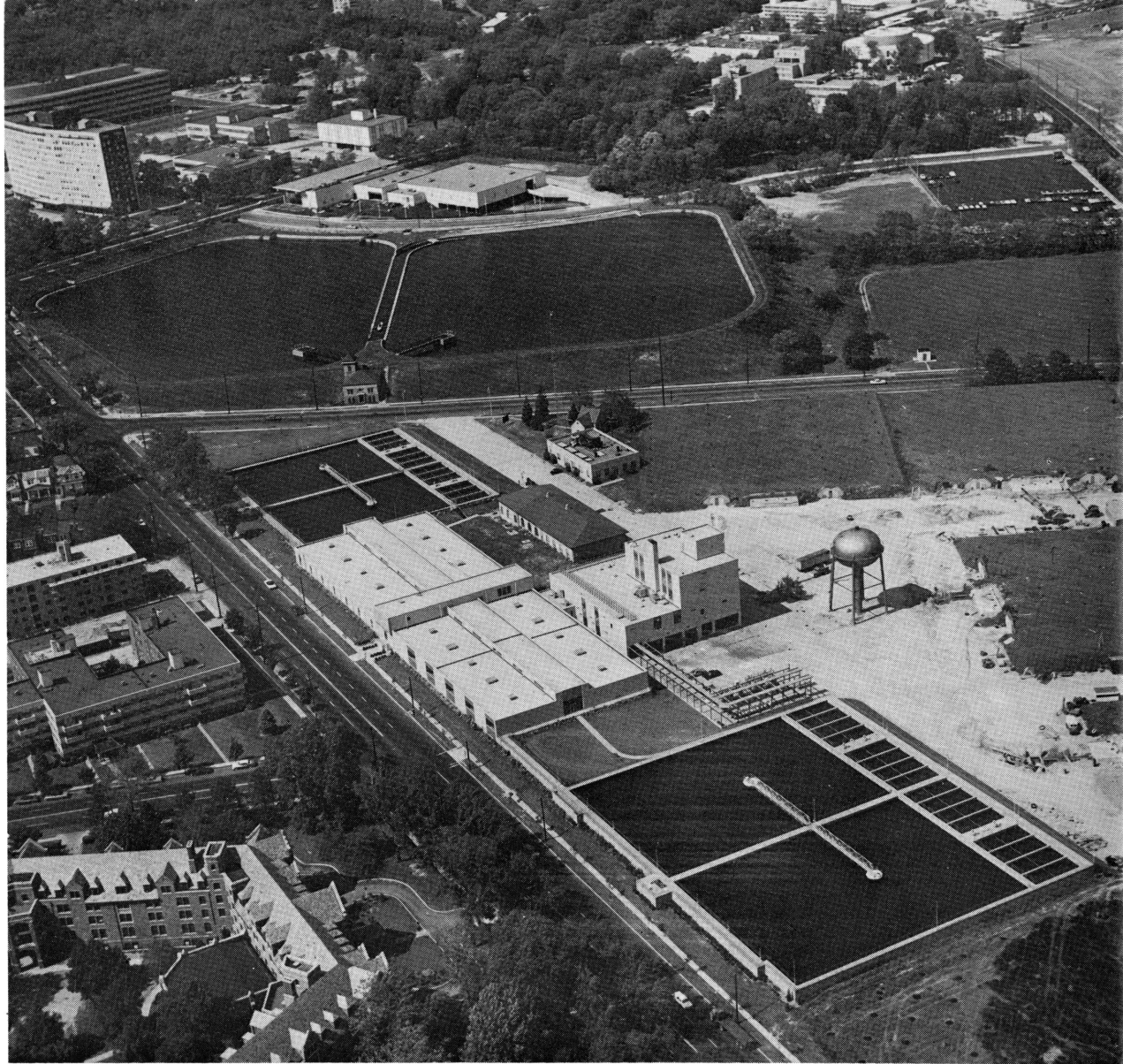


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C1 OF 2

WATER QUALITY IN PHILADELPHIA -- 1968

*Analyses by Laboratories
of the
Philadelphia Water Department*



Belmont Plant: Put into service in 1965, this is the third and smallest of three modern water treatment plants built by the City under its huge capital program. The Belmont Plant has a rated daily capacity of 78 million gallons and it serves all that part of Philadelphia west of the Schuylkill River.

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 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 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 has been significantly increased at the purification plants by conversion of obsolete slow-sand filters to water storage basins. The final phase of this work (at the Queen Lane Plant) is under way.

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 readily 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 1968, 10,716 samples were collected from the districts for this purpose. From these samples 53,580 bacteriological portions were tested. These produced a coliform count of only 2.6 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.

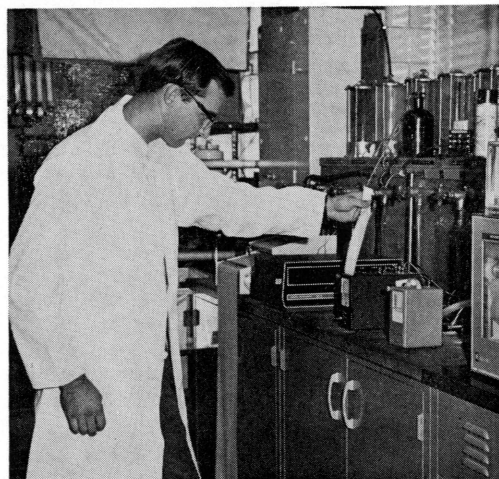
The range of hardness of treated water from the Delaware River water varies from 2.9 to 7 grains per gallon, the long-term average being about 5.4 grains per gallon. The range on treated water from the Schuylkill varies from 5.2 to 16.3 grains per gallon, with the long-term average about 9.1 grains per 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 particles 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 32°F to 86°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.

