

Forest View Acres Water District

Operations Report – July 2020

Prepared by Clyde Penn ORC Water Professionals

Arapahoe Water Plant

- The plant produced 67% of demand for June; Started up SWTP on 8 June
- Purged Chlorine Analyzer as Needed
- Changed Injector for Chlorine Feed
- Changed Stenner Pump Tube for Chlorine Feed
- The megger test measured 0.7 Meg Ohms to ground. This has fallen from 1.2 Meg Ohms in 2019, and 1.4 Meg Ohms in 2018. It is evident that the issue with the cable and/or motor is worsening.
- Plant Checks, Mixed Chemicals

Booster Pump Station

- Checked Booster Station
- Booster Station Alarm – Loss of Communication with AWP
- See attached Letter from Jeff Robison and Gabby

Distribution

- Meters were Read on 28 June 2020 and will be read on 28 July – Reports completed
- In 2017 one of our dive teams cleaned and inspected this District's 250KG water tank. At that time, we made the recommendation to have a half day of epoxy repairs made to areas of corrosion found within this tank during the inspection. I may have found another District tank operated by another company like ORC which also needs a half day of work. This tank is located about 30 miles east of the Forest View tank. **If we can schedule both tanks to have this work completed the same day our cost per tank would be \$1,800.00 plus material which shouldn't run more than \$125.00.**
- Monthly BACTI's /
 - o Upcoming samples include SOC/VOC,

Surface Water Plant

- The plant produced 33% of demand for June; Plant Started on 8 June;
- Plant is at 25 gpm; Low Flow at Inlet; Increase flow rate when water is available
 - o Mixed Chemicals
 - o Calibrated Turbidity Meters
 - New Meter Approx \$2800.00 – Needed for Primary Combined
- Completed monthly MOR report for state – No Violations

Locates

- New Company doing locates – Contacted new company doing locates, offered assistance should they need help on locates

Production for the Month of June 2020

Year	Month	SWTP Production - BW	% of Total	AWP Production	% of Total	Total Production	Total Water Sold	Percentage Discrepancy
2020	Jan	0	0%	2,061,922	100%	2,061,922	1,256,861	39.04%
	Feb	0	0%	1,922,915	100%	1,922,915	1,252,367	34.87%
	Mar	0	0%	1,651,707	100%	1,651,707	1,204,035	27.10%
	Apr	0	0%	1,814,822	100%	1,814,822	1,379,752	23.97%
	May	0	0%	1,997,113	100%	1,997,113	1,935,338	3.09%
	Jun	824,456	33%	1,697,757	67%	2,522,213	2,281,558	9.54%
	Jul							
	Aug							
	Sep							
	Oct							
	Nov							
	Dec							
Total		824,456	5%	11,146,236	95%	11,970,692	9,309,911	22.23%

2019 Water Leaks:

13 March 2019 Service Line Leak – 3830 Range View – Being repaired by homeowner

05 June 2019 Main Line Break on Oxbridge – Hit by Foothills Electric

23 October Service Line Break on Rockbrook Dr. – Repaired by Homeowner

Flushed Hydrants on Rockbrook Dr because of water quality complaint – Brown Water.

2" Main on Clovenhoof was flushed multiple times during sewer line installation

2020 Water Leaks:

4825 Limestone – Service line between the Main and Curb Stop – REPAIRED

18810 Cloven Hoof – Service line leak – Repaired by Homeowner

Flushed Hydrants – Water Quality Complaints

Meters

Total of 327 Meters in District of which 326 are Remote Reading currently

2019 New Meter Installations / Water Taps:

4660 Red Stone Ridge Rd

4640 Red Stone Ridge Rd

Two meters installed for new homes on Forest View Rd.

2020 New Meter Installations / Water Taps:

4909 Redstone Ridge – Meter Installed

4820 Limestone Rd – Tap Fee Paid

Following our site visit on July 1st, 2020 I have identified several ways to improve the radio communications between FVAWD's Arapaho Well Plant, Booster Station, and Surface Water Treatment Plant. The root issue causing unreliable communications is a lack of line-of-site radio path, particularly between the Arapaho Well Plant and the Booster Station. The radio manufacture recommends at least a 30 dBm difference between the radio signal and noise. Currently they are operating with a 17-18 dBm difference. The best solution is to achieve a line-of-site radio path. In my judgement this could be accomplished by installing a repeater radio on the water storage tank. A radio path survey should be completed prior to designing and building a radio panel at the tank. If the tank was utilized for a radio repeater site I would also recommend installing a small PLC to read the tank level and eliminate the second radio system that transmits tank level.

There are also several solutions I recommend to incrementally improve the existing radio configuration. These changes are:

- Replace the existing Yagi antennas with higher gain Yagi antennas. Currently the Arapaho Well and Booster Station antennas have 8.15 dBi of gain. We can increase this to the maximum FCC approved directional antenna gain of 10 dBi. A higher gain antenna will require a more precise alignment.
- Move the Arapaho Well antenna to a new mast on near the peak of the roof. The increased elevation will improve the radio path. This will increase the physical separation from the tank radio antenna and allow us to test a horizontal and slant orientations. Currently the antennas are too close to each other to have the same polarization.
- Remount the antenna at the Booster Station. The current antenna mount does not provide full range of motion to allow the antenna direction to be optimized.

Additionally the HMI display at the Arapaho Well has experienced loss of Ethernet communication to the local PLC. The most likely culprit is a bad Ethernet cable, followed by a failing Ethernet switch. I recommend replacing both the cable and switch.

