

Preliminary Engineering Report Water System Improvements for the Florida River Estates Homeowner's Association, Durango, Colorado PWSID No. CO0134300

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This Preliminary Engineering Report (PER) was prepared by Goff Engineering & Surveying Inc. using RUS Bulletin 1780-2 and FmHA Instruction 1942-A (Guide 7), "Rural Utilities Service (RUS) Preliminary Engineering Report-Water Facility."

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I. Introduction

At the direction of the Florida River Estates Homeowner's Association Board of Directors, Goff Engineering and Surveying Inc. (Goff) has prepared this Preliminary Engineering Report (PER) analyzing water system infrastructure improvements for the Florida River Estates Subdivision, Durango, Colorado. The report recounts a brief history of the Association and subdivision, evaluates the current water system, explores improvement alternatives for the water system, and concludes by making recommendations based on an engineering perspective.

The Florida River Estates Subdivision was platted and recorded in the La Plata County Clerk and Records office in February, 1965. During the formation of the subdivision, Protective Covenants were recorded that established the Florida River Estates Homeowner's Association (FRE) which governs the subdivision. The FRE governs the architectural control within the subdivision and the water system. Subdivision roads have been dedicated to La Plata County and are maintained by the County's Road and Bridge Department.

The subdivision is comprised of 94 lots or tracts within an area of 186.7 acres. Lots are used for residential dwelling units accessed via County Roads. Most lots have been fully developed with home construction beginning in the early 1970's. It is our understanding the water system was installed in this time frame as well.

Presently there exists 90 active taps within the subdivision. The few tracts owned by the FRE are undeveloped and used as open space. Based upon US Census Bureau current data, average residential lots contains 2.64 people per household. Thus for planning purposes, the current population of the subdivision is estimated to be 238 people.

The water system for FRE is comprised of a spring, treatment plant with pumping, water storage and three pressure zones. Water storage is provided via a ground bolted steel water tank containing 100,000 gallons. One pressure zone near and above the water storage tank is pressurized via a constant pressure VFD controlled booster pump system set in a below ground vault. The other two pressure zones are fed via gravity flow from the water storage tank, with the lowest zone being controlled by a pressure reducing valve. The system has been designed for household use only with small water mains. Fire hydrant flows are were not considered during the installation of the system. The system was not constructed to be utilized for fire protection. Main lines range from 3 and 4 inch pipe with some areas utilizing smaller pipes; thus greatly reducing any potential for adequate fire flow. The water storage tank is sized for domestic use only and additional fire storage is not a part of this system.

The current system is nearing its useful life for many components. One of the major concerns is excessive water loss due to the age of the water mains. Numerous water leaks have occurred in the lower pressure zone located along the Florida River. During break repairs, it has been noted that there is little to no bedding around the pipes and leaks appear to result at main line breaks and at the glued fitting joints that have been stressed over the years. The joints appear to have been stressed sufficiently that the glued connections have separated from the pipe and pipe bell fitting. There are few isolation valves within the system and some valves have not been located or have not been exercised to determine if they even function. The water treatment plant has experienced numerous pipe breaks and leaks. Most of the water plant plumbing is constructed of plastic pipe. The system breaks have occurred at fittings and joint restraint via mechanical means is minimal in the plant. The plant piping has recently been

replaced with copper pipe except for the two floor penetrations. The electrical system has been modified numerous times over the years and the components are mostly not water tight or water resistant. This is a safety problem. Water quality issues occur seasonally during the spring runoff of Mud Spring Creek located near the water treatment plant. Due to the increased turbidity occurring for the one to two months each spring, the present filtration system is not adequate to reduce the turbidity to required limits. Due to the higher turbidity water entering the system the current filters plug very quickly and require replacement weekly, versus getting a couple months of service life. The filter bags need to be changed frequently during this period of time and the expense for FRE during this period is very expensive. In addition, to maintain compliant water turbidity, the pump system flow must be greatly reduced, thus limiting the available water production. The water storage tank is sized adequately to provide a storage of approximately 1,000 gallons per residential unit. The storage is for domestic use only. The water tank has aged well and from previous inspections, only minor work is suggested.

The water system does not have any SCADA controls (Supervisory Control and Data Acquisition), requiring the operator to physically visit the plant when any alarm is sent via an autodialer to the designated phone line. The current autodialer is located in the treatment plant. Most system operations are done via a timer system or automated via a level sensor in the tank that calls for water when the tank level drops a predetermined level.

Overall, the current water system configuration is not optimal and poses numerous operation and service concerns. In consultation with the ORC (Operator in Responsible Charge), most water meters have reached their service life as well as the water mains. Water meters record less flow as they age which relates to reduced revenue for the Association. The lack of proper isolation valves across the system is also problematic. Due to excessive water leakage in the current range of 40%+, treated water is being wasted, causing additional strain on the system and expense to FRE for treatment, electricity, etc.

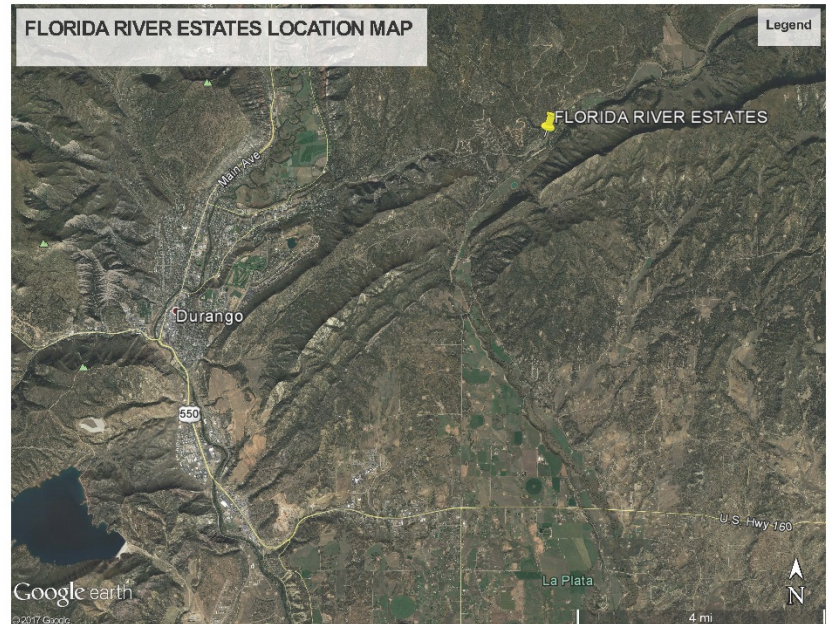
Because FRE does not currently have the financial resources to complete the improvements discussed and recommended in this report, the FRE HOA will be using the information and evaluations provided in this report to support funding requests necessary to complete the projects identified through this report. The rate structure for water billing has been revised to a tiered water use as well as a fixed fee for funding of capital improvements. The Board of FRE will look into the capability of grants and/or loans to assist in the capital funding for the proposed improvements.

II. Project Planning Area

A. Location

The Florida River Estates Subdivision is located approximately 7 miles northeast of Durango, Colorado, in La Plata County. It is situated at an elevation of approximately 7,500 to 7200 feet in the Florida River drainage. The subdivision is surrounded by mountainous terrain to the north and south, with the river flowing east to west along the lower portion of the subdivision. The region lies within the Florida River watershed.

The platted subdivision occupies an area of approximately 187 acres. Typical homesites are approximately one acre in size. The subdivision is located in Sections 7 & 8, T35N, R8W, NMPM, which is located at approximately 37.317° North latitude and 107.772° West longitude.



The layout of Florida River Estates, including depiction of the water distribution infrastructure is included in Appendix A as Figure 1.

B. Environmental Resources Present

Florida River Estates subdivision lies along the Florida River and along an upper bench above the valley floor. The area is comprised of predominantly larger residential lots, with larger tract residential lots (5 to 35 acres) beyond the subdivision limits. Further above the lots, public lands controlled by the USFS and BLM extend over a large area.

This area is not used for agricultural purposes. However, upstream and downstream along the Florida River drainage agricultural lands do exist and primarily are irrigated for pasture grass from diversions of the Florida River. Most people use the Florida River corridor in this area for recreation, such as walking and fishing.

Being in a river valley, the area supports a wide variety of wildlife. Deer, bear, and small mammals are present throughout the area. The river contains various fish and river flows are regulated from Lemon Reservoir located about 9 miles upstream of the subdivision.

The area annually receives roughly 19 inches of precipitation which includes 79 inches of snow. The drinking water source for the subdivision is the groundwater aquifer (spring) in the Florida River valley.

C. Growth Areas and Population trends

As stated above, the Florida River Estates subdivision is comprised of 94 lots. Presently there are 90 taps within the water system. The growth potential is limited to a few lots and expansion of the system to serve beyond the association boundaries is limited with minimal residential lots available that could be served by FRE if they association chooses to serve others beyond the subdivision boundary.

Therefore, the current population density is approximately 238 people based upon the U.S. Census Bureau data of 2.64 people per household for the period of 2011-2015. The Census Bureau data for La Plata County is slightly lower with 2.41 people per household (2012-2016). With limited growth potential, the planning number for total population served has been conservatively set in the range of 250 to 270 people. Please note that according to a population survey of the taps, the population was reported to be comprised of approximately 130 year round residents. This is approximately half of the average household density. The population density is stable with most homes being actively occupied. The area appears to contain primary residences and does not cater to the second home market. The background population data is included in Appendix A.

According to Mark Fuson, the Operator in Responsible Charge (ORC) the water service customer distribution includes 90 residential taps, 0 commercial taps and 1 industrial tap for the fire station.

III. Existing Facilities

A. Location Map

The layout of the existing subdivision under FRE, including depiction of the water distribution infrastructure is included in Appendix A as Figure 1. The water system is classified as a community water system regulated by the Colorado Department of Public Health and Environment (CDPHE) under PWSID No.CO0134300, La Plata County.

B. History

Development of the FRE central water system was initiated in the late 1960's. Very little historic information or data is available about the FRE water system. Basic water system maps are available, but no information related to the water source is available. For the purpose of this report, the FRE water distribution pipe network has been mapped from an assortment of as-built drawings as reviewed by the operator and long-time residents. Initially, it is believed the system was a pressurized system, with the water storage tank being installed at a later date. The water tank is a used bolted steel ground level tank purchased from the Town of Rico, Colorado. Information about the storage tank has been assembled from inspection reports and historical accounts from the ORC. Details about the FRE's water source and pumping equipment has been collected through discussions with the Board, ORC, and records provided. Water treatment facilities and processes have been



observed and partially designed by Goff Engineering as part of a previous project.



C. Condition of Facilities

i. Certified Operator

The FRE HOA has a full time certified water system operator and meets the State Regulation. The present ORC (operator in responsible charge), Mark Fuson is the sole operator for the HOA system. He reports to the HOA Board and ensures the system is maintained to comply with the CDPHE permit and testing requirements.

ii. Water Supply

The Florida River Estates water system is supplied via the Sortais Spring and collection system located within the existing water treatment building. The spring enters a concrete manhole infiltration gallery where submersible pumps are installed to pump the water through the water treatment plant and into the distribution and storage system serving the subdivision. Since the spring is very shallow, the system is considered to be under the influence of surface water as per the CDPHE rules and regulations. Thus, filtration and disinfection are required and have been installed as a part of the system infrastructure.

iii. Water Rights

The Florida River Estates Pipeline (Sortais Spring) supplies water to the subdivision. The absolute water right is 0.5 cfs (224 gpm), with a conditional amount of 1.5 cfs. In future review the conditional flow amount of 1.5 cfs was stated to be abandoned to allow FRE to retain the absolute water right of 0.5 cfs (Case No. 80CW77 states the water is non-tributary to the water course). Based upon the decreed absolute amount of water, there is sufficient legal water for the water system. Also, water rights allow for the storage of water within the two FRE ponds known as Lake Carol and Lake Susan. These two ponds can store 8.109 and 17.459 acre feet consecutively. The spring has an appropriation date of Oct. 1, 1962 under Court Case 1751-B. The spring has been continually used for over 56 years.

iv. Treatment Facilities

The treatment system is classified as a community water system and as such is regulated by the CDPHE. The treatment system is permitted with the state under the public water system permit: PWSID #CO 0134300. The treatment plant is comprised of the following major items with the treatment plant schematic depicted in Figure 2, Appendix A:

- Raw water pumps are two Gould's submersible pumps with CentriPro 5Hp, 230 V, 3ph pump controllers and VFD controllers to set pumping rate to desired levels.
- Filtration system is comprised of two Harmsco 170x2 pre filters, three roughening filters and three each, pre and post Strainrite bag filters.
- Pre and post disinfection is provided by LMI chemical metering pumps utilizing liquid sodium hypochlorite (bleach).
- Flow meters for the main distribution system and a flow meter for the lower pressure zone are provided.
- Hach Turbidimeter 1720E and Hach CL17 chlorine analyzer are provided to record turbidity and chlorine levels for the finished water leaving the treatment plant prior to entering the distribution system. Continuous monitoring results are recorded on a Partlow MRC 5000 circular chart recorder.
- Miscellaneous valves, pressure gauges, relief valves, solution containers, etc. are included in the system along with the necessary electrical controls for the pumps, sensors and building lighting, service outlets, auxiliary heating.
- Due to limitations on the flow through each filter bag container, the maximum treatment plant flow is 20 gallons/minute x 3 filters = 60 gpm. A flow restrictor to ensure this flow is not exceeded is provided with the treatment train.
- To ensure proper chlorine contact time is met prior to the first customer tap, a buried chlorine contact chamber comprised of 8 inch and 18 inch pipes for plug flow is adjacent to the treatment plant.
- System controls for the system include a timed pump system and pressure level sensors to automatically operate the system when the tank level drops to a predetermined level and a signal is sent to the water plant to start pumping operations.

v. Water Storage Facilities

Water storage is provided via a ground level 100,000 gallons bolted steel water storage tank. The tank was purchased used from the Town of Rico in the early 1970's and installed at the upper part of the subdivision in a deeded HOA parcel. Thus, the tank has been in service approximately forty four years. The tank sits on a gravel foundation pad at ground level. The tank had an inspection of the interior and exterior of the tank performed by CW Divers, Farmington, NM on June 22, 2017. At present the interior coating appears to be in good condition and minor work is recommended around the tank and on the exterior. The report did recommend the installation of a roof hatch and new exterior ladder with safety cage. Previous improvements provided a new roof top vent with screening and a fire hydrant connection was added to the tank to allow drafting from the hydrant to pumper trucks to assist in fire protection services for the community.

The tank inspection report has been included in Appendix D.

Refurbishment work includes minor grading around the tank, addition of some gravel along the grade ring and under the edges of the tank and removal of vegetation. The recommendations from the inspection noted above should be provided.

vi. Distribution System

The FRE water distribution network includes approximately 2.95 miles of pipeline consisting primarily of 4 inch and 3 inch mains, 0.54 miles of 2 inch and 1 inch mains and 0.85 miles of service lines. The mains are older ASTM pressure rated water pipe with an unknown pressure rating. From review of the system, the water pipes were constructed with glued joints and fittings. There are also a few mains that are constructed of 1 inch to 2 inch pipe that serve only a couple lots. Water isolation valves are located throughout the system and are located on the existing system map. The current system was designed for household use only and no fire hydrants exist within the system, except for the single fire hydrant at the water storage tank referenced above. Some yard hydrants exist for system flushing and sampling.

Water services to each home are comprised of single and/or double taps to the main lines. The meter pits have meters installed for each active tap, but no meter yokes with shut off and check valves are included in the original design.

The water system is comprised of three pressure zones. The lower pressure zone (Zone #1) located along the River lots is controlled by pressure reducing valves located in the water treatment plant. The static pressure at the water treatment plant is approximately 100 psi. The pressure is reduced to 65 psi for the lower pressure zone that serves approximately 40 active taps. Household static pressures are in the range of 75 psi to 55 psi. The second pressure zone (Zone #2) is served via gravity from the water storage tank. The approximate pressure for the lots within this zone along the upper bench above the river bottom ranges from approximately 65 psi to 10 psi for the lots located near the water storage tank. Homes with low static pressure near the water storage tank have installed individual water booster pumps to increase the pressure to normal household levels. Zone #2 serves 54 active taps. For the third pressure zone (Zone #3), a booster pump station near the water storage tank provides household pressure to 8 lots connected to this upper zone (Lots 12-19, Block #1) at a pressure leaving the booster station of 65 psi. This provides pressure in the range of 40 to 60 psi to the Zone #3 lots. Overall, the majority of lots are served with normal household pressures in the range of 40 psi to 60 psi.

The water distribution piping is in fair to poor condition as described by the ORC and as noted in the CCR (Consumer Confidence Report) and site sanitary survey. There has been excessive water leakage in the lower section, Zone #1, for some time. Numerous breaks have been repaired and the condition of the pipe in this area appears to have met its useful life. The ORC since he has taken over the system has monitored the water production to the meter readings of the customers and has determined Zone #1 has leakage in the 25% range and Zone #2 leakage rate is approximately 15%, for total leakage of approximately 40%. Zone #3 does not appear to have excessive leakage.

In 2017, a few major leaks were located and repaired. After these identified leaks have been repaired, leakage in Zone #1 still exceeds accepted standards.

vii. Drinking Water Quality

A copy of the Public Water Supply (PWS) Consumer Confidence Report (CCR) has been included in Appendix D. The CCR represents that no Maximum Contaminant Levels were exceeded when sampling the Town's water for the past period.

A Sanitary survey was prepared by the CDPHE January 26, 2017. Deficiencies were noted that very high leakage rates in the distribution system were noted in the lower portion of the distribution system. The attached Sanitary Survey Response letter is included in Appendix D of this report. This survey identified this significant deficiency. The pertinent issues of the survey are summarized in the following section of this report. In addition, the 2014 Sanitary survey is provided in Appendix D which focused on water storage tank recommendations.

D. Financial Status of any Operating Central Facilities

Rate Schedule

The current monthly water rate schedules for customers of the Florida River Estates HOA are summarized in the following Table.

BASE RATE		
Rate Type	New Monthly Cost	
Operations Account	\$70.00	All customers we are serving water to
Capital Account	\$28.00	All customers we are serving water to
Rec Fee	\$3.00	All customers we are serving water to**
Ready to Serve	\$40.00	Those without active taps, vacant lots***
Each customer has the right to abstain payment / *These customer are not charged for capital or operations		
TIERED WATER COST STRUCTURE		
Less than 10,000 gal. used	\$0.0018	Per gallon
Between 10,000 and 15,000 gal. used	\$0.0030	Per gallon
Between 15,000 and 20,000 gal. used	\$0.0050	Per gallon
Between 20,000 and 50,000 gal. used	\$0.0100	Per gallon
50,000 gal. and above used	\$0.0200	Per gallon

The HOA employs a variable tiered rate for water usage to encourage conservation. Previous rates were adjusted to increase the operations account, add a capital account and add a new tiered rated for high water users. A copy of the current rate sheet has been included in Appendix C.

Annual Operating and maintenance (O&M) Cost

Budgeted costs for the 2017-2018 Fiscal year and actual O&M costs for the 2010 – 2017 FY for the FRE water system are listed in the following Table. Please note the Associations fiscal year is July 1 through June 30 and not the calendar year.

FISCAL YEAR (JULY 1 - JUNE 30)	O & M COST	NOTES
JUL 2010 - JUNE 2011	\$ 48,802	
JUL 2011 - JUNE 2012	\$ 47,016	
JUL 2012 - JUNE 2013	\$ 45,891	
JUL 2013 - JUNE 2014	\$ 53,201	
JUL 2014 - JUNE 2015	\$ 69,069	
JUL 2015 - JUNE 2016	\$ 62,567	
JUL 2016 - JUNE 2017	\$ 165,049	EXCESSIVE REPAIRS, MAINT., FILTERS
JUL 2017 - JUNE 2018 (EST.)	\$ 91,000	INCLUDES NEW FILTER CANISTERS

O&M Costs include Personnel, Operating expenses, Administration, and overhead as detailed in the Profit & Loss worksheet presented in Appendix C. The FRE water plant has a separate electric meter as well as the booster station for Zone #3. Combined electric costs for the two meters is shown in the detailed worksheet noted above.

System Users

The Subdivision has a total of 90 service connections and 13 lots with taps not using water at present. All connections are for residential use, except one tap for the existing fire station. All users are billed at the residential rate.

Financial Income and Expenses

Total income compared to total expenses is shown in the table below. As noted, most years have positive cash flow except when major repairs were required, mostly due to water leaks from the distribution system. Appendix C includes the revenue and expense reports for Fiscal Years 2010 through 2018 (estimated) for the FRE water system obtained from the Administrator.

FISCAL YEAR (JULY 1 - JUNE 30)	O & M COST	TOTAL INCOME
JUL 2010 - JUNE 2011	\$ 48,802	\$ 77,331
JUL 2011 - JUNE 2012	\$ 47,016	\$ 75,984
JUL 2012 - JUNE 2013	\$ 45,891	\$ 83,601
JUL 2013 - JUNE 2014	\$ 53,201	\$ 76,930
JUL 2014 - JUNE 2015	\$ 69,069	\$ 71,966
JUL 2015 - JUNE 2016	\$ 62,567	\$ 65,695
JUL 2016 - JUNE 2017	\$ 165,049	\$ 89,920
JUL 2017 - JUNE 2018 (EST.)	\$ 91,000	\$ 125,000
TOTALS OVER ABOVE PERIOD	\$ 582,595	\$ 666,427

Existing Debt and Reserve Accounts

The FRE HOA has no outstanding Debt at present as confirmed by the association administrator.

IV. Need for Project

The improvements considered in this report apply to the distribution system, water storage, water treatment and pumping facilities for the Florida River Estates Subdivision managed by the Homeowners Association. Health and safety and operation and maintenance, contribute to the need for the recommended improvements and are reviewed in more detail below. Since the development is nearly built out and no expansion beyond the current service area is proposed. The major project need is to upgrade the system, which for many portions, has exceeded its useful service life.

A. Hydraulic Modeling

A detailed hydraulic model was not created for this project. With only residential use, users have not stated a lack of water pressure to their homes during routine operations. Since each lot is separately metered, a tally of actual water usage for each lot is available. For general

planning, an 'in-house' water usage amount of 250 gallons/day per unit is considered one equivalent residential unit (EQR= one standard single family residence). For planning purposes, an additional 100 gpd is added to each EQR for lawn/gardening watering. This equates to a total of 350 gpd per EQR. This amount reflects typical local planning and State of Colorado Division of Water Resources recommended equivalent residential water use. In review of actual tally of water meter records, the above planning numbers exceed the current average usage.

B. Distribution and Water Service/Metering

The Sanitary Survey prepared by the CDPHE (dated January 26, 2017), identified 1 significant deficiency, no violations, and 12 observations and recommendations. The 2014 Sanitary Survey identified no violations and had only 1 recommendation. The pertinent issues of the surveys as related to distribution system are as follows:

Item 1 – High Leakage Rates

Classification: Significant Deficiency

During the time of the Sanitary Survey, excessive leakage was estimated to be in the range of 70%. This amount was determined by comparison of the raw water pump volume and the sum of all metered water billed to the customers. The probable cause is the age of pipe and glued joints that have deteriorated over time and tap connections to the system.

Due to significant loses, FRE worked on reducing the excessive leakage. A significant leak of 19 gpm was found near two water meters and subsequently repaired. Also, it was noted a 3 inch isolation valve experienced leaks after the main line isolation process. This valve was also replaced. Additional leakage is continuing, but the rate has been reduced by these repairs.

Other leaks as noted in the FRE Sanitary Survey Response letter of March 13, 2017 has been noted. The response letter is included in Appendix D. This letter provides a written plan with milestones and timeframe to alleviate the high leakage problem.

From water meter records, it appears the present leakage within Zone #1 is approximately 25%. Zone #2 and Zone #3 appear to have leakage amounts around 15%. From this data, Zone #1 is the primary area where the distribution system needs the most immediate attention. The upper zones have leakage rates that are within acceptable limits considering the age of the system, although continued monitoring is essential.

All customers are metered for water use and the service connections consist of a tap from the water main with a service line (generally 1 inch) is extended to a meter pit. The meter is installed in the pit and the service line is extended to the residential unit. The ORC has noted that the meters do not have a meter yoke assembly for the meters and many have been in service for decades. The meter yokes allow isolation and include a double check valve assembly to ensure back siphonage does not occur to the water mains. Most of the water meters have been operation longer than the recommended length of use for replacement. Meter replacement can be variable, but a replacement range of approximately 10 to 16 years is reasonable. As the meters age, their flow accuracy diminishes and it more pronounced at low flows. It is suggested meters be changed out no longer than 16 years. For ease of operations, maintenance and safety, meter yokes should be provided for all new taps and for taps that are replaced.

C. Storage

The existing water tank in review of the last inspection from CW Divers performed June 22, 2017, shows minor repairs are suggested. The inspection service was performed based on the recommendation of the 2014 Sanitary Survey. The suggested work involves some general yard cleanup, grading and adding some ballast under portions of the tank. In addition, a new ladder, safety cage, cathodic protection and roof top access hatch be installed. These recommendations would bring the water tank into compliance with the current CDPHE "Design Criteria for Potable Water Systems" effective December 15, 2017. Overall, the water tank is in good condition considering its age.

Water demand during the summer months of 2017 was approximately 1.0 Mg per month or 33,000 gallons/day. At the peak demand, the storage tank has 3 days of domestic storage. Using the standard demand from La Plata County planning, a 350 gal/day/unit an average day would be in the range of 35,000 gallons/ day. A maximum day is approximately 2.5 times the average daily flow and is estimated to be 87,500 gallons.

Using the USDA-Rural Utility Service recommendation for two days of drinking water storage at 100 gallons per capita per day, drinking water storage of 54,000gallons is recommended for the buildout population of 270. Per these guidelines, the FRE current treated water storage facility exceeds the present storage needs for domestic drinking water.

While the above estimations and storage tank volumes apply to drinking water, they do not consider reserve storage for fire flow demands. As specified in the 2009 International Fire Code: fire flow needs for a Type 5 (frame construction, less than 3,600 square feet) structure is 1,500 gallons per minute for 2 hour duration. This equates to a water storage volume of 180,000 gallons required to meet fire flow demands. The current storage capacity of 100,000 gallons does not meet the minimum fire flow storage requirement.

CDPHE design criteria specifies that adequate storage should be provided for domestic demand AND fire flow. Fire flow storage volume is determined by the Insurance Service Office (ISO). Domestic storage demand is estimated at 300 gallons per capita day (gpcd) for un-metered systems, which equates to 81,000 gallons for the entire subdivision.

Summarily, based on RUS guidance, the current 100,000 gallons of water storage is adequate for the current population and projections to full buildout. Based on CDPHE criteria additional storage is suggested if fire flow storage is considered an option. Thus, if the system were to provide fire flow storage, an additional 200,000 gallons would be suggested to provide a total storage volume of approximately 250,000 to 300,000 gallons. This would also require all water mains to be increased in size to 8 inch minimum diameter to allow for sufficient fire hydrant flow.

Fire flow storage and distribution is not considered in this report due to the ability to pay for the necessary improvements that would be required to provide this increase in service. The local Durango Fire Protection District substation lies within the subdivision and the station has fire pump equipment available due to the rural nature of the area. Overall the amount of storage provided for the subdivision is sufficient for domestic use based upon the various parameters listed above.

D. Water Treatment Plant

The water treatment plant pumps water from the spring which is considered surface water / GWUDI (ground water under direct influence) and is properly filtered and disinfected prior to

distribution to the service connections. The treatment system is currently comprised of 3 -3M 522A roughing filters with 2.5-micron bags followed by 3 StrainRite HPM99-CC-2SR 1-micron nominal bag filters followed by 3 StrainRite HPM99-CCX-2SR 1-micron absolute finishing compliance filters. Due to the maximum allowable flow through each StrainRite filter of 20 gpm, the maximum allowable pumping rate is 60 gpm. To ensure this capacity is not exceeded, a flow restrictor is provided as a requirement of the CDPHE. To pump the water from the spring to the water tank, there are two Gould's pumps located in the spring that pump water from the spring, through the filters and to the water storage tank. These pumps were recently replaced. The VFD (variable frequency drive) controls were not replaced and are versions from the previous pumps. Most piping with the water treatment plant is comprised of PVC plastic pipe with threaded (Sch. 80) and glued (Sch. 40) fittings. These connections have failed numerous times causing water leaks, loss of service and potential damage to the electrical equipment due to water intrusion of the electrical components. In March, 2018, the plumbing has been replaced with copper pipe. The remaining plastic pipe consists of two four inch main line penetrations through the floor slab to serve deliver water to the storage tank and to the Zone #1 residences. The static pressure at the plant is 100 psi (to tank overflow) with pressure upwards of 140 psi in the pipes before the filters to overcome the pressure drop across the 3 stages of filters.