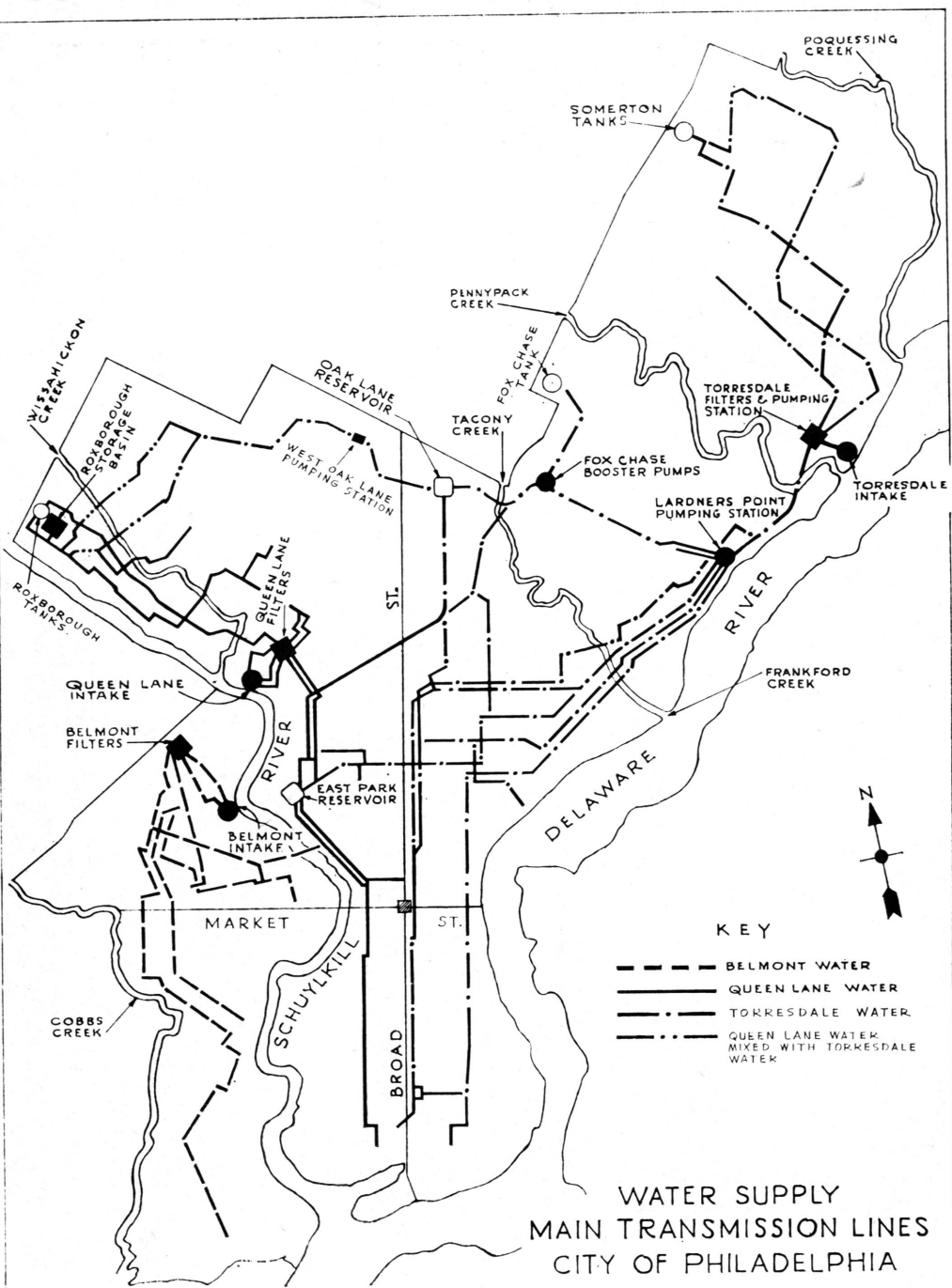
Schuylkill water is sometimes pumped east of Broad Street, in the area generally bounded by Roosevelt Boulevard, Lehigh Avenue, Wyoming Avenue and Kensington Avenue. Express mains direct from Lardner's Point Pumping Station deliver Delaware water to the vicinity of East Park Reservoir,

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.





WATER SUPPLY
MAIN TRANSMISSION LINES
CITY OF PHILADELPHIA

PHYSICAL AND CHEMICAL SUMMARIES FOR RAW WATER FROM SCHUYLKILL AND DELAWARE RIVERS IN 1968

Table I
Figures in mg/l except for items marked by †

PHYSICAL AND CHEMICAL CHARACTERISTICS		SCHUYLKILL AT BELMONT & QUEEN LANE				DELAWARE AT TORRESDALE		
		Fr	Yearly	Mon.	Avg.	Yearly	Mon.	Avg.
			Avg.	Max.	Min.		Avg.	Max.	Min.
Rainfall, Pptn. †	(Inch)	X	35.45	5.89	0.44	35.45	5.89	0.44
Temperature, Water †	(°F)	1D	60	82	34	58	80	37
Alkalinity	(CaCO ₃)	8D	65	86	49	34	44	26
Carbon Dioxide	(CO ₂)	8D	3	5	1	6	15	1
Chloride	(Cl)	WC	29	42	16	12	16	7
Color, Apparent †	(Units)	1W	29	43	15	—	—	—
Color, Filtered †	(Units)	1W	9	15	4	19	32	10
Conductance, Specific †	(μmhos)	WC	392	485	290	178	217	125
Cyanide	(CN)	1W	—	—	—	0.00	0.00	0.00
Detergents, MBAS	(ABS)	WC	0.06	0.10	0.02	0.06	0.08	0.02
Fluoride	(F)	3W	0.29	0.40	0.22	0.27	0.31	0.22
Hardness, EDTA	(CaCO ₃)	WC	153	212	113	67	77	49
Nitrogen, Ammonia	(N)	1W	0.64	1.65	0.31	0.61	0.88	0.38
Nitrogen, Nitrate	(N)	1W	2.59	3.33	2.02	0.85	1.42	0.64
Nitrogen, Nitrite	(N)	1W	0.064	0.098	0.028	0.028	0.081	0.006
Oxygen Demand, BOD	(O)	1W	2.5	3.5	1.5	3.4	5.1	2.1
Oxygen Demand, COD	(O)	1W	14.4	25.9	9.1	11.5	18.2	6.6
Oxygen, Dissolved	(O)	1W	9.3	13.1	5.6	8.4	12.4	4.0
Oxygen, % Saturation ₂ †	(—)	1W	88	104	69	77	98	46
pH †	(Units)	8D	7.6	8.1	7.2	7.2	7.3	7.1
Phenols	(C ₆ H ₅ OH)	1W	0.003	0.009	0.001	0.002	0.010	0.000
Phosphates, Ortho	(PO ₄)	1W	0.93	1.73	0.33	0.35	0.47	0.23
Phosphates, Poly (Meta)	(PO ₄)	1W	0.10	0.27	0.02	0.04	0.06	0.01
Radioactivity, Gross Beta †	(pc/L)	WC	5.5	7.6	3.9	3.6	5.1	2.8
Residue, Total	(—)	WC	292	398	230	135	156	104
Residue, Filtrable	(—)	WC	267	367	214	—	—	—
Silica	(SiO ₂)	WC	8.4	11.0	5.6	3.1	5.0	0.9
Sulfate	(SO ₄)	WC	76	117	57	25	30	19
Turbidity †	(JTU)	8D	27	85	9	22	36	13
Aluminum	(Al)	WC	0.01	0.03	0.00	0.04	0.05	0.01
Arsenic	(As)	WC	0.005	0.010	0.001	—	—	—
Calcium	(Ca)	WC	37	48	28	15	17	11
Chromium, Hexa	(Cr)	1W	0.006	0.010	0.003	0.005	0.010	0.002
Copper	(Cu)	1W	0.03	0.04	0.01	0.11	0.18	0.07
Iron, Total	(Fe)	WC	0.49	1.45	0.15	1.08	1.55	0.60
Iron, Dissolved	(Fe)	WC	0.06	0.13	0.02	—	—	—
Lead	(Pb)	1W	—	—	—	0.014	0.022	0.006
Magnesium	(Mg)	WC	15	20	10	6	8	4
Manganese, Total	(Mn)	WC	0.18	0.44	0.04	0.14	0.30	0.05
Manganese, Dissolved	(Mn)	WC	0.08	0.37	0.00	—	—	—
Potassium	(K)	WC	3.9	5.2	2.8	1.9	2.4	1.3
Sodium	(Na)	WC	21.7	34.8	10.5	9.5	12.5	5.8

