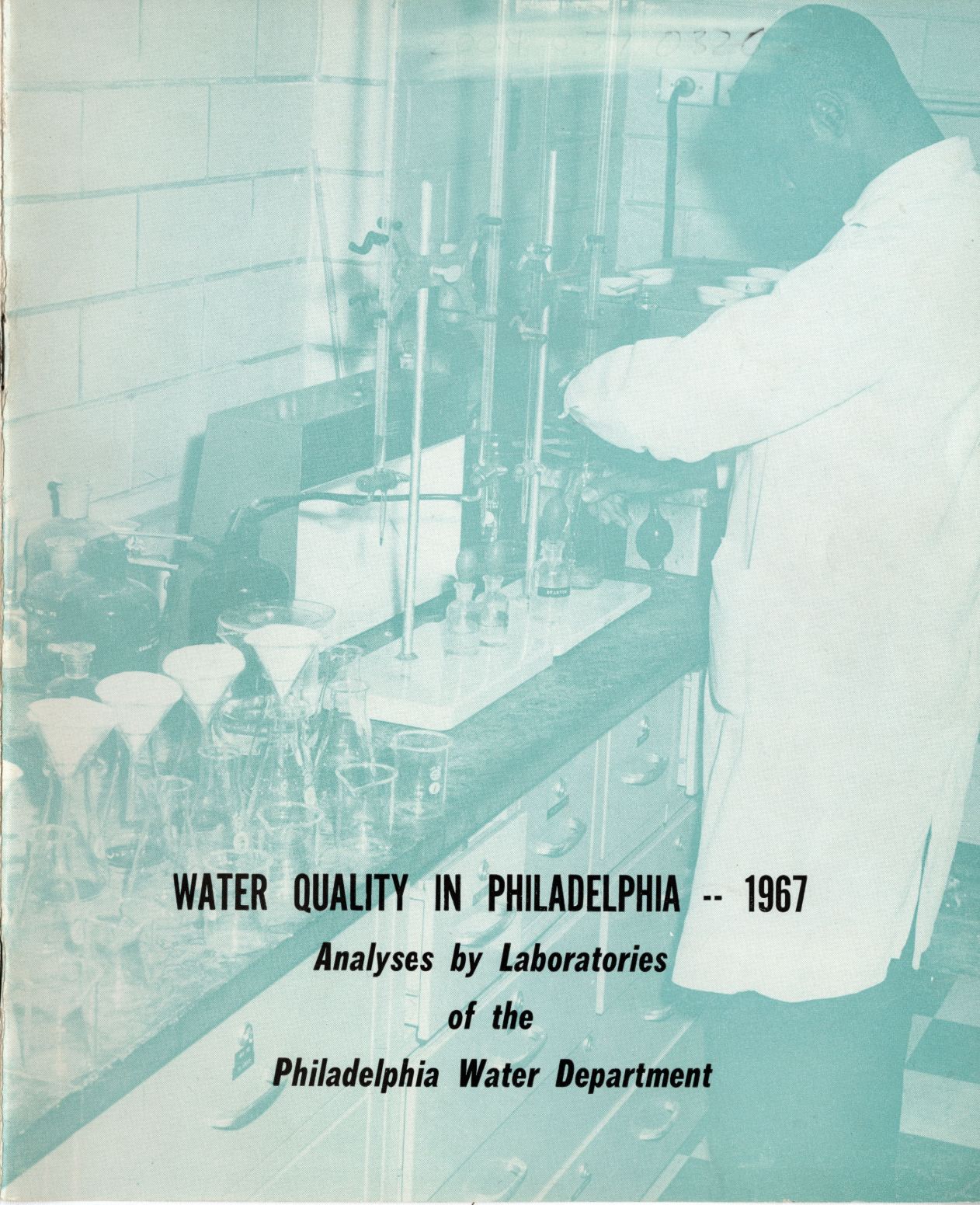


WATER QUALITY IN PHILADELPHIA -- 1967

Analyses by Laboratories

of the

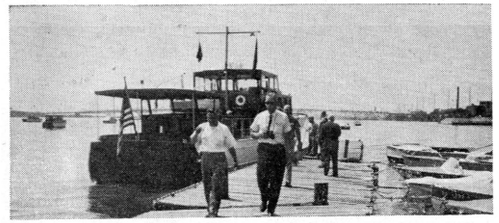
Philadelphia Water Department

Torresdale Plant: One of the biggest semi-automatic water plants in the country, Philadelphia's Torresdale complex has been the scene of many improvements in the methods of water treatment. Here a large laboratory keeps check on half of the city's water supply.

Sources of City Water

Philadelphia draws its water from the Delaware and Schuylkill Rivers in approximately equal quantities. These rivers are surface waters which are relatively consistent, but are subject to changes in quality according to rainfall and other conditions existing on their watersheds.

Although the land comprising the watersheds of the two rivers has a fairly high population density and many diversified industries are located on it, an effective pollution abatement program assures the city that this abundant supply of water will not contain impurities that will prevent it from being processed, in the Water Department's purification plants, into a safe and satisfactory water of excellent quality. The success of the program is due largely to the excellent liaison which exists between the communities and industries located on the watershed, the Pennsylvania Sanitary Water Board, and the Water Department of the City of Philadelphia.

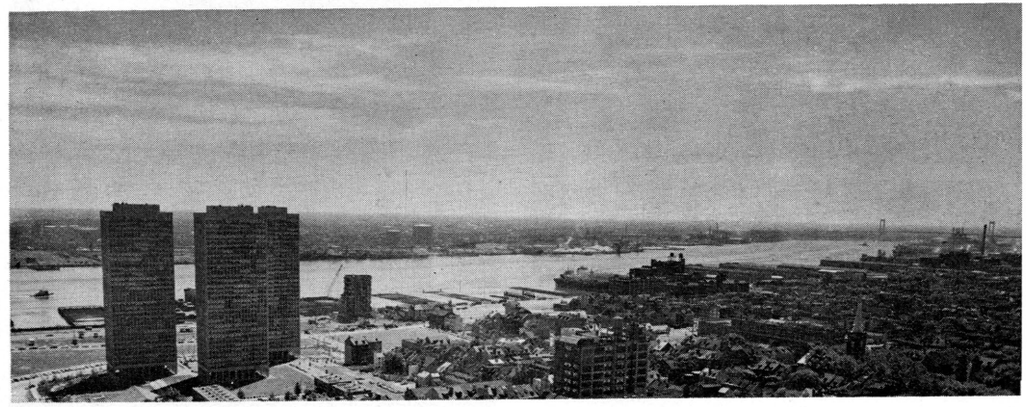


Sanitary engineers from the State and City Governments make regular visits to industries and communities located on the watershed to prevent conditions from developing which might prove detrimental to the quality of the surface waters. The Philadelphia Water Department also routinely collects and makes analyses of water samples from locations selected as sensing points in the rivers, and their tributaries, in order to detect changes or trends in the quality of the river waters.

TREATMENT

During the past few years modern water purification plants have replaced the old plants at Torresdale, Queen Lane and Belmont. The completion of these plants was a significant step in the Water Department's rehabilitation program. Since the Belmont plant was completed in 1965, the entire supply for the city is now purified in modern, efficient plants capable of producing water of excellent quality in sufficient quantity to meet the needs of our customers for many years in the future. Another part of the program has included the construction of modern automatic pumping stations.

To supply customers in all parts of the city with ample water to meet domestic and commercial uses and for adequate fire protection, many new large-sized express mains have been installed. In addition many of the old existing mains have been cleaned



and lined with cement. Elevated storage tanks have been strategically placed in distribution to help maintain pressures during periods of heavy usage. Underground storage for filtered water is being significantly increased at the purification plants by conversion of obsolete slow-sand filters to water storage basins.

The treatment processes at the purification plants are under the control of plant chemists who work in shifts, in modern, well-equipped laboratories, to provide "round the clock" control of the treatment processes. Each laboratory is under the direction of a professionally trained sanitary chemist who is responsible for over-all supervision of the treatment processes of his particular plant.

