maximum	1	1	1	1	1
	Geo. Std. Dev.	0	0	0	0	0
	Median	1	1	1	1	1
	Coeff. Var.	0	0	0	0	0
Hard., as CaCO ₃ , mg/L	Minimum	733	732	754	456	568
	Mean	773	736	758	506	592
	Maximum	817	743	765	588	608
	Std. Dev.	42	6	6	71	21
	Median	769	734	756	475	599
	Coeff. Var.	5	1	1	14	4
NH ₄ ⁺ -N, mg/L	Minimum	0.18	0.34	0.41	0.39	0.66
	Mean	0.25	0.39	0.45	0.44	0.70
	Maximum	0.32	0.45	0.52	0.52	0.74
	Std. Dev.	0.07	0.06	0.06	0.07	0.04
	Median	0.25	0.37	0.43	0.41	0.71
	Coeff. Var.	28.00	14.71	12.93	15.91	5.75

TABLE 1 (Continued): SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-21 THROUGH QD-25

Parameter		Well Number				
		QD-21	QD-22	QD-23	QD-24	QD-25
pH	Minimum	6.8	7.0	7.0	7.2	7.0
	Mean	7.3	7.4	7.3	7.4	7.2
	Maximum	8.2	7.8	7.7	7.8	7.6
	Std. Dev.	0.8	0.4	0.4	0.3	0.3
	Median	7.0	7.3	7.1	7.2	7.1
	Coeff. Var.	10.3	5.5	5.2	4.7	4.4
SO ₄ , mg/L	Minimum	283	280	295	137	177
	Mean	296	535	628	382	476
	Maximum	316	1038	1287	830	1031
	Std. Dev.	18	436	570	388	481
	Median	289	286	303	180	221
	Coeff. Var.	6	82	91	102	101
TDS, mg/L	Minimum	1318	1134	1126	756	1294
	Mean	1541	1253	1250	842	1396
	Maximum	1670	1342	1342	1002	1568
	Std. Dev.	194	107	111	139	150
	Median	1636	1284	1282	768	1326
	Coeff. Var.	13	9	9	16	11
TOC, mg/L	Minimum	1.0	1.0	1.6	1.5	1.4
	Mean	1.1	1.1	1.7	1.7	1.7
	Maximum	1.3	1.1	1.8	1.9	2.0
	Std. Dev.	0.2	0.1	0.1	0.2	0.3
	Median	1.1	1.1	1.7	1.6	1.8
	Coeff. Var.	13.5	5.4	5.9	12.5	17.6

¹For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

TABLE 2: SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-26 THROUGH QD-30

Parameter		Well Number				
		QD-26	QD-27	QD-28	QD-29	QD-30
Cl, mg/L	Minimum	16	212	316	138	128
	Mean	17	269	323	142	141
	Maximum	19	321	332	145	162
	Std. Dev.	2	36	8	4	18
	Median	17	274	322	142	133
	Coeff. Var.	9	13	2	2	13
Cond., µmhos/cm	Minimum	355	515	655	551	520
	Mean	513	1510	1184	860	890
	Maximum	828	2430	2063	1378	1529
	Std. Dev.	273	810	766	451	556
	Median	356	1668	835	652	620
	Coeff. Var.	53	54	65	52	62
FC, ¹ cfu/100 mL	Minimum	1	1	1	1	1
	Geo. Mean	1	1	1	1	1
	Maximum	1	1	1	1	1
	Geo. Std. Dev.	0	0	0	0	0
	Median	1	1	1	1	1
	Coeff. Var.	0	0	0	0	0
Hard., as CaCO ₃ , mg/L	Minimum	399	420	687	667	708
	Mean	415	489	711	679	735
	Maximum	424	527	735	695	770
	Std. Dev.	14	38	24	15	32
	Median	423	504	710	674	726
	Coeff. Var.	3	8	3	2	4
NH ₄ ⁺ -N, mg/L	Minimum	0.25	14.39	0.47	0.32	0.23
	Mean	0.26	19.53	0.54	0.34	0.74
	Maximum	0.28	25.56	0.59	0.36	1.76
	Std. Dev.	0.02	4.63	0.06	0.02	0.88
	Median	0.26	18.82	0.55	0.34	0.24
	Coeff. Var.	5.80	23.68	11.39	5.88	118.45

TABLE 2 (Continued): SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-26 THROUGH QD-30

Parameter		Well Number				
		QD-26	QD-27	QD-28	QD-29	QD-30
pH	Minimum	7.4	7.0	7.2	7.2	7.2
	Mean	7.5	7.4	7.5	7.6	7.4
	Maximum	7.6	7.7	7.8	7.9	7.7
	Std. Dev.	0.1	0.2	0.3	0.4	0.3
	Median	7.5	7.4	7.4	7.6	7.4
	Coeff. Var.	1.3	3.2	4.1	4.6	3.4
SO ₄ , mg/L	Minimum	106	32	231	245	318
	Mean	111	52	246	254	348
	Maximum	117	75	268	267	384
	Std. Dev.	6	14	19	12	33
	Median	111	54	239	250	343
	Coeff. Var.	5	28	8	5	10
TDS, mg/L	Minimum	534	980	1308	1030	1140
	Mean	553	1113	1478	1126	1198
	Maximum	566	1236	1586	1190	1282
	Std. Dev.	17	92	149	85	74
	Median	560	1102	1540	1158	1172
	Coeff. Var.	3	8	10	8	6
TOC, mg/L	Minimum	0.6	14.8	0.8	1.4	0.9
	Mean	0.7	16.1	1.0	1.5	1.0
	Maximum	0.7	17.8	1.1	1.8	1.2
	Std. Dev.	0.1	1.4	0.2	0.2	0.2
	Median	0.7	15.8	1.0	1.4	0.9
	Coeff. Var.	8.7	8.6	15.8	15.1	17.3