NOTES: FR=frequency of analyses. Individual or grab samples: (8D) eight per day. (1D) one per day. (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly 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 1968

Table I-A

Figures in mg/l except for items marked by †

PHYSICAL AND CHEMICAL CHARACTERISTICS		BELMONT INTAKE				QUEEN LANE INTAKE		
		Fr	Yearly Avg.	Mon. Max.	Avg. Min.	Yearly Avg.	Mon. Max.	Avg. Min.
Rainfall, Pptn. †	(Inch)	X	35.45	5.89	0.44	35.45	5.89	0.44
Temperature, Water †	(°F)	1D	61	82	35	58	80	34
Alkalinity	(CaCO ₃)	8D	62	86	49	67	83	53
Carbon Dioxide	(CO ₂)	1W	3	5	1	3	3	1
Chloride	(Cl)	WC	27	42	16	31	42	19
Color, Apparent †	(Units)	1W	29	43	16	29	42	15
Color, Filtered †	(Units)	1W	9	15	4	9	14	4
Conductance, Specific †	(μmhos)	WC	381	485	290	403	482	310
Cyanide	(CN)	1W	—	—	—	—	—	—
Detergents, MBAS	(ABS)	WC	0.05	0.09	0.02	0.06	0.10	0.02
Fluoride	(F)	3W	0.29	0.40	0.22	0.28	0.38	0.22
Hardness, EDTA	(CaCO ₃)	WC	151	211	113	154	212	116
Nitrogen, Ammonia	(N)	1W	0.55	0.88	0.32	0.72	1.65	0.31
Nitrogen, Nitrate	(N)	1W	2.49	3.17	2.12	2.68	3.33	2.02
Nitrogen, Nitrite	(N)	1W	0.059	0.098	0.028	0.069	0.095	0.038
Oxygen Demand, BOD	(O)	1W	2.4	3.2	1.5	2.6	3.5	2.1
Oxygen Demand, COD	(O)	1W	13.7	20.4	9.1	15.0	25.9	10.6
Oxygen, Dissolved	(O)	1W	9.3	12.7	7.1	9.3	13.1	5.6
Oxygen, % Saturation †	(—)	1W	89	101	79	87	104	69
pH †	(Units)	8D	7.5	7.9	7.3	7.6	8.1	7.2
Phenols	(C ₆ H ₅ OH)	1W	0.003	0.009	0.001	0.002	0.005	0.001
Phosphates, Ortho	(PO ₄)	1W	0.69	1.07	0.33	1.16	1.73	0.60
Phosphates, Poly (Meta)	(PO ₄)	1W	0.08	0.17	0.04	0.12	0.27	0.02
Radioactivity, Gross Beta †	(pc/L)	WC	5.0	6.1	3.9	5.9	7.6	4.4
Residue, Total	(—)	WC	285	385	230	299	398	249
Residue, Filtrable	(—)	WC	266	367	214	268	364	230
Silica	(SiO ₂)	WC	8.3	10.8	5.7	8.5	11.0	5.6
Sulfate	(SO ₄)	WC	76	111	58	76	117	57
Turbidity †	(JTU)	8D	31	85	17	22	71	9
Aluminum	(Al)	WC	0.01	0.03	0.00	0.01	0.03	0.00
Arsenic	(As)	WC	0.004	0.008	0.001	0.005	0.010	0.002
Calcium	(Ca)	WC	37	48	28	37	48	29
Chromium, Hexa	(Cr)	1W	0.005	0.006	0.003	0.006	0.010	0.004
Copper	(Cu)	1W	0.03	0.04	0.01	0.03	0.03	0.02
Iron, Total	(Fe)	WC	0.51	1.45	0.21	0.46	1.19	0.15
Iron, Dissolved	(Fe)	WC	0.06	0.13	0.03	0.05	0.08	0.02
Lead	(Pb)	1W	—	—	—	—	—	—
Magnesium	(Mg)	WC	15	20	10	15	20	11
Manganese, Total	(Mn)	WC	0.24	0.44	0.07	0.12	0.25	0.04
Manganese, Dissolved	(Mn)	WC	0.11	0.37	0.00	0.04	0.20	0.00
Potassium	(K)	WC	3.7	4.8	2.8	4.1	5.2	3.0
Sodium	(Na)	WC	20.5	33.6	10.5	22.9	34.8	13.5

NOTES: FR=frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly composite. (X) Total precipitation at International Airport, Philadelphia, from U.S. Weather Bureau reports. Radioactivity equals gross beta activity in picocuries per liter.

COLIFORM ORGANISMS IN RAW WATER FROM SCHUYLKILL AND DELAWARE RIVERS IN 1968

Table II

1968 Monthly Average Phelps Index and Most Probable Number Per 100 Milliliters.

MONTH	SCHUYLKILL RIVER		DELAWARE RIVER	
	Belmont		Queen Lane	
	Index	M.P.N.	Index	M.P.N.
Jan.	12,000	29,000	38,000	89,000
Feb.	6,200	15,000	45,000	102,000
Mar.	15,000	33,000	15,000	35,000
April	1,900	4,600	7,200	17,000
May	18,000	45,000	96,000	233,000
June	26,000	68,000	109,000	234,000
July	21,000	48,000	23,000	51,000
Aug.	5,100	10,000	53,000	99,000
Sept.	17,000	41,000	48,000	142,000
Oct.	11,000	26,000	60,000	106,000
Nov.	47,000	102,000	69,000	152,000
Dec.	24,000	68,000	59,000	143,000
Avg.	17,000	41,000	52,000	117,000
Max.	47,000	102,000	109,000	234,000
Min.	1,900	4,600	7,200	17,000

1959—1968 10-YEAR PERIOD AVERAGES

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
1968	17,000	41,000	52,000	117,000	22,000	54,000
Avg.	17,000	41,000	49,000	116,000	31,000	76,000
Max.	22,000	53,000	84,000	200,000	45,000	114,000
Min.	9,900	23,000	12,000	28,000	17,000	41,000

NOTES: Frequency of analyses: Three individual or grab samples per day at each location (Belmont, Queen Lane, Torresdale Plants.)

