

A NEW "PHILADELPHIA STORY"

Or, How a Systematic Water Waste Survey in Progress Has Already Saved Philadelphia a Needed 13,000,000 Gallons Daily to Meet Defense Demands

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DURING the recent depression Philadelphia found herself, in common with most other municipalities, in straitened financial circumstances. Demands upon the water works system instead of increasing began to decrease and the need for making additions to the system ceased to exist. But with this contraction in use there was also a decrease in revenue and many improvements, and even items of maintenance had to be deferred. At length, in 1939, a committee of experts was appointed to investigate the water works system for the purpose of recommending improvements necessary to bring it into first class operating condition. A bond issue of \$18,000,000 was voted to pay for these improvements and engineers from the office of Morris Knowles of Pittsburgh, Pa., were employed to supervise the expenditure of this money.

However, the design of the needed additions would in itself consume considerable time and it seemed desirable to relieve the load on the system as much and as quickly as

possible. During the years from 1926 to 1931 The Pitometer Co. had been employed to make a Pitometer Water Waste Survey of the system. The results of that survey were most gratifying. Underground leakage of about 35,000,000 gallons per day had been located and repaired. House waste of approximately 50,000,000 gallons per day had been stopped and industrial meter under-registration of approximately 4,750,000 had been corrected.

Waste Reduction First Logical Step

With a definite knowledge of the possibilities of conserving the available water supply by the elimination of the underground leakage which undoubtedly had developed since the previous survey, the city decided to again contract with The Pitometer Co. to make another Water Waste Survey of the distribution system, and arrangements were made with the WPA to furnish most of the labor in connection with the operation. To date all of West Philadelphia has been surveyed and the survey of that

section of the city lying to the south of Callowhill St. is approaching completion. An additional contract has recently been entered into covering a section of the city lying along the Delaware River northeast of the central part of the city.

How the Survey Is Conducted

The survey is conducted in the following manner:

The district which is to be tested, and which includes an average of 8 miles of distribution main, is segregated by valve operation and all but one or two feeds in this district are shut off. Recording Pitometers are installed on these feed lines through 1 in. corporation cocks and the flow into the district measured for a twenty-four hour period. Indirect measurements are then made at night to determine the distribution of the night rate of flow in small one or two block "shut-outs." Manifestly where little or no flow exists at night there can be no leakage, but where the measurements show appreciable flows after midnight in-



A cracked 12" main shooting away 455,000 g.p.d.



More Typical Exhibits
 A 6" main carrying the weight of another failed for 50,000 g.p.d.



A good trick if it only worked. A sewer manhole found resting on a 6" main cost 100,000 g.p.d.

vestigations are made to determine the cause of the high flow. The actual location of the leak is determined by the use of sound intensifying instruments in the hands of engineers who have become proficient in this particular line of work through years of experience. It is very seldom that the leak is not located within the limits of the first excavation made for its repair.

Since the inauguration in 1940 of the defense program, the demand for water upon the Philadelphia water works system began to increase and had continued to increase as more and more industries turn to the manufacture of war material. All the water saved to date, by the elimination of underground leakage, has been made available for use by the war industries without further taxing the capacity of the existing system. That the savings to date have been of considerable assistance is evident from an analysis of the findings.

The Most Important Sources of Waste

The largest single source of waste so far discovered has been leakage from the cast iron mains themselves, broken mains, split mains, and blown joints. A number from each source has been found. Up to date, 62 leaks of this kind have been located wasting a total of 4,369,000 gallons per day.

In almost every case these breaks were caused by underground conditions, such as the construction of masonry structures by other utilities in such a way that a bearing load was placed upon the cast iron main. Several examples of leaks caused by this loading of the mains are shown in illustrations accompanying this article.