¹For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

TABLE 3: SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-31 THROUGH QD-35

Parameter		Well Number				
		QD-31	QD-32	QD-33	QD-34	QD-35
Cl, mg/L	Minimum	118	469	334	108	119
	Mean	120	485	349	114	123
	Maximum	122	502	360	122	126
	Std. Dev.	2	17	10	5	4
	Median	120	483	352	113	124
	Coeff. Var.	2	3	3	4	3
Cond., µmhos/cm	Minimum	483	1336	938	473	543
	Mean	540	1995	1925	866	969
	Maximum	582	3257	2553	1697	1717
	Std. Dev.	51	1093	737	539	650
	Median	555	1392	2245	562	646
	Coeff. Var.	9	55	38	62	67
FC, ¹ cfu/100 mL	Minimum	1	1	1	1	1
	Geo. Mean	1	1	1	2	1
	Maximum	1	1	1	71	1
	Geo. Std. Dev.	0	0	0	6	0
	Median	1	1	1	1	1
	Coeff. Var.	0	0	0	280	0
Hard., As CaCO ₃ , mg/L	Minimum	249	24	24	707	630
	Mean	256	30	27	771	672
	Maximum	264	38	28	806	711
	Std. Dev.	8	7	2	37	41
	Median	254	27	27	784	676
	Coeff. Var.	3	25	6	5	6
NH ₄ ⁺ -N, mg/L	Minimum	0.16	0.08	0.14	0.25	0.25
	Mean	0.18	0.12	0.84	0.31	0.26
	Maximum	0.21	0.18	2.10	0.44	0.27
	Std. Dev.	0.03	0.05	0.89	0.07	0.01
	Median	0.18	0.10	0.40	0.29	0.26
	Coeff. Var.	13.73	44.10	106.75	21.94	3.85

TABLE 3 (Continued): SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-31 THROUGH QD-35

Parameter	Well Number					
	QD-31	QD-32	QD-33	QD-34	QD-35	
pH	Minimum	7.5	8.2	7.0	7.0	7.2
	Mean	7.6	8.8	7.9	7.4	7.7
	Maximum	7.6	9.3	8.4	7.7	8.0
	Std. Dev.	0.1	0.6	0.5	0.3	0.4
	Median	7.6	8.8	8.0	7.4	7.8
	Coeff. Var.	0.8	6.3	6.8	3.7	5.4
SO ₄ , mg/L	Minimum	170	210	192	322	284
	Mean	187	223	204	367	285
	Maximum	204	238	227	408	286
	Std. Dev.	17	14	15	31	1
	Median	187	222	197	363	286
	Coeff. Var.	9	6	7	8	0
TDS, mg/L	Minimum	906	1912	1566	1096	982
	Mean	934	2153	1665	1233	1148
	Maximum	948	2602	1762	1404	1248
	Std. Dev.	24	389	79	122	145
	Median	948	1946	1683	1231	1214
	Coeff. Var.	3	18	5	10	13
TOC, mg/L	Minimum	0.8	0.4	0.4	0.9	3.4
	Mean	0.9	0.4	0.6	1.1	4.6
	Maximum	1.0	0.5	1.0	1.2	6.6
	Std. Dev.	0.1	0.1	0.2	0.1	1.8
	Median	1.0	0.4	0.5	1.1	3.7
	Coeff. Var.	12.4	13.3	42.7	13.1	38.7

¹For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

TABLE 4: SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-36 THROUGH QD-40

Parameter		Well Number				
		QD-36	QD-37	QD-38	QD-39	QD-40
Cl, mg/L	Minimum	117	241	200	42	17
	Mean	124	261	214	57	63
	Maximum	131	293	221	77	140
	Std. Dev.	7	19	12	18	67
	Median	124	259	220	51	33
	Coeff. Var.	6	7	6	32	106
Cond., µmhos/cm	Minimum	550	384	451	692	945
	Mean	949	1443	794	1045	1091
	Maximum	1630	2279	1376	1250	1187
	Std. Dev.	592	787	507	307	128
	Median	668	1531	555	1194	1140
	Coeff. Var.	62	55	64	29	12
FC, ¹ cfu/100 mL	Minimum	1	1	1	1	1
	Geo. Mean	1	1	1	1	1
	Maximum	1	1	1	1	1
	Geo. Std. Dev.	0	0	0	0	0
	Median	1	1	1	1	1
	Coeff. Var.	0	0	0	0	0
Hard., As CaCO ₃ , mg/L	Minimum	712	337	251	18	22
	Mean	741	487	259	19	24
	Maximum	757	590	267	20	26
	Std. Dev.	25	111	8	1	2
	Median	753	509	258	19	23
	Coeff. Var.	3	23	3	5	9
NH ₄ ⁺ -N, ² mg/L	Minimum	0.21	0.05	0.31	0.02	0.02
	Mean	0.22	0.19	0.32	0.08	0.11
	Maximum	0.24	0.27	0.32	0.21	0.25
	Std. Dev.	0.02	0.09	0.01	0.11	0.13
	Median	0.22	0.22	0.32	0.02	0.05
	Coeff. Var.	6.84	49.16	1.82	131.64	117.22

TABLE 4 (Continued): SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-36 THROUGH QD-40

Parameter		Well Number				
		QD-36	QD-37	QD-38	QD-39	QD-40
pH	Minimum	7.2	7.0	7.6	7.3	7.0
	Mean	7.6	7.4	7.7	7.8	7.9
	Maximum	8.0	7.8	7.9	8.5	8.7
	Std. Dev.	0.4	0.3	0.2	0.6	0.9
	Median	7.6	7.3	7.6	7.5	7.9
	Coeff. Var.	5.3	3.6	2.2	8.3	10.8
SO ₄ , mg/L	Minimum	276	338	100	100	345
	Mean	304	409	104	111	380
	Maximum	345	567	111	123	398
	Std. Dev.	36	81	6	12	30
	Median	291	381	102	110	397
	Coeff. Var.	12	20	6	10	8
TDS, mg/L	Minimum	1138	1362	906	836	736
	Mean	1237	1425	949	899	780
	Maximum	1296	1472	974	984	810
	Std. Dev.	86	52	37	76	39
	Median	1276	1440	966	878	794
	Coeff. Var.	7	4	4	8	5
TOC, mg/L	Minimum	1.1	0.6	0.5	0.5	0.8
	Mean	1.2	0.7	0.5	0.6	0.8
	Maximum	1.3	0.9	0.5	0.6	0.8
	Std. Dev.	0.1	0.1	0.0	0.1	0.0
	Median	1.3	0.7	0.5	0.6	0.8
	Coeff. Var.	9.4	16.3	0.0	10.2	0.0

¹For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

²For purposes of statistical evaluation, NH₄⁺-N values less than 0.02 (the detection limit) were set equal to 0.02.

