

AUGUST, 1914

Complete Reports
on
**Municipally Owned
Utility Plants**
in the
State of Ohio

Investigations Made by Members of the
Staff of the Public Service Publishing Co.

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PUBLISHED BY
PUBLIC SERVICE PUBLISHING CO.
122 SOUTH MICHIGAN AVE.,
CHICAGO, ILL.

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WATER AND ELECTRIC LIGHT PLANTS.

Norwood, O.

Norwood is a rapidly growing suburb of Cincinnati, with a population estimated at 20,000 in 1913. It owns a municipal water plant which was built in 1893 and an electric light plant which was built in 1895, both being housed in the same building and having a common steam plant.

The plant at the present time is overloaded about 30% and is giving poor service. In August, 1913, the city issued \$105,000 of bonds for the construction of improvements, but the engineer's plans are not ready yet, although practically a year has elapsed, and the bonds are drawing interest at 5% meanwhile.

When I asked the city auditor for information regarding the plant he refused to give it to me without the authorization of the mayor, saying that he had never been asked to give such information before. Apparently the people of Norwood are not very familiar with the financial condition of their public utilities. The most unenlightening report of a municipal officer I have ever seen is the published annual report of the city auditor of Norwood for the year 1913. What there is in it is so fragmentary and confused as to be of no value whatsoever, and I doubt if the most experienced accountant could piece together the information contained in that report so as to give any intelligible idea of the financial condition of the city or any of its departments.

After securing the mayor's authority to get the information I sought, the city auditor read off the receipts and expenditures of the water and light plants, in totals only, for the year 1913, at the same time volunteering the information that the expenditure account was not complete, as frequently the department of public service paid for fuel and supplies used in the water and light plants and that these expenditures were not charged up against the plants. What these expenditures amounted to in detail I was unable to ascertain. The mayor very kindly gave me all the information he had available, except the consulting engineer's report on the proposed improvements. This, although completed by the engineer, was not to be made public until it had been revised to meet the views of the board of public service, thereby preventing the public from learning any facts about the numerous shortcomings of the plant, except those the knowledge of which the board considers harmless.

During the late spring of 1914, there have been many occasions when there have been serious shortages in the water supply, and simultaneously the plant has not been able to supply enough steam to operate both the water and light plants. The result has been frequent shut-downs of the street lighting service, leaving the streets in darkness in order to get steam enough to keep the people supplied with water. The

city of Norwood has a connection with the water mains of the city of Cincinnati, so that it makes up for any shortage in its own supply by purchasing water (on a meter basis for amount used only, with no stand-by charge whatever) from Cincinnati. This purchase of water only solves part of the difficulty, however, for the pressure has to be supplied by the Norwood pumps, and frequently there is not steam enough to do this, in spite of the fact that the lighting load is naturally at its lowest during the late spring and early summer.

There are outstanding \$252,650 of waterworks bonds, as shown in Appendix "B," and \$162,000 of electric light bonds, assuming that \$75,000 of the last bond issue will be spent on light improvements and \$30,000 on water improvements, which is as near as can be estimated without the so far unobtainable consulting engineer's report. There are also outstanding \$45,923.64 of debt extension bonds, all or nearly all of which are said to have been issued to take care of operating deficits in connection with the water and electric plants. Of course, neither the water nor electric plant is worth anything like the amount out against it. The reproduction value of the present electric light plant is probably in the neighborhood of \$50,000 to \$60,000, while a waterworks to serve the city of Norwood as efficiently as the present plant would certainly not cost over \$125,000. The outstanding indebtedness does not represent the total sums issued against these plants. The first serial number of the outstanding water issues is Series 2, and the first outstanding series of debt extension bonds is Series 5. There is one electric light issue without series number preceding the electric light series 2 issue, but whether there was a series 1 issue could not be learned. The city auditor was unwilling to give me the amounts of issues already paid, on the ground that they were out of the way and nobody bothered about them any more.

The plant equipment is as follows:

- Station building with brick chimney.
- Two Tudor boilers installed in 1901-1902, 250 hp. each.
- Two McIlvane & Spiegel boilers, 125 hp. each, installed 1905.
- Auxiliary boiler equipment, installed 1905.
- Two 150-hp. Skinner engines, installed 1906, direct connected to
- Two Triumph 100-kw. 250-volt D. C. generators.
- One 250-hp. Houston Stenwood Gamble engine, installed 1894, direct connected to
- One Siemens & Halske 135-kw. D. C. generator, installed 1894.
- One 300-hp. Miller gas engine, installed 1910, direct to
- One 175-kw. Allis-Chalmers D. C. generator, installed 1910.
- One Westinghouse motor-generator set, 30 kw., installed 1910.
- One 3,000,000-gallon pump, installed 1908.
- One 1,000,000-gallon pump, out of service, installed 1894.
- One 500,000-gallon pump, out of service, installed 1900(?).
- Eight 10-inch wells; three out of service.
- Two 14-inch wells, installed from time to time.
- Two intake wells.
- One air compressor.
- One water tower, 333,000 gallons capacity, installed 1894.
- One 11-panel switchboard, installed from time to time since 1906.
- Electric distribution system, estimated 40 miles.
- 375 A B arc lamps, 6.6 amp.