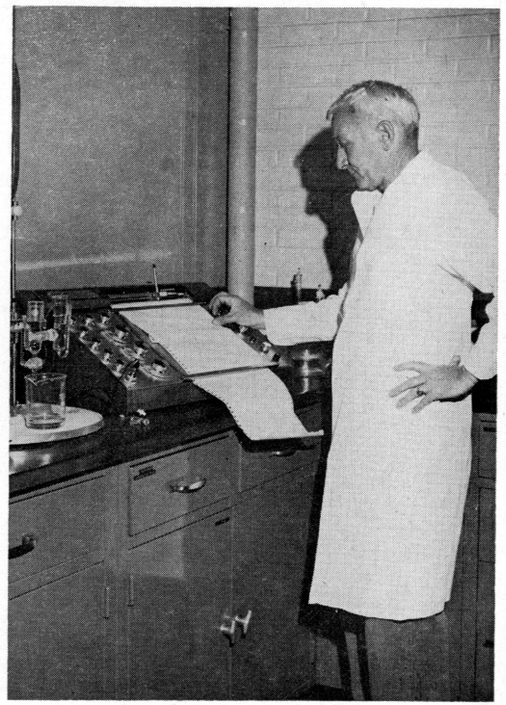
To determine the quality of the water as it is received by the consumer, samples for sanitary analyses are collected several times each week from approximately sixty locations throughout the city. Along with the sanitary analyses the samples are checked for such characteristics as would be immediately apparent to the consumer, such as taste and odor, color, and turbidity. As a part of the sanitary analyses the bacteriological quality is also checked. In 1967, 10,657 samples were collected from the districts for this purpose. From these samples 53,285 bacteriological portions were tested. These produced a coliform count of only 1.8 percent of that allowed by the Drinking Water Standards of the United States Public Health Service for interstate carriers. A glance at Table VI will show that similar low coliform levels are held year after year.

HARDNESS

Hardness will be mentioned as of special interest because of industrial use and the use of modern soap compounds and washing facilities. This varies with the amount of rainfall and runoff, also the temperatures. It is not a seasonal change and therefore cannot be predicted—regardless of the time of the year, the drier the season the higher the hardness. The effects of the drought of the past five years are reflected in the higher hardness shown, above that for 1960 and 1961. The range of hardness of treated water from the Delaware River water varies from 2.5 to 7 grains per gallon, the long-term average being about 5.2 grains per gallon. The range on treated water from the Schuylkill varies from 5 to 16 grains per gallon, with the long-term average about 9 grains per gallon.

RADIOACTIVITY

Gross counts on water samples collected from both the Delaware and Schuylkill Rivers have been made since 1957. These show the radioactivity to be very slightly above the normal background such as is found in the atmosphere which surrounds us. The normal water treatment processes used by the Department remove more than one half of the radioactive isotopes found in the river waters. The water delivered to the consumers has always been well below the maximum allowable concentration of



mixed fission products in drinking water as recommended by the National Bureau of Standards in their Handbook No. 52. This safe value (100 pc/L or pico-curies per liter) of permissible concentration has been demonstrated as not producing biological damage.

TEMPERATURES

Water temperatures at the plant effluents vary from 33°F to 85°F. At customers' services, due to the effect of ground temperatures, these are slightly higher in winter and lower in summer, ranging from about 35°F to 82°F.

Warming of pipes in the customers' basements, or in the walls of buildings during the colder weather, will cause release of air bubbles in water drawn from the taps, and is the cause of "white water" complaints.

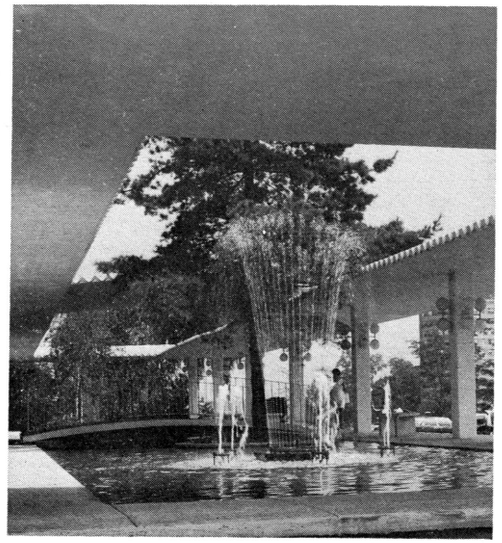
PURIFIED WATERS

Table III shows physical and chemical characteristics of the water as it enters the distribution system after purification. The purification plant located at Torresdale is the only plant that treats water from the Delaware River. The effluent characteristics as listed in Table III under "Delaware Plant (Torresdale.") are for that plant alone. The effluent characteristics listed as being from "Schuylkill Plants" are the averages of the two plants (Belmont and Queen Lane) located along its banks. Although these two plants draw their water from the Schuylkill, the plants' effluents are not identical. Table III-A lists the characteristics of the individual plant effluents.

Tables IV-A1, IV-A2, IV-B1, IV-B2, IV-C1 and IV-C2 list the analytical components of Belmont, Queen Lane and Torresdale Plant effluent waters on a monthly basis.

WATER DELIVERED TO YOUR AREA

Delaware water is delivered generally to areas east of Broad Street, and Schuylkill

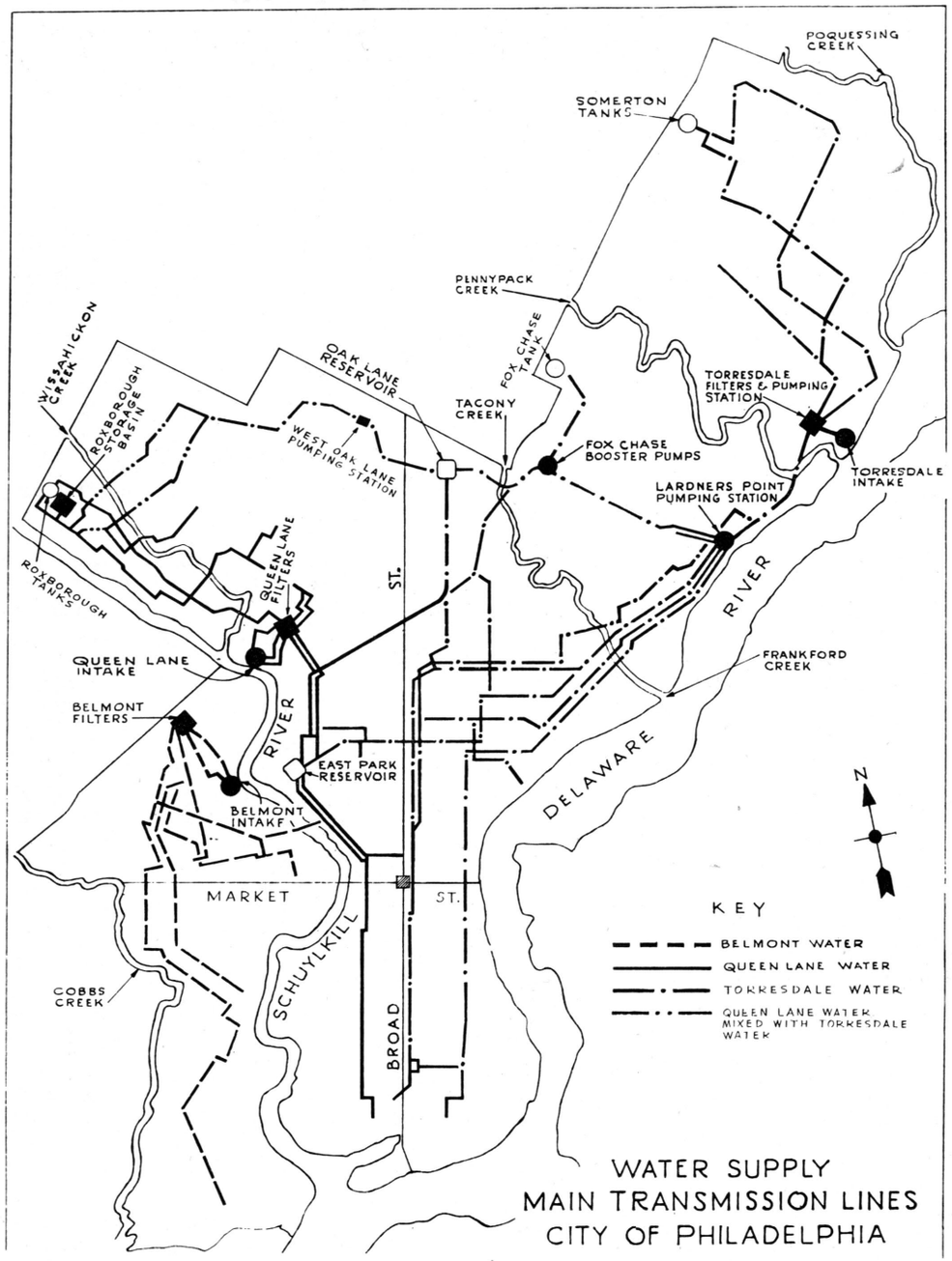


water west of Broad Street. Delaware water is pumped to West Oak Lane and at times to some sections of Chestnut Hill. It is also frequently supplied to many areas south of Erie Avenue.

Schuylkill water is sometimes pumped east of Broad Street, in the area generally bounded by Roosevelt Boulevard, Lehigh Avenue, Wyoming Avenue and Kensington Avenue. Express mains direct from Lardner's Point Pumping Station deliver Delaware water to the vicinity of East Park Reservoir, where it mixes with Schuylkill water before entering the central city area.

