

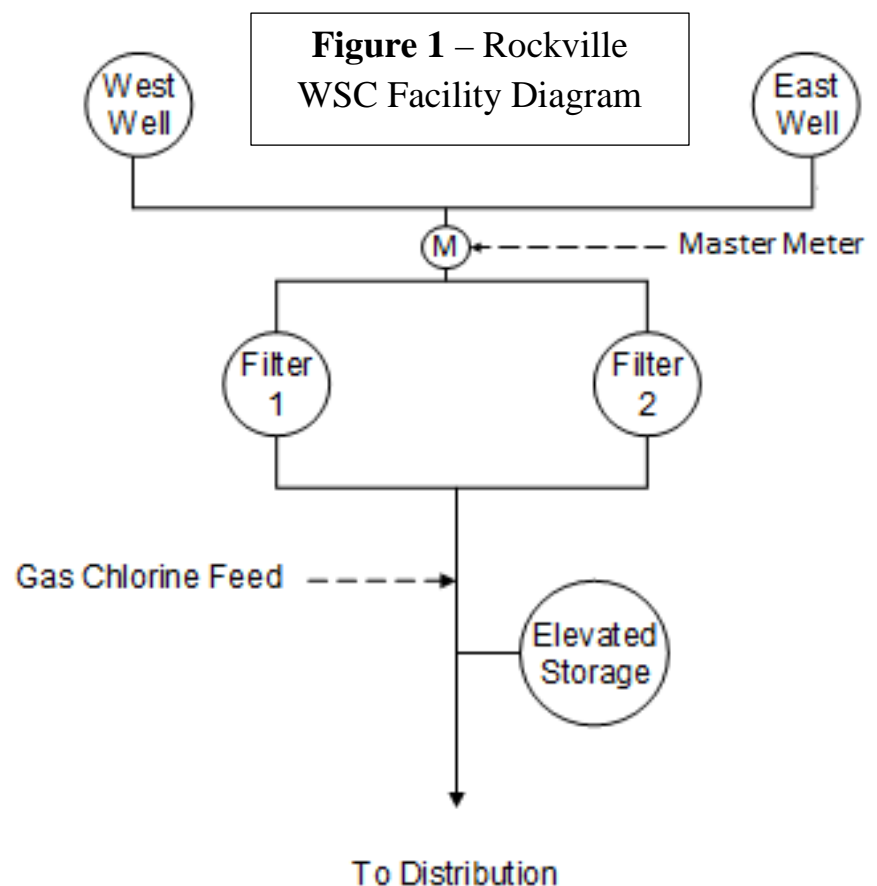
Rockville Water Supply Corporation Background Information

The town of Rockville, is served water by the Rockville Water Supply Corporation (WSC), a publically funded non-profit utility. Rockville WSC has 348 active connections in the system, serving about 1000 people. The connections are broken down in the following categories:

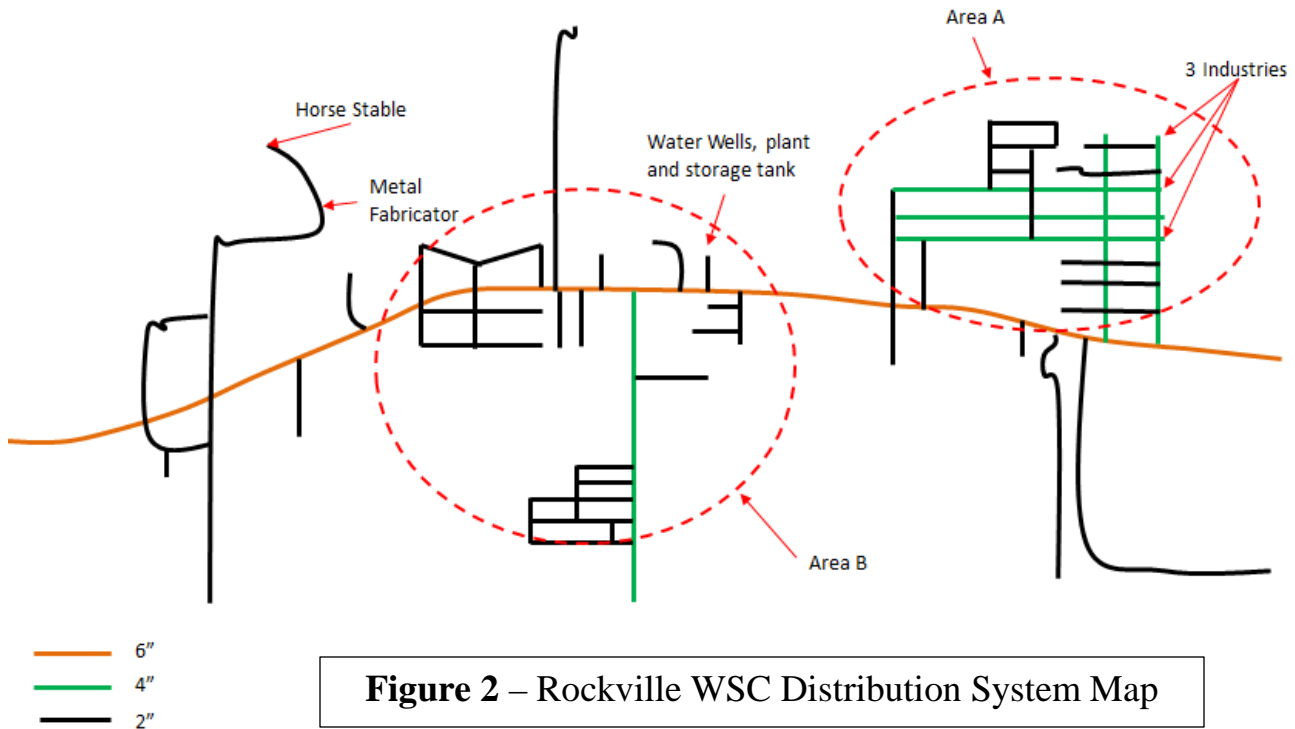
- 304 Residences
- 41 Commercial establishments
- 3 Industrial establishments