Monitoring for turbidity and chlorine residual are constantly monitored and recorded as referenced on pages 5 and 6 above.

Due to seasonal high ground water, the plant experiences an increase in the raw water turbidity when Mud Spring Creek flows from one to two months in the late spring associated with the seasonal snow melt period for the drainage basin above the treatment plant. The ORC is presently recording TOC (total organic content) and particulate size levels prior to the runoff and will collect TOC levels when the turbidity levels are high. The major issue with the higher turbidity is the filter bags will collect sediment much more frequently than the rest of the year. Thus, the bags must be replaced very frequently (~ once/week or at times once per day) and the cost is extremely expensive during this period of time. Also, the flow rate has been adjusted lower due to the increased pressure drop as the filters clog with sediment. The water treatment plant design flow of 60 gpm had to be reduced to a very low amount of 6 gpm (10% capacity) to extend service life of the filters. System replenishment is compromised at this level of treatment. Until the results of the TOC levels and particulate analysis is complete, only projected improvements can be assumed until the analysis is complete. From the prior season, the ORC has noticed that there is an increase in sediment and to provide longer filter runs, two new Harmsco Industrial bag filters Model HUR 1X170FL-XP with a surface area of 170 square feet have been installed upstream of the current filter trains. These filters are intended to capture the seasonal sediment to lengthen the service life of the StrainRite filters. Currently these have been put into operation and to date, they are extending the service of the final filters. These will be tested this year if Mud Spring Creek has normal runoff that has plagued the system seasonally.

Controls to operate the water treatment plant to maintain tank levels are based upon the storage tank level and the treatment system is operated when a call for water is sent to the pumps to turn on. Currently an older radio system sends signals from the water tank to the pumps in the treatment plant. There are also controls to operate the system via a timer and one via a pressure switch that monitors the static pressure. All of the systems have been in operation for many year and all have inherent issues. There are no SCADA sensors in the system to allow the ORC to monitor the system remotely. Thus any autodialer call requires the operator to physically go to the plant to determine what issues need assistance. The water plant has seen

some upgrades in equipment over time, with the plastic plumbing pipes being replaced with copper during March, 2018. These improvements will ensure the system is more secure, reliable and safe. Since all electrical controls are housed in the same room, safety is paramount. The building, plumbing, wiring and controls should all be upgraded. The concrete slab around the spring is in need of repair, although the main slab for the treatment system components is in good shape. Communication between the water tank and water treatment plant should be improved with a direct radio signal communication to enhance operations.

Replacement of the entire structure has been suggested in the past with some board members, but space is limited and a full relocation could be problematic due to space constraints. In our past review, some structural members may need replacement along the walls where water damage over the years rotted some studs. The only way to truly assess the condition would be to remove at least the lower four feet of fiber panel sheathing and check the conditions. If the interior sheathing is removed, a fiberglass waterproof paneling can be applied to limit any future damage from water spills, pipe breaks, etc.

E. Water Booster Station (Zone #3)

To serve the upper lots within the subdivision, a water booster station is located in a buried vault near the water tank on the northwest corner of the intersection of Sortais Drive and Nusbaum Road. The vault is a concrete structure with locking hatch, access ladder, pressure pumps, pressure tanks and controls. Since the vault is buried, a sump pump is provided to ensure any water intrusion or water seeps are collected and discharged to a surface swale to drain away from the tank.

The system has been upgraded to a constant pressure VFD controlled pump system and includes an Aquavar AB-II variable speed pump controller for Gould's pumps to provide varied flow based on demand. The system plumbing is comprised of hard (metal pipe), PEX piping and PVC plastic pipes. Overall the system appears to function well with limited work and maintenance required by the ORC.

Some surface grading could be performed to ensure snowmelt runoff is properly directed away from the hatch.

V. Alternatives Considered

A. Distribution System and Water Service/Metering

i. Description

As stated above in the report the majority of the water distribution piping has exceeded its useful life in Zone #1. With lower pressures system pressures and better ground conditions for Zones #2 and #3, the pipeline issues are not as prevalent in these areas.

Replacement of the water mains, service lines and meter assemblies in Zone #1 is considered a priority. Zone #2 and #3 need to be monitored and scheduled for review in the future. Due to the number of leaks, poor service connections and observed poor pipe bedding in areas where repairs have been performed, the only viable option has been determined to replace the water mains to reduce the excessive leakage.

The replacement project may be in phases due to construction costs. Also, if additional valves were installed in the existing system, isolation of the worse sections of line might be determined. This would allow the worse areas to be replaced first and to continue with the remainder of the project as funds become available. New valves installed in the existing system could be re-used as warranted for the new pipe installation to recoup some costs. Acoustic leak detection firms might be warranted to determine if spots leakage areas could be pinpointed. This assessment could allow smaller sections of pipe to be repaired and hopefully reduce the system losses.

ii. Design Criteria

As the FRE water system is regulated by the Colorado Department of Public Health and Environment (CDPHE), the water system improvements will be designed in accordance with CDPHE and AWWA criteria. These design criteria and capacity planning are detailed in CDPHE publications titled; *New Water System Capacity Planning Manual* and *Design Criteria for Potable Water Systems (Revision date December 15, 2017)*.

All water facilities must meet the requirements of the Safe Drinking Water Act (Pub. L. 93-523) and provide water of a quality that meets the current Interim Primary Drinking Water Regulations (40 CFR 141).

iii. Map

Refer to Appendix B for the location and schematic layout of the proposed water main alignment for future water main replacement.

iv. Land Requirements

The current water mains follow the existing subdivision roads which are dedicated to the public and as such are maintained by the La Plata County Road and Bridge Department. There are areas along the roads where property is owned by the Association and some pipelines presently cross in the back of lots for convenience of construction when initially installed. It is proposed to contain construction within the existing platted right of ways. There may be the need for some temporary construction easements in areas where space may be limited.

v. Construction Problems

Based upon review of NRCS Soils information, site observation and consultation with the ORC there will be difficult sections of pipeline to construct. High ground water is present in the area of Zone #1 and the Pescar fine sandy loam soil contains large amounts of gravel. This soil type covers the entire Zone #1 area. Excavation along the county roads may require dewatering for construction. Directional drilling methods are possible so long as the bore hole does not

collapse due to the cobble and ground water. Length of directional drilling runs are probably in the 300 to 400 lineal feet range. Alternatively, pipe burst methods are possible, however, this method could limit service to more users for longer periods of time.

With the county owning the roads, a utility permit will be necessary and impacts to the county road system need to be minimized due to the backfill and road crossing requirements. The county requirements for any utility construction must comply with their current standards and specifications.

Along the route existing utilities exist (overhead and underground) and, to date, the actual location of the existing water main is not well defined. The existing pipeline does not have a tracer wire and there are long lengths between isolation valves. Some valves do not function and have not been properly exercised over the years.

vi. Cost Estimate

Material costs were obtained from a variety of sources including vendors, regional representative projects, and local contractors. The costs associated with construction, design, and O&M, for each phase of water main replacement is listed in the Tables below:

ENGINEER'S ESTIMATE OF PROJECT COST					
FLORIDA RIVER ESTATES					
WATER MAIN REPLACEMENT - PHASE 1 (Zone#1)					
Item	Description	Unit	Qty	Unit Cost	Cost
A	General				
1	Mobilization	LS	1	\$10,000.00	\$ 10,000
2	Bonding and Insurance	LS	1	\$ 7,500.00	\$ 7,500
3	Potholing & Investigation	HR	24	\$ 275.00	\$ 6,600
4	Cl. 6 ABC 3/4 inch Gravel Road Base for Road Rehabilitation	CY	300	\$ 42.00	\$ 12,600
5	Concrete Flow Fill	CY	100	\$ 160.00	\$ 16,000
B	Water Line				\$ -
1	Connect to Existing Water Mains.	EA	1	\$ 3,000.00	\$ 3,000.00
2	Bored 4" HDPE Waterline Installation (Complete)	LF	100	\$ 150.00	\$ 15,000
3	F&I 4" PVC C-900 DR-18 (Incl. Trenching, Bedding, Backfill)	LF	5,300	\$ 35.00	\$ 185,500
4	F&I 4" End Cap (Incl. Thrust Block)	EA	6	\$ 350.00	\$ 2,100
5	F&I 4" Bend Fitting (Incl. Thrust Block)	EA	17	\$ 670.00	\$ 11,390
6	F&I 4" Tee Fitting (Incl. Thrust Block)	EA	4	\$ 720.00	\$ 2,880
7	F&I 4" Gate Valve (Complete)	EA	7	\$ 1,600.00	\$ 11,200
8	1" Flushing Yard Hydrant	EA	2	\$ 600.00	\$ 1,200
9	F & I Water Service with 1" Service Line, tap, Meter Pit, Yoke and meter. Trench to be directional drilled.	EA	41	\$ 1,750.00	\$ 71,750
10	Tracer Wire	LF	6,150	\$ 0.60	\$ 3,690
				Total Construction Cost	\$ 360,410
				Administration/Engineering/Construction Management	\$ 42,000
				Contingency at 15%	\$ 54,062
				Total Project Cost	\$ 456,472

ENGINEER'S ESTIMATE OF PROJECT COST					
FLORIDA RIVER ESTATES					
WATER MAIN REPLACEMENT - PHASE 2 (Zone #2 subdivision connector)					
Item	Description	Unit	Qty	Unit Cost	Cost
A	General				
1	Mobilization	LS	1	\$ 5,000.00	\$ 5,000.00
2	Bonding and Insurance	LS	1	\$ 2,000.00	\$ 2,000.00
3	Potholing & Investigation	HR	8	\$ 275.00	\$ 2,200.00
4	Cl. 6 ABC 3/4 inch Gravel Road Base for Road Rehabilitation	CY	10	\$ 42.00	\$ 420
5	Concrete Flow Fill	CY	40	\$ 160.00	\$ 6,400
B	Water Line				\$ -
1	Connect to Existing Water Mains.	EA	1	\$ 3,000.00	\$ 3,000.00
2	Bored 4" HDPE Waterline Installation (Complete)	LF	150	\$ 150.00	\$ 22,500.00
3	F&I 4" PVC C-900 DR-18 (Incl. Trenching, Bedding, Backfill)	LF	1,240	\$ 35.00	\$ 43,400.00
4	F&I 4" End Cap (Incl. Thrust Block)	EA	1	\$ 350.00	\$ 350.00
5	F&I 4" Bend Fitting (Incl. Thrust Block)	EA	7	\$ 670.00	\$ 4,690.00
6	F&I 4" Gate Valve (Complete)	EA	3	\$ 1,600.00	\$ 4,800.00
9	F & I Water Service with 1" Service Line, tap, Meter Pit, Yoke and meter. Trench to be directional drilled.	EA	1	\$ 1,750.00	\$ 1,750.00
10	Tracer Wire	LF	1,390	\$ 0.60	\$ 834.00
				Total Construction Cost	\$ 97,344
				Administration/Engineering/Construction Management	\$ 13,000
				Contingency at 15%	\$ 14,602
				Total Project Cost	\$ 124,946

ENGINEER'S ESTIMATE OF PROJECT COST					
FLORIDA RIVER ESTATES					
WATER MAIN REPLACEMENT - PHASE 4 (Zone#3)					
Item	Description	Unit	Qty	Unit Cost	Cost
A	General				
1	Mobilization	LS	1	\$ 5,000.00	\$ 5,000
2	Bonding and Insurance	LS	1	\$ 1,200.00	\$ 1,200
3	Potholing & Investigation	HR	24	\$ 275.00	\$ 6,600
4	Cl. 6 ABC 3/4 inch Gravel Road Base for Road Rehabilitation	CY	50	\$ 42.00	\$ 2,100
5	Concrete Flow Fill	CY	15	\$ 160.00	\$ 2,400
B	Water Line				\$ -
1	Connect to Existing Water Mains.	EA	1	\$ 3,000.00	\$ 3,000.00
2	F&I 4" PVC C-900 DR-18 (Incl. Trenching, Bedding, Backfill)	LF	850	\$ 35.00	\$ 29,750
3	F&I 4" End Cap (Incl. Thrust Block)	EA	1	\$ 350.00	\$ 350
4	F&I 4" Bend Fitting (Incl. Thrust Block)	EA	2	\$ 670.00	\$ 1,340
5	F&I 4" Gate Valve (Complete)	EA	1	\$ 1,600.00	\$ 1,600
6	1" Flushing Yard Hydrant	EA	1	\$ 600.00	\$ 600
7	F & I Water Service with 1" Service Line, tap, Meter Pit, Yoke and meter. Trench to be directional drilled.	EA	7	\$ 1,750.00	\$ 12,250
8	Tracer Wire	LF	850	\$ 0.60	\$ 510
				Total Construction Cost	\$ 66,700
				Administration/Engineering/Construction Management	\$ 25,000
				Contingency at 15%	\$ 10,005
				Total Project Cost	\$ 101,705

vii. Advantages / Disadvantages

Compared to retaining the existing distribution system the **advantages** of a new water main system include:

- Reduced finished water treatment volume will utilize less electrical cost, filter bag replacement, emergency repairs.
- New water meters will ensure proper billing for actual water use.
- Less wear and tear on pumps at the water treatment plant
- Reduced annual O&M costs
- Provides increased water storage capacity.

Compared to not replacing the water mains, the **disadvantages** of no replacement includes:

- Increased service disruptions to customers due to system breaks and down time to repair.
- Potential for contamination due to leaks and repairs.
- Not in compliance with the State due to excessive system losses.

B. Storage

i. Description

As noted in the sanitary surveys minor work is recommended for the storage tank exterior. A new roof hatch, exterior ladder with safety cage and cathodic protection are recommended. Overall most work can be considered routine maintenance with the exception of the hatch and cathodic protection. Clearing the project site, and filling along the grade ring with gravel will ensure the tank is fully supported and drainage is directed away from the tank. Some touch up paint is suggested to limit spot rusting. An air/vacuum relief valve located downstream of the tank isolation valve should be installed when water mains are replaced at the tank to ensure lines can drain properly when required.

The addition of water plant controls is listed in the next section, since they are for operation of the water treatment plant.

ii. Design Criteria

As the FRE water system is regulated by the Colorado Department of Public Health and Environment (CDPHE), the water system improvements will be designed in accordance with CDPHE and AWWA criteria. These design criteria and capacity planning are detailed in CDPHE publications titled; *New Water System Capacity Planning Manual* and *Design Criteria for Potable Water Systems (Revision date December 15, 2017)*.

All water facilities must meet the requirements of the Safe Drinking Water Act (Pub. L. 93-523) and provide water of a quality that meets the current Interim Primary Drinking Water Regulations (40 CFR 141).

iii. Map

Refer to Appendix A for the proposed improvements at the storage tank.

iv. Land Requirements

No land issues are present since the tank site is a deeded parcel to the FRE HOA.

v. Construction Problems

No adverse construction issues are present. Minor clearing and grubbing will not disturb any utilities buried at the site. Direct access to the tank exists.

Tank blasting/sanding and coating (painting) work cannot be performed between November and March due to weather constraints and should be done in favorable weather.

vi. Cost Estimate

Material costs were obtained from a variety of sources including vendors, regional representative projects, and local contractors. The costs associated with construction, design, and O&M, for each type of surface tank considered is presented in the following Table:

ENGINEER'S ESTIMATE OF PROJECT COST					
FLORIDA RIVER ESTATES WATER STORAGE TANK					
Item	Description	Unit	Qty	Unit Cost	Cost
A	General				
1	Mobilization	LS	1	\$ 800.00	\$ 800
2	Bonding and Insurance	LS	1	\$ 300.00	\$ 300
3	Clearing and Grubbing	LS	1	\$ 1,500.00	\$ 1,500
B	Water Storage Tank				
1	F & I Roof Access Hatch w/ lock, (Complete)	EA	1	\$ 900.00	\$ 900
2	Exterior Ladder w/ Cage and locking security door. (Complete)	EA	1	\$ 1,200.00	\$ 1,200
3	Cathodic Protection (passive system)	LS	1	\$ 1,000.00	\$ 1,000
4	Add Cl. 6 ABC gravel under tank edges and around tank.	CY	15	\$ 80.00	\$ 1,200
5	Touch up paint on Exterior (sand and paint)	SF	30	\$ 15.00	\$ 450
				Total Construction Cost	\$ 7,350
				Administration/Engineering/Construction Management	\$ 1,500
				Contingency at 15%	\$ 1,103
				Total Project Cost	\$ 9,953

vii. Advantages / Disadvantages

There are two choices regarding the existing tank: do nothing or perform the remedial work.

The **advantages** of maintaining the tank:

- Extended life span of tank.
- Better drainage from site
- Easier inspection of facility
- Safety for operator to access the tank interior.
- Complies with CDPHE Sanitary Survey recommendations.

The **disadvantages** of maintaining the tank:

- Exterior degradation will continue
- Does not comply with State recommendations

C. Water Treatment Plant

i. Description

The water treatment plant is currently in compliance with the CDPHE guidelines, but operationally many items should be considered for safety, security, routine operations and maintaining a properly functioning water treatment plant.

ii. Design Criteria

As the FRE water system is regulated by the Colorado Department of Public Health and Environment (CDPHE), the water system improvements will be designed in accordance with

CDPHE and AWWA criteria. These design criteria and capacity planning are detailed in CDPHE publications titled; *New Water System Capacity Planning Manual* and *Design Criteria for Potable Water Systems (Revision date September 1, 2013)*.

All water facilities must meet the requirements of the Safe Drinking Water Act (Pub. L. 93-523) and provide water of a quality that meets the current Interim Primary Drinking Water Regulations (40 CFR 141).

iii. Map

Refer to Appendix A for the location and schematic layout of the water treatment plant.

iv. Land Requirements

Currently the water treatment plant building appears to be within Association property, nestled between CR 248 (Estates Road) and the undeveloped Carol Circle (County property). A utility permit was obtained from the county for installation of the expanded chlorine contact chamber which lies outside the Association property. The earlier installed chlorine contact chamber appears to lie in the Carol Circle property as well. There is limited room in the immediate area to relocate the water treatment plant if this option were to be explored. The plant, if ever relocated could be on the same parcel, but moved to the west. The Sortais spring is within the Association property.

v. Construction Problems

There has been consideration in past years about the potential to relocate and construct a new treatment plant building. The current building houses the Sortais Spring, which due to legal water rights should remain in the existing location. It appears there is no construction data on the spring, but observation shows a concrete manhole was installed at the spring and the building subsequently constructed adjacent and around the spring. Due to the shallow depth of the spring, there is not an issue on servicing the submersible pumps within the spring.

The concrete pad around the spring has settled and cracked excessively, but still functions. The slab beyond the spring is well constructed and performs adequately. Any work within the building to add floor drains or to repair the slab around the spring is problematic, since the plant needs to remain in operation except for low water use periods when there is sufficient reserves in the water plant to allow plant shutdown for any work envisioned.

The water treatment plant building appears to be within Association property, nestled between CR 248 (Estates Road) and the undeveloped Carol Circle (County property). A utility permit was obtained from the county for installation of the expanded chlorine contact chamber which lies outside the Association property. The previous installed 8 inch chlorine contact chamber appears to lie in the Carol Circle property as well. There is limited room in the immediate area to relocate the water treatment plant if this option were to be explored. The plant if ever relocated could be on the same parcel, but moved to the west, with the spring having a cover installed.

vi. Cost Estimate

Material costs were obtained from a variety of sources including vendors, regional representative projects, and local contractors. The costs associated with construction, design, and O&M, for the water treatment plant and building are in the Table below:

ENGINEER'S ESTIMATE OF PROJECT COST					
FLORIDA RIVER ESTATES WATER TREATMENT PLANT					
Item	Description	Unit	Qty	Unit Cost	Cost
A	General				
1	Mobilization	LS	1	\$ 4,000.00	\$ 4,000
2	Bonding and Insurance	LS	1	\$ 2,000.00	\$ 2,000
3	Potholing & Investigation	HR	4	\$ 275.00	\$ 1,100
B	Water Treatment Plant				
1	F & I 2 in. Type 'L' Copper solid plumbing to repalce existing plastic piping, (Complete) - NOTE - completed in March 2018.	LS	1	\$25,000.00	\$ 25,000
2	F & I Harsmco Filters and Connect to Ex. System (Currently under installation)	LS	1	\$ -	\$ -
3	Replumb internal pipe for Zone #1 and for Pipe to tank. Extend 5 lf beyond WTP	LS	1	\$ 5,000.00	\$ 5,000
4	Replace Zone #1 PRV valves and Water meters	LS	1	\$ 4,500.00	\$ 4,500
5	Replace VFD controllers for raw water submersible pumps	EA	2	\$ 4,000.00	\$ 8,000
6	Rehabillate building with new studs where warranted and lower interior sheathing	LS	1	\$10,000.00	\$ 10,000
7	Provide new SCADA system and new Pressure Transducer for tank level control system.	LS	1	\$20,000.00	\$ 20,000
8	Provde motorized ventillation system for summer use and replace existing electric heater. Upgrade electric for components	LS	1	\$12,000.00	\$ 12,000
9	Replace Strainrite Filters with Harsmco Filters, 2 units, complete in place.	LS	1	\$15,000.00	\$ 15,000
10	Replace concrete slab around spring	LS	1	\$ 7,000.00	\$ 7,000
Total Construction Cost					\$ 113,600
Administration/Engineering/Construction Management					\$ 17,000
Contingency at 15%					\$ 17,040
Total Project Cost					\$ 147,640

vii. Advantages / Disadvantages

Compared to alternatives considered in this report, the **advantages** of upgrades to the water treatment plant include:

- System safety for operator and controls.
- Reduction in filter bag replacement (lower O & M cost)
- Improved controls and SCADA allows ORC to monitor and troubleshoot issues effectively.
- No impacts to the existing spring.

Compared to alternatives considered in this report, the **disadvantages** of not upgrading the water treatment plant include:

- Continued pipe breaks and leaks, causing system shutdown.
- Electrical controls might be ruined with water intrusion and the need for replacement.
- Non safe environment for the ORC and personnel accessing the facility.
- Potential for contamination of water supply.
- Excessive maintenance costs for all plumbing, piping electrical and building.

VI. Recommended Alternative

Selection of an Alternative and sequence of work depends on several factors. The most significant will be available funds for the FRE HOA to complete the selected Alternative. Fortunately, most improvements can be performed in a phased schedule based on available fund and the ability to obtain grants and / or low interest loans in the future.

A. Project Design

The project design should include replacement of the water mains, valves and water service connections. The water storage tank should implement the recommendations from the storage tank inspection report. Continued improvements to the water plant, including SCADA controls needs to continue. Providing these upgrades will provide capital expense, but ensure a reliable and safe water system well into the future. New water mains will have a 75 years life cycle which is the backbone of the water system. The tank with proposed improvement will extend the useful tank life for at least twenty to thirty years. Water plant upgrades extends the plant for at least twenty years, although some equipment such as pumps and motors will see 10 to 15 year life cycle. New plant plumbing will exceed the twenty year life cycle.

B. Cost Estimate

The budgetary cost estimate, for the proposed overall system improvements is roughly \$1.57 Million dollars (\$1,570,000). A proposed priority list of improvements is listed in the Conclusion and Recommendations.

VII. Conclusions and Recommendations

i. Distribution System

It is the recommendation of this PER that installation of new water mains and water meters be implemented. The FRE HOA has been proactive with increasing tiered rate water fees and the establishment of a capital account to cover improvements. The Zone #1 replacement should be a high priority to control costs associated with excess usage, and promote water conservation. New meters would also allow the Association to better track and bill for customer water usage and to compare to plant production. This will address the deficiencies and observations detailed in the Sanitary Survey. The FRE HOA should implement a water metering and cross connection control program to maintain compliance with regulations.

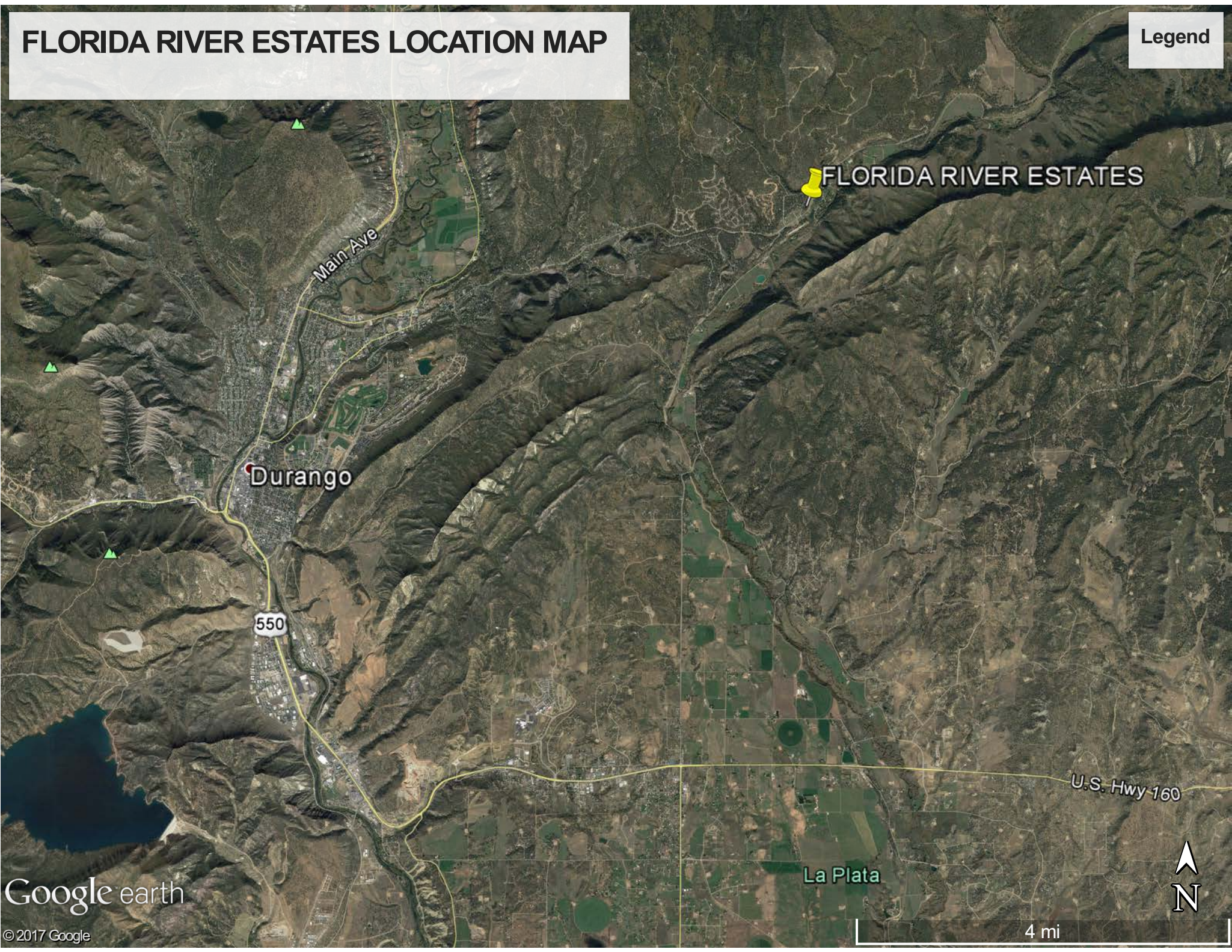
ii. Storage

The recommendations noted in the storage tank inspection should be performed. This will bring the tank into compliance with the current CDPHE regulations. Also, the improvements will extend the service life of the tank and safety of all personnel is enhanced.