With changes in demands, and occasionally required changes in plant operation, it is, therefore, uncertain as to which of the river waters or what combination of the two will be received in much of the center city area south of Callowhill Street, and in many areas west of Broad Street, north of the city center to Erie Avenue. West Philadelphia receives purified Schuylkill water at all times except in emergency.

Note: If interested in specific information on "Treatment and Distribution," request leaflet by that title.



PHYSICAL AND CHEMICAL SUMMARIES FOR RAW WATER FROM SCHUYLKILL AND DELAWARE RIVERS IN 1967

Table I

Figures in mg/1 except for items marked by †

PHYSICAL & CHEMICAL CHARACTERISTICS		SCHUYLKILL AT BELMONT & QUEEN LANE				DELAWARE AT TORRESDALE		
		Fr	Yearly Avg.	Monthly Max.	Avg. Min.	Yearly Avg.	Monthly Max.	Avg. Min.
Temperature †	(°F)	**	59	80	37	57	78	38
Rainfall, Ppt. †	(Inch)	X	44.82	7.11	1.67	44.82	7.11	1.67
Turbidity †	(JTU)	*	25	59	6	32	51	24
Residue, Total		‡	278	364	211	156	200	138
Residue, Filtrable		‡	261	355	196	—	—	—
Conductance, Sp. †	(μmhos)	‡	389	504	300	196	273	146
Color, Apparent †	(Units)	+	32	73	8	—	—	—
Color, Filtered †	(Units)	+	8	14	5	13	16	7
pH †	(Units)	*	7.4	7.6	7.2	7.2	7.3	7.2
Alkalinity	($CaCO_3$)	*	61	92	41	36	49	28
Carbon Dioxide	(CO_2)	+	6	9	4	2	5	1
Hardness, EDTA	($CaCO_3$)	‡	140	175	115	65	78	47
Calcium	(Ca)	‡	35	44	29	15	19	11
Magnesium	(Mg)	‡	14	17	11	6	8	4
Potassium	(K)	‡	4.7	7.0	3.3	2.1	2.7	1.4
Sodium	(Na)	‡	20.5	39.3	12.0	8.5	11.8	6.00
Aluminum	(Al)	‡	.02	.04	.01	0.07	0.12	0.03
Copper	(Cu)	‡	.05	.24	.01	0.10	0.16	0.07
Iron, Total	(Fe)	‡	.35	.96	.10	1.12	1.64	0.58
Iron, Diss'd.	(Fe)	‡	.05	.09	.02	—	—	—
Manganese	(Mn)	‡	.17	.44	.01	0.12	0.19	0.09
Ammonia	(N)	+	.47	.78	.09	.37	.75	.10
Nitrite	(N)	+	.063	.108	.031	.039	.083	.009
Nitrate	(N)	+	2.75	3.83	1.90	.74	1.07	.52
Oxy. Demand, COD	(O)	+	15.6	25.4	9.6	12.5	15.9	10.0
Oxy. Demand, BOD	(O)	+	2.2	3.9	0.5	2.1	4.6	1.1
Oxy., Diss'd.	(O)	+	9.7	14.5	6.3	8.3	12.0	3.8
Oxy., % Sat'n. †		+	91	107	66	75	94	45
Chloride	(Cl)	‡	21	36	15	11	14	9
Fluoride	(F)	+	.25	.39	.16	.21	.32	.12
Phosphate, Ortho	(PO_4)	+	.87	1.41	.26	.36	.42	.32
Phosphate, Poly	(PO_4)	+	.13	.25	.05	.03	.05	.01
Silica	(SiO_2)	‡	8.9	10.6	7.8	3.5	4.7	2.5
Sulfate	(SO_4)	‡	77	106	54	25	30	20
Arsenic	(As)	‡‡	.005	.015	.001	.004	.009	.000
Chromium, Hexa.	(Cr^{+6})	+	.005	.006	.003	.009	.015	.004
Cyanide	(CN)	+	—	—	—	.00	.00	.00
Lead	(Pb)	‡	—	—	—	.085	.375	.010
Phenols	(C_6H_5OH)	+	.001	.002	.000	.006	.010	.003
Detergents	(ABS)	‡	.07	.12	.03	.07	.180	.030
Radioactivity †	(pc/L)	‡	5.3	10.7	4.0	4.3	7.0	3.3

NOTES: FR = frequency of analyses. Individual or grab samples: (*) eight per day, (**) one per day, (+) one or more per week, (++) one or more per month. COMPOSITE OF daily (6:00 A.M.) grab samples: (‡) one on weekly composite, (‡‡) one on semi-monthly or monthly composite. (X) Total precipitation at International Airport, Philadelphia, from U.S. Weather Bureau reports. Radioactivity equals gross beta activity in picocuries per liter.

PHYSICAL AND CHEMICAL SUMMARIES FOR RAW WATER FROM SCHUYLKILL RIVER AT BELMONT & QUEEN LANE IN 1967

Table I-A

Figures in mg/1 except for items marked by †

PHYSICAL & CHEMICAL CHARACTERISTICS			BELMONT INTAKE			QUEEN LANE INTAKE		
		Fr	Yearly Avg.	Monthly Max.	Avg. Min.	Yearly Avg.	Monthly Max.	Avg. Min.
Temperature †	(°F)	**	59	80	40	58	80	37
Rainfall, Ppt. †	(Inch)	X	44.82	7.11	1.67	44.82	7.11	1.67
Turbidity †	(JTU)	*	25	48	10	24	59	6
Residue, Total		‡	274	364	211	282	361	240
Residue, Filtrable		‡	257	355	196	265	351	213
Conductance, Sp. †	(μmhos)	‡	379	498	300	398	504	313
Color, Apparent †	(Units)	+	30	52	12	33	73	8
Color, Filtered †	(Units)	+	7	13	5	8	14	5
pH †	(Units)	*	7.3	7.4	7.2	7.5	7.6	7.4
Alkalinity	($CaCO_3$)	*	56	79	41	66	92	51
Carbon Dioxide	(CO_2)	+	6	8	4	6	9	4
Hardness, EDTA	($CaCO_3$)	‡	139	171	115	141	175	117
Calcium	(Ca)	‡	35	44	29	35	43	30
Magnesium	(Mg)	‡	14	17	11	13	16	11
Potassium	(K)	‡	4.6	7.0	3.3	4.7	6.3	3.8
Sodium	(Na)	‡	19.6	39.3	12.0	21.3	34.0	14.0
Aluminum	(Al)	‡	.02	.04	.01	.02	.03	.01
Copper	(Cu)	‡	.05	.15	.03	.05	.24	.01
Iron, Total	(Fe)	‡	.32	.66	.17	.37	.96	.10
Iron, Diss'd.	(Fe)	‡	.05	.09	.02	.05	.07	.02
Manganese	(Mn)	‡	.22	.44	.01	.11	.22	.01
Ammonia	(N)	+	.51	.69	.25	.42	.78	.09
Nitrite	(N)	+	.059	.106	.034	.066	.108	.031
Nitrate	(N)	+	2.57	3.12	1.90	2.93	3.83	2.46
Oxy. Demand, COD	(O)	+	14.3	18.7	9.6	16.9	25.4	10.4
Oxy. Demand, BOD	(O)	+	2.0	3.2	0.5	2.3	3.9	0.9
Oxy., Diss'd.	(O)	+	9.5	12.7	6.3	9.8	14.5	6.7
Oxy. % Sat'n. †		+	91	102	66	91	107	79
Chloride	(Cl)	‡	23	35	15	18	36	21
Fluoride	(F)	+	.25	.38	.16	.25	.39	.16
Phosphate, Ortho	(PO_4)	+	.63	1.09	.26	1.10	1.41	.82
Phosphate, Poly	(PO_4)	+	.12	.25	.05	.13	.18	.06
Silica	(SiO_2)	‡	8.8	10.0	7.8	9.0	10.6	7.8
Sulfate	(SO_4)	‡	78	104	59	76	106	54
Arsenic	(As)	‡‡	.005	.014	.002	.005	.015	.001
Chromium, Hexa.	(Cr^{+6}	+	.005	.006	.003	.005	.006	.003
Cyanide	(CN)	+	—	—	—	—	—	—
Lead	(Pb)	‡	—	—	—	—	—	—
Phenols	(C_6H_5OH)	+	.001	.002	.000	.001	.002	.000
Detergents	(ABS)	‡	.06	.12	.03	.07	.11	.03
Radioactivity†	(pc/L)	‡	4.6	5.6	4.0	5.9	10.7	4.4