TABLE 5: SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-41 THROUGH QD-45

Parameter		Well Number				
		QD-41	QD-42	QD-43	QD-44	QD-45
Cl, mg/L	Minimum	18	19	35	14	18
	Mean	56	19	37	19	19
	Maximum	132	20	39	25	20
	Std. Dev.	66	1	2	6	1
	Median	19	19	38	17	18
	Coeff. Var.	116	3	6	30	6
Cond., µmhos/cm	Minimum	935	943	946	330	395
	Mean	1034	1021	997	673	749
	Maximum	1119	1116	1048	961	991
	Std. Dev.	93	88	51	319	313
	Median	1047	1003	997	727	860
	Coeff. Var.	9	9	5	47	42
FC, ¹ cfu/100 mL	Minimum	1	1	1	1	1
	Geo. Mean	1	1	1	1	1
	Maximum	1	1	1	1	1
	Geo. Std. Dev.	0	0	0	0	0
	Median	1	1	1	1	1
	Coeff. Var.	0	0	0	0	0
Hard., as CaCO ₃ , mg/L	Minimum	429	381	421	236	85
	Mean	441	401	437	267	89
	Maximum	448	420	448	313	93
	Std. Dev.	10	20	14	41	4
	Median	446	402	442	251	89
	Coeff. Var.	2	5	3	15	4
NH ₄ ⁺ -N, mg/L	Minimum	0.21	0.25	0.19	0.25	0.18
	Mean	0.23	0.27	0.23	0.28	0.22
	Maximum	0.24	0.30	0.27	0.31	0.27
	Std. Dev.	0.02	0.03	0.04	0.03	0.05
	Median	0.23	0.26	0.22	0.29	0.20
	Coeff. Var.	6.74	9.80	17.83	10.78	21.81

TABLE 5 (Continued): SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-41 THROUGH QD-45

Parameter		Well Number				
		QD-41	QD-42	QD-43	QD-44	QD-45
pH	Minimum	7.6	7.5	7.6	6.4	7.5
	Mean	7.7	7.6	7.7	7.4	7.8
	Maximum	7.8	7.7	7.9	8.1	8.2
	Std. Dev.	0.1	0.1	0.2	0.9	0.4
	Median	7.6	7.7	7.6	7.6	7.8
	Coeff. Var.	1.5	1.5	2.2	11.9	4.5
SO ₄ , mg/L	Minimum	316	252	189	177	192
	Mean	351	265	210	189	203
	Maximum	378	286	228	208	219
	Std. Dev.	32	18	20	16	14
	Median	360	258	214	183	199
	Coeff. Var.	9	7	9	9	7
TDS, mg/L	Minimum	794	742	682	518	552
	Mean	817	779	713	574	569
	Maximum	830	800	742	634	592
	Std. Dev.	20	32	30	58	21
	Median	828	796	714	570	562
	Coeff. Var.	2	4	4	10	4
TOC, mg/L	Minimum	1.1	0.9	0.7	1.0	0.8
	Mean	1.2	0.9	0.8	1.0	0.8
	Maximum	1.3	0.9	0.8	1.1	0.9
	Std. Dev.	0.1	0.0	0.1	0.1	0.1
	Median	1.3	0.9	0.8	1.0	0.8
	Coeff. Var.	9.4	0.0	7.5	5.6	6.9

¹For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

TABLE 6: SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-46 THROUGH QD-50

Parameter		Well Number				
		QD-46	QD-47	QD-48	QD-49	QD-50
Cl, mg/L	Minimum	22	16	14	14	1
	Mean	23	17	15	15	10
	Maximum	24	17	17	15	16
	Std. Dev.	1	1	2	1	8
	Median	22	17	14	15	14
	Coeff. Var.	5	3	12	5	79
Cond., µmhos/cm	Minimum	456	344	353	288	394
	Mean	644	505	591	290	793
	Maximum	961	808	1020	291	1005
	Std. Dev.	276	263	372	2	346
	Median	516	363	400	290	981
	Coeff. Var.	43	52	63	1	44
FC, ¹ cfu/100 mL	Minimum	1	1	1	1	1
	Geo. Mean	1	1	1	1	1
	Maximum	1	1	1	1	1
	Geo. Std. Dev.	0	0	0	0	0
	Median	1	1	1	1	1
	Coeff. Var.	0	0	0	0	0
Hard., as CaCO ₃ , mg/L	Minimum	66	237	261	206	7
	Mean	78	239	329	266	8
	Maximum	86	241	389	326	8
	Std. Dev.	10	2	64	85	1
	Median	81	239	337	266	8
	Coeff. Var.	13	1	20	32	8
NH ₄ ⁺ -N, mg/L	Minimum	0.16	0.17	0.23	0.16	0.06
	Mean	0.18	0.20	0.26	0.21	0.09
	Maximum	0.21	0.23	0.28	0.26	0.11
	Std. Dev.	0.03	0.03	0.03	0.07	0.03
	Median	0.18	0.21	0.26	0.21	0.10
	Coeff. Var.	13.73	15.02	9.80	33.67	29.40

TABLE 6 (Continued): SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-46 THROUGH QD-50

Parameter		Well Number				
		QD-46	QD-47	QD-48	QD-49	QD-50
pH	Minimum	7.6	7.6	7.6	7.7	7.7
	Mean	8.0	7.7	7.7	7.8	8.3
	Maximum	8.2	7.9	7.8	7.8	9.4
	Std. Dev.	0.3	0.2	0.1	0.1	1.0
	Median	8.1	7.7	7.8	7.8	7.8
	Coeff. Var.	4.0	2.0	1.5	0.9	11.5
SO ₄ , mg/L	Minimum	123	132	274	225	272
	Mean	135	148	286	229	281
	Maximum	152	174	300	233	289
	Std. Dev.	15	23	13	6	9
	Median	131	138	283	229	282
	Coeff. Var.	11	15	5	2	3
TDS, mg/L	Minimum	660	522	562	514	678
	Mean	674	528	651	576	699
	Maximum	688	538	728	638	714
	Std. Dev.	14	9	84	88	19
	Median	674	524	664	576	706
	Coeff. Var.	2	2	13	15	3
TOC, mg/L	Minimum	0.7	0.8	1.4	1.0	0.7
	Mean	0.8	0.8	1.7	1.1	0.9
	Maximum	0.9	0.9	2.2	1.1	1.0
	Std. Dev.	0.1	0.1	0.4	0.1	0.2
	Median	0.7	0.8	1.5	1.1	1.0
	Coeff. Var.	15.1	6.9	25.6	6.7	19.2