APPENDIX A

FLORIDA RIVER ESTATES LOCATION MAP

Legend



FLORIDA RIVER ESTATES

Durango

550

U.S. Hwy 160

La Plata

Google earth

© 2017 Google

4 mi



FLORIDA RIVER ESTATES WATER DISTRIBUTION SYSTEM

LOCATED IN PORTIONS OF SECTION 7 & 8, T 35 N, R 8 W, N.M.P.M.
LA PLATA COUNTY, COLORADO

SUBDIVISION BOUNDARY ZONE BOUNDARY

GENERAL WATER NOTES:

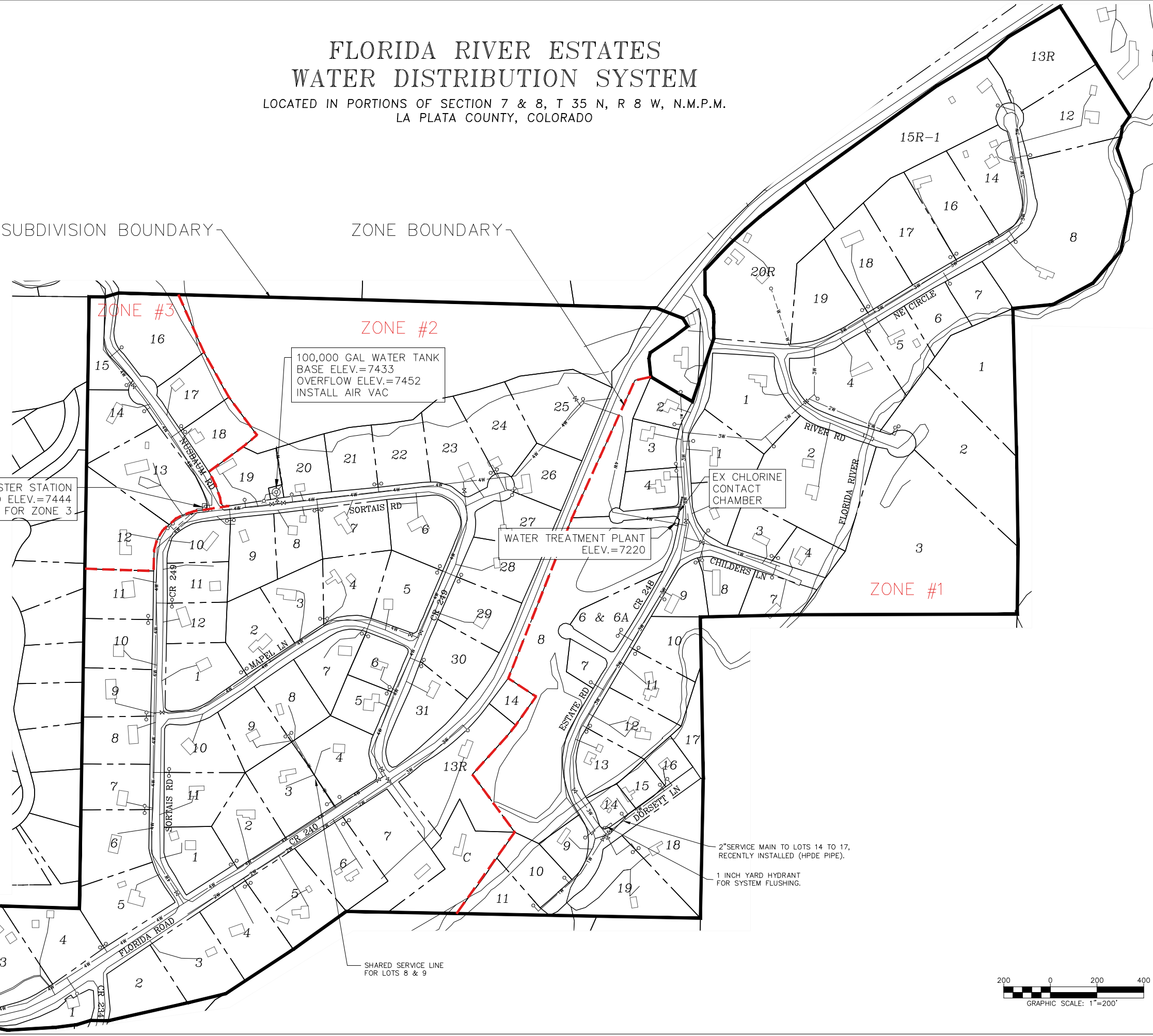
- ZONE 1:**
LOWER AREA ALONG RIVER CONTROLLED BY PRV STATION LOCATED IN WATER TREATMENT PLANT.
- ZONE 2:**
GRAVITY SYSTEM FED BY WATER STORAGE TANK.
- ZONE 3:**
PRESSURIZED ZONE SERVED BY BOOSTER STATION AT SORTAIS/NUSBAUM INTERSECTION.

LEGEND

— W —	EX. WATER MAIN (SIZE NOTED)
○ ○	EX. DOUBLE WATER SERVICE
○	EX. SINGLE WATER SERVICE
X	EX. WATER VALVE
— P —	P. WATER MAIN (SIZE NOTED)
X	P. WATER VALVE

NOTES:

1. CONTOUR AND PLANIMETRIC INFORMATION AS SHOWN HEREON WAS OBTAINED FROM THE LA PLATA COUNTY GIS DATA BASE AND HAS NOT BEEN INDEPENDENTLY FIELD VERIFIED BY GOFF ENGINEERING AND SURVEYING, INC. ACTUAL GROUND CONDITIONS AND CONTOURS MAY VARY.
2. WATER MAIN INFORMATION FROM EXISTING "EXHIBIT A" WATER SYSTEMS MAP FROM H.O.A. & MARK-UPS FROM SYSTEM OPERATOR.



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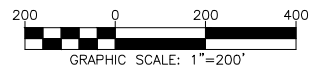
**FLORIDA RIVER ESTATES
WATER DISTRIBUTION SYSTEM**
LA PLATA COUNTY, COLORADO

Issue Record:
PER REPORT 04-02-2018

Revisions:

Project Number: 17-195
Drawn By: CTH
Designed by: CTH
Checked By: BAH

Sheet
C1.0
EXISTING
CONDITIONS
MAP



2" SERVICE MAIN TO LOTS 14 TO 17, RECENTLY INSTALLED (HPDE PIPE).
1 INCH YARD HYDRANT FOR SYSTEM FLUSHING.

SHARED SERVICE LINE FOR LOTS 8 & 9

1" EX. SERVICE MAIN TO LOTS 2 & 3

FLORIDA RIVER ESTATES CHLORINE CONTACT CHAMBER EXTENSION PROJECT

PROJECT DESCRIPTION

INSTALLATION OF APPROXIMATELY 220 LINEAL FEET OF 18-INCH C-905 DR-18 PVC WATERLINE. PROJECT INCLUDES TWO (2) CONNECTIONS TO EXISTING WATERLINE. CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL, LANDSCAPE RESTORATION TO MATCH EXISTING AND DESIGN AND IMPLEMENTATION OF AN EROSION CONTROL PLAN TO ENSURE SEDIMENT IS NOT CARRIED TO THE ADJACENT POND.

SPECIFIC PROJECT NOTES:

- ALL TIE-INS TO THE EXISTING WATER SYSTEM SHALL BE COORDINATED WITH THE ENGINEER AND OPERATOR. EXISTING SYSTEM SHALL REMAIN IN SERVICE AT ALL TIMES EXCEPT FOR THE TIE-INS AND SHALL BE COORDINATED TO ENSURE THE WATER TANK IS FULL AND THE TIMING FOR THE INTERRUPTION IS FULLY COORDINATED WITH THE OWNER AND HIS REPRESENTATIVES.
- ALL FITTINGS SHALL INCLUDE MECHANICAL JOINT RESTRAINT IN ADDITION TO CONCRETE THRUST BLOCKS.
- THE CONTRACTOR SHALL PERFORM THE REQUIRED WORK AS PER THESE PLANS AND SPECIFICATIONS.
- ALL WORK IS OUTSIDE THE TRAFFIC AREAS, BUT CARE MUST BE EXERCISED WHEN WORKING NEAR TRAFFIC. PROPER TRAFFIC CONTROL SHALL BE PROVIDED AS WARRANTED.
- THE EXISTING WATER MAINS SHALL REMAIN IN SERVICE DURING THE NEW LINE CONSTRUCTION. IF AN EXISTING WATER MAIN MUST BE TAKEN OUT OF SERVICE FOR TIE-IN PURPOSES, THE CONTRACTOR IS REQUIRED TO OBTAIN APPROVAL TO INTERRUPT WATER SERVICE FROM THE WATER SYSTEM OPERATOR AT LEAST 24 HOURS PRIOR TO SHUTTING OFF THE MAIN.

GENERAL WATER NOTES:

- ALL WATER MAIN PIPING SHALL BE AWWA C-900 OR C-905 DR 18 PVC PIPE, AS REQUIRED.
- ALL WATER MAIN FITTINGS SHALL BE DUCTILE IRON PIPE, CLASS 52, COMPLYING WITH AWWA C-150.
- ALL PIPE LINES SHALL BE BURIED A MINIMUM OF FOUR FEET, AND BEDDED TO 12" ABOVE THE PIPE, UNLESS OTHERWISE APPROVED AS NOTED ON THE PLANS.
- ALL LINES SHALL BE PRESSURE TESTED PER AWWA STANDARDS. MINIMUM TEST PRESSURE SHALL BE 150 PSI FOR A MINIMUM OF ONE HOUR. A LEAKAGE TEST SHALL BE PERFORMED PER AWWA STANDARDS.
- THE MINIMUM FACE AREA FOR ALL THRUST BLOCKS SHALL BE AS SHOWN IN THE THRUST BLOCK TABLE.
- WHERE MINOR BENDS ARE SHOWN FOR WATER LINES, DEFLECTION IS TO BE TAKEN IN JOINTS NO GREATER THAN 3 DEGREES OR THAT RECOMMENDED BY THE MANUFACTURER, WHICHEVER IS MORE RESTRICTIVE. FOR THE 18 INCH PVC PIPE, THE JOINT DEFLECTION SHALL BE 1.5 DEGREES MAXIMUM, AS RECOMMENDED.

MATERIAL QUANTITIES

##	DESCRIPTION	QUANTITY	UNIT
EXTENSION OF CHLORINE CONTACT CHAMBER			
1.	18" C-905 DR 18 PVC WATERLINE	310	L.F.
2.	8" C-900 DR 18 PVC WATERLINE	10	L.F.
3.	18" DIP 90° M.J. FITTINGS, WITH MEGALUGS	2	E.A.
4.	18" x 8" DIP M.J. REDUCER W/ MEGALUGS	2	E.A.
5.	8" DIP M.J. 45° FITTINGS, W/ MEGALUGS	3	EACH
6.	8" DIP M.J. 22-1/2° FITTINGS W/ MEGALUGS	1	EACH
7.	THRUST BLOCKS	8	EACH
8.	2" DOW BLUEBOARD - 4'x8' SHEETS	28	EACH

NOTE - BLUEBOARD ONLY REQ'D FOR SHALLOW COVER

GENERAL NOTES:

- THE CONTRACTOR MUST BE FAMILIAR WITH THE PROPOSED PROJECT'S EXISTING CONDITIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, DIFFICULT CONSTRUCTION AROUND EXISTING TREES AND UTILITIES, CONNECTING TO EXISTING WATER LINES AND SMALL VERTICAL GRADE ADJUSTMENTS NECESSARY TO AVOID CONSTRUCTION CONFLICTS. THE CONTRACTOR MUST ADJUST PRICING TO ACCOUNT FOR THESE DIFFICULT CONSTRUCTION SITUATIONS. NO COMPENSATION SHALL BE GIVEN FOR EXISTING SURFACE CONDITIONS THAT MAY CAUSE DIFFICULT FIELD CONSTRUCTION MODIFICATIONS. CONTRACTOR SHALL EXPECT EXCAVATION TO INCLUDE INDIVIDUAL ROCKS OF VARYING SIZE, SOME TO BE VERY LARGE.
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THESE PLANS AND SPECIFICATIONS AS SHALL BE MATCH INDUSTRY STANDARDS. ALL WORK SHALL BE INSPECTED AND APPROVED BY PERSONNEL OF THE OWNER.
- THE CONTRACTOR SHALL NOTIFY THE OWNER, TWENTY-FOUR (24) HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FOLLOWING:
 - THE LOCATION OF ALL UTILITY LINES, BOTH HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION. THE UTILITIES SHOWN ON THE DESIGN DRAWINGS ARE FROM UTILITY MAPS AND SURFACE EVIDENCE AND MAY NOT REFLECT THE EXACT FIELD LOCATION.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PERMITS, FEES, OR TARIFFS REQUIRED FOR THE PROJECT. PERMITS, FEES, OR TARIFFS SHALL BE CONSIDERED INCIDENTAL TO THE WORK.
 - THE NOTIFICATION OF THE PROPER AUTHORITIES PRIOR TO CONSTRUCTION AND A PRE-CONSTRUCTION MEETING WITH THE OWNER'S REPRESENTATIVE.
 - PROVIDING THE OWNER WITH AN "AS CONSTRUCTED" RED LINED PRINT PRIOR TO FINAL ACCEPTANCE OF THE WORK.
 - THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.).
 - THE PROPER AND LEGAL DISPOSAL OF ALL DEMOLISHED AND EXCESS MATERIALS.
 - ALL BACKFILL, SOIL, AND ASPHALT COMPACTION AND QUALITY TESTS REQUIRED BY THE STANDARDS AND SPECIFICATIONS.
 - THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
 - ALL DIMENSIONS ARE TO THE CENTER OF PIPE AND CENTER OF FITTING.
 - PIPELINE STATIONING IS ALONG THE CENTER LINE OF THE NEW PIPE.
 - THE EXISTING WATER MAINS SHALL REMAIN IN SERVICE DURING THE NEW LINE CONSTRUCTION.
 - IF AN EXISTING WATER MAIN MUST BE TAKEN OUT OF SERVICE FOR TIE-IN PURPOSES, THE CONTRACTOR IS REQUIRED TO OBTAIN APPROVAL OF WATER SERVICE PERMIT FROM OWNER 24 HOURS PRIOR TO SHUTTING OFF THE MAIN.
 - THE CONTRACTOR SHALL REPAIR OR REPLACE THE EXISTING LANDSCAPING, IN KIND, THAT WAS REMOVED OR DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL GUARANTEE SAID LANDSCAPING FOR ONE (1) YEAR AFTER THE FINAL ACCEPTANCE OF THE CONSTRUCTION.
 - PIPE BEDDING - ALL PIPE BEDDING SHALL BE 3/4 INCH MINUS MATERIAL BEDDING WITH AT LEAST 12-INCHES OF BEDDING ABOVE THE PIPE AND AT LEAST 4-INCHES OF BEDDING BELOW THE BELLS. ALL BEDDING SHALL BE COMPACTED TO 90% MODIFIED PROCTOR (ASTM 1557).
 - BEDDING MATERIAL - ALL PIPE BEDDING MATERIAL SHALL BE 3/8" MINUS WASHED PEA GRAVEL, CONCRETE SAND, CL. 6 A.B.C GRAVEL OR OTHER MATERIAL AS APPROVED.
 - TRENCH BACKFILL - VEGETATED/NATIVE AREA: ALL TRENCH BACKFILL SHALL BE NATIVE MATERIAL SCREENED TO 3-INCH MINUS MATERIAL AND COMPACTED TO 90% MODIFIED PROCTOR IN ACCORDANCE WITH ASTM 1557 AT ±2% OPTIMUM MOISTURE CONTENT.
 - THE CONTRACTOR SHALL INFORM THE OWNER'S REPRESENTATIVE 24 HOURS IN ADVANCE WHEN TRENCH WILL BE READY FOR COMPACTION TESTS. THE CONTRACTOR SHALL OBTAIN A GEOTECHNICAL TESTING LABORATORY TO PERFORM ALL REQUIRED TESTS.
 - THE CONTRACTOR SHALL PROTECT, REPAIR OR REPLACE ANY UTILITY IN KIND INCLUDING BUT NOT LIMITED TO: RESIDENTIAL SERVICES, WATER LINES, SEWER LINES, STORM DRAINS, ETC., THAT WAS REMOVED OR DAMAGED DURING CONSTRUCTION.
 - CONTRACTOR IS ADVISED THAT UNDERGROUND WATER, SEWER, DRAINAGE, TELEPHONE, GAS, AND CABLE TV FACILITIES ARE LOCATED IN THE VICINITY OF THIS PROJECT. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE. OTHER UTILITIES MAY EXIST WHICH ARE NOT SHOWN ON THE PLANS INCLUDING SEWER AND WATER SERVICE CONNECTIONS.
 - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE TRUE AND CORRECT LOCATIONS OF EXISTING UTILITIES THAT MAY IMPACT EACH PORTION OF THE WORK. 48 HOURS PRIOR TO PERFORMING WORK, THE CONTRACTOR SHALL CONTACT THE UTILITY LOCATION SERVICE AT (800) 922-1987 (CALL 811). CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO COMMENCING CONSTRUCTION IF MARKED UTILITIES APPEAR TO CONFLICT WITH PROPOSED IMPROVEMENTS. THE COST OF LOCATING, PROTECTING AND ACCOMMODATING EXISTING UTILITIES SHALL BE INCIDENTAL TO THE COST OF THE PROJECT. IF AN ACTUAL CONFLICT REQUIRES RELOCATION OF AN EXISTING UTILITY OR THE REDESIGN OF THE PROPOSED IMPROVEMENT, THE CITY WILL DETERMINE IF EXTRA PAY IS WARRANTED TO ACCOMMODATE THE CHANGED OR UNFORESEEN CONDITION. MINOR HORIZONTAL OR VERTICAL ADJUSTMENTS OF THE PROPOSED IMPROVEMENTS TO AVOID CONFLICTS SHALL NOT ENTITLE THE CONTRACTOR TO EXTRA PAY.
 - CONTRACTOR MUST OBTAIN & COMPLY WITH ALL LOCAL, STATE, AND EPA REQUIREMENTS REGARDING STORMWATER PERMITTING, EROSION CONTROL AND DISCHARGE.

AGENCIES

DOMESTIC WATER
Florida River Estates HOA
Mike Amato, O.R.C.
(970) 247-2429

NATURAL GAS
Atmos Energy
1 (888) 442-1313
Emergency Phone No.
1 (800) 662-6185

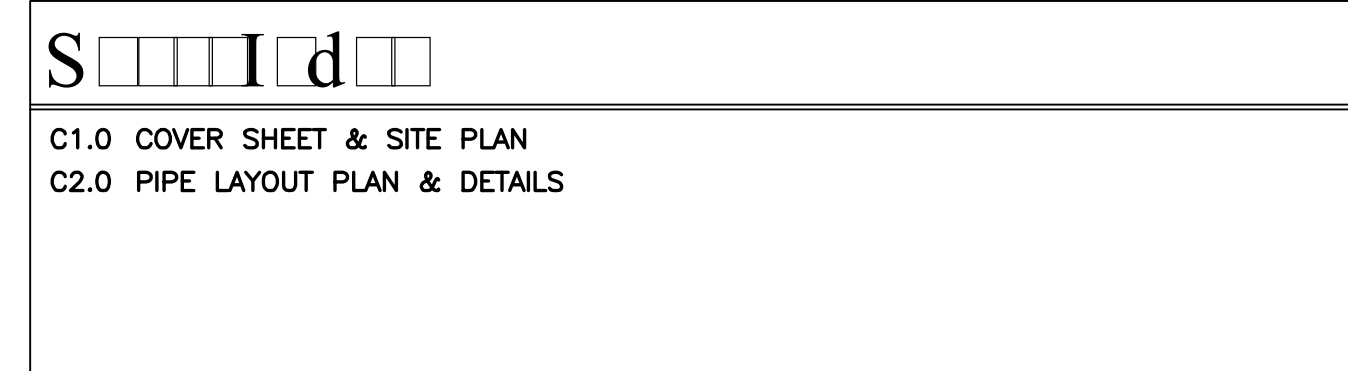
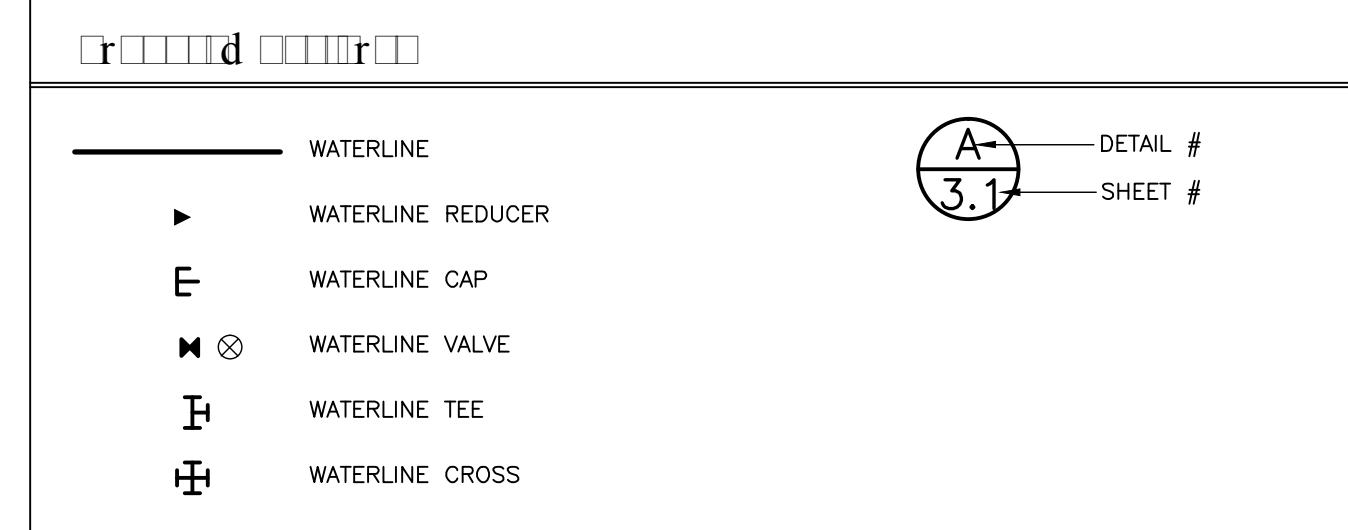
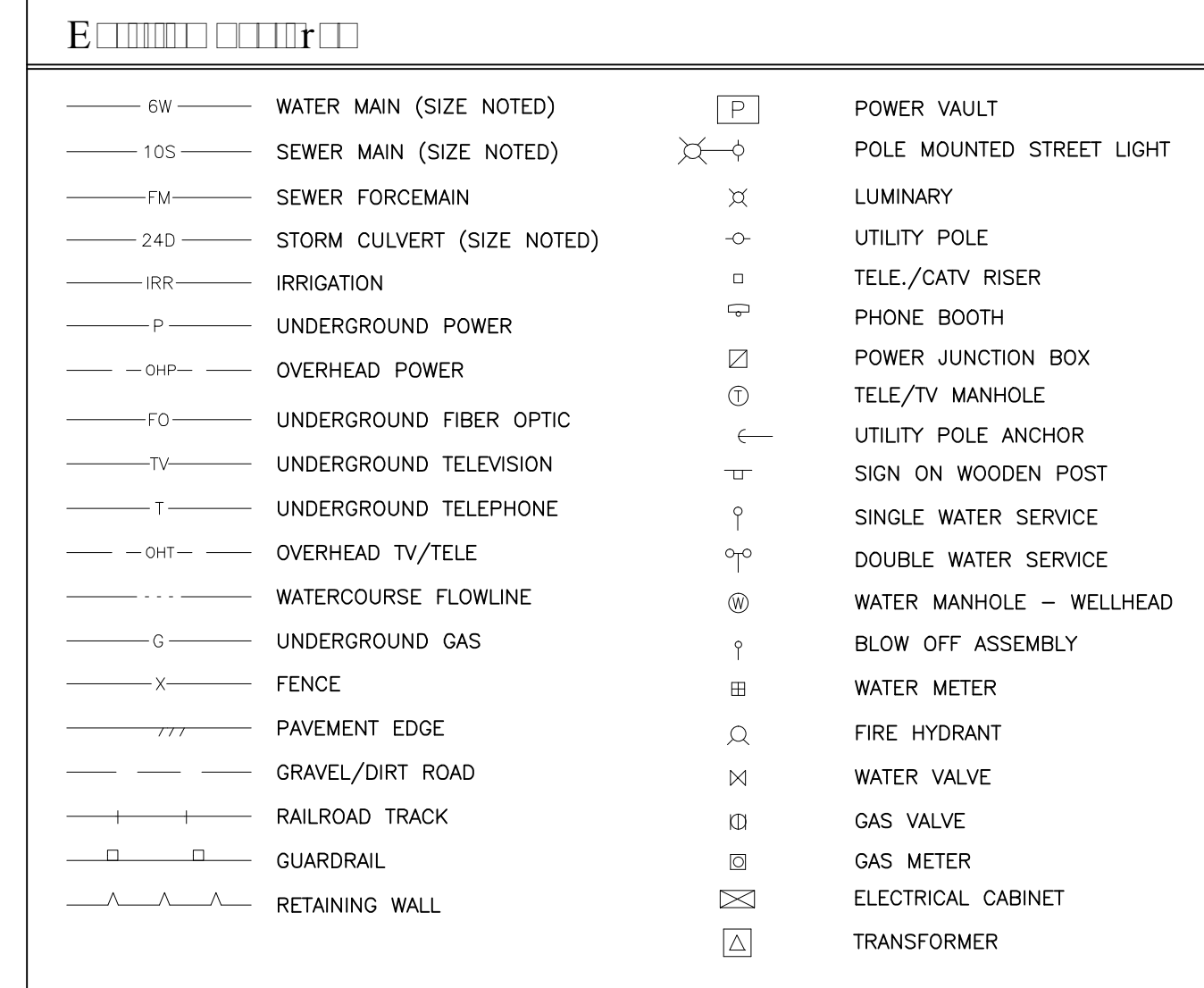
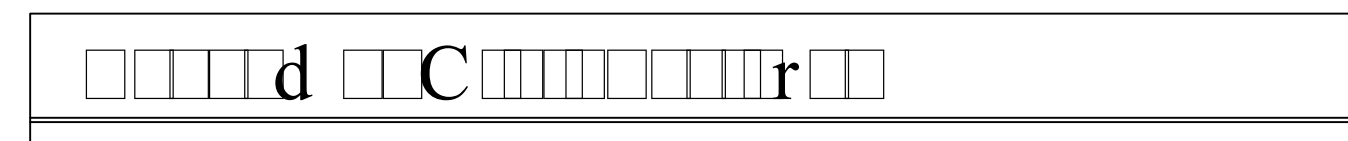
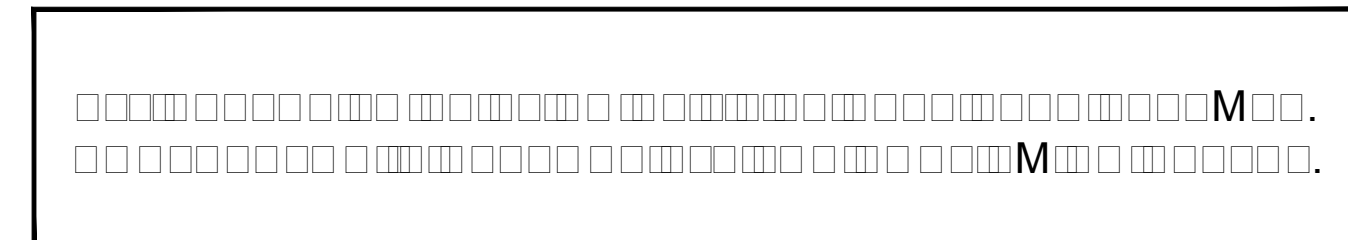
ELECTRICAL POWER
LPEA
45 Stewart Street
Durango, CO 81301
(970) 247-5788