For notes, see TABLE I

COLIFORM ORGANISMS IN RAW WATER FROM SCHUYLKILL AND DELAWARE RIVERS IN 1967

Table II

1967 Monthly Average Phelps Index and Most Probable Number Per 100 Mililiters.

	SCHUYLKILL RIVER				DELAWARE RIVER	
	Belmont		Queen Lane		Torresdale	
MONTH	Index	M.P.N.	Index	M.P.N.	Index	M.P.N.
Jan.	23,000	63,000	100,000	244,000	27,000	61,000
Feb.	31,000	71,000	58,000	134,000	91,000	23,000
Mar.	27,000	62,000	33,000	79,000	22,000	50,000
April	26,000	63,000	96,000	233,000	5,800	14,000
May	8,200	20,000	62,000	155,000	28,000	75,000
June	17,000	41,000	60,000	141,000	156,000	244,000
July	35,000	90,000	102,000	244,000	85,000	197,000
Aug.	24,000	57,000	127,000	304,000	51,000	112,000
Sept.	14,000	33,000	65,000	156,000	22,000	56,000
Oct.	9,100	21,000	72,000	177,000	22,000	46,000
Nov.	16,000	37,000	66,000	156,000	27,000	63,000
Dec.	33,000	75,000	114,000	274,000	33,000	125,000
Aver.	22,000	53,000	80,000	190,000	32,000	92,000
Max.	35,000	90,000	127,000	304,000	156,000	244,000
Min.	8,200	20,000	33,000	79,000	5,800	14,000

1958—1967 10-YEAR PERIOD AVERAGES

1958	9,600	23,000	22,000	53,000	27,000	62,000
1959	14,000	34,000	33,000	79,000	36,000	87,000
1960	16,000	37,000	12,000	28,000	32,000	75,000
1961	19,000	47,000	16,000	37,000	17,000	41,000
1962	19,000	45,000	30,000	72,000	23,000	54,000
1963	15,000	36,000	71,000	173,000	33,000	81,000
1964	21,000	50,000	84,000	200,000	45,000	110,000
1965	9,900	23,000	49,000	116,000	45,000	114,000
1966	19,000	46,000	62,000	148,000	21,000	50,000
1967	22,000	53,000	80,000	190,000	32,000	92,000
Aver.	16,000	39,000	46,000	110,000	31,000	77,000
Max.	22,000	53,000	84,000	200,000	45,000	114,000
Min.	9,600	23,000	12,000	28,000	17,000	41,000

PHYSICAL AND CHEMICAL SUMMARIES FOR FINISHED WATER FROM THE WATER TREATMENT PLANTS IN 1967

Table III

Figures in mg/1 except for items marked by †

PHYSICAL & CHEMICAL CHARACTERISTICS			SCHUYLKILL PLANTS QUEEN LANE & BELMONT			DELAWARE PLANT TORRESDALE		
			Yearly	Monthly	Avg.	Yearly	Monthly	Avg.
		Fr	Avg.	Max.	Min.	Avg.	Max.	Min.
Turbidity †	(JTU)	*	0.10	0.34	0.00	0.00	0.00	0.00
Residue, Total		‡	293	384	232	156	200	138
Conductance, Sp. †	(μmhos)	‡	422	538	325	298	412	193
Color, Apparent †	(Units)	+	0	1	0	0	0	0
pH †	(Units)	*	7.1	7.3	6.7	8.0	8.5	7.7
Alkalinity	($CaCO_3$)	*	52	73	39	42	55	30
Carbon Dioxide	(CO_2)	+	9	13	5	1	3	0
Hardness, EDTA	($CaCO_3$)	‡	149	188	117	99	115	75
Calcium	(Ca)	‡	38	50	30	28	33	22
Magnesium	(Mg)	‡	14	18	11	9	12	6
Potassium	(K)	‡	4.7	7.0	3.5	2.1	2.8	1.4
Sodium	(Na)	‡	24.5	42.5	14.0	8.9	13.3	6.2
Aluminum	(Al)	‡	.03	.04	.01	.07	.21	.02
Copper	(Cu)	‡	.04	.28	.01	—	—	—
Iron, Total	(Fe)	‡	.04	.11	.01	.01	.03	.00
Manganese	(Mn)	‡	.01	.05	.00	.00	.00	.00
Ammonia	(N)	+	SEE TABLE III-A			.00	.01	.00
Nitrite	(N)	+	.001	.002	.000	.000	.000	.000
Nitrate	(N)	+	2.75	3.38	2.05	.66	1.23	.47
Chlorine Residual			FREE CHLORINE TREATMENT					
Total	(Cl)	*	1.42	1.70	1.20	1.60	1.76	1.40
Free	(Cl)	*	1.18	1.40	1.00	1.37	1.50	1.14
Chlorine Residual			CHLORAMINE TREATMENT			(See Table III-A)		
Total	(Cl)	*	2.33	2.70	2.00	—	—	—
Free	(Cl)	*	.06	.08	.05	—	—	—
Oxy. Demand, COD	(O)	+	4.8	6.5	3.1	4.7	8.8	2.4
Oxy., Diss'd.	(O)	+	10.0	13.5	7.3	9.1	12.7	5.0
Oxy., % Sat'n. †		+	98	110	86	85	100	60
Chloride	(Cl)	‡	38	52	25	26	31	18
Fluoride	(F)	**	.92	1.11	.26			
Phosphates (Gravity)								
Ortho-	(PO_4)	+	SEE TABLE III-A			—	—	—
Poly-	(PO_4)	+	" " "			—	—	—
Phosphates (Hi-Service)								
Ortho-	(PO_4)	+	.24	.48	.10	.13	.17	.10
Poly-	(PO_4)	+	1.08	1.87	.53	.62	.81	.29
Silica	(SiO_2)	‡	8.7	10.1	7.5	3.7	4.6	2.7
Sulfate	(SO_4)	‡	90	117	67	35	48	27
Chromium, Hexa	(Cr^{+6})	+	.005	.006	.003	.000	.000	.000
Phenols	(C_6H_5OH)	+	.000	.001	.000	—	—	—
Detergents	(ABS)	‡	.08	.12	.04	.08	.11	.05
Radioactivity †	(pc/L)	‡	4.1	6.0	2.6	3.5	4.9	2.2

For notes, see TABLE I

PHYSICAL AND CHEMICAL SUMMARIES FOR FINISHED WATER FROM THE WATER TREATMENT PLANTS ON THE SCHUYLKILL IN 1967

Table III-A

Figures in mg/1 except for items marked by †

PHYSICAL & CHEMICAL CHARACTERISTICS			BELMONT			QUEEN LANE		
			Yearly	Monthly	Avg.	Yearly	Monthly	Avg.
		Fr	Avg.	Max.	Min.	Avg.	Max.	Min.
Turbidity †	(JTU)	*	0.20	0.34	0.14	0.01	0.03	0.00
Residue, Total		‡	296	384	232	290	384	246
Conductance, Sp. †	(μmhos)	‡	413	538	328	430	521	325
Color, Apparent †	(Units)	+	0	1	0	0	1	0
pH †	(Units)	*	7.2	7.3	7.1	6.9	7.2	6.7
Alkalinity	($CaCO_3$)	*	51	73	39	52	69	41
Carbon Dioxide	(CO_2)	+	8	11	5	10	13	7
Hardness, EDTA	($CaCO_3$)	‡	156	188	132	141	181	117
Calcium	(Ca)	‡	41	50	33	35	43	30
Magnesium	(Mg)	‡	14	17	11	14	18	11
Potassium	(K)	‡	4.6	710	3.5	4.8	7.0	3.8
Sodium	(Na)	‡	20.3	40.0	14.0	28.7	42.5	22.3
Aluminum	(Al)	‡	.03	.04	.02	.02	.04	.01
Copper	(Cu)	‡	.04	.28	.01	.03	.09	.02
Iron, Total	(Fe)	‡	.03	.06	.01	.04	.11	.02
Manganese	(Mn)	‡	.01	.05	.00	.00	.01	.00
Ammonia	(N)	+	.26	.63	.02	.04	.09	.02
Nitrite	(N)	+	.001	.002	.000	.001	.003	.000
Nitrate	(N)	+	.263	3.26	2.05	2.86	3.38	2.48
Chlorine Residual			FREE CHLORINE TREATMENT					
Total	(Cl)	*	1.46	1.70	1.30	1.38	1.60	1.20
Free	(Cl)	*	1.17	1.40	1.10	1.18	1.40	1.00
Chlorine Residual			CHLORAMINE TREATMENT					
Total	(Cl)	*	2.33	2.70	2.00	—	—	—
Free	(Cl)	*	.06	.08	.05	—	—	—
Oxy. Demand, COD	(O)	+	4.7	6.5	3.2	4.8	6.2	3.1
Oxy., Diss'd.	(O)	+	9.9	12.6	7.3	10.0	13.5	7.3
Oxy., % Sat'n. †		+	99	110	86	97	107	90
Chloride	(Cl)	‡	35	51	25	41	52	31
Fluoride	(F)	**	.89	1.02	.26	.94	1.11	.73
Phosphates (Gravity)								
Ortho-	(PO_4)	+	.28	.44	.12	.07	.12	.04
Poly-	(PO_4)	+	1.01	1.22	.81	.12	.38	.05
Phosphates (Hi-Service)								
Ortho-	(PO_4)	+	.30	.48	.12	.17	.35	.10
Poly-	(PO_4)	+	.97	1.21	.79	1.19	1.87	.53
Silica	(SiO_2)	‡	8.6	10.1	7.5	8.8	10.1	7.5
Sulfate	(SO_4)	‡	90	117	67	90	115	72
Chromium, Hexa	(Cr^{+6})	+	.005	.006	.003	.004	.005	.003
Phenols	(C_6H_5OH)	+	.000	.001	.000	.000	.001	.000
Detergents	(ABS)	‡	.07	.10	.04	.08	.12	.04
Radioactivity †	(pc/L)	‡	3.9	6.0	2.6	4.2	5.5	2.8