¹For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

TABLE 7: SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-51 THROUGH QD-55

Parameter		Well Number				
		QD-51	QD-52	QD-53	QD-54	QD-55
Cl, mg/L	Minimum	1	1	20	18	18
	Mean	8	10	20	27	19
	Maximum	12	15	20	46	20
	Std. Dev.	6	8	0	16	1
	Median	12	15	20	18	18
	Coeff. Var.	76	78	0	59	6
Cond., µmhos/cm	Minimum	421	391	490	364	359
	Mean	691	610	752	586	524
	Maximum	831	728	888	736	793
	Std. Dev.	234	190	227	196	235
	Median	822	710	877	658	421
	Coeff. Var.	34	31	30	33	45
FC, ¹ cfu/100 mL	Minimum	1	1	1	1	1
	Geo. Mean	1	1	1	1	1
	Maximum	1	1	1	1	1
	Geo. Std. Dev.	0	0	0	0	0
	Median	1	1	1	1	1
	Coeff. Var.	0	0	0	0	0
Hard., as CaCO ₃ , mg/L	Minimum	5	20	10	40	170
	Mean	5	23	11	41	176
	Maximum	5	25	12	43	184
	Std. Dev.	0	3	1	2	7
	Median	5	24	11	40	174
	Coeff. Var.	0	12	9	4	4
NH ₄ ⁺ -N, ² mg/L	Minimum	0.02	0.02	0.02	0.14	0.28
	Mean	0.06	0.08	0.02	0.17	0.32
	Maximum	0.14	0.14	0.02	0.20	0.34
	Std. Dev.	0.07	0.06	0.00	0.03	0.03
	Median	0.02	0.07	0.02	0.16	0.33
	Coeff. Var.	115.47	78.62	0.00	18.33	10.15

TABLE 7 (Continued): SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-51 THROUGH QD-55

Parameter		Well Number				
		QD-51	QD-52	QD-53	QD-54	QD-55
pH	Minimum	7.8	7.6	7.7	7.6	7.4
	Mean	8.4	8.1	8.2	8.4	7.8
	Maximum	9.4	8.9	9.0	9.0	8.4
	Std. Dev.	0.9	0.7	0.7	0.7	0.5
	Median	7.9	7.7	7.8	8.6	7.6
	Coeff. Var.	10.7	9.0	8.9	8.6	6.8
SO ₄ , mg/L	Minimum	119	140	161	149	197
	Mean	120	182	193	248	292
	Maximum	122	265	251	443	477
	Std. Dev.	2	72	51	169	161
	Median	119	141	166	151	201
	Coeff. Var.	1	39	26	68	55
TDS, mg/L	Minimum	548	480	570	458	510
	Mean	571	499	597	496	520
	Maximum	616	534	622	550	526
	Std. Dev.	39	30	26	48	9
	Median	550	484	600	480	524
	Coeff. Var.	7	6	4	10	2
TOC, mg/L	Minimum	0.7	0.7	0.9	0.6	0.9
	Mean	0.8	0.8	1.0	0.7	0.9
	Maximum	0.9	0.9	1.3	1.0	1.0
	Std. Dev.	0.1	0.1	0.2	0.2	0.1
	Median	0.9	0.9	0.9	0.6	0.9
	Coeff. Var.	13.9	13.9	22.3	31.5	6.2

¹For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

²For purposes of statistical evaluation, NH₄⁺-N values less than 0.02 (the detection limit) were set equal to 0.02.

TABLE 8: SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-56 THROUGH QD-60

Parameter		Well Number				
		QD-56	QD-57	QD-58	QD-59	QD-60
Cl, mg/L	Minimum	11	13	1	110	51
	Mean	12	13	9	112	52
	Maximum	12	14	13	113	52
	Std. Dev.	1	1	7	2	1
	Median	12	13	12	112	52
	Coeff. Var.	5	4	77	1	1
Cond., µmhos/cm	Minimum	272	303	256	396	346
	Mean	388	417	350	672	537
	Maximum	498	616	417	850	647
	Std. Dev.	113	173	84	243	166
	Median	395	333	376	771	618
	Coeff. Var.	29	41	24	36	31
FC, ¹ cfu/100 mL	Minimum	1	1	1	1	1
	Geo. Mean	1	1	1	1	1
	Maximum	1	1	1	1	1
	Geo. Std. Dev.	0	0	0	0	0
	Median	1	1	1	1	1
	Coeff. Var.	0	0	0	0	0
Hard., as CaCO ₃ , mg/L	Minimum	48	18	116	256	248
	Mean	49	18	117	271	252
	Maximum	50	18	118	278	260
	Std. Dev.	1	0	1	13	7
	Median	49	18	117	278	249
	Coeff. Var.	2	0	1	5	3
NH ₄ ⁺ -N, mg/L	Minimum	0.16	0.14	0.22	0.30	0.31
	Mean	0.19	0.18	0.24	0.37	0.34
	Maximum	0.21	0.20	0.26	0.46	0.39
	Std. Dev.	0.03	0.03	0.02	0.08	0.05
	Median	0.21	0.19	0.24	0.34	0.31
	Coeff. Var.	14.93	18.20	8.33	22.71	13.72

TABLE 8 (Continued): SUMMARY STATISTICS OF THE 2006 DATA FOR THE WATER QUALITY MONITORING WELLS IN THE DES PLAINES TUNNEL SYSTEM: WELLS QD-56 THROUGH QD-60