Next in importance based on the average size of the individual leak, though not in total waste, is the waste from leaking abandoned services. As is to be expected, leaks on dead services will average greater losses than leaks on live services because after a leak on a live service becomes large enough to affect the pressure, the consumer complains and the leak is repaired, but an abandoned or uncompleted service can become completely severed without being discovered unless the water finds its way to the surface. So far, 127 abandoned services have been found leaking, a total of 2,273,000 gallons per day.

There have also been located a large number of leaking services in use, and it is surprising to note how much water can escape each day from a leak in an ordinary domestic service before the pressure is affected to such an extent that the customer complains. A total of 373 live services have so far been found to be leaking 2,754,000 gallons per day.

Six miscellaneous leaks not included under any of the above headings were found to be wasting 146,000 gallons per day.

Under-Registration of Large Meters an Important Item

One feature of the survey, not previously mentioned, is the testing in place of industrial meters on 4 in. and larger services. Increased revenue resulting from the repair of defective meters discovered in this manner has been considerable. A total daily under-registration of 3,060,000 gallons has been discovered to date. Not all of this has been reflected in increased sales as a very large percentage of this amount was found on the meters supplying a semi-charitable con-

sumer. As the result of these findings this consumer greatly reduced its consumption of water so that the benefit to the department was in the nature of decreased consumption rather than increased revenue.

Altogether, a total of 13,000,000 gallons per day has been saved so far. About 40 per cent of the city has been covered and it is hoped and believed that savings will continue at about the same rate as the survey is extended into other parts of the city. Some idea as to how valuable a saving of 13,000,000 gallons per day is, can be visualized when we realize that it is enough water to supply an average American city of 130,000 persons with all the domestic and industrial water normally used. In this city, about a ton and a half of coal is required to pump a million gallons of water, so that the indicated savings from this one item are about 7,000 tons, or 150 freight cars annually. Aside from the cost this is a distinct contribution to the war effort by the relief it affords our over-burdened railroads. There have been additional savings of power, chemicals, etc. While Philadelphia uses very little chlorine, when compared to most cities, it is still true that the savings of a million gallons of water per day results in the saving of approximately a ton of chlorine per year. Although the money value of the twelve or thirteen tons saved each year is not large it is a distinct contribution to the war effort as it conserves a critical material.

A By-Product of the Survey

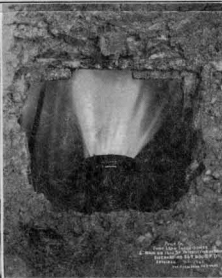
A by-product of the survey has been the location of closed and defective valves and many valves have been found in each category. The



The effect of traffic on a 6" hydrant joint—25,000 g.p.d.



Some of Our "Philadelphia Story"
 A typical service leak of which there were many—15,000 g.p.d.



This 6" main, actually in a sewer, was discharging 565,000 g.p.d.

closed valves were opened and the defective ones repaired. This has not only put us in a better shape to make shut downs for routine repairs, but has also improved our ability to quickly cut out sections where mains may at some future time be broken as the result of enemy bombing.

Although the financial savings to the city have been more than enough to justify the survey, the greatest present benefit has been the relief which it affords to our water system.

heavily loaded as it is with war demands. We realize its full value when we contemplate the effect of adding to our present demand the necessity for filtering, pumping, and distributing an additional 13,000,000 gallons of water per day. This is equivalent to the construction of a pumping station, filtration plant and transmission main of sufficient capacity to supply 13,000,000 gallons per day.

Due to the difficulty in obtaining priorities and the inability to secure

the necessary materials, the water works improvement program has of necessity been materially slowed up, and it is questionable whether or not the benefits from this program will be felt in time to assist in the present emergency. It can, therefore, be seen how essential it is to conserve every available gallon of water in the City of Philadelphia, by the elimination of all sources of waste, such as is being done by the Pitometer Water Waste Survey now in progress.

Paul Record
Those Mythical Mains

Philadelphia's City Hall repeatedly has been held up to public censure for doing nothing about the scandalous water situation.

Now we are able to report the City Hall are doing something about it.