PHYSICAL AND CHEMICAL SUMMARIES FOR FINISHED WATER FROM THE WATER TREATMENT PLANTS IN 1968

Table III

Figures in mg/l except for items marked by †

PHYSICAL AND CHEMICAL CHARACTERISTICS		SCHUYLKILL PLANTS QUEEN LANE & BELMONT				DELAWARE PLANT TORRESDALE			
		Fr	Yearly	Mon.	Avg.	Yearly	Mon.	Avg.	
			Avg.	Max.	Min.	Avg.	Max.	Min.	
Alkalinity (CaCO ₃)		8D	55	80	34	40	51	31	
Carbon Dioxide (CO ₂)		1W	6	11	1	2	4	0	
Chloride (Cl)		WC	42	57	27	30	33	26	
FREE CHLORINE TREATMENT									
QUEEN LANE (ONLY)									
Chlorine Residual Total (Cl)		8D	1.70	2.10	1.30	1.50	1.66	1.31	
Chlorine Residual Free (Cl)		8D	1.50	1.80	1.10	1.31	1.47	1.12	
CHLORAMINE TREATMENT									
BELMONT (ONLY)									
Chlorine Residual Total (Cl)		8D	2.30	2.90	1.50	—	—	—	
Chlorine Residual Free (Cl)		8D	0.06	0.08	0.05	—	—	—	
Color, Apparent † (Units)		1W	1	2	0	0	0	0	
Conductance, Specific † (μmhos)		WC	436	538	345	292	357	235	
Detergents, MBAS (ABS)		WC	0.08	0.14	0.04	0.08	0.11	0.05	
Fluoride (F)		1D	0.94	1.09	0.71	0.95	1.09	0.84	
Hardness, EDTA (CaCO ₃)		WC	163	236	113	99	113	86	
Nitrogen, Ammonia (N)		1W	SEE TABLE III-A			0.00	0.01	0.00	
Nitrogen, Nitrate (N)		1W	2.63	3.36	2.00	0.73	1.14	0.52	
Nitrogen, Nitrite (N)		1W	0.001	0.003	0.000	0.000	0.000	0.000	
Oxygen Demand, COD (O)		1W	5.5	7.3	3.7	5.5	8.0	2.8	
Oxygen Dissolved, DO (O)		1W	9.7	13.4	7.1	9.4	13.1	6.1	
Oxygen, % Saturation † (—)		1W	96	108	89	89	99	74	
pH † (Units)		8D	7.3	8.0	6.7	8.0	8.2	7.8	
Phenols (C ₆ H ₅ OH)		1W	0.001	0.001	0.000	0.000	0.000	0.000	
QUEEN LANE (GRAVITY ONLY)									
Phosphates Ortho- (PO ₄)		1W	0.09	0.18	0.03	—	—	—	
Phosphates Poly- (Meta) (PO ₄)		1W	0.05	0.08	0.01	—	—	—	
SEE TABLE III-A									
Phosphates Ortho- (PO ₄)		1W	0.27	0.52	0.14	0.15	0.29	0.08	
Phosphates Poly- (Meta) (PO ₄)		1W	1.17	2.05	0.68	0.73	0.95	0.26	
Radioactivity, Gross Beta † (pc/L)		WC	4.4	6.6	2.9	3.6	5.1	2.8	
Residue, Total (—)		WC	314	430	245	176	214	141	
Silica (SiO ₂)		WC	8.3	11.0	5.5	3.1	4.8	1.3	
Sulfate (SO ₄)		WC	91	135	70	29	35	22	
Turbidity † (JTU)		8D	0.11	0.33	0.00	0.00	0.10	0.00	
Aluminum (Al)		WC	0.03	0.07	0.01	0.04	0.10	0.00	
Calcium (Ca)		WC	42	59	32	27	30	23	
Chromium, Hexa (Cr)		1W	0.006	0.010	0.004	0.000	0.000	0.000	
Copper (Cu)		1W	0.02	0.03	0.00	0.00	0.00	0.00	
Iron, Total (Fe)		WC	0.04	0.10	0.01	0.02	0.04	0.00	
Magnesium (Mg)		WC	14	21	10	8	10	6	
Manganese, Total (Mn)		WC	0.01	0.04	0.00	0.00	0.00	0.00	
Potassium (K)		WC	3.9	5.3	3.0	1.8	2.4	1.3	
Sodium (Na)		WC	26.2	40.8	11.5	9.5	12.6	6.0	

NOTES: FR=frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly composite. Radioactivity equals gross beta activity in picocuries per liter.

PHYSICAL AND CHEMICAL SUMMARIES FOR FINISHED WATER FROM THE WATER TREATMENT PLANTS ON THE SCHUYLKILL IN 1968

Table III-A

Figures in mg/l except for items marked by †

PHYSICAL AND CHEMICAL CHARACTERISTICS		BELMONT				QUEEN LANE			
		Fr	Yearly	Mon.	Avg.	Yearly	Mon.	Avg.	
			Avg.	Max.	Min.	Avg.	Max.	Min.	
Alkalinity (CaCO ₃)		8D	60	80	47	51	66	34	
Carbon Dioxide (CO ₂)		1W	4	6	1	7	11	3	
Chloride (Cl)		WC	39	55	27	45	57	29	
FRE CHLORINE TREATMENT									
Chlorine Residual Total (Cl)		8D	—	—	—	1.70	2.10	1.30	
Chlorine Residual Free (Cl)		8D	—	—	—	1.50	1.80	1.10	
CHLORAMINE TREATMENT									
Chlorine Residual Total (Cl)		8D	2.30	2.90	1.50	—	—	—	
Chlorine Residual Free (Cl)		8D	0.06	0.08	0.05	—	—	—	
Color, Apparent † (Units)		1W	1	2	0	0	1	0	
Conductance, Specific † (μmhos)		WC	433	538	345	438	519	348	
Detergents, MBAS (ABS)		WC	0.08	0.12	0.04	0.08	0.14	0.04	
Fluoride (F)		1D	0.97	1.07	0.71	0.91	1.09	0.80	
Hardness, EDTA (CaCO ₃)		WC	173	236	135	153	206	113	
Nitrogen, Ammonia (N)		1W	0.38	0.74	0.13	0.04	0.07	0.03	
Nitrogen, Nitrate (N)		1W	2.53	3.32	2.00	2.72	3.36	2.30	
Nitrogen, Nitrite (N)		1W	0.001	0.002	0.000	0.001	0.003	0.000	
Oxygen Demand, COD (O)		1W	5.4	6.6	3.7	5.5	7.3	4.1	
Oxygen Dissolved, DO (O)		1W	10.0	13.4	7.8	9.4	12.4	7.1	
Oxygen, % Saturation † (—)		1W	99	108	90	93	97	89	
pH † (Units)		8D	7.6	8.0	7.1	7.0	7.6	6.7	
Phenols (C ₆ H ₅ OH)		1W	0.001	0.001	0.000	0.000	0.001	0.000	
Phosphates (Gravity)									
Ortho- (PO ₄)		1W	0.31	0.46	0.14	0.09	0.18	0.03	
Poly- (Meta) (PO ₄)		1W	0.97	1.19	0.75	0.05	0.08	0.01	
Phosphates (Hi-Service)									
Ortho- (PO ₄)		1W	0.33	0.52	0.14	0.21	0.30	0.14	
Poly- (Meta) (PO ₄)		1W	0.99	1.46	0.78	1.35	2.05	0.68	
Radioactivity, Gross Beta † (pc/L)		WC	4.0	5.3	2.9	4.7	6.6	3.6	
Residue, Total (—)		WC	318	430	255	310	412	245	
Silica (SiO ₂)		WC	8.2	10.8	5.5	8.3	11.0	5.8	
Sulfate (SO ₄)		WC	90	132	70	91	135	71	
Turbidity † (JTU)		8D	0.21	0.33	0.12	0.01	0.03	0.00	
Aluminum (Al)		WC	0.03	0.07	0.01	0.02	0.02	0.01	
Calcium (Ca)		WC	45	59	36	38	48	32	
Chromium, Hexa (Cr)		1W	0.006	0.010	0.004	0.005	0.007	0.004	
Copper (Cu)		1W	0.02	0.03	0.01	0.02	0.03	0.00	
Iron, Total (Fe)		WC	0.03	0.07	0.01	0.05	0.10	0.01	
Magnesium (Mg)		WC	14	21	10	14	20	11	
Manganese, Total (Mn)		WC	0.01	0.04	0.00	0.01	0.03	0.00	
Potassium (K)		WC	3.7	5.0	3.0	4.1	5.3	3.0	
Sodium (Na)		WC	20.9	35.2	11.5	31.5	40.8	24.5	

NOTES: FR=frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly composite. Radioactivity equals gross beta activity in picocuries per liter.