CABLE TELEVISION
Bresnan Communications
146 East 15th Avenue
Durango, CO 81301
(970) 247-2681

TELEPHONE
Century Link
225 Sawyer Drive
Durango, CO 81301
(970) 259-1441



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FLORIDA RIVER ESTATES CHLORINE CONTACT PROJECT

DURANGO, COLORADO

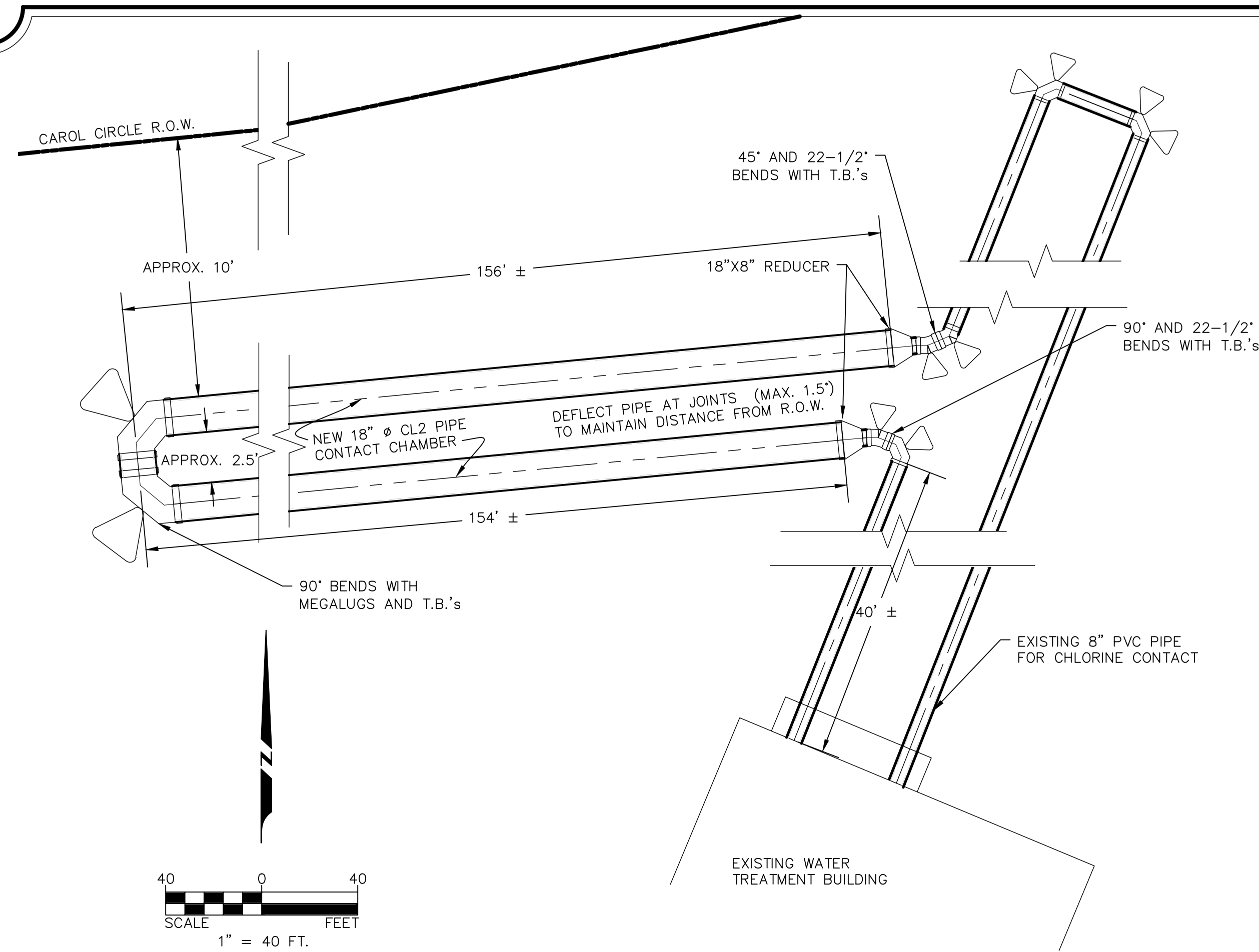
Issue Record:
REVIEW 12-15-2011

Revisions:
EXPAND CL2 CHAMBER 08-21-2012

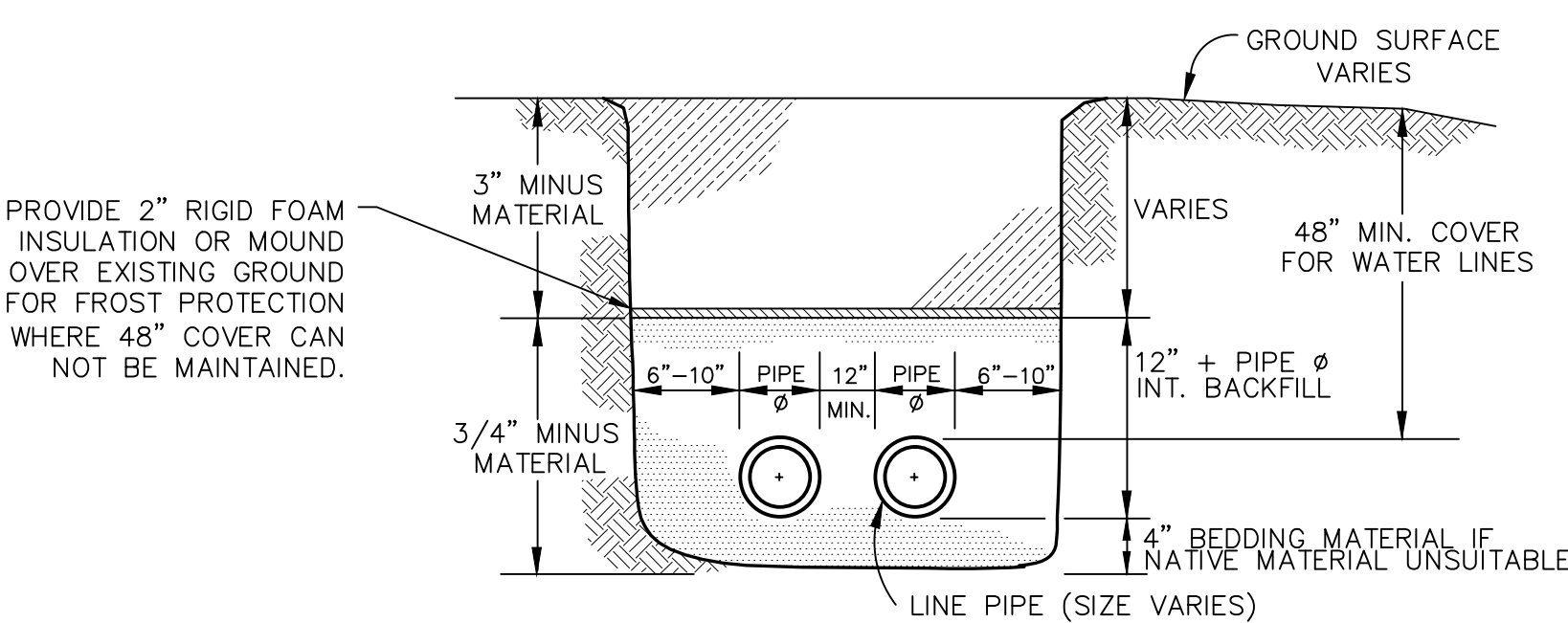
Project Number: 11-001
Drawn By: RCM
Designed by: BAH
Checked By: BAH

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C1.0

COVER SHEET
SITE PLAN

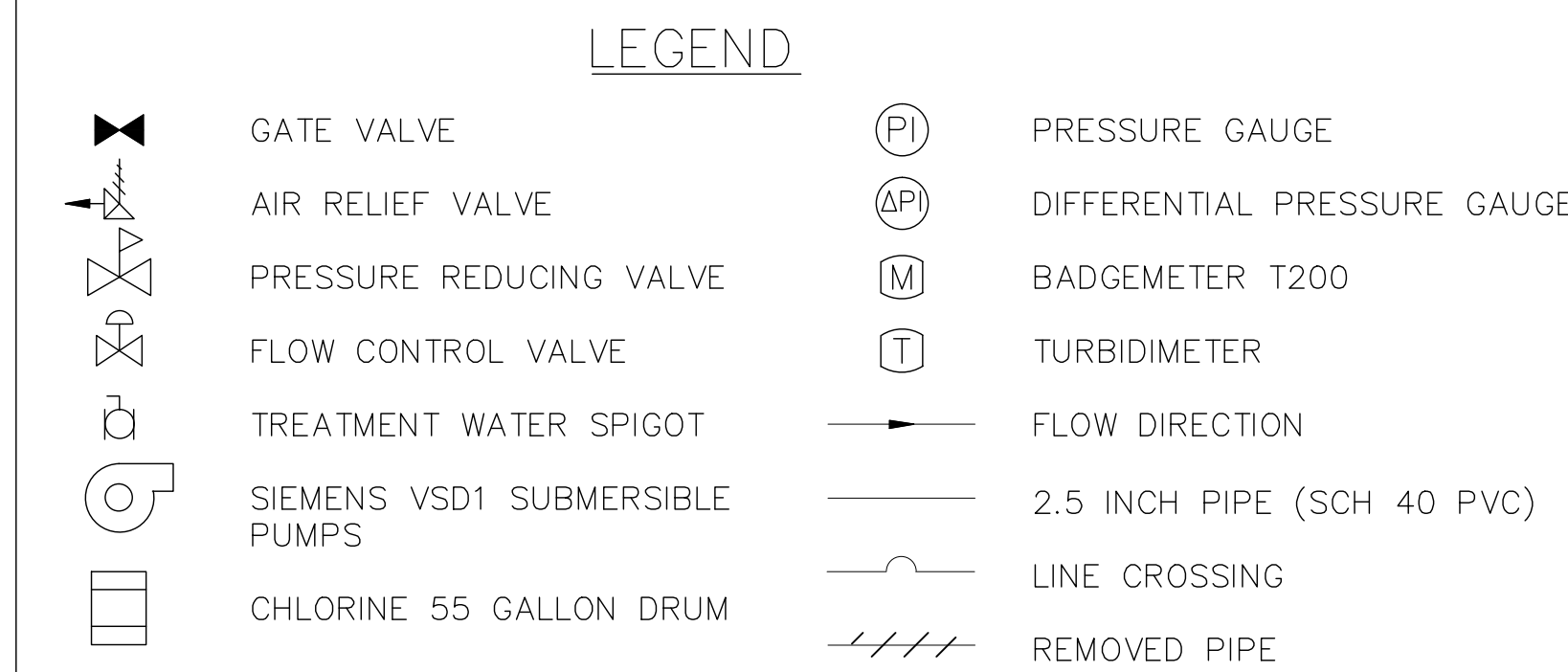


ENLARGED PIPE LAYOUT PLAN



STANDARD TRENCH DETAIL

(NO SCALE)



GENERAL CHLORINE CONTACT CHAMBER NOTES:

- 18" DIA. C-905 DR 18 PIPE TO BE USED FOR CL2 CHAMBER.
- FITTINGS SHALL BE DUCTILE IRON PIPE OF THE SIZES SHOWN.
- MEGALUG JOINT RESTRAINTS SHALL BE PROVIDED FOR ALL FITTINGS.
- DEPTH OF BURY SHALL BE 4'; IF 4' IS NOT OBTAINABLE, DOW BLUEBOARD INSULATION SHALL BE INSTALLED AT 1' ABOVE TOP OF PIPE AS A FROST BREAK FOR FREEZE PROTECTION. IF ALLOWABLE, THE FINISHED GRADE ABOVE PIPE CAN BE RAISED UP TO ONE FOOT ABOVE EXISTING GRADE TO PROVIDE FROST PROTECTION IN LIEU OF RIGID INSULATION.
- SPACING FOR 18" PIPES IN PARALLEL IS APPROX. 24".
- CONTRACTOR SHALL CONTACT UNDERGROUND LINE LOCATION SERVICE (CALL 811) FOR UTILITY LOCATES PRIOR TO CONSTRUCTION.
- UTILITY PERMIT FOR WORK WITHIN COUNTY RIGHT-OF-WAY SHALL BE OBTAINED PRIOR TO CONSTRUCTION.
- ALL PERMIT FEES TO BE PAID BY CONTRACTOR.
- CONTRACTOR TO UNCOVER EXISTING 8" PIPE TO VERIFY ANGLES FOR FITTINGS

REQUIRED FREE CHLORINE RESIDUAL:

REFER TO CALCULATIONS INCLUDED FOR REQUIRED CONTACT CHAMBER LENGTHS TO ACHIEVE ADDITIONAL LOG REMOVAL AS REQUIRED.

PRESENT DESIGN PROVIDES PRE FILTER CHLORINATION.

PLUMBING CHANGES PROPOSED WILL CHANGE EXISTING CHLORINATION LOCATION TO POST FILTER CHLORINATION.

STRAINRITE FILTER BAGS SUGGEST MAXIMUM 0.6 mg/L CHLORINE RESIDUAL THROUGH FILTERS. DUE TO SEASONAL DEMANDS AND WATER QUALITY A SECOND CHLORINATOR IS PROPOSED TO ALLOW PRE OR POST FILTER CHLORINATION TO BE DETERMINED BY OPERATION OF RESPONSIBLE CHARGE (ORC). ORC TO USE EITHER OR BOTH CHLORINATORS BASED UPON SYSTEM REQUIREMENTS AND TO ENSURE MAXIMUM CHLORINE DOSAGE THROUGH FILTER BAGS IS NOT EXCEEDED.

SODIUM HYPOCHLORITE FEED CALCULATIONS:
(FOR PRE-FILTER LOCATION)

ASSUME 6% SOLUTION (60,000 mg/L)

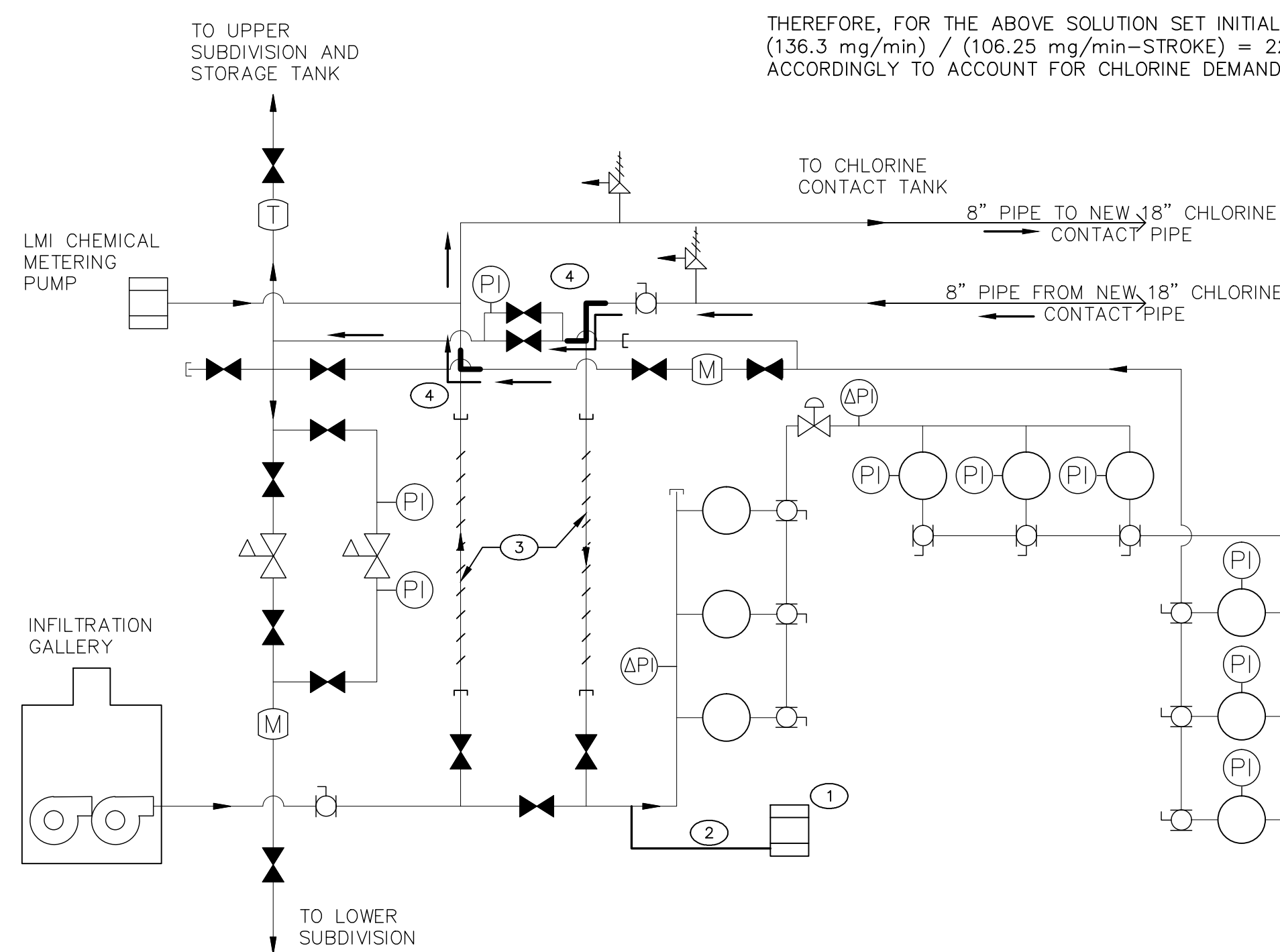
DESIRED FREE CHLORINE RESIDUAL = 0.6 mg/L

MAX PUMP FLOW RATE = 60 gpm (CURRENT APPROVED)

REQUIRED CHLORINE = 600 gal/min (0.6 mg/L) (3.7854 L/gal) = 136.3 mg/min

CHEMICAL FEED PUMP CAPABLE OF DELIVERING BETWEEN 0.07 AND 0.22 mL PER STROKE. FOR THE ABOVE SOLUTION, IF SET AT SAY 0.1 mL/STROKE, CHEMICAL FEED PUMP WILL DELIVER 60,000 mg/L (0.1 mL/STROKE) (1 L/1000 mL) = 6 mg/STROKE

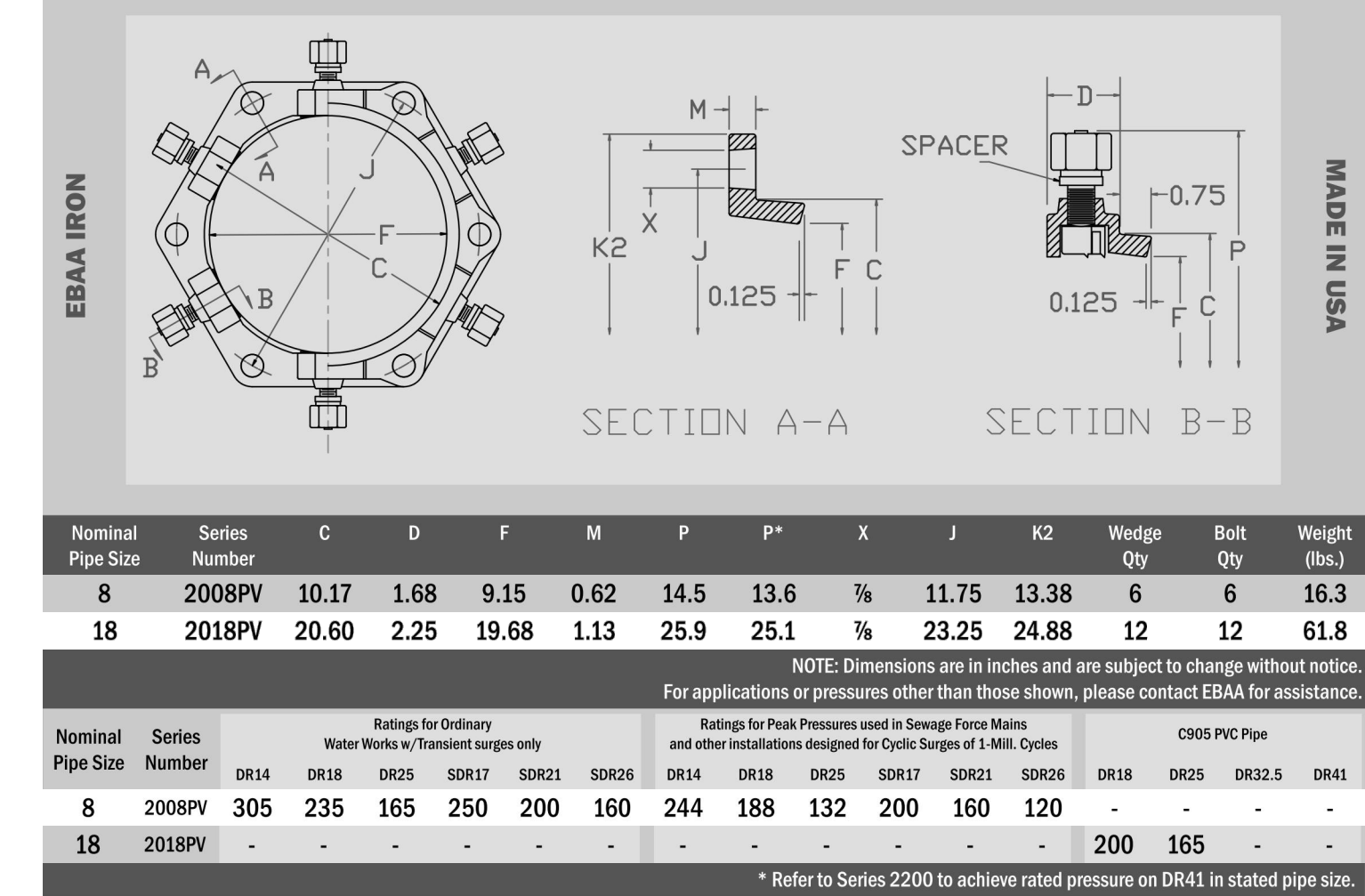
THEREFORE, FOR THE ABOVE SOLUTION SET INITIAL CHEMICAL FEED PUMP SPEED AT (136.3 mg/min) / (106.25 mg/min-STROKE) = 22 STROKES, AND ADJUST ACCORDINGLY TO ACCOUNT FOR CHLORINE DEMAND AND FREE RESIDUAL.



WATER TREATMENT FACILITY PLUMBING SCHEMATIC

(NO SCALE)

Series 2000PV Submittal Reference Drawing



MINIMUM REQUIRED BEARING AREA (SQ FT)

PIPE	Tees/ends	90°, 45°, 22.5°, 11.25°				
		A	B	C	D	E
4"	1.3	1.8	1.0	0.5	--	
6"	2.8	4.0	2.2	1.1	0.5	
8"	5.0	7.1	3.8	2.0	1.0	
10"	7.8	11.1	6.0	3.0	1.5	
12"	11.3	16.0	8.6	4.4	2.2	
14"	15.4	21.7	11.8	6.0	3.0	
18"	25.4	36.0	19.4	10.0	5.0	

- THE TABLE PROVIDES THE MINIMUM CONCRETE BEARING SURFACE OF THRUST BLOCKS & ARE BASED ON THE FOLLOWING PARAMETERS:
 - 100 PSI INTERNAL FLUID PRESSURE
 - 1,000 PSF SOIL BEARING CAPACITY
- CONCRETE SHALL BE CAST-IN-PLACE WITH A MIN 1/4 SQ FT BEARING AGAINST THE FITTING
- CONCRETE SHALL BEAR AGAINST FITTING ONLY AND NOT ADJACENT PIPING. CONCRETE SHALL NOT IMPEDE DISMANTLING JOINT OR FITTING.
- BLOCKING SHALL WITHSTAND BOTH THE TEST PRESSURE AND ALL OPERATING PRESSURES.
- IF VERTICAL BENDS ARE REQUIRED TO INSTALL WATERMAIN, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR CONSTRUCTION DETAILS
- BEARING AREA MAY BE REDUCED OR ELIMINATED BY USING TIE RODS OR RESTRAINED JOINTS, WHEN DESIGNED AND SEALED BY A P.E.
- VALVES & FITTINGS MUST BE ENCASED IN PE IN ACCORDANCE WITH AWWA C-105 PRIOR TO INSTALLING THE THRUST BLOCKING.

NOTE: DESIGN PRESSURE = 150 PSI
ASSUMED SOIL BEARING CAPACITY = 2500 PSF
CORRECTION FACTOR FOR TABLE = 1.5/2.5 = 0.6
(TO BE VERIFIED IN THE FIELD)

THRUST BLOCKING SCHEDULE

(NO SCALE)

SYSTEM DETAIL KEYNOTES:

- INSTALL 0.2 GPH LMI MILTON ROY ELECTRONIC METERING PUMP (SERIES P76 MODEL P12-150 PSI) FOR USE WITH SODIUM HYPOCHLORITE) ON SHELF OF LMI 35-GALLON SOLUTION TANK (MODEL 27400). USE NSF 60 COMPLIANT SODIUM HYPOCHLORITE SOLUTION. SOLUTION TANK TO BE PLACED ON LOW-PROFILE 19-GALLON CONTAINMENT TRAY (BLUEBOOK MODEL MG-42657).
- CONNECT 3/8" CL2 SOLUTION TUBING (NSF 61 COMPLIANT) FROM CHEMICAL FEED PUMP TO WATER LINE.
- DISCONNECT THESE 2 1/2" Ø PVC LINES TO REROUTE FLOW PATH FOR CHLORINE CONTACT PIPES TO BE AFTER FILTER SYSTEM.
- CONNECT 2 1/2" Ø SCH 40 PVC PIPE INTO NEW FLOW PATH AS SHOWN. PROVIDE PIPE, FITTINGS AND COUPLERS.

WATER SYSTEM CONSTRUCTION NOTES:

PRIOR TO PLACING NEW CHLORINATION DEVICE INTO SERVICE, CONTRACTOR TO SUPPLY LMI CHEMICAL FEED PUMP REPAIR KIT AND SUFFICIENT CHEMICAL FEED PUMP REPLACEMENT SUCTION TUBING (CLEAR PVC) AND DISCHARGE TUBING (PE).

DISINFECTION AT STARTUP SHALL COMPLY WITH AWWA STD. C-652 FOR STORAGE TANKS AND AWWA STD. C-651 FOR WATER MAINS.

ALL WATER PIPING AND APPURTENANCES SHALL COMPLY WITH NSF STANDARD 61 FOR POTABLE WATER USE.

DAILY REQUIRED CHLORINE DOSE:

AVERAGE DAY WATER DEMAND FOR SUBDIVISION = 30,000 MPD (0.03 MGD)

AVERAGE DAY WATER DEMAND FOR WEST PUMPHOUSE = SAY 0.5 MGD

CHLORINE DEMAND OF WATER UNKNOWN, THEREFORE REQUIRED CHLORINE DOSE AT MINIMUM = [2.0 mg/L (0.5 MGD) (8.345 lb-L/mg-MG)] / 0.125 = 2.5 lb/day, OR 0.3 gal/day OF SODIUM HYPOCHLORITE SOLUTION THAT IS 6% AVAILABLE CHLORINE.



