

BOROUGH OF MANHATTAN

Pumping Stations connected with the Croton High Service

Station	Location	Source of Supply	Delivery of Water	Average daily pumpage in 1899 (U.S. GALS.)	Maker of Engine	Date of Installation	Description of Engine	Rated Capacity (U.S. GALS. & 24 HRS.)	Dimensions of Steam & Water Ends (INCHES)	Diameter of pump rod (INCHES)	Theoretical displacement (U.S. GALS.)	Loss of action allowed (PER CENT)	Assumed efficient displacement (U.S. GALS.)	Elevation of center of pump (FEET ABOVE TIDE)	Average suction head used in center of pump (FEET)	Total dynamic lift (FEET)	Average elevation of water as supplied from (FEET ABOVE TIDE)	Elevation of ground at Station (FEET ABOVE TIDE)
High Bridge	West end of High Bridge West 174 th Street	old Aqueduct at West end of High Bridge	to High Bridge Reservoir 215 feet above tide	Reserve pump - 542,400	DeLamater	1875	Vertical, direct acting, crank and fly wheel, bucket and plunger pump, condensing	5,000,000	32" x 72" x 32" x 72"	3 1/2	850.8	5	238.14	100.5	17.5 (head)			
					Worthington	1883	High duty, double compound, duplex, condensing. (Two months in operation)	6,000,000	19 1/2 x 36" x 24 x 36"	3 1/2	279.0	5	265.06	128.	10. "	97.	118.	125
					Worthington	1880	Double compound, condensing, duplex	7,500,000	27" x 36" x 26" x 48"	3 1/2	437.36	7 1/2	404.50	88.	17. (head)			
West 98 th Street	West of Columbus Ave	Central Park Reservoir	into Main High service, overflowing into High Bridge Reservoir	20,802,000	"	1891	High duty, double compound " condensing	10,000,000	18" x 36" x 26" x 36"	3 1/2	327.58	5	311.14	"	"	100 ft 110.	105	85
					"	"	"	"	"	"	"	"	"	"	"	"	"	"
West 179 th Street	Between Amsterdam Ave and Harlem River	new Croton Aqueduct at West end of Harlem River	into Main High service, overflowing into High Bridge Reservoir	18,648,000	Blake	1897	Three throw triple expansion, crank and fly wheel, double acting pumps, condensing.	10,000,000	15" x 27" x 42" x 17 1/2" x 40"	5 1/2	237.54	2 1/2	231.60	94.	27	93.	122	108
			into Upper High service, connecting with High Bridge Tower 321 feet above tide	3,960,000	"	"	"	4,000,000	15" x 27" x 42" x 11 1/4" x 40"	3 1/2	106.92	"	104.25	"	"	200.		
					"	"	"	"	"	"	"	"	"	"	"	"		