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE BELMONT WATER TREATMENT PLANT IN 1968

Table IV-A1

Figures in mg/1 unless otherwise indicated

MONTH	FREQ.	Turbid- ity (JTU)	Res- idue Total	Spec. Cond. (μmhos)	Color Appar- ent	pH (Units)	Alka- linity (CaCO ₃)	Carbon Dioxide (CO ₂)	Hard- ness (CaCO ₃)
		8D	WC	WC	1W	8D	8D	1W	WC
Jan.		0.32	277	438	1	7.2	51	6	161
Feb.		0.21	255	394	0	7.1	48	6	141
Mar.		0.25	288	412	0	7.1	47	6	151
April		0.20	276	417	0	7.4	53	3	155
May		0.19	287	416	0	7.6	56	4	164
June		0.12	259	345	0	7.7	49	3	135
July		0.16	334	429	1	7.6	67	2	169
Aug.		0.16	401	515	1	7.7	80	3	205
Sept.		0.14	381	460	0	7.7	66	3	199
Oct.		0.22	430	538	0	7.9	80	3	236
Nov.		0.29	357	436	2	8.0	71	2	199
Dec.		0.33	274	396	1	8.0	56	1	165
Avg.		0.21	318	433	1	7.6	60	4	173
Max. Mo.		0.33	430	538	2	8.0	80	6	236
Min. Mo.		0.12	255	345	0	7.1	47	1	135

MONTH	FREQ.	Postas- sium (K)	Sod- ium (Na)	Cal- cium (Ca)	Magne- sium (Mg)	Iron Total (Fe)	Magna- nese (Mn)	Alu- minum (Al)	Chlo- ride (Cl)	Sul- fate (SO ₄)	Sil- ica (SiO ₂)
		WC	WC	WC	WC	WC	WC	WC	WC	WC	WC
Jan.		3.3	19.0	41	13	.02	.04	.03	38	83	10.0
Feb.		3.2	15.6	37	12	.02	.01	.01	34	70	9.6
Mar.		3.3	10.5	40	13	.02	.00	.03	37	81	8.3
April		3.0	16.7	36	12	.02	.02	.02	32	76	5.7
May		3.0	17.6	43	12	.03	.01	.03	34	78	8.4
June		3.0	11.5	38	10	.01	.01	.04	27	72	8.5
July		3.5	20.0	47	14	.03	.00	.06	35	90	6.5
Aug.		4.4	30.8	54	18	.06	.01	.07	54	99	5.8
Sept.		4.3	26.0	50	18	.03	.00	.04	45	110	5.5
Oct.		5.0	35.2	59	21	.07	.00	.03	55	132	8.4
Nov.		4.0	22.5	49	16	.02	.00	.02	41	110	10.8
Dec.		4.0	16.0	45	14	.04	.04	.02	37	84	10.8
Avg.		3.7	20.9	45	14	.03	.01	.03	39	90	8.2
Max. Mo.		5.0	35.2	59	21	.07	.04	.07	55	132	10.8
Min.		3.0	11.5	36	10	.01	.00	.01	27	70	5.5

NOTES: FREQ. =frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly composite.

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE BELMONT WATER TREATMENT PLANT IN 1968

Table IV-A2

Figures in mg/1 unless otherwise indicated

MONTH	FREQ.	Chro- mium (Cr ⁺⁶)	PHOSPHATES		Fluo- ride (F)	CHLORINE RESID. (Cl)		Chem. O. D.
		1W	Ortho (PO ₄)	Poly (PO ₄)	1D	Total (Chloramine)	(Free)	(C.O.D.)
Jan.		.005	.14	.78	.95	1.70	.05	5.2
Feb.		.006	.14	1.07	.96	1.50	.07	4.6
Mar.		.006	.30	1.00	.88	1.80	.06	6.1
April		.005	.32	.93	1.00	1.00	.05	4.9
May		.005	.30	1.00	1.00	2.50	.05	4.8
June		.004	.35	.89	.71	2.00	.05	4.9
July		.005	.46	.99	.86	2.40	.05	5.7
Aug.		.006	.38	.91	.96	2.60	.08	6.4
Sept.		.010	.52	.88	.99	2.70	.06	6.0
Oct.		.010	.39	.92	1.05	2.90	.05	6.6
Nov.		.007	.37	1.46	.98	2.80	.05	5.9
Dec.		.008	.27	1.05	1.06	2.70	.05	3.7
Avg.		.006	.33	.99	.95	2.30	.06	5.4
Max. Mo.		.010	.52	1.46	1.06	2.90	.08	6.6
Min. Mo.		.004	.14	.78	.71	1.50	.05	3.7

MONTH	FREQ.	DISSOLVED OXYGEN		NITROGEN			Deter- Gents	β-Radio- Activity
		PPM (D.O.)	Sat'n. Per Cent	NH ₃ (N)	NO ₂ (N)	NO ₃ (N)	(ABS)	(pc/L)
Jan.		13.4	104	.74	.000	2.79	.11	4.0
Feb.		13.1	107	.19	.000	2.74	.12	3.7
Mar.		11.1	97	.13	.001	2.73	.10	3.8
April		9.1	95	.19	.001	2.60	.07	3.2
May		8.1	90	.24	.001	2.06	.07	3.4
June		8.1	93	.29	.000	2.30	.04	4.7
July		8.1	105	.30	.002	2.37	.05	3.0
Aug.		7.8	97	.34	.001	2.00	.07	5.0
Sept.		9.1	107	.42	.001	2.39	.....	5.3
Oct.		8.1	90	.37	.001	3.32	.07	3.6
Nov.		10.0	95	.74	.002	2.55	.09	4.8
Dec.		12.2	108	.57	.002	2.55	.08	2.9
Avg.		10.0	99	.38	.001	2.53	.08	4.0
Max. Mo.		13.4	108	.74	.002	3.32	.12	5.3
Min. Mo.		7.8	90	.13	.000	2.00	.04	2.9

NOTES: FREQ. =frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly composite. Radioactivity equals gross beta activity in picocuries per liter.