For notes, see TABLE I

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE BELMONT WATER TREATMENT PLANT IN 1967

Table IV-A1

Figures in mg/1 unless otherwise indicated

MONTH	Turbidity (Units)	Residue Total	Spec. Cond. (μmhos)	Color Apparent	pH (Units)	Alkalinity ($CaCO_3$)	Carbon Dioxide (CO_2)	Hardness ($CaCO_3$)
FREQ.	*	‡	‡	+	*	*	+	‡
Jan.	0.19	291	374	0	7.1	41	9	145
Feb.	0.20	257	350	1	7.3	41	11	135
Mar.	0.34	242	339	1	7.3	39	7	134
April	0.16	251	352	0	7.2	41	7	143
May	0.19	232	328	0	7.2	41	7	132
June	0.18	335	485	0	7.1	53	8	183
July	0.14	358	487	0	7.2	57	8	178
Aug.	0.16	306	406	0	7.2	57	9	155
Sept.	0.16	358	474	0	7.2	68	10	175
Oct.	0.25	384	538	0	7.2	73	10	188
Nov.	0.22	280	458	0	7.2	54	8	165
Dec.	0.20	257	363	0	7.3	45	5	143
Avg.	0.20	296	413	0	7.2	51	8	156
Max. Mo.	0.34	384	538	1	7.3	73	11	188
Min. Mo.	0.14	232	328	0	7.1	39	5	132

MONTH	Postasium (K)	Sodium (Na)	Calcium (Ca)	Magnesium (Mg)	Iron Total (Fe)	Manganese (Mn)	Aluminum (Al)	Chloride (Cl)	Sulfate (SO_4)	Silica (SiO_2)
FREQ.	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Jan.	4.8	18.5	40	15	.03	.01	.03	34	90	9.8
Feb.	4.8	19.0	37	12	.01	.00	.03	33	84	10.1
Mar.	3.5	15.6	37	11	.02	.01	.03	30	84	8.4
April	3.5	15.3	38	13	.03	.01	.02	28	96	7.5
May	3.5	14.0	33	11	.02	.00	.02	25	84	8.5
June	5.3	22.3	48	17	.03	.01	.03	40	117	8.6
July	4.5	19.3	46	15	.03	.00	.04	40	104	8.5
Aug.	4.2	16.0	40	12	.04	.01	.03	33	76	8.8
Sept.	5.0	28.0	44	14	.03	.00	.04	42	88	8.0
Oct.	7.0	40.0	50	16	.02	.00	.02	51	101	8.3
Nov.	4.8	21.2	44	16	.05	.05	.03	37	87	8.8
Dec.	4.0	14.7	36	13	.06	.02	.02	26	67	8.3
Avg.	4.6	20.3	41	14	.03	.01	.03	35	90	8.6
Max. Mo.	7.0	40.0	50	17	.06	.05	.04	51	117	10.1
Min. Mo.	3.5	14.0	33	11	.01	.00	.02	25	67	7.5

For notes, see TABLE I

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE BELMONT WATER TREATMENT PLANT IN 1967

Table IV-A2

Figures in mg/1 unless otherwise indicated

MONTH	Chromium (Cr^{+6})	PHOSPHATES Ortho (PO_4)	PHOSPHATES Poly (PO_4)	Fluoride (F)	CHLORINE RESIDUAL Break-Point Total	CHLORINE RESIDUAL Break-Point Free	CHLORINE RESIDUAL Chloramine Total	CHLORINE RESIDUAL Chloramine Free	Chem. O.D. (C.O.D.)
FREQ.	+	+	+	**	*	*	*	*	+
Jan.	.004	.12	1.21	0.91	1.40	1.10	.....	.....	4.1
Feb.	.006	.30	.95	1.01	1.40	1.20	.....	.....	4.8
Mar.	.004	.20	1.03	0.99	1.40	1.10	.....	.....	4.3
April	.005	.39	.86	0.96	1.40	1.10	.....	.....	3.2
May	.003	.41	1.13	0.97	1.30	1.10	.....	.....	4.2
June	.003	.30	.79	1.02	1.60	1.20	.....	.....	4.7
July	.004	.31	.90	0.84	1.70	1.40	2.50	0.05	6.5
Aug.	.006	.48	1.12	0.26	.....	.....	2.70	0.08	5.5
Sept.	.005	.33	.86	0.75	.....	.....	2.50	0.05	5.6
Oct.	.006	.29	.87	0.98	.....	.....	2.30	0.05	5.1
Nov.	.005	.24	.96	1.00	.....	.....	2.00	0.05	4.6
Dec.	.004	.17	.98	0.95	.....	.....	2.00	0.05	3.8
Avg.	.005	.30	.97	0.89	1.46	1.17	2.33	0.06	4.7
Max. Mo.	.006	.48	1.21	1.02	1.70	1.40	2.70	0.08	6.5
Min. Mo.	.003	.12	.79	0.26	1.30	1.10	2.00	0.05	3.2

MONTH	DISSOLVED OXYGEN PPM (D.O.)	DISSOLVED OXYGEN Sat'n. Per Cent	NITROGEN NH_3 (N)	NITROGEN NO_2 (N)	NITROGEN NO_3 (N)	Detergents (ABS)	β-Radio-Activity (pc/L)
FREQ.	+	+	+	+	+	‡	‡
Jan.	12.6	110	.03	.000	2.94	.09	4.0
Feb.	12.5	109	.02	.000	2.71	.10	3.5
Mar.	12.6	108	.03	.001	3.26	.06	3.6
April	10.2	101	.02	.001	2.51	.06	3.6
May	9.9	102	.02	.001	2.05	.06	3.3
June	7.8	92	.03	.001	2.41	.07	4.0
July	7.3	88	.03	.002	2.61	.05	6.0
Aug.	7.7	94	.59	.002	2.66	.04	4.1
Sept.	7.9	93	.54	.001	2.60	.08	4.8
Oct.	7.9	86	.52	.001	2.73	.10	.....
Nov.	10.4	101	.60	.000	2.56	.09	3.7
Dec.	12.2	109	.63	.001	2.48	.07	2.6
Avg.	9.9	99	.26	.001	2.63	.07	3.9
Max. Mo.	12.6	110	.63	.002	3.26	.10	6.0
Min. Mo.	7.3	86	.02	.000	2.05	.04	2.6

NOTE: Chlorine residuals: Free chlorine treatment from January 1 through July 18, 1967. Chloramine treatment from July 20 through December 31, 1967.

