



FALCON MEADOW RV CAMPGROUND

**OUTFALL LIFT STATION
1041 APPLICATION**

APRIL 2019

REVISED JUNE 2019

**1041 PERMIT APPLICATION SUBMITTAL
FOR
FALCON MEADOW RV CAMPGROUND
OUTFALL LIFT STATION**

APRIL 2019
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EE Job No.: 0055.0001

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RESPONSES TO CHAPTER 2, ARTICLE 3 PARAGRAPH 2.303 – SUBMISSION REQUIREMENTS OF THE COUNTY GUIDELINES**SECTION 2.303 (1) COMPLETED APPLICATION FORM**

The completed application form can be seen in Exhibit B.

SECTION 2.303 (2) ADDITIONAL REQUIRED INFORMATION

The Director may require submission of any plan, study, survey or other information, in addition to the information required by this Section, at the applicant's expense, as in the Director's judgment is necessary to enable it to review and act upon the application.

To be determined by Director.

SECTION 2.303 (3) MINERAL RIGHTS

Any application which requires compliance with § 24-65.5-101, et seq., C.R.S., (Notification to Mineral Owners of Surface Development) shall not be considered to have been submitted as complete until the applicant has provided a certification signed by the applicant confirming that the applicant or its agent has examined the records of the El Paso County Clerk and Recorder for the existence of any mineral estate owners or lessees that own less than full fee title in the property which is the subject of the application, and stating whether or not any such mineral estate owners or lessees exist. In addition, for purposes of the County convening its initial public hearing on any application involving property which mineral estate owners or lessees owning less than full fee title in the property have been certified by the applicant to exist, the application shall not be considered to have been submitted as complete until the applicant has provided an additional signed certification confirming that the applicant has, at least 30 days prior to the initial public hearing, transmitted to the County and to the affected mineral estate owners and lessees the notices required by C.R.S. §24- 65.5-101, et seq.

Based on an examination of the records of the Clerk and Recorder's Office, no mineral estate owners were found. Confirmation of this can be seen in Exhibit C.

SECTION 2.303 (4) INFORMATION DESCRIBING THE APPLICANT

2.303 (4a): *The names, addresses, including email address and fax number, organizational form, and business of the applicant and, if different, the owner of the Project.*

Owner:
James C. and Delia L. Ozburn
11150 Hwy 24
Peyton, CO 80831
davidozburn@hotmail.com
719-421-0604

Applicant:
Falcon Meadow RV Campground
11150 Hwy 24
Peyton, CO 80831
719-421-0604

Engineer:
Element Engineering, LLC
12687 West Cedar Drive, Suite 300
Lakewood, CO 80228
courtneyh@elementengineering.net
303-242-9992

2.303 (4b): *The names, addresses and qualifications, including those areas of expertise and experience with projects directly related or similar to that proposed in the application package, of individuals who are or will be responsible for constructing and operating the Project.*

The names, addresses, and qualifications of the contractor for the construction of the project will be provided after it is determined for the project (a contractor has not been selected). Prior to selecting a contractor, CDPHE approval must be obtained. CDPHE approval cannot be obtained until the 1041 process is completed.

The owner of the campground will contract with someone who has to appropriate certification to operate the proposed lift station.

2.303 (4c): *Written authorization of the application package by the Project owner, if different than the applicant.*

The owner is the legal representative of the applicant and is who signed the application and therefore authorizes the application package as seen in Exhibit B.

2.303 (4d): *Documentation of the applicant's financial and technical capability to develop and operate the Project, including a description of the applicant's experience developing and operating similar projects.*

The residents of the FMRVC are currently charged for sewer usage as part of the monthly lot fee for the campground. The owner will privately fund the project and will increase lot rent fees as necessary to support the project. The proposed project will replace the existing leach fields. The operations and maintenance costs associated with the proposed lift station are expected to increase slightly compared to the existing facility. The owner is willing to increase lot rents to cover the project and any increases to the operations and maintenance resulting from the project.

2.303 (4e): *Written qualifications of report preparers.*

The Element Engineering team has had experience with completing the 1041 process. These projects have included lift stations and water treatment plants. The team has also completed numerous other similar projects that have gone through the State of Colorado permitting process.

Nick Marcotte, P.E.

President

Nick Marcotte has over 11 years of experience providing permitting, design, and construction management services for rural towns, cities, and special districts throughout Colorado, Kansas, Wyoming, and Washington. He has specialized expertise in water and wastewater infrastructure and treatment planning, design, CDPHE permitting, hydraulics, municipal infrastructure, master planning, environmental processes, and acquisition of grants and loans to fund various projects.

Courtney Husted, P.E.
Project Engineer

Courtney has over 5 years of experience in Civil Engineering including wastewater treatment and collection design, water treatment and distribution design, contract documents, and grant funding assistance and coordination.

The complete resumes of the report preparers are included in Exhibit D.

SECTION 2.303 (5) INFORMATION DESCRIBING THE PROJECT

2.303 (5a): *Vicinity map showing the proposed site and the surrounding area.*

A vicinity map of the project, which shows the location of the Woodmen Hills Metropolitan District and the project location can be seen in Exhibit E.

2.303 (5b): *Executive summary of the proposal indicating the scope and need for the Project.*

The existing Falcon Meadow RV Campground wastewater is treated through onsite leach fields. Currently, there is a central leach field and a southwest leach field that are used for treatment of sewage from separate areas within the system. The campground is anticipating further campsites being filled and rather than continuing to install more leach fields, would like to consolidate with Woodmen Hills Metropolitan District (WHMD). The proposed project includes the construction of a lift station that will consolidate FMRVC with the neighboring WHMD. FMRVC has been working with WHMD and WHMD has agreed to accept the flows from FMRVC as seen in Exhibit F. All of the flows that are received by the current leach fields will be received by the proposed lift station and pumped to the WHMD collection system. Per the Colorado Department of Public Health and the Environment Regulation 43 – On-Site Wastewater Treatment System Regulation, the existing flow rates are assumed to be approximately 2,600 gpd. This is based on an estimated 50 gallons per RV campsite per day, 0.1 gallons per square foot for the general store, and 400 gallons per day for the laundry room. The anticipated flows with full build out of the campsite results in estimated flows of approximately 5,500 gpd.

The proposed lift station will be located on FMRVC property, adjacent to the existing central leach field so that the existing collection system can be utilized. It will pump to WHMD's gravity sewer main that runs between Tamlin Road and Antelope Meadow Circle. Once it joins with the WHMD collection system, it will be treated at the Woodmen Hills Metropolitan District Regional Water Reclamation Facility, which is a new facility that went online January 21, 2019. The flows from FMRVC will contribute approximately 1.67% of the permitted hydraulic capacity for the WHMD Water Reclamation Facility. WHMD will not need to be upgraded or enlarged to accommodate the additional flows.

It is anticipated that the lift station will be constructed in the summer of 2019 with an anticipated construction time of 5 months.

2.303 (5c): *Plans and specifications of the Project in sufficient detail to evaluate the application against the applicable Review Criteria.*

The plans for the Project are included in Exhibit G. The specifications can be seen in Exhibit H.

2.303 (5d): *Descriptions of alternatives to the Project considered by the applicant. If the Director determines that the nature or extent of the proposal involves the potential for significant damage and warrants examination of other specific, less damaging alternatives, the Director may require the applicant to evaluate and present information on such additional alternatives as part of the application.*

Several alternatives were analyzed by the applicant for this Project. The first alternative was to install more leach fields as the campground continues to grow. This was determined to not be feasible because there is limited space available to continue to install more leach fields within the property. The next alternative the campground explored was consolidation. After conversations with WHMD, it was determined that the FMRVC would be allowed to consolidate with WHMD. With consolidation requiring a lift station and approximately 1,600 ft of force main, consolidation was determined to be the best and most feasible alternative and was the chosen project.

2.303 (5e): *Schedules for designing, permitting, constructing and operating the Project, including the estimated life of the Project.*

The proposed schedule for the Project can be seen in the table below.

Task	Start Date	End Date
Complete and Submit 22.7 Site Application to CDPHE	-	3/31/2019
Complete and Submit Revised 22.7 Site Application to CDPHE	-	5/31/2019
CDPHE Review and Approval of Site Application	3/31/2019	8/1/2019
Complete and Submit Basis of Design Report, 100% Plans and Specs to CDPHE	3/31/2019	8/1/2019
CDPHE Review and Approval of Basis of Design Report, 100% Plans and Specs	4/30/2019	7/30/2019
Project Completion	-	12/31/2019

The lift station has an expected life of 20 years, but the pumps will likely need to be replaced every 10 years.

2.303 (5f): *The need for the Project, including a discussion of alternatives to the Project that were considered and rejected; existing/proposed facilities that perform the same or related function; and population projections or growth trends that form the basis of demand projections justifying the Project.*

The FMRVC currently owns and operates two leach fields. In order for the campground to expand to full build out, more leach fields will be required. Because there is limited space on the property for additional leach fields, consolidation is a more feasible alternative that will allow the campground to grow to full build out without the need for more leach fields on the property. Additionally, the flows from the RV campground are minor compared to the flows currently received by the WHMD and the permitted hydraulic limit for the WHMD treatment facility.

Currently, there are 43 active RV campsites on the campground. The full build out conditions for the campground allows for 100 RV campsites. The lift station is sized to accommodate the full build out conditions of the campground.

In total the disturbed area for construction will be approximately 0.37 acres.

2.303 (5g): *Description of relevant conservation techniques to be used in the construction and operation of the Project.*

Best management practices will be followed for the construction of the lift station. This includes storm water/drainage conservation techniques.

2.303 (5h): *Description of demands that this Project expects to meet and basis for projections of that demand.*

The proposed lift station is designed to convey an average wastewater flow of 5,500 gpd (3.8 gpm) with a peak hour flow of 22,000 gpd (15.1 gpm). Due to the available pump sizes, the lift station will pump at 34 gpm, which is a higher flow rate than is required to handle peak hour flows. Because FMRVC is planning on future growth, the design flow is based on the future projected flow. The lift station is also designed to limit the amount of time the wastewater will sit in the wet well before being pumped into the system at current average day flows. A more detailed explanation of the flow rates and how the lift station will operate can be seen in the Site Application that can be seen in Exhibit I.

2.303 (5i): *List of adjacent property owners and their mailing addresses.*

Adjacent property owners are as follows:

Owner: H2O SUB BLR LLC
Location: E Highway 24
Mailing Address: 14614 N Kierland Blvd #120
Scottsdale, AZ 85254-2743

Owner: H2O SUB BLR LLC
Location: 13-13-65
Mailing Address: 14614 N Kierland Blvd #120
Scottsdale, AZ 85254-2743

Owner: BLH No 2 LLC
Location: 12-13-65
Mailing Address: 111 S. Tejon St Ste 222
Colorado Springs, CO 80903-2246

Owner: Naber Harold Estate
Location: 11135 E Highway 24
Mailing Address: 11125 E Highway 24
Peyton, CO 80831-8126

Owner: Triple A Real Estate LLC
Location: 11145 E Highway 24
Mailing Address: 19350 Pinon Rd
Peyton, CO 80831-5301

Owner: Richard J Demark
Location: 11185 E Highway 24
Mailing Address: 11185 E US Highway 24
Peyton, CO 80831-8126

Owner: Steve Hui Kang
Location: 11401 E Highway 24
Mailing Address: 520 Edison St
Brush, CO 80723-2011

Owner: Challenger Communities LLC
Location: 12-13-65
Mailing Address: 8605 Explorer Drive #250
Colorado Springs, CO 80920-1013

Owner: BLH No 2 LLC
Location: E Highway 24
Mailing Address: 111 S. Tejon St Ste 222
Colorado Springs, CO 80903-2246

SECTION 2.303 (6) PROPERTY RIGHTS, OTHER PERMITS, AND APPROVALS

2.303 (6a): *Description of property rights that are necessary for or that will be affected by the Project, including easements and property rights proposed to be acquired through negotiation or condemnation.*

The proposed project will take place on the FMRVC property and will cross the BLH property and the Challenger Communities property to connect with the WHMD sewer main. An easement has been obtained through the BLH property for the force main. WHMD is working on obtaining the easement through the Challenger Communities property that will allow the force main to connect to the exiting WHMD collection system. This information can be seen in Exhibit J.

2.303 (6b): *A list of all other federal, state and local permits and approvals that will be required for the Project, together with any proposal for coordinating these approvals with the County permitting process. Copies of any permits or approvals related to the Project that have been granted.*

Below is a list of federal, state and local permits and approvals that will be required:

- CDPHE Approval of Design
- Work Within Right of Way Permit (already obtained)
- Building Permit from Pikes Peak Regional Building Department

2.303 (6c): *Copies of relevant official federal and state consultation correspondence prepared for the Project; a description of all mitigation required by federal, state and local authorities; and copies of any draft or final environmental assessments or impact statements required for the Project.*

The Site Application for the project, which was submitted to CDPHE, is included in Exhibit I. The Work within Right of Way Permit is included in Exhibit J.

SECTION 2.303 (7) LAND USE

2.303 (7a): *Provide a map at a scale relevant to the Project and acceptable to the Department describing existing land uses and existing zoning of the proposed Project area and the Project service area, including peripheral lands which may be impacted. The land use map shall include but need not necessarily be limited to the following categories: residential, commercial, industrial, extractive, transportation, communication and utility, institutional, open space, outdoor recreation, agricultural, forest land and water bodies. Show all special districts (school, fire, water, sanitation, etc.) within the Project area.*

A land use map is attached in Exhibit K. According to this map and the El Paso County Assessor, the FMRVC is Zoned as Residential Rural-5.

The FMRVC is located within the Falcon Fire Protection District and the El Paso County School District No. 49, based on the El Paso County Assessor's details of the property.

The FMRVC will consolidate with the WHMD for sanitation services. WHMD acceptance of the discharge from the lift station is included in Exhibit F.

2.303 (7b): *All immediately affected public land boundaries should be indicated on the map. Potential impacts of the proposed development upon public lands will be visually illustrated on the map as well as described in the text.*

There are no known public lands other than the public right of ways (Tamlin Road and US Hwy 24) that are adjacent to the property.

2.303 (7c): *Specify whether and how the proposed Project conforms to the El Paso County Master Plan.*

The El Paso County Master Plan is made up of several smaller master plans combined. The proposed project falls under the Falcon/Peyton Small Area Master Plan. Goal 3.4.4 of the Falcon/Peyton Small Area Master Plan states that the committee should "recognize the negative water quality impact of individual septic systems in the planning area." Section 4.5.7.3 states that a wastewater policy is to "discourage the further proliferation of individual septic systems in the area by encouraging the connection of new subdivisions to central systems and ensuring additional rezonings to RR-2.5 or equivalent Planned Unit Development densities will either be connected to central sewer systems or will meet a very high standard for individual on-site sewage treatment." The proposed project achieves that goal by consolidating with Woodmen Hills Metropolitan District and eliminating the need for more leach fields as the campground accommodates more RVs. Also, per the El Paso County Policy Plan, section 10.1.5, interconnection to a regional wastewater system is encouraged. The proposed project complies with that by consolidating with Woodmen Hills Metropolitan District.

2.303 (7d): *Specify whether and how the proposed Project conforms to applicable regional and state planning policies.*

This project is in general conformance with all known regional and state planning policies.

2.303 (7e): *Specify whether and how the proposed Project conforms to applicable federal land management policies.*

The project does not involve any federal lands.

2.303 (7f): *If relevant to the Project design, describe the agricultural productivity capability of the land in the Project area, using Soils Conservation Service soils classification data.*

The NRCS soils classification map of the Falcon Meadow RV Campground Area can be seen in Exhibit L. As seen, the area is mostly Blakeland Loamy Sand, Blakeland-Fluvaquentic Haplaquolis, and Truckton Sandy Loam.

2.303 (7g): *Describe the probability that the Project may be significantly affected by earthquakes, floods, fires, snow, slides, avalanches, rockslides or landslides and any measures that will be taken to reduce the impact of such events upon the Project.*

The project location is not identified as a high hazard site.

2.303 (7h): *Specify if excess service capabilities created by the proposed Project will prove likely to generate sprawl or strip development.*

The proposed project is designed for the wastewater flows from the Falcon Meadow RV Campground with the campground at full build out. The design accounts for excess flows from the current flows, but are only designed for the full buildout of the campground, so additional sprawl or development is unlikely.

2.303 (7i): *Specify whether the demand for the Project is associated with development within or contiguous to existing service areas.*

The proposed project will accommodate development within the campground. The proposed lift station is sized to accommodate full build out of all 100 campsites within the campground. There is no associated development from areas outside of the FMRVC that will be accommodated by the proposed lift station.

SECTION 2.303 (8) SURFACE AND SUBSURFACE DRAINAGE ANALYSIS

2.303 (8): *The applicant shall supply a surface and subsurface drainage analysis.*

A drainage analysis is included in Exhibit M. The plans also include erosion control as shown in Exhibit G.

SECTION 2.303 (9) FINANCIAL FEASIBILITY OF THE PROJECT

2.303 (9a): *Relevant bond issue, loan and other financing approvals or certifications (ex: approved bond issues; bond counsel opinion).*

The FMRVC will pay for the project through private funds. The owner will increase the lot rent fees to compensate for the project cost.

2.303 (9b): *Business plan that generally describes the financial feasibility of the Project.*

The owner of FMRVC can privately fund the project and will increase lot rent fees to repay the private funding of the project over time.

SECTION 2.303 (10) LOCAL INFRASTRUCTURE AND SERVICES IMPACTS

2.303 (10): *An impact analysis that addresses the manner in which the applicant will comply with the relevant Permit Application Review Criteria. The impact analysis shall include the following information: description of existing capacity of and demand for local government services including but not limited to roads, schools, water and wastewater treatment, water supply, emergency services, transportation, infrastructure, and other services necessary to accommodate the Project within El Paso County.*

The project is a lift station to consolidate with Woodmen Hills Metropolitan District. The flows from the FMRVC will increase the flows currently seen at the Woodmen Hills Metropolitan District Water Reclamation Facility (WHMD WRF) by approximately 1.67%. This slight impact is not expected to impact the wastewater treatment at the WHMD WRF. The project will not impact the roads, schools, water treatment, water supply, emergency services, transportation, infrastructure, or any other services.

SECTION 2.303 (11) RECREATION OPPORTUNITIES

2.303 (11): *Description of the impacts and net effect of the Project on present and potential recreational opportunities.*

There are no anticipated impacts to present or potential recreational opportunities.

SECTION 2.303 (12) AREAS OF PALEONTOLOGICAL, HISTORIC OR ARCHEOLOGICAL IMPORTANCE

2.303 (12): *Description of the impacts and net effect of the Project on sites of paleontological, historic or archaeological interest.*

It is not anticipated that artifacts of paleontological, historic, or archeological importance will be uncovered during this project; however, if any are uncovered during construction, the appropriate authorities will be notified.

SECTION 2.303 (13) NUISANCE

2.303 (13): *Descriptions of noise, glare, dust, fumes, vibration, and odor levels anticipated to be caused by the Project.*

There will be temporary nuisances including but not limited to noise, dust, fumes, and vibrations during construction due to the required equipment and earthwork that will be required for construction. These are anticipated to be minimal since the project is small.

The project will have a long term odor nuisance due to the project being a wastewater lift station. This is mitigated by the design limiting the amount of time the wastewater sits in the lift station wet well. At average day flows, the wastewater will sit for approximately 60 minutes between pumping cycles. This is equivalent to the maximum allowable detention time of 60 minutes per CDPHE design criteria, which will help limit the odor nuisance. The location of the lift station is also adjacent to the existing leach field and tank. It is not expected that the odor for the lift station will be more of a nuisance than the campsite residents currently experience from the leach field.

There are no expected long term nuisances due to noise, dust, fumes, or vibration from the project.

SECTION 2.303 (14) AIR QUALITY

2.303 (14): *Description of the impacts and net effect that the Project would have on air quality during both construction and operation, and under both average and worst case conditions, considering particulate matter and aerosols, oxides, hydrocarbons, oxidants, and other chemicals, temperature effects and atmospheric interactions.*

During construction, there will be temporary and typical impacts to air quality. These temporary impacts include but are not limited to equipment exhaust emissions, dust, and other chemical fumes. These impacts will be localized to the project site and will not have a permanent measurable effect on the air quality.

Operation of the lift station will not produce measurable negative effects to the air quality.

SECTION 2.303 (15) VISUAL QUALITY

2.303 (15): *Description of the impacts and net effect that the Project would have on visual quality, considering viewsheds, scenic vistas, unique landscapes or land formations within view of the Project area.*

The project will not change the visual quality of the project area because only the top of the lift station with vents and a control panel will be visible. There are no known scenic vistas, unique landscapes, or land formations that will be impeded by the project.

SECTION 2.303 (16) SURFACE WATER QUALITY

2.303 (16a): *Map and/or description of all surface waters relevant to the Project, including description of provisions of the applicable regional water quality management plan, and NPDES Phase II Permit and necessary El Paso County Erosion and Stormwater Quality Control Permit ("ESQCP"), Section 404 Federal Clean Water Act Permit that applies to the Project and assessment of whether the Project would comply with those provisions.*

There are no surface waters relevant to the project.

Since the construction area for the project will be less than 1 acre, the NPDES Phase II Permit, ESQCP, and Section 404 Federal Clean Water Act Permit are not needed for the project.

2.303 (16b): *Existing data monitoring sources.*

There are no known data monitoring sources.

2.303 (16c): *Descriptions of the immediate and long-term impact and net effects that the Project would have on the quantity and quality of surface water under both average and worst case conditions.*

Since there are no surface waters relevant to the project, there are no immediate or long-term impacts and net effects that the project would have on the quantity and quality of surface water.

SECTION 2.303 (17) GROUNDWATER QUALITY

2.303 (17a) *Map and/or description of all groundwater, including any and all aquifers relevant to the Project. At a minimum, the description should include:*

- (i) *Seasonal water levels in each portion of the aquifer affected by the Project.*

A geotechnical evaluation was completed by Kumar & Associates, Inc. on January 25, 2019. The report is attached in Exhibit N. According to the geotechnical report, groundwater was not encountered at the time of drilling. It is anticipated, however, that the groundwater levels will fluctuate over time.

- (ii) *Artesian pressure in said aquifers.*

Artesian pressures were not observed during the geotechnical evaluation.

- (iii) *Groundwater flow directions and levels.*

Groundwater flow and direction were not evaluated in the geotechnical evaluation because groundwater was not encountered as seen in Exhibit N. The project is not anticipated to affect the groundwater flows or directions.

- (iv) *Existing aquifer recharge rates and methodology used to calculate recharge to the aquifer from any recharge sources.*

An aquifer recharge rate was not observed in the project area. It is not anticipated that the project will impact storage capacity for aquifer recharge.

- (v) *For aquifers to be used as part of a water storage system, methodology and results of tests used to determine the ability of the aquifer to impound groundwater and aquifer storage capacity.*

No aquifers will be used as part of a water storage system for this project.

- (vi) *Seepage losses expected at any subsurface dam and at stream aquifer interfaces and methodology used to calculate seepage losses in the affected streams, including description and location of measuring devices.*

The project is not anticipated to come in contact with or affect any subsurface or stream-aquifer interfaces.

(vii) Existing groundwater quality and classification.

The groundwater in the area is EPA Class II – Potential or Current Drinking Water. The only treatment that is required in the area is disinfection. Water quality is generally good and meets state and federal drinking water standards.

(viii) Location of all water wells potentially affected by the Project and their uses.

A map of the wells within a 1-mile radius of the project is attached in Exhibit O. The closest well to the project is approximately 160 ft from the proposed lift station.

2.303 (18b): *Description of the impacts and net effect of the Project on groundwater.*

There is no anticipated negative impact of the project on groundwater. The project will improve the groundwater in the area by no longer using the existing leach fields, which will eliminate discharge of untested treated wastewater through the leach fields.

SECTION 2.303 (18) WATER QUALITY

2.303 (18a): *Map and/or description of existing stream flows and reservoir levels relevant to the Project.*

The project is not anticipated to affect existing stream flows or reservoir levels.

2.303 (18b): *Map and/or description of existing minimum stream flows held by the Colorado Water Conservation Board.*

There are no known Colorado Water Conservation Board studies that discuss minimum stream flows for the project area.

2.303 (18c): *Descriptions of the impacts and net effect that the Project would have on water quantity.*

The project is not anticipated to have any effect on water quantity.

2.303 (18d): *Statement of methods for efficient utilization of water, including recycling and reuse.*

No water will be utilized for the project.

SECTION 2.303 (19) FLOODPLAINS, WETLANDS, RIPARIAN AREAS, TERRESTRIAL AND AQUATIC ANIMALS, PLANT LIFE AND HABITAT

2.303 (19): *Applicant shall only provide description of foregoing natural conditions, animal and plant life at, but not to exceed, the level of detail required by other federal or state Permits or reviews which are applicable to the Project.*

The FEMA FIRM map, the wetlands map, and the IPaC resource list are attached in Exhibit P. The project will not take place near any floodplains or wetlands. According to the IPaC resource list, there are 3 endangered species, 5 threatened species, and 1 proposed threatened species in the planning area. Several of the listed species included in this report are at risk of being affected by water-related activities/use in

the N. Platte, S. Platte, and Laramie River Basis. The planning area does not overlap any of these basins; therefore, the proposed project is not expected to affect these listed species. No critical habitats were found at the project location.

SECTION 2.303 (20) SOILS, GEOLOGIC CONDITIONS AND NATURAL HAZARDS

2.303 (20a): *Map and/or description of soils, geologic conditions, and natural hazards including but not limited to soil types, drainage areas, slopes, avalanche areas, debris fans, mud flows, rock slide areas, faults and fissures, seismic history, and wildfire hazard areas, all as relevant to the Project area.*

According to the NCRS Soil map of the area, which is included as Exhibit L, the area soils are classified mostly Blakeland loamy sand, Blakeland-Fluvaquentic Haplaquolis, and Truckton Sandy Loam. There are no known geologic hazards on or adjacent to the project area.

2.303 (20b): *Descriptions of the risks to the Project from natural hazards.*

There are no known natural hazards that pose a risk to the project.

2.303 (20c): *Descriptions of the impacts and net effect of the Project on soil and geologic conditions in the area.*

There are no known impacts to the soil and geologic conditions because of the project.