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE QUEEN LANE WATER TREATMENT PLANT IN 1968

Table IV-B1

Figures in mg/1 unless otherwise indicated

MONTH	FREQ.	Turbidity (JTU)	Residue Total	Spec. Cond. (µmhos)	Color Apparent	pH (Units)	Alkalinity (CaCO ₃)	Carbon Dioxide (CO ₂)	Hardness (CaCO ₃)
		8D	WC	WC	1W	8D	8D	1W	WC
Jan.		0.00	283	450	0	6.9	45	11	138
Feb.		0.00	272	433	0	7.0	48	9	140
Mar.		0.03	279	436	0	7.0	43	6	134
April		0.02	270	432	0	7.4	53	3	146
May		0.01	276	427	0	7.4	56	4	142
June		0.00	245	348	0	7.6	49	3	113
July		0.00	318	424	1	7.2	58	4	149
Aug.		0.02	392	496	0	7.0	64	8	177
Sept.		0.01	369	454	0	6.9	53	6	179
Oct.		0.01	412	519	0	6.9	59	7	206
Nov.		0.02	326	423	1	6.9	50	9	170
Dec.		0.00	274	414	0	6.7	34	11	143
Avg.		0.01	310	438	0	7.0	51	7	153
Max. Mo.		0.03	412	519	1	7.6	64	11	206
Min. Mo.		0.00	245	348	0	6.7	34	3	113

MONTH	FREQ.	Postassium (K)	Sodium (Na)	Calcium (Ca)	Magnesium (Mg)	Iron Total (Fe)	Manganese (Mn)	Aluminum (Al)	Chloride (Cl)	Sulfate (SO ₄)	Silica (SiO ₂)
		WC	WC	WC	WC	WC	WC	WC	WC	WC	WC
Jan.		3.5	37.0	34	14	.06	.00	.02	50	81	10.0
Feb.		4.0	28.4	33	14	.02	.02	.01	53	76	9.6
Mar.		4.0	32.0	35	12	.02	.00	.02	44	81	8.3
April		3.3	26.7	35	13	.01	.00	.01	37	80	6.0
May		3.6	31.2	34	12	.04	.00	.01	35	82	8.4
June		3.0	24.5	32	11	.03	.00	.02	29	71	9.3
July		4.3	29.0	37	14	.05	.00	.02	35	90	6.3
Aug.		5.3	37.6	44	17	.05	.00	.02	54	99	6.2
Sept.		4.3	34.7	44	16	.07	.00	.01	54	111	5.8
Oct.		5.2	40.8	48	20	.10	.00	.01	57	135	8.2
Nov.		4.8	30.5	41	17	.05	.03	.02	45	100	10.3
Dec.		4.0	26.0	35	13	.05	.01	.02	47	82	11.0
Avg.		4.1	31.5	38	14	.05	.01	.02	45	91	8.3
Max. Mo.		5.3	40.8	48	20	.10	.03	.02	57	135	11.0
Min. Mo.		3.0	24.5	32	11	.01	.00	.01	29	71	5.8

NOTES: FREQ. =frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF (6:00 A.M.) grab samples: (WC) one on weekly composite.

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE QUEEN LANE WATER TREATMENT PLANT IN 1968

Table IV-B2

Figures in mg/1 unless otherwise indicated

MONTH	Chro- mium (Cr ⁺⁶)	PHOSPHATES (PO ₄)				Fluo- ride (F)	CHLORINE RESID. (Cl)		Chem. O. D. (COD)
		Gravity		High Service			Total (Break-Point)	Free	
FREQ.	1W	1W	1W	1W	1W	1D	8D	8D	1W
Jan.	.005	.05	.08	.17	1.47	.87	1.5	1.3	5.8
Feb.	.006	.03	.07	.14	1.96	.80	1.5	1.3	5.3
Mar.	.005	.05	.06	.16	2.05	.95	1.3	1.1	7.3
April	.005	.09	.01	.19	2.01	.80	1.4	1.2	4.5
May	.004	.08	.03	.30	1.57	1.09	1.3	1.2	4.9
June	.004	.06	.06	.17	1.07	.95	1.8	1.5	4.1
July	.005	.08	.03	.18	1.12	.88	2.0	1.6	4.9
Aug.	.005	.06	.06	.29	1.40	.96	2.0	1.6	7.3
Sept.	.007	.14	.03	.26	.77	.80	2.0	1.6	5.7
Oct.	.004	.15	.04	.18	1.24	.99	2.1	1.7	5.9
Nov.	.005	.18	.06	.23	.68	.92	2.0	1.8	6.4
Dec.	.006	.08	.06	.21	.90	.95	2.0	1.7	4.3
Avg.	.005	.09	.05	.21	1.35	.91	1.7	1.5	5.5
Max. Mo.	.007	.18	.08	.30	2.05	1.09	2.1	1.8	7.3
Min. Mo.	.004	.03	.01	.14	.68	.80	1.3	1.1	4.1

MONTH	FREQ.	DISSOLVED OXYGEN		NITROGEN			Detergents (ABS)	β-Radio-Activity (pc/L)
		PPM (D.O.)	Sat'n. Per Cent	NH ₃ (N)	NO ₂ (N)	NO ₃ (N)	WC	WC
Jan.		11.7	90	.05	.003	2.93	.13	4.8
Feb.		12.4	94	.03	.003	2.86	.14	4.5
Mar.		10.9	92	.04	.001	2.83	.13	4.9
April		9.1	94	.03	.002	2.88	.07	3.9
May		8.4	90	.03	.001	2.30	.07	4.7
June		7.9	90	.03	.000	2.40	.04	4.7
July		7.1	89	.07	.001	2.39	.05	3.6
Aug.		7.3	93	.06	.001	2.34	.07	6.6
Sept.		8.1	96	.05	.002	2.59	.....	4.0
Oct.		8.2	91	.07	.001	3.36	.08	5.3
Nov.		10.7	96	.04	.001	2.72	.08	5.0
Dec.		11.4	97	.03	.001	2.98	.08	4.4
Avg.		9.4	93	.04	.001	2.72	.08	4.7
Max. Mo.		12.4	97	.07	.003	3.36	.14	6.6
Min. Mo.		7.1	89	.03	.000	2.30	.04	3.6

NOTES: FREQ. =frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly composite. Radioactivity equals gross beta activity in picocuries per liter.

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE TORRESDALE WATER TREATMENT PLANT IN 1968

Table IV-C1

Figures in mg/1 unless otherwise indicated

MONTH	FREQ.	Turbid- ity (JTU)	Res- idue Total	Spec. Cond. (μmhos)	Color Appar- ent	pH (Units)	Alka- linity (CaCO ₃)	Carbon Dioxide (CO ₂)	Hard- ness (CaCO ₃)
		8D	WC	WC	1W	8D	8D	1W	WC
Jan.		0.0	182	304	0	7.9	39	1	99
Feb.		0.0	162	270	0	7.8	38	0	98
Mar.		0.0	168	280	0	7.8	38	3	102
April		0.0	153	256	0	7.8	36	1	91
May		0.0	149	249	0	8.1	33	1	90
June		0.0	183	305	0	8.0	33	2	91
July		0.0	188	313	0	8.2	42	1	102
Aug.		0.0	214	357	0	8.1	51	1	113
Sept.		0.0	204	341	0	8.1	50	3	108
Oct.		0.0	195	325	0	8.2	49	0	103
Nov.		0.0	167	278	0	8.1	41	2	101
Dec.		0.1	141	235	0	7.9	31	4	86
Avg.		0.0	176	292	0	8.0	40	2	99
Max. Mo.		0.1	214	357	0	8.2	51	4	113
Min. Mo.		0.0	141	235	0	7.8	31	0	86