The system has two active wells (both are line shaft wells, with the motor above ground), one elevated storage tank, treatment facilities and distribution lines. Average daily production is 180,000 gallons per day and maximum production can be up to 240,000 gallons per day. The elevated storage tank holds about 100,000 gallons. The wells are wired to a control switch that stops production when the storage tank reaches an elevation of 63 feet. The operator does not remember an instance in the last 10 years when the storage tank has overflowed. The wells alternate and operate a total of about 12 hours per day on average. Flow rate for both wells is the same at about 250 gpm each.

Rockville WSC does not purchase any water from outside sources; its two wells feed to one master meter prior to greensand filters that remove iron and manganese from the water. The wells are operated one at time. Totalized water production is recorded daily on a log sheet in the water utility office (which happens to be only a few yards from both of the wells and the from the treatment facilities). The raw water meter data are summarized monthly and entered into a State GW Monthly Operating Report and the same totals are used in an annual analysis that is done for the PWS Governing Board. The layout of the water wells and related facilities is shown in Figure 1.



All connections are metered and monthly meter reading is done for all meters over a three day period in the last week of the month. The billing is done using a four tiered rate structure that provides usage data for four types of customers; Industrial, Commercial, Residential and multi-unit residential. Each month the totals for each meter are compiled for billing and the billing data are available in the office. A layout of the distribution system is shown in Figure 2 below:



Area A is a residential area, developed around the 3 large industries at the end of the town. The industries use water sporadically, when their processes call for it and all three purchase water at industrial rates. Area B is the center of town, with commercial customers, as well as single and multi-unit residences. There are also two commercial customers outside area B, a horse stable and metal fabricator.

There are 353 meters in the system, about 150 of which are in area A and 100 of which are in Area B. When the water system was built, by FmHA in 1973, it started at Area A, the Board of Directors acquired another FmHA loan in 1978 to add the area to the west of Area B and a HUD loan in 1990 to add the area to the east of area B (including Area A and the service lines to the industries, which were previously on private wells). Meters are replaced on an as-needed basis when they are damaged or when readings are considered unreliable. There has never been a recalibration of the raw water meter. All lines are PVC and the lead operator, Mike, reports that line breaks are rare, about one or two a month. Mike does not document water leaks or line repairs. All connections are metered and billed, other than

the water utility office (no meter), the fire department building (no meter) and the wastewater facility (no meter).