Water distribution system, estimated 35 miles.
Fire plugs, number unknown (out of jurisdiction of water dept.).

As will be noted from the table of equipment, the plant is entirely D. C. at 250 volts. The voltage at the ends of the lines is of course much lower, and there are constant fluctuations in voltage which have a very deleterious effect on the life of lamps. A purchaser of lamps to be used on this system is in a very unfortunate position. He must either get lamps of sufficiently high voltage to protect himself against the fluctuations in the voltage, and suffer from serious losses in illuminating value, or he must get low voltage lamps in order to keep his illumination up to standard and have his lamps frequently burned out by the periods of high voltage which are of nearly daily occurrence.

In the fall of 1913 there was a severe fire across the street from the plant and the roof of the generator room was burned, falling in on the apparatus, which, while it did not suffer greatly from the fire, was badly water-soaked, and resulted in a shutdown of the plant for about a week. The repairs, I am told, were not made out of the earnings of the plant, but were charged up against the general funds of the city. I could not verify this, however, on account of the unwillingness of the city auditor to go into detail regarding the financial operations of the plant.

This plant has been in operation between 18 and 19 years. Of the original equipment there remains the old Siemens & Halske unit and its engine. Everything else is new. The boilers have been thrown out, and new boilers installed after eight years' use. The pole line was rebuilt, partly in 1905 and partly in 1910, and it will, according to the verbal statement by a member of the consulting engineer's staff, have to be entirely rebuilt during the next year. "We expect to be able to use some of the present copper," he said, "but the rest will have to be new. We can use very few of the present poles."

The plan of the consulting engineer is to install an A. C. circuit and eventually, when the city has the money to spend, make the entire system A. C. This depends, of course, on what the board of public service is willing to do, but a prominent city official told me that it was the plan to use the money already voted to begin to put the plant in shape, and then, in about a year, to go before the people for a bond issue to complete the improvements as planned by the consulting engineer. Not only did the members of the consulting engineer's staff state that the present issue of \$105,000 would not be sufficient to put the plant into proper shape, but the majority of the city officials with whom I talked admitted the same thing. It is apparently the idea to get the work started with the available sum and then, after this is spent, call for more on the ground that the money already spent will be wasted if the people do not vote to spend more. This is a frequent practice of the sponsors for municipal lighting plants, and is almost universally successful, for after the people have put their money into a plant to the extent of a hundred thousand dollars or more they will spend another \$50,000 or so rather than see their initial investment become useless, and the public, without unbiased technical information, is in no

position to know whether it is sending good money after bad or not. The people of Norwood have apparently failed to connect their constantly advancing tax bills with the operations of the municipal light and water plant.

The income of the plants for 1913 was, according to the city auditor, as follows:

Water	\$37,420.24
Light	29,286.93

This includes revenue from all sources, such as meter testing, which comes to \$300 or \$400 a year, sale of junk and miscellaneous receipts. It also includes receipts for running services and deposits for securing payments of bills. Unfortunately these items could not be segregated.

The operating expenses, as reported by the city auditor, and stated by him to be incomplete on account of payments charged to the board of public service, were as follows:

Water	\$39,747.39
Light	34,523.75

These figures show deficits in both cases, the water deficit being \$2,327.15 and the electric deficit being \$5,236.82. In neither case is credit given for public service, nor are any fixed charges whatever included.

Taking the city auditor's figures as the most nearly correct figures available, and allowing \$50 a year each for the street lights, which are supposed to burn on the same schedule as the Cincinnati street lights but which do not, the total cost of operating and maintaining the electric plant in 1913 was as follows:

Auditor's operating expense	\$34,523.75
Electric bond interest	5,515.00
Sinking fund on outstanding electric bonds	12,042.33
Depreciation (10% of \$60,000)	6,000.00
½ interest on debt extension bonds	932.86
½ sinking fund debt extension bonds	1,149.75
Lost taxes @ \$1.41 on \$60,000	846.00
	<hr/>
	\$61,009.69

The revenue should be as follows:

Auditor's revenue account	\$29,286.93
Street lights (375 @ \$50)	18,750.00
	<hr/>
Deficit	\$12,972.76

It must be borne in mind that this deficit was accumulated while the city was getting electric service of a quality that would not have been tolerated for a day from a private company in a city the size of Norwood. The extra cost of lamp renewals due to the fluctuations in voltage can be figured at a cent per kilowatt hour at the very least. Some lamps were put in at the generating station a few days prior to my examination of the property, and they were burned out in a few hours. The modern high efficiency lamp will not stand up under such conditions of non-regulation of voltage as exist in Norwood. If a customer cannot afford lamp renewals at this rate he must use carbon

lamps and pay three times as much per candlepower as is paid by his neighbors in nearby towns and cities where the voltage regulation is within reasonable limits. Therefore, while the deficit in cash on the year's operation shows a true advance in rates of only two cents to cover the cost of operation, this tells only part of the story. Add another cent for excessive lamp renewals, and still another sum for deficient candlepower, and we find that the customer is actually paying more for the light he gets than the average patron of a private company, and is getting only inferior service for his money. There are only 1,500 light customers in Norwood, 25% less than the average in similar cities.