MONTH	FREQ.	Postas- sium (K)	Sod- ium (Na)	Cal- cium (Ca)	Magne- sium (Mg)	Iron Total (Fe)	Magna- nese (Mn)	Alu- minum (Al)	Chlo- ride (Cl)	Sul- fate (SO ₄)	Sil- ica (SiO ₂)
		WC	WC	WC	WC	WC	WC	WC	WC	WC	WC
Jan.		1.9	11.4	27	9	.02	.00	.00	31	35	4.5
Feb.		1.8	9.6	29	7	.02	.00	.01	30	31	4.8
Mar.		1.8	10.2	28	9	.00	.00	.00	32	29	3.9
April		1.4	8.1	24	10	.04	.00	.03	26	26	3.0
May		1.3	6.8	24	7	.02	.00	.06	26	22	2.6
June		1.4	6.0	25	7	.01	.00	.08	27	28	3.4
July		1.9	7.6	28	6	.03	.00	.10	30	26	3.0
Aug.		2.1	11.6	27	8	.01	.00	.06	32	29	1.3
Sept.		2.3	11.4	30	8	.02	.00	.04	31	28	2.0
Oct.		2.4	12.6	27	7	.01	.00	.02	33	30	1.6
Nov.		2.1	9.7	28	7	.03	.00	.01	30	32	3.3
Dec.		1.5	8.4	23	6	.03	.00	.05	28	28	4.3
Avg.		1.8	9.5	27	8	.02	.00	.04	30	29	3.1
Max. Mo.		2.4	12.6	30	10	.04	.00	.10	33	35	4.8
Min. Mo.		1.3	6.0	23	6	.00	.00	.00	26	22	1.3

NOTES: FREQ. =frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly composite.

PHYSICAL AND CHEMICAL ANALYSES FOR FINISHED WATER FROM THE TORRESDALE WATER TREATMENT PLANT IN 1968

Table IV-C2

Figures in mg/1 unless otherwise indicated

MONTH	FREQ.	Chro- mium (Cr ⁺⁶)	PHOSPHATES Ortho (PO ₄)	Poly (PO ₄)	Fluo- ride (F)	CHLORINE RESID. (C1) (Break-Point)	Chem. O. D. (C.O.D.)
		1W	1W	1W	1D	Total 8D	(Free) 8D
Jan.		.000	.10	.86	.92	1.66	1.47
Feb.		.000	.09	.82	.93	1.66	1.45
Mar.		.000	.10	.95	1.09	1.58	1.40
April		.000	.08	.77	1.07	1.51	1.32
May		.000	.11	.83	1.06	1.38	1.18
June		.000	.12	.71	1.05	1.31	1.12
July		.000	.18	.74	.89	1.36	1.16
Aug.		.000	.29	.63	.87	1.36	1.15
Sept.		.000	.24	.88	.98	1.54	1.33
Oct.		.000	.23	.69	.89	1.49	1.27
Nov.		.000	.15	.67	.84	1.61	1.41
Dec.		.000	.12	.26	.85	1.60	1.40
Avg.		.000	.15	.73	.95	1.50	1.31
Max. Mo.		.000	.29	.95	1.09	1.66	1.47
Min. Mo.		.000	.08	.26	.84	1.31	1.12

MONTH	FREQ.	DISSOLVED OXYGEN PPM (D.O.)	Sat'n. Per Cent	NITROGEN NH ₃ (N)	NO ₂ (N)	NO ₃ (N)	Deter- Gents (ABS)	β-Radio- Activity (pc/L)
		1W	1W	1W	1W	1W	WC	WC
Jan.		13.1	99	.00	.000	.63	.09	3.6
Feb.		12.9	99	.00	.000	.82	.10	3.5
Mar.		11.9	97	.00	.000	.61	.07	3.5
April		10.4	98	.00	.000	.67	.06	3.0
May		8.8	90	.00	.000	.60	.07	3.7
June		8.0	89	.00	.000	.52	.05	3.2
July		6.2	74	.00	.000	.61	.07	2.9
Aug.		6.1	74	.00	.000	.82	.07	2.6
Sept.		6.3	74	.00	.000	.94	.08	3.2
Oct.		7.3	80	.01	.000	1.14	.09	3.8
Nov.		9.8	89	.00	.000	.81	.11	3.4
Dec.		12.4	99	.00	.000	.59	.09	3.2
Avg.		9.4	89	.00	.000	.73	.08	3.2
Max. Mo.		13.1	99	.01	.000	1.14	.11	3.8
Min. Mo.		6.1	74	.00	.000	.52	.05	2.6

NOTES: FREQ. =frequency of analyses. Individual or grab samples: (8D) eight per day, (1D) one per day, (1W or 3W) one or three per week. COMPOSITE OF daily (6:00 A.M.) grab samples: (WC) one on weekly composite. Radioactivity equals gross beta activity in picocuries per liter.

COLIFORM ORGANISMS IN WATER TREATMENT PLANT EFFLUENTS AND IN THE DISTRIBUTION SYSTEM—1968

Table V

<i>MONTH</i>	<i>*Number of Std. Samples</i>	<i>No. 10 ml. Portions Tested</i>	<i>10 ml. Portions Positive No. %</i>	<i>Samples with 3 or more Portions Positive No. %</i>
EFFLUENTS—DELAWARE AND SCHUYLKILL TREATMENT PLANTS				
January.....	591	2955	1 0.03	0 0.00
February.....	545	2725	2 0.07	0 0.00
March.....	548	2920	0 0.00	0 0.00
April.....	568	2840	3 0.11	1 0.18
May.....	586	2930	1 0.03	0 0.00
June.....	537	2685	0 0.00	0 0.00
July.....	540	2700	1 0.04	0 0.00
August.....	582	2910	4 0.14	1 0.17
September.....	564	2820	0 0.00	0 0.00
October.....	585	2925	8 0.27	1 0.17
November.....	563	2815	5 0.18	1 0.18
December.....	577	2885	2 0.07	0 0.00
TOTAL.....	6822	34110	27 	4
Percent.....			 0.08	 0.06
Max. Mo.....	591	2955	8 0.27	1 0.18
Min. Mo.....	537	2685	0 0.00	0 0.00

DISTRIBUTION SYSTEM—DELAWARE AND SCHUYLKILL				
January.....	950	4750	5 0.11	1 0.11
February.....	829	4125	0 0.00	0 0.00
March.....	919	4595	10 0.22	1 0.11
April.....	880	4400	8 0.18	1 0.12
May.....	963	4815	6 0.12	1 0.10
June.....	824	4120	13 0.32	2 0.24
July.....	913	4565	32 0.70	8 0.88
August.....	931	4655	35 0.75	6 0.64
September.....	872	4360	12 0.28	2 0.23
October.....	990	4950	20 0.40	3 0.30
November.....	778	3890	0 0.00	0 0.00
December.....	867	4335	0 0.00	0 0.00
TOTAL.....	10716	53580	141 	25
Percent.....			 0.26	 0.23
Max. Mo.....	990	4950	35 0.75	8 0.88
Min. Mo.....	778	3890	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—1959-1968

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.
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
1968.....	0.11	0.00	0.22	0.18	0.12	0.32	0.70	0.75	0.28	0.40	0.00	0.00	0.26	0.75	0.00
10 YEAR PERIOD — 1959-1968 INCLUSIVE															
Aver.....	0.10	0.06	0.13	0.10	0.15	0.47	0.98	0.70	0.54	0.32	0.20	0.15	0.33	.....	.....
Max.....	0.41	0.22	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—1959-1968