For notes, see TABLE I

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE QUEEN LANE WATER TREATMENT PLANT IN 1967

Table IV-B1

Figures in mg/1 unless otherwise indicated

MONTH	Turbidity (Units)	Residue Total	Spec. Cond. (μmhos)	Color Apparent	pH (Units)	Alkalinity ($CaCO_3$)	Carbon Dioxide (CO_2)	Hardness ($CaCO_3$)
FREQ.	*	‡	‡	+	*	*	+	‡
Jan.	0.03	281	418	0	7.1	47	8	133
Feb.	0.02	270	400	1	7.0	45	7	126
Mar.	0.03	264	400	1	7.1	43	7	120
April	0.01	259	408	0	7.2	46	7	132
May	0.00	246	325	0	7.0	41	9	117
June	0.00	307	483	0	6.8	48	10	162
July	0.00	342	479	0	6.9	60	12	159
Aug.	0.00	260	403	0	6.8	58	13	135
Sept.	0.00	340	487	0	6.9	69	13	153
Oct.	0.00	384	521	0	6.8	68	12	181
Nov.	0.00	281	458	0	6.7	49	12	152
Dec.	0.00	252	383	0	6.7	44	12	126
Avg.	0.01	290	430	0	6.9	52	10	141
Max. Mo.	0.03	384	521	1	7.2	69	13	181
Min. Mo.	0.01	246	325	0	6.7	41	7	117

MONTH	Postassium (K)	Sodium (Na)	Calcium (Ca)	Magnesium (Mg)	Iron Total (Fe)	Manganese (Mn)	Aluminum (Al)	Chloride (Cl)	Sulfate (SO_4)	Silica (SiO_2)
FREQ.	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Jan.	5.3	30.3	33	14	.02	.00	.03	44	91	10.0
Feb.	4.8	34.0	31	12	.03	.00	.04	41	82	10.1
Mar.	4.0	29.8	30	11	.03	.00	.03	43	82	8.4
April	4.0	25.3	33	13	.02	.00	.01	35	94	7.5
May	3.8	22.3	31	11	.02	.00	.01	31	81	8.5
June	4.3	28.0	40	16	.03	.00	.01	48	115	9.0
July	4.8	28.0	39	15	.03	.00	.02	40	109	9.0
Aug.	4.6	23.4	33	12	.02	.00	.02	37	72	9.0
Sept.	5.0	31.3	39	14	.03	.00	.04	42	92	8.5
Oct.	7.0	42.5	43	18	.02	.00	.01	52	102	8.0
Nov.	5.2	27.2	38	15	.06	.01	.02	43	89	8.6
Dec.	4.3	22.7	32	11	.11	.01	.02	36	75	8.3
Avg.	4.8	28.7	35	14	.04	.00	.02	41	90	8.8
Max. Mo.	7.0	42.5	43	18	.11	.01	.04	52	115	10.1
Min. Mo.	3.8	22.3	30	11	.02	.00	.01	31	72	7.5

For notes, see TABLE I

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE QUEEN LANE WATER TREATMENT PLANT IN 1967

Table IV-B2

Figures in mg/1 unless otherwise indicated

MONTH	Chromium (Cr^{+6})	PHOSPHATES (PO_4) Gravity Ortho	Gravity Poly	High Service Ortho	High Service Poly	Fluoride (F)	CHLORINE RESID. Total (Cl)	Free (Cl)	Chem. O.D. (C.O.D.)
FREQ.	+	+	+	+	+	**	*	*	+
Jan.	.004	.07	.09	.13	1.49	0.71	1.40	1.20	4.6
Feb.	.005	.08	.06	.15	.57	0.76	1.40	1.20	4.5
Mar.	.005	.09	.10	.14	.58	0.85	1.50	1.30	4.0
April	.004	.05	.09	.15	.79	0.87	1.30	1.20	4.9
May	.003	.05	.07	.10	.77	1.05	1.30	1.10	3.1
June	.003	.06	.08	.18	.53	1.11	1.30	1.10	5.1
July	.003	.05	.19	.13	1.16	1.11	1.30	1.10	5.9
Aug.	.004	.08	.12	.35	1.37	0.94	1.30	1.10	6.2
Sept.	.003	.05	.15	.17	1.43	1.07	1.20	1.00	5.5
Oct.	.005	.12	.38	.11	1.87	1.05	1.40	1.20	4.6
Nov.	.005	.10	.06	.21	1.47	0.90	1.60	1.40	4.8
Dec.	.004	.04	.05	.18	1.51	0.87	1.50	1.20	4.8
Avg.	.004	.07	.12	.17	1.19	0.94	1.38	1.18	4.8
Max. Mo.	.005	.12	.38	.35	1.87	1.11	1.60	1.40	6.2
Min. Mo.	.003	.04	.05	.10	.53	0.73	1.20	1.00	3.1

MONTH	DISSOLVED OXYGEN PPM (D.O.)	DISSOLVED OXYGEN Sat'n. Per Cent	NITROGEN NH_3 (N)	NITROGEN NO_2 (N)	NITROGEN NO_3 (N)	Detergents (ABS)	β-Radioactivity (pc/L)
FREQ.	+	+	+	+	+	‡	‡
Jan.	13.5	107	.02	.001	3.11	.12	3.9
Feb.	13.3	106	.03	.001	3.00	.11	4.0
Mar.	11.9	97	.03	.000	3.38	.09	4.5
April	10.0	97	.02	.001	2.87	.07	3.9
May	9.5	96	.02	.001	2.48	.06	3.7
June	7.6	90	.03	.001	2.65	.06	5.0
July	7.3	91	.04	.001	2.64	.04	5.5
Aug.	7.8	97	.09	.002	2.88	.04	4.7
Sept.	8.1	90	.03	.002	2.72	.04	4.2
Oct.	8.4	96	.03	.001	2.80	.10	.....
Nov.	10.3	95	.05	.001	2.81	.08	4.1
Dec.	11.8	99	.04	.003	2.95	.09	2.8
Avg.	10.0	97	.04	.001	2.86	.08	4.2
Max. Mo.	13.5	107	.09	.003	3.38	.12	5.5
Min. Mo.	7.3	90	.02	.000	2.48	.04	2.8

For notes, see TABLE I

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE TORRESDALE WATER TREATMENT PLANT IN 1967

Table IV-C1

Figures in mg/1 unless otherwise indicated

MONTH	Turbidity (Units)	Residue Total	Spec. Cond. (μmhos)	Color Apparent	pH (Units)	Alkalinity ($CaCO_3$)	Carbon Dioxide (CO_2)	Hardness ($CaCO_3$)
FREQ.	*	‡	‡	+	*	*	+	‡
Jan.	0.0	154	310	0	8.0	36	2	108
Feb.	0.0	154	282	0	8.0	32	0	103
Mar.	0.0	200	297	0	8.0	34	1	103
April	0.0	143	193	0	8.0	30	1	75
May	0.0	146	236	0	7.8	34	2	91
June	0.0	148	299	0	7.7	36	3	100
July	0.0	152	321	0	7.7	47	1	104
Aug.	0.0	180	412	0	7.8	48	2	110
Sept.	0.0	151	324	0	8.0	54	1	115
Oct.	0.0	158	321	0	8.4	55	0	102
Nov.	0.0	145	315	0	8.2	43	0	91
Dec.	0.0	138	269	0	8.5	39	0	91
Avg.	0.0	156	298	0	8.0	42	1	99
Max. Mo.	0.0	200	412	0	8.5	55	3	115
Min. Mo.	0.0	138	193	0	7.7	30	0	75

MONTH	Postassium (K)	Sodium (Na)	Calcium (Ca)	Magnesium (Mg)	Iron Total (Fe)	Manganese (Mn)	Aluminum (Al)	Chloride (Cl)	Sulfate (SO_4)	Silica (SiO_2)
FREQ.	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Jan.	2.4	13.3	30	9	.00	.00	.08	26	41	4.4
Feb.	1.9	11.0	29	12	.00	.00	.03	24	39	4.2
Mar.	1.9	9.6	29	8	.00	.00	.03	23	48	4.6
April	1.4	6.2	22	6	.00	.00	.02	18	37	3.4
May	1.7	6.3	25	9	.01	.00	.05	21	37	3.1
June	2.1	8.8	28	8	.00	.00	.05	24	39	3.0
July	2.0	7.6	28	9	.01	.00	.10	27	34	3.8
Aug.	2.3	7.2	33	9	.01	.00	.21	31	28	4.5
Sept.	2.7	8.6	32	7	.00	.00	.12	31	30	4.0
Oct.	2.8	11.3	29	8	.00	.00	.07	28	35	2.9
Nov.	2.1	8.6	27	9	.03	.00	.03	25	30	3.8
Dec.	2.0	7.7	25	8	.01	.00	.02	28	27	2.7
Avg.	2.1	8.9	28	9	.01	.00	.07	26	35	3.7
Max. Mo.	2.8	13.3	33	12	.03	.00	.21	31	48	4.6
Min. Mo.	1.4	6.2	22	6	.00	.00	.02	18	27	2.7

For notes, see TABLE I

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE TORRESDALE WATER TREATMENT PLANT IN 1967

Table IV-C2

Figures in mg/1 unless otherwise indicated

MONTH	Chromimum (Cr^{+6})	PHOSPHATES Ortho (PO_4)	PHOSPHATES Poly (PO_4)	Fluoride (F)	CHLORINE RESIDUAL Total (Cl)	CHLORINE RESIDUAL Free (Cl)	Chem. O.D. (C.O.D.)
FREQ.	+	+	+	**	*	*	+
Jan.	.000	.08	.66	.98	1.65	1.45	4.0
Feb.	.000	.15	.81	.83	1.70	1.45	2.4
Mar.	.000	.16	.65	.90	1.70	1.50	4.3
April	.000	.17	.55	.86	1.55	1.30	2.4
May	.000	.11	.62	1.01	1.55	1.35	4.3
June	.000	.10	.68	1.02	1.43	1.20	5.6
July	.000	.11	.54	.99	1.58	1.37	5.8
Aug.	.000	.12	.29	.93	1.40	1.14	5.7
Sept.	.000	.16	.59	.94	1.64	1.37	8.8
Oct.	.000	.16	.65	1.08	1.76	1.50	7.7
Nov.	.000	.15	.70	.96	1.51	1.34	5.5
Dec.	.000	.07	.64	.98	1.68	1.49	6.0
Avg.	.000	.13	.62	.95	1.60	1.37	4.7
Max. Mo.	.000	.17	.81	1.08	1.76	1.50	8.8
Min. Mo.	.000	.10	.29	.83	1.40	1.14	2.4