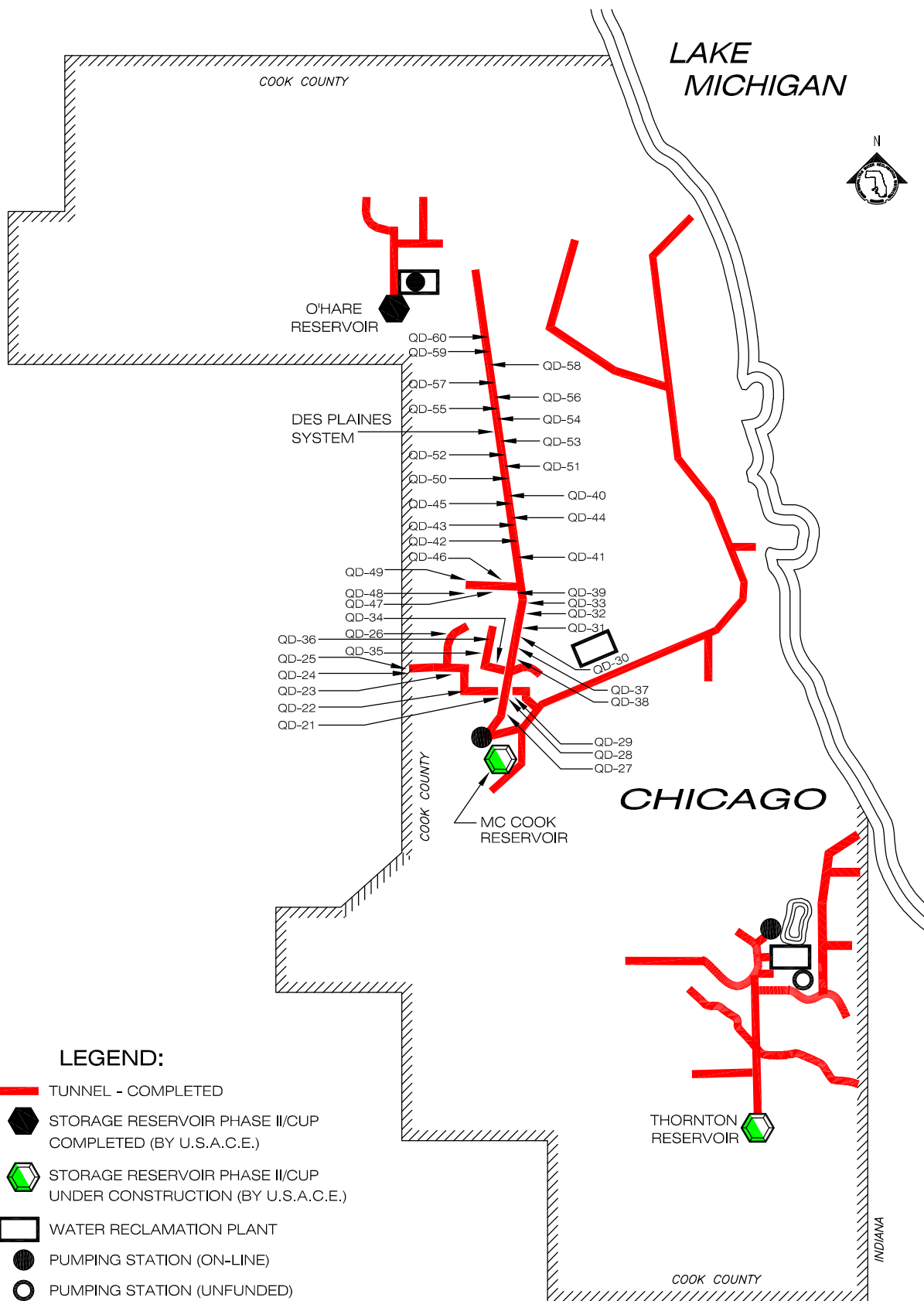
Parameter	Well Number					
	QD-56	QD-57	QD-58	QD-59	QD-60	
pH	Minimum	7.4	7.4	7.0	7.2	7.1
	Mean	7.8	8.0	7.5	7.5	7.5
	Maximum	8.6	8.7	7.8	7.7	7.8
	Std. Dev.	0.7	0.7	0.4	0.3	0.4
	Median	7.5	7.8	7.6	7.7	7.7
	Coeff. Var.	8.5	8.4	5.6	3.8	5.0
SO ₄ , mg/L	Minimum	10	56	2	58	101
	Mean	93	143	10	86	132
	Maximum	257	313	25	139	190
	Std. Dev.	142	148	13	46	51
	Median	12	59	3	62	104
	Coeff. Var.	153	103	130	53	38
TDS, mg/L	Minimum	262	380	280	484	424
	Mean	316	401	293	499	445
	Maximum	344	426	306	524	472
	Std. Dev.	47	23	13	22	25
	Median	342	398	292	490	438
	Coeff. Var.	15	6	4	4	6
TOC, mg/L	Minimum	0.5	0.6	0.3	0.6	0.2
	Mean	0.5	0.6	0.4	0.7	0.2
	Maximum	0.6	0.7	0.4	0.8	0.2
	Std. Dev.	0.1	0.1	0.1	0.1	0.0
	Median	0.5	0.6	0.4	0.6	0.2
	Coeff. Var.	10.8	9.1	15.7	17.3	0.0

¹For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

²For purposes of statistical evaluation, TOC values less than 0.2 (the detection limit) were set equal to 0.2.

APPENDIX AI

LOCATION MAP OF GROUNDWATER QUALITY MONITORING WELLS
QD-21 THROUGH QD-60
IN THE DES PLAINES TUNNEL SYSTEM



**DES PLAINES TUNNEL SYSTEM
LOCATION MAP OF GROUNDWATER
QUALITY MONITORING WELLS**

METROPOLITAN WATER RECLAMATION
DISTRICT OF GREATER CHICAGO

APPENDIX AII

2006 GROUNDWATER QUALITY DATA
FOR MONITORING WELLS QD-21 THROUGH QD-60
IN THE DES PLAINES TUNNEL SYSTEM

TABLE AII-1: 2006 pH, CONDUCTIVITY, TEMPERATURE, HARDNESS, AMMONIA NITROGEN, AND CHLORIDE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	pH ¹	Cond. ¹ μmhos/cm	Temp. °C	Hard. as CaCO ₃ mg/L	NH ₄ ⁺ -N mg/L	Cl mg/L
QD-21	5/31/06	7.0	2627	13	817	0.25	355
QD-21	8/16/06	6.8	1505	15	769	0.32	302
QD-21	11/28/06	8.2	851	13	733	0.18	103
QD-22	5/31/06	7.0	1573	14	734	0.37	157
QD-22	8/16/06	7.3	1305	14	732	0.45	147
QD-22	11/28/06	7.8	680	13	743	0.34	141
QD-23	5/31/06	7.0	1727	14	765	0.43	141
QD-23	8/16/06	7.1	1406	14	756	0.52	138
QD-23	11/28/06	7.7	726	13	754	0.41	138
QD-24	5/31/06	7.2	1562	13	456	0.41	95
QD-24	8/16/06	7.2	1242	13	588	0.52	101
QD-24	11/28/06	7.8	732	12	475	0.39	87
QD-25	5/31/06	7.1	2179	14	568	0.66	353
QD-25	8/16/06	7.0	1977	13	608	0.74	375
QD-25	11/28/06	7.6	899	11	599	0.71	359
QD-26	5/11/06	7.6	356	12	424	0.25	19
QD-26	8/10/06	7.5	355	13	423	0.26	17
QD-26	11/1/06	7.4	828	12	399	0.28	16
QD-27	2/2/06	7.4	515	11	504	19.32	280
QD-27	3/23/06	7.0	1407	12	509	18.31	268
QD-27	5/25/06	7.7	607	13	473	14.39	212
QD-27	6/22/06	7.4	1928	16	527	25.56	321
QD-27	10/18/06	7.2	2430	13	420	15.20	254
QD-27	11/16/06	7.4	2175	12	503	24.42	281
QD-28	5/30/06	7.2	2063	15	735	0.55	332
QD-28	8/9/06	7.4	655	13	687	0.59	322
QD-28	11/29/06	7.8	835	13	710	0.47	316