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.
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
1968.....	0.11	0.00	0.11	0.12	0.10	0.24	0.88	0.64	0.23	0.30	0.00	0.00	0.23	0.88	0.00

18

10 YEAR PERIOD—1958-1967 INCLUSIVE

Aver.....	0.05	0.01	0.09	0.07	0.11	0.32	0.92	0.50	0.37	0.24	0.18	0.10	0.25	.....	.....
Max.....	0.34	0.13	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	0.21	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—1968			QUEEN LANE—1968			TORRESDALE—1968			ALL PLANTS ANNUAL 1968		
	Mo. Avg.	Daily Max.	Min.	Mo. Avg.	Daily Max.	Min.	Mo. Avg.	Daily Max.	Min.	Mo. Avg.	Daily Max.	Min.
January.....	35	41	32	34	43	32	37	42	32	35	43	32
February.....	38	42	33	39	42	34	38	47	32	38	47	32
March.....	45	50	40	44	54	40	41	48	32	43	54	32
April.....	62	65	51	58	64	54	54	59	47	58	65	47
May.....	68	71	62	60	68	50	62	65	59	63	71	50
June.....	74	80	63	71	76	59	68	72	62	71	80	59
July.....	82	85	78	78	86	72	74	82	71	78	86	71
August.....	82	85	78	80	86	75	80	81	79	81	86	75
September.....	77	81	74	74	78	71	75	80	73	75	81	71
October.....	69	79	59	64	74	55	69	74	64	67	79	55
November.....	55	64	49	50	54	42	56	62	51	54	64	42
December.....	41	53	35	42	52	32	45	52	37	43	53	32
Annual.....	61	85	32	58	86	32	58	82	32	59	86	32

10 YEAR PERIOD AVERAGES (1959-1968)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Avg.	Daily Max.	Min.
1959.....	37	38	43	56	68	76	79	80	76	67	51	41	59	86	32
1960.....	38	39	39	56	66	75	79	79	72	62	55	40	58	83	32
1961.....	37	37	44	51	63	74	79	80	79	67	57	44	59	85	32
1962.....	40	40	44	54	67	76	78	80	74	66	51	41	59	82	32
1963.....	35	35	43	57	67	75	81	79	71	66	55	40	59	86	32
1964.....	37	38	45	53	67	75	82	79	75	65	56	45	60	85	32
1965.....	40	39	45	54	70	75	79	79	75	64	53	45	60	86	32
1966.....	39	38	47	53	62	74	82	80	73	62	55	44	59	88	32
1967.....	40	39	41	54	59	76	79	78	72	65	50	42	58	87	32
1968.....	35	38	43	58	63	71	78	81	75	67	54	43	59	86	32
Avg.....	38	38	43	55	65	75	80	80	74	65	54	43	59	.....	.....
Max.....	40	40	47	58	70	76	82	81	79	67	57	45	*82	88	.....
Min.....	35	35	39	51	59	71	78	78	71	62	50	40	*35	.....	32

*Equals 10-year maximum and minimum monthly average.

TOTAL PRECIPITATION AT
PHILADELPHIA INTERNATIONAL AIRPORT ‡

Table VIII

Precipitation in Inches

MONTH	*NORMAL VALUES AND AVERAGES			RECORD VALUES 1941-1968				TOTAL PRECIPITATION	
	1872	1931	1951	Maximum		Minimum		1968	1967
	1968	1960	1968	Pptn.	Yr.	Pptn.	Yr.		
Jan.....	3.21	3.32	2.72	6.06	1949	0.45	1955	2.90	1.67
Feb.....	3.11	2.80	2.64	4.64	1958	1.37	1954	1.40	1.82
Mar.....	3.52	3.80	3.39	6.27	1953	0.68	1966	4.98	4.53
April.....	3.26	3.40	3.05	6.58	1947	1.13	1963	1.57	2.17
May.....	3.31	3.74	2.41	7.41	1948	0.47	1964	5.17	3.49
June.....	3.52	4.05	3.27	7.40	1962	0.11	1949	5.89	4.12
July.....	4.09	4.16	4.29	7.48	1959	0.64	1957	2.00	7.11
Aug.....	4.54	4.63	3.48	9.70	1955	0.49	1964	1.24	7.08
Sept.....	3.37	3.46	3.93	8.78	1960	0.44	1968	0.44	2.96
Oct.....	2.78	2.78	2.31	5.21	1943	0.09	1963	3.15	2.00
Nov.....	3.06	3.40	2.97	6.67	1963	1.05	1965	4.17	1.99
Dec.....	3.13	2.94	3.31	5.88	1967	0.25	1955	2.54	5.88
Annual.....	40.90	42.48	37.77	49.06	1948	29.34	1965	35.45	44.82

TOTAL PRECIPITATION

MONTH	1966	1965	1964	1963	1962	1961	1960	1959	1958
Jan.....	2.82	2.35	3.92	2.31	2.95	3.16	3.11	2.03	3.53
Feb.....	4.30	2.18	2.83	2.19	3.51	3.13	3.44	1.60	4.64
Mar.....	0.68	3.19	1.94	3.94	3.91	5.17	1.96	3.55	4.97
April.....	4.35	2.33	5.27	1.13	3.69	4.82	2.92	2.25	4.19
May.....	2.95	1.23	0.47	1.06	1.85	3.38	3.65	0.80	3.65
June.....	0.41	2.85	0.21	2.88	7.40	2.95	0.71	5.28	5.13
July.....	2.35	3.22	3.83	3.13	2.30	5.96	5.52	7.48	5.98
Aug.....	1.63	4.06	0.49	3.35	6.58	3.42	3.19	3.73	6.20
Sept.....	8.70	3.02	2.42	6.44	2.77	2.41	8.78	1.33	2.55
Oct.....	5.12	2.02	1.73	0.09	0.95	1.83	2.79	3.41	3.65
Nov.....	2.36	1.05	1.64	6.67	4.60	2.04	1.92	3.29	2.05
Dec.....	4.33	1.85	5.13	1.76	2.11	2.78	3.16	3.62	1.13
Annual.....	40.00	29.34	29.88	34.95	42.62	41.05	41.15	38.37	47.87

NOTE: ‡WEATHER BUREAU DATA—U.S. Weather Bureau, International Airport, Philadelphia, Pa.
*Normal Values: 1872-1968 = Record mean values unadjusted
1931-1960 = Climatological standard normals
1959-1968 = 10 year averages

COMPARATIVE HARDNESSES OF FINISHED WATER 1959-1968

Table IX

SCHUYLKILL WATER

YEAR	PARTS PER MILLION			GRAINS PER GALLONS		
	Yearly Avg.	Monthly Avg.		Yearly Avg.	Monthly Avg.	
		Max.	Min.		Max.	Min.
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
1968.....	163	236	113	9.5	13.8	6.6
10 Yr. Avg...	156	278	89	9.1	16.3	5.2

DELAWARE WATER

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
1062.....	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
1968.....	99	113	86	5.8	6.6	5.0
10 Yr. Avg...	93	120	49	5.4	7.0	2.9

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.