BOROUGH OF QUEENS

Pumping Stations connected with the City's Waterworks

Station	Location	Source of Supply	Delivery of Water	Average daily pumpage in 1899 (G.S. GALS.)	Maker of Engine	Date of Installation	Description of Engine	Rated Capacity (U.S. GALS. & 24 HRS.)	Dimensions of Steam & Water Ends (INCHES)	Diameter of pump rod (INCHES)	Theoretical displacement (U.S. GALS.)	Loss of action allowed (PER CENT)	Assumed efficient displacement (U.S. GALS.)	Vacuum on suction (FEET)	Pressure of delivery (FEET)	Service head (FEET ABOVE TIDE)	Elevation of Water in pump well or test well (FEET ABOVE TIDE)	Elevation of ground at Station (FEET ABOVE TIDE)
Long Island City No. 1	Van Dam St. L.I. City	7-6" wells, 18' deep, 1 pump well, 5 1/2" dia, 30' deep, pumpers alternately	Direct service	Reserve pump - 602,800	Holly	1875	Quadruplex, inclined, crank and fly wheel, non-compound, condensing	3,000,000	16" x 9" x 27"	2 1/2	57.2	10	47.2	10	115.	130.	Average of pump well - 6	18
Long Island City No. 2	Cabot St. L.I. City	28-6" wells, 45' deep, 1 pump well, 18" dia, 22' deep	Direct service	803,000	Gurley & Garrison	1886	Direct acting, double compound, horizontal, duplex, condensing	2,500,000	16" x 20" x 16" x 20"	2 1/2	68.8	10	68.1	20	170	184	No data	14
Long Island City No. 3	Grove St. L.I. City	12-6" wells, 44' deep	Direct service	621,800	Snow	1894	Direct acting, double compound, horizontal, duplex, condensing	1,000,000	14" x 20 1/2" x 14" x 18"	2 1/2	37.2	10	30.4	28.	110.	157	32	42
Flushing	Broadway Bayside	21-3 1/2" x 6" wells, 40' deep, and 50' deep	Direct service overflowing into standpipes 218 above M.H.T.	980,000	Holly	1874	Quadruplex, inclined, crank and fly wheel, non-compound, condensing	1,500,000	12" x 7 1/2" x 28"	1 1/2	32.7	10	32.4	16	182	175	No data	8
					Blake	1888	Direct acting, double compound, horizontal, duplex, condensing	2,000,000	14" x 24 1/2" x 14" x 18"	2 1/2	47.2		42.5	11.	167	219	No data	8
College Point	Fresh Meadow Rd. Flushing	Reservoir fed by Springs	Direct service overflowing into standpipes 188.5 above M.H.T.	622,700	Worthington	1874	Direct acting, cross compound, horizontal, duplex, condensing	1,200,000	17 1/4" x 34 1/2" x 13 1/4" x 24"	2 1/2	58.6	10	58.0	8	163.	188	20	25
					Snow	1899	Crank and fly wheel, cross compound, horizontal, duplex, "	2,000,000	15" x 30" x 9 1/2" x 18"	2 1/2	80.4		18.35					
Whitestone No. 1	Lawrence Ave. Whitestone	17-4 1/2" x 6" wells, 55' to 75' deep	Direct service overflowing into standpipes	181,000	Worthington	1892	Direct acting, double compound, horizontal, duplex, condensing	1,000,000	12" x 20" x 10" x 10"	2 1/2	73.3	10	11.95	72	184.	182	No data	16
Whitestone No. 2	31 st St. Whitestone	5-3 1/2" x 4" wells, 60' deep	Direct service overflowing into standpipes	Reserve Station	Worthington	1888	Direct acting, double compound, horizontal, duplex, condensing	900,000	12" x 18" x 10" x 10"	2 1/2	73.3	10	11.95	72	181	182		