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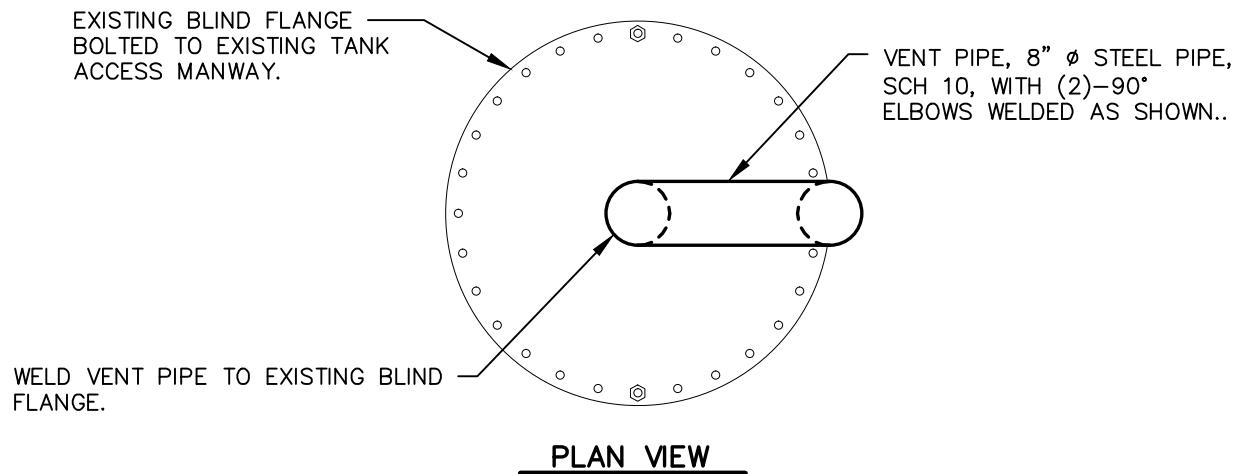
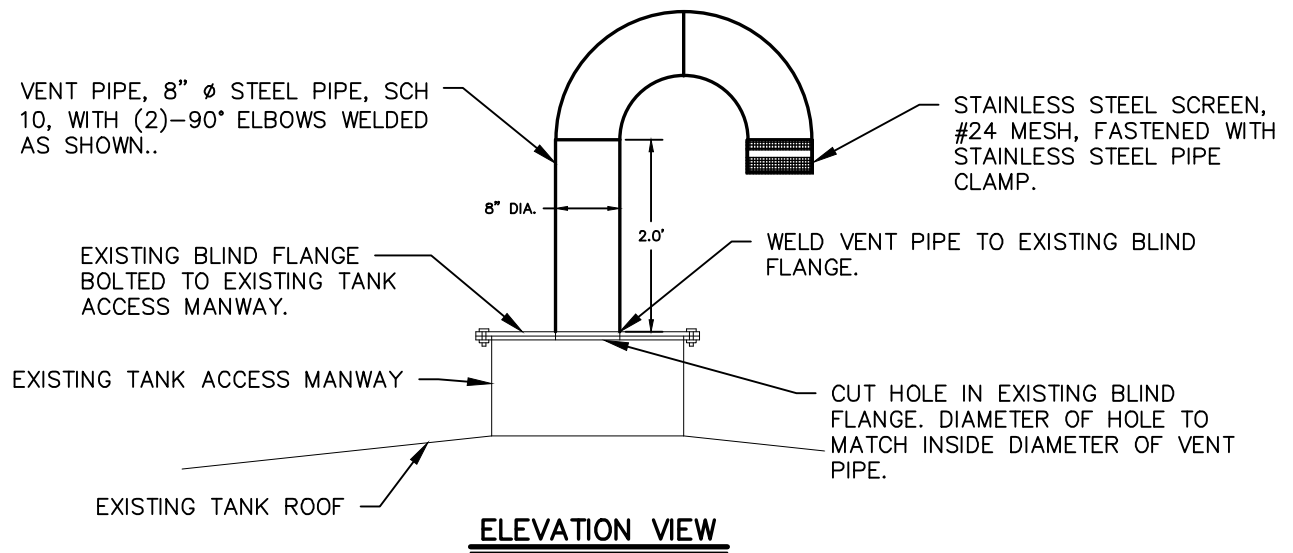
FLORIDA RIVER ESTATES
CHLORINE CONTACT PROJECT
DURANGO, COLORADO

Issue Record:
REVIEW 12-15-2011

Revisions:
EXPAND CL2 CHAMBER 08-21-2012


Project Number: 11-001
Drawn By: RCM
Designed by: BAH
Checked By: BAH

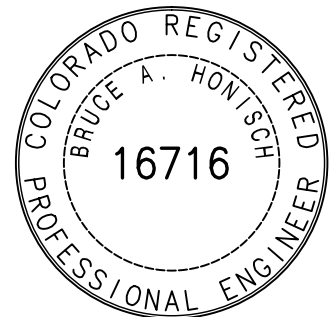
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PIPE AND DETAILS



NOTES:

1. ALL WORK SHALL BE DONE PER AWWA STANDARD SPECIFICATIONS, D-100.
2. NEW VENT PIPE AND WELDS TO BE PAINTED PER AWWA D-102.

 <p>GOFF ENGINEERING + SURVEYING INC 126 ROCK POINT DRIVE PO BOX 97 DURANGO, COLORADO 81302 970.247.1706</p>	<p>FLORIDA RIVER ESTATES WATER TANK VENT DETAIL</p>		<p>SHEET 1 OF 1</p>
	<p>PREPARED BY: RA CHECKED BY: BAH</p> <p>PROJECT NO. 11-063 SCALE: AS SHOWN DATE: 8/7/13</p>		
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**FLORIDA RIVER ESTATES
FIRE PREVENTION SYSTEM**
LA PLATA COUNTY, CO

Issue Record:
CONSTR PLAN 21-Jun-10

Revisions:

Project Number: N/A

Designed by: TWE
Checked by: BAH

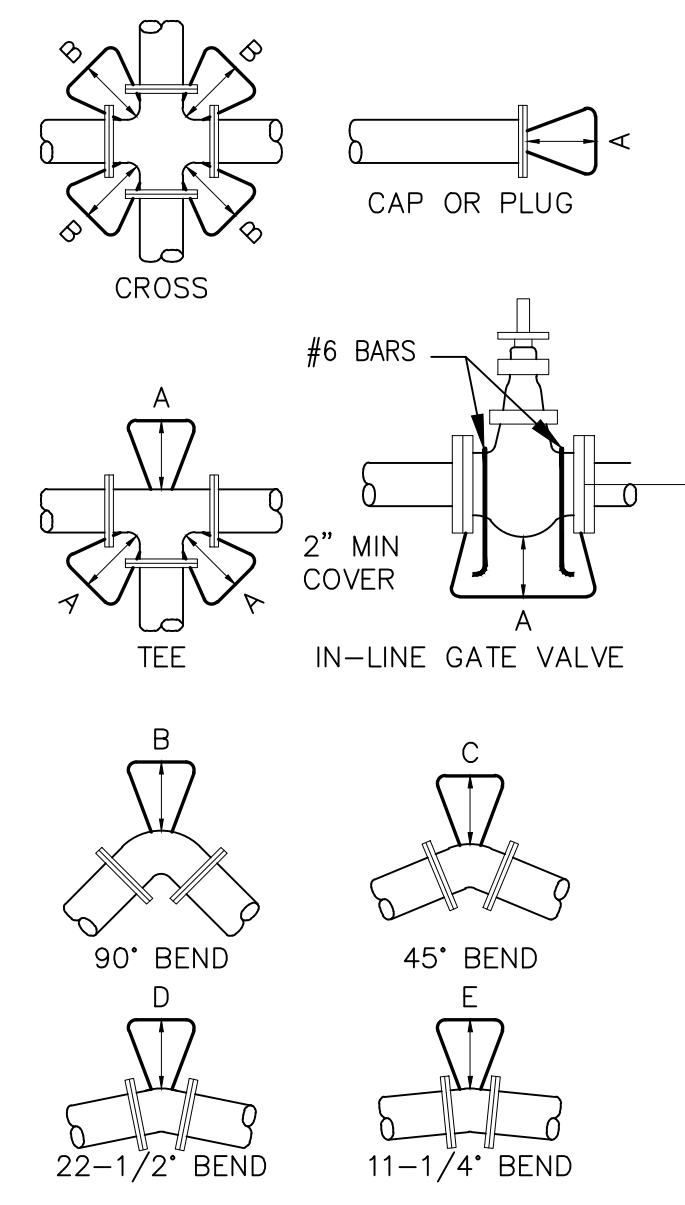
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ENGINEERING SYSTEM

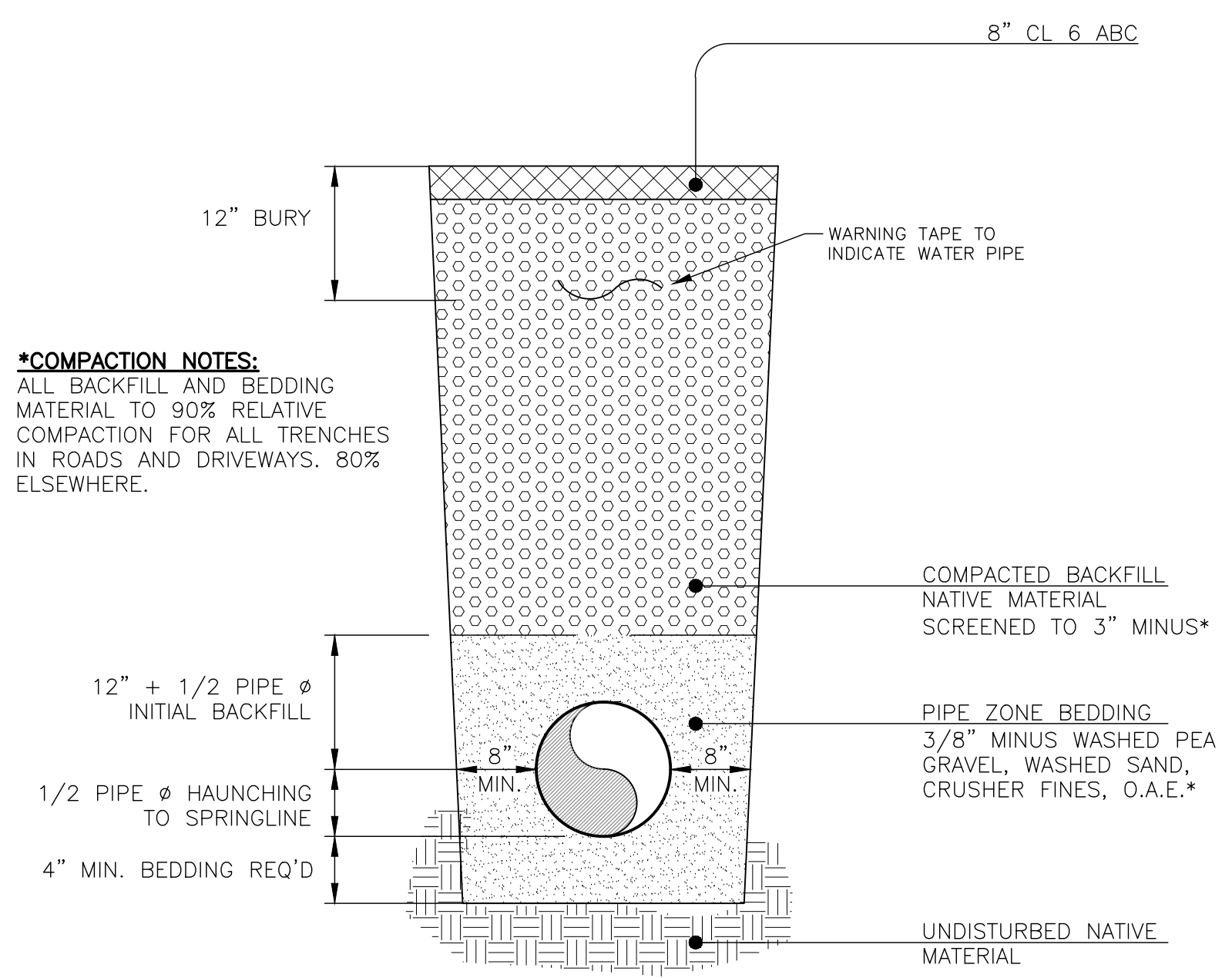
FLORIDA RIVER ESTATES FIRE PREVENTION SYSTEM

MINIMUM REQUIRED BEARING AREA (SQ FT)						
PIPE	Tees/ends		90'	45'	22.5'	11.25'
	A	B				
4"	1.3	1.8	1.0	0.5	--	--
6"	2.8	4.0	2.2	1.1	0.5	--
8"	5.0	7.1	3.8	2.0	1.0	--
10"	7.8	11.1	6.0	3.0	1.5	--
12"	11.3	16.0	8.6	4.4	2.2	--
14"	15.4	21.7	11.8	6.0	3.0	--



- THE TABLE PROVIDES THE MINIMUM CONCRETE BEARING SURFACE OF THRUST BLOCKS & ARE BASED ON THE FOLLOWING PARAMETERS:
 - 100 PSI INTERNAL FLUID PRESSURE
 - 1,000 PSF SOIL BEARING CAPACITY
 DEVIATIONS FROM THESE CONDITIONS REQUIRE RECALCULATING SIZE OF THRUST BLOCK CONCRETE SHALL BE CAST-IN-PLACE WITH A MIN 1/4 SQ FT BEARING AGAINST THE FITTING CONCRETE SHALL BEAR AGAINST FITTING ONLY AND NOT ADJACENT PIPING. CONCRETE SHALL NOT IMPEDE DISMANTLING JOINT OR FITTING.
- BLOCKING SHALL WITHSTAND BOTH THE TEST PRESSURE AND ALL OPERATING PRESSURES.
- IF VERTICAL BENDS ARE REQUIRED TO INSTALL WATERMAIN, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR CONSTRUCTION DETAILS
- BEARING AREA MAY BE REDUCED OR ELIMINATED BY USING TIE RODS OR RESTRAINED JOINTS, WHEN DESIGNED AND SEALED BY A P.E.
- VALVES & FITTINGS MUST BE ENCASED IN PE IN ACCORDANCE WITH AWWA C-105 PRIOR TO INSTALLING THE THRUST BLOCKING.

THRUST BLOCKING TABLE
(NO SCALE)



BACKFILL DETAIL
(NO SCALE)

GENERAL WATER NOTES:

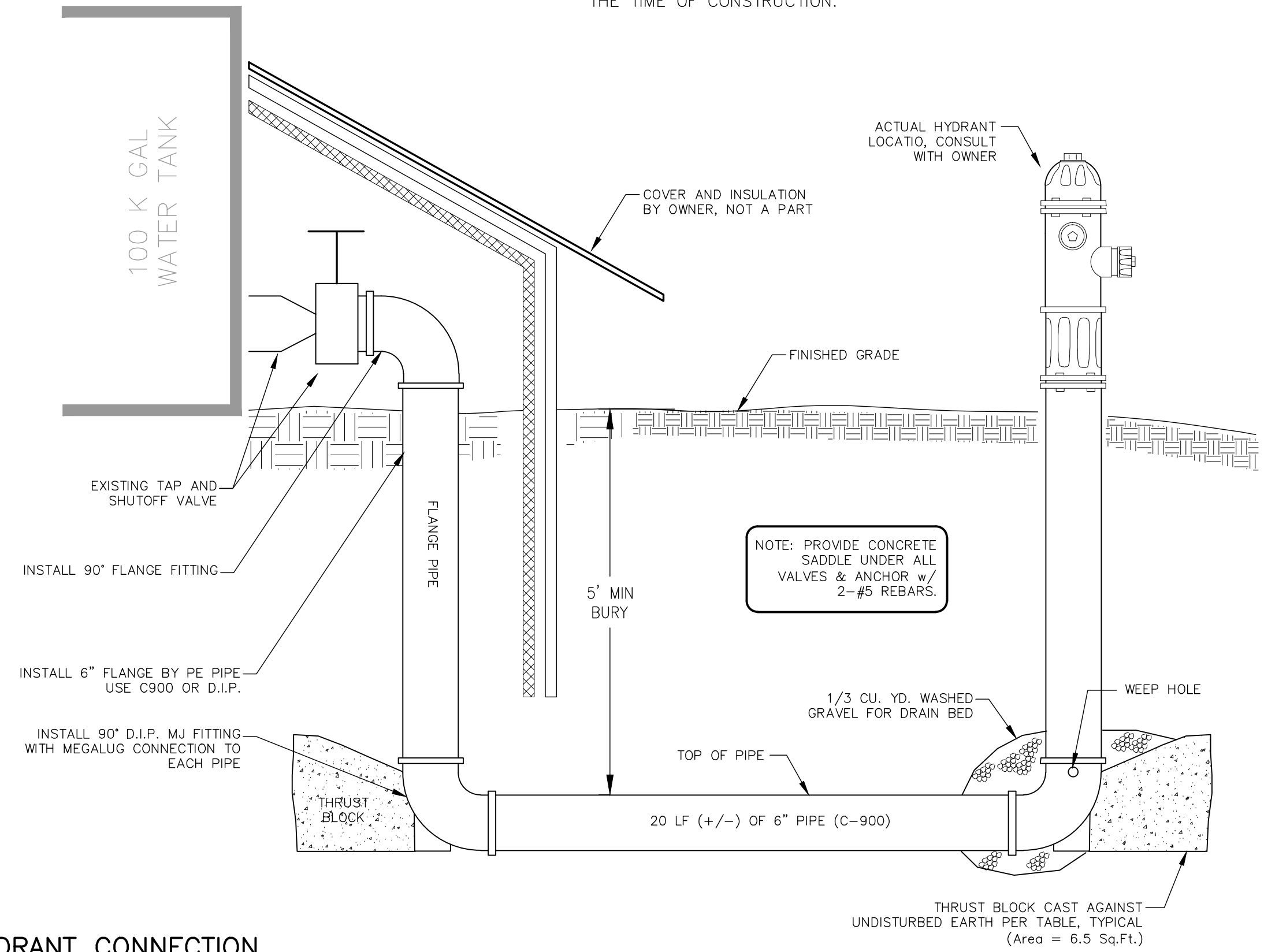
- ALL WATER MAIN PIPING SHALL BE C-900 DR 18 COMPLYING WITH AWWA C900 OR CL 52 D.I.P.
- ALL LINES SHALL BE PRESSURE TESTED PER AWWA STANDARDS. MINIMUM TEST PRESSURE SHALL BE 50 PSI FOR A MINIMUM OF ONE HOUR.
- A LEAKAGE TEST SHALL BE PERFORMED PER AWWA STANDARDS, IF REQUIRED BY OWNER.
- THE MINIMUM FACE AREA FOR ALL THRUST BLOCKS SHALL BE AS SHOWN IN THE THRUST BLOCK TABLE.
- FIRE HYDRANTS SHALL COMPLY WITH AWWA C-502. THE HYDRANTS SHALL BE MUELLER CENTURIAN MODEL No. A-423 WITH 5" STORTZ CONNECTION OR EQUAL AS APPROVED BY DURANGO FIRE AND RESCUE AUTHORITY.

GENERAL NOTES:

- THE CONTRACTOR MUST BE FAMILIAR WITH THE PROPOSED PROJECT'S EXISTING CONDITIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, DIFFICULT CONSTRUCTION AROUND EXISTING TREES AND UTILITIES, CONNECTING TO EXISTING WATER LINES AND SMALL VERTICAL GRADE ADJUSTMENTS NECESSARY TO AVOID CONSTRUCTION CONFLICTS. THE CONTRACTOR MUST ADJUST PRICING TO ACCOUNT FOR THESE DIFFICULT CONSTRUCTION SITUATIONS. NO COMPENSATION SHALL BE GIVEN FOR EXISTING SURFACE CONDITIONS THAT MAY CAUSE DIFFICULT FIELD CONSTRUCTION MODIFICATIONS. CONTRACTOR SHALL EXPECT EXCAVATION TO INCLUDE INDIVIDUAL ROCKS OF VARYING SIZE, CONTACT ENGINEER FOR DIRECTION IF LARGE BOULDERS OR BEDROCK IS ENCOUNTERED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FOLLOWING:
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PERMITS, FEES, OR TARIFFS REQUIRED FOR THE PROJECT. PERMITS, FEES, OR TARIFFS SHALL BE CONSIDERED INCIDENTAL TO THE WORK.
 - PROVIDING THE OWNER WITH AN "AS CONSTRUCTED" RED LINED PRINT PRIOR TO FINAL ACCEPTANCE OF THE WORK.
 - THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.).
 - THE PROPER AND LEGAL DISPOSAL OF ALL DEMOLISHED AND EXCESS MATERIALS.
 - THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
- THE CONTRACTOR SHALL REPAIR OR REPLACE THE EXISTING LANDSCAPING, IN KIND, THAT WAS REMOVED OR DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL GUARANTEE SAID LANDSCAPING FOR ONE (1) YEAR AFTER THE FINAL ACCEPTANCE OF THE CONSTRUCTION.
- THE CONTRACTOR SHALL PROTECT, REPAIR OR REPLACE ANY UTILITY IN KIND INCLUDING BUT NOT LIMITED TO: RESIDENTIAL SERVICES, WATER LINES, SEWER LINES, STORM DRAINS, ETC., THAT WAS REMOVED OR DAMAGED DURING CONSTRUCTION.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE TRUE AND CORRECT LOCATIONS OF EXISTING UTILITIES THAT MAY IMPACT EACH PORTION OF THE WORK. 48 HOURS PRIOR TO PERFORMING WORK, THE CONTRACTOR SHALL CONTACT THE UTILITY LOCATION SERVICE AT (800) 922-1987. CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO COMMENCING CONSTRUCTION IF MARKED UTILITIES APPEAR TO CONFLICT WITH PROPOSED IMPROVEMENTS. THE COST OF LOCATING, PROTECTING AND ACCOMMODATING EXISTING UTILITIES SHALL BE INCIDENTAL TO THE COST OF THE PROJECT. MINOR HORIZONTAL OR VERTICAL ADJUSTMENTS OF THE PROPOSED IMPROVEMENTS TO AVOID CONFLICTS SHALL NOT ENTITLE THE CONTRACTOR TO EXTRA PAY.

NOTES:

- PER THE REQUIREMENTS OF DURANGO FIRE AND RESCUE AUTHORITY (DFRA), HYDRANTS SHALL BE RED-PAINTED, OPEN LEFT (COUNTER-CLOCKWISE) MUELLER BRAND SUPER CENTURION 250 A-423 WITH (2) 2 1/2" NH PORTS AND ONE STEAMER CONNECTION EQUIPPED WITH A 5" STORTZ FITTING AND CAP (OPTION 479, 5").
- THE STEAMER CONNECTION MUST FACE AWAY FROM THE TANK. HYDRANTS SUBJECT TO PROBABLE VEHICULAR DAMAGE MUST BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE INTERNATIONAL FIRE CODE. A DISTANCE OF 3' CLEAR MUST BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE HYDRANT. WHEN LANDSCAPING IS COMPLETE ALL HYDRANT BASE FLANGES ARE TO BE 6" ABOVE FINISHED GRADE.
- ALL FIRE HYDRANTS MUST MEET THE DFRA REQUIREMENTS. FIELD INSPECTION AND VERIFICATION OF LOCATION SHALL BE REQUIRED AT THE TIME OF CONSTRUCTION.

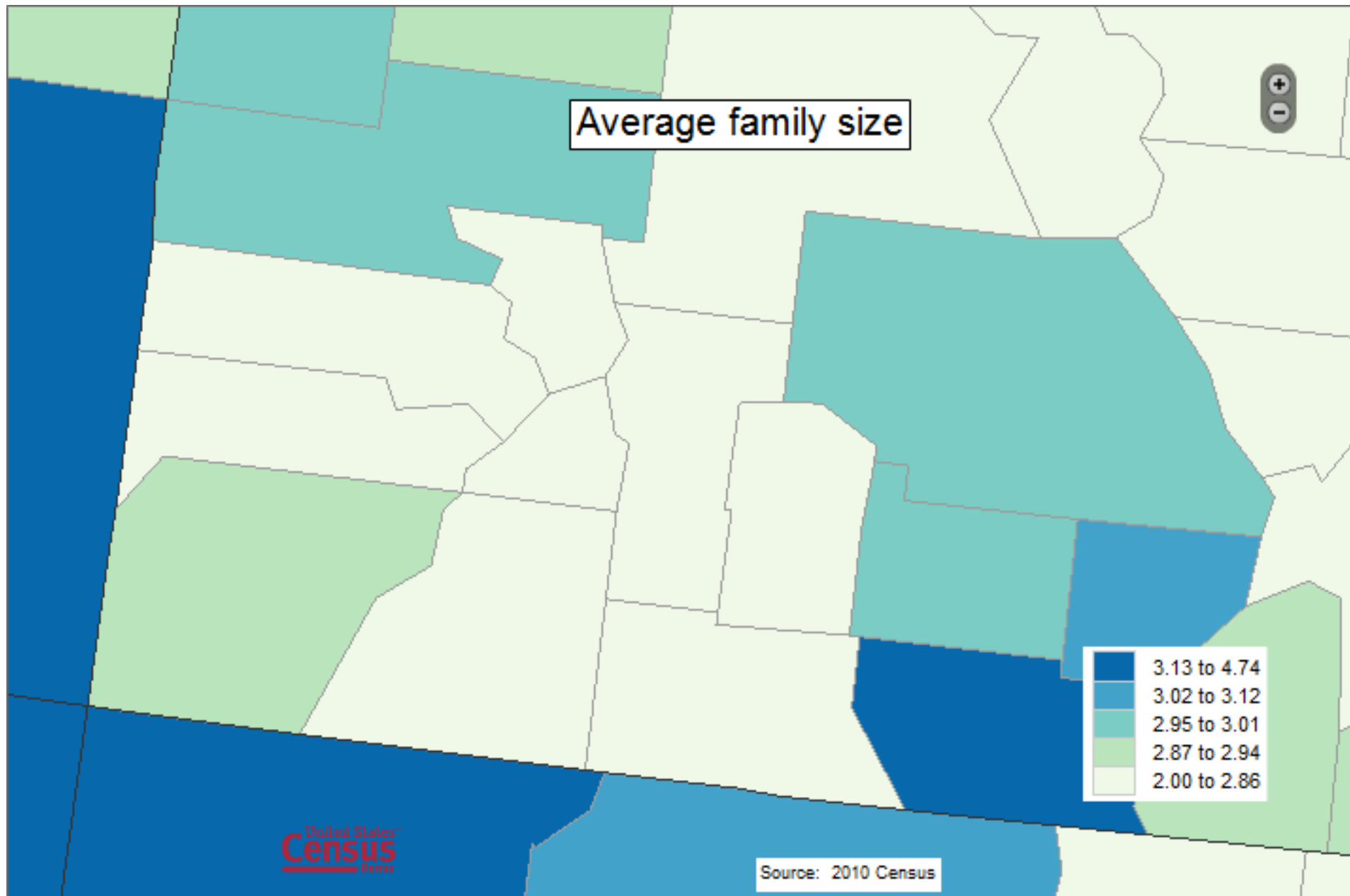


FIRE HYDRANT CONNECTION
(NO SCALE)

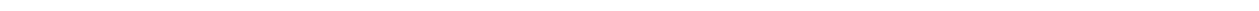


Know what's below.
Call before you dig.

Average family size



APPENDIX B



FLORIDA RIVER ESTATES WATER DISTRIBUTION SYSTEM

LOCATED IN PORTIONS OF SECTION 7 & 8, T 35 N, R 8 W, N.M.P.M.
LA PLATA COUNTY, COLORADO

SUBDIVISION BOUNDARY ZONE BOUNDARY

GENERAL WATER NOTES:

- ZONE 1:**
LOWER AREA ALONG RIVER CONTROLLED BY PRV STATION LOCATED IN WATER TREATMENT PLANT.
- ZONE 2:**
GRAVITY SYSTEM FED BY WATER STORAGE TANK.
- ZONE 3:**
PRESSURIZED ZONE SERVED BY BOOSTER STATION AT SORTAIS/NUSBAUM INTERSECTION.

LEGEND

— W —	EX. WATER MAIN (SIZE NOTED)
— W —	EX. DOUBLE WATER SERVICE
— W —	EX. SINGLE WATER SERVICE
○	EX. WATER VALVE
○	P. WATER MAIN (SIZE NOTED)
○	P. WATER VALVE

NOTES:

1. CONTOUR AND PLANIMETRIC INFORMATION AS SHOWN HEREON WAS OBTAINED FROM THE LA PLATA COUNTY GIS DATA BASE AND HAS NOT BEEN INDEPENDENTLY FIELD VERIFIED BY GOFF ENGINEERING AND SURVEYING, INC. ACTUAL GROUND CONDITIONS AND CONTOURS MAY VARY.
2. WATER MAIN INFORMATION FROM EXISTING "EXHIBIT A" WATER SYSTEMS MAP FROM H.O.A. & MARK-UPS FROM SYSTEM OPERATOR.
3. ALL WATER MAINS & SERVICE LINES MUST BE BORED UNDER FLORIDA ROAD.
4. PROVIDE VALVE CLUSTERS AT ALL INTERSECTION ON NEW WATER MAINS.