TABLE AII-1 (Continued): 2006 pH, CONDUCTIVITY, TEMPERATURE, HARDNESS, AMMONIA NITROGEN, AND CHLORIDE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	pH ¹	Cond. ¹ µmhos/cm	Temp. °C	Hard. as CaCO ₃ mg/L	NH ₄ ⁺ -N mg/L	Cl mg/L
QD-29	5/30/06	7.2	1378	13	695	0.36	145
QD-29	8/9/06	7.6	551	13	667	0.34	138
QD-29	11/29/06	7.9	652	13	674	0.32	142
QD-30	5/25/06	7.4	620	12	770	1.76	162
QD-30	8/10/06	7.7	520	12	708	0.24	128
QD-30	11/1/06	7.2	1529	11	726	0.23	133
QD-31	2/2/06	7.6	483	11	254	0.18	120
QD-31	5/25/06	7.6	582	12	264	0.21	122
QD-31	8/10/06	7.5	555	12	249	0.16	118
QD-32	5/25/06	8.8	1392	12	24	0.10	483
QD-32	8/10/06	8.2	1336	13	27	0.08	469
QD-32	11/1/06	9.3	3257	10	38	0.18	502
QD-33	2/2/06	7.6	1065	12	26	0.16	360
QD-33	3/23/06	7.0	2055	12	27	2.10	348
QD-33	5/11/06	7.7	938	12	28	0.14	355
QD-33	6/22/06	8.4	2553	13	26	0.58	355
QD-33	10/18/06	8.3	2434	12	24	1.84	342
QD-33	11/16/06	8.2	2504	11	28	0.21	334
QD-34	1/5/06	7.4	473	12	748	0.29	108
QD-34	2/23/06	7.3	500	12	784	0.27	110
QD-34	5/30/06	7.1	1697	14	806	0.31	122
QD-34	6/27/06	7.0	1403	15	784	0.25	113
QD-34	8/9/06	7.7	571	13	794	0.29	117
QD-34	10/5/06	7.6	552	12	707	0.44	112
QD-35	5/30/06	7.2	1717	13	711	0.27	126
QD-35	8/9/06	7.8	543	13	676	0.26	119
QD-35	11/29/06	8.0	646	12	630	0.25	124

TABLE AII-1 (Continued): 2006 pH, CONDUCTIVITY, TEMPERATURE, HARDNESS, AMMONIA NITROGEN, AND CHLORIDE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	pH ¹	Cond. ¹ μmhos/cm	Temp. °C	Hard. as CaCO ₃ mg/L	NH ₄ ⁺ -N mg/L	Cl mg/L
QD-36	5/30/06	7.2	1630	13	753	0.24	117
QD-36	8/9/06	7.6	550	12	712	0.22	124
QD-36	11/29/06	8.0	668	13	757	0.21	131
QD-37	3/2/06	7.3	2279	12	337	0.10	270
QD-37	3/23/06	7.0	384	12	575	0.19	258
QD-37	5/11/06	7.5	834	12	584	0.27	241
QD-37	6/22/06	7.3	2100	14	590	0.24	259
QD-37	10/26/06	7.8	1051	13	443	0.26	243
QD-37	11/16/06	7.3	2010	12	391	0.05	293
QD-38	5/11/06	7.6	555	12	267	0.32	200
QD-38	8/10/06	7.6	451	13	258	0.31	220
QD-38	11/1/06	7.9	1376	11	251	0.32	221
QD-39	3/2/06	7.3	1250	11	19	<0.02	42
QD-39	5/25/06	7.5	692	12	18	0.21	77
QD-39	6/22/06	8.5	1194	12	20	<0.02	51
QD-40	3/23/06	7.0	945	12	23	<0.02	33
QD-40	6/8/06	7.9	1140	14	22	0.25	140
QD-40	10/19/06	8.7	1187	12	26	0.05	17
QD-41	3/16/06	7.8	1047	12	446	0.23	19
QD-41	6/8/06	7.6	935	14	448	0.24	132
QD-41	10/19/06	7.6	1119	12	429	0.21	18
QD-42	3/16/06	7.7	943	11	402	0.26	19
QD-42	6/8/06	7.7	1003	12	420	0.30	20
QD-42	10/19/06	7.5	1116	11	381	0.25	19
QD-43	3/16/06	7.9	997	11	442	0.19	35
QD-43	6/8/06	7.6	946	13	448	0.27	39
QD-43	10/19/06	7.6	1048	11	421	0.22	38

TABLE AII-1 (Continued): 2006 pH, CONDUCTIVITY, TEMPERATURE, HARDNESS, AMMONIA NITROGEN, AND CHLORIDE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	pH ¹	Cond. ¹ µmhos/cm	Temp. °C	Hard. as CaCO ₃ mg/L	NH ₄ ⁺ -N mg/L	Cl mg/L
QD-44	1/30/06	6.4	961	10	251	0.31	14
QD-44	6/27/06	8.1	727	13	236	0.25	25
QD-44	7/6/06	7.6	330	12	313	0.29	17
QD-45	3/16/06	7.8	860	11	85	0.18	18
QD-45	6/8/06	8.2	991	13	93	0.27	20
QD-45	7/19/06	7.5	395	12	89	0.20	18
QD-46	5/30/06	8.2	961	12	81	0.21	24
QD-46	8/9/06	7.6	456	12	66	0.16	22
QD-46	11/29/06	8.1	516	12	86	0.18	22
QD-47	3/16/06	7.7	363	13	241	0.17	16
QD-47	6/8/06	7.9	808	17	237	0.23	17
QD-47	7/19/06	7.6	344	13	239	0.21	17
QD-48	3/16/06	7.8	353	11	261	0.23	14
QD-48	6/8/06	7.8	1020	15	337	0.26	14
QD-48	7/19/06	7.6	400	15	389	0.28	17
QD-49	3/16/06	7.8	291	12	206	0.26	14
QD-49	6/8/06			Well could not be sampled			
QD-49	7/19/06	7.7	288	16	326	0.16	15
QD-50	5/18/06	7.8	981	12	8	0.11	1
QD-50	8/2/06	7.7	394	12	7	0.06	14
QD-50	11/2/06	9.4	1005	12	8	0.10	16
QD-51	5/18/06	7.8	831	12	5	0.14	1
QD-51	8/2/06	7.9	421	12	5	<0.02	12
QD-51	11/2/06	9.4	822	12	5	<0.02	12
QD-52	5/18/06	7.7	728	13	24	0.14	1
QD-52	8/2/06	7.6	391	14	25	0.02	15
QD-52	11/2/06	8.9	710	12	20	0.07	15