The following programming changes were made to reduce alarms and plant shutdowns:

- Modified the communications timeout from 45 seconds to ten minutes. Once the communications timeout the Arapaho Well is turned off.

- Modified the PLC logic at the Booster Station to improve its recovery from a loss of communications. Please let me know if you have any questions or wish to proceed with a radio path study, antenna improvements, or both. Best Regards,

Jeff Robison

Clyde,

FVAC would be better off installing new alarm systems from Mission. See the attached literature and pass it on to the board.

I worked up a cost estimate based on the type of devices we would need for each facility. The pros to these units are that they datalog for state reporting, have realtime data displayed on a web based cloud that operators can access, are easy to install and do not require a controls expert to pay a service call to update. We can program the units to alarm whomever we want on a schedule and insert delays or turn off nuisance alarms. The units are very cost effective and the customer service is very good. The team of engineers have customized the units and the data that comes out of them for free in many cases for me.

I highly recommend these devices for water plants and are installing them all over.

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The Next Generation of Wireless Real-Time Alarm, Monitoring, and Remote-Control

All of the functionality of the legacy series (M110 and M800) with an onboard interactive display and enhanced electronics

MyDro 150 and 850 RTUs

Easy to Install

Each remote terminal unit (RTU) includes all necessary hardware for a standard installation, such as a cellular radio, enclosure, backup battery, transformer, antenna with cable, and mounting hardware. Purpose-built RTUs simplify and speed installation. There is no programming required, and RTUs are self-enrolling.

Reliable Wireless Communications

RTUs operate on current generation cellular radios for dependable data transmissions. Mission maintains direct relationships with the largest cellular carriers in the U.S. and Canada to ensure the best service possible. There are no radios to license or cellular contracts to set up.

Real-Time Alarms Delivered To All Devices

Real-time alarms are delivered via phone call, text message, email, fax, page, and even to an existing HMI software through an OPC data link. Each alarm is logged with a time stamp for tracking and reporting. The alarm call-out schedule is easy, flexible, and intuitive to set up.

Managed Service—The Complete Package

The Mission system includes all cellular data service, data storage, alarm call-outs, reports, and on-call, 24-7-365 technical support. The highly reliable turnkey system offers more features at a lower cost than an in-house setup. No engineering or programming is required, and there are no networks to maintain.

View data and reports using the secure 123SCADA web portal, accessible from any web-enabled device. The 123SCADA user interface is designed to mimic industry-standard HMI SCADA and also includes a legacy user mode. Tabular and graphical reports can be used for compliance reporting and comparative studies. System enhancements are available immediately and included at no cost.

M150 RTUs

Real-Time Alarms with Hourly Summaries

M150 RTUs summarize pump runtimes and pump starts hourly. All alarm data is reported in real-time. Analog data and RTU status are reported hourly. Simultaneous pump runtimes can be reported when two pumps run.

M850 RTUs

Real-Time Alarms and Streaming Data

M850 RTUs report pump starts and stops in real-time. Analog values are reported every two minutes or on a five percent change. Volumetric flow calculations can utilize this information along with sump volume (as determined by an analog level sensor or fixed entries) to calculate hourly volumetric flow rates.

Remote-Control

Expand system operations with optional remote-control for off-site wells, tanks, gates, chlorine dosers, variable frequency drives, and more. Optional automatic remote control interfaces include the Tank and Well Control Package, Digital Interconnect, and Analog Interconnect.



LCD Touch Screen

- Displays current status
- Supports local configuration

Radio

- Cellular radios support LTE, 4G, 3G, and 2G for both GSM (AT&T and partners) and CDMA (Verizon and partners)
- No radio licenses or site path studies required

Expandable

- Up to 16 digital inputs, 6 analog inputs, 2 pulse inputs, and 2 analog outputs, simultaneously
- Onboard digital inputs configurable for wire fault supervision or strap on current sensing switch for easier pump run indication
- RS485 for digital, analog, and pulse expansion

Enhanced

- 12 or 24 VDC auxiliary output for battery-backed analog instrument loop power
- Over-the-air upgradeable firmware

	MyDro 150	MyDro 850
Wastewater	Sewage lift station, industrial water quality (WQ) alarming, lift station generator alarming	Master pump station monitoring and remote-control, critical process monitoring, open channel flow monitoring, sewer station power monitoring, reuse water monitoring and control
Water	Pump station alarming, reservoir level alarming, remote valve alarming, chlorine (Cl) residual WQ alarming, pressure reducing valve station alarming	Pump station monitoring, tank and multiple well control, remote valve monitoring and control, Cl residual WQ alarming, flow or pressure monitoring
Other	Gate status alarming, rainfall monitoring	Septic offfload and billing, custody transfer and billing, canal level monitoring and gate control, I&I flow, level data logging

Facility	Unit Type	Cost	Comments
Arapahoe	MyDro 150	\$1,445.00	
	Annual Service Package	\$295.20	With 3 year commitment
Booster Station	MyDro 150	\$1,445.00	
	Annual Service Package	\$295.20	With 3 year commitment
Surface Plant	MyDro 850 w/ expansion module	\$2,840.00	With Nema 4x enclosure and expansion board for data logging
	Annual Service Package	\$539.00	With 3 year commitment
	New Account Setup	\$250.00	
	Shipping	\$75.00	
		\$6,055.00	Up Front Cost
		\$1,129.40	Annual Cost for Service