MONTH	DISSOLVED OXYGEN PPM (D.O.)	DISSOLVED OXYGEN Sat'n. Per Cent	NITROGEN NH_3 (N)	NITROGEN NO_2 (N)	NITROGEN NO_3 (N)	Detergents (ABS)	β-Radio-Activity (pc/L)
FREQ.	+	+	+	+	+	‡	‡
Jan.	12.2	95	.01	.000	1.23	.10	3.6
Feb.	12.7	98	.00	.000	.83	.08	3.4
Mar.	12.7	100	.00	.000	.77	.10	3.6
April	10.5	97	.00	.000	.53	.08	3.1
May	9.3	91	.00	.000	.54	.08	3.1
June	5.7	65	.00	.000	.47	.11	3.3
July	5.0	60	.00	.000	.74	.09	4.9
Aug.	5.6	67	.00	.000	.73	.08	3.8
Sept.	6.8	78	.00	.000	.79	.05	3.7
Oct.	7.1	77	.00	.000	.70	.05	.....
Nov.	9.8	90	.00	.000	.56	.06	3.5
Dec.	12.3	100	.00	.000	.65	.05	2.2
Avg.	9.1	85	.00	.000	.66	.08	3.5
Max. Mo.	12.7	100	.01	.000	1.23	.11	4.9
Min. Mo.	5.0	60	.00	.000	.47	.05	2.2

For notes, see TABLE I

COLIFORM ORGANISMS IN WATER TREATMENT PLANT EFFLUENTS AND IN THE DISTRIBUTION SYSTEM—1967

Table V

MONTH	*Number of Std. Samples	No. 10 ml. Portions Tested	10 ml. Portions Positive No.	10 ml. Portions Positive %	Samples with 3 or more Portions Positive No.	Samples with 3 or more Portions Positive %
EFFLUENTS—DELAWARE AND SCHUYLKILL TREATMENT PLANTS						
January	547	2735	5	0.18	1	0.18
February	508	2540	0	0.00	0	0.00
March	579	2895	76	2.63	15	2.59
April	562	2810	0	0.00	0	0.00
May	579	2895	0	0.00	0	0.00
June	536	2680	33	1.23	7	1.49
July	569	2845	0	0.00	0	0.00
August	577	2885	0	0.00	0	0.00
September	564	2820	0	0.00	0	0.00
October	561	2805	0	0.00	0	0.00
November	567	2835	0	0.00	0	0.00
December	583	2915	1	0.03	0	0.00
TOTAL	6732	33660	115	.....	23	.....
Percent	.....	.....	.....	0.34	....	0.34
Max. Mo.	583	2915	76	2.63	15	2.59
Min. Mo.	508	2540	0	0.00	0	0.00
DISTRIBUTION SYSTEM—DELAWARE AND SCHUYLKILL						
January	905	4525	1	0.02	0	0.00
February	738	3690	0	0.00	0	0.00
March	918	4590	41	0.89	7	0.76
April	874	4370	17	0.39	4	0.46
May	962	4810	11	0.23	2	0.21
June	925	4625	1	0.02	0	0.00
July	858	4290	0	0.00	0	0.00
August	950	4750	12	0.25	2	0.21
September	883	4415	2	0.05	0	0.00
October	925	4625	4	0.09	1	0.11
November	860	4300	3	0.07	1	0.12
December	859	4295	6	0.14	1	0.12
TOTAL	10657	53285	98	.....	18	.....
Percent	.....	.....	....	0.18	....	0.17
Max. Mo.	962	4810	41	0.89	7	0.76
Min. Mo.	738	3690	0	0.00	0	0.00

NOTE:—*Each Standard Sample consists of five-10 ml. Standard Portions as defined by U.S. Public Health Service Drinking Water Standards for 1962.

COLIFORM ORGANISMS IN THE FINISHED WATERS OF THE DISTRIBUTION SYSTEM—1958-1967

Table VI

Per Cent of 10 Mililiter Standard Portions Having Positive Confirmed Tests

YEAR	MONTHLY PERCENTAGES												Annual	MONTHLY	
	Jan.	*Feb.*	*Mar.*	*April*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Aver.*	*Max.*	*Min.*
1958	0.26	0.47	0.00	0.00	0.17	0.52	0.46	0.85	0.21	0.10	0.41	0.26	0.31	0.85	0.00
1959	0.41	0.12	0.00	0.00	0.00	1.10	0.33	0.58	0.68	0.17	0.12	0.63	0.35	1.10	0.00
1960	0.25	0.22	0.03	0.28	0.14	0.38	0.49	1.00	0.92	0.78	0.90	0.33	0.53	1.00	0.03
1961	0.05	0.00	0.00	0.07	0.35	0.49	0.47	0.37	0.59	0.61	0.40	0.10	0.30	0.61	0.00
1962	0.07	0.06	0.00	0.00	0.21	1.30	3.30	0.50	0.40	0.32	0.15	0.03	0.53	3.30	0.00
1963	0.02	0.03	0.02	0.12	0.26	0.16	0.79	0.66	0.46	0.35	0.30	0.06	0.27	0.79	0.02
1964	0.02	0.10	0.04	0.00	0.05	0.23	0.60	0.88	1.10	0.27	0.00	0.09	0.29	1.10	0.00
1965	0.00	0.00	0.02	0.00	0.12	0.23	1.54	1.63	0.36	0.02	0.03	0.00	0.35	1.63	0.00
1966	0.00	0.08	0.06	0.00	0.05	0.45	1.55	0.37	0.56	0.14	0.07	0.07	0.28	1.55	0.00
1967	0.02	0.00	0.89	0.39	0.23	0.02	0.00	0.25	0.05	0.09	0.07	0.14	0.18	0.89	0.00
10 YEAR PERIOD—1958-1967 INCLUSIVE															
Aver.	0.11	0.11	0.11	0.09	0.16	0.49	0.95	0.71	0.53	0.29	0.25	0.17	0.34	.....	.....
Max.	0.41	0.47	0.89	0.39	0.35	1.30	3.30	1.63	1.10	0.78	0.90	0.63	0.53	3.30	.....
Min.	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.25	0.05	0.02	0.00	0.00	0.18	.....	0.00

NOTE:—U.S. Public Health Service Drinking Water Standards (1962) require that when 10 ml. standard portions are examined, NOT MORE THAN 10% OF THESE PORTIONS in any month shall show the presence (positive confirmed tests) of coliform group.

COLIFORM ORGANISMS IN THE FINISHED WATERS OF THE DISTRIBUTION SYSTEM—1958-1967

Table VI-A

Per Cent of Samples Having Three or More 10 Mililiter Portions with Positive Confirmed Tests

YEAR	MONTHLY PERCENTAGES												Annual	MONTHLY	
	Jan.	*Feb.*	*Mar.*	*April*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Aver.*	*Max.*	*Min.*
1958	0.33	0.43	0.00	0.00	0.00	0.35	0.16	0.68	0.00	0.00	0.41	0.16	0.20	0.68	0.00
1959	0.34	0.00	0.00	0.00	0.00	0.86	0.16	0.34	0.51	0.00	0.00	0.50	0.23	0.86	0.00
1960	0.00	0.00	0.00	0.00	0.00	0.17	0.35	0.76	0.72	0.86	0.77	0.27	0.38	0.86	0.00
1961	0.00	0.00	0.00	0.00	0.23	0.35	0.50	0.32	0.49	0.35	0.50	0.00	0.23	0.50	0.00
1962	0.00	0.00	0.00	0.00	0.23	1.00	3.50	0.20	0.24	0.21	0.13	0.00	0.46	3.50	0.00
1963	0.00	0.00	0.00	0.12	0.21	0.00	0.44	0.49	0.26	0.21	0.28	0.00	0.17	0.49	0.00
1964	0.00	0.13	0.00	0.00	0.00	0.11	0.62	0.79	0.70	0.23	0.00	0.11	0.23	0.79	0.00
1965	0.00	0.00	0.00	0.00	0.12	0.11	1.14	0.99	0.36	0.00	0.00	0.00	0.23	1.14	0.00
1966	0.00	0.00	0.00	0.00	0.00	0.34	1.60	0.22	0.23	0.12	0.00	0.00	0.21	1.60	0.00
1967	0.00	0.00	0.76	0.46	0.21	0.00	0.00	0.21	0.00	0.11	0.12	0.12	0.17	0.76	0.00
10 YEAR PERIOD—1958-1967 INCLUSIVE															
Aver.	0.07	0.06	0.08	0.06	0.10	0.33	0.85	0.50	0.35	0.21	0.22	0.12	0.25	.....	.....
Max.	0.34	0.43	0.76	0.46	0.23	1.00	3.50	0.99	0.72	0.86	0.77	0.50	0.46	3.50	.....
Min.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.17	.....	0.00

NOTE:—U.S. Public Health Service Drinking Water Standards (1962) require that when 10 ml. standard portions are examined, not more than 5% of the standard samples in any month shall have three or more 10 ml. standard portions positive.