SECTION 2.303 (21) HAZARDOUS MATERIALS

2.303 (21a): *Description of all solid waste, hazardous waste, petroleum products, hazardous, toxic, and explosive substances to be used, stored, transported, disturbed or produced in connection with the Project, including the type and amount of such substances, their location, and the practices and procedures to be implemented to avoid accidental release and exposure.*

The lift station will collect all of the wastewater from the FMRVC, which is currently estimated to be an average of 2,600 gpd. With the full build out of the campsite, it is estimated that the average flow into the lift station will be 5,500 gpd. This results in a peak hour flow of 22,000 gpd (15.1 gpm), which is what the lift station is designed for. In order to minimize the occurrence of accidental release of raw wastewater, the proposed lift station will be equipped with pump failure and high-water alarms. There will be an audible alarm siren and visual alarm light that will activate to alert and draw attention in the surrounding area when an alarm is triggered. The FMRVC has dedicated 24-hour on-call staffing that will quickly respond to emergencies or alarms. In addition to the alarms, the existing 10,000 tank that is currently used as part of the central leach field will be connected to the lift station wet well and will be used as overflow storage. In order to provide a minimum of 2 hours of peak hour flow or 8 hours of average day flow, the required overflow storage is 1,812 gallons. The existing tank is capable of holding up to 11 hours of peak hour flow if necessary.

2.303 (21b): *Location of storage areas designated for equipment, fuel, lubricants, and chemical and waste storage with an explanation of spill containment plans and structures.*

Required equipment is stored at the FMRVC office, which is on site. This allows for easy access to any necessary equipment in case of a mechanical failure at the lift station. There are no chemicals that are needed to operate the project, so no chemicals need to be stored.

SECTION 2.303 (22) MONITORING AND MITIGATION PLAN

2.303 (22a): *Description of all mitigation that is proposed to avoid, minimize or compensate for adverse impacts of the Project and to maximize positive impacts of the Project.*

(i) *Describe how and when mitigation will be implemented and financed.*

The design of the lift station takes steps to minimize potential wastewater spills. The lift station will be equipped with a portable generator quick-connect that will allow a portable generator to be hooked up to the lift station in case there is a loss of power. Emergency storage for more than 2 hours of peak hour flow or 8 hours of average day flow is also provided. FMRVC has access to portable pumps and generators in case of a mechanical or electrical failure. Access to the lift station site will be limited to approved staff members of FMRVC and WHMD to limit adverse impacts to the public.

(ii) *Describe impacts that are unavoidable that cannot be mitigated.*

There are no known unavoidable impacts.

2.303 (22b): *Description of methodology used to measure impacts of the Project and effectiveness of proposed mitigation measures.*

Any spill at the lift station will be reported to CDPHE. Refer to the Site Application located in Exhibit I for more information.

2.303 (22c): *Description, location and intervals of proposed monitoring to ensure that mitigation will be effective.*

The lift station will be equipped with pump failure and high-water alarms that will alert operations staff to emergency situations and/ or high wet well levels. Pumping equipment will include overcurrent and high temperature protection. An audible alarm siren and visual alarm light will activate to alert and draw attention in the surrounding area. FMRVC has dedicated 24-hour on-call staffing that will quickly respond to emergencies or alarms.

SECTION 2.303 (23) ADDITIONAL INFORMATION

2.303 (23): *The Director may request that the applicant supply additional information related to the Project if the Director and/or the Permit Authority will not be able to make a determination on any one of the applicable Review Criteria without the additional information. Such additional information may include applicant's written responses to comments by a referral agency.*

This is noted and will be addressed as requested by the Director.

RESPONSE TO CHAPTER 4, ARTICLE 2, OF THE COUNTY GUIDELINES

The following sections are in response to Chapter 4, Article 2, Paragraph 4.201 of the County Guidelines as the Project relates to Domestic Sewage Treatment within unincorporated El Paso County as outlined in Paragraph 4.201 of the guidelines.

SECTION 4.201 (1) AGENCY REVIEW

4.201 (1): *Preliminary review and comment on the proposal by the appropriate agency of the Colorado Department of Natural Resources and the Colorado Department of Public Health and Environment within sixty (60) days of the date of submittal of the proposal for review.*

The site application (30% plans) for the lift station was submitted to CDPHE for review in March 2019 and was updated in May 2019 in response to comments from the Pikes Peak Area Council of Governments. In order for CDPHE to finalize the review of the site application, the 1041 permit needs to be approved and all agencies including El Paso County, the Pike's Peak Area Council of Local Governments, and the El Paso County Department of Health and Environment need to sign off.

SECTION 4.201 (2) SCOPE OF PROPOSAL

4.201 (2a): *Provide detailed plans of the proposal, including proposed system capacity and service area plans mapped at a scale acceptable to the Department.*

Detailed plans and information about the system capacity and service area can be found in the Site Application in Exhibit I.

4.201 (2b): *Provide a description of all existing or approved proposed domestic water or sewage treatment systems within the Project area.*

The closest domestic sewage system is Woodmen Hills Metropolitan District's Water Reclamation Facility, which is approximately 3.5 miles northwest of the FMRVC. This is the sewage treatment facility that FMRVC will consolidate with. Currently septic treatment is through leach fields on the site that will no longer be used at the end of the project.

4.201 (2c): *Describe the design capacity of each domestic water or sewage treatment system facility proposed and the distribution or collection network proposed in the Project area.*

The lift station is designed to convey the wastewater flows from FMRVC to a WHMD gravity sewer line that runs south of Antelope Meadow Drive approximately 1,600 ft northwest of the location of the lift station. The lift station is designed to convey an average day flow of 5,500 gpd and a peak hour flow of 22,000 gpd. The design is discussed in detail in the Site Application in Exhibit I.

4.201 (2d): *Describe the excess capacity of each treatment system and distribution or collection network in the affected community or Project area.*

There are currently 43 active campsites within the FMRVC with the potential for 100 campsites. The lift station is designed to convey flows from all 100 campsites. The lift station is not designed for excess

capacity since it is designed to convey the fully built out campground. A complete discussion of the design can be found in the Site Application in Exhibit I.

4.201 (2e): *Provide an inventory of total commitments already made for current water or sewage services.*

The FMRVC has a commitment from Woodmen Hills Metropolitan District to accept the flows from FMRVC. The letter allowing the acceptance can be seen in Exhibit F.

4.201 (2f): *Describe the operational efficiency of each existing system in the Project area, including the age, state of repair and level of treatment.*

The existing septic treatment for FMRVC is through two on-site leach fields. The collection system is in good condition and AMHP staff has had no major issues with or breaks in the pipes. As a result of this project, the existing leach fields will no longer be used.

4.201 (2g): *Describe the existing water utilization, including the historic yield from rights and use by category such as agricultural, municipal and industrial supply obligations to other systems.*

The FMRVC water system is currently made up of 1 well. The well pumps into a raw water storage tank. After the raw water storage, the water is chlorinated prior to entering the distribution system. The system is a transient, non-community system. The well pumps at a rate of 8 gpm. The well is permitted for domestic usage.

SECTION 4.201 (3) DEMONSTRATION OF NEED

4.201 (3a): *Provide population trends for the Project area, including present population, population growth and growth rates, documenting the sources used.*

FMRVC consists of 43 currently active campsites and has an estimated population of 86 based on an estimated 2 people per RV. The estimate of 2 people per RV is based on the State Board of Health Guidelines on Individual Sewage Disposal Systems (ISDS), which indicates that mobile homes should be estimated at two persons per bedroom and it is assumed that the RVs have one bedroom. Full build out of the campground allows for 100 campsites and an estimated population of 200.

4.201 (3b): *Specify the predominant types of developments to be served by the proposed new water and/or sewage systems or extensions thereof.*

The service area that will be served by the lift station is an RV campground that can accommodate up to 100 RVs onsite. There are no proposed future developments that will be served by the lift station.

4.201 (3c): *Specify at what percentage of the design capacity the current system is now operating:*

(i) *Water treatment system.*

Not Applicable

(ii) *Wastewater treatment system.*

The WHMD WRF currently operates at approximately 61% of the design capacity.

4.201 (3d): *Specify whether present facilities can be upgraded to accommodate adequately the ten-year projected increase needed in treatment and/or hydraulic capacity.*

The FMRVC lift station is designed to accommodate the full build out of the campground so further expansion to accommodate a further increase is not anticipated. The WHMD WRF has sufficient capacity to accommodate the flows from FMRVC with the FMRVC flows increasing the flow at the WHMD RWF by approximately 1.7%.

SECTION 4.201 (4) WATER USAGE

4.201 (4): *Description of the water to be used by the Project and, to the extent identified by the Director in consultation with the applicant, alternatives, including: the source, amount, the quality of such water; the applicant's right to use the water, including adjudicated decrees or determinations and any substitute water supply plans, and applications for decrees or determinations; proposed points of diversion and changes in the points of diversion; the existing uses of the water; adequate proof that adequate water resources have been or can and will be committed to and retained for the Project, and that applicant can and will supply the Project with water of adequate quality, quantity, and dependability; and approval by the respective Designated Ground Water Management District if applicable. If an augmentation or replacement plan for the Project has been decreed or determined or an application for such plan has been filed in the court or with the Ground Water Commission, the applicant must submit a copy of that plan or application.*

The proposed lift station will not require the use of any water.

SECTION 4.201 (5) LOSS OF AGRICULTURAL PRODUCTIVITY

4.201 (5a): *Information on any agricultural water rights in the region converted to provide water for the Project, now or in the future.*

No agricultural water rights will be converted to provide water for the project now or in the future.

4.201 (5b): *Information on the amount of irrigated agricultural lands taken out of production, and a description of revegetation plans.*

No irrigated agricultural lands will be taken out of production as a result of this project.

4.201 (5c): *Economic consequences of any loss of irrigated agriculture, including loss of tax base, in the region.*

No loss in irrigated agriculture will result from this project; therefore, no economic consequences from that loss will result.

4.201 (5d): *Information as to loss of wildlife habitat, loss of topsoil, or noxious weed invasion, as a result of the transfer of water rights and subsequent dry-up of lands.*

No transfer of water rights will result from this project.

4.201 (5e): *Information on impacts to agricultural head gates and water delivery systems.*

There are no anticipated impacts to agricultural head gates and water delivery systems.

SECTION 4.201 (6) FINANCIAL IMPACT

The financial impact analysis of site selection and construction of major new water and sewage treatment facilities and/or major extension of existing domestic water and sewage treatment systems shall include but need not be limited to the following items:

4.201 (6a): *A review and summary of any existing engineering and/or financial feasibility studies, assessed taxable property valuations and all other matters of financial aid and resources in determining the feasibility of the proposed new facility, including:**(i) Service area and/or boundaries.*

The service area can be seen in the Site Application in Exhibit I. The project will be privately funded. The residents of the campground within the service area will pay for the project in the long term with increased lot rents.

(ii) Applicable methods of transmitting, storing, treating and delivering water and collecting, transmitting, treating and discharging sewage, including effluent and/or sludge disposal.

The lift station will convey wastewater to connect with the WHMD WRF collection system.

(iii) Estimated construction costs and period of construction of each new or extension facility component.

It is anticipated that construction will start in the summer of 2019. Construction is expected to take approximately five months.

(iv) Assessed valuation of the property to be included within the service area boundaries.

The 2019 assessed value of the property is \$101,490 according to the El Paso County Assessor's office.

(v) Revenues and operating expenses of the proposed new or extension facility, including but not limited to historical and estimated property taxation, service charges and rates, assessments, connection and tap fees, standby charges and all other anticipated revenues of the proposed new facility.

The FMRVC does not have a separate revenue and expense account for the wastewater system. The owner includes the wastewater service in the lot rent that is charged for each lot.

(vi) Amount and security of the proposed debt and method and estimated cost of debt service.

The project will be privately funded and the owner will increase lot rents to cover the cost of the project.

- (vii) *Provide the details of any substantial contract or agreement for revenues or for services to be paid, furnished or used by or with any person, association, corporation or governmental body.*

The lot rents cover the costs associated with operating and maintaining the FMRVC water and wastewater systems. The owner maintains contracts with the residents to ensure payment for the lot rents. With consolidation with WHMD, the FMRVC will have to pay a tap fee to tie in. FMRVC is working with WHMD to determine what the tap fee will be. FMRVC will also have to pay WHMD monthly for the amount of wastewater that is pumped into WHMD's collection system from the lift station. All of these fees will be accounted for with the increase in lot rents to cover the cost of the project.

EXHIBIT B – 1041 APPLICATION FORM

Exhibit B

APPLICATION FOR A PERMIT TO CONDUCT A
DESIGNATED ACTIVITY OF STATE INTEREST OR TO
ENGAGE IN DEVELOPMENT IN A DESIGNATED AREA
OF STATE INTEREST

To: Permit Authority, El Paso County

Re: Falcon Meadow RV Campground – Outfall Lift Station
as a matter of state interest.

From: James Ozburn, Falcon Meadow RV Campground Owner
11150 Hwy 24
Peyton, CO 80831
(719) 421-0604

Date Submitted: April 29, 2019

Date Received and Accepted as Complete:

1. Matter of State Interest.

The applicant requests that a permit be issued for each of the items checked below: A
permit to conduct one or more of the following matters of state interest:

- ~~a. Efficient utilization of municipal and industrial water projects~~
- b. Site selection and construction of major new domestic water and sewage treatment systems and/or major extension of existing domestic water and sewage treatment systems
- ~~c. Site selection and construction of major facilities of a public utility~~
- ~~d. Development in areas containing or having a significant impact upon floodplain natural hazard areas~~
- ~~e. Site selection and expansion of airports~~
- ~~f. Site selection of arterial highways and interchanges and collector highways~~
- ~~g. Site selection of rapid or mass transit facilities~~

2. Proposed Activity or Development.

General description of the specific activity or development proposed:

The project includes the construction of a lift station on campground property and approximately 1,600 feet of force main in order to connect to the Woodmen Hills Metropolitan District collection system. The force main will tie into a new manhole in the Woodmen Hills gravity collection system. There are currently 43 occupied campsites hooked up with a full build out of 100 campsites. The lift station is sized for all 100 campsites. Operation of the lift station and maintenance of all piping and equipment on the campground property will be the responsibility of the Owner. See the Site Application Report in Exhibit I for additional project details.

3. Location of Development:

A general, nonlegal description and the popular name, if any, of the tract of land upon which the activity or development is to be conducted:

Falcon Meadow RV Campground (FMRVC) is located approximately 12.5 miles northeast of Colorado Springs adjacent to US Highway 24, in Section 13, Township 13 South, Range 65 West of the 6th Prime Meridian.

4. Legal Description.

The legal description, including the acreage, of the tract of land upon which the development or the activity is to be conducted, by metes and bounds or by government survey description: (attach additional sheets if necessary):

See Exhibit J.

5. Owners and Interests.

Set out below the names of those persons holding recorded legal, equitable, contractual and option interests and any other person known to the applicant having any interest in the property described in paragraph 4, above, as well as the nature and extent of those interests for each person, provided that such recorded interests shall be limited to those which are recorded in the El Paso County Clerk and Recorder's Office, the land office of the Bureau of Land Management for this State, the Office of the State Board of Land Commissioners of the Department of Natural Resources, or the Secretary of State's Office of this State (attach additional sheets if necessary):

James C. and Delia L. Ozburn

6. Submission Requirements.

Submission requirements described in the Guidelines and Regulations for Areas and Activities of State Interest of El Paso County for each of the activities or areas checked in paragraph 1 above, are attached to this application. Those attachments are identified, by letter or number, and

described by title below:

2.303 – Submission Requirements for all Permit Applications; Waivers

4.201 – Application Submission for Site Selection and Construction of Major New Domestic Water and Sewage Systems and Major Extensions of Existing Water and Sewage Treatment Systems

Please see the Table of Contents for the location of responses and supporting exhibits.

7. Additional Information Required:

Attach any additional information required by the Guidelines and Regulations, and as may be required by the Development Services Department Director.

N/A

8. Duration of Permit.

The Applicant requests a permit for a period of one (1) years.

9. Application Fee.

The required application fee is submitted herewith.

APPLICANT:

By: James C. Ozburn 4-26-19

James Ozburn

Campground Owner

EXHIBIT C – MINERAL RIGHTS



EL PASO COUNTY, COLORADO
Office of the County Assessor
Steve Schleiker



April 25, 2019

RE: Severed mineral interest underlying APN 53130-00-006 & 094

Courtney Husted

The records of the El Paso County Assessor's Office were searched to determine if a severed mineral interest existed on property identified by APN 53130-00-006 & 094. These parcels are located within the northwest ¼ of Section 13, Township 13 south, Range 65 west of the 6th P.M.

There are no severed interests being assessed to the area in question. Therefore it would be assumed by the El Paso County Assessor's Office that the surface owner has 100% of the mineral interests underlying the above mentioned parcel numbers.

Please contact me if you have questions or concerns in regards to this matter.

Rick Davis
Vacant Land Manager #CG1317849
El Paso County Assessor's Office
(719) 520-6644 (office)
(719) 216-3563 (cell)
rickdavis@elpasoco.com

WE VALUE EL PASO COUNTY AND ITS RESIDENTS!

1675 West Garden of the Gods Road, Suite 2300
Colorado Springs, CO 80907
Phone: (719) 520-6600 Fax: (719) 520-6635
assessor.elpasoco.com E-mail: ASRWEB@elpasoco.com
Twitter: @EPC_Assessor

EXHIBIT D – REPORT WRITERS RESUMES



NICHOLAUS P. MARCOTTE, PE

PRESIDENT & PROJECT MANAGER



PROJECT EXPERIENCE

Wastewater Treatment Plant Improvements | Project Manager Center Sanitation District | Center, CO

Managed design of 0.60 MGD activated sludge wastewater treatment plant to replace lagoon system. Acted as project and client manager including oversight of design, budget, and funding. Plant was designed to meet stringent effluent groundwater limits including total inorganic nitrogen limit of 10 mg/L and total coliform limit of 2.2 per 100 mL. Design included: influent lift station, headworks, hybrid continuous flow/sequencing batch reactor activated sludge system, tertiary filter, UV disinfection, and sludge handling. Obtained and managed funding for project design and construction through CDPHE, DOLA, and USDA.

Water System Improvements | Project Manager Lake Forest Mutual Water Company | Grand Lake, CO

Acted as project and client manager for water system improvements project including 12,500 linear feet of water distribution pipe, pressure reducing valves, 45,000 gallon potable water storage tank, and distribution pumping system. Coordinated between company representatives and design team to determine appropriate pipe alignment based on narrow utility corridors and mountainous terrain. Compiled EJCDC contract documents in accordance with USDA requirements. Managed funding for project design and construction through USDA.

Wastewater Treatment Plant Improvements | Project Manager Town of Hugo | Hugo, CO

Managed design of 0.085 MGD evaporative pond system and associated lift station to replace un-aerated, un-lined lagoon system not capable of meeting CDPHE effluent limits. Coordinated with CDPHE and client to manage design, permitting, funding, and floodplain details. Obtained and managed design and construction funding through CDPHE and DOLA.

Wastewater Treatment Plant Improvements | Project Manager Town of Alma | Alma, CO

Managed design of 0.117 MGD wastewater treatment plant rehabilitation to meet effluent ammonia limits of 20 mg/L. Acted as client and project manager including design and budget oversight, CDPHE coordination, and funding coordination. Existing facility consisted of three pond lagoon system situated at over 10,000 feet elevation that experiences harsh winter conditions including wastewater approaching 0°C. Improvements included new diffusers, pond covers, and construction of a small MBR coupled with a heat exchanger run off of solar panels for ammonia reduction. Obtained and managed design and construction funding through CDPHE and DOLA.

EDUCATION

BS, CIVIL ENGINEERING
UNIVERSITY OF KANSAS
LAWRENCE, KANSAS

PROFESSIONAL CERTIFICATION

STATE OF COLORADO
PROFESSIONAL ENGINEER
LICENSE NO. 47164

STATE OF KANSAS
PROFESSIONAL ENGINEER
LICENSE NO. 23806

STATE OF WYOMING
PROFESSIONAL ENGINEER
LICENSE NO. 16199

EXPERIENCE

NICK HAS OVER 10 YEARS OF EXPERIENCE IN CIVIL ENGINEERING INCLUDING PROJECT MANAGEMENT, CLIENT MANAGEMENT, WASTEWATER TREATMENT AND COLLECTION DESIGN, WATER TREATMENT AND DISTRIBUTION DESIGN, MASTER PLANNING, CONTRACT DOCUMENTS, CONSTRUCTION OBSERVATION, AND GRANT FUNDING ASSISTANCE.

NICHOLAUS P. MARCOTTE, PE

PRESIDENT & PROJECT MANAGER



Wastewater Treatment Plant Improvements—Activated Sludge | Project Manager & Project Engineer

Managed and designed activated sludge wastewater treatment plants including flow monitoring, lift station, headworks, secondary treatment, tertiary filter, UV disinfection, and chlorine disinfection. Designed to meet stringent effluent ammonia, total inorganic nitrogen, and total coliform limits. Compiled and managed the compilation of design reports, construction drawings, and contract documents. Projects include:

Center Sanitation District | Edgemont Ranch Metropolitan District | North La Junta Sanitation District | Town of Red Cliff

Wastewater Treatment Plant Improvements—Lagoons | Project Manager & Project Engineer

Managed and designed lagoon wastewater treatment plant improvements including flow monitoring, lift station, headworks, complete mix and partial mix lagoons, cold weather nitrification technologies, chlorine disinfection, hydraulic rearrangement, and discharge point relocation. Designed to meet effluent BOD, TSS, ammonia, and Regulation 84 re-use limits. Compiled and managed the compilation of alternative technology reports, design reports, construction drawings, and contract documents. Projects include:

Kremmling Sanitation District | Town of Alma | Fairways Metropolitan District | Town of Del Norte

Evaporative Wastewater Treatment | Project Manager & Project Engineer

Managed and designed non-discharging evaporative wastewater treatment ponds as low maintenance alternatives to discharging lagoons or activated sludge plants. Compiled and managed the compilation of design reports, construction drawings, and contract documents. Projects include:

Town of Hugo | Town of Eckley | Town of Wiley

Water System Improvements | Project Manager & Project Engineer

Managed and designed water treatment, storage, and distribution system pumping equipment including: groundwater and surface water treatment; buried, at-grade, and elevated water storage tanks and clearwells; and pumping systems designed to meet 10 - 2,000 gpm. Compiled and managed the compilation of design reports, construction drawings, and contract documents. Projects include:

Town of Del Norte | Town of Buena Vista | Town of Hugo | Lone Star School | Lake Forest Mutual Water Company

Water Distribution, Sanitary Sewer Collection, and Irrigation Systems | Project Manager & Project Engineer

Managed and designed thousands of linear feet of water distribution pipe, pressure reducing valves, sanitary gravity collection pipe, wastewater lift stations, wastewater force main, and sanitary sewer manholes. Compiled and managed the compilation of design reports, construction drawings, and contract documents. Projects include:

Lake Forest Mutual Water Company | Town of Del Norte | Town of Buena Vista | City of Monte Vista | East Alamosa Water and Sanitation District | Buckhorn Valley Metropolitan District | Crestview Water and Sanitation District

Utility Master Planning | Project Manager & Project Engineer

Managed and compiled master plans documenting existing utility infrastructure and recommended improvements including cost estimates and user rate analyses to support improvements. Projects include:

Deer Creek Water District | City of Monte Vista | Last Dollar PUD | Town of Del Norte | Town of Eckley

Development Review

Performed reviews on several developments and site plans. Reviews include a range of development sizes from subdivisions as large as 500 lots to site plans for commercial properties.

Town of Del Norte | Town of Calhan | Town of Gilcrest | Crestview Water and Sanitation District



COURTNEY D. HUSTED, P.E.

PROJECT ENGINEER



PROJECT EXPERIENCE

Wastewater Treatment Plant Improvements | Project Engineer

Town of Eckley | Eckley, CO

Designed 0.047 MGD evaporative pond system with two associated lift stations. Performed engineering calculations, drafted design reports, and compiled construction plans. Completed cost estimates and assisted in obtaining and managing grant and loan funding for design and construction of project through CDPHE Small Communities Grant and USDA.

Water System Improvements | Project Engineer

Town of Buena Vista | Buena Vista, CO

Performed engineering calculations to design a redundant 750,000 gallon water storage tank. Performed engineering calculations to add chlorine disinfection to an existing irrigation well to add a redundant drinking water source. Compiled the basis of design reports for the storage tank and drinking water well. Assisted with funding coordination through CDPHE.

Collection System Improvements Project | Project Engineer

Town of Del Norte | Del Norte, CO

Designed 80,000 linear feet of sanitary sewer gravity pipe rehabilitation including slope and alignment modifications due to significant utility crossings. Performed engineering calculations to design a 720 gpm lift station and force main to pump wastewater from the town's collection system to the wastewater treatment plant. Drafted EJCDC contract documents per USDA requirements. Assisted with grant and loan coordination through DOLA and USDA.

Wastewater Treatment Plant Improvements | Project Engineer

Galeton Water and Sanitation District | Galeton, CO

Designed 0.0185 MGD activated sludge wastewater treatment plant to meet effluent total inorganic nitrogen limit of 10 mg/L. This plant replaced an existing lagoon system that was under a Notice of Violation/Cease and Desist Order due to effluent violations. Design included: headworks, secondary treatment activated sludge system, and chlorine and dechlorination system. Assisted with and managed funding for project design and construction through USDA.

Water Treatment Pilot Plants | Project Engineer

Denver Water | Denver, CO

Operated a pilot plant to determine the filter loading rate for Anthracite and GAC filter media to obtain higher filter loading rate approval through CDPHE. Operated a pilot plant to determine the optimum corrosion control treatment technology for reduced lead levels.

EDUCATION

BS, CHEM. ENGINEERING
COLORADO SCHOOL OF MINES
GOLDEN, COL.