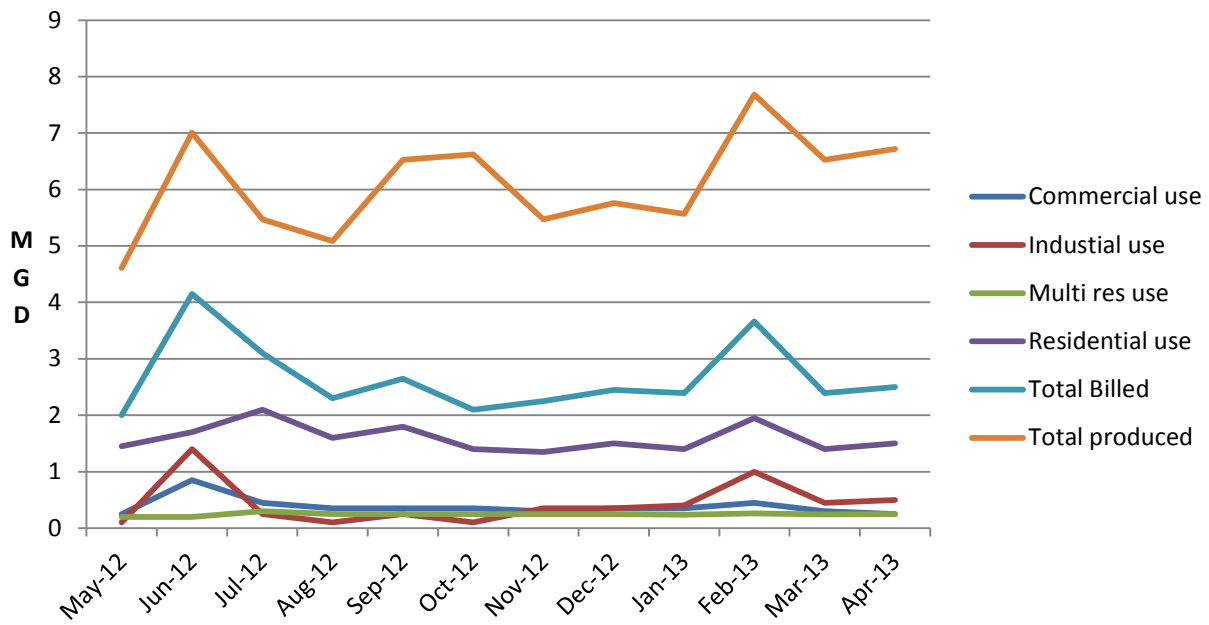
The greensand filters are backwashed about twice a week each at about 350 gpm for about 5 minutes, according to Mike. There are fire hydrants throughout the distribution system, but Mike reports that the fire department does not flush them and only uses them for firefighting. Mike flushes the fire hydrants according to a flushing program that involves him going to both ends of the system (east and west) and flushing the far ends until the water turns clear (about 10 minutes) once every 3 months. None of the flushing water is metered or billed. Neither is the firefighting water. The backwash water is not metered or billed. The Rockville Waste Water Department uses a lagoon to treat domestic waste from the town, and does not use much water but the water used by the department is not metered or billed. The Waste Water Department has a project underway in the northern end of Area A to expand their waste water collection system since January 2013 and the water used for the construction is not metered or billed. The water utility board members suspect a lot of water is being used for the project and are concerned about it.

Although Rockville is considered a low income area, there is no program to provide financial relief to low income customers. Billing adjustments are done, “off the books” and not documented. There are five board members but only one pays a monthly water bill (Two of the others are married so there would only be four connections among the board members). The Board members do not know of any water theft incidences at their water system, although there is a high rate of nonpayment of water bills. Any theft that might be occurring at inactive connections or hydrants is not tracked or detected.

Water Usage Data:

Rockville Water Usage and Production by Month (All values in MGD)						
	Commercial use	Industrial use	Multi res use	Residential use	Total Billed	Total produced
May-12	0.25	0.1	0.2	1.45	2	4.608
Jun-12	0.85	1.4	0.2	1.7	4.15	7.008
Jul-12	0.45	0.25	0.3	2.1	3.1	5.472
Aug-12	0.35	0.1	0.25	1.6	2.3	5.088
Sep-12	0.35	0.25	0.25	1.8	2.65	6.528
Oct-12	0.35	0.1	0.25	1.4	2.1	6.624
Nov-12	0.3	0.35	0.25	1.35	2.25	5.472
Dec-12	0.35	0.35	0.25	1.5	2.45	5.76
Jan-13	0.35	0.4	0.24	1.4	2.39	5.568
Feb-13	0.45	1	0.26	1.95	3.66	7.68
Mar-13	0.3	0.45	0.245	1.4	2.395	6.528
Apr-13	0.25	0.5	0.25	1.5	2.5	6.72

Rockville Water Usage and Production by Month



Rockville Water Supply Corporation Supplemental Information

Master Meter & Supply Error Adjustment:

The supply meter was accuracy flow tested last year, and determined to be over-registering by 14.5%. This is believed to be caused by the meter's proximity to 90 deg bends upstream and downstream.

Customer Metering Inaccuracy:

Average age of customer meters is approx. 25 years. There is no customer meter test data, so the average customer meter inaccuracy is guesstimated to be 5%.

Length of Mains:

There are approx. 20 miles of mains in the network. Mapping is from available paper records. As a policy, customer meters are placed in pits at the property line.

Average Operating Pressure:

Network is operated as a single zone. Pressure readings are limited to measurements at the wells, storage tank and occasional static readings when Mike is flushing hydrants. The average pressure from this data is estimated to be approx. 60 psi.

Total Annual Cost of Operating Water System:

Approximately \$395,000. A basic electronic accounting system is in place, but not audited annually by a CPA.

Customer Retail Unit Cost:

This is the 'customer's cost to purchase the next 1,000 gallons'. It's used to value apparent losses. Rate structure includes 2 rates – residential rate is \$1.65 per thousand gallons, and non-residential rate is \$1.35 per thousand gallons.

The residential sales are 70% of total sales by volume. The non-residential sales are 30% of total sales by volume.

To calculate this input, a simple weighted calculation is needed:

$(\text{Residential rate}) \times (\text{residential \% of sales}) + (\text{non-residential rate}) \times (\text{non-residential \% of sales})$

Variable Production Cost

This is the 'utility's cost to supply the next 1,000 gallons'. Basic way to calculate it is just from power and chemical costs. This figure is used to value real losses.

Total power costs for the audit year were approx. \$19,500. Total chemical costs for the audit year were approx. \$9,000.

To calculate this input, add the power and chemical costs together, and divide by volume of water produced for the audit year.