TABLE AII-1 (Continued): 2006 pH, CONDUCTIVITY, TEMPERATURE, HARDNESS, AMMONIA NITROGEN, AND CHLORIDE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	pH ¹	Cond. ¹ µmhos/cm	Temp. °C	Hard. as CaCO ₃ mg/L	NH ₄ ⁺ -N mg/L	Cl mg/L
QD-53	5/18/06	7.8	888	13	10	0.02	20
QD-53	8/2/06	7.7	490	15	12	<0.02	20
QD-53	11/2/06	9.0	877	12	11	<0.02	20
QD-54	5/11/06	7.6	364	12	43	0.20	46
QD-54	8/2/06	8.6	736	15	40	0.14	18
QD-54	11/2/06	9.0	658	11	40	0.16	18
QD-55	5/11/06	7.4	359	12	174	0.33	20
QD-55	8/2/06	8.4	793	14	170	0.28	18
QD-55	11/2/06	7.6	421	11	184	0.34	18
QD-56	2/2/06	7.4	395	11	50	0.21	11
QD-56	5/11/06	7.5	272	11	49	0.21	12
QD-56	8/2/06	8.6	498	13	48	0.16	12
QD-57	5/11/06	7.4	303	12	18	0.19	13
QD-57	8/2/06	8.7	616	13	18	0.14	13
QD-57	11/2/06	7.8	333	11	18	0.20	14
QD-58	5/18/06	7.0	417	11	118	0.26	1
QD-58	8/3/06	7.8	376	12	117	0.22	13
QD-58	11/2/06	7.6	256	11	116	0.24	12
QD-59	5/18/06	7.2	771	11	278	0.34	112
QD-59	8/3/06	7.7	850	13	278	0.30	110
QD-59	11/2/06	7.7	396	11	256	0.46	113
QD-60	5/18/06	7.1	647	12	260	0.39	51
QD-60	8/3/06	7.7	618	13	248	0.31	52
QD-60	11/2/06	7.8	346	11	249	0.31	52

¹Unfiltered samples, all others were filtered through 0.45 µm membrane.

TABLE AII-2: 2006 SULFATE, TOTAL ORGANIC CARBON,
TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND
RECHARGE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH
QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	SO ₄ mg/L	TOC mg/L	TDS mg/L	FC ¹ cfu/100 mL	Water Elevation ² Feet	Recharge ³ Hours
QD-21	5/31/06	283	1.3	1670	<1	-76	<4
QD-21	8/16/06	316	1.0	1636	<1	-75	<4
QD-21	11/28/06	289	1.1	1318	<1	-76	<4
QD-22	5/31/06	280	1.0	1284	<1	-35	<4
QD-22	8/16/06	1038	1.1	1342	<1	-34	<4
QD-22	11/28/06	286	1.1	1134	<1	-34	<4
QD-23	5/31/06	295	1.6	1282	<1	-41	<4
QD-23	8/16/06	1287	1.7	1342	<1	-41	<4
QD-23	11/28/06	303	1.8	1126	<1	-40	<4
QD-24	5/31/06	137	1.5	756	<1	11	<4
QD-24	8/16/06	830	1.9	1002	<1	13	<4
QD-24	11/28/06	180	1.6	768	<1	14	<4
QD-25	5/31/06	177	1.8	1326	<1	24	<4
QD-25	8/16/06	1031	1.4	1568	<1	26	<4
QD-25	11/28/06	221	2.0	1294	<1	25	<4
QD-26	5/11/06	111	0.6	566	<1	-18	<48
QD-26	8/10/06	106	0.7	534	<1	-21	<48
QD-26	11/1/06	117	0.7	560	<1	-20	<48
QD-27	2/2/06	75	15.3	1116	<1	-195	<48
QD-27	3/23/06	53	16.2	1088	<1	-196	<48
QD-27	5/25/06	32	14.9	980	<1	-193	<48
QD-27	6/22/06	54	17.8	1236	<1	-193	<48
QD-27	10/18/06	43	14.8	1064	<1	-180	<48
QD-27	11/16/06	54	17.8	1196	<1	-194	<48
QD-28	5/30/06	239	0.8	1540	<1	-129	<4
QD-28	8/9/06	231	1.0	1586	<1	-129	<4
QD-28	11/29/06	268	1.1	1308	<1	-129	<4

TABLE AII-2 (Continued): 2006 SULFATE, TOTAL ORGANIC CARBON,
TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND
RECHARGE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH
QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	SO ₄ mg/L	TOC mg/L	TDS mg/L	FC ¹ cfu/100 mL	Water Elevation ² Feet	Recharge ³ Hours
QD-29	5/30/06	250	1.4	1158	<1	-196	<4
QD-29	8/9/06	245	1.8	1190	<1	-194	<4
QD-29	11/29/06	267	1.4	1030	<1	-193	<4
QD-30	5/25/06	384	1.2	1282	<1	-129	<48
QD-30	8/10/06	318	0.9	1140	<1	-128	<48
QD-30	11/1/06	343	0.9	1172	<1	-134	<48
QD-31	2/2/06	204	1.0	906	<1	-179	<48
QD-31	5/25/06	187	1.0	948	<1	-174	<48
QD-31	8/10/06	170	0.8	948	<1	-173	<48
QD-32	5/25/06	222	0.4	1912	1	-213	<48
QD-32	8/10/06	210	0.5	2602	<1	-212	<48
QD-32	11/1/06	238	0.4	1946	<1	-212	<48
QD-33	2/2/06	227	0.4	1678	<1	-101	<48
QD-33	3/23/06	193	0.4	1574	<1	-167	<48
QD-33	5/11/06	194	0.4	1722	<1	-168	<48
QD-33	6/22/06	218	0.5	1688	<1	-169	<48
QD-33	10/18/06	192	0.7	1566	<1	-172	<48
QD-33	11/16/06	200	0.4	1762	<1	-173	<48
QD-34	1/5/06	349	0.9	1116	<1	-119	<4
QD-34	2/23/06	408	1.0	1176	<1	-114	<4
QD-34	5/30/06	364	0.9	1286	<1	-115	<4
QD-34	6/27/06	394	1.1	1318	<1	-114	<4
QD-34	8/9/06	362	1.2	1404	<1	-115	<4
QD-34	10/5/06	322	1.2	1096	71	-109	<4
QD-35	5/30/06	284	3.7	1214	<1	-110	<4
QD-35	8/9/06	286	6.6	1248	<1	-109	<4
QD-35	11/29/06	286	3.4	982	<1	-110	<4