MS, ENVIRO. ENGINEERING
C S M
G, C O

PROFESSIONAL CERTIFICATION

STATE OF COLORADO
PROFESSIONAL ENGINEER
LICENSE NO. 55165

EXPERIENCE

C S
ENGINEERING INCLUDING
, A
, GRA

EXHIBIT E – VICINITY MAP



VICINITY MAP

DATE
APRIL 2019



ELEMENT
ENGINEERING LLC

12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165
WWW.ELEMENTENGINEERING.NET

JOB NUMBER
0055.0001

SCALE
NTS

EXHIBIT F – WOODMEN HILLS METROPOLITAN DISTRICT APPROVAL TO ACCEPT FLOW

WOODMEN HILLS

METROPOLITAN DISTRICT

May 16, 2018

David Ozburn
11150 Hwy 24
Peyton, CO 80831

SUBJECT: Service for Falcon Meadow RV Campground

Dear Mr. Ozburn,

Woodmen Hills agrees to receive for treatment the sanitary sewer for your campground. The WHMD WRRF is currently at about 61% of the design capacity. The treatment facility is currently under a Compliance Order on Consent from the Colorado Department of Public Health and Environment. JDS Hydro Consulting Engineers has designed a new treatment plant and is currently under construction. Completion scheduled for October 2018.

The wastewater will be conveyed to Woodmen Hills Metropolitan District through a lift station owned and operated by Falcon Meadow RV Campground. The connection can be made upon receiving approval of the lift station from Colorado Department of Public Health and Environment. Engineered plans of the connection designed as per Woodmen Hills Specifications and approved by Woodmen Hills Metropolitan District are also required.



Jerry Jacobson
Operations Manager

EXHIBIT G – LIFT STATION PLANS

48 hours before you dig, CALL UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) **811**
Gas, Electric, Telephone, CATV and
Panhandle Eastern Pipeline Locations

CONSTRUCTION PLANS

FALCON MEADOW RV CAMPGROUND

OUTFALL LIFT STATION

A PORTION OF THE SOUTHWEST QUARTER OF SECTION 12 AND THE NORTHWEST QUARTER OF SECTION 13, TOWNSHIP 13 SOUTH, RANGE 65 WEST OF THE 6TH P.M.
EL PASO COUNTY, COLORADO

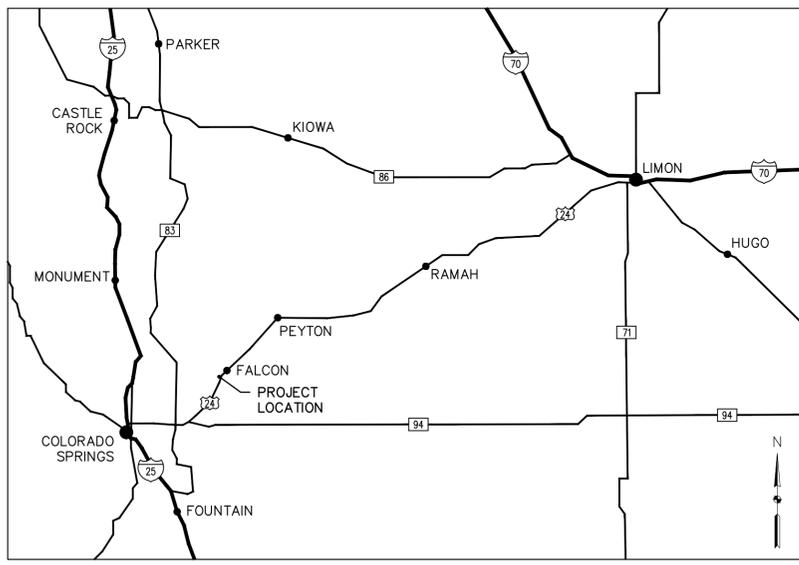
ELEMENT ENGINEERING LLC
720.749.4165
WWW.ELEMENTENGINEERING.NET
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80226

PREPARED FOR
FALCON MEADOW RV CAMPGROUND
DAVID OZBURN, OWNER
719.421.0604
11150 HWY 24
PEYTON, CO 80831

ENGINEERING
ELEMENT ENGINEERING, LLC
ALICE M. ARSENAULT, P.E. #53350
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
303.981.0453

WOODMEN HILLS METROPOLITAN DISTRICT
JERRY JACOBSON, GENERAL MANAGER
DANNY EVERETT, CHIEF INSPECTOR
8046 EASTONVILLE ROAD
FALCON, CO 80831
719.495.2500

- SHEET INDEX**
- 1 COVER SHEET
 - 2 GENERAL NOTES & DETAILS
 - 3 TOPOGRAPHICAL SURVEY
 - 4 LIFT STATION
 - 5 FORCE MAIN PLAN & PROFILE
 - 6 OWNERSHIP & EASEMENTS
 - 7 WOODMEN HILLS DETAILS
 - 8 EROSION CONTROL DETAILS



NO.	REVISIONS DESCRIPTION	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
COVER SHEET
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

FALCON MEADOW RV CAMPGROUND OWNER _____ DATE _____

THESE PLANS HAVE BEEN APPROVED BY THE FALCON MEADOW RV CAMPGROUND. A CAMPGROUND REPRESENTATIVE WILL OBSERVE THE WORK FOR COMPLIANCE WITH THE APPROVED PLANS, BUT DOES NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION OF THE FACILITIES IN ACCORDANCE WITH THE APPROVED PLANS AND WITH APPLICABLE RULES AND REGULATIONS. WORK NOT PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS WILL NOT BE ACCEPTED. ACCEPTANCE OF THE WORK DOES NOT RELIEVE THE CONTRACTOR OF THEIR OBLIGATIONS UNDER APPLICABLE WARRANTIES.

THE WOODMEN HILLS METROPOLITAN DISTRICT RECOGNIZES THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN AND HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

WOODMEN HILLS METROPOLITAN DISTRICT
WASTEWATER DESIGN APPROVAL

DATE: _____ BY: _____
PROJECT NO. _____

IN CASE OF ERRORS OR OMISSIONS WITH THE WATER DESIGN AS SHOWN ON THIS DOCUMENT THE STANDARDS AS DEFINED IN THE "RULES AND REGULATIONS FOR INSTALLATION OF WASTEWATER MAINS AND SERVICES" SHALL RULE.

APPROVAL EXPIRES 180 DAYS FROM DESIGN APPROVAL.

ONSITE BENCHMARK INFORMATION
CONTROL POINT #100, SET NO. 4 REBAR AS SHOWN HEREON.
NORTHING (Y) 29961.01, EASTING (X) 20058.38, ELEVATION (Z) 6826.05, NAVD 88 (BASED ON NGS MONUMENT E24 WITH AN ELEVATION 6902.30 NAVD 88).

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE:
MARCH 2019

JOB NUMBER:
0055.0001

SCALE:
AS SHOWN

DRAWING NAME:
COVER

SHEET
1 OF 8

WOODMEN HILLS METROPOLITAN DISTRICT GENERAL NOTES

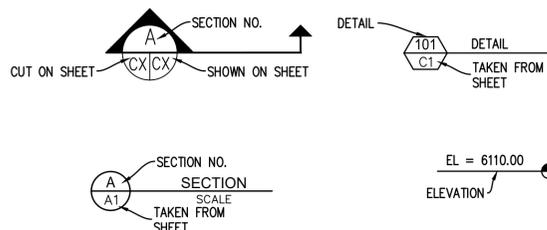
- ALL UTILITY CONSTRUCTION TO BE CONDUCTED IN CONFORMANCE WITH THE CURRENT WOODMEN HILLS METROPOLITAN DISTRICT (WHMD, THE DISTRICT) SPECIFICATIONS.
- ALL PLANS ON THE JOB SITE SHALL BE SIGNED BY THE DISTRICT AND THE DISTRICT'S ENGINEER. ANY REVISIONS TO THE PLANS SHALL BE SO NOTED WITH THE OLD DRAWING MARKED NOT VALID.
- ALL STATIONING IS CENTER LINE UNLESS OTHERWISE NOTED. ALL ELEVATIONS ARE CENTER LINE UNLESS OTHERWISE NOTED.
- ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE DISTRICT. THE DISTRICT RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
- ALL WATER AND SEWER SERVICE LOCATIONS SHALL BE CLEARLY MARKED ON EITHER THE CURB HEAD OR THE FACE OF THE CURB, WITH AN "S" FOR SEWER AND A "W" FOR WATER.
- DUCTILE IRON PIPES, INCLUDING FITTINGS, VALVES, AND FIRE HYDRANTS, SHALL BE WRAPPED WITH POLYETHYLENE TUBING, DOUBLE BONDED AT EACH JOINT, AND ELECTRICALLY ISOLATED. BONDING AND ANODE CONNECTIONS SHALL BE THOROUGHLY COATED WITH BITUMINOUS COATINGS.
- ALL DUCTILE IRON PIPE LESS THAN 12 INCHES AND FITTINGS SHALL HAVE CATHODIC PROTECTION USING TWO NO. 6 WIRES WITH 17 LB. MAGNESIUM ANODES EVERY 400 FEET AND 9 LB. MAGNESIUM ANODES AT EACH FITTING. ALL DUCTILE IRON PIPE 12 INCHES AND GREATER AND FITTINGS SHALL HAVE CATHODIC PROTECTION USING TWO NO. 6 WIRES WITH 17 LB. MAGNESIUM ANODES EVERY 300 FEET AND 9 LB. MAGNESIUM ANODES AT EACH FITTING.
- ALL PIPE MATERIAL, BACKFILL, AND INSTALLATION SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS, COLORADO DEPARTMENT OF TRANSPORTATION, EL PASO COUNTY DEPARTMENT OF TRANSPORTATION, COLORADO SPRINGS UTILITIES, AND THE GEOTECHNICAL ENGINEER.
- COMPACTION TESTS SHALL BE 95% STANDARD PROCTOR AS DETERMINED BY ASTM D698, UNLESS OTHERWISE APPROVED BY THE DISTRICT OR HIGHER STANDARD AS IMPOSED BY ANOTHER AGENCIES HAVING RIGHT-OF-WAY JURISDICTION. THIS SHALL INCLUDE ALL VALVES, FIRE HYDRANT RUNS, WATER & SEWER SERVICE LINES, AND MANHOLES. ALL REPORTS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.
- THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE LOCATION OF ALL UTILITIES SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE DISTRICT SHALL BE NOTIFIED OF ANY DEVIATIONS TO THE LINE AND/OR GRADE AS DEPICTED ON THE PLANS. CONTRACTOR SHALL SUBMIT TO THE DISTRICT AND THE ENGINEER OF RECORD A REPORT OF THE FIELD VERIFIED INFORMATION PRIOR TO THE START OF CONSTRUCTION.
- ALL BENDS SHALL BE FIELD STAKED PRIOR TO THE START OF CONSTRUCTION.
- BENDS, DEFLECTION, AND CUT PIPE LENGTHS SHALL BE USED TO HOLD HORIZONTAL ALIGNMENT OF SEWER AND WATER LINES TO NO MORE THAN 0.5' FROM THE DESIGNED ALIGNMENT. CONSTRUCTION STAKES TO BE AT 25' INTERVALS ALONG CURVES TO ASSURE LOCATION OF PIPE LINE CONSTRUCTION.
- AT ALL LOCATION WHERE CAP AND STUB IS NOTED ON DRAWINGS, PROVIDE A PLUG AT THE END OF THE PIPE JOINT NEAREST THE SPECIFIED STATION. PROVIDE A REVERSE ANCHOR AT ALL WATER LINE PLUGS.
- ALL UNUSED SALVAGED WATER UTILITY MATERIAL SHALL BE RETURNED TO THE METROPOLITAN DISTRICT AS REQUESTED.
- AT THE CONTRACTOR'S EXPENSE, ALL UTILITY MAINS SHALL BE SUPPORTED AND PROTECTED SUCH THAT THEY SHALL FUNCTION CONTINUOUSLY DURING CONSTRUCTION OPERATIONS. SHOULD A UTILITY MAIN FAIL AS A RESULT OF THE CONTRACTOR'S OPERATION, IT SHALL BE REPLACED IMMEDIATELY BY THE CONTRACTOR OR BY THE DISTRICT AT FULL COST OF LABOR AND MATERIALS TO THE CONTRACTOR/DEVELOPER.
- PUMPING OR BYPASS OPERATIONS SHALL BE REVIEWED AND APPROVED BY BOTH THE DISTRICT AND THE DISTRICT ENGINEER PRIOR TO EXECUTION.
- THE CONTRACTOR SHALL REPLACE OR REPAIR DAMAGE TO ALL SURFACE IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO FENCES, LANDSCAPING, CURB AND GUTTER, AND/OR ASPHALT THAT MAY BE CAUSED DURING CONSTRUCTION.
- ALL CONTRACTORS WORKING ON OR NEAR A WATER OR SEWER FACILITY (TO INCLUDE SERVICE LINES) SHALL HAVE LIABILITY INSURANCE NAMING THE DISTRICT AS AN ADDITIONAL INSURED AND SHALL PROVIDE A CURRENT COPY OF WORKERS COMPENSATION INSURANCE ON FILE WITH THE DISTRICT. NO WORK CAN PROCEED WITHOUT CURRENT CERTIFICATES ON FILE AT THE DISTRICTS' OFFICE.
- THE CONTRACTOR SHALL NOTIFY THE DISTRICT AND ALL AFFECTED UTILITY COMPANIES ADJACENT TO THE PROPOSED UTILITY CONSTRUCTION A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF CONSTRUCTION. A WEEKLY CONSTRUCTION MEETING SHALL BE REQUIRED WITH THE CONTRACTOR, DISTRICT ENGINEER, AND ALL OTHER PARTIES AS DEEMED NECESSARY BY THE DISTRICT.
- COMMENCEMENT OF CONSTRUCTION OF WATER/SEWER SYSTEMS WITHIN METROPOLITAN DISTRICT:
 - PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING IS REQUIRED A MINIMUM OF 48 HOURS IN ADVANCE OF COMMENCEMENT OF WORK. A REPRESENTATIVE OF THE OWNER OR DEVELOPER, A REPRESENTATIVE OF THE CONTRACTOR AND DESIGN ENGINEER ARE REQUIRED TO ATTEND. CONTACT THE DISTRICT TO SCHEDULE THE PRE-CONSTRUCTION MEETING. NO PRE-CONSTRUCTION MEETING CAN BE SCHEDULED PRIOR TO FOUR (4) SIGNED/APPROVED PLAN SETS ARE RECEIVED BY THE DISTRICT.
 - THE CONTRACTOR IS REQUIRED TO NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 2 WEEKS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY AFFECTED UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION ADJACENT TO THE KNOWN UTILITY LINES.
- TESTING OF FACILITIES:
 - THE CONTRACTOR SHALL NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF ANY TESTING.
 - ALL SECTIONS OF WATER LINE ARE TO MEET THE FOLLOWING PRESSURE TESTING REQUIREMENTS:
 - TEST 100% OF ALL LINES
 - MUST PASS PRESSURE TEST TO 200 PSI FOR TWO HOURS (UNLESS OTHERWISE APPROVED ON THE PLANS)
 - ALL SANITARY SEWER FACILITIES ARE TO MEET THE FOLLOWING TESTING REQUIREMENTS:
 - ALL LINES SHALL BE JET CLEANED PRIOR TO VACUUM OR PRESSURE TESTING
 - ALL MANHOLES SHALL BE VACUUM TESTED WITH DISTRICT STAFF PRESENT PRIOR TO CCTV INSPECTION
 - SEWER MAINS TO BE PRESSURE TESTED PRIOR TO CCTV INSPECTION
 - ALL LINES SHALL BE CCTV INSPECTED AND VIDEO SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.

- PRELIMINARY ACCEPTANCE SHALL BE DEFINED AS THE POINT IN TIME THAT THE DISTRICT ACCEPTS THE FACILITY FOR USE. ALL SURFACE IMPROVEMENTS AND RESTORATION SHALL BE COMPLETED WITHIN 30 DAYS OF COMMENCEMENT. SHOULD THE CONTRACTOR FAIL TO COMPLETE ALL SURFACE IMPROVEMENTS AND RESTORATION WITHIN 30 DAYS OF COMMENCEMENT OF SERVICE, THE DISTRICT, AT THEIR DISCRETION, MAY ELECT TO COMPLETE THE IMPROVEMENTS AT THE CONTRACTOR'S COST.
- FINAL ACCEPTANCE BY THE DISTRICT OF ANY LINE OR SYSTEM SHALL NOT OCCUR UNTIL COMPLETION OF FINAL ASPHALT LAYERS AND/OR FINAL COMPLETION AND/OR RESTORATION OF ALL SURFACE IMPROVEMENTS. THE WARRANTY PERIOD FOR ALL FACILITIES PRIOR TO FINAL ACCEPTANCE SHALL BE 24 MONTHS COMMENCING AFTER PRELIMINARY ACCEPTANCE.
- ACCEPTANCE
 - THE DISTRICT MAY GIVE PRELIMINARY ACCEPTANCE ONCE ALL OF THE TESTS ON ALL THE LINES HAVE BEEN COMPLETED AND A WALK-THRU HAS OCCURRED.
 - A SECOND ACCEPTANCE MAY OCCUR ONCE FIRST LIFT OF ASPHALT GOES DOWN AND A SECOND WALK-THRU OF THE SYSTEM OCCURS. IF ALL FACILITIES ARE CLEAN AND ACCESSIBLE, A FINAL ACCEPTANCE MAY OCCUR (THE DISTRICT MAY REQUIRE CLEANING AND RE-VIDEO OF THE SYSTEM, DEPENDING ON THE SEVERITY OF THE CONTAMINATION).
- ALL WATER AND SEWER MAINS, INCLUDING SERVICE LINES, SHALL HAVE "AS-BUILT" DRAWINGS PREPARED AND APPROVED PRIOR TO PRELIMINARY ACCEPTANCE BY THE DISTRICT.
- ALL COMMERCIAL/BUSINESS DEVELOPMENTS SHALL HAVE AN EIGHT INCH (MIN.) WATER MAIN LOOPED THROUGH THE PROPOSED PROPERTY WITH GATE VALVES LOCATED WHERE THE MAIN ENTERS THE PROPERTY LINE. AN EIGHT INCH SEWER MAIN SHALL BE INSTALLED FOR SERVICE TO COMMERCIAL/BUSINESS DEVELOPMENTS, AND A MANHOLE SHALL BE LOCATED WHERE THE MAIN ENTERS THE PROPERTY. THE END OF THE MAINS SHALL BE MARKED WITH THE APPROPRIATE COLORED CARSONITE MARKER ALONG WITH TRACER WIRE.
- AFTER REVIEW AND APPROVAL OF PLANS FOR THE EXTENSION OF LINES, FACILITIES AND/OR SERVICES, CONSTRUCTION MUST BE COMMENCED WITHIN 18 MONTHS FOR RESIDENTIAL SUBDIVISIONS AND 12 MONTHS FOR ANY COMMERCIAL INSTALLATIONS.
- INSPECTION FEES: CALL THE DISTRICT (719-495-2500) FOR FEE SCHEDULE.
- SANITARY SEWER LENGTHS ARE MH CENTER TO MH CENTER. ALL SANITARY SEWER PIPES SHALL BE SDR 35 PVC OR EQUAL SEWER LINES MAY NOT EXCEED 7% GRADE FOR ANY SIZE WITHOUT PRIOR APPROVAL OF THE DISTRICT. ALL NEWLY CONSTRUCTED RESIDENTIAL SANITARY SEWER TAPS SHALL USE PRE-MANUFACTURED IN-LINE PVC PUSH-ON WYES. TAPPING SADDLES MAY ONLY BE USED FOR TAPPING PRE-EXISTING MAINS.
- ALL SANITARY SEWER MANHOLES SHALL BE WRAPPED WITH RU116-RUBR-NEK JOINT WRAP OR EQUIVALENT AND COATED.
- COMMENCEMENT OF USE OF SEWER LINES AND/OR SYSTEMS:
 - NO SANITARY SEWER FACILITY SHALL BE PLACED IN SERVICE UNTIL THE COMPLETION OF ALL JET CLEANING, PRESSURE TESTING, VACUUM TESTING, CCTV INSPECTION, COMPACTION TESTING, AND AS-BUILT DRAWINGS ARE SUBMITTED AND APPROVED BY THE DISTRICT.
 - NO SANITARY SEWER FACILITY SHALL BE PLACED IN SERVICE UNTIL ALL SERVICE LINES ARE COMPLETED AND THE FIRST LIFT OF ASPHALT IS COMPLETED OVER THE LINE. IN THE CASE WHERE NO ASPHALT IS TO BE PLACED OVER THE LINE, ANY REQUIRED SURFACE IMPROVEMENTS SHALL BE COMPLETED PRIOR TO USE OF THE FACILITY.
 - ALL NECESSARY EASEMENTS (PLATTED OR DEEDED) ARE DEDICATED, EXECUTED BY THE DISTRICT, AND RECORDED.
 - DOWNSTREAM PLUG CAN BE REMOVED ONCE FIRST LIFT OF ASPHALT IS DOWN AND THE ABOVE REQUIREMENTS ARE MET.

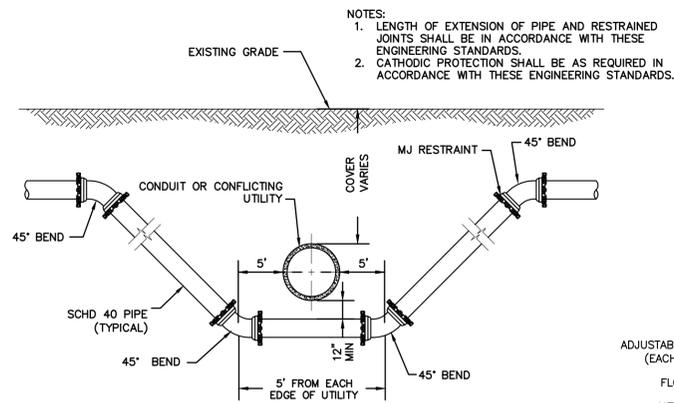
ABBREVIATIONS

ARVB	AIR RELIEF VACUMBREAKER VALVE	MH	MANHOLE
BEG	BELOW EXISTING GRADE	N	NORTH
BFV	BUTTERFLY VALVE	NE	NORTHEAST
CL	CENTERLINE	NW	NORTHWEST
CMP	CORRUGATED METAL PIPE	OH	OVERHEAD
DIA. OR Ø	DIAMETER	PVC	POLYVINYL CHLORIDE
E	EAST	RAD OR R	RADIUS
EA	EACH	RPP	REINFORCED POLYPROPYLENE
ELEC	ELECTRICAL LINE	S	SOUTH
EOA	EDGE OF ASPHALT	SE	SOUTHEAST
EXIST. OR EX.	EXISTING	SW	SOUTHWEST
INV	INVERT	T.O.P.	TOP OF PIPE
LP	LOW POINT	UON	UNLESS OTHERWISE NOTED
FM	FORCE MAIN		

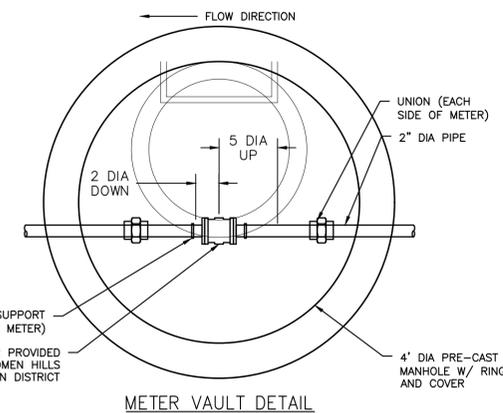
CIVIL/ARCHITECTURAL/PROCESS SYMBOLS LIBRARY



EL = 6110.00
ELEVATION

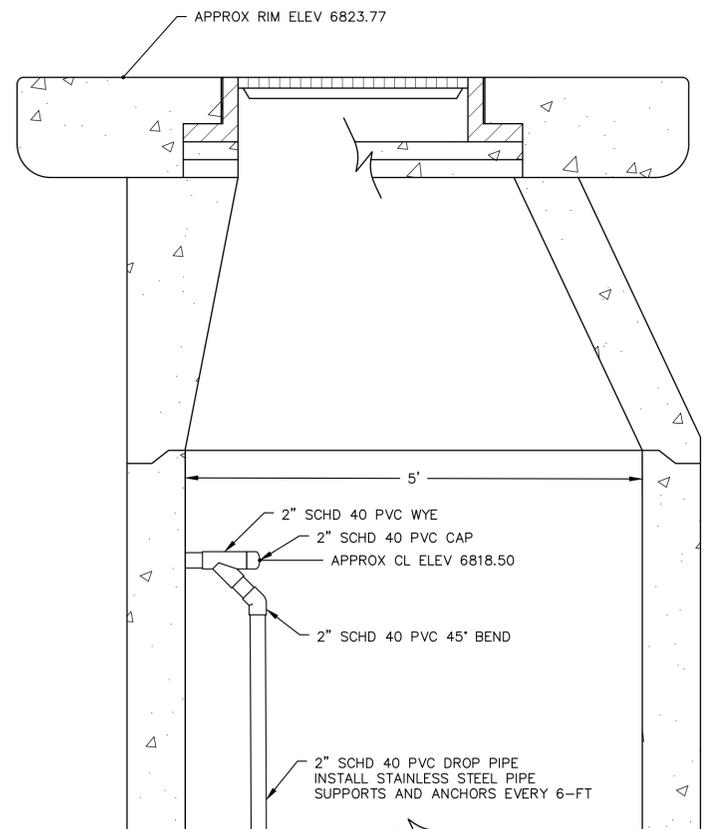


FORCE MAIN LOWERING DETAIL



NOTES:

- DIMENSIONS SHOWN ARE REQUIRED UPSTREAM AND DOWNSTREAM DIAMETERS OF STRAIGHT PIPE.
- DETAIL FOR SCHEMATIC PURPOSES ONLY, CONFIRM DIMENSIONS AND FITTINGS AS NECESSARY.
- INSTALL METER PER MANUFACTURER'S REQUIREMENTS.
- FLOW METER 18" MIN ABOVE MANHOLE FLOOR.