WATER TEMPERATURES TAKEN AT 6:00 A.M. AT WATER TREATMENT PLANTS

Table VII

Temperatures in Degrees Fahrenheit

MONTH	BELMONT—1967 Mo. Avg.	BELMONT—1967 Daily Max.	BELMONT—1967 Daily Min.	QUEEN LANE—1967 Mo. Avg.	QUEEN LANE—1967 Daily Max.	QUEEN LANE—1967 Daily Min.	TORRESDALE—1967 Mo. Avg.	TORRESDALE—1967 Daily Max.	TORRESDALE—1967 Daily Min.	ANNUAL—1967 Mo. Avg.	ANNUAL—1967 Daily Max.	ANNUAL—1967 Daily Min.	10-YR. VALUES 1958-1967 MONTHLY Avg.	10-YR. VALUES 1958-1967 MONTHLY Max.	10-YR. VALUES 1958-1967 MONTHLY Min.
Jan.	42	49	38	40	52	35	38	42	35	40	52	35	38	40	35
Feb.	40	43	37	37	40	32	39	42	37	39	43	32	38	40	35
Mar.	43	51	37	41	47	33	40	46	36	41	51	33	43	47	39
April	57	60	53	55	62	50	51	56	43	54	62	43	54	57	51
May	60	66	53	59	66	50	57	60	52	59	66	50	65	70	59
June	78	82	67	78	83	65	72	79	58	76	83	58	75	76	71
July	80	84	77	80	87	75	78	81	77	79	87	75	80	82	78
Aug.	78	84	73	77	83	72	78	82	76	78	84	72	79	80	78
Sept.	72	76	67	72	78	64	73	76	70	72	78	64	74	79	71
Oct.	65	70	56	64	74	54	66	71	59	65	74	54	65	67	61
Nov.	49	59	44	50	60	44	52	59	45	50	60	44	54	57	50
Dec.	42	46	37	43	50	36	41	45	40	42	50	36	42	45	37
Annual	59	84	37	58	87	32	57	82	35	58	87	32	59	82	35

10 YEAR PERIOD AVERAGES (1958-1967)

MONTH	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	10 Year Avg.
Jan.	37	37	38	37	40	35	37	40	39	40	38
Feb.	35	38	39	37	40	35	38	39	38	39	38
Mar.	41	43	39	44	44	43	45	45	47	41	43
April	52	56	56	51	54	57	53	54	53	54	54
May	62	68	66	63	67	67	67	70	62	59	65
June	71	76	75	74	76	75	75	75	74	76	75
July	80	79	79	79	78	81	82	79	82	79	80
Aug.	80	80	79	80	80	79	79	79	80	78	79
Sept.	73	76	72	79	74	71	75	75	73	72	74
Oct.	61	67	62	67	66	66	65	64	62	65	65
Nov.	52	51	55	57	51	55	56	53	55	50	54
Dec.	37	41	40	44	41	40	45	45	44	42	42
Avg.	57	59	58	59	59	59	60	60	59	58	59

TOTAL PRECIPITATION AT PHILADELPHIA INTERNATIONAL AIRPORT ‡

Table VIII

Figures in Inches

MONTH	NORMAL VALUES AND AVERAGES 1872-1966	1931-1960	1958-1967	RECORD VALUES 1941 — 1967 Max.	Min.	TOTAL PRECIPITATION 1967	1966	1965
Jan.	3.22	3.32	2.79	6.06	0.45	1.67	2.82	2.35
Feb.	3.14	2.80	2.96	4.64	1.37	1.82	4.30	2.18
Mar.	3.50	3.80	3.38	6.27	0.68	4.53	0.68	3.19
April	3.29	3.40	3.31	6.58	1.13	2.17	4.35	2.33
May	3.28	3.74	2.25	7.41	0.47	3.49	2.95	1.23
June	3.49	4.05	3.19	7.40	0.11	4.12	0.41	2.85
July	4.08	4.16	4.69	7.48	0.64	7.11	2.35	3.22
Aug.	4.55	4.63	3.97	* 9.70	0.49	7.08	1.63	4.06
Sept.	3.41	3.46	4.14	8.78	0.88	2.96	8.70	3.02
Oct.	2.79	2.78	2.38	5.21	* 0.09	2.00	5.12	2.02
Nov.	3.06	3.40	2.76	6.67	1.08	1.99	2.36	1.05
Dec.	3.10	2.94	3.18	5.88	0.25	5.88	4.33	1.85
Annual	40.91	42.48	39.00	*49.06	*29.34	44.82	40.00	29.34

MONTH	TOTAL PRECIPITATION 1964	1963	1962	1961	1960	1959	1958	1957
Jan.	3.92	2.31	2.95	3.16	3.11	2.03	3.53	1.67
Feb.	2.83	2.19	3.51	3.13	3.44	1.60	4.64	2.81
Mar.	1.94	3.94	3.91	5.17	1.96	3.55	4.97	3.24
April	5.27	1.13	3.69	4.82	2.92	2.25	4.19	4.22
May	0.47	1.06	1.85	3.38	3.65	0.80	3.65	1.31
June	0.21	2.88	7.40	2.95	0.71	5.28	5.13	2.41
July	3.83	3.13	2.30	5.96	5.52	7.48	5.98	0.64
Aug.	0.49	3.35	6.58	3.42	3.19	3.73	6.20	3.38
Sept.	2.42	6.44	2.77	2.41	8.78	1.33	2.55	3.10
Oct.	1.73	0.09	0.95	1.83	2.79	3.41	3.65	2.05
Nov.	1.64	6.67	4.60	2.04	1.92	3.29	2.05	2.98
Dec.	5.13	1.76	2.11	2.78	3.16	3.62	1.13	4.49
Annual	29.88	34.95	42.62	41.05	41.15	38.37	47.87	32.20

NOTE:—‡ WEATHER BUREAU DATA—U.S. Weather Bureau, International Airport, Philadelphia, Pa.
* Record values at International Airport:

Max.: Annual = 1948, Month = 1955
Min.: Annual = 1965, Month = 1963

Normal Values: 1872-1966 = Record mean values unadjusted
1931-1960 = Climatological standard normals

COMPARATIVE HARDNESSES of FINISHED WATER 1958-67

	Year	PARTS PER MILLION Yearly Avg.	Monthly Avg. Max.	Min.	GRAINS PER GALLONS Yearly Avg.	Monthly Avg. Max.	Min.
SCHUYLKILL WATER	1958	137	190	92	8.0	11.1	5.4
	1959	143	200	92	8.4	11.7	5.4
	1960	131	164	99	7.7	9.6	5.8
	1961	153	266	97	9.0	15.6	5.7
	1962	148	251	89	8.7	14.7	5.2
	1963	160	230	99	9.4	13.5	5.8
	1964	164	278	108	9.6	16.3	6.3
	1965	180	230	125	10.5	13.5	7.3
	1966	171	238	114	10.0	13.9	6.7
	1967	149	185	125	8.7	10.8	7.3
	10-Year	154	278	89	9.0	16.3	5.2
DELAWARE WATER	1958	61	77	42	3.6	4.5	2.5
	1959	68	74	49	4.0	4.3	2.9
	1960	84	95	63	4.9	5.6	3.7
	1961	90	102	64	5.3	6.0	3.7
	1962	93	107	69	5.4	6.3	4.0
	1963	99	108	87	5.8	6.3	5.1
	1964	97	114	74	5.7	6.7	4.3
	1965	99	120	74	5.8	7.0	4.3
	1966	98	116	80	5.7	6.8	4.7
	1967	99	115	75	5.8	6.7	4.4
	10-Year	89	120	42	5.2	7.0	2.5

NOTE: One grain per gallon is equivalent to 17.1 parts per million (P.P.M.)

Data prepared by Belmont unit of Water Quality Control and Research Division. Charles I. Pierce, unit supervisor.