TABLE AII-2 (Continued): 2006 SULFATE, TOTAL ORGANIC CARBON,
TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND
RECHARGE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH
QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	SO ₄ mg/L	TOC mg/L	TDS mg/L	FC ¹ cfu/100 mL	Water Elevation ² Feet	Recharge ³ Hours
QD-36	5/30/06	291	1.1	1296	<1	-120	<4
QD-36	8/9/06	276	1.3	1276	<1	-119	<4
QD-36	11/29/06	345	1.3	1138	<1	-123	<4
QD-37	3/2/06	567	0.8	1362	<1	-200	<48
QD-37	3/23/06	385	0.7	1456	<1	-205	<48
QD-37	5/11/06	377	0.6	1424	<1	-204	<48
QD-37	6/22/06	409	0.7	1472	<1	-203	<48
QD-37	10/26/06	376	0.6	1362	<1	-208	<48
QD-37	11/16/06	338	0.9	1472	<1	-208	<48
QD-38	5/11/06	102	0.5	906	<1	-203	<48
QD-38	8/10/06	100	0.5	974	<1	-203	<48
QD-38	11/1/06	111	0.5	966	<1	-178	<48
QD-39	3/2/06	123	0.6	836	<1	-144	<48
QD-39	5/25/06	100	0.6	984	<1	-139	<48
QD-39	6/22/06	110	0.5	878	<1	-144	<48
QD-40	3/23/06	397	0.8	810	<1	-88	<48
QD-40	6/8/06	345	0.8	736	<1	-79	<48
QD-40	10/19/06	398	0.8	794	<1	-80	<48
QD-41	3/16/06	378	1.1	794	<1	-131	<48
QD-41	6/8/06	316	1.3	828	<1	-125	<48
QD-41	10/19/06	360	1.3	830	<1	-137	<48
QD-42	3/16/06	252	0.9	742	<1	-123	<48
QD-42	6/8/06	258	0.9	796	<1	-123	<48
QD-42	10/19/06	286	0.9	800	<1	-126	<48
QD-43	3/16/06	228	0.8	682	<1	-142	<48
QD-43	6/8/06	189	0.7	714	<1	-145	<48
QD-43	10/19/06	214	0.8	742	<1	-141	<48

TABLE AII-2 (Continued): 2006 SULFATE, TOTAL ORGANIC CARBON, TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND RECHARGE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	SO ₄ mg/L	TOC mg/L	TDS mg/L	FC ¹ cfu/100 mL	Water Elevation ² Feet	Recharge ³ Hours
QD-44	1/30/06	177	1.1	518	<1	-11	<4
QD-44	6/27/06	183	1.0	570	<1	-12	<4
QD-44	7/6/06	208	1.0	634	<1	-12	<4
QD-45	3/16/06	219	0.8	552	<1	-10	<48
QD-45	6/8/06	192	0.8	592	<1	-10	<48
QD-45	7/19/06	199	0.9	562	<1	-10	<48
QD-46	5/30/06	131	0.7	688	<1	-168	<4
QD-46	8/9/06	123	0.9	674	<1	-168	<4
QD-46	11/29/06	152	0.7	660	<1	-182	<4
QD-47	3/16/06	174	0.9	524	<1	2	<48
QD-47	6/8/06	132	0.8	538	<1	3	<48
QD-47	7/19/06	138	0.8	522	<1	2	<48
QD-48	3/16/06	300	2.2	562	<1	-171	<48
QD-48	6/8/06	283	1.4	664	<1	-169	<48
QD-48	7/19/06	274	1.5	728	<1	-173	<48
QD-49	3/16/06	233	1.0	514	<1	-181	<48
QD-49	6/8/06			Well could not be sampled			
QD-49	7/19/06	225	1.1	638	<1	-182	<48
QD-50	5/18/06	282	1.0	678	<1	-133	<48
QD-50	8/2/06	272	1.0	706	<1	-132	<48
QD-50	11/2/06	289	0.7	714	<1	-133	<48
QD-51	5/18/06	119	0.9	550	<1	-101	<48
QD-51	8/2/06	122	0.9	616	<1	-102	<48
QD-51	11/2/06	119	0.7	548	<1	-101	<48

TABLE AII-2 (Continued): 2006 SULFATE, TOTAL ORGANIC CARBON,
TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND
RECHARGE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH
QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	SO ₄ mg/L	TOC mg/L	TDS mg/L	FC ¹ cfu/100 mL	Water Elevation ² Feet	Recharge ³ Hours
QD-52	5/18/06	141	0.9	484	<1	-58	<48
QD-52	8/2/06	265	0.9	534	<1	-58	<48
QD-52	11/2/06	140	0.7	480	<1	-59	<48
QD-53	5/18/06	166	0.9	570	<1	-160	<48
QD-53	8/2/06	251	1.3	622	<1	-167	<48
QD-53	11/2/06	161	0.9	600	<1	-166	<48
QD-54	5/11/06	149	0.6	550	<1	-18	<48
QD-54	8/2/06	443	0.6	480	<1	-19	<48
QD-54	11/2/06	151	0.4	458	1	-18	<48
QD-55	5/11/06	197	1.0	526	<1	-131	<48
QD-55	8/2/06	477	0.9	510	<1	-129	<48
QD-55	11/2/06	201	0.9	524	<1	-137	<48
QD-56	2/2/06	12	0.6	262	<1	-60	<48
QD-56	5/11/06	10	0.5	342	<1	-61	<48
QD-56	8/2/06	257	0.5	344	<1	-61	<48
QD-57	5/11/06	59	0.7	380	<1	-99	<48
QD-57	8/2/06	313	0.6	398	<1	-99	<48
QD-57	11/2/06	56	0.6	426	<1	-108	<48
QD-58	5/18/06	3	0.4	292	<1	-98	<48
QD-58	8/3/06	25	0.4	306	<1	-95	<48
QD-58	11/2/06	2	0.3	280	<1	-104	<48
QD-59	5/18/06	62	0.6	484	<1	-38	<48
QD-59	8/3/06	139	0.8	524	<1	-36	<48
QD-59	11/2/06	58	0.6	490	<1	-37	<48

TABLE AII-2 (Continued): 2006 SULFATE, TOTAL ORGANIC CARBON,
TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND
RECHARGE DATA FOR WATER QUALITY MONITORING WELLS QD-21 THROUGH
QD-60 IN THE DES PLAINES TUNNEL SYSTEM

Well	Date of Sampling	SO ₄ mg/L	TOC mg/L	TDS mg/L	FC ¹ cfu/100 mL	Water Elevation ² Feet	Recharge ³ Hours
QD-60	5/18/06	104	0.2	424	<1	-99	<48
QD-60	8/3/06	190	0.2	438	<1	-112	<48
QD-60	11/2/06	101	0.2	472	<1	-115	<48

¹Unfiltered samples, all others were filtered through 0.45 µm membrane.

²Water level elevations are relative to Chicago City Datum.

³Refers to elapsed time after initial drawdown before the well recovered sufficiently for sampling.