**INSIDE DROP DETAIL
APPROX. TO SCALE**

NO	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
GENERAL NOTES & DETAILS
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

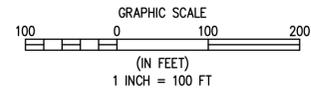
PREPARED UNDER THE DIRECT SUPERVISION OF

DATE	MARCH 2019
JOB NUMBER	0055.0001
SCALE	NTS
DRAWING NAME	NOTES
SHEET	2 OF 8

- NOTES:
- BENCHMARK: CONTROL POINT #100, SET NO. 4 REBAR AS SHOWN HEREON. NORTHING (Y) 29961.01, EASTING (X) 20058.38, ELEVATION (Z) 6826.05, NAVD 88 (BASED ON NGS MONUMENT E24 WITH AN ELEVATION 6902.30 NAVD 88).
 - THIS IS AN ALIGNMENT AND TOPOGRAPHIC MAP. IT IS NOT A LAND SURVEY PLAT OR IMPROVEMENT SURVEY PLAT.
 - THE FIELDWORK FOR THIS SURVEY WAS COMPLETED ON DECEMBER 26, 2018 BY FORTH LAND SURVEYING, INC.
 - ANY UNDERGROUND OR ABOVE GROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AS OBSERVED IN THE FIELD. UNDERGROUND LINES SHOWN HEREON ARE SHOWN APPROXIMATELY. WHERE ADDITIONAL OR MORE DETAIL IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION MAY BE NECESSARY.
 - SANITARY SEWER MANHOLES 1 & 2 (SSMH 1 & 2) ARE MAINTAINED BY WOODMEN HILLS METROPOLITAN DISTRICT AND WERE OPENED AND CLOSED BY A WOODMEN HILLS METROPOLITAN DISTRICT REPRESENTATIVE.

LEGEND

- FOUND PLSS MONUMENT AS NOTED
- FOUND MONUMENT AS NOTED
- △ SET SITE BENCHMARK AS NOTED
- ▲ FOUND 60D NAIL
- (R) RECORD VALUE per Land Survey Plat El Paso County Rec. # 205900052
- (R1) RECORD VALUE per Land Survey Plat El Paso County Rec # 217900138
- (R2) RECORD VALUE per Warranty Deed El Paso County Rec # 206055833
- (M) MEASURED VALUE
- CPP CORRUGATED PLASTIC PIPE
- ⊕ SANITARY SEWER MANHOLE
- SANITARY SEWER VENT PIPE
- ⊗ ELECTRIC TRANSFORMER
- ⊙ UTILITY POLE
- GUY WIRE
- OHE OVERHEAD ELECTRIC LINE
- X — X — CHAIN-LINK FENCE
- APPROX ROAD/TRAIL AREA



SSMH 1
WOODMEN HILLS MH
4 FT DIA CONCRETE
RIM ELEV 6822.90
INV IN N (10") ELEV 6799.62
INV IN E (10") ELEV 6799.62
INV OUT S (10") ELEV 6799.62

SSMH 2
WOODMEN HILLS MH
4 FT DIA CONCRETE
RIM ELEV 6824.11
DEPTH 23.03 FT
INV IN E (10") ELEV 6801.08
INV OUT W (10") ELEV 6801.08

OWNER: CHALLENGER COMMUNITIES LLC

OWNER: FALCON HIGHLANDS METRO DISTRICT

APPROXIMATE EXISTING 6" WOODMEN HILLS FORCE MAIN
ACTUAL LOCATION SHALL BE FIELD VERIFIED DURING CONSTRUCTION

WOODMEN HILLS FALCON HIGHLAND LIFT STATION
SEE DETAIL C THIS SHEET

TERMINATION OF INSTALLED FORCE MAIN

WEST 1/16 CORNER OF SECTION 12, FOUND NO. 6 REBAR WITH A 3.25" ALUMINUM CAP, PLS 30829, 0.3' BELOW GRADE

OWNER: BLH NO 2 LLC

SW CORNER OF SECTION 12
FOUND 2" PIPE WITH A 3.25" ALUMINUM CAP, PLS 38256, 0.1" BELOW GRADE

S89°18'34"E 1,328.13' (M)
S89°18'34"E 1,328.02' (R)
BASIS OF BEARINGS

S89°18'39"E 282.89' (R1)

S89°18'46"E 461.28' (R1)

S89°18'17"E 234.83' (R1)

FOUND NO. 4 REBAR WITH ILLEGIBLE 1.25" ALUMINUM CAP PLS 30118 0.3' BELOW GRADE

FOUND NO. 5 REBAR WITH 1.5" ALUMINUM CAP PLS 30118 FLUSH WITH GRADE

OWNER: H2O SUB BLR LLC C/O WALTON INTERNATIONAL

OWNER: JAMES & DELIA OZBURN

FOUND NO. 5 REBAR WITH 1.5" ALUMINUM CAP PLS 30118 FLUSH WITH GRADE

OWNER: BLH NO 2 LLC

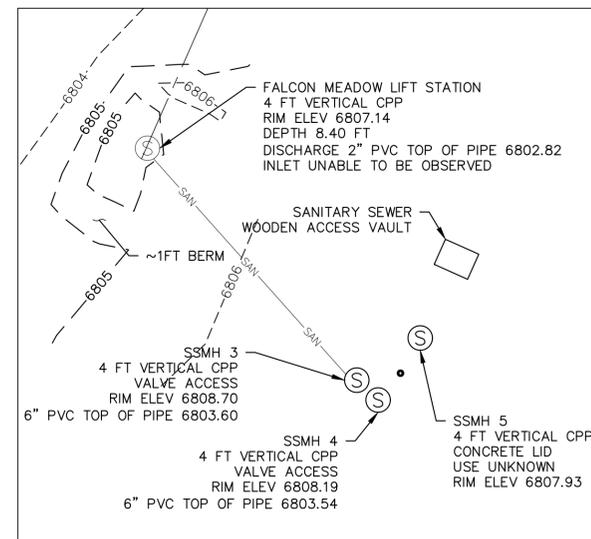
OWNER: H2O SUB BLR LLC C/O WALTON INTERNATIONAL

FOUND NO. 5 REBAR WITH 1.5" ALUMINUM CAP PLS 30118 FLUSH WITH GRADE

OWNER: JAMES & DELIA OZBURN

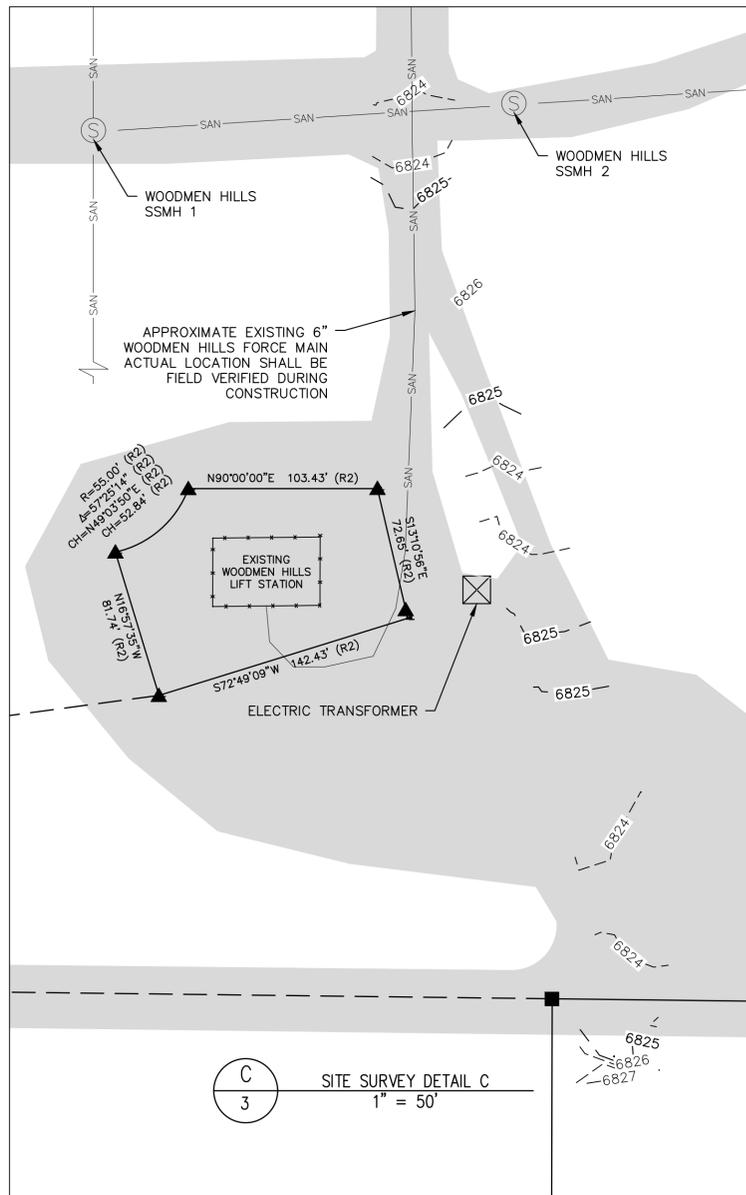
OWNER: H2O SUB BLR LLC C/O WALTON INTERNATIONAL

FALCON MEADOW LIFT STATION AREA
SEE DETAIL B THIS SHEET

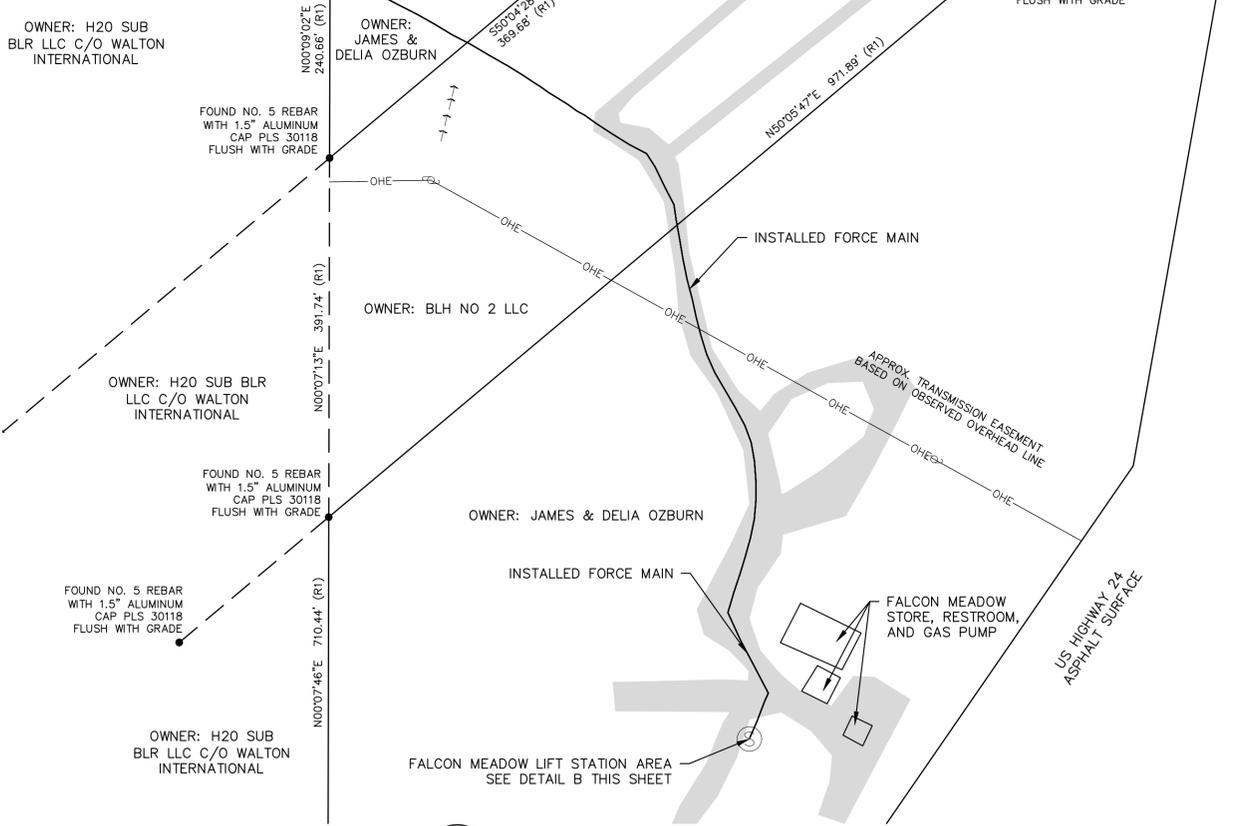


B
3 SITE SURVEY DETAIL B
1" = 10'

NOTE: ALL WASTEWATER FROM FALCON MEADOW CAMPGROUND SERVICE AREA IS DIRECTED THROUGH SSMH 3 TO THE PROPOSED LIFT STATION.



C
3 SITE SURVEY DETAIL C
1" = 50'



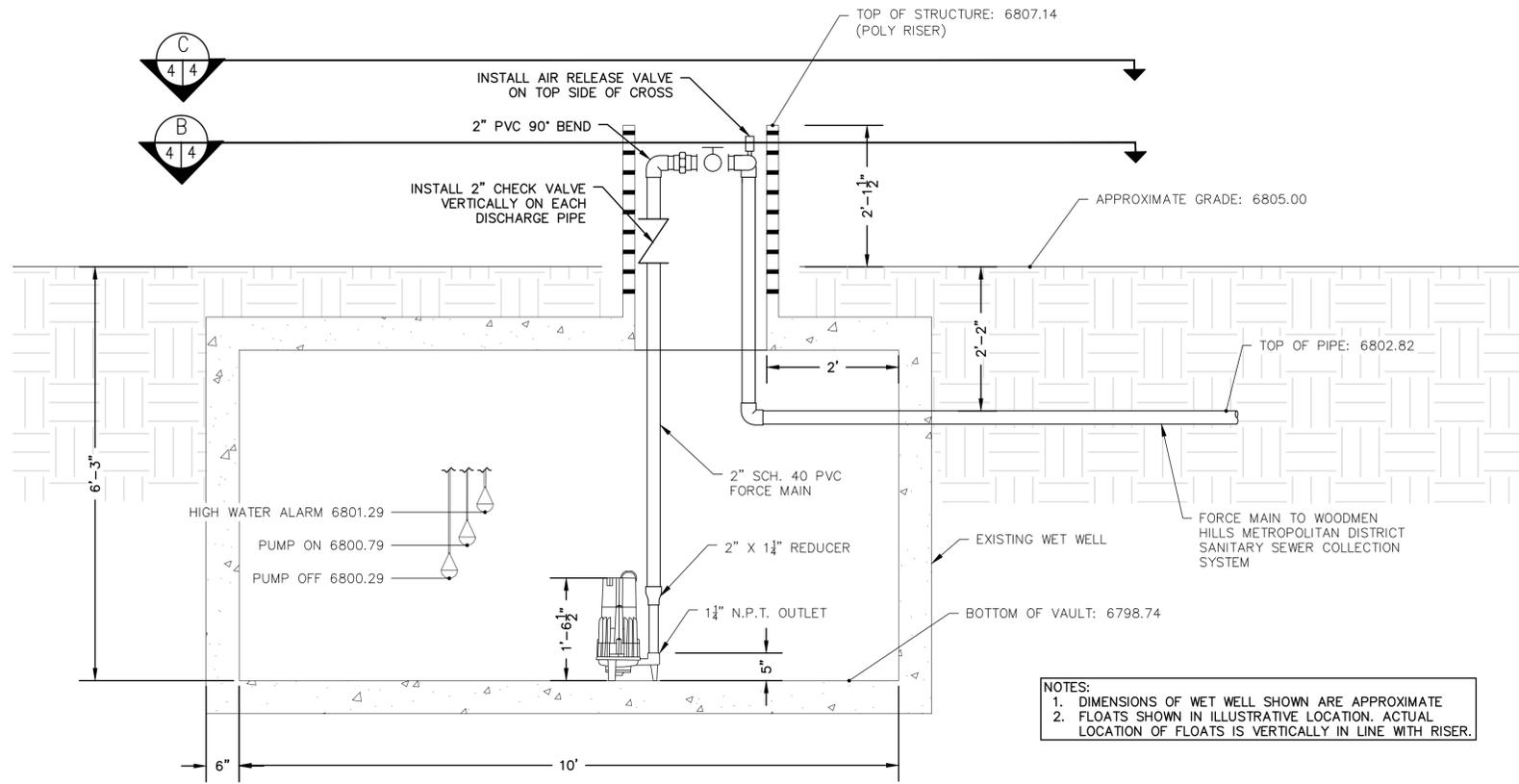
A
3 SITE SURVEY
1" = 100'

NO	REVISIONS	DESCRIPTION	DATE	BY
1	MODIFY TO TWO PUMPS		5/19	AA

LIFT STATION - CONSOLIDATION
TOPOGRAPHICAL SURVEY
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

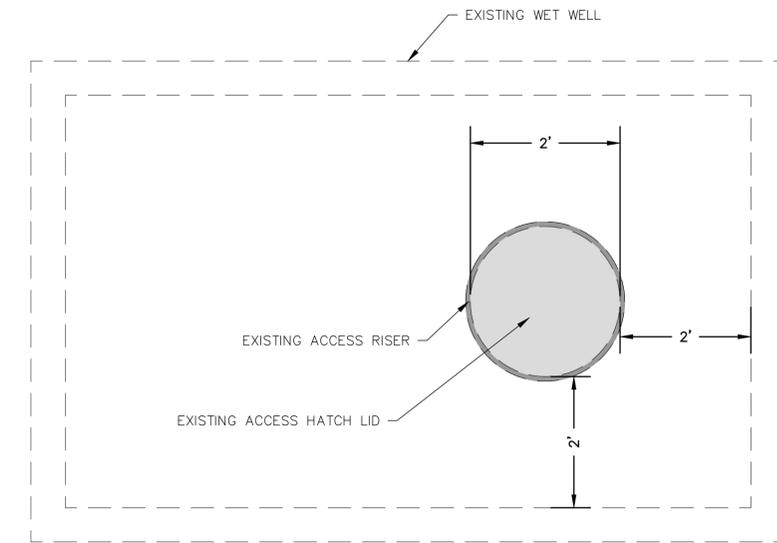
PREPARED UNDER THE DIRECT SUPERVISION OF

DATE	MARCH 2019
JOB NUMBER	0055.0001
SCALE	AS SHOWN
DRAWING NAME	SURVEY
SHEET	3 OF 8



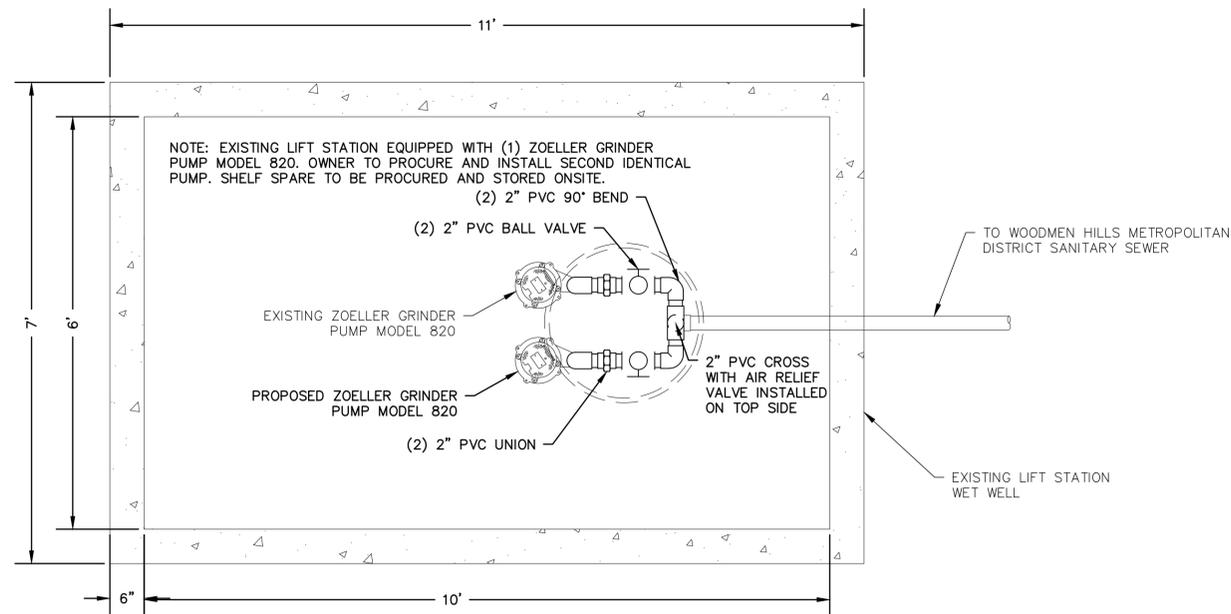
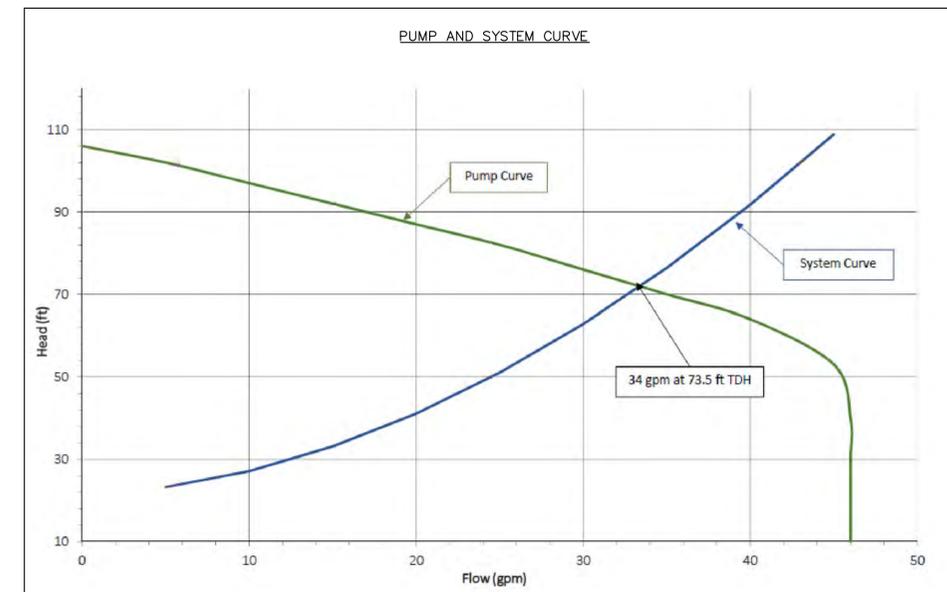
A
4 LIFT STATION PROFILE VIEW
3/4" = 1'

NOTES:
1. DIMENSIONS OF WET WELL SHOWN ARE APPROXIMATE
2. FLOATS SHOWN IN ILLUSTRATIVE LOCATION. ACTUAL LOCATION OF FLOATS IS VERTICALLY IN LINE WITH RISER.



C
4 LIFT STATION GRADE VIEW
3/4" = 1'

LIFT STATION DESIGN SUMMARY	
PUMP INFORMATION	ZOELLER PUMP COMPANY SHARK SERIES 820 GRINDER PUMP 2 HP, 60 HZ, 3,450 RPM
MINIMUM FLOWRATE	15.1 GPM (FUTURE PEAK HOUR)
EXPECTED OPERATING POINT	34 GPM AT 73.5 FT TDH
FORCE MAIN	2-INCH SCHD 40 PVC



B
4 LIFT STATION PLAN VIEW
3/4" = 1'

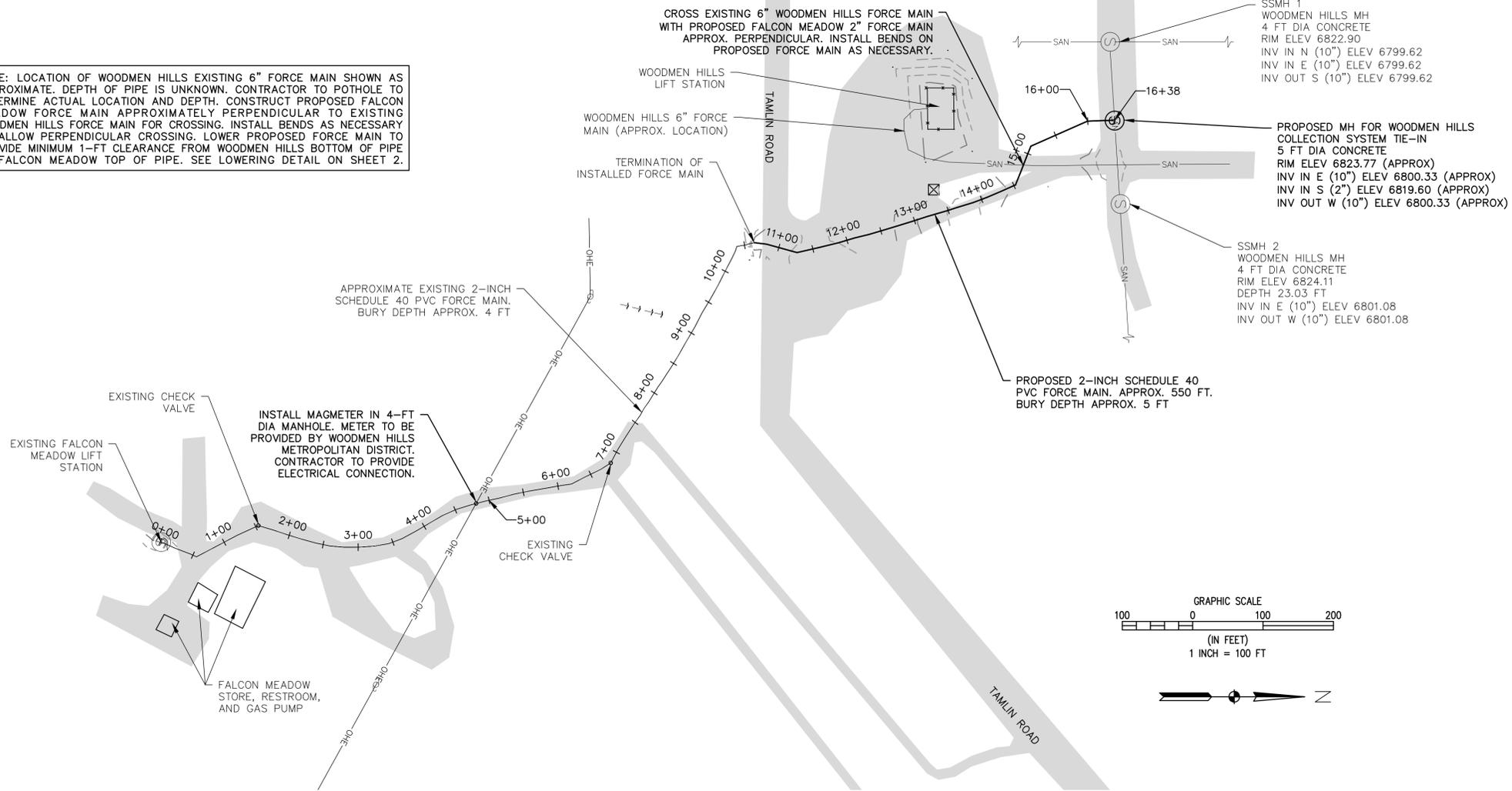
NOTE: EXISTING LIFT STATION EQUIPPED WITH (1) ZOELLER GRINDER PUMP MODEL 820. OWNER TO PROCURE AND INSTALL SECOND IDENTICAL PUMP. SHELF SPARE TO BE PROCURED AND STORED ONSITE.