Pumping Stations connected with Waterworks of Private Companies

Company	Location of Station	Source of Supply	Delivery of Water	Average daily pumpage in 1899 (G.S. GALS.)	Maker of Engine	Date of Installation	Description of Engine	Rated Capacity (U.S. GALS. & 24 HRS.)	Dimensions of Steam & Water Ends (INCHES)	Diameter of pump rod (INCHES)	Theoretical displacement (U.S. GALS.)	Loss of action allowed (PER CENT)	Assumed efficient displacement (U.S. GALS.)	Vacuum on suction (FEET)	Pressure of discharge (FEET)	Service head (FEET ABOVE TIDE)	Elevation of Water in pump well or test well (FEET ABOVE TIDE)	Elevation of ground at Station (FEET ABOVE TIDE)		
Citizens Water Supply Co.	No. 1, 82 Claremont Ave. Elmhurst	28-8" wells, 45' to 62' deep	Direct service	608,000	Worthington	1894	Direct acting, double compound, horizontal, duplex, condensing	3,000,000	12" x 18 1/2" x 8 1/2" x 10"	2 1/2	9.5	10	8.6	23	208.	227	No data	19.		
					"	1895	"	"	"	"	"	"	"	"	"				"	"
					"	1896	"	"	"	"	"	"	"	"	"				"	"
Citizens Water Supply Co.	No. 2, Jackson Ave. & 12 th St. Woodside	78-4 1/2" wells, 45' to 80' deep	Direct service	1,510,000	Worthington	1897	Direct acting, triple compound, horizontal, duplex, condensing	2,000,000	10" x 16" x 25" x 13 1/2" x 18"	2 1/2	40.6	10	36.5	21	185.	206	"	21.		
"	"	"	"	"	"	"	"	"	"	"	40.6	"	"	"	"	"	"	"		
Citizens Water Supply Co.	No. 3, Union Ave. near 74 th Street	31-6" wells, 45' to 90' deep	Direct service	2,067,700	Worthington	1899	Direct acting, triple compound, horizontal, duplex, condensing	4,000,000	9 1/2" x 15" x 25" x 11" x 48"	2 1/2	76.9	10	69.2	32	238.	247	"	9.		
Jamaica Water Supply Co.	Corline & Campbell Sts. Jamaica	7-10" } wells, 50' to 80' deep, 6-6" } "	Direct service overflowing into standpipes 175 above M.H.T.	1,500,000	Deane	1898	Direct acting, double compound, horizontal, duplex, condensing	2,750,000	12" x 24" x 14" x 18"	2 1/2	47.0	10	42.3	12.	150	175		51.		
					Smider-Hughes	1900	"	4,000,000	20" x 36" x 18" x 36"	3	156.4		140.9							
Woodhaven Water Supply Co.	Throal St. Woodhaven	10-4 1/2" } wells, 80' to 110' deep, 6-6" } "	Direct service overflowing into standpipes 165 above M.H.T.	548,000	Worthington	1896	Direct acting, non-compound, horizontal, duplex, condensing	1,500,000	20" x 12" x 10"	2 1/2	19.8	10	17.3	19.	104.	125.	20	50.		
					Knowles	1890	"	"	"	"	"	"	"	"	"				"	"
Montauk Water Company	Danion Station, Van Wyck Ave. Jamaica	17-10" wells, 30' to 50' deep	Direct service overflowing into standpipes at Glen Dale 175 above M.H.T.	1,800,000	Worthington	1894	Direct acting, triple compound, horizontal, duplex, condensing	2,000,000	9 1/4" x 22" x 12" x 18"	2 1/2	34.5	10	31.1	28	170.	175	No data	40.		
					"	"	"	"	"	"	"	"	"	"	"				"	"
Queens County Water Co.	Valley Stream, or Cedarhurst Nassau County	18-3 1/2" x 6" wells, 145' to 180' deep, 4 1/2" x 3" } 30' to 50' } pumpers take filter beds	Direct service & standpipes	1,000,000	Worthington	1899	Direct acting, triple compound, horizontal, duplex, condensing, pumping from filter beds into distributing pipes.	4,000,000	13" x 21" x 34" x 18" x 24"	3	82.1	8	73.9	8	118.	118.	-7.	4.		
					"	1891	"	"	"	"	"	"	"	"	"				"	"
					"	1893	"	"	"	"	"	"	"	"	"				"	"
					"	1895	"	"	"	"	"	"	"	"	"				"	"
					Davidson	1899	"	"	"	"	"	"	"	"	"				"	"

BOROUGH OF RICHMOND

Pumping Stations connected with the City's Waterworks

Station	Location	Source of Supply	Delivery of Water	Average daily pumpage in 1899 (G.S. GALS.)	Maker of Engine	Date of Installation	Description of Engine	Rated Capacity (U.S. GALS. & 24 HRS.)	Dimensions of Steam & Water Ends (INCHES)	Diameter of pump rod (INCHES)	Theoretical displacement (U.S. GALS.)	Loss of action allowed (PER CENT)	Assumed efficient displacement (U.S. GALS.)	Vacuum on suction (FEET)	Pressure of delivery (FEET)	Service head (FEET ABOVE TIDE)	Elevation of Water in pump well or test well (FEET ABOVE TIDE)	Elevation of ground at Station (FEET ABOVE TIDE)
Tottenville	Central Ave. Tottenville	1-6" well, 60' deep, 1-8" " 85' " 1-10" " 85' " Receiving well 10' dia, 20' deep	To standpipes 140 above M.H.T.	80,000	Worthington	1897	Direct acting, double compound, horizontal, duplex, condensing	500,000	6" x 9" x 6 1/2" x 10"	1 1/2	5.5	5	5.2	2	95.	140	in tube wells 0.	40
					Blake	"	non-compound, vertical, single, non-condensing	"	10" x 4 1/2" x 24"	"	13	10	11.7	No data	No data			
					Howdells	"	"	"	10" x 6 1/2" x 25"	"	4.0	"	3.6	"	"			