NEW 2 INCH HDPE SERVICE TO REPLACE EX. SERVICE LINE. INSTALL NEW METER PIT ASSEMBLIES

NEW 2 INCH HDPE SERVICE TO REPLACE EX. SERVICE LINE. INSTALL NEW METER PIT ASSEMBLIES

EX. 1 INCH WATER MAIN TO BE ABANDONED. NO ACTIVE SERVICES EXIST ON THIS LINE.

CONNECT NEW 4 INCH WATER MAIN TO EXISTING 2 IN HDPE WATER MAIN THAT SERVICES LOTS 14 TO 17. PROVIDE NECESSARY REDUCER.

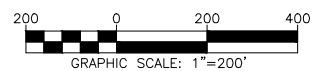
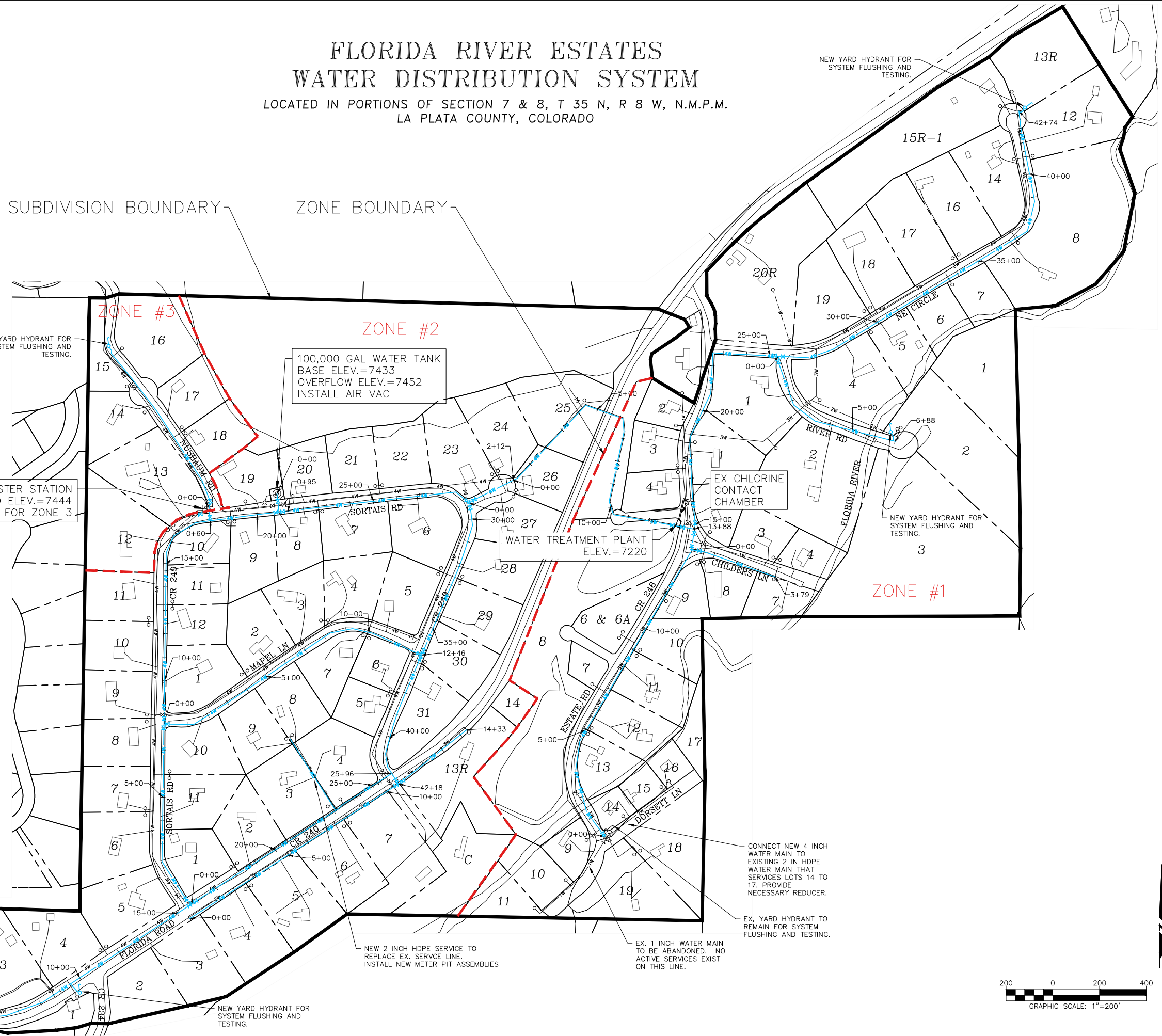
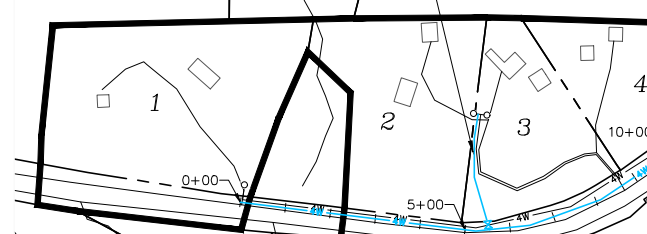
EX. YARD HYDRANT TO REMAIN FOR SYSTEM FLUSHING AND TESTING.

BOOSTER STATION
GROUND ELEV.=7444
FOR ZONE 3

100,000 GAL WATER TANK
BASE ELEV.=7433
OVERFLOW ELEV.=7452
INSTALL AIR VAC

WATER TREATMENT PLANT
ELEV.=7220

EX CHLORINE CONTACT CHAMBER



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**FLORIDA RIVER ESTATES
WATER DISTRIBUTION SYSTEM**
LA PLATA COUNTY, COLORADO

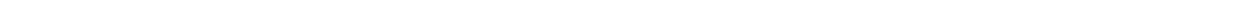
Issue Record:
PER REPORT 04-02-2018

Revisions:

Project Number: 17-195
Drawn By: CTH
Designed by: CTH
Checked By: BAH

Sheet
C2.0
PROPOSED
WATER SYSTEM
MAP

APPENDIX C



Florida River Estate HOA, Inc.
Profit & Loss
 July 2010 through June 2017

5:01 PM

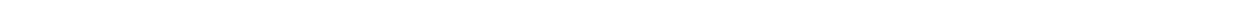
03/19/2018

(not full year) **Accrual Basis**

	Jul '10 - Jun 11	Jul '11 - Jun 12	Jul '12 - Jun 13	Jul '13 - Jun 14	Jul '14 - Jun 15	Jul '15 - Jun 16	Jul '16 - Jun 17	Jul '17 - Mar 18	TOTAL
Total Income	77,331.46	75,983.65	83,600.51	76,930.41	71,966.40	65,695.17	89,920.35	104,718.70	646,146.65
Cost of Goods Sold									
*Cost of Goods Sold	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50000 · Cost of Sales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50100 · Cost of Sales Chemicals	431.60	377.74	503.70	810.72	516.82	742.59	1,118.42	1,477.82	5,979.41
50200 · Cost of Sales Electricity	2,775.32	2,729.26	3,006.36	3,414.77	3,824.82	4,195.37	5,115.42	3,140.92	28,202.24
50250 · Cost of Sales Filters	4,993.20	2,739.03	2,647.41	3,177.55	6,645.49	8,073.02	23,535.91	12,262.03	64,073.64
50300 · Cost of Sales Operator	11,400.00	11,400.00	11,580.00	12,040.00	12,750.00	13,819.57	19,040.00	13,920.00	105,949.57
50400 · Cost of Sales Repairs & Maint	674.40	3,147.84	6,195.44	6,680.65	13,280.76	4,145.70	73,382.90	6,011.85	113,519.54
50500.1 · Cost of Sales Supplies Heading									
50500 · Cost of Sales Supplies	0.00	187.78	607.11	0.00	0.00	0.00	348.25	79.87	1,223.01
50505 · Meter Supplies	0.00	0.00	0.00	0.00	0.00	0.00	0.00	720.02	720.02
50510 · Monitoring	0.00	0.00	0.00	0.00	0.00	20.65	104.38	137.40	262.43
Total 50500.1 · Cost of Sales Supplies Heading	0.00	187.78	607.11	0.00	0.00	20.65	452.63	937.29	2,205.46
50600 · Cost of Sales Testing	2,446.00	2,726.00	882.00	2,718.00	804.05	943.00	1,328.48	2,714.00	14,561.53
Total COGS	22,720.52	23,307.65	25,422.02	28,841.69	37,821.94	31,939.90	123,973.76	40,463.91	334,491.39
Expense									
60000 · Accounting Expense	400.00	400.00	400.00	660.00	460.00	480.00	480.00	0.00	3,280.00
60500 · Administrator Expense	8,100.00	8,100.00	8,100.00	11,750.00	10,800.00	11,730.10	16,330.70	7,901.10	82,811.90
62000 · Bank Charges	0.00	0.00	0.00	0.00	20.00	250.00	106.00	2.10	378.10
64000 · Depreciation Expense	11,571.88	7,004.92	7,453.46	6,576.89	9,933.27	10,056.82	14,459.96	8,547.93	75,605.13
64500 · Dues and Subscriptions Exp	500.00	325.00	310.00	361.00	516.39	385.00	250.00	250.00	2,897.39
67000 · Insurance Expense	3,247.12	3,246.71	3,303.09	3,463.00	3,805.04	3,303.98	3,811.50	3,272.14	27,452.58
68500 · Legal and Professional Expense	0.00	0.00	0.00	0.00	1,360.00	0.00	610.00	840.00	2,810.00
69000 · Licenses Expense	20.00	0.00	0.00	0.00	0.00	60.00	70.00	75.00	225.00
69100 · Line Locates Expense	50.00	50.00	121.18	68.34	335.68	32.77	145.11	118.90	921.98
70000 · Maintenance Expense	0.00	0.00	0.00	0.00	404.36	988.70	350.00	30.56	1,773.62
70500 · Meals and Entertainment Exp	207.81	106.00	115.00	130.00	40.23	0.00	0.00	0.00	599.04
71000 · Office Expense	0.00	0.00	0.00	262.21	0.00	543.24	219.14	69.87	1,094.46
71500 · Other Taxes	138.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	138.17
73500 · Postage & Shipping Expense	424.49	531.43	403.66	525.85	811.56	0.00	381.50	407.65	3,486.14
74000 · Rent or Lease Expense	0.00	0.00	0.00	0.00	0.00	0.00	70.00	0.00	70.00
74500 · Repairs and Maint Expense	0.00	0.00	0.00	0.00	2,169.11	0.00	0.00	0.00	2,169.11
75200 · Small Equipment									
75210 · Monitoring	0.00	0.00	0.00	0.00	0.00	1,960.11	0.00	0.00	1,960.11
75220 · Small Equipment/ Non-monitoring	0.00	0.00	0.00	0.00	0.00	761.87	3,044.80	0.00	3,806.67
Total 75200 · Small Equipment	0.00	0.00	0.00	0.00	0.00	2,721.98	3,044.80	0.00	5,766.78
75400 · Software expense	0.00	0.00	0.00	0.00	199.95	0.00	0.00	0.00	199.95
75500 · Supplies Expense	0.00	0.00	0.00	0.00	0.00	0.00	121.34	0.00	121.34
76000 · Telephone Expense	0.00	0.00	0.00	0.00	0.00	0.00	541.24	598.70	1,139.94
77600 · Website	0.00	0.00	0.00	0.00	0.00	0.00	83.88	143.88	227.76
78000 · Engineering and Design Expense	1,136.25	3,677.06	187.50	562.00	0.00	0.00	0.00	5,556.00	11,118.81
89000 · Other Expense	285.36	267.64	75.00	0.00	390.97	74.45	0.00	0.00	1,093.42
Total Expense	26,081.08	23,708.76	20,468.89	24,359.29	31,246.56	30,627.04	41,075.17	27,813.83	225,380.62
Total COGS & EXPENSE	48,801.6	47,016.4	45,890.9	53,201.0	69,068.5	62,566.9	165,048.9	68,277.7	559,872.0

INCOME & EXPENSE REPORT

APPENDIX D



FLORIDA RIVER ESTATES HOA INC 2017 Drinking Water Quality Report For Calendar Year 2016

Public Water System ID: CO0134300

Esta es información importante. Si no la pueden leer, necesitan que alguien se la traduzca.

We are pleased to present to you this year's water quality report. Our constant goal is to provide you with a safe and dependable supply of drinking water. Please contact MARK FUSON at with any questions or for public participation opportunities that may affect water quality.

General Information

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (1-800-426-4791) or by visiting <http://water.epa.gov/drink/contaminants>.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV-AIDS or other immune system disorders, some elderly, and infants can be particularly at risk of infections. These people should seek advice about drinking water from their health care providers. For more information about contaminants and potential health effects, or to receive a copy of the U.S. Environmental Protection Agency (EPA) and the U.S. Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and microbiological contaminants call the EPA Safe Drinking Water Hotline at (1-800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- Microbial contaminants:** viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants:** salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides:** may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.
- Radioactive contaminants:** can be naturally occurring or be the result of oil and gas production and mining activities.
- Organic chemical contaminants:** including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and also may come from gas stations, urban storm water runoff, and septic systems.

In order to ensure that tap water is safe to drink, the Colorado Department of Public Health and Environment prescribes

FLORIDA RIVER ESTATES HOA INC, PWS ID: CO0134300

regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Lead in Drinking Water

If present, elevated levels of lead can cause serious health problems (especially for pregnant women and young children). It is possible that lead levels at your home may be higher than other homes in the community as a result of materials used in your home's plumbing. If you are concerned about lead in your water, you may wish to have your water tested. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. Additional information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at <http://www.epa.gov/safewater/lead>.

Source Water Assessment and Protection (SWAP)

The Colorado Department of Public Health and Environment has provided us with a Source Water Assessment Report for our water supply. For general information or to obtain a copy of the report please visit <http://wqcdcompliance.com/ccr>. The report is located under "Source Water Assessment Reports", and then "Assessment Report by County". Select LA PLATA County and find 134300; FLORIDA RIVER ESTATES HOA INC or by contacting MARK FUSON at 970 759-3930 . The Source Water Assessment Report provides a screening-level evaluation of potential contamination that **could** occur. It **does not** mean that the contamination **has or will** occur. We can use this information to evaluate the need to improve our current water treatment capabilities and prepare for future contamination threats. This can help us ensure that quality finished water is delivered to your homes. In addition, the source water assessment results provide a starting point for developing a source water protection plan. Potential sources of contamination in our source water area are listed on the next page.

Please contact us to learn more about what you can do to help protect your drinking water sources, any questions about the Drinking Water Quality Report, to learn more about our system, or to attend scheduled public meetings. We want you, our valued customers, to be informed about the services we provide and the quality water we deliver to you every day.

Our Water Sources

<u>Source</u>	<u>Source Type</u>	<u>Water Type</u>	<u>Potential Source(s) of Contamination</u>
SORTAIS SPRING	Well	Groundwater UDI Surface Water	Row Crops, Pasture/Hay, Deciduous Evergreen and Mixed Forest, Road miles

Terms and Abbreviations

- **Maximum Contaminant Level (MCL)** – The highest level of a contaminant allowed in drinking water.
- **Treatment Technique (TT)** – A required process intended to reduce the level of a contaminant in drinking water.
- **Health-Based** – A violation of either a MCL or TT.
- **Non-Health-Based** – A violation that is not a MCL or TT.
- **Action Level (AL)** – The concentration of a contaminant which, if exceeded, triggers treatment and other regulatory requirements.
- **Maximum Residual Disinfectant Level (MRDL)** – The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **Maximum Contaminant Level Goal (MCLG)** – The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- **Maximum Residual Disinfectant Level Goal (MRDLG)** – The level of a drinking water disinfectant, below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **Violation (No Abbreviation)** – Failure to meet a Colorado Primary Drinking Water Regulation.
- **Formal Enforcement Action (No Abbreviation)** – Escalated action taken by the State (due to the risk to public health, or number or severity of violations) to bring a non-compliant water system back into compliance.
- **Variance and Exemptions (V/E)** – Department permission not to meet a MCL or treatment technique under certain conditions.
- **Gross Alpha (No Abbreviation)** – Gross alpha particle activity compliance value. It includes radium-226, but excludes radon 222, and uranium.
- **Picocuries per liter (pCi/L)** – Measure of the radioactivity in water.
- **Nephelometric Turbidity Unit (NTU)** – Measure of the clarity or cloudiness of water. Turbidity in excess of 5 NTU is just noticeable to the typical person.
- **Compliance Value (No Abbreviation)** – Single or calculated value used to determine if regulatory contaminant level (e.g. MCL) is met. Examples of calculated values are the 90th Percentile, Running Annual Average (RAA) and Locational Running Annual Average (LRAA).
- **Average (x-bar)** – Typical value.
- **Range (R)** – Lowest value to the highest value.
- **Sample Size (n)** – Number or count of values (i.e. number of water samples collected).
- **Parts per million = Milligrams per liter (ppm = mg/L)** – One part per million corresponds to one minute in two years or a single penny in \$10,000.
- **Parts per billion = Micrograms per liter (ppb = ug/L)** – One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.
- **Not Applicable (N/A)** – Does not apply or not available.
- **Level 1 Assessment** – A study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.
- **Level 2 Assessment** – A very detailed study of the water system to identify potential problems and determine (if possible) why an E. coli MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.
- **UDI** = Under the influence of surface water.

Detected Contaminants

FLORIDA RIVER ESTATES HOA INC routinely monitors for contaminants in your drinking water according to Federal and State laws. The following table(s) show all detections found in the period of January 1 to December 31, 2016 unless otherwise noted. The State of Colorado requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. Therefore, some of our data, though representative, may be more than one year old. Violations and Formal Enforcement Actions, if any, are reported in the next section of this report.

Note: Only detected contaminants sampled within the last 5 years appear in this report. If no tables appear in this section then no contaminants were detected in the last round of monitoring.

Disinfectants Sampled in the Distribution System						
TT Requirement: At least 95% of samples per period (month or quarter) must be at least 0.2 ppm <i>OR</i> If sample size is less than 40 no more than 1 sample is below 0.2 ppm						
Typical Sources: Water additive used to control microbes						
Contaminant Name	Time Period	Results	Number of Samples Below Level	Sample Size	TT Violation	MRDL
Chlorine	December, 2016	Lowest period percentage of samples meeting TT requirement: 100%	0	1	No	4.0 ppm

Lead and Copper Sampled in the Distribution System								
Contaminant Name	Time Period	90 th Percentile	Sample Size	Unit of Measure	90 th Percentile AL	Sample Sites Above AL	90 th Percentile AL Exceedance	Typical Sources
Copper	07/20/2014 to 07/20/2014	0.22	5	ppm	1.3		No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead	07/20/2014 to 07/20/2014	6.8	5	ppb	15		No	Corrosion of household plumbing systems; Erosion of natural deposits

Disinfection Byproducts Sampled in the Distribution System										
Name	Year	Average	Range Low – High	Sample Size	Unit of Measure	MCL	MCLG	Highest Compliance Value	MCL Violation	Typical Sources
Total Haloacetic Acids (HAA5)	2016	1.3	1.3 to 1.3	1	ppb	60	N/A		No	Byproduct of drinking water disinfection
Total Trihalome thanes	2016	4.4	4.4 to 4.4	1	ppb	80	N/A		No	Byproduct of drinking water

Disinfection Byproducts Sampled in the Distribution System

Name	Year	Average	Range Low – High	Sample Size	Unit of Measure	MCL	MCLG	Highest Compliance Value	MCL Violation	Typical Sources
(TTHM)										disinfection

Disinfectants Sampled at the Entry Point to the Distribution System

Contaminant Name	Year	Number of Samples Above or Below Level	Sample Size	TT/MRDL Requirement	TT/MRDL Violation	Typical Sources
Chlorine/Chloramine	2016	0	365	TT = No more than 4 hours with a sample below 0.2 MG/L	No	Water additive used to control microbes

Summary of Turbidity Sampled at the Entry Point to the Distribution System

Contaminant Name	Sample Date	Level Found	TT Requirement	TT Violation	Typical Sources
Turbidity	Date/Month: Apr	<u>Highest single</u> measurement: 0.63 NTU	Maximum 5 NTU for any single measurement	No	Soil Runoff
Turbidity	Month: Dec	<u>Lowest monthly percentage</u> of samples meeting TT requirement for our technology: 100 %	In any month, at least 95% of samples must be less than 1 NTU	No	Soil Runoff

Radionuclides Sampled at the Entry Point to the Distribution System

Contaminant Name	Year	Average	Range Low – High	Sample Size	Unit of Measure	MCL	MCLG	MCL Violation	Typical Sources
Gross Alpha	2014	1.56	1.56 to 1.56	1	pCi/L	15	0	No	Erosion of natural deposits
Combined Uranium	2014	1.7	1.7 to 1.7	1	ppb	30	0	No	Erosion of natural deposits

Inorganic Contaminants Sampled at the Entry Point to the Distribution System

Contaminant Name	Year	Average	Range Low – High	Sample Size	Unit of Measure	MCL	MCLG	MCL Violation	Typical Sources
Barium	2012	0.11	0.11 to 0.11	1	ppm	2	2	No	Discharge of drilling wastes; discharge from metal refineries; erosion of natural

Inorganic Contaminants Sampled at the Entry Point to the Distribution System

Contaminant Name	Year	Average	Range Low – High	Sample Size	Unit of Measure	MCL	MCLG	MCL Violation	Typical Sources
									deposits
Nitrate	2016	0.06	0.06 to 0.06	2	ppm	10	10	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium	2012	1.9	1.9 to 1.9	1	ppb	50	50	No	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines

Secondary Contaminants**

**Secondary standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (such as skin, or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

Contaminant Name	Year	Average	Range Low – High	Sample Size	Unit of Measure	Secondary Standard
Sodium	2012	5.7	5.7 to 5.7	1	ppm	N/A
Total Dissolved Solids	2014	364	364 to 364	1	ppm	500

Unregulated Contaminants***

EPA has implemented the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act. EPA uses the results of UCMR monitoring to learn about the occurrence of unregulated contaminants in drinking water and to decide whether or not these contaminants will be regulated in the future. We performed monitoring and reported the analytical results of the monitoring to EPA in accordance with its Third Unregulated Contaminant Monitoring Rule (UCMR3). Once EPA reviews the submitted results, the results are made available in the EPA's National Contaminant Occurrence Database (NCOD) (<http://www.epa.gov/dwucmr/national-contaminant-occurrence-database-ncod>) Consumers can review UCMR results by accessing the NCOD. Contaminants that were detected during our UCMR3 sampling and the corresponding analytical results are provided below.

Contaminant Name	Year	Average	Range Low – High	Sample Size	Unit of Measure

Unregulated Contaminants***

EPA has implemented the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act. EPA uses the results of UCMR monitoring to learn about the occurrence of unregulated contaminants in drinking water and to decide whether or not these contaminants will be regulated in the future. We performed monitoring and reported the analytical results of the monitoring to EPA in accordance with its Third Unregulated Contaminant Monitoring Rule (UCMR3). Once EPA reviews the submitted results, the results are made available in the EPA’s National Contaminant Occurrence Database (NCOD) (<http://www.epa.gov/dwucmr/national-contaminant-occurrence-database-ncod>) Consumers can review UCMR results by accessing the NCOD. Contaminants that were detected during our UCMR3 sampling and the corresponding analytical results are provided below.

Contaminant Name	Year	Average	Range Low – High	Sample Size	Unit of Measure
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***More information about the contaminants that were included in UCMR3 monitoring can be found at: <http://www.drinktap.org/water-info/whats-in-my-water/unregulated-contaminant-monitoring-rule.aspx>. Learn more about the EPA UCMR at: <http://www.epa.gov/dwucmr/learn-about-unregulated-contaminant-monitoring-rule> or contact the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/contact.cfm>.



Violations, Significant Deficiencies, Backflow/Cross-Connection, and Formal Enforcement Actions

No Violations or Formal Enforcement Actions
--

Significant Deficiencies			
Date Identified	Deficiency Description	Steps Taking to Correct and Progress To Date	Estimated Completion Date
1/26/2017	D250 - HIGH LEAKAGE RATES; System usage data indicates that high leakage rates pose a risk of backsiphonage.;	Leaks were identified and (2) repair events have been completed on CR 248 for service connection leaks and a main valve leak. (1) Line replacement on Dorsett Lane and the installation of isolation valves at the corner of CR 248 and Dorsett Lane	6/10/17
Additional Deficiency Information			



COLORADO

Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

February 7, 2017

Mr. Mark Fuson
Florida River Estates HOA Inc
383 Meadowbrook Dr
Bayfield, CO 81122

Subject: Sanitary Survey of Florida River Estates HOA Inc
Public Water System Identification (PWSID) No. CO0134300
La Plata County

Dear Mr. Fuson:

A sanitary survey was performed on January 26, 2017 by the Field Services Section of the Colorado Department of Public Health & Environment's Water Quality Control Division (the department) at Florida River Estates HOA Inc (the supplier) in accordance with *the Colorado Primary Drinking Water Regulations, 5 CCR 1002-11* (Regulation 11), Sections 11.38(1)(b) and 11.38(2). This letter serves to provide the supplier with written notification of the sanitary survey findings, including any identified significant deficiencies and violations of Regulation 11. The assistance that was provided during the sanitary survey was very helpful and is greatly appreciated. Table 1 identifies the parties present during the sanitary survey.

Table 1: Parties Present

Name	Organization
Mark Fuson	Florida River Estates HOA Inc
KC Kay	Colorado Department of Public Health & Environment

In response to this letter, the supplier must provide a written response, documenting resolution of all significant deficiencies and violations, and/or propose a corrective action plan with a corrective action schedule, as required by Regulation 11, Section 11.38(3)(d,f). Also, for findings that are violations of Regulation 11, the supplier must comply with the public notification requirements described in Section V, below. The supplier's written response is due within forty-five (45) days. If a corrective action plan is proposed, it must outline the course of action that has been or will be taken and the date by which the supplier proposes to correct each significant deficiency and violation of Regulation 11. Table 2 summarizes the number of findings and the required written response and resolution dates.

Table 2: Sanitary Survey Findings

Severity Category	Number Identified	Written Response Due (within 45 days of letter date)	Resolution Due (within 120 days of letter, or department-approved alternate date)	Public Notice Required (Violations of Regulations 11 or 100)
Significant Deficiencies	1	March 24, 2017	June 7, 2017	Not Required
Violations	0	No response required	Not applicable	Not Required
Observations - Recommendations	12	No response required	Not applicable	Not applicable

Failure to adequately address all significant deficiencies and violations referenced above may result in additional violations of Regulation 11. A list of the findings for each category in Table 2 can be found in the following sections:

Section I: Significant Deficiencies

According to Regulation 11, Section 11.3(71), a significant deficiency means:

any situation, practice, or condition in a public water system with respect to design, operation, maintenance, or administration, that the state determines may result in or have the potential to result in production of finished drinking water that poses an unacceptable risk to health and welfare of the public served by the water system.

The items in this category are significant deficiencies. Please direct questions regarding resolution of the following items to the department inspector.

1. D250 - Distribution: Distribution System (SDWIS ID: DS001)

High Leakage Rates: Supplier usage data indicated that leakage rates may pose a risk of back-siphonage.

During the sanitary survey, the department inspector discussed the high leakage rates experienced by the supplier. The supplier has estimated that the current leakage rate is approximately 70%. The high leakage rates was discovered by the operator comparing pumping rates and raw water volume with billed usage. Further analysis by the operator appears to show that the distribution system may be of glued-joint hard plastic. This type of piping is fragile and ages poorly. The high leakage rates have resulted in continuous pumping of raw water which reduces the lifecycle of the pumps, increases frequency of filter bag replacement due to increased turbidity of constantly drawn water from the spring source. The operator has explored statewide leak detection contractors to determine where the leakage is occurring and it is strongly recommended that the supplier continue those efforts.