NO.	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

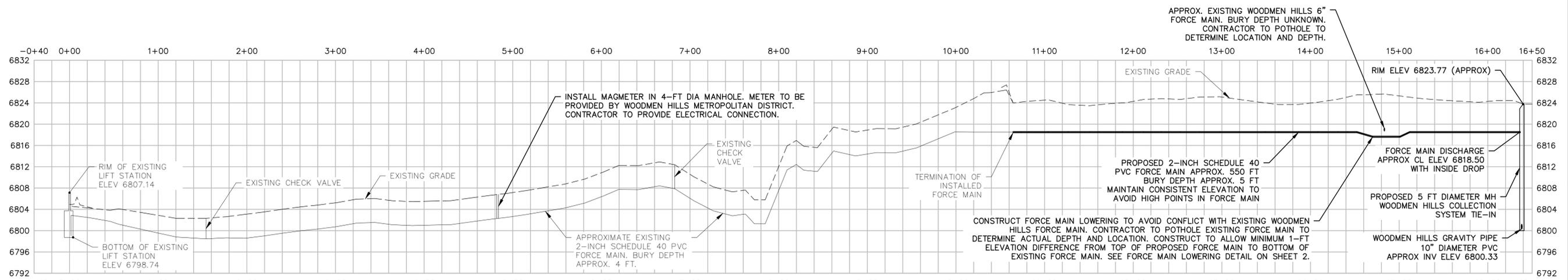
LIFT STATION - CONSOLIDATION
LIFT STATION
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC
DATE: MARCH 2019
JOB NUMBER: 0055.0001
SCALE: AS SHOWN
DRAWING NAME: LIFT STATION
SHEET 4 OF 8

NOTE: LOCATION OF WOODMEN HILLS EXISTING 6" FORCE MAIN SHOWN AS APPROXIMATE. DEPTH OF PIPE IS UNKNOWN. CONTRACTOR TO POTHOLE TO DETERMINE ACTUAL LOCATION AND DEPTH. CONSTRUCT PROPOSED FALCON MEADOW FORCE MAIN APPROXIMATELY PERPENDICULAR TO EXISTING WOODMEN HILLS FORCE MAIN FOR CROSSING. INSTALL BENDS AS NECESSARY TO ALLOW PERPENDICULAR CROSSING. LOWER PROPOSED FORCE MAIN TO PROVIDE MINIMUM 1-FT CLEARANCE FROM WOODMEN HILLS BOTTOM OF PIPE TO FALCON MEADOW TOP OF PIPE. SEE LOWERING DETAIL ON SHEET 2.



A
5 EXISTING AND PROPOSED FORCE MAIN PLAN
1" = 100'



HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 10'

B
5 EXISTING AND PROPOSED FORCE MAIN PROFILE
AS SHOWN

- NOTES:
- CUT EXISTING SANITARY SEWER PIPE PER WHMD DETAILS.
 - PROPOSED MANHOLE SHALL BE 5-FT PRECAST WITH CAST IN PLACE BASE. FIELD CORE PIPE PENETRATIONS PER WHMD DETAILS.
 - PROPOSED MANHOLE SHALL BE COATED, HAVE DOUBLE-RAMNECK INSIDE EACH JOINT, AND JOINT WRAP AROUND EACH JOINT.
 - INSTALL SEALED PVC WYE WITH CAP AND BEND TO CREATE INSIDE DROP IN PROPOSED MANHOLE (SEE DETAIL SHEET 2). EXTEND 2" SCHD 40 PVC PIPE TO BOTTOM OF MANHOLE AND INSTALL STAINLESS STEEL PIPE BRACKETS AND ANCHOR BOLTS EVERY 6-FT TO SUPPORT DOWN PIPE. EXTEND DROP PIPE INTO THE BENCH OF THE MANHOLE AND DAYLIGHT PIPE INTO A SHAPED CONCRETE TROUGH. INSTALL GROUT TO CHANNELIZE FLOW (SEE WHMD DETAIL).

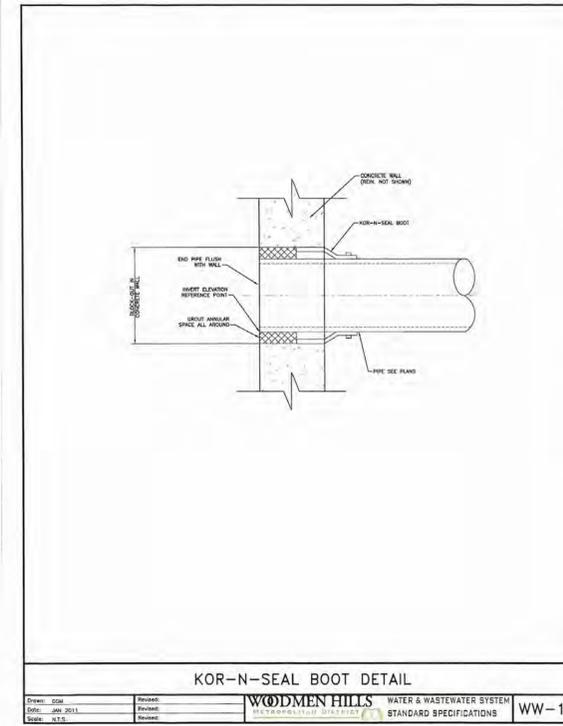
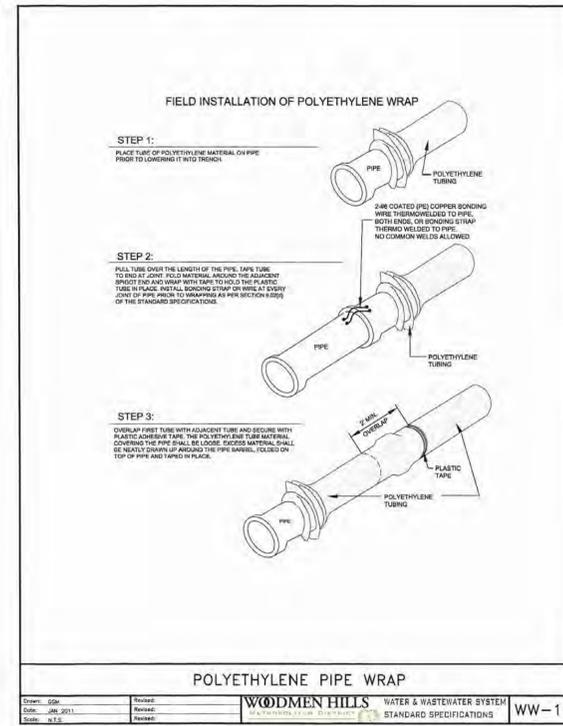
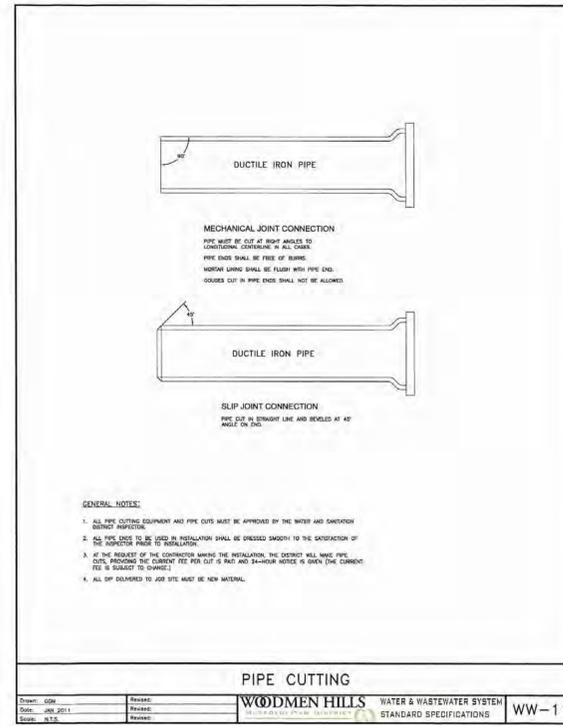
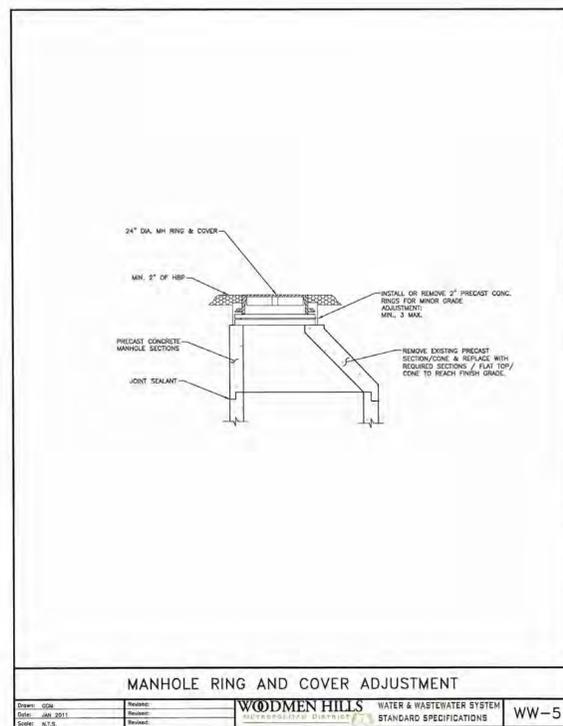
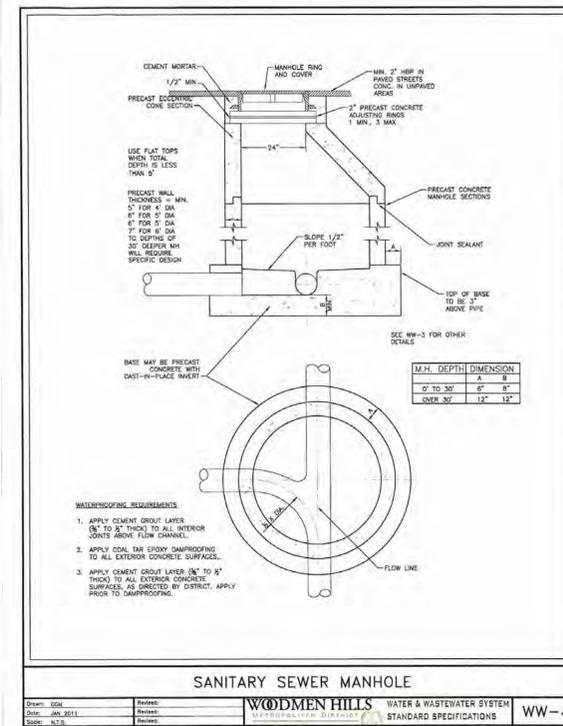
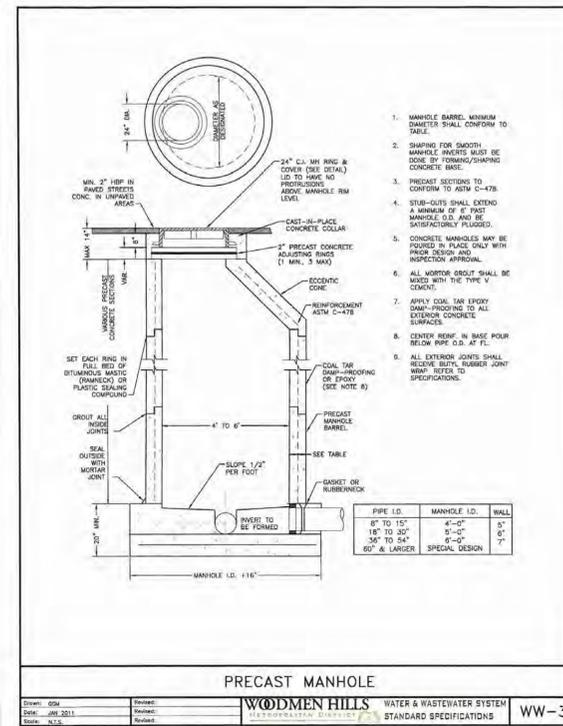
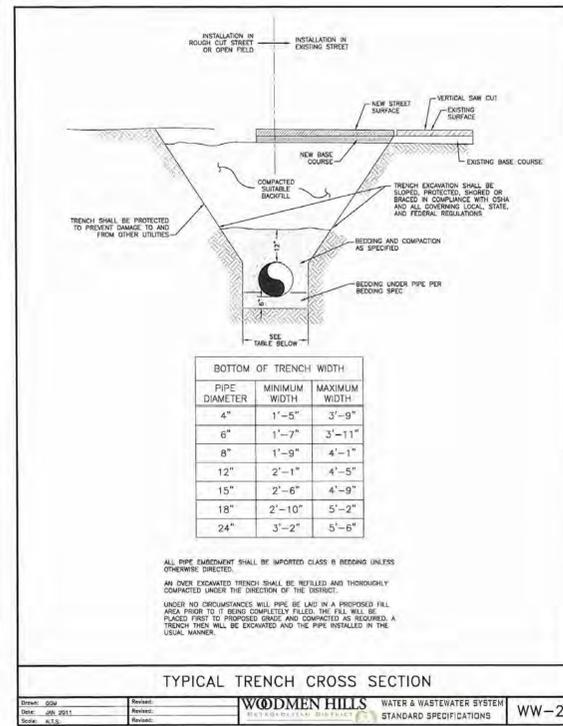
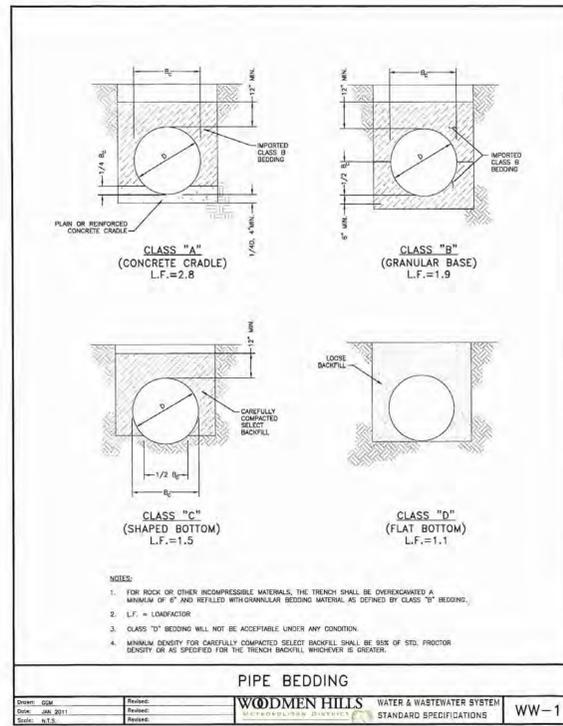
NO.	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
FORCE MAIN PLAN &
PROFILE
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE	MARCH 2019
JOB NUMBER	0055.0001
SCALE	AS SHOWN
DRAWING NAME	P & P
SHEET	5 OF 8

NOTE: ALL CONSTRUCTION OF INFRASTRUCTURE THAT WILL BE PART OF THE WOODMEN HILLS METROPOLITAN DISTRICT'S COLLECTION SYSTEM SHALL ABIDE BY THE CURRENT WOODMEN HILLS METROPOLITAN DISTRICT WATER AND WASTEWATER SYSTEM STANDARD SPECIFICATIONS



NO.	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
 WOODMEN HILLS
 DETAILS
 FALCON MEADOW RV CAMPGROUND
 11150 HWY 24
 PEYTON, CO 80831

DATE: MARCH 2019
 JOB NUMBER: 0055.0001
 SCALE: NTS
 DRAWING NAME: WHMD DET
 SHEET: 7 OF 8

STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES

GENERAL NOTES

1. THE APPROVED EROSION CONTROL PLAN SHALL BE MAINTAINED FOR THE ENTIRE DURATION OF THIS PROJECT.
2. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.
3. A THOROUGH INSPECTION OF THE STORMWATER MANAGEMENT PLAN BEST MANAGEMENT PRACTICES (BMPs) IS RECOMMENDED EVERY FOURTEEN (14) DAYS AND AFTER ANY PRECIPITATION OR SNOW MELT EVENT.
4. PERIODIC INSPECTIONS SHALL ALSO INCLUDE INSPECTING EQUIPMENT FOR LEAKS AND REVIEWING EQUIPMENT MAINTENANCE PRACTICE. ALL INSPECTIONS AND MAINTENANCE SHALL BE DOCUMENTED BY THE PROJECT EROSION CONTROL SUPERVISOR AND MADE AVAILABLE TO THE OWNER AND COPHE UPON REQUEST. ANY EROSION CONTROL BMP THAT HAS BEEN COMPROMISED OR HAS BEEN DISTURBED SHALL BE REPLACED OR RECONSTRUCTED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL EROSION CONTROL BMPs IN PLACE AND EFFECTIVE PRIOR TO A STORM EVENT.
5. THE STORMWATER MANAGEMENT PLAN LOG BOOK SHALL BE UPDATED EVERY FOURTEEN (14) DAYS. THIS LOG SHALL REMAIN ON SITE AVAILABLE FOR REVIEW BY SAGUACHE COUNTY AND COPHE UPON REQUEST UNTIL AN INACTIVATION NOTICE FOR CONSTRUCTION STORMWATER DISCHARGE GENERAL PERMIT CERTIFICATION HAS BEEN OBTAINED. MAINTENANCE ACTIVITIES TO CORRECT PROBLEMS NOTED DURING INSPECTIONS MUST BE DOCUMENTED AND KEPT IN THE STORMWATER MANAGEMENT PLAN LOG BOOK.
6. ALL STREETS WITHIN AND IMMEDIATELY SURROUNDING A CONSTRUCTION SITE SHALL BE CLEANED OF DIRT AND DEBRIS ON A WEEKLY BASIS. STREETS SHALL BE CLEANED BY SCRAPING AND SWEEPING THE DIRT OFF THE ROADWAYS. SCRAPED OR SWEEPED MATERIAL SHALL NOT BE DEPOSITED IN THE STORM SEWER SYSTEM. DIRT TRACKED ONTO ROADWAYS AND OTHER PAVED SURFACES SHALL BE CLEANED UP BY THE END OF THE WORKDAY.
7. ALL CONSTRUCTION SITE OPERATORS SHALL CONTROL WASTE SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, HAZARDOUS CHEMICALS (TO INCLUDE BUT NOT LIMITED TO HEAVY EQUIPMENT MAINTENANCE FLUIDS, MOTOR OIL, ANTIFREEZE AND VEHICLE FUEL), LITTER, AND SANITARY WASTE AT THE CONSTRUCTION SITE THAT MAY CAUSE ADVERSE IMPACTS TO STORMWATER QUALITY.
8. ALL POTENTIAL POLLUTION SOURCES ON-SITE SHALL BE IDENTIFIED AND CONTROL MEASURES INSTALLED AND PRACTICED TO MINIMIZE THE LIKELIHOOD OF A RELEASE. REFER TO THE SPILL PREVENTION, CONTROL, AND COUNTERMEASURE (SPCC) PLAN FOR MEASURES TO RESPOND TO ANY SPILLS, LEAKS OR OTHER RELEASES.
9. ALL PORTABLE TOILET FACILITIES SHALL BE LOCATED AWAY FROM GUTTERS, INLETS DITCHES, DRAINAGEWAYS, RECEIVING WATERS AND AREAS SUSCEPTIBLE TO FLOODING OR DAMAGE BY CONSTRUCTION EQUIPMENT.
10. ALL PORTABLE TOILET FACILITIES SHALL BE SECURED IN PLACE BY STAKES INTO THE GROUND TO PREVENT TIPPING.
11. STOCKPILES INCLUDING LANDSCAPING MATERIALS, EARTH MATERIALS AND DIRT FROM GRADING OR EXCAVATION SHALL NOT BE LOCATED ADJACENT TO WATERWAYS; SHALL BE STABILIZED WITHIN FOURTEEN (14) DAYS OF ESTABLISHMENT BY SURFACE ROUGHENING, SEEDING, AND MULCHING; AND SHALL NOT EXCEED TEN FEET IN HEIGHT.
12. SLOPES 3:1 OR STEEPER SHALL BE PROTECTED WITH BIODEGRADABLE EROSION CONTROL BLANKETS.
13. ALL MATERIAL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT THE LOSS OF MATERIAL DURING TRANSPORT. HAUL ROUTES MUST BE PRE-APPROVED BY THE COUNTY. NO MATERIAL SHALL BE TRANSPORTED TO ANOTHER SITE WITHOUT FIRST OBTAINING A HAULING PERMIT FROM THE OWNER.
14. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL CONTAIN ALL WASHOUT WATER. STORMWATER SHALL NOT CARRY WASTES FROM WASHOUT LOCATION.
15. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL BE LOCATED A MINIMUM OF FIFTY (50) FEET HORIZONTAL FROM WATERS OF THE STATE. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL BE SIGNED AS - CONCRETE WASHOUT.
16. PERMANENT SOIL STABILIZATION MEASURES SHALL BE APPLIED WITHIN FOURTEEN (14) DAYS TO DISTURBED AREAS IN WHICH FINAL GRADE IS COMPLETED.

BMP MAINTENANCE NOTES

1. IT IS ANTICIPATED THAT THE BMPs IMPLEMENTED AT THE SITE WILL HAVE TO BE MODIFIED TO ADAPT TO CHANGING CONDITIONS OR TO ENSURE THAT POTENTIAL POLLUTANTS ARE BEING PROPERLY MANAGED AT THE SITE.
2. ALL INLET/OUTLET PROTECTIONS WILL BE CHECKED FOR MAINTENANCE AND FAILURE. SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF ONCE IT HAS ACCUMULATED TO HALF THE DESIGN OF THE TRAP.
3. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY, OR CONTAINED UNTIL APPROPRIATE CLEANUP METHODS CAN BE EMPLOYED. MANUFACTURE'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE FOLLOWED, ALONG WITH PROPER DISPOSAL METHODS.
4. EACH CONCRETE TRUCK OPERATOR SHALL BE AWARE OF THE DESIGNATED CONCRETE WASHOUT AREA.
5. THE CONTRACTOR SHALL CHECK THE CAPACITY FOR ALL CONCRETE WASHOUT AREAS. WASTE MATERIALS MUST BE REMOVED BY THE CONTRACTOR AND LEGALLY DISPOSED OF WHEN ACCUMULATIONS AMOUNT TO TWO-THIRDS OF THE WET STORAGE CAPACITY OF THE STRUCTURE.
6. ALL CONCRETE WASHOUT AREAS SHALL BE CLEARLY MARKED. THE CONCRETE WASHOUT CONTAINMENT DETAIL WILL INCLUDE ORANGE PLASTIC CONSTRUCTION FENCING OR EQUIVALENT AROUND THE WASHOUT STRUCTURE AND A SIGN POSTED WITH THE WORDS "CONCRETE WASHOUT".
7. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND/OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
8. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF AT AN APPROVED WASTE SITE.
9. ALL SEDIMENT SHALL BE REMOVED UPON INITIAL ACCEPTANCE FROM TEMPORARY SEDIMENT BASINS AND STORM SEWER FACILITIES, I.E., PIPES, OUTLETS AND INLETS. THIS SEDIMENT SHALL NOT BE FLUSHED OFF-SITE, BUT SHALL BE CAPTURED ON-SITE AND DISPOSED OF AT AN APPROVED LOCATION.
10. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
11. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
12. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.
2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.
3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.
5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.
6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK". THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').
7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".
2. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.
3. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.
4. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED, AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

ROCK SOCK MAINTENANCE NOTES

1. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.
2. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 1/2 OF THE HEIGHT OF THE ROCK SOCK.
3. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
4. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED, AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

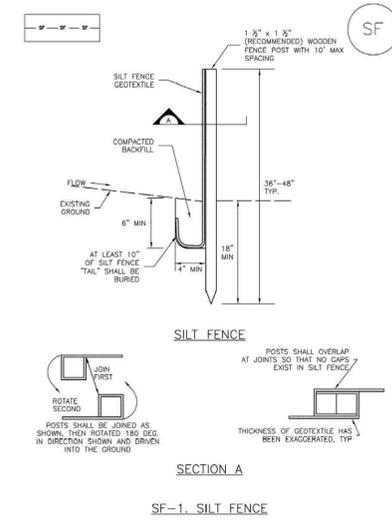
STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
 - 1.1. LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S)
 - 1.2. TYPE OF CONSTRUCTION ENTRANCE(S)/EXIT(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM)
2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.
3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.
4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.
6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

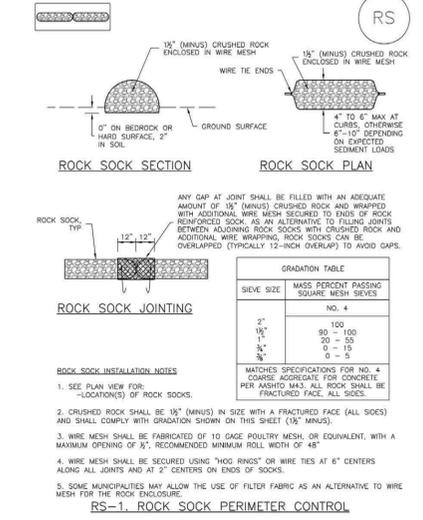
1. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.
2. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

Silt Fence (SF) SC-1



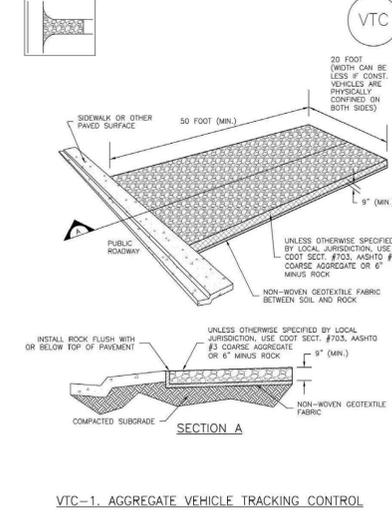
November 2010 Urban Drainage and Flood Control District SF-3
Urban Storm Drainage Criteria Manual Volume 3

SC-5 Rock Sock (RS)



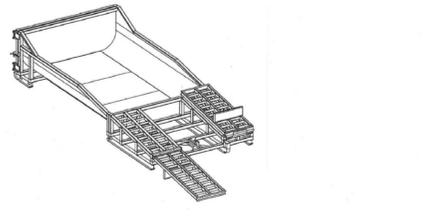
RS-2 Urban Drainage and Flood Control District November 2010
Urban Storm Drainage Criteria Manual Volume 3

Vehicle Tracking Control (VTC) SM-4



November 2010 Urban Drainage and Flood Control District VTC-3
Urban Storm Drainage Criteria Manual Volume 3

PORTABLE CONCRETE WASHOUT CONTAINER



DESCRIPTION
A portable, self-contained and watertight container affixed with ramps that controls, captures and contains caustic concrete wastewater and washout material.