Yes, indeed. While factories, households and all users of water are being urged to save every drop they can—

We find from the newest report of the Committee of Seventy that the City is *wasting*, not by the drop but by the million, that \$18,000,000 fund which voters approved in 1940 for rebuilding the water system.

In two and a half years since the water bond referendum, the committee reports, \$1,200,520 has been spent.

Of this, only \$742,740, or about 60 percent, has been spent for materials and supplies.

The other 40 percent, or \$457,780, has been spent—*you guessed it*—on the payroll, where 100 jobs have sprouted.

The committee consulted engineers who returned an opinion that while further tech-

Daily Times
Oct 9 1942

City's water safe despite pollution, Hewitt declares

Despite the fact that water pollution at the Dunne crib off the South Side has set a new high, Oscar E. Hewitt, commissioner of public works, gave assurance today that the water is safe for drinking.

Amounts of chlorine used for purification have been doubled on many days, Hewitt said, to guarantee that water for the 1,500,000 persons served from the crib would be safe.

During September, the bacteria coli test showed an average of 6,907 per 100 cubic centimeters, double the count for August, and far above the high of 1,424 set in September of 1941.

Mayor Kelly, who returned from Washington yesterday at a conference with Rep. A. J. Sabath on his bill to increase water diversion for Chicago, said he was confident something soon would happen on the bill, now before the rivers and harbors committee.

The hearing, however, has been delayed, he said, because the committee has been unable to get a quorum recently. That he blamed on members being absent for election campaigns.

A SINGLE BIDDER ON \$1,000,000 JOB

Metal Shortage Prevent Others From Seeking City Contract.

The city received just one bid yesterday for construction of a building for the new Torresdale pumping station, together with water piping, valves and equipment.

Kaufman Construction Company, of Philadelphia, asked \$1,068,888 for the job. Officials attributed absence of other bids to difficulty in obtaining critical metals.

The city has an A-1-a priority covering about one-fifth of the \$18,000,000 water program and an A-1-j for the rest. A-1-a is sixth from the top—AAA and AA-1 to AA-4 are ahead of it.

The pumps themselves were contracted for more than a year ago and will be ready for installation late this year or early next.

WPB AIDE TO INSPECT WATER SYSTEM HERE

The Philadelphia water system will be inspected today by Arthur E. Gorman, head of the WPB water production section, it was announced yesterday at a regional conference of the American Waterworks Association.

Gorman will be conducted on the tour by J. J. McLaughlin, chief of the Bureau of Water, who told the conference the system "is in abnormal condition imposed on it by wartime

CITY ASKS 2 BIDS FOR WATER PLANTS

New Pumping Station and Filtration Treatment Works Planned.

The city took its largest single step in the \$18,000,000 water system improvement program yesterday with a call for bids on \$3,500,000 worth of construction.

The job comprises two separate contracts. One is for the building of a new pumping station at Torresdale, expected to cost about \$1,500,000. The other is for a preliminary treatment plant at the Queen Lane filtration station, to cost around \$1,700,000.

Work to Take Year.
 Bids on the first contract will be opened September 28. Those on the second, which is being re-advertised, will be opened September 23. The contract is being re-advertised because the low bid on the first advertising recently was slightly in excess of the \$1,700,000 limit set by city engineers.

The work is expected to take a year to complete. The two projects will bring to about \$8,000,000 the sum spent or committed thus far under the \$18,000,000 program.

Delayed by Priorities.
 The program was approved by Philadelphia voters in the spring of 1940. Preparation of engineering plans consumed about a year. Recently difficulties over Government priorities for materials have been blamed by the city for the apparent tardiness of the program.

Though priorities undoubtedly are a factor now, the entire program could have been launched and completed long ago if City Council had been willing to accept Government funds for the purpose.

The Water Bureau also announced yesterday a saving of nearly 4 1/2 percent in water consumption last month as a result of the drive to conserve water for war needs.