The supplier has not yet experienced a loss of pressure within the system, however, if a major line break were to occur, the water treatment plant may not be capable of keeping up with the increased demand. If fifty percent of the distribution system is without water, the supplier must call the Department's 24-Hour incident reporting hotline at 1-877-518-5608. The WQCD acute team will review the circumstances and the Department may require a Tier 1 public notice and bottled water advisory to protect public health. Please see the "Pressure Loss and Main Break Response Guidance" accessible at <https://www.colorado.gov/pacific/cdphe/wq-drinking-water-incidents>. To resolve this deficiency, the supplier is expected to submit a written plan with milestones and timeframe to alleviate the high leakage problem.

Section II: Violations

The items in this category are violations of Regulation 11. Please direct questions regarding resolution of the following items to the department inspector.

No Violations were identified.

Section III: Observations/Recommendations

The department recommends the supplier follow-up and consider the following observations-recommendations. Please direct questions regarding any of the items below to the department inspector.

1. D251 - Distribution: Distribution System (SDWIS ID: DS001)

Unaccounted for Water: Determining the percentage of unaccounted for water. Colorado Design Criteria for Potable Water Systems (Design Criteria), Section 8.12.

During the sanitary survey, the department inspector discussed the economics of water loss in costs of water production including filter bag filter replacement, pump lifespan, electrical and disinfection costs. The supplier's distribution system is 100% metered. The cause of Unaccounted for Water could be , incorrect or inaccurate meters, broken water lines, unconnected service taps that are leaking, household taps left open, etc.

Unaccounted for Water is an expense that is not recovered by the supplier. As noted in the Significant Deficiency #1 above, the Unaccounted for Water was discovered by the operator comparing pumping rates and raw water volume with billed usage.

2. D430 - Distribution: Distribution System (SDWIS ID: DS001)

Line Disinfection Procedures: Supplier did not have adequate disinfection procedures for installation or repair of water mains. Colorado Design Criteria for Potable Water Systems (Design Criteria), Chapter 8, Section 8.7.7.

At the time of the sanitary survey, the department inspector found that the supplier was following American Water Works Association (AWWA) disinfection procedures but did not have the procedures in writing and included in an Operations and Maintenance (O&M) Plan. These procedures can be obtained from the AWWA Disinfection of Pipelines and Storage Facilities Field Guide, and should be included in the written O&M plan. This AWWA field guide can be found at the AWWA website: <http://www.awwa.org/>.

3. D410 - Distribution: Distribution System (SDWIS ID: DS001)

Valve Inspection and Exercising Program: Valve inspection and exercising program implementation.

At the time of the sanitary survey, the department inspector and the supplier discussed the valve exercising program for the water system. A component of a public water system Operations and Maintenance (O&M) plan is a valve inspection and exercising program. The supplier should have a list of all of the valves in the distribution system, their location and maintenance information. The department recommends developing a program in accordance with AWWA Standard G200-04 Distribution System Operation and Maintenance, which states: "This program shall include at least the following elements:

- a) A goal for the number of transmission valves to be exercised annually based on the percentage of the total valves in the system.
- b) A goal for the number of distribution valves to be exercised annually.
- c) Measures to verify that the goals are met and written procedures for action if the goals are not attained.
- d) Critical valves in the distribution system shall be identified for exercising on a regular basis. Potential quality and isolation concerns shall be recognized. The program shall track the annual results and set goals to reduce the percent of inoperable valves."

Inspecting and exercising valves should include completely closing, opening, and re-closing until the valve seats properly. Leaking or damaged valves should be scheduled for repair. A record of valve maintenance and operation, including the number and direction of turns to closure, should be kept.

The supplier's current distribution system map does not appear to identify all system valves. The supplier should make an effort to locate, identify, and exercise all systems valves and update the distribution system map.

4. D400 - Distribution: Distribution System (SDWIS ID: DS001)

Line Flushing Program: System lacked an adequate line flushing program or the flushing program can be improved.

At the time of the sanitary survey, the department inspector found that the supplier did not have a program in place for line flushing or was in the process of developing a flushing program. In accordance with the Standard G200-04, Distribution System Operation and Maintenance, "the utility shall develop and implement a systematic American Water Works Association (AWWA) flushing program that meets the needs of the utility, taking into consideration the condition of the public water system including but not limited to, hydraulic capacity, treatment, water quality, and other site specific criteria. At a minimum, the flushing program, according to AWWA, shall incorporate the following items:

1. The program addresses a preventive approach to distribution system flushing, including occasional spot flushing to address localized problems or customer concerns and routine flushing to avoid water quality problems.
2. The utility shall perform system flushing at the velocity appropriate to address water quality concerns.
3. The utility has written procedures addressing all activities associated with system flushing, water quality,

monitoring, frequency, locations, and duration, as well as adherence to all regulatory requirements.” The department recommends developing a written line flushing program that can be incorporated into the supplier’s Operations and Maintenance (O&M) plan. Records of flushing activities should be maintained in the plan.

Flushing of water aids in the reduction of Distribution By Products in addition to aiding in reducing color, odor, and taste issues. The supplier does not have hydrants or flushing hydrants to perform line flushing functions. During the resolution of Significant Deficiency #1 D250 - High Leakage Rates and Observation #1 D251 - Unaccounted for Water, the supplier should explore adding flushing hydrants to the distribution system.

5. D320 - Distribution: Distribution System (SDWIS ID: DS001)

Distribution Construction Standards: Distribution system construction standards. Colorado Design Criteria for Potable Water Systems (Design Criteria), Section 8.1, 8.7.

At the time of the sanitary survey, the department inspector observed that the supplier did not have written distribution construction standards or was in the process of developing standards. The department recommends that the supplier adopt and periodically update distribution construction standards to ensure that distribution system repairs are made in accordance with minimum design and construction criteria including the Colorado Design Criteria for Potable Water Systems requirements and AWWA guidelines. Contractors should have a copy of the supplier’s construction standards prior to commencing work on distribution system projects. A list of construction contractors in priority order should be kept for emergency purposes.

6. T995 - Treatment: Florida River Estates Ywtp01 (SDWIS ID: 001)

Other Treatment Observations: department inspector identified treatment observation.

An isolation valve between the water treatment plant and the storage tank exists within the water treatment plant building. An isolation valve should be installed outside of the water treatment building allowing the tank to be isolated under the operator’s direct request without having to access the interior of the treatment building.

7. T110 - Treatment: Florida River Estates Ywtp01 (SDWIS ID: 001)

Log Inactivation (Surface Water and GWUDI): Supplier demonstration of adequate disinfection at the time of the sanitary survey. Adequate disinfection is required prior to the entry point to the distribution system. Regulation 11, Section 11.8(1)(b)(i)(A).

Per Regulation 11, Section 11.8(3)(b)(i)(A), the supplier must maintain disinfection treatment sufficient to ensure that the total treatment processes, including filtration and disinfection, achieve 99.9 percent (3-log) treatment of *Giardia lamblia* cysts and 99.99 percent (4-log) treatment of viruses, as determined by the department. The supplier utilizes a Strainrite bag filtration system that, if properly operated, allows for 2.5-log removal credit for *Giardia lamblia* and 0-log removal credit of viruses. Per the information provided by the supplier, the disinfection contact time is achieved at the surface water treatment plant via a free chlorine injection. Regulation 11 defines the first customer as the first potable water service connection downstream of the point where complete water treatment, including disinfection contact time, has occurred. Typically, the first customer is the water treatment plant’s domestic water system. The supplier is accessing house water from a tap after a contact chamber consisting of a clear well, 310’ of 18” pipe, and 200’ of 8” pipe.

At the time of the sanitary survey, the department inspector noted that the current location for the entry point chlorine residual monitor used for compliance reporting is located at after the piping used for CT. Though this requirement has been part of Regulation 11 since the U.S. Environmental Protection Agency’s Surface Water Treatment Rule went into effect, the department has recently begun a statewide outreach and disinfection verification project to reevaluate surface water treatment. The department has formed a Disinfection Outreach and Verification Effort (DOVE) team to perform this reevaluation and assist suppliers of water in assessing their disinfection.

During the sanitary survey, the department inspector informed the supplier that the DOVE team will be providing additional information regarding the department’s evaluation process under separate letter. The department has assigned Mark Henderson to assess the supplier’s treatment plant for sufficient disinfection. If the supplier opts

to proactively start addressing this issue, please contact Mark Henderson at 303-692-6255 or mark.henderson@state.co.us.

8. M990 - Management:

Other Management Observations: department inspector identified system management and operation observation.

The supplier is organized as a 501c(3) non-profit Home Owners Association. The supplier may want to consider reorganizing the water system into a Public Improvement District or other entity that allows the ability to establish a Capital Improvement Plan and funds. The PID may assist the supplier with grants, loans, and assessments for district improvements. The supplier may wish to discuss with a lawyer cognizant of benefits and disadvantages of a 501c(3) vs PID.

9. M642 - Management:

Repair and Replacement Plan: Planning and/or financial capacity for repair and replacement of aging equipment.

During the sanitary survey, the department inspector and the supplier discussed the supplier's managerial and financial processes for maintaining a budget, fiscal records and rate structure to ensure reliable operation and future repair and replacement of aging equipment. The supplier is encouraged to continue efforts to ensure that all current and long term fiscal needs are being met and to identify and prioritize future repair and replacement costs for aging equipment and infrastructure. Information to assist the supplier with developing an Asset Management Program and a Capital Improvement Plan can be found online at <http://www.colorado.gov/CDPHE/WQCD>. The supplier might also benefit from utilization of the U.S. Environmental Protection Agency's Check Up Program for Small Systems (CUPSS) program, which is available on the internet at: <http://www.epa.gov/dwcapacity/information-check-program-small-systems-cupss-asset-management-tool>. In addition, the department's Local Assistance Unit may be able to assist you with preparing an Asset Management Program and can be contacted by calling 303-692-3665.

10. R510 - Monitoring & Recordkeeping and Data Verification:

General Monitoring Plan: Monitoring plan required content, updates for facility changes, submittal to the department.

According to Section 11.5 of Regulation 11, all suppliers of water shall develop and implement a monitoring plan. At the time of the sanitary survey, the department inspector reviewed the supplier's monitoring plan and noted that the plan is of a deprecated template (2005). The supplier must develop a monitoring plan that includes all the requirements of Section 11.5. In order to aid in the development of the plan, the department recommends that the supplier use the department's monitoring plan template, which can be accessed from <http://wqcdcompliance.com>. If the supplier would like help developing the plan, please request coaching assistance via the department's Local Assistance Unit website at <https://www.colorado.gov/pacific/cdphe/drinking-water-training-opportunities>, which has an online coaching request link.

After developing the monitoring plan, the supplier is required to submit a copy to the department via the department's online portal, which can be accessed at <https://wqcdcompliance.com/login>. The supplier is required to create a portal account, if not done previously. The portal can be used for uploading non-emergency information for suppliers of water in addition to monitoring plans. For portal support, please contact Kaleb Winisko at kaleb.winisko@state.co.us or 303-691-7803.

Once submitted to the department, the plan will be reviewed by the department's Drinking Water Compliance Assurance Section. For questions regarding the Monitoring Plan requirements please contact Tim Jones of the Compliance Assurance Section at timothy.jones@state.co.us or 303-692-2085.

11. T119 - Treatment: Florida River Estates WTP01 (SDWIS ID: 001)

Proper Operation: Surface water or ground water under the direct influence (GWUDI) of surface water treatment operational practices. Regulation 11, Section 11.8(1)(b) and CDPHE-WQCD Policy 4.

During the sanitary survey, the department inspector discussed the surface water/GWUDI treatment process with the supplier's certified operator. The treatment and disinfection processes consist of (3) 3M 522A roughing filters with 2-micron bags followed by (3) StrainRite HPM99-CC-2SR 1-micron nominal bag filters followed by (3) StrainRite HPM99-CCX-2SR 1-micron absolute finishing compliance filters. The piping within the water treatment plant is hard plastic with glue-together joints. Flexible joints and connections should be considered to reduce the likelihood of piping breaks.

12. 0997 - Operator:

Other Operator Compliance Observations: department inspector identified operator compliance observation.

Title 25 of the Colorado Revised Statutes (CRS), Article 9, requires that every drinking water facility and water distribution system be under the supervision of a certified operator, holding a certificate in a class equal to or higher than the class of the facility or system. In accordance with Regulation 100 (Water and Wastewater Facility Operators Certification Requirements), the supplier's water system is classified as a D drinking water treatment system and a 1 distribution system. At the time of the sanitary survey, the supplier was under the supervision of a certified operator in responsible charge (ORC), Mark Fuson, with Class A water treatment and Class 1 distribution certifications. The ORC began operational control November 1, 2016 and performed an in-depth evaluation of the system.

At the time of the sanitary survey, the supplier could not adequately demonstrate that the operator in responsible charge (ORC) was making operational decisions for the control and operation of the water treatment and distribution system or that a written operating plan was in place for delegation of activities to other facility operators or personnel. Please note that Regulation 100, Sections 100.16.5 and 100.16.6 clearly define the required roles of the ORC as the following:

- a) the management or administration of the operation of the water or wastewater facility;
- b) the accountability for the proper operation and maintenance of the water or wastewater facility for compliance with applicable regulations and/or permit requirements, including monitoring and reporting requirements;
- c) the control of, supervision over, or active participation in the daily planning, operation or maintenance of a water or wastewater facility;
- d) authority to make day-to-day process control and system integrity decisions on the operation and maintenance of the water or wastewater facility;
- e) the availability to make decisions and initiate actions regarding the operation of the water or wastewater facility in a timely manner;
- f) ensuring proper inspection and testing of new, modified, or repaired facilities prior to placing or returning such facilities into service;
- g) developing and implementing preventative maintenance programs and performing routine maintenance functions for facilities;
- h) overseeing compliance with laws and regulations and reporting as appropriate to facility owners and the department; and
- i) the performance of other functions of direct responsibility, including those enumerated in section 100.15.

Regulation 100 allows the certified ORC of a water or wastewater facility to delegate tasks or activities to other facility operators when delineated by a written operating plan. During the sanitary survey, no written plan was available. **Please develop a written operating plan in accordance with Regulation 100.** The department expects that this written operating plan will be available during the next sanitary survey. More information regarding operating plans is available at: <https://www.colorado.gov/pacific/cdphe/wq-facility-operator-certification-operating-plan> . Please note that the operating plan must be precise in defining the limits of tasks or activities that can occur while the ORC is not on-site. Also, the operating plan must be reviewed and updated, as needed and at least once each calendar year by the certified ORC. The operating plan must be available to the facility owner and other facility operators at all times. The operating plan must be available for inspection by the department upon request. In addition, any operational activity beyond the limits defined in the operating plan requires the immediate and direct consultation with and participation of a certified ORC or another operator holding a certificate equal to or above the classification of the facility he or she is operating.

Section IV: Field Verification/Sampling

While performing the sanitary survey, the inspector verified operator certification requirements and performed water quality sampling for chlorine residual and turbidity. Table 3 indicates the results of the water quality sampling performed on-site.

Table 3: Sampling Results

Parameter	Sample Location	Value	Units	Notes
Entry Point Disinfectant Residual	EP	0.80	mg/L	
Distribution System Disinfectant Residual	195 County Rd 248	0.80	mg/L	
Turbidity	CFE - EP	0.05	NTU	

Reminders

- Regulation 11, Section 11.4(1)(b) (Prior Approval Required) requires the department's approval prior to commencement of construction of any improvements, treatment process modifications, or the addition of new water sources.
- Most regulations, guidance documents, and forms are available on the department's website at <http://wqcdcompliance.com>.

Attached is a form that the supplier may use to document the required written response to this letter. While using this form is optional, it will fulfill the requirement to provide a written response if completed and submitted to the department by the written response due date listed above.

Enclosed with this letter you will find a postage-paid Customer Satisfaction Survey Postcard. Please take a few moments to complete the survey and return it to the department. Your efforts to provide feedback to improve the sanitary survey process are appreciated.

If you have any questions, please contact me at (970) 248-7154 or casey.kay@state.co.us. Thank you for your time and cooperation.

Sincerely,



KC Kay, Environmental Protection Specialist
Field Services Section
Water Quality Control Division
Colorado Department of Public Health & Environment

cc: San Juan Basin Health Department
Drinking Water File, PWSID No. CO0134300
Aquifer Case FS.17.INSP.03514
Mark Fuson MARKFUSON@FRONTIER.NET

Florida River Estates HOA Inc. PWS 45-Day Sanitary Survey Response Letter

March 13

ATTN: KC Kay, Environmental Protection Specialist
Colorado Department of Public Health and Environment
Field Services Section-Northwestern Regional Unit Office
222 South 6th Street, Room 232
Grand Junction, CO 81501

This letter serves as the required 45-day response to the 2017 sanitary survey conducted on January 26 2017 for the Public Water System listed below.

System Name:	Florida River Estates HOA Inc.
PWSID:	CO 00134300
Date of Survey Letter:	2/7/17
Response Due:	3/24/17
Inspector Name:	KC Kay

1) Deficiency D250-High Leakage Rates

The lower portion of the subdivision was experiencing very high leakage rates in the distribution system.

2) Corrective Actions Taken

Prior to and after the sanitary survey the operator and the Board of Directors began the process of trying to determine where the high rate of loss leak or leaks existed within the lower subdivision. After finding several valves and completing isolation processes two segments were identified. A contractor (Bonds Construction) was retained to help with leak detection on 12/31/16 on those two segments. These efforts lead to the fixing of one leak and to the possible location of another leak.

- a) The leak that was found was repaired and stopped an approximate 19 gpm leak. It involved the excavation of two meter pits and the service line near those pits. The copper from the pit to the plastic service line failed in several places with holes up to ¼ " and smaller in a 5 foot section going to the PVC service line.

Additionally a 3" main valve developed a leak after the isolation process.

Installation of new service lines to the two brand new pits and replacement of the 3" valve in the county road was started 2/6/17 and completed 2/9/17.

b) The second location did not yield success in finding the actual leak. It was a large excavation and did however allow Bonds to install one 2", and two 1" valves into a intersection that did allow us to determine, by isolation, which segment of the main was still leaking. Additionally efforts were made with locating equipment to find the main and the leak in this segment but the location effort was inconclusive. This leak is estimated at 10 gpm based on isolation efforts.

Installation of the isolation valves in the county road and location effort was started 2/14/17 and completed 2/24/17.

c) Quotes were requested from several contractors for the installation of 415 feet of new main and the adjustment of two meter pits in this segment to get them out of private property.

These quotes were requested during the week February 27.

d) A total of \$26,439.09 has been spent repairing and trying to find these leaks thus far. We estimate that one more similar repair effort will take us down to a critical level in the operations budget.

e) During the annual HOA meeting on February 25 the state of the system was discussed in a public meeting with many residents in attendance. At this time it was conveyed that the Board of Directors for Florida River Estates HOA Inc. will be modifying future water rates and structure.

f) Goff Engineering is developing a proposal for the Preliminary Engineering Report for a system analysis and future recommendations.

3) Corrective Action Plans

a) Since repair of leak 1 the plant now has sufficient capacity. The plant will operate in the interim as needed until the second large leak has been repaired. This will then get the system out of a high loss scenario and back to a historically manageable operating range. We anticipate this repair happening in April 2017 which would satisfy the 120 day deadline of June 7 for resolution of the deficiency without an additional plan. However the following plan is included should this repair get delayed

b) The board will decide by the end of March 2017 whether to proceed with main replacement on the segment that is leaking in the county road or to try chasing the main to find the leak through problematic access on private property.

c) By May 1 2017 the board will decide what the new rate structure will look like and send this information out to the residents in written form or email, and on the billing document.

d) On June 1 2017 Florida River Estates HOA will implement rate changes and begin putting a prescribed portion of the water bill into a Capital Improvement Account.

e) Leak events moving forward will be handled out of the operation account until such time as the reserve account must be used for repairs. This is estimated to be the case for three years.

f) It is estimated that by 2020 that there will be sufficient money in the Capital Improvement Account to obtain a loan in which to shop for bids to repair/replace the distribution system infrastructure in the lower subdivision and the upper subdivision to the point where total system leakage is minimal.

g) Grant effort processes for USDA Rural Development, Colorado Water Resource and Power Authority Revolving Fund, Southwest Conservation District and Southwest Basin Roundtable grants will begin in April 2017 to see if funds are available for this subdivision.

Paul DeJulio, HOA President

Signature



Date

3-13-17

Mark Fuson, ORC

Signature



Date

3-13-17

STATE OF COLORADO

John W. Hickenlooper, Governor
Larry Wolk, MD, MSPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

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222 South 6th Street, Room 232
Grand Junction, CO 81501
Fax (970) 248-7198.



Colorado Department
of Public Health
and Environment

www.colorado.gov/cdphe

June 2, 2014

Mr. Adam Smith
Florida River Estates HOA Inc.
PO Box 456
Durango, CO 81301

Subject: Sanitary Survey of Florida River Estates HOA Inc.
Public Water System Identification (PWSID) No. CO0134300
La Plata County

Dear Mr. Adam Smith:

This letter serves to report the findings of the sanitary survey conducted by the Field Services Section of the Colorado Department of Public Health and Environment's Water Quality Control Division ("the Department") at Florida River Estates HOA Inc. ("the Supplier") on May 15, 2014. The assistance that was provided during the sanitary survey was very helpful and is greatly appreciated. Table 1 identifies the parties present during the sanitary survey.

Table 1: Parties Present

Name	Organization
Mike Amato	Florida River Estates HOA Inc.
KC Kay	CDPHE

This letter is the Supplier's notification of any significant deficiencies and/or alleged violations of the *Colorado Primary Drinking Water Regulations* (Regulation 11), 5 CCR 1002-11 identified during the sanitary survey. A significant deficiency represents an unacceptable risk to public health or safe delivery of drinking water. For all significant deficiencies, a written response to this letter is required within forty five (45) days. Significant deficiencies must be resolved either within one hundred twenty (120) days of this notification or by an alternative deadline proposed by the Supplier and agreed to by the Department. Table 2 summarizes the number of findings and the required written response and resolution dates.

Table 2: Sanitary Survey Findings

Severity Category	Number Identified	Written Response Due (within 45 days of letter date):	Resolution Due (within 120 days of letter, or Department-approved alternate date):
Significant Deficiencies	0		
Other Violations	0		
Observations-Recommendations	1	No response required	Not applicable

A list of the findings for each category in Table 2 can be found immediately below.

Significant Deficiencies:

According to Regulation 11, Section 11.3(66), a significant deficiency means:

any situation, practice, or condition in a public water system with respect to design, operation, maintenance, or administration, that the state determines may result in or have the potential to result in production of finished drinking water that poses an unacceptable risk to health and welfare of the public served by the water system.

The Supplier's written response to this letter must address all items listed in this category. All significant deficiencies must be corrected and will be followed-up by the Department. The following significant deficiencies were identified:

No Significant Deficiencies were identified.

Other Violations:

Other violations may be identified during a sanitary survey that are not significant deficiencies but must be corrected. The Supplier may be contacted by a compliance specialist from the Department's Compliance Assurance Section for additional follow-up on these violations. The Supplier must resolve these violations prior to the subsequent sanitary survey, which will be verified by the Department's inspector at that time. The following other violations were identified:

No Other Violations were identified.

Observations/Recommendations:

While the Department does not directly follow-up on the observations/recommendations, the Supplier is advised to address them. The following observations/recommendations were identified:

1. F314 - Finished Water Storage: Water Storage Tank (SDWIS ID: 003)

Storage Structural Integrity: Storage facility structural condition.

At the time of the sanitary survey, the storage tank condition was discussed. During the sanitary survey, the inspector observed that the area around the tank is susceptible to debris, animal nesting, and washout due to the tank's location in a forested area. It is recommended that the area around the tank be checked often for indications of animal burrowing or nesting, and cleared of debris and tree branch downfall. It is also recommended that the tank be evaluated by a professional tank inspection company. Please note that if the tank fails, and the Supplier is not capable of maintaining service to the distribution system, the Supplier is expected to immediately notify the Department's 24-Hour incident reporting hotline at 1-877-518-5608.

Field Verification/Sampling

While performing the sanitary survey, the inspector verified operator certification requirements and performed water quality sampling for chlorine residual and pressure. Table 3 indicates the operator certification verification for Florida River Estates HOA Inc. Table 4 indicates the results of the water quality sampling performed onsite.

Table 3: Operator Certification Verification

Category	Required	Name of Operator	Certification	Certification
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	Certification Level	in Responsible Charge	Level Held and No.	Expiration Date
Treatment	D	Oliver M Amato	A - 1558	10/30/15
Distribution	1	Oliver M Amato	1 - 14698	12/30/16

Table 4: Sampling Results

Parameter	Sample Location	Value	Units	Notes
Disinfectant Residual	Entry Point Sample Tap	0.82	mg/L	
Disinfectant Residual	186 Estates Drive	0.62	mg/L	
Pressure Reading	186 Estates Drive	52	psi	
Turbidity	sample tap after clear well	0.07	NTU	

Reminders

- Regulation 11, Section 11.4(1)(b) (Prior Approval Required) requires the Department's approval prior to commencement of construction of any improvements, treatment process modifications, or the addition of new water sources.
- Most regulations, guidance documents, and forms are available via Internet on the Department's website. Please link to <http://wqcdcompliance.com> for further information.

Enclosed with this letter you will find a postage-paid Customer Satisfaction Survey Postcard. Please take a few moments to complete the survey and return it to the Department. Your efforts to provide feedback to improve the sanitary survey process are appreciated.

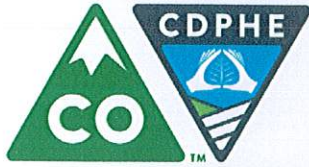
If you have any questions, please contact me by phone at (970) 248-7154 or via e-mail at casey.kay@state.co.us. Thank you for your time and cooperation.

Sincerely,



KC Kay, Engineering / Physical Science Tech
Field Services Section
Water Quality Control Division
Colorado Department of Public Health and Environment

cc: La Plata County
Drinking Water File, PWSID No. CO0134300
GJ Drinking Water File, PWSID No. CO0134300
Mike Amato, omamato@bresnan.net



COLORADO

Department of Public Health & Environment

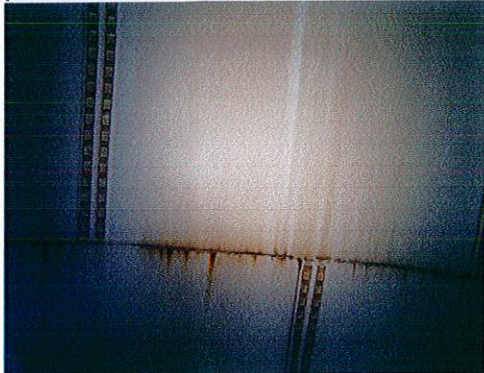

Section 11.28 Storage Tank Rule Regulation No. 11 (5 CCR 1002-11) Comprehensive Inspection Checklist


System Name & PWSID:	Florida River Estates
Inspection Date:	06/22/2017
Inspector's Name:	Charles "Bill" Donohue NACE Inspector #763
Inspector's Phone:	1-505-330-2531
Inspector's Email:	CWDIVERS@MSN.COM
SDWIS Tank Name:	Main Tank
SDWIS Facility State ID:	CO-134300
Inspection Start & Finish Time [±] :	
Tank level [±] :	
Weather conditions [±] :	
List Sanitary Defects Identified by Inspection Item # (which are in bold)*:	


[±] These items are not required and are included for the sole benefit of the supplier of water.

* **Bolded inspection items that are sanitary defects if answered 'Yes': 2, 3, 6, 7, 8, 9, 11, & 13.**
Bolded inspection items that are sanitary defects if answered 'No': 10 & 12.