PURPOSE & OBJECTIVE
Allows trade personnel to easily washout concrete trucks, pumps and other equipment associated with cement on site and allows easy off site recycling of the same concrete materials and wastewater.

APPLICATION
Construction projects where concrete, stucco, mortar, grout and cement are used as a construction material or where cementitious wastewater is created.

MAINTENANCE
Inspect and clean out when 3/4 full, not allowing the container to overflow. Inspect wastewater level and request a vacuum if needed. Inspect subcontractors to ensure that proper housekeeping measures are employed when washing out equipment.

SPECIFICATIONS
The container must be portable and temporary, watertight, equipped with ramps and have a holding capacity to accept washout from approximately 350 yards of poured concrete. A vacuum service must accompany washout container and be used by site superintendent as needed. A rampless container may be used in conjunction with a ramped container or by itself if a concrete pump is not needed. The wastewater must be disposed of or treated and recycled in an environmentally safe manner and in accordance with federal, state or local regulatory guidelines.

TARGETED POLLUTANTS
Caustic wastewater (high pH level near 12 units)
Suspended solids
Assorted Metals; Chromium VI, Nickel, Sulfate, Potassium, Magnesium and Calcium Compounds

NO.	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
EROSION CONTROL
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

PREPARED UNDER THE DIRECT SUPERVISION OF

EXHIBIT H – TECHNICAL SPECIFICATIONS

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TECHNICAL SPECIFICATIONS****FALCON MEADOW RV CAMPGROUND LIFT STATION**

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02310	EARTHWORK - PIPELINES	10
02550	VALVES	6
02671	PRESSURE TESTING	1
03300	CAST IN PLACE CONCRETE	6
03410	PRECAST STRUCTURAL CONCRETE	6
18110	PIPE & PIPE FITTINGS.....	10
18130	MANHOLES AND THRUST BLOCKS	3
18160	PIPE INSTALLATION	5
	PUMP SPECIFICATION.....	6

**SECTION 00000
GENERAL INFORMATION****PART 1.0 - DEFINITION**

Technical Standards and Specifications to be used for this project for the **Falcon Meadow RV Campground Lift Station Project**.

PART 2.0 – CONTACT INFORMATION

Owner – David Ozburn

11150 Hwy 24
Falcon, CO 80831
(719) 495-2694

Engineer – Element Engineering, LLC

Nicholaus P. Marcotte, P.E.
President
12687 W Cedar Drive, Suite 300
Lakewood, CO 80228
(303) 378-2969
nmarcotte@elementengineering.net

END OF SECTION

**SECTION 02200
SITE PREPARATION AND EARTHWORK****PART 1.0 - GENERAL**1.01 Summary

- A. This Section includes site preparation activities and items of earthwork necessary to complete the project.

1.02 Submittals

- A. Submit to Engineer for approval the name, location, and qualifications of the testing laboratory selected for compaction testing.
- B. Submit compaction test reports to Engineer as work progresses.

1.03 Quality Assurance

- A. Standards:

1. American Society of Testing and Materials (ASTM):

- D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft)
- D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³(2,700 kN-m/m³))
- D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
- D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
- D2937 - Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method
- D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
- D4718 - Standard Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles

2. American Association of State Highway and Transportation Officials Standard Method of Test (AASHTO):

- T-96 - Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact by the Los Angeles Machine.
- T-99 - The Moisture-Density Relations of Soils Using a 2.5 kG (5.5 lb) Rammer and a 305 mm (12 in) Drop.
- T104 - Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate Test.

B. Testing:

1. An acceptable testing laboratory shall be selected and paid for by the Contractor to perform all required laboratory and field soil testing necessary to demonstrate compliance with compaction requirements. Geotechnical testing agency shall be qualified according to ASTM D 698 or ASTM D 1557.

1.04 Site Conditions

- A. Lines and grades shall be as indicated. Layout and construct the work from control data furnished or established as specified.
- B. Carefully maintain all bench marks, monuments and other reference points and replace as directed if disturbed or destroyed.
- C. Do not close or obstruct streets, walks, or other adjacent or used facilities without advance permission from Owner and authorities having jurisdiction.
- D. Do not proceed with earth moving work until temporary site fencing and erosion and sedimentation control measures are in place.
- E. Utility Locator Service: Notify On-Call for area where project is located prior to beginning earth moving operations.
- F. Disposition of Existing Facilities, Structures and Property:
 1. Adequately protect from damage all existing utilities, structures and property and remove or relocate only as indicated, specified or as directed by the Engineer.
 2. Report inactive and abandoned utilities encountered in excavating and grading operations. Remove, plug, or cap as directed.
 3. Confine operations to that area provided through easements, licenses, agreements and rights-of-way. The Contractor's entrance upon any lands outside of that area provided by easements, licenses, agreements or public rights-of-way, shall be at the Contractor's sole liability.

PART 2.0 - PRODUCTS2.01 Materials

A. Materials Classification:

1. All materials encountered, regardless of type, character, composition, or condition thereof, shall be unclassified.

B. Material properties for compaction:

1. Cohesionless materials include gravels, gravel-sand mixtures, sands and gravelly sands exclusive of clayey and silty material - materials which are free-draining and for which impact compaction will not produce a well-defined moisture-density relationship curve and for which the maximum density by impact methods will generally be less than by vibratory methods.
2. Cohesive materials include silts and clays generally exclusive of sands and gravel - materials for which impact compaction will produce a well-defined moisture-density relationship curve.

C. Waste Materials:

1. Includes excess suitable material and material unsuitable for use in the Work.
2. Remove from work area as excavated.
3. Keep excess suitable material segregated from other waste material.
4. Legally dispose of waste material off site.

D. Borrow Materials (Not Used)

E. Granular Fill and Pipe Embedment Materials.

1. Squeegee as specified below:

Product 4515-Squeegee
Specification Squeegee S&T

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	6	100	0.0	100-100	100-100
#4 (4.75mm)	6	83	7.7	61-91	60-100
#8 (2.36mm)	6	18	6.4	5-35	0-45
#16 (1.18mm)	6	5	3.5	1-25	0-30
#30 (0.6mm)	6	2	2.1	1-7	
#50 (0.3mm)	6	1	1.4	1-6	0-6
#100 (0.15mm)	6	1	0.7	0-2	
#200 (75um)	6	0.3	0.36	0-1	0-2
Pan	6	0.0	0.00		

F. Topsoil Materials:

- Includes those materials obtained from excavation or borrow area(s) which are free from roots, rocks and debris and which are suitable for supporting growth of vegetation.

G. Backfill Materials:

- Native material may be used for backfill if approved by the Engineer. No rocks or stones greater than 3-inches in diameter may be included in the backfill material. This shall supersede any recommendations made in the geotechnical report.
- Include suitable approved materials from excavations and borrow area(s).
- Shall be friable sandy or silty clay containing fine material sufficient to provide a dense mass free of voids and capable of satisfactory compaction.
- Shall be free of roots or other organic matter, refuse, cinders, ice, snow, frozen earth, or other unsuitable matter.

PART 3.0 - EXECUTION

3.01 Clearing and Grubbing

- Perform clearing and grubbing where indicated and as necessary to perform excavation, trenching, embankment, borrow and other work required.
- Clearing:
 - Clearing includes felling and disposal of trees and brush. Remove only those trees necessary for prosecution of the work. Preserve and protect all trees not specifically required to be removed.

2. Temporarily remove existing fences within the limits of clearing.
- C. Grubbing:
1. Removal and disposal of tree stumps and roots larger than 3 inches in diameter.
 2. Remove to a depth of at least 18 inches below existing grade.
 3. Backfill all excavated depressions with approved material and grade to drain.

3.02 Demolition

- A. Remove existing equipment or structures as indicated, or as required to perform new construction.
- B. Materials not indicated or specified to be relocated or returned to Owner shall be disposed of as specified in "Disposal of Debris" in this section.
- C. Obstructions:
1. Sidewalks, driveways, curb and gutter, drainage structures and similar obstructions permitted to be removed shall be cut in straight lines or removed to the nearest construction joint if located within five feet of the edge of the excavation. In no case shall the joint or line of cut be less than one foot outside the edge of the excavation. Surface obstructions removed to permit construction shall be reconstructed as specified and to the dimensions, lines and grades of original construction.
 2. Fences interfering with construction and located within public rights-of-way or as may be allowed for in permits or agreements, may be removed by the Contractor. Provide narrow trench openings in fence with a temporary gate, maintained in a closed position except to permit passage of equipment and vehicles. Fences within temporary construction easements may be removed by the Contractor provided that temporary fencing is installed in such a manner as to serve the purpose of the fencing removed. The Contractor shall coordinate with the Owner of the fence prior to removing fence. The Contractor shall locate and record all fence corners prior to removal. Restore all removed fencing to the condition existing prior to construction unless otherwise specified or directed. The Contractor shall be solely liable for the straying of any fenced or corralled animals or other damage caused by any fence so removed.

3.03 Stripping

- A. Remove topsoil from areas within limits of excavation, trenching, borrow and areas designed to receive embankment or compacted fill.
- B. Scrape areas clean of all brush, grass, weeds, roots and other unsuitable material.

- C. Strip to a minimum depth of 6 inches, and to a sufficient depth to remove excessive roots in heavy vegetation or brush areas and as required to segregate topsoil.
- D. Stockpile topsoil reasonably free of subsoil, debris and stones larger than 2-inch diameter, in sufficient quantity to complete the work. Stockpile shall not interfere with construction operations and existing facilities.

3.04 Disposal of Debris

- A. Dispose of debris off the jobsite in an approved manner and at a location provided by the Contractor.

3.05 Excavation Support

- A. Support excavations and slopes using sheeting, bracing, or other means as necessary to:
 - 1. Protect life and property.
 - 2. Conform to Federal, State and local regulations.
 - 3. Avoid excessively wide cuts in unstable material.
 - 4. Protect existing structures and facilities from soil movement.
- B. Plan layout of excavation operations to protect adjacent property and existing structures and facilities.
- C. Take precautions against movement or settlement of existing structures. Establish and record elevations of existing facilities near excavations before excavating. Remove sheeting and bracing in a manner that does not create voids or induce settlement of adjacent soil.
- D. If existing or adjacent structures show structural distress, or become endangered by any condition or event, cease operations immediately and notify Engineer. Do not resume operations prior to correction or modification of procedures leading to the unstable condition.

3.06 Excavation

- A. General:
 - 1. Includes excavation for the installation to the alignment and elevation indicated of ground wires, electrical conduits, storm drainage pipes, process piping and structures.
- B. Trenches:
 - 1. Ground Wires and Electrical Conduits:

- a. Remove material required for alignment and elevation, or minimum depth of installation.
2. Pipes:
 - a. Trench depth to provide embedment and to remove unsuitable bottom material.
 - b. Trench width, at top of pipe and below, to be between pipe outside diameter plus 1 foot (minimum) and plus 2.25 foot (maximum).
 - c. Trench walls to be vertical below the top of pipe and may be vertical or sloped above top of pipe as determined by the stability of the material being trenched.
 - d. Trenches to be sheeted and braced when required.
 - e. Maximum length of open trench shall comply with local codes and shall not exceed 200 feet.
 - f. Erect barriers or other appropriate protection to prohibit accidental or unauthorized entry of persons into trenches.
- C. Structures: Perform as specified for "Trenches" and as follows:
 1. Excavate area adequate to permit erection and removal of forms.
 2. Trim to neat lines where concrete is to be deposited against earth.
 3. Excavate by hand in areas where space and access will not permit use of machines.
 4. Notify Engineer immediately when excavation has reached the depth indicated. Do not proceed further until approved.
 5. Restore bottom of excavation to proper elevation in areas over excavated, as follows:
 - a. For structures supported by piles or caissons, with compacted embankment.
 - b. For structures supported by concrete footings or mats, with concrete.
 6. Excavate rock, where encountered, to a distance of at least three (3) feet away from outside of structure walls. Bench any additional rock excavation required for stability during construction to maintain vertical cuts. Perform such additional excavation and furnish any additional backfill subsequently required at no extra cost to Owner.
- D. Rock Excavation:

1. Rock excavation shall consist of igneous, metamorphic and/or sedimentary rock which cannot be excavated without blasting and cannot be excavated with rock teeth (rock rippers).
- E. Blasting (Not Used for This Project):
1. Comply with the requirements of all local blasting codes and ordinances.
 2. Continuous seismographic records shall be kept at all structures within 300 feet of blasting operations. The seismograph shall be a tape type unit with reproducible waveform, self-calibrated and self-triggering.
 3. The maximum peak particle velocity at any structure as a result of the Contractor's efforts shall not exceed 1-inch per second.
 4. Provide suitable weighted plank coverings, mattresses, or backfill to confine all materials lifted by the blasting to the limits of the trench or excavation.
 5. Notify the Engineer prior to initiation of blasting.
- 3.07 Dewatering (If Necessary)
- A. Control grading around excavations to prevent surface water from flowing into excavation.
 - B. Drain or pump surface and groundwater as required to continually maintain all excavations and trenches free of water or mud. Commence when water first appears and continue until work is complete to the extent that no damage will result from the presence of water.
 - C. Discharge to approved drains or channels. The Contractor shall obtain State or local permits for discharge. Water discharged to streams shall be free of silt and other objectionable materials and shall be in compliance with all State requirements per the discharge permit requirements. Discharge water so that the work in progress and other properties are not damaged. Do not interfere unduly with the use of streets, alleys, private drives, or entrances.
 - D. Use pumps of adequate capacity to ensure rapid drainage.
 - E. Construct and use drainage channels and subdrains as required.
 - F. Remove unsuitable excessively wet materials and replace with approved material.
- 3.08 Stockpiling
- A. Stockpile in amounts sufficient for and in a manner to segregate materials suitable for backfilling trenches and structures.

- B. Do not obstruct or prevent access to roads and drives with stockpiles.
- C. Do not obstruct drainage patterns.

3.09 Compaction and Testing for Embankment, Backfilling, and Subgrade

- A. Perform wetting or drying of compacted material as required to obtain specified density. Moisture content at time of placement shall not be less than optimum or more than 4 percent above optimum as determined by ASTM D 698.
- B. Do not place snow, ice or frozen earth in compacted soil and do not place compacted soil on a frozen surface.
- C. Remove waste material, trees, organic material, rubbish, or other deleterious substances from soil to be compacted.
- D. An acceptable testing laboratory shall be selected and paid for by the Contractor to perform all laboratory and field soil testing necessary to demonstrate compliance with compaction requirements. The soil density testing frequency shall be as follows:
 - 1. For trenches, density tests representative of each two (2) feet of trench depth shall be taken at two hundred (200) linear foot intervals along the lines. Concentrate tests at cross streets and drives.
- E. Perform testing in accordance with ASTM D 698 where AASHTO T-99 or "Standard Proctor" has been indicated. AASHTO T-99 may be used only with prior written approval of the Engineer.
- F. Follow all county compaction testing requirements within county right-of-way.

3.10 Embankment (Not Used)

3.11 Backfilling

- A. Place backfill to the elevations indicated.
- B. In areas requiring 95 percent compaction, place backfill in lifts not exceeding six (6) inches (uncompacted depth). Place in twelve (12) inch maximum lifts in other areas.
- C. Obtain compaction specified by normal methods and equipment. Accomplish without inundation or flooding.
- D. Complete promptly after approval to proceed.
- E. Backfill failing to meet specified densities shall be removed or scarified and recompacted to meet specified densities.
- F. Dispose of acceptable topsoil materials.

G. Trenches:

1. Backfill pipes in 6-inch lifts deposited alternately on opposite sides of pipe to a plane 12 inches above pipe.
2. Compact backfill to 95 percent of maximum density (ASTM D 698) under all areas to be surfaced with concrete, asphaltic concrete, or gravel, including streets, drives, sidewalks, and parking areas, and under developed lots and lawns.

H. Structures:

1. Backfill pipes in 6-inch lifts around the structure.
2. Compact backfill to 95 percent of maximum density (ASTM D 698) under all areas to be surfaced with concrete, asphaltic concrete, or gravel, including streets, drives, sidewalks, and parking areas, and under developed lots and lawns.

3.12 Subgrade Preparation

A. General:

1. Excavate or place embankment as required to construct subgrades to elevations and grades indicated.
 2. Remove all unsuitable material and replace with approved material. Perform all wetting, drying, shaping, and compacting required to prepare a suitable subgrade.
- B. Roughen subgrade for embankment by discing or scarifying and wet or dry the top 6 inches as required to insure bond with embankment.
- C. Extend subgrade the full width of surfaced areas plus one foot.
- D. Compact the top six inches of subgrades for traffic areas and slabs on grade to 95 percent of maximum density (ASTM D 698).
- E. Proof roll subgrade after moisture conditioning and compaction to identify soft or disturbed areas. Use a fully loaded tandem axle dump truck or equipment providing an equivalent loading for proofrolling. Undercut and replace soft areas identified by proofrolling with structural backfill if so directed by the Engineer.

3.13 Granular Fill Pipe Embedment

- A. Place in trench to limits indicated. Provide for proper support of pipe and even distribution around pipe.
- B. Compact as indicated, in lifts not to exceed 6 inches, using approved vibratory equipment.

3.14 Placement of Topsoil

- A. Place topsoil on all areas indicated.
- B. Placement:
 - 1. Clear site of vegetation heavy enough to interfere with proper grading and tillage operations.
 - 2. Clear surfaces of all stones or other objects larger than 3 inches in thickness or diameter, all roots, brush, wire, grade stakes, or other objectionable material.
 - 3. Loosen subgrade by discing or scarifying to a depth of 2 inches wherever compacted by traffic or other causes to permit bonding of the topsoil to the subgrade.
 - 4. Distribute topsoil over required areas without compaction other than that obtained with spreading equipment.
 - 5. Place material within following limits:
 - a. Not less than four (4) inches in depth.
 - b. Not more than six (6) inches in depth.
 - 6. Shape cuts, fills and embankments to contours indicated.
 - 7. Grade to match contours of adjacent areas and permit good natural drainage.
 - 8. Grade a gentle mound over trenches.
- C. After spreading topsoil, clear surface of stones or other objects larger than two (2) inches in thickness or diameter and of objects that might interfere with planting and maintenance operations.
- D. Protect areas from erosion until grass is established. Repair eroded areas as required.

3.15 Maintenance and Repair

- A. Maintenance:
 - 1. Protect newly graded areas from actions of the elements.
 - 2. Settling or erosion shall be filled, repaired and grades reestablished to elevations and slopes indicated.
- B. Correction of Settlement:

1. Settlement of embankments, backfill, or trenches occurring within the Two-Year Correction Period after substantial completion shall indicate defective work and shall be promptly corrected if the settlement results in the following:
 - a. Visible depressions, ruts, or ground slumping.
 - b. Pooling of water where positive slope existed or has been required.
 - c. Voids beneath or beside slabs or structures.
 - d. Movement of soil exposing unfinished or waterproofed structure surfaces.
 - e. Movement of structures or facilities, including but not limited to foundation settlement, differential settlement, cracking, misalignment of adjacent objects, or movement of vertical elements out of plumb.
2. Contractor shall correct settlement and damages arising from or attributable to the settlement.
3. Make repairs within ten (10) days from and after due notification by Owner of embankment or backfill settlement and resulting damage.
4. Make own arrangements for access to the site for purposes of correction and maintenance of corrected areas.

END OF SECTION

**SECTION 02310
EARTHWORK - PIPELINES****PART 1.0 - GENERAL****1.01 EARTHWORK DEFINED**

Earthwork shall include all necessary clearing, grubbing, grading and excavating for pipelines and appurtenances, backfilling, compacting and disposing of excess excavated material as required for the complete performance of the work for the installation of pipelines and appurtenances, all as indicated on the plans and as specified herein.

Earthwork, including grading as referred to herein or in connection herewith, shall be construed as including any or all of the following described operations:

Excavating all classes of whatever substance encountered; backfilling, fine grading as finished for unpaved areas; preparing right-of-way, subgrading for pipe; and performing any other similar, incidental or appurtenant earthwork operation which may be necessary to properly complete the entire work indicated and specified.

1.02 SCOPE OF WORK

The Contractor shall furnish all services, labor, materials, equipment and perform all operations in connection with all earthwork necessary for the construction of such scheduled contract units as are awarded to him, together with appurtenances; thereto, all as the removal of water and all material of whatever nature and shall include clearing of sites for construction.

1.03 EARTHWORK IN STATE, COUNTY, AND CITY RIGHTS-OF-WAY

Earthwork within the right-of-way of the State Department of Transportation, the County Road Department and the respective cities, shall be done in accordance with requirements and provisions of the permits issued by those agencies for the construction within their respective rights-of-way. Such requirements and provisions, where applicable, shall take precedence and supersede the provisions of these specifications. It shall be the Contractor's responsibility to secure all required permits and the cost of said permits shall be included in the applicable prices for the associated work.

1.04 SAFETY PRECAUTIONS

All excavations shall be performed, protected, and supported as required for safety and in the manner set forth in the operation rules, orders and regulations prescribed by the OSHA Federal Register. Barriers shall be placed at each end of all excavations to warn all pedestrian and vehicular traffic of such excavations. Lights shall also be placed along excavations from sunset each day to sunrise of the next day until such excavation is entirely refilled.

1.05 OBSTRUCTIONS

The Contractor’s attention is directed to the possible existence of pipe and other underground improvements which may or may not be shown on the plans. All reasonable precautions shall be taken to preserve and protect any such improvements whether shown on the plans or not. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute the work, they shall be removed, maintained in operation and permanently replaced by the Contractor at his expense.

PART 2.0 - MATERIAL
2.01 GRANULAR SOIL

Wherever the term "granular soil" is issued in these specifications, it shall be defined as a soil having a minimum sand equivalent of 30 as determined in accordance with quality requirements of AASHTO M 147, and not more than 20% of it will pass through a 200-mesh sieve.

2.02 SAND BACKFILL

The sand shall be natural bank sand, graded from fine to coarse, not lumpy or frozen and free from slag, cinders, ashes, rubbish or other material that, in the opinion of the ENGINEER, is objectionable or deleterious. The sand shall not contain a total of more than 10%, by weight of loam or clay, and all material must be capable of being passed through a three eights inch sieve. Not more than 5% shall remain on a No. 4 sieve.

2.03 CRUSHED ROCK OR GRAVEL FOR PIPE BEDDING

Where crushed rock or gravel is specified in the bedding detail on the plans, the material shall have the following gradations:

Sieve Sizes	No.3 Rock % Passing	No.4 Rock % Passing	ASTM No. 67 % Passing
1-1/2"	100	-	-
1"	90-100	-	-
3/4"	60-80	100	90-100
3/8"	0-15	90-100	29-55
No. 4	0-5	0-15	0-15
No. 8	-	0-5	0-5

Unless otherwise specified, No. 3 rock shall be used for pipes with inside diameters of 27-inches and larger and No. 4 rock shall be used for pipes with inside diameters of 24-inches and less.

2.04 BACKFILL MATERIAL

All backfill material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rock or stones or other material that, in the opinion of the Engineer, is unsuitable.

2.05 USE OF EXCAVATED MATERIAL AS BACKFILL

The Contractor may backfill with the excavated materials, provided that such material consists of loam, clay, sand, gravel or other materials that, in the opinion of the Engineer, are suitable for backfilling.

PART 3.0 - EXECUTION

3.01 CLEARING AND GRUBBING

Areas where construction is to be performed shall be cleared of all trees, shrubs, rubbish and other objectionable material of any kind which, if left in place, would interfere with the proper performance or completion of the contemplated work, would impair its subsequent use or form obstructions therein. Trees and other natural growths outside the actual lines of construction operations shall not be destroyed and such measures as are necessary shall be taken by the Contractor for the protection thereof.

Organic material from clearing and grubbing operations will not be incorporated in excavation backfill.

It shall be the Contractor's responsibility to remove and dispose of all excess material resulting from clearing and grubbing operations at his own expense. The Contractor shall make his own arrangements for disposal sites at his own expense, at which said material may be wasted. The provisions of EXCESS EXCAVATED MATERIALS, of these specifications, shall apply to disposal of such material.

3.02 EXCAVATION AND BACKFILL FOR PIPELINES

A. Excavation

Excavation for pipelines, fittings, and appurtenances shall be open trench to the depth and in the direction necessary for the proper installation of the same as shown on the contract drawings or as otherwise approved by the Engineer. Any water which may be encountered or may accumulate in the excavation shall be pumped out or otherwise removed as necessary to keep the bottom of the excavation free and clear of water during the progress of the work.

Tunneling may be permitted as indicated by economy of construction or necessity of preserving existing improvements. If the earth in the tunnel sloughs off, the roof of the tunnel shall be broken down, and the trench excavated as an open trench.

B. Limit of Excavation

Except by expressed written permission of the Engineer, the maximum length of open trench shall be 200 feet, or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is the greater. The distance is the collective length at any location, including open excavation, pipe laying and appurtenances, construction and backfill which has not been temporarily resurfaced.