Pumping Stations connected with Waterworks of Private Companies

Company	Location of Station	Source of Supply	Delivery of Water	Average daily pumpage in 1899 (G.S. GALS.)	Maker of Engine	Date of Installation	Description of Engine	Rated Capacity (U.S. GALS. & 24 HRS.)	Dimensions of Steam & Water Ends (INCHES)	Diameter of pump rod (INCHES)	Theoretical displacement (U.S. GALS.)	Loss of action allowed (PER CENT)	Assumed efficient displacement (U.S. GALS.)	Vacuum on suction (FEET)	Pressure of delivery (FEET)	Service head (FEET ABOVE TIDE)	Elevation of Water in pump well or test well (FEET ABOVE TIDE)	Elevation of ground at Station (FEET ABOVE TIDE)
Staten Island Water Supply Co.	No. 1, Columbia St. West New Brighton	156-6" wells, 180' to 225' deep, 25" dia.	Low direct service overflowing to Reservoir 215 above M.H.T.	3657,800	Holly-Gashill	1892	Direct acting, crank and fly wheel, double compound, horizontal, duplex, condensing	3,000,000	21" x 42" x 19 1/2" x 36"	4	182.	20	145.9	"	310.	215	in pump well - 12	5.
					Knowles	1882	"	2,000,000	12" x 22" x 12" x 24"	2 1/2	46		36.8					
						1881	"	1,000,000	16" x 36" x 15" x 24"	2 1/2	36.1		28.9					
Staten Island Water Supply Co.	No. 2, Ridgewood Pl. Bayside Heights	8-6" wells, 60' deep	Direct high service	739,000	Worthington	1898	Direct acting, non-compound, horizontal, duplex, non-condensing	300,000	10" x 6" x 10"	1 1/2	4.7	10	4.2	No data	231.	400.	No data	180.
					Worthington	1899	Direct acting, triple compound, horizontal, duplex, condensing, in operation since Nov. 12/1899	1,500,000	9 1/4" x 22" x 9 1/2" x 18"	2 1/2	21.3	10	19.2	14.	325.			
Staten Island Water Supply Co.	No. 3, Union Ave. New Springville	42-6" wells, 38' to 50' deep	Low direct service overflowing to Reservoir 215 above M.H.T.	77,200			"	"	"	"	"		"	"	"	215	"	5.
Capital Water Co. of Edgewater	Richmond Turnpike near head of Clove Lake	32-8" wells, 60' to 120' deep	Direct service into Reservoir 231' above M.H.T.	1,000,000	Worthington	1897	Direct acting, double compound, horizontal, duplex, condensing	1,800,000	12" x 18" x 12" x 15"	2 1/2	26.7	10	25.0	18.	18.3	251		130
					Deane	1896	"	2,000,000	12" x 22" x 14" x 18"	2 1/2	46.7		41.5					
							"	500,000	10" x 18" x 7" x 18"	2 1/2	6.9	15	5.1		335.	418		10
Capital Water Co. of Edgewater	Richmond Turnpike near Bulls Head	42-6" wells, 50' to 75' deep	Direct service and to Reservoir 231' above M.H.T.	Reserve Station	Worthington	1894	Direct acting, double compound, horizontal, duplex, condensing	1,500,000	12" x 20" x 12" x 15"	2 1/2	28.7	10	25.8	24.	245	251		10
					Deane	1895	"	1,000,000	12" x 14" x 18"	2	31.1		28.0					
South Shore Waterworks Co.	Beach Ave. New Dorp	2-8" wells, 45' deep	To standpipes 135 above M.H.T.	100,000	Worthington	1893	Direct acting, non-compound, horizontal, duplex, non-condensing	300,000	10" x 8" x 10"	1 1/2	4.7	10	4.2	10.		135		20.
						1897	"	500,000	12" x 8 1/2" x 10"	2	9.6		8.6		81			