Inspection Item:	Yes/No	N/A	Comments/Corrective Action Schedule/Action Taken/Corrective Action Completion Date:
1. Photographs or video taken?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		If no, why not? Both video and photo
INTERNAL TANK INSPECTION			
2. Contamination in the tank (e.g. floating debris, insects, other animal contamination, roots, etc.)?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		Traces of tree pollen, no insects.
3. Water turbid, discolored, stale or foul?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		No turbidity, water very clear.
4. Is stored water routinely turned over (stand pipe with valves or mechanical mixer), even in times of low demand	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		Common inlet/outlet, turned over by consumption

(includes reviewing logged/written data)?			
5. Cathodic protection functioning appropriately? (is the anode missing, is it in contact with water or is tank corrosion present)	<input type="checkbox"/> Y <input type="checkbox"/> N	X	Only check 'N/A' if the tank has no cathodic protection system. Galvanized, coated tank.
6. Interior coating: Blistering, peeling, scaling, rusting, any irregularities or other failure?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		If conditions exist but do not constitute a sanitary defect, answer 'N' to the left and describe them here; include recommendations to prevent sanitary defects. 
7. Interior sidewalls: Structural deficiencies, biofilm, sealant loss, any irregularities or other failure?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		Observed no film. Shell in good condition.
8. Roof interior: Structural deficiencies, any irregularities or other failure?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		Roof interior in good condition. 
9. Interior hatch: Structural deficiencies, any irregularities or other failure?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		Tank has no roof hatch. Removed vent for access.
10. Is there a stamp in the tank, documentation, or other evidence that the interior coating meets ANSI/NSF Standard 61 or equivalent potable water certification? If there is, include a photograph of the stamp, a copy of the	<input type="checkbox"/> Y <input type="checkbox"/> N	X	Only check 'N/A' if the tank has no interior coating. Interior coated with NSF epoxy.

documentation, or other evidence in the written inspection plan.			
11. Tank floor: Corrosion? Sediment/Sludge? Any structural deficiencies? Any irregularities? Other failure?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		
12. Tank penetrations (joints/ gaskets), as seen from the interior, adequately sealed?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	Joints and gasket penetrations sealed.
13. When viewed from inside the tank, is there visible daylight around the hatches, vents, joints or other fixtures? If yes, document location where light can be observed in 'Comments...' column.	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	
14. Is there evidence of damage or corrosion to the internal ladder?	<input type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	
15. Other concerns?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		Recommend cathodic protection, recommend installing roof hatch for safe egress into the tank.
16. Cleaning completed? Please note: The Storage Tank Rule does not require routine tank cleaning during tank inspections.	Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	If so, when? If cleaning revealed any findings or sanitary defect corrections, document above. Cleaning is not necessary, no sediment.

Inspector Signature:	Charles "Bill" Donohue NACE Inspector #763 Corrosion Technologist #3119
Date	Signature
06/22/2017	

Attorney client privilege

C W Divers

903 N. Watson • Farmington, NM 87401

Phone: (505) 327-2830

Cathodic Protection

Member AWWA

NACE Level III

Inspector #763

Underwater Inspections

Welding & Burning

Specializing in Water

Tank Inspections

Florida River Estates Water Company

Attn: Mark Fuson

RE: 100K gallon Main Tank, CO-134300 ROV Inspection

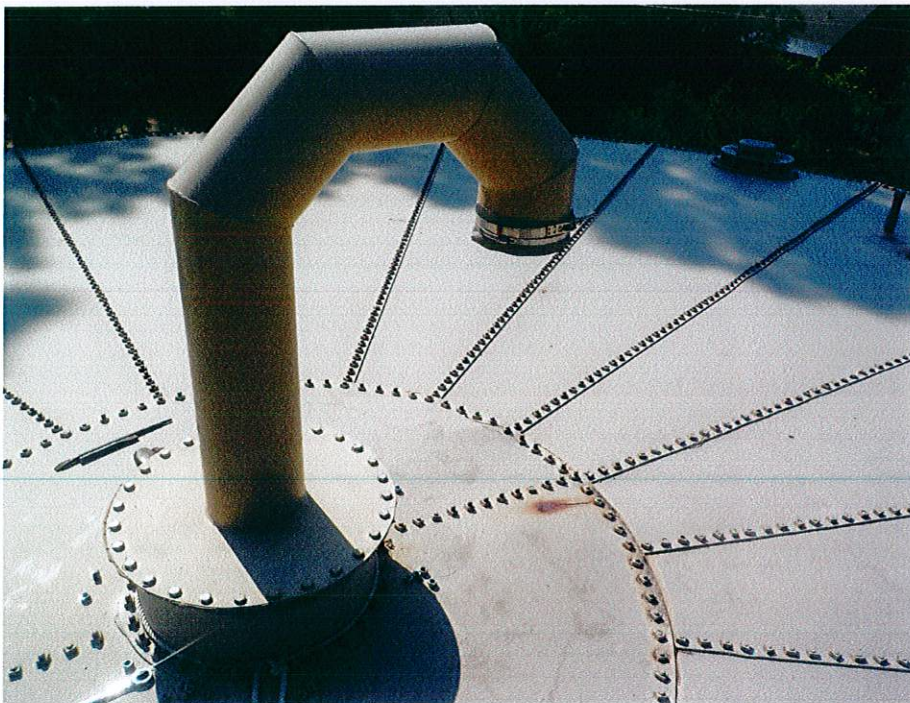
On 6/22/2017, CW Divers performed an ROV (remote operated vehicle) inspection on the internal water tank surfaces. The inspection was performed by NACE Level III Coatings Inspector #763, Charles Donohue. The report was documented by DVD video and photography. The purpose of the inspection was to evaluate the condition of the coating, determine extent of corrosion to the internal members and assess any un-sanitary conditions.



Exterior paint condition is good on the shell surface. Observed spot area's of light surface rust and peeling paint on the upper ring wall, next to the ladder.



The roof is in good condition, no rust or peeling paint.



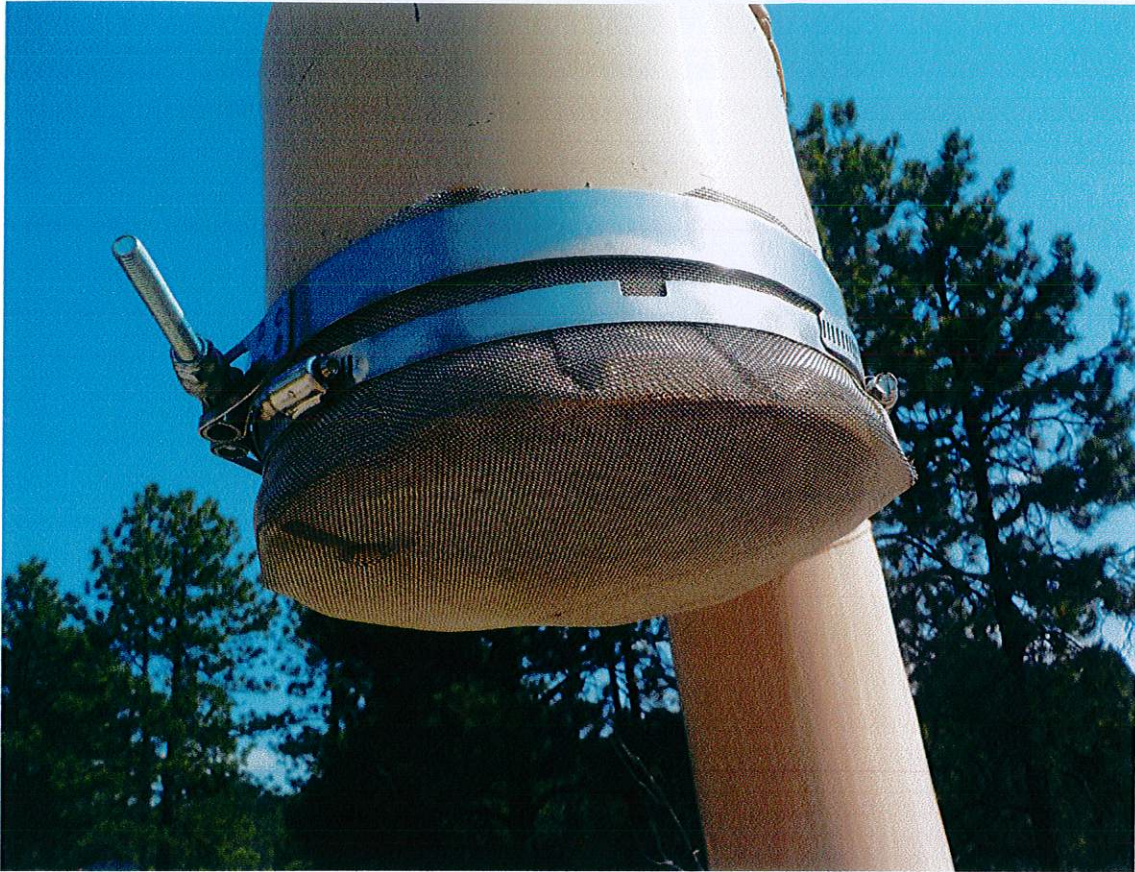
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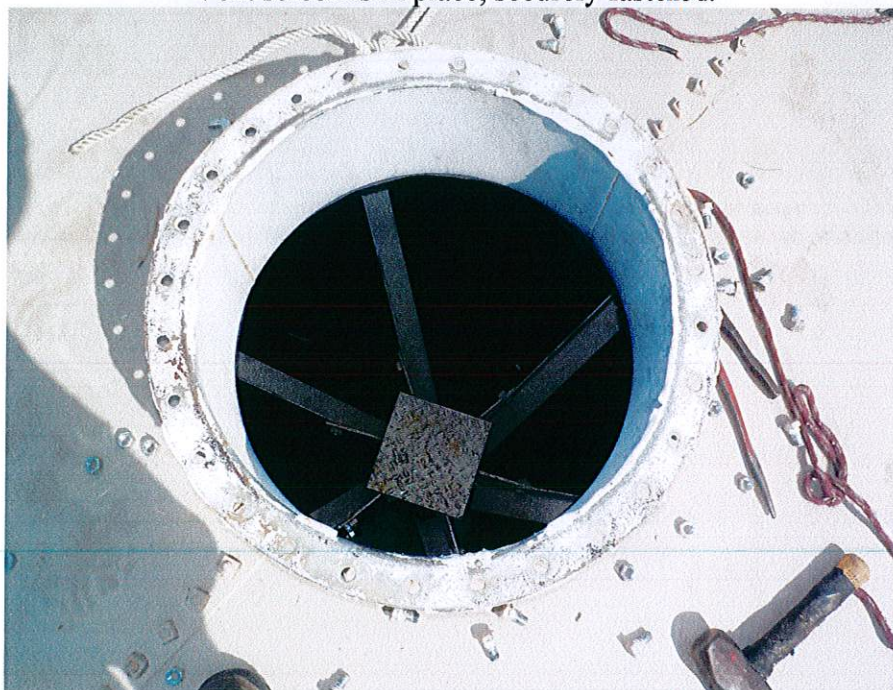
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Vent screen is in place, securely fastened.



Removal of the vent is required to allow interior access

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The overflow is PVC, piped thru the bolted shell



Bottom of overflow supported by a rock

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Rafters and ceiling plates are galvanized in good condition



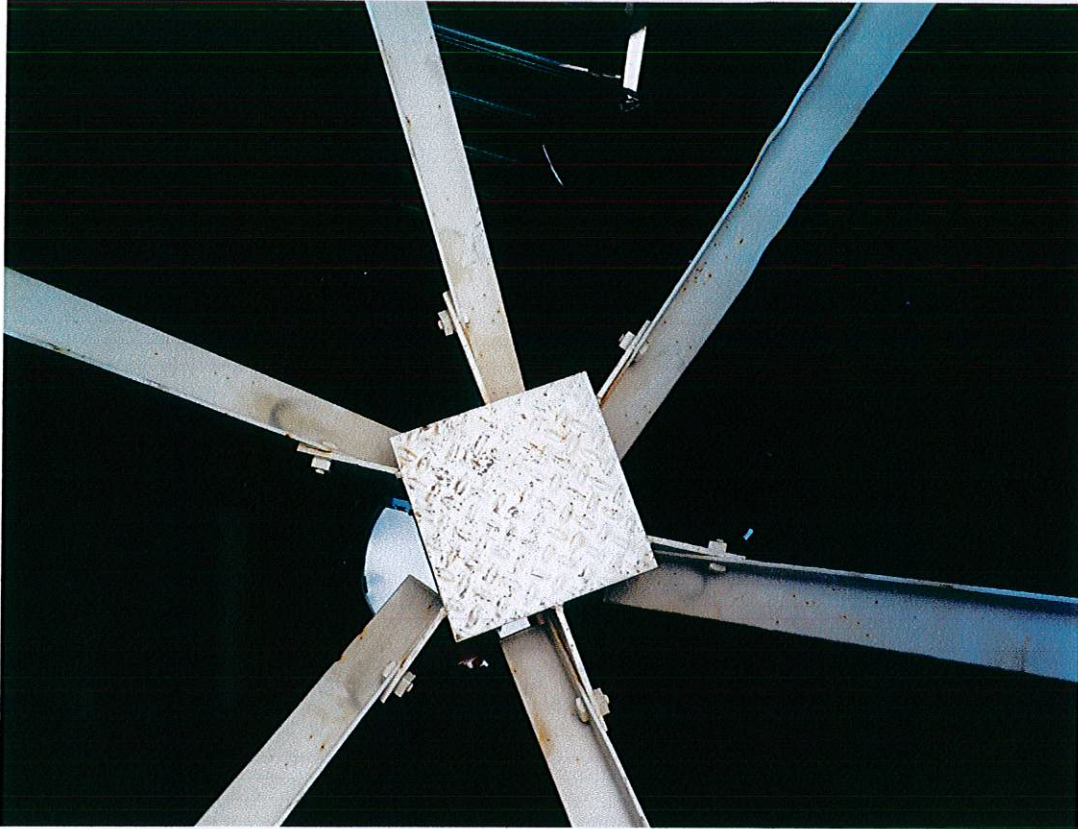
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Upper center support



Lower center support

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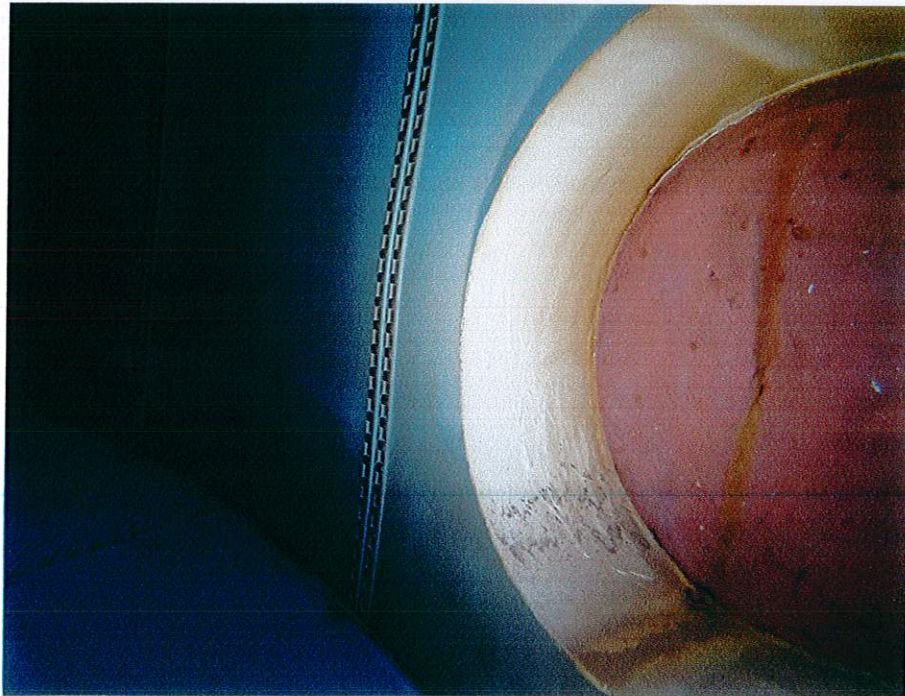
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Minor corrosion at floor/shell area. Drain on floor.



Shell manway @ 5:00 position

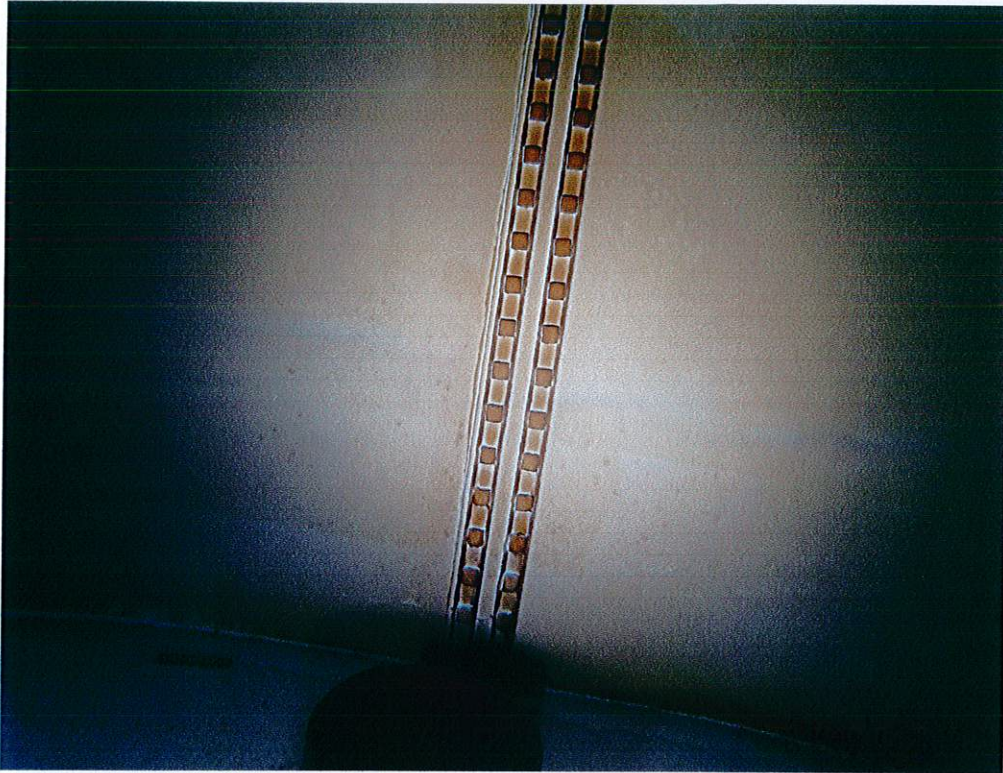
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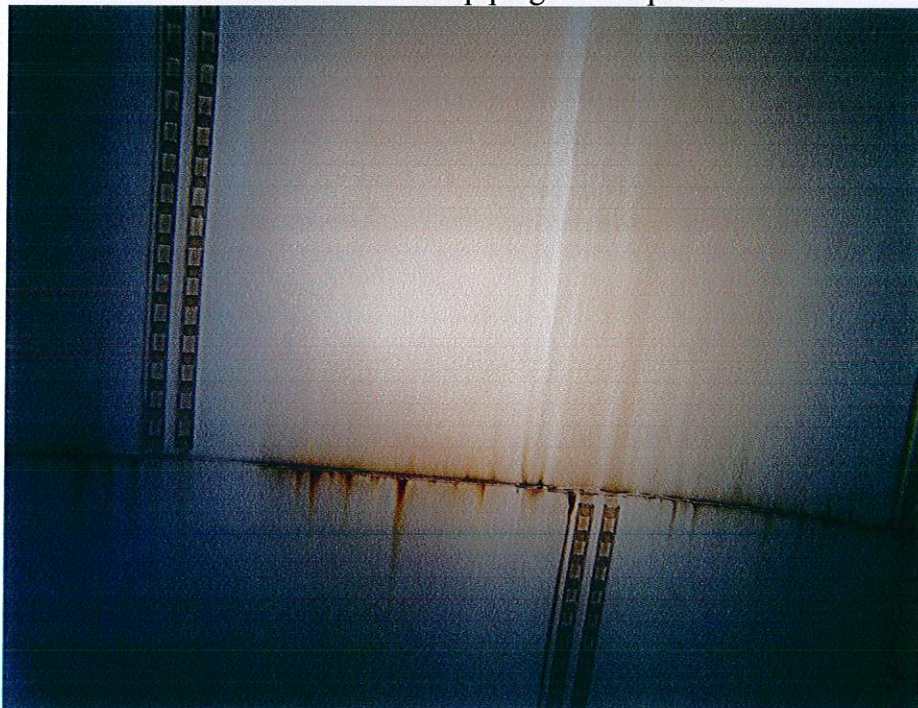
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Common inlet/outlet piping at 3:00 position



Minor corrosion on shell

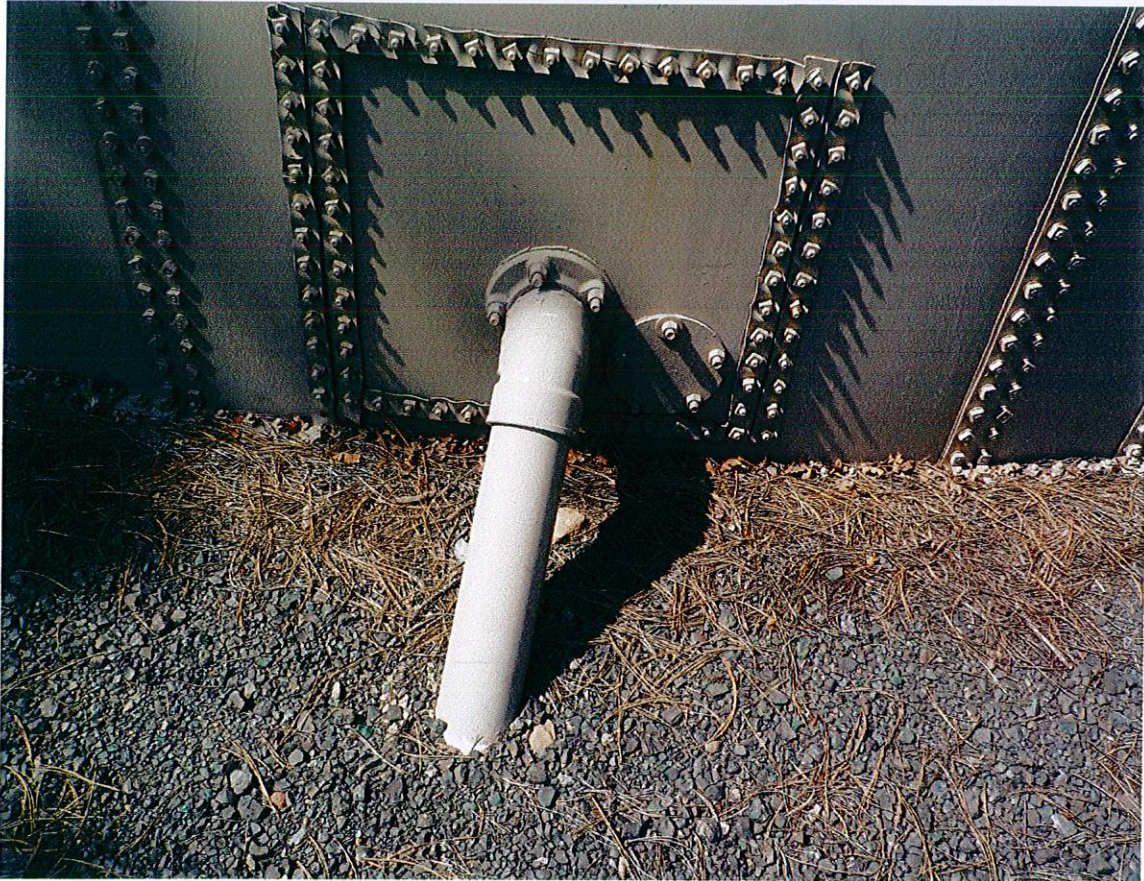
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Overflow piping



Overflow and drain

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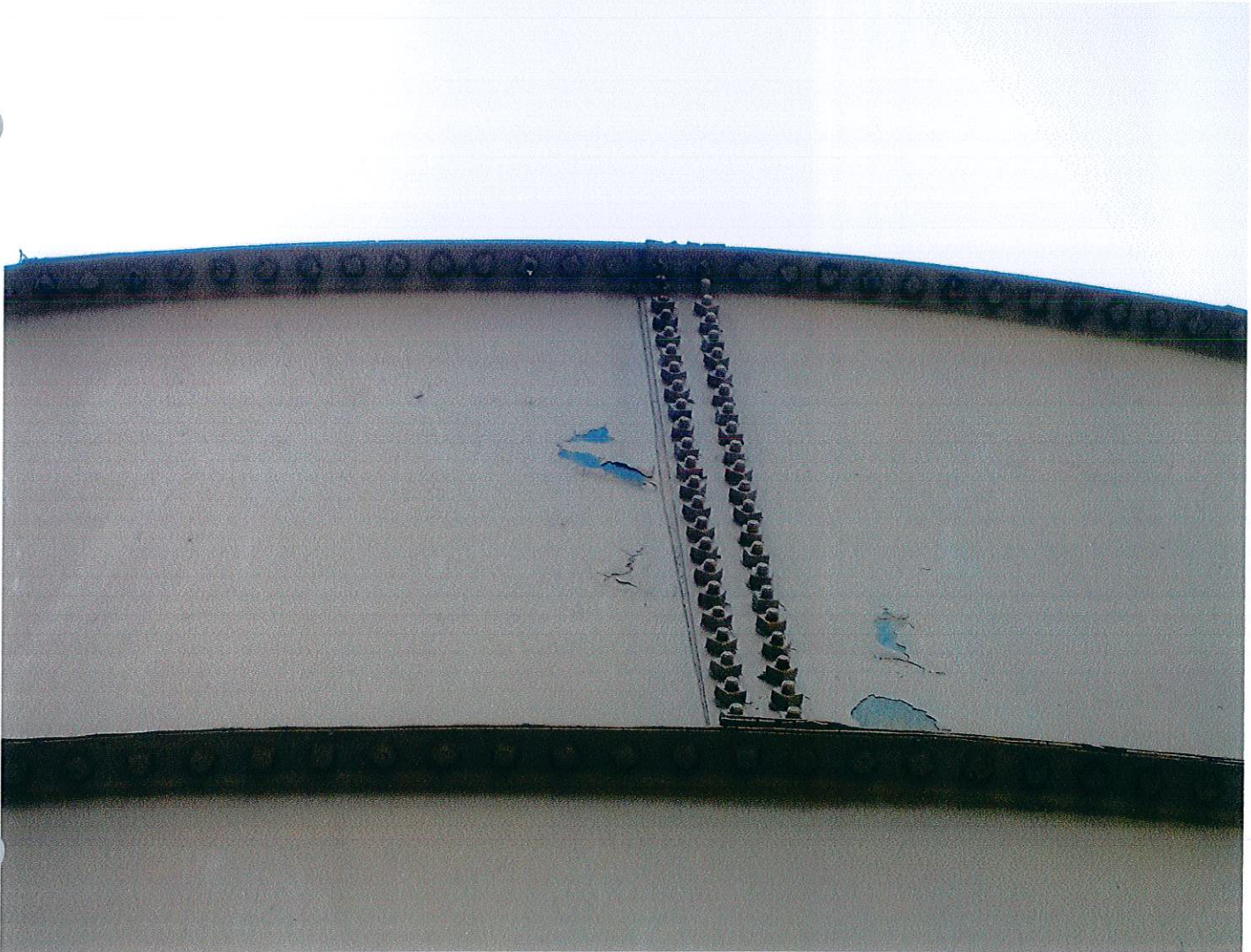
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Wood skids for floor support





Observed no measurable corrosion on the interior shell, floor, or ceiling. The interior shell coating is in good condition with no blisters only pinpoint rust. Observed no sanitary defects. Floor cleaning is not necessary at this time.

Recommendations: We recommend cathodic protection be installed to control corrosion at the shell bolted seams. We recommend the installation of a roof hatch. The roof vent removal for entry is an unsafe entry method. The external ladder handrails need to be extended 3' above the landing surface. CW Divers can provide these recommended improvements. Inspect the reservoir in 4 years. For any questions regarding this inspection, contact Bill Donohue at 505-330-2531.

NACE Level III Coatings Inspector #763
NACE Corrosion Technologist #3119

CW Donohue