C. Trench Width

The overall trench width shall not be more than 30-inches nor less than 12-inches wider than the largest outside diameter of the pipe to be laid therein, measured at a point 12-inches above the top of the pipe, exclusive of branches. Excavating and trenching shall be true to line so that a clear space of not more than 8-inches or less than 6-inches in width is provided on each side of the largest outside diameter of the pipe in place. For the purpose of this section, the largest outside diameter shall be the outside diameter of the bell, on bell and spigot pipe.

Where the trench width, measured at a point 12-inches above the top of the bell of the pipe, is wider than the maximum set forth above, the trench area around the pipe shall be backfilled with Class A concrete to form a cradle for the pipe as shown on the plans and in accordance with the American Concrete Pipe Association's standards. Special care shall be used when pouring the concrete cradle around the pipe so no displacement will occur. In the event of movement, the Contractor shall remove and replace all pipe and cradle affected. The price paid for water/sewer pipe in-place shall include full compensations for constructing concrete cradles as above specified and no additional allowance will be made therefor.

D. Excavation Below Grade

The trench shall be excavated to a minimum depth of 6-inches below the bottom of the pipe. Before the pipe is laid, the subgrade shall be made by backfilling with an approved material in 3-inch uncompacted layers. The layers shall be thoroughly tamped as directed by the Engineer so as to provide a continuous bearing and support for the pipe at every point between coupling or bell holes, except that it will be permissible to disturb and otherwise damage the finished surface over a maximum length of 18-inches near the middle of each length of pipe by the withdrawal of pipe slings or other lifting tackle. The finished subgrade shall be prepared accurately by means of hand tools.

E. Correction of Faulty Grades

Where excavation is inadvertently carried below subgrade and/or foundation elevations, suitable provision shall be made at the expense of the Contractor for adjustment of same, as directed by the Engineer to meet requirements incurred by the deeper excavation in such locations shall be rectified by backfilling with approved sand and/or graded gravel, and shall be compacted to provide a firm and unyielding subgrade and/or foundation, as directed by the Engineer, all at the expense of the Contractor.

F. Trenching By Hand Or Machine

Hand methods for excavation shall be employed in locations shown on the drawings. In other locations, the Contractor may use trench digging machinery or employ hand methods.

G. Structure Protection

Temporary supports, adequate protection and maintenance of all underground and surface structures, drains, sewers and other obstructions encountered in the progress of the work shall

be furnished by the Contractor at his expense and under the direction of the Engineer. Any structure that has been disturbed shall be restored upon completion of the work.

H. Protection of Property and Surface Structures

Trees, shrubbery, fences, poles and all other property and surfaces structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer. When it is necessary to cut roots and tree branches, such cutting shall be done under the supervision and direction of the Engineer. Any structure that has been disturbed shall be restored upon completion of the work.

I. Bracing Excavations

All excavations shall be properly supported in the manner as required by OSHA Federal Register Vol. 37, No. 243, Sub-part P, Section 1926.652 or as required by state laws and municipal ordinances and as may be necessary to protect life, property, the work or as ordered by the Engineer. Excavations shall be so braced, sheeted and supported that they will be safe, and the ground alongside the excavation will not slide or settle, and all existing improvements of any kind, either on public or private property, will be fully protected from damage. If any damage does result to such improvements of any kind, either on public or private property, will be fully protected from damage. If any damage does result to such improvements, at the Contractor, at his own expense, shall make the necessary repairs or reconstruction required as directed by the Engineer.

Excavations shall be so braced or sheeted so as to provide conditions under which workmen may work safely and efficiently at all times. The sheeting, shoring and bracing shall be so arranged as not to place any stress on portions of the completed work until the general construction thereof has proceeded far enough to provide ample strength. Any damage to structures occurring through settlements, water or earth pressures, slides, caves of other causes due to failure or lack of sheeting or bracing or improper bracing or through negligence or fault of the Contractor in any other manner shall be repaired by the Contractor at his own expense.

J. Dewatering (If Necessary)

The Contractor shall provide and maintain, at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Said methods may include well points, sump pumps, suitable rock or gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the Engineer. All dewatering as described herein shall be accomplished by and at the sole expense of the Contractor.

Dewatering for the structures and pipelines shall commence when ground water is first encountered and shall be continuous until such time as water can be allowed to rise in accordance with the provisions of this water be allowed to rise over them until the concrete or mortar has set at least eight hours. Water shall not be allowed to rise unequally against walls for a period of 28 days.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed in such a manner as not to be a menace to the public health.

K. Pipe Foundation And/Or Subgrade

1. Trench Bottom for Pipe

The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. Should large gravel and cobbles be encountered at the trench bottom or pipe subgrade, they shall be removed from beneath the pipe and replaced with clean imported sand which shall be compacted to provide uniform support and a firm foundation, all at the Contractor's expense.

2. Foundations in Poor Soil

If excessively wet, soft, spongy, unstable or similarly unsuitable material is encountered at the surface upon which the bedding material is to be placed, the unsuitable material shall be removed to a depth as determined in the field by the Engineer. Removal of material and additional bedding so ordered over and above the amount required by the "bedding details", will be paid for under the General provisions, unless, however, the necessity for such additional bedding material has been occasioned by an act or failure to act on the part of the Contractor, in which event the Contractor shall bear the expense of the additional excavation and backfill to the required depth. The Contractor's attention is called to section 02310.B.10 regarding his responsibilities in maintaining adequate dewatering procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water in the trench excavation.

3. Foundation in Rock

Where rock is encountered, it shall be removed below grade and the trench backfilled with clean imported sand to provide a compacted foundation cushion with a minimum allowable thickness of 6-inches under the outside diameter of the pipe bell. Removal of rock and additional imported sand bedding over and above sand bedding required by the detail specifications shall be included in the bid item for which the work relates, or as specifically provided for in the schedule of bid items.

4. Pipe Clearance in Rocks

Ledge rock, boulders, and large stones shall be removed to provide a clearance of at least 6-inches below and on each side of the pipe and fittings for pipes 24-inch in diameter or less, and 9-inch for pipes larger than 24-inches in diameter. The specified minimum clearances are the minimum clear distances that will be permitted between any part of the pipe and appurtenances being laid and any part, projection, or point of such work, boulder or stone.

L. Blasting

Not used.

M. Trench Backfill

All trenches shall be backfilled after pipe, fittings and appurtenances have been installed, inspected and approved by the Engineer. Whenever a relative compaction requirement value is specified herein, the optimum moisture content and relative density shall be determined in accordance with Standard Proctor Density AASHTO T-99 or ASTM D-698.

All wood and waste material shall be removed from excavation prior to backfilling. Backfill material shall be approved in all cases by the Engineer and shall be free of trash, wood, large rock or other objectionable debris. Backfilling shall include the refilling and compacting of the fill in trenches of excavations up to the subgrade of the street or to the existing ground surface.

1. Procedure At Pipe Zone

Selected backfill material consisting of loose earth or sand free from stones, clods, or other deleterious material shall be placed in the trench simultaneously on each side of the pipe for the full width of the trench in layers of about 6-inches in depth. Each layer shall be thoroughly compacted to a Standard Proctor of 95% or, where the material is sufficiently granular in nature as approved by the Engineer, by water settling. Particular attention is to be given to the underside of the pipe and fittings to provide a firm bedding support along the full length of the pipe. Care shall be exercised in backfilling to avoid damage to the pipe. The "pipe zone" shall be considered to extend 12-inches above the top of the outside diameter of the pipe bell.

2. Pipe Bedding - General

The pipe shall be carefully bedded as shown in the bedding detail on the plans. The Contractor shall be responsible for accurately shaping the pipe subgrade to fit the bottom of the pipe for the width shown on the "embedding details". Use of a drag template shaped to conform to the outer surface of the pipe will be required if other methods do not give satisfactory results.

Each joint shall be recessed in undisturbed soil or bedding material as required by the bedding detail in such a manner as to relieve the bell of the pipe of all load and to ensure continuous bearing along the pipe barrel upon the pipe subgrade.

The pipe bedding, using either selected material, clean imported sand or crushed rock or gravel, shall be compacted by approved methods to Standard Proctor of 95%. When the bedding material is selected material or imported sand, the pipe bedding backfill shall be brought to optimum moisture content and shall be placed by hand in layers not exceeding 3-inches in thickness to the centerline (springline) of the pipe and each layer shall be solidly tamped with the proper tools so as not to injure, damage or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe. Water settling for compaction may be approved by the Engineer in the event the

foundation and bedding materials are sufficiently granular and sandy in nature that the required compaction will be obtained.

3. Pipe Bedding - Sand For Pipe Bedding

Where the trench excavation and pipe foundation and/or subgrade consist of granular soil, the pipe may be bedded in the material found in the trench as herein after provided. Clean imported sand shall be used when specified on the drawings or when the trench excavation material and pipe foundation is not granular soil which is suitable for adequate bedding. In all cases, the material to be used for pipe bedding shall be subject to the approval of Engineer.

4. Procedure Above Piped Zone

The remaining portion of the trench to within 2-1/2 feet of the finished roadway surface or ground surface, as the case may be, shall be backfilled, compacted and/or consolidated by approved methods to obtain a Standard Proctor of 95%. Backfilling shall be done with good sound earth, sand or gravel, and no oil cake, bituminous pavement, concrete, rock or other lumpy material shall be used in the backfill unless these materials are scattered and do not exceed 6-inches in any dimension and are not placed within 1-foot of the 2-1/2 foot limit. Material of perishable, spongy or otherwise, improper nature shall not be used in backfilling, and no material greater than 4-inches in any dimension shall be placed within 1-foot of any pipe, manhole or structure.

5. Compacted Fill

Compaction shall be done by use of vibratory equipment, tamping rollers, pneumatic tire rollers or other mechanical tampers of the type and size approved by the Engineer. The backfill shall be placed in horizontal layers of such depths as are considered proper for the type of compacting equipment being used in relation to the backfill material being placed. Each layer shall be evenly spread, properly moistened and compacted to the specified relative density in Section 02310.B.13. Any damage to the pipe as a result of Contractor's operation shall be repaired and/or replaced at the Contractor's expense.

6. Procedure At Grade

The top 2-1/2 feet from finish street grade or ground surface, as the case may be, shall be compacted in horizontal layers not exceeding 8-inches in thickness, using approved hand pneumatic or mechanical type tampers to obtain a Standard Proctor of 95%. Flooding and jetting will be permitted in this upper 2-1/2 feet. From existing street grade to 2-1/2 feet below street grade, at the material for backfill may contain stones ranging in inches up to 2-inches in diameter; in quantity not exceeding 20% of the volume where said coarse materials are well distributed throughout the finer material and the specified compaction can be obtained. County specifications shall be used within county right-of-way.

6. Compaction Test

The Contractor will engage the services of a testing laboratory to test the degree of compaction attained in the backfill. Compaction shall be tested in accordance with the methods specified by the Engineer. The Contractor will pay for the initial cost of all compaction tests. If the backfill compaction fails to meet the density requirements set forth herein, the Contractor shall pay for subsequent compaction tests at the current rate for each individual test.

The Contractor shall make all necessary excavations for compaction tests as directed by the Engineer and all work in connection with compaction testing by the Contractor shall be included in the various contract bid prices and no additional allowance will be made therefor.

Compaction tests shall be performed for the pipe trenches and subgrades; and shall be in conformance with the governing standards as specified in the Contract Documents and Specifications

Compaction tests shall be performed at all water services, valve boxes, structures, fire hydrants, etc. and at 200-foot intervals at (1) pipe zone, (2) each 2 feet of fill and (3) at top of trench, as a minimum or as specified by the Engineer.

Manhole and Structure Backfill – The Contractor shall give special emphasis to the backfill around all appurtenances, water services, valves, and structures. The backfill shall be placed in horizontal layers not exceeding 12-inches in depth and shall be adequately moistened and thoroughly tamped with air or vibrator plate or jumping jack compactor. Emphasis will also be placed on amount of density testing as directed by Engineer.

Settlement – The Contractor will be responsible for repairing or complete replacement of any deterioration or settlement of the pipe trenches and associated street surfaces. Notification of the required repairs will be issued by the Owner’s Representative. All costs of repairs and all liability, as a result of surface deterioration or settlement, shall be the responsibility of the Contractor. The Warranty Period shall be extended for the full period for the entire Project to cover future settlement deterioration until the Project as a whole shows no signs of settlement deterioration.

3.03 EXCESS EXCAVATED MATERIAL

The Contractor shall make the necessary arrangements for and shall remove and dispose of all excess excavated material. All costs for the disposal of excess waste material shall be borne by the Contractor.

It is the intent of these specifications that all surplus material not required for backfill or fill shall be disposed of by the Contractor outside the limits of the public right-of-way and/or easements at no cost or liability to the Owner.

No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the Contractor. Before the Owner will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom he has entered into

agreements for disposal of excess excavated material absolving the Owner from any liability connected therewith.

3.04 IMPORTED BACKFILL MATERIAL

Whenever the excavated material is not suitable for backfill, the Contractor shall arrange for and furnish suitable imported backfill material which is capable of attaining the required relative density as this own expense. He shall dispose of the excess trench excavation as specified in the preceding section. The backfilling with imported material shall be done in accordance with methods described herein.

3.05 FINAL CLEAN-UP

After backfill has been completed, the right-of-way shall be dressed smooth and left in a neat and presentable condition to the satisfaction of the Engineer.

3.06 RESTORATION OF DAMAGED SURFACES AND PROPERTY

If any pavement, trees, shrubbery, fences, poles or other property and surface structures have been damaged, removed or disturbed by the Contractor, whether deliberately or through failure to carry out the requirement of the contract documents, state laws, municipal ordinances or the specific direction of the Engineer or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor.

END OF SECTION

**SECTION 02550
VALVES****PART 1.0 – GENERAL**

1.01 Work Included

The Contractor shall furnish all material, equipment, tools and labor necessary to accomplish the work specified herein and shown on the Contract Drawings. The valves body shall have the same pressure rating as the pipe that it is connected to.

1.02 Related Sections

- A. General Conditions and Division 1
- B. Section 02200 – Earthwork
- C. Section 18110 – Pipe and Pipe Fittings

1.03 Quality Standards

Ensure valves contained in this and referenced sections are produced in full compliance with specified items and any references to codes and standards. Abbreviated forms of more commonly referenced standards are as follows:

- A. AGMA - American Gear Manufacturers Association
- B. ANSI - American National Standards Institute
- C. ASTM - American Society for Testing and Materials
- D. AWWA - American Water Works Association
- E. MSS - Manufacturers Standardization Society of the Valve and Fittings Industry

PART 2.0 – MATERIALS

2.01 General

A. Valve Components

1. All valves shall have the manufacturer and size of the valve visibly cast on the body or on a plate attached to the body of the valve.
2. Valves and required operating appurtenances shall be the product of the same manufacturer.
3. Valve components shall withstand the environmental conditions in contact and provide continuous trouble-free service.
4. Valve seals shall be able to provide tight closure and prevent metal-to-metal contact.

B. Materials

1. Brass and bronze components of valves and appurtenances in contact with water and brass

or bronze used in any part of a valve in buried or submerged service shall be alloys containing less than 16 percent zinc and 2 percent aluminum.

2. Acceptable alloys are of the following ASTM designations: B 61, B 62, B 98 (Alloy A,B, or D), B 139 (Alloy A), B 143 (Alloy 1-B), B 164, B 194, B 292 (Alloy A), and B 127.
3. Stainless steel Alloy 18-8 may be substituted for bronze at the option of the manufacturer with the acceptance of the Engineer.

C. Ends and Trim

Not Used

D. Operators

1. Valve operators shall open by turning counter-clockwise (left) unless otherwise noted.
2. All below ground valves shall be provided with a 2" operating nut. Valves in excess of 6'-0" bury depth shall have operator extensions with centering spiders. Operator extensions shall be mechanically fastened to operating nut.

E. Protective Coatings

All valves servicing potable water systems shall have fusion bonded epoxy linings in accordance with AWWA C213. Stainless steel, PVC, bronze and resilient lined valves are excluded.

2.02 Gate Valves

A. General

All gate valves shall conform to AWWA C509 "Resilient-Seated Gate Valves for Water Supply Service". The additional requirements and exceptions to the AWWA standards contained herein shall also be applicable. NSF approval of gate valves is not required.

B. Service Conditions

All valves shall be suitable for throttling service and/or frequent operation as well as service involving long periods of inactivity. The operating pressure for all sizes shall be 150 p.s.i. gage.

2.03 Gate Valve Requirements

Acceptable manufacturers include Clow, Kennedy, M&H, or approved equal.

A. Mechanical Joints

All components of this type of joint shall conform to ANSI 21.11 (AWWA Standard C111, "Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings"). The bolts and hexagon nuts shall be fabricated from a high-strength, low alloy steel conforming to ASTM A 242 and known

in the industry as "Cor-Ten" or "Usalloy".

Accessories for the mechanical joint consisting of the gasket, gland and fasteners shall be furnished and packaged separately from the valves. Each package shall be labeled in such a manner as to provide for proper identification and number of units per package or bundle.

B. Bolting Material

Bolts and hex nuts used on the valve shall be the manufacturer's standard, either fabricated from a low-alloy steel for corrosion resistance or electroplated with zinc or cadmium. The hot-dip process in accordance with ASTM Standard Designation A-153 is not acceptable for the threaded portions of the bolts and nuts.

C. Valve Stems

The maximum input torque required to fully open or close the valve for Class 150B conditions shall not exceed 150 foot-pounds when applied to the operating nut.

D. Affidavit of Compliance

The manufacturer of valves supplied under this Specification shall furnish to the Engineer, an affidavit of compliance in accordance with all applicable provisions of AWWA C504 and AWWA C500 as modified or supplemented herein.

2.04 Eccentric Plug Valves

A. Acceptable Manufacturers:

1. DeZurik Corporation.
2. Pratt Valves.
3. Or approved equal.

B. Plug valves shall be quarter-turn non-lubricated eccentric type with resilient faced plug. Alternate seat and plug materials may be considered provided this specification is met and, in addition, the manufacturer must prove prior to approval that the valve meets AWWA C517 "proof of design tests" (10,000 cycles) in both directions. Flanged valve ends shall be faced and drilled to conform to ANSI B16.1, Class 150 for diameter and drilling. Mechanical or push-on type rubber-gasketed joint ends shall conform to AWWA C111. Port areas for valves smaller than 20-inch shall be at least 80 percent of full pipe area. Port areas for valves 24-inch and larger shall be at least 70 percent of full pipe area.

C. Materials and Construction:

1. Bodies shall be of ASTM A126, Class B cast iron.
2. Valve plug shall be ASTM A126, Class B cast iron or ASTM A536 ductile iron. Resilient plug facing shall be synthetic rubber, neoprene or Buna N compound suitable for use with water and wastewater applications.

3. Seats shall be a raised welded overlay of 90% pure nickel, a minimum of .125" thick and 0.50" wide, conforming to AWWA C517. When the plug is in the closed position, the resilient plug facing shall contact only nickel. Sprayed or plated mating seat surfaces are not acceptable for resilient plugs.
 4. Bearings shall be replaceable. Sleeve bearings in the upper and lower journals shall be permanently lubricated 316 stainless steel per ASTM A743 Grade CF-8M. Nonmetallic journal bearings shall not be acceptable. Thrust bearings shall be teflon.
 5. Shaft seals shall be self-adjusting chevron-type conforming to AWWA C517. Valve shall be designed so it can be repacked while the valve is in line and under pressure without removing the actuator. O-ring seals shall not be acceptable in valves larger than 3".
 6. All exposed fastening hardware shall be zinc plated or stainless steel. Provide stainless steel bolting on buried service valves.
- D. Manual Operators:
1. All valves shall open counterclockwise.
 2. Provide indicators to show position of plug except on buried operators.
 3. Actuators: Manual valves shall have lever or worm gear actuators with handwheels, chainwheels, tee wrenches, extension stems, floorstands, etc., as shown on the plans or as called for in the valve schedule. Lever actuators shall be furnished for valves 8" or smaller where the maximum shutoff pressure is 25 psi or less as indicated on the plans or in the valve schedule. Worm gear actuators shall be furnished for all valves 4" or larger where the maximum reverse shutoff pressure is greater than 25 psi. Worm gear actuators shall be sized for 150 psi. All gearing shall be enclosed in a semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator. The actuator shaft and the quadrant shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. This adjustable stop shall be the only adjustment necessary to set the clearance between the valve plug and the seat while the valve is in line and under pressure. Handwheel and chainwheel sizes for worm gear actuators shall be no smaller than 6" in diameter and no larger than twice the diameter of the actuator's gear sector. All exposed nuts, bolts, and washers shall be zinc plated.
 4. Valves and gear actuators for buried or submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent the entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs, and washers shall be stainless steel.
 5. Handwheels shall be located for easy access on exposed valves.
 6. Buried valves shall be operated by a 2" AWWA nut with valve box.

2.05 Check Valves

- A. Acceptable Manufacturers: VAL-MATIC, PRATT, OR APPROVED EQUAL.
- B. Check valves shall be Val-Matic Surgebuster swing check valve or approved equal.
- C. Check Valve to be AWWA C508 Certified.

PART 3.0 – EXECUTION

3.01 Setting of Valves and Fittings

A. General Requirements

Valves, fittings, plugs, and caps shall be joined to pipe in the manner specified herein for cleaning, laying and joining pipe.

B. Mechanical Joint Connections

All buried piping connections shall be restrained mechanical joint connections. All mechanical joints shall conform to ANSI/AWWA C111/A21.11.

1. Mechanical joints shall be carefully assembled in accordance with the manufacturer's recommendations. If effective sealing is not obtained, the joint shall be disassembled, thoroughly cleaned, and reassembled. Bolts shall be uniformly tightened to the torque values listed in Appendix A of ANSI/AWWA C111/A21.11. Over-tightening of bolts to compensate for poor installation practice will not be permitted.
2. The holes for mechanical joint tie rods shall be carefully aligned to permit installation of the tie rods. In flange and mechanical joint pieces, holes in the mechanical joint bells and the flanges shall straddle the top (or side for vertical piping) center line. The top (or side) center line shall be marked on each flange and mechanical joint piece at the foundry.
3. The restraint shall use a series of individually actuated gripping wedges to positively engage the pipe surface while allowing joint deflection both before and after the installation. The wedging action shall provide high pressure restraint capability for mechanical joint fittings, valves, hydrants, and pipe, rated at 100 PSI. All sizes shall be tested to a minimum of 2:1 safety factor.
4. Approved restraints include "Megalug" by EBAA Iron Sales Inc.

C. Location of Valves and Valve Markers

Valves on water mains shall, where possible, be located on the street property lines extended unless shown otherwise on the plans.

3.02 Pressure Tests

- A. Valves shall be tested at the same time that the adjacent pipeline is tested.
- B. If there are any special parts of control system or operators that might be damaged by the pipeline test, they shall be properly protected. The Contractor will be held responsible for any damage caused by the testing.
- C. Joints shall show no visible leakage under test. Repair joints that show signs of leakage prior to final acceptance.

END OF SECTION

**SECTION 02671
PRESSURE TESTING****PART 1.0 - GENERAL**

1.01 WORK INCLUDED

The work to be performed includes the pressure testing of pipes. This work shall be performed after disinfection of the pipeline.

PART 2.0 - MATERIALS (NOT USED)**PART 3.0 - EXECUTION**

3.01 GENERAL

Pressure testing of all pipelines shall be performed in accordance with the Owner's standards.

3.02 TESTING OF PRESSURE PIPE

All pipe shall be field pressure tested to the design pressure specified for each pipe.

The Engineer shall be notified 24 hours in advance of testing. All testing shall be made in the presence of the Engineer or Owner's representative.

The Contractor will furnish the calibrated meter and the pump for testing. The pipeline shall be in a state of readiness for testing; all bulkheads, pumps, taps and appurtenances necessary to fill the pipeline and maintain the required pressure shall be in place. The pipeline shall be filled with water and the test pressure of 150 psi applied to the pipeline by means of a pump, equipped with a suitable pressure regulator. When filling the pipeline, it shall be filled at a rate which will not cause any surges nor will it exceed the rate at which the air can be released.

All air in the line shall be properly purged. Where blow-offs or hydrants are not available or effective in purging air from the line, the Contractor will install a tap to purge the line. The location and size of tap shall be at the Engineer's discretion.

While the test pressure is maintained, the pipe will be examined for any leaks. Any pipe or fitting found to be cracked shall be removed and replaced. Cutting and replacing of pavement, excavating and backfilling are a necessary part of locating and repairing leaks discovered by pressure testing of pipe.

After all visible leaks have been stopped; the full test pressure shall be maintained for 24 continuous hours.

END OF SECTION

**SECTION 03300
CAST IN PLACE CONCRETE****PART 1.0 – GENERAL**

1.01 SUMMARY

- A. This Section includes cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. See Division 2, Section “Structural Excavation.”

1.02 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- B. Comply with ACI 301, “Specification for Structural Concrete,” and ACI 318 “Building Code Requirements for Structural Concrete”
- C. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
 - 1. Formwork and form accessories.
 - 2. Steel reinforcement and supports.
 - 3. Concrete mixtures.
 - 4. Handling, placing, and constructing concrete.

PART 2.0 – MATERIALS AND EQUIPMENT

2.01 MATERIALS

- A. Formwork: Furnish formwork and form accessories according to ACI 301.
- B. Steel Reinforcement
 - 1. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- C. Concrete Materials
 - 1. Portland Cement: ASTM C 150, Type I/II.

2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding $\frac{3}{4}$ -inch nominal size.
 3. Water: Complying with ASTM C 94.
- D. Admixtures
1. Air-Entraining Admixture: ASTM C 260.
 2. Water-Reducing Admixture: ASTM C 494, Type A.
 3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
 4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
 5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
 6. Cement material may be replaced by up to 20% by weight of fly ash.
- E. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- F. Curing Materials
1. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 2. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf.
 3. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
 4. Water: Potable.
 5. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- G. Kryptonite Swelling Water Stop (or Engineer Approved Equal)
1. Rubber or polyvinyl chloride expanding water stops shall be placed in joints of structures as shown on the drawings. (4-inch minimum width)
 2. Shall be resistant to high hydrostatic pressure and suitable for use in sewage and containment structures.
 3. The Contractor shall fabricate all special intersections, splices and joints, and make bends at corners as shown on the drawings or as directed by the Engineer. All joints, splices, bends and intersections shall be made in strict accordance with the

manufacturer's printed instructions; using materials approved by the manufacturer, and shall be formed to produce a strong, sound and watertight joint.