BOROUGH OF THE BRONX

Pumping Stations connected with Waterworks of Private Companies

Company	Location of Station	Source of Supply	Delivery of Water	Average daily pumpage in 1899 (G.S. GALS.)	Maker of Engine	Date of Installation	Description of Engine	Rated Capacity (U.S. GALS. & 24 HRS.)	Dimensions of Steam & Water Ends (INCHES)	Diameter of pump rod (INCHES)	Theoretical displacement (U.S. GALS.)	Loss of action allowed (PER CENT)	Assumed efficient displacement (U.S. GALS.)	Vacuum on suction (FEET)	Pressure of delivery (FEET)	Service head (FEET ABOVE TIDE)	Elevation of Water in pump well or test well (FEET ABOVE TIDE)	Elevation of ground at Station (FEET ABOVE TIDE)
N.Y. & Westchester Water Co.	Glenhill Park, New York	Brins Aqueduct	Direct service overflowing into standpipes	1,500,000	Unknown	1892	Horizontal, cross compound, horizontal, non-condensing	1,500,000	14" x 28" x 10" x 20"	3	2.6	10	2.4	135	135	216	No data	81
N.Y. & Westchester Water Co.	3 rd Street, Pelham	16 driven wells, dia. 4 1/2" deep	Direct service	Reserve pump - 1,125,000	Blake	1891	Direct acting, duplex, non-condensing	1,000,000	14" x 10" x 12"	2 1/2	15.6	10	14.0	16	160	170		10
					Worthington	1895	"	1,500,000	12" x 18 1/2" x 11 1/2" x 12"	3	17.4		15.6					

Pumping Stations connected with Distribution Service of the Brooklyn Waterworks

Pumping Stations connected with Aqueduct Service of the Brooklyn Waterworks

Pumping Stations connected with Private Companies supplying water in Brooklyn

Company	Location of Station	Source of Supply	Delivery of Water	Average daily pumpage in 1899 (U.S. gals.)	Maker of Engine	Date of Installation	Description of Engine	Rated Capacity (U.S. gals. in 24 hrs.)	Dimensions of Steam & Water Ends (inches)	Discharge pumped (inches)	Theoretical displacement (U.S. gals.)	Loss of action allowed (PER CENT)	Assumed efficient displacement (U.S. gals.)	Average Vacuum on suction (FEET)	Average Pressure of delivery (FEET)	Average Service head (FEET ABOVE TIDE)	Elevation of Water in pump well or jet well (FEET ABOVE TIDE)	Elevation of ground at Station (FEET ABOVE TIDE)
Long Island Water Supply Co.	New Lots Road and Poughkeepsie Ave. East New York	22-2" wells 45 ft deep 14-6" " 80 ft 90" 4-6" " at bottom of open well 29 dia. x 24 deep	Direct service overflowing to Reservoir 150 feet above M.H.T.	4,330,600	Davidson	1896	Direct acting, double compound, horizontal, duplex, condensing	3,000,000	16" x 34" x 16" x 24	3	82.1	10	73.9	27	139	150.	No data	10.
					"	1883	" " " " " " " "	1,500,000	18" x 34" x 16" x 24	"	41.0	"	36.9	"	"			
					"	"	" " " " " " " "	"	"	"	"	"	"	"	"			
Flatbush Waterworks Co.	Ave E near New York Ave. Flatbush	3-5" wells 18" deep in each of 12 rows with 8 dia. x 26" deep 19-5" wells 55" deep	Direct service overflowing to standpipe 194 feet above M.H.T.	2,155,400	Worthington	1893	Direct acting, double compound, horizontal, duplex, condensing	5,000,000	19 1/4 x 33 1/2 x 21 x 24	3 3/4	141.6	10	127.4	12.	170.	180	No data	10.
					"	1885	" " " " " " " "	2,500,000	14" x 24 1/2 x 16 x 18	2 1/2	61.9	"	55.7	"	"			
					Knowles	1889	" " " " " " " "	3,000,000	16" x 24 1/2 x 14 x 18	"	47.2	"	42.5	"	"			
Blythebourne Water Co.	Eleventh Ave & 74 St. Bay Ridge Park	1 open well 5' dia. x 90" deep 1 " " 20 " x 90 "	Direct service overflowing to Tanks 160 feet above M.H.T.	200,000	Worthington	1891	Direct acting, non-compound, horizontal, duplex, non-condensing	115,000	5 1/4 x 3 1/2 x 5	2	0.7	10	0.6	10.	152	160.	5.0	88.
					"	"	" " " " " " " "	216,000	7 1/4 x 5 x 6	"	1.9	"	1.7	"	"			
					"	"	" " " " " " " "	216,000	" " " " " " " "	"	"	"	"	"	"			
German Am. Impr. Co.	Pennsylvania & Stanley Aves. Long Island City	3-6" wells 60 ft 70" deep	To stand pipe and mains	70,000	Worthington	1892	Direct acting, double compound, horizontal, duplex, condensing	500,000	8" x 12" x 7" x 10	2	6.4	10	5.8	10.	128.	90.	No data	10.