The rates now in force in Norwood for electricity are as follows:

Minimum charge for electricity per month	50c
Monthly meter rent	10c
	60c
Minimum bill	60c
Electricity, for lighting only	6c per kw. h.
Electricity, for power from light meter	6c per kw. h.
Electricity, for power from special meter.....	4c per kw. h.
Penalty for non-payment in 10 days	10%

In the water department conditions are not so good. The rates are high, the supply is deficient and the deficit is large. The customer must buy his own water meter and pay for any repairs it may require. He must pay \$10 for running his service connection. He must pay 75 cents per thousand cubic feet for water, with a minimum bill of 25 cents per month. He suffers a 10% penalty if his bill is not paid within 10 days.

The city auditor reports the expenditures of the water department at \$39,747.39. Adding the fixed charges, the actual cost of operation and maintenance for 1913 was, as nearly as can be ascertained, as follows:

Auditor's operating expense	\$39,747.39
Interest W. W. bonds	11,626.75
Sinking fund W. W. bonds	12,007.16
Depreciation @ 5% of \$125,000	6,250.00
½ debt extension bond interest	932.86
½ debt extension bond sinking fund	1,149.75
Lost taxes @ \$1.41 on \$125,000	1,762.50
	\$73,476.41
Total	

The water department is not entitled to any earnings on account of fire protection, as the expense of placing and maintaining fire plugs is borne by the department of public safety; and such investment as the water department has made on account of fire protection may be considered as offset by the sums the people have paid from taxes in retiring the first series of bonds against the waterworks. As the revenue from all other sources was \$37,420.24, the deficit for the year 1913 was at least \$36,056.17, or, when the unknown expenses are considered, at least 100% of the total revenue from all sources, making the proper

charge for water not less than \$1.40 per 1,000 cubic feet instead of the 75 cents now charged.

June 23, 1914.

APPENDIX "A"—NORWOOD.

BONDS OUTSTANDING ON ACCOUNT OF WATER AND ELECTRIC PLANTS.

Amount.	Date of Issue.	Maturity.	Title.	Interest.
\$ 22,500.00	July, 1893	1922	Waterworks, Series 2.....	5½
25,000.00	Sept., 1893	1923	Waterworks, Series 3.....	5½
15,000.00	Oct., 1894	1914	Waterworks, Series 4.....	5
15,000.00	Mar., 1895	1915	Waterworks, Series 5.....	4½
13,000.00	Oct., 1895	1926	Electric light	5
5,000.00	Mar., 1897	1917	Waterworks	5
5,000.00	Sept., 1897	1917	Waterworks	5
15,000.00	Apr., 1900	1930	Waterworks extension	4
22,388.32	Apr., 1901	1921	Debt extension, Series 5.....	4
17,818.24	Oct., 1901	1926	Debt extension, Series 6.....	4
20,000.00	Nov., 1901	1916	Electric light enlarging.....	4
20,000.00	May, 1902	1922	Electric light, Series 2.....	4
10,000.00	Apr., 1903	1928	Electric light, Series 3.....	4
6,500.00	Mar., 1904	1924	Waterworks	4½
3,650.00	July, 1904	1914	Debt extension	4½
6,000.00	May, 1904	1929	Electric light extension	4½
2,700.00	Dec., 1904	1924	Waterworks	4½
4,500.00	Dec., 1904	1924	Waterworks	4½
4,250.00	May, 1905	1925	Waterworks	4½
1,500.00	Aug., 1905	1925	Waterworks extension	4½
2,067.08	Aug., 1905	1925	Debt extension	4½
25,000.00	June, 1906	1931	Waterworks	4
5,200.00	Nov., 1906	1931	Waterworks	4½
6,500.00	July, 1907	1932	Waterworks	4
34,000.00	July, 1907	1937	Waterworks, real estate	4
5,000.00	Dec., 1908	1933	Water main extension	4½
18,000.00	Apr., 1910	1930	Electric light plant	4
2,500.00	Apr., 1910	1935	Water main extension	4
15,500.00	Apr., 1910	1930	Waterworks plant	4
3,000.00	Oct., 1910	1930	Water main extension	4½
4,000.00	July, 1912	1932	Water main extension	4½
105,000.00	Aug., 1913	1923	W. W. and electric light extension.	5
Total outstanding against water				\$252,650.00
Total outstanding against electric				162,000.00
Total debt extension bonds				45,923.64

(Note.—In the above summary it is estimated that \$75,000 of the Aug., 1913, issue will be spent on light and \$30,000 on water.)