4. The Contractor shall take suitable precautions to support and protect the expanding water stops during the progress of the work.

2.02 CONCRETE MIXES

- A. Comply with ACI 301 requirements for concrete mixtures.
- B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test databases, as follows:
 1. Compressive Strength (28 Days): 4000 psi. Field test databases shall be accompanied by calculations for standard deviation and based on test results from within 12 months.
 2. Slump: 4-inches \pm 1-inch.
 3. Maximum Water Cement Ratio: .46
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 6.0-percent within a tolerance of plus 1.0 or minus 1.0-percent.
- D. Grout or Dry Pack
 1. Grout shall be composed of Portland Cement, sand, and water proportioned and mixed as specified in this section. Grout shall be furnished and placed in recesses and holes, on surfaces, under structural members, and at other locations specified in these specifications, the special provisions or shown on the plans.
 2. The proportion of cement to sand, measured by volume, shall be one to two unless otherwise specified.

2.03 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with ASTM C 94.
 1. When air temperature is between 85- and 90-deg F, reduce mixing and delivery time from 1½-hours to 75-minutes; when air temperature is above 90-deg F, reduce mixing and delivery time to 60-minutes.

- B. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3.0 – EXECUTION

3.01 INSTALLATION, GENERAL

- A. Formwork: Design, construct, erect, shore, brace, and maintain formwork according to ACI 301. Forms shall conform to the shape, lines and dimensions of the members as called for on the plans, and shall be substantial and sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain position and shape. The material to be used and the design of the forms shall be subject to acceptance by the Engineer before construction of forms is started. However, such approval will not relieve the Contractor of responsibility for the adequacy of the forms not from the necessity for remedying any defects, which may develop or become apparent with use.
- B. Removal of Forms & Shoring: Forms and shores shall not be removed until the concrete has achieved 80% of its strength and cured seven days. When the forms are stripped, there shall be no excessive deflection or distortion and no evidence of damage to the concrete, due either to removal of support or the stripping operation.
- C. Steel Reinforcement: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- D. Joints: Construct joints true to line with faces perpendicular to surface plane of concrete.
 - 1. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Engineer.
- E. Tolerances: Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.02 CONCRETE PLACEMENT

- A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- B. Do not add water to concrete during delivery, at Project site, or during placement.
- C. Consolidate concrete with mechanical vibrating equipment.

3.03 FINISHING FORMED SURFACES

- A. Smooth-Formed Finish: When forms are removed, repair and patch tie holes and defective areas. Completely remove fins and other projections.

1. This finish applies to all formed concrete surfaces whether exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing or dampproofing.
- B. Trowel Finish (bottom slab): Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view.
- C. Nonslip Broom Finish (top slab): Apply a nonslip broom finish to surfaces indicated and to exterior concrete sidewalks, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.04 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Cure formed and unformed concrete for at least seven days as follows:
 1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12-inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.05 FIELD QUALITY CONTROL

- A. Testing Agency: The Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete

placement. Tests will be performed according to ACI 301. The Owner will pay for this testing.

- B. Testing Frequency: One composite sample for each day's pour of each concrete mix exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof. Each sample shall consist of 6 standard cylinders.
- C. Test 2 cylinders at 7 days and 3 cylinders at 28 days. Hold remaining cylinder for later testing if required.

END OF SECTION

**SECTION 03410
PRECAST STRUCTURAL CONCRETE****PART 1.0 - GENERAL**

1.01 SUMMARY

- A. Section Includes:
 - 1. Precast structural concrete.
 - 2. Precast structural concrete with commercial architectural finish.
- B. All manholes and vaults will require a coating of Tnemec Series 46-465 or approved equal.

1.02 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design precast structural concrete, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Precast structural concrete units and connections shall withstand design loads indicated within limits and under conditions indicated.

1.03 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm that assumes responsibility for engineering precast structural concrete units to comply with performance requirements. Responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C. Design Standards: Comply with ACI 318-11 and design recommendations in PCI MNL 120, "PCL Design Handbook – Precast and Prestressed Concrete," applicable to types of precast structural concrete units indicated.
- D. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 116, "Manual for Quality for Plants and Production of Structural Precast Concrete Products."
- E. Welding Qualifications: Quality procedures and personnel according to the following:
 - 1. AWS D1.1:201, "Structural Welding Code – Steel."
 - 2. AWS D1.4, "Structural Welding Code – Reinforcing Steel."

PART 2.0 - PRODUCTS

2.01 MANUFACTURERS

- A. Fabricators: Subject to compliance with requirements

2.02 MOLD MATERIALS

- A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that will provide continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.
 - 1. Mold-Release Agent: Commercially produced liquid-release agent that will not bond with, stain or adversely affect precast concrete surfaces and will not impair subsequent surface or joint treatments of precast concrete.
- B. Form Liners: Units of face design, texture, arrangement, and configuration indicated. Furnish with manufacturer's recommended liquid-release agent that will not bond with, stain, or adversely affect precast concrete surfaces and will not impair subsequent surface or joint treatments or precast concrete.
- C. Surface Retarder: Chemical set retarder, capable of temporarily delaying final hardening of newly placed concrete mixture to depth of reveal specified.

2.03 REINFORCING MATERIALS

- A. Reinforcing Bars: ACI 318-11, Grade 50, deformed.
- B. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM 615/A 615M, Grade 60 deformed bars, assembled with clips.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- D. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 116.

2.04 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type III, gray, unless otherwise indicated.
- B. Supplementary Cementitious materials:
 - 1. Fly Ash: ASTM C 618, Class C or F, with maximum loss on ignition of 3 percent.

2. Metakaolin Admixture: ASTM C 618, Class N.
 3. Silica Fume Admixture: ASTM C 1240, with optional chemical and physical requirement.
 4. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- C. Normal-Weight Aggregates: Except as modified by PCI MNL 116, ASTM C 33, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for the Project.
1. Face-Mixture- Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample. Aggregate shall not exceed $\frac{3}{4}$ " diameter.
 - a. Gradation: Uniformly graded
 2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand of same material as coarse aggregate unless otherwise approved by Architect.
- D. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 116.
- E. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.
- F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.
1. Water-Reducing Admixtures: ASTM C 494/C 494M, Type A.
 2. Retarding Admixture: ASTM C 494/C494M, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494/C494M, Type D.
 4. Water-Reducing and Accelerating Admixture: ASTM C 494/C494M, Type E.
 5. High-Range, Water-Reducing Admixture: ASTM C 494/C494M, Type F.
 6. High-Range, Water Reducing and Retarding Admixture: ASTM C 494/C494M, Type G.
 7. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M.
- G. Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

2.05 STEEL CONNECTION MATERIALS

- A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.
- B. Carbon-Steel-Headed Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished AWS D1.1/D1.1M, Type A or B, with arc shields and with minimum mechanical

properties of PCI MNL 116.

- C. Carbon-Steel Plate: ASTM A 283/A283M.
- D. Malleable-Iron Castings: ASTM A 47/A 47M.
- E. Carbon-Steel Castings: ASTM A 27/A 27M, Grade 60-30.
- F. High-Strength, Low-Alloy Structural Steel: ASTM A 572/A 572M.
- G. Carbon-Steel Structural Tubing: ASTM A 500, Grade B.
- H. Wrought Carbon-Steel Bars: ASTM A 675/A 675M, Grade 65.
- I. Deformed-Steel Wire or Bar Anchors: ASTM A 496 or ASTM A 706/A 706M.
- J. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A; carbon-steel, hex-head bolts and studs; carbon-steel nuts, ASTM A 563; and flat, un hardened steel washers, ATM F 844.
- K. High-Strength Bolts and Nuts: ASTM A 325 or ASTM A 490, Type 1, heavy hex steel structural bolts; heavy hex carbon-steel nuts, ASTM A 563; and hardened carbon-steel washers, ASTM F 436.
 - 1. Do not zinc coat ASTM A 490 bolts.
- L. Zinc-Coated Finish: For exterior steel items, steel in exterior walls, and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A 132/A 132M or ASTM A 153/A 153M electrodeposition according to ASTM B 633, SC 3, Types 1 and 2.
 - 1. For Steel shapes, plates, and tubing to be galvanized, limit silicon content of steel to less than 0.03 percent or to between 0.15 and 0.25 percent or limit sum of silicon and 2.5 times phosphorus content to 0.09 percent.
 - 2. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035B or SSPC-Paint 20.
- M. Shop Primed Finish: Prepare surfaces of nongalvanized-steel items, except those surfaces to be embedded in concrete, according to requirements in SSPC-SP 3, and shop apply lead- and chromate-free, rust-inhibitive primer, complying with performance requirements in MPI 79 SSPC-Paint 25 according to SSPC-PA 1.
- N. Welding Electrodes: Comply with AWS standards.
- O. Precast Accessories: Provide clips, hangers, plastic or steel shims, and other accessories required to install precast structural concrete units.

2.06 STAINLESS-STEEL CONNECTION MATERIALS

- A. Stainless-Steel Plate: ASTM A 666, Type 304, of grade suitable for application.
- B. Stainless-Steel Bolts and Studs: ASTM F 593, Alloy 304 or 316, hex-head bolts and studs; stainless-steel nuts; and flat, stainless-steel washers. Lubricate threaded parts of stainless-steel bolts with and antiseize thread lubricant during assembly.
- C. Stainless-Steel-Headed Studs: ASTM A 276, with minimum mechanical properties of PCI MNL 116.

2.07 GROUT MATERIALS

- A. Sand-Cement Grout: Portland cement, ASTM C 150, Type I, and clean, natural sand, ASTM C 144 or ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, Portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time.
- C. Epoxy-Resin Grout: Two-component, mineral-filles epoxy resin; ASTM C 881/C 881M, or type, grade, and class to suit requirements.
- D. Sand-Cement Mortar: Portland cement, ASTM C 150, Type I, and clean, natural sand, ASTM C 144. Mix at ratio of 1 part cement to 4 parts sand, by volume, with minimum water required for placement.

2.08 CONCRETE MIXTURES

- A. Prepare design mixtrues for each type of precast concrete required.
 - 1. Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.
 - 2. Limit use of fly ash to 25 percent replacement of Portland cement by weight and granulated blast-furnace slag to 40 percent of Portland cement by weight; metakaolin and silica fume to 10 percent of portland cement by weight.
- B. Normal-Weight Concrete Mixtures: Proportion face mixtures by either laboratory trial bath or field test data methods according to ACI 211.1, with materials to be used on the Project, to provide normal-weight concrete with the following properties:
 - 1. Compressive Strength (28 Days): 4,000 psi.

2. Maximum Water-Cementitious Materials Ratio: 0.52

2.09 FABRICATION

- A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.
- B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing precast structural concrete units to supporting and adjacent construction.

PART 3.0 - EXECUTION

3.01 EXAMINATION

- A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance of the Work.

END OF SECTION

SECTION 18110**PIPE AND PIPE FITTINGS****PART 1.0 - GENERAL**1.01 Summary

- A. The purpose and intent of this Section are to require that all necessary piping and related material shall be furnished and installed to provide complete and workable piping systems.
- B. Provide all pipe and fittings required to install all new piping systems specified in Division 18 and as indicated on the drawings.
- C. This Section includes:
 - 1. Forcemain Piping.
 - 2. Gravity Sanitary Sewer Piping.
 - 3. Yard Piping.
 - 4. Water Line Piping.
 - 5. Air Piping
 - 6. All interior piping except for storm and sanitary drains, water supply piping, and plumbing.
 - 7. All small piping such as cooling or sealing water connections, vents, drains, control tubing, lubricating tubing, etc., required to complete the installation of each piece of mechanical equipment.
 - 8. Furnish and install piping connected to accessories which must vary from the drawings because of requirements peculiar to the particular equipment furnished, as required to make a complete and workable installation at no additional cost to the Owner. This requirement shall include changes required in the piping systems because of design changes made by the manufacturer between the time of design and the time of installation or because of equipment furnished of different manufacture than that specified.

1.02 References

- A. Pipe and fittings shall be designed and tested in accordance with manufacturers' recommended procedures and the following codes and applicable standards:
 - 1. American National Standards Institute (ANSI):

- A312 - Seamless and Welded Austenitic Stainless Steel Pipe.
- A403 - Wrought Austenitic Stainless Steel Piping Fittings.
- A21.4 - Cement Mortar Lining for Cast-Iron Pipe and Fittings for Water.
- A21.6 - Cast-Iron Pipe Centrifugally Cast in Metal Molds, for Water or Other Liquids
- A21.8 - Cast-Iron Pipe Centrifugally Cast in Sand-Lined Molds, for Water or Other Liquids.
- A21.10 - Gray-Iron and Ductile-Iron Fittings, 2 Inch Through 48 Inch, for Water and Other Liquids.
- A21.11 - Rubber Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings.
- A21.15 - Flanged Cast-Iron and Ductile-Iron Pipe with Threaded Flanges.
- A21.51 - Ductile Iron Pipe, Centrifugally Cast, in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
- B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings, 25, 125, 250 and 800 Pound
- B16.3 - Malleable Iron Screwed Fittings, 150 and 300 Pound.
- B16.5 - Steel Pipe Flanges and Flanged Fittings.
- B16.9 - Factory-Made Wrought Steel Butt Welding Fittings.
- B16.11 - Forged Steel Fittings, Socket Welding and Threaded.
- B16.21 - Nonmetallic Gaskets for Pipe Flanges.
- B16.22 - Wrought Copper and Bronze Solder Joint Pressure Fittings.
- B16.25 - Butt Welding Ends.
- B36.10 - Wrought-Steel and Wrought-Iron Pipe.

2. American Society for Testing and Materials (ASTM):

- A53 - Welded and Seamless Carbon Steel Pipe.
- A106 - Seamless Carbon Steel Pipe for High Temperature Service.
- A120 - Black and Hot Dipped Zinc-Coated (Galvanized) Welded and Seamless Pipe for Ordinary Uses.
- A182 - Forged and Rolled Alloy Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High Temperature Service.
- A307 - Carbon Steel Externally and Internally Threaded Standard Fasteners.
- A312 - Stainless and Welded Austenitic Stainless Steel Pipe.
- A403 - Wrought Austenitic Stainless Steel Pipe Fittings.
- A536 - Ductile Iron Castings.
- A674 - Polyethylene Encasement for Gray and Ductile Cast-Iron Pipe for water or other Liquids.
- A746 - Standard for Ductile Iron Gravity Service Pipe.
- B75 - Seamless Copper Tube.
- B88 - Seamless Copper Water Tube.
- C150 - Portland Cement.
- D1248 - Polyethylene Plastic Molding and Extrusion Materials.
- D1784 - Rigid Polyvinyl Chloride Compounds and Chlorinated Polyvinyl Chloride Compounds.

- D2310 - Machine Made Reinforced Thermosetting Resin Pipe.
- D2997 - Centrifugally Cast Reinforced Thermosetting Resin Pipe.
- D3034 - Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings (4" through 15").
- F679 - Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings (18" through 27").

3. American Water Works Association (AWWA):

- C104 - Cement-mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fittings for Water.
- C105 - Polyethylene Encasement for Gray and Ductile Iron Piping for Water and Other Liquids.
- C110 - Gray-Iron and Ductile-Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids.
- C111 - Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings.
- C115 - Flanged Cast-Iron and Ductile-Iron Pipe with Threaded Flanges.
- C150 - Thickness Design of Ductile Iron Pipe.
- C151 - Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
- C153 - Ductile Iron Compact Fittings.
- C600 - Installation of Ductile Iron Pipe.
- C900 - Polyvinyl Chloride Pressure Pipe.
- C950 - Glass-Fiber-Reinforced Thermosetting-Resin Pressure Pipe.

4. American Society of Mechanical Engineers (ASME):

- B31.1 - Code for Pressure Piping, Power Piping Section

ASME Boiler Code - Section 1.

5. National Bureau of Standards, Voluntary Products Standard (NBS):

- PS15-69 - Custom Contact-Molded Reinforced-Polyester Chemical- Resistant Process Equipment.

1.03 Compliance Submittals

A. Submit the following for acceptance:

1. Color code for random length pipe shipped to job site.
2. Affidavits of compliance with applicable standards.
3. Test certificates.
4. Special fitting detail.

5. Joint details.
 6. Butt welding end preparation details.
 7. Test results or calculations for restrained joint assemblies.
- B. Submit laying schedules with dimensioned plans or diagrams for all pipe 2 inches and larger.
1. Show pipe class, thickness, or schedule.
 2. Show joint types for all pipe.
 3. Show or schedule all accessories, including restraint fittings.
 4. Furnish definitions for abbreviations with all submittals.

1.04 Delivery, Storage, and Handling

- A. Ship all random-length pipe to the job site marked with a continuous color stripe indicating material and schedule number.
- B. Handle all pipe and fittings in a manner to ensure that pipe and fittings will not be damaged.
- C. Do not drop or bump pipe or fittings.
- D. Use slings, lifting lugs, hooks or other devices designed to handle pipe.
- E. Store pipe and fittings with provisions to prevent movement or slipping into adjacent units.
- F. Ship all gaskets to the job site tagged with size, material and pressure rating.
- G. Ship spare gaskets separately packaged and tagged as spare parts.

1.05 Job Conditions

- A. Lines and grades shall be as indicated. Engineer will furnish a benchmark and a base line or other necessary horizontal control points to permit the Contractor to layout, stake, and construct the work.

PART 2.0 - PRODUCTS

2.01 Acceptable Manufacturers

- A. Ductile-Iron Pipe:
 1. American Ductile Iron Pipe

2. U.S. Pipe Supply.
 3. Or approved equal.
- B. Plastic Pressure and Gravity Pipe (PVC):
1. JM Eagle
 2. Diamond Plastics.
 3. Clow Corp.
 4. Or approved equal.

2.02 Materials

- A. Ductile Iron Pipe and Fittings:
1. Ductile iron pressure pipe shall conform to AWWA C115, C150, and C151 except as otherwise specified.
 2. Minimum thickness class for flanged pipe, AWWA C115, shall be class 53.
 3. Joints:
 - a. All buried gravity pipe shall have push-on joints conforming to AWWA C111, except where otherwise noted.
 - b. All interior and exposed exterior pipe shall be flanged unless otherwise indicated or specified.
 - 1) Flanges shall match drilling and pressure class of connected valves, pumps, and other components. Contractor shall coordinate flange requirements with equipment supplied.
 - c. Pipe flanges shall be ductile iron, conforming to AWWA C115, except flange dimensions and drilling shall conform to ANSI B16.1 Class 250 where required to match supplied valves or equipment.
 - d. Sleeved or coupled joints shall be provided where indicated. Furnish pipe ends suitable for installing style of sleeve or coupling indicated or specified. Provide anchor couplings or thrust blocks where restraint is required to withstand specified operating or hydraulic test pressure and where indicated.
 - e. Flexible joints, where indicated on the drawings for buried piping, shall be one of the following:
 - 1) Mechanical joint

- 2) Sleeve Coupling:
 - a) Dresser Style 38
 - b) JCM Model 201 or 210
 - c) Ford FCI
 - d) Smith-Blair 411
 - e) Romac Style 501
- 3) Sleeve couplings shall be cast iron, ductile iron, or fusion-bonded epoxy coated steel. Bolts shall be stainless steel.
- f. Restrained flexible joints, where indicated on the drawings for buried piping, shall be one of the following:
 - 1) Mechanical joint with rod-coupled gland and welded retainer ring.
 - 2) Sleeve coupling with coupling glands, tie rods, and welded retainer rings.
 - 3) Ball-joint pipe.
 - 4) Mechanical joints with tie-rod assemblies to other fittings or wall pipes.
 - 5) Tie-rods for restrained flexible joints shall be stainless steel.
4. Restrained Joints:
 - a. Furnish restrained joints, harnesses, anchors, or thrust blocks where called for on the drawings and at all locations where required to prevent separation of joints under operating and specified test hydraulic test pressures.
 - b. Proprietary restrained joints for push-on pipe shall be rated for the greater of 150 psi minimum working pressure and the specified hydraulic test pressure:
 - 1) Flex Ring, American Cast Iron Pipe.
 - 2) Tr-Flex, U.S. Pipe Co.
 - 3) Snap-Lok, Griffin Pipe Products.
 - 4) FIELD LOK 350, U.S. Pipe Co. (12-inch and smaller pipe only).
 - 5) Fast-Grip Gasket, American Cast Iron Pipe Co. (12-inch and smaller pipe only).
 - 6) Or approved equal.
 - 7) Joint restraint systems consisting primarily of wedge elements in rubber gaskets will not be acceptable for pipe greater than 12-inch diameter.
 - c. Restrained mechanical joints shall be rated for the greater of 150 psi minimum working pressure and the specified hydraulic test pressure:
 - 1) EBAA Iron Mega-Lug.
 - 2) Or approved equal.

- 3) Stainless steel tie-rod assemblies. Tie rods shall connect no less than 50 percent of the bolts in the coupled glands.
 - d. Mechanical joint glands and field-assembled flanges using set screws bearing directly against the pipe for restraint will not be acceptable.
5. Fittings:
 - a. Fittings shall conform to AWWA C110 or C153 and shall be ductile iron.
 - b. Fittings provided with buried pressure or flooded pipe shall have mechanical joints.
 - c. Fittings for gravity pipe with push-on joints shall be mechanical joints or push-on joints.
 - d. Provide all specials, taps and plugs as specified or indicated.
 - e. Flanged fittings shall be provided for flanged pipe.
 - f. Flange faces shall be coated with a rust-preventive compound.
6. Lining:
 - a. All ductile iron pipe and fittings for potable water and non-potable treated water (plant effluent water) service shall be lined with cement mortar conforming to ANSI 21.4 and AWWA C 104.
 - b. All ductile iron piping and fittings for air shall be un-lined.
 - c. All ductile iron pipe and fittings for raw or pre-treated wastewater shall be lined with one of the following:
 - 1) Calcium aluminate mortar made of fused calcium aluminate binders and fused calcium aluminate aggregates designed for sewer pipe applications (Laforge SewperCoat). The thickness of the lining shall be at least 0.125-inch for pipe up to 12 inches in diameter and at least 0.1875-inch for larger pipe. Other details of the lining shall conform to ANSI A21.4/AWWA C104. Inside of socket shall be epoxy coated in accordance with AWWA C104.
 - 2) Amine cured novalac epoxy coating containing at least 20 percent by volume of ceramic quartz pigment, applied to form a 40-mil nominal dry film thickness (PROTECTO 401).
 - d. Lining shall extend from edge of plain end to the gasket seat in the bell socket.

- e. Pipe penetration and lining application shall be in accordance with the manufacturer's recommendations for the lining supplied.
7. All buried iron pipe and fittings shall be coated with manufacturer's standard exterior enamel coating. All exposed pipe and fittings shall be exterior coated with the finish coatings as specified in the plans.
8. Gaskets and Bolting Material:
 - a. Provide all gaskets, bolts, lubricants, and other accessories required to install pipe and fittings complete and ready for service.
 - b. Bolts for flanged joints shall conform to ASTM A307 Grade B.
 - c. Gaskets for flanged joints shall be 1/8" thick, full faced synthetic rubber.
 - d. Gaskets for flanged joints on air service shall be rated for 250 F minimum.
9. Polyethylene Encasement: Buried ductile iron piping and fittings shall be encased in polyethylene conforming to ASTM D1248, Type 1, Class C, Grade E-1 when noted on the plans.
10. Flanged Coupling Adapters:
 - a. Shall be Ford 193, Smith-Blair 913, Rockwell 913, or approved equal.
 - b. Couplings shall be coated per plans.
 - c. Flanged coupling adapters shall have anchor studs and/or tie-rod harnesses designed for the greater of 150 psi or the specified hydraulic test pressure.
 - d. Where couplings are used underground, Type 316 stainless steel bolts shall be used.
 - e. Gaskets, except for air piping, shall be neoprene rubber. Gaskets for air piping shall be suitable for operation at a temperature of 250 F.
- B. Plastic Pressure Pipe and Fittings (PVC)
 1. The materials of this pipe shall be uniformly blended with unplasticized polyvinyl chloride. Nothing used in its manufacture shall be injurious to humans or animals, nor shall it impart taste or odor to domestic water or in any manner alter the chemical content of waters flowing through the pipe. It shall consist of all new materials, and the manufacturer shall furnish a sworn statement that no reused or materials known as "mill shorts" were used in the manufacture of the pipe or fittings. All pipe shall have superior high-tensile strength. Pipe shall conform to all requirements of commercial standards and ANSI, as specified on the drawings

and/or in the Piping Schedule in Section 18160. The PVC pipe shall conform to the following standard specifications:

- a. AWWA C-900, Class 200, DR 14 (Green Pipe for Sewer, Blue for Water)
 - b. AWWAC-905 Class 200, DR 21 Cast Iron O.D. (Green Pipe for Sewer, Blue for Water)
 - c. ASTM 2241, 200 psi, SDR 21 (Green Pipe for Sewer, Blue for Water)
2. All plastic pipe shall be approved by and bear the National Sanitation Foundation seal of approval and will comply with the requirements for Class 12454-A or Class 12454-B virgin components as defined in ASTM D1784 with an estimated hydrostatic design basis (HDB) rating of 4000 psi (27.58 MPa) for liquid at 73.4°F (23°C). Pipe and fittings with elastomeric seal joints shall meet the requirements of ASTM D3139.
 3. Certificates of conformance with the foregoing specifications shall be furnished with each lot of pipe supplied.
 4. PVC Pipe. Pipe shall be joined by means of a rubber ring slip joint, by means of a bell joint which shall be an integral and homogeneous part of the pipe barrel.
 - a. At no point in the pipe bell, including the recess groove for rubber rings, shall the wall thickness be less than that for the pipe barrel.
 - b. Samples of pipe shall be submitted to the Engineer for acceptance.
 - c. Maximum laying length of pipe shall be 20 feet.
 - d. All pipe shall have a guