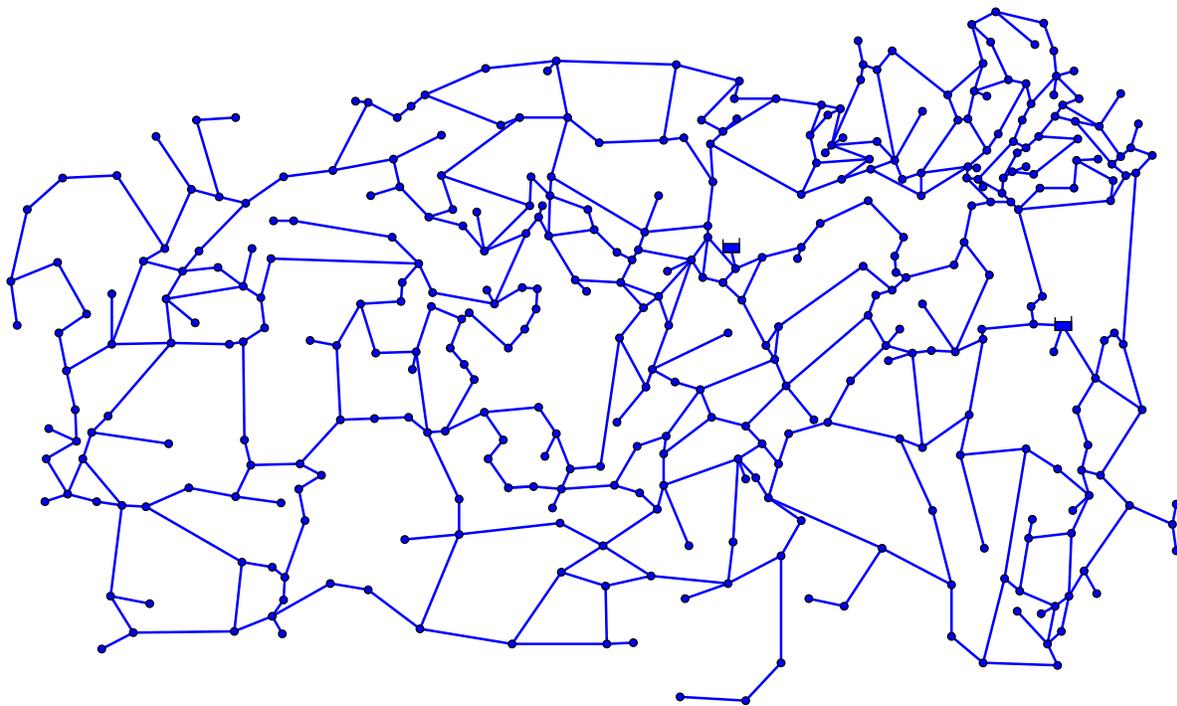


SYSTEM ID: Rural Network

NARRATIVE DESCRIPTION

The Rural network was adapted from a real irrigation network and was first presented by Marchi et al (2014). The average annual demand is 2.21 MGD.

NETWORK SCHEMATIC:



HISTORY OF THE NETWORK FILE

The network was first optimized by Marchi et al (2014) using genetic algorithms, particle swarm optimization and differential evolution. It has since been optimized by Bi et al (2015) by incorporating domain knowledge into a genetic algorithm model.

AVAILABLE INFORMATION

Physical attributes	Yes
Schematic diagram	Yes
Network geometry data	Yes
GIS data file	No
Background map	No
Elevation data	Yes
Pipe data	Yes
<i>Pipe material</i>	No
<i>Pipe age</i>	No
<i>Pipe pressure class</i>	No
<i>Nominal or actual diameters</i>	Actual
Pump data	N.A.
<i>Useful horsepower</i>	
<i>Pump operating curves</i>	
Tank data	N.A.
<i>Elevation data</i>	
<i>Stage storage curves</i>	
<i>Water quality information</i>	
Valve data	N.A.
<i>PRV/FCV data</i>	
<i>Isolation valve data</i>	
<i>Hydrant data</i>	
Demand data	Yes
<i>Total system demand</i>	Yes
<i>Nodal demand data</i>	Yes
<i>Temporal data demands</i>	No
<i>System leakage</i>	No
Hydraulic data	Yes
<i>Hydraulically calibrated model</i>	
<i>Field hydraulic calibration data</i>	
Water quality data	No
<i>Disinfection method</i>	No
<i>Chlorine residual data</i>	No
<i>Booster station data</i>	No
<i>Fluoride/Chloride field data</i>	No
<i>Water quality calibrated model</i>	No
Operational data	No
<i>SCADA datasets</i>	No
<i>Operational rules</i>	No

REFERENCES:

Bi, W., Dandy, G. C. and Maier, H. R. (2015) Improved genetic algorithm optimization of water distribution system design by incorporating domain knowledge, *Environmental Modelling & Software*, Vol. 69, 370-381.

Marchi, A, Dandy, G., Wilkins, A and Rohrlach, H (2014) A methodology for comparing evolutionary algorithms for the optimization of water distribution systems, *J. of Water Resources Plan. and Man.*, ASCE, 140 (1), 22-31.

DETAILED DATA SUMMARIES

PHYSICAL ASSETS:

Asset Type:	# of Assets
Master Meters	0
Tanks	0
Pumps	0
Pump Stations	0
Water Treatment Plants	0

NETWORK CHARACTERISTICS:

# Total Pipes:	476
# Branch Pipes:	43
Ratio (Branch Pipes / Total Pipes):	0.09
# Nodes	379
# Reservoirs	2
# Tanks	0
# Regulating Valves	Unknown
# Isolation Valves	Unknown
# Hydrants	Unknown
Elevation Data	YES

PIPE DATA:

Diameter (mm)	Length (m)
44.0	To be determined
64.0	To be determined
80.8	To be determined
104	To be determined
117	To be determined
141	To be determined
159	To be determined
207	To be determined
225	To be determined
262	To be determined
307	To be determined
384	To be determined
480	To be determined
518	To be determined
622	To be determined

PUMP DATA:

Pump Horsepower	NO
Pump Curves:	NO

DEMAND STATISTICS:

Demographic Type	Population	Households
Directly Serviceable:	Unknown	Unknown
Indirectly Serviceable:	Unknown	Unknown
Total Serviceable:	Unknown	Unknown

Production Statistics	
Total Annual Volume Produced (MG):	2.21
Total Annual Volume Purchased (MG):	2.21
Total Annual Volume Provided (MG):	2.21
Estimated Annual Water Loss:	Unknown

Water Costs	
Customer Type	Cost per 1000 gallons
Customers within the municipality	Unknown
Customers outside the municipality	Unknown

CUSTOMERS AND USAGE:

Customer Type	Customer Count	Average Daily Demand (MGD)
Wholesale:		
Residential:		
Commercial:		
Institutional:		
Industrial:		
Other:		
Total Customers:		
Flushing, Maintenance & Fire Protection:		
Total Water Usage:		2.21

DATA FILE ATTRIBUTES:

ATTRIBUTE		UNITS
Pipe Length & Diameter	X	metres, mm
Pipe Age		
Node Elevation	X	metres
Node Demand	X	L/s
Valves		
Hydrants		
Tank Levels		
Tank Volume		
PRVs		
WTP		
WTP Capacity		
Pump Data		