

Gibson Canyon Improvement District
Alternate Source Study
Technical Memorandum #1, Addendum

SCENARIO #4

SCENARIO #4 DESCRIPTION

The goal of Scenario #4 is to reduce the Maximum Day Demands (MDD) to domestic use only by shutting off all irrigation uses when necessary. To accomplish this goal, the existing water service would be split into two separate meters. One meter would serve domestic uses, and the second meter would serve irrigation and landscaping uses. The new meters would be part of an Advanced Metering Infrastructure (AMI) system. An AMI system is made up of special meters, data transmitting and receiving infrastructure (radio or cellular), and internet base interface software. Some AMI systems include the ability to shut down water services remotely. For this scenario, the irrigation meters would include the remote shut off capability so that they could be turned off when there is a failure in the water system which requires immediate conservation of water.

There are currently two manufacturers who are completing beta testing on the remote shut off AMI meters: Badger and Sensus. The exact system will need to be evaluated fully based on radio surveys, cellular availability, GCID component selection, etc.

SCENARIO #4 EVALUATION

WATER QUANTITY AND STORAGE CAPACITY:

The water treatment plant is can produce 900 gallons per day using two Microfiltration units. This is equivalent to 1.3 million gallons per day, and is more than the 900,000 gallons per day needed at build-out.

If the irrigation systems are isolated from the domestic systems and can be shut off remotely in time of need, the MDD would include only the water necessary for domestic use which can be estimated based on winter water use. The average low month production for the years 2014-2016 is 3.88 mgd or 134,313 gallons per day, as shown in the table below.

Table 1: Average Low Month Production

Year	Month	Production	
		Million Gallons/Day	Average Gallons/Day
2014	February	3.68	131,429
2015	February	4.17	148,929
2016	December	3.80	122,581

Therefore, the MDD for domestic use only can be met with the existing storage capacity of 154,000 gallons.

Scenario #4 would still require replacement of the existing 40,000 gallon clearwell with a nominal 200,000 gallon clearwell at the existing treatment plant to reduce the disinfection byproducts in the system. The new clearwell would increase the storage capacity to 314,000 which is more than double the MDD for domestic use only.

WATER QUALITY:

The water quality will be the same as the existing water quality, which meets California State Water Resources Control Board – Division of Drinking Water and the United States Environmental Protection Agency Standards. Similar to Scenario #1, if the new clearwell is constructed as assumed above, the water quality related to disinfection by-products would be expected to improve dramatically with increased chlorine contact time.

PROJECT EXPENDITURES:

Capital Costs

The estimated capital expenditure is \$948,377 including parts and labor to install a new meter box two AMI meters, backflow preventers, software set-up and training and the first year of cellular service. Table 2, below, provides a detailed estimate. The costs are based on cellular service due to the rural nature of the area and the hilly terrain. A forty percent contingency is included to remain consistent with other scenarios and because the site will have to be analyzed very carefully prior to system selection, and the design may require additional components not currently envisioned.

The capital expenditure does not include plumbing work on the homeowner's side of the meter that will be necessary to separate the domestic and irrigation water piping.

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Table 2: Meter Split Auto Shut-Off Project Cost Estimate

Line	Item	Quantity	Unit	Unit Cost	Cellular Based
1	Meters				
2	3/4" AMI Meter with Automatic Shutoff	163	EA	\$ 430.00	\$ 70,090.00
3	3/4" AMI Meter without Automatic Shutoff	163	EA	\$ 161.00	\$ 26,243.00
4	Data transmitter	326	EA	\$ 125.00	\$ 40,750.00
5	Meter box	163	EA	\$ 253.00	\$ 41,239.00
6	Buschings in existing boxes, Curb stop in new boxes, pipe and misc.	163	EA	\$ 150.00	\$ 24,450.00
7	1" RP Backflow Preventer	326	EA	\$ 400.00	\$ 130,400.00
8				Sub Total	\$ 333,172.00
9					
10					
11	Hardware Sales Tax (8.125% Vacaville, Solano County)				\$ 27,070.23
12					
13	Software Set-Up/Training				
14	Software Suite	1	LS	\$ 6,250.00	\$ 6,250.00
15	Training	1	LS	\$ 540.00	\$ 540.00
16	Data Exchange Software	1	LS	\$ 420.00	\$ 420.00
17				Sub Total	\$ 7,210.00
18					
19	Annual Recurring Charges				
20	Cellular Network	163	EA	\$ 9.72	\$ 1,584.36
21				Sub Total	\$ 1,584.36
22					
23	Labor				
24	Install 3/4" Meter & Cell Modem ¹	163	EA	\$ 91.13	\$ 14,854.19
25	Install Meter Box & Piping ²	163	EA	\$ 805.60	\$ 131,312.80
26	Install New Meter in Existing Box	163	EA	\$ 45.57	\$ 7,427.10
27	Install Backflow Preventer ⁴	326	EA	\$ 292.53	\$ 95,364.78
28	Crossconnection Testing ⁵	163	EA	\$ 364.52	\$ 59,416.76
				Sub Total	\$ 308,375.63
				TOTAL COST:	\$ 677,412.21
			Contingency:	40%	\$ 270,964.88
				Budgetary Total:	\$ 948,377.09
				COST PER METER SPLIT³	\$ 5,818.26
<p>NOTES:</p> <p>1) Install Meter Box & Piping: 2019 prevailing wage Solano County Underground Utility/Pipefitter: \$71.10/hour + Caltrans rate pickup truck: \$29.60; 8 hours for box & piping</p> <p>2) Assume SID Utility Worker - top step: \$37.97 *2.4 for all overhead = \$91.13</p> <p>3) Does not include cost of separating plumbing on homeowner's side of the meter</p> <p>4) Install RP Backflow Preventer: 2019 prevailing wage Solano County Underground Utility/Pipefitter: \$71.10/hour + Caltrans rate pickup truck: \$29.60; 2 hours per unit + 1 Hour SID Utility worker for BFP testing</p> <p>5) 4 Hour SID Utility worker to ensure the irrigation and domestic services are completely separated</p>					

The new clearwell at the treatment plant will remain in the capital improvement program as originally anticipated.

Operating Costs or Savings

Although fairly minor, some savings on the operating costs will be realized because the drive-by meter reading activities that currently take place bi-monthly will be eliminated. Additional operating cost will be monitoring the annual backflow testing that will be required of each homeowner.

Apparent water losses may be reduced, and revenue increased with the replacement of water meters for many reasons. The existing meters are old, and are most likely not reading as accurately as they were when newly installed. The new meters will have a customer interface that will allow them to track their water usage, and identify leaks more quickly. GCID could also set alarms based on larger than anticipated water use and notify homeowner of potential leaks.

Impact on Water Rates

The clearwell construction is already included in the water rates. The additional cost to rate payers will be approximately \$6,000 to cover capital costs, and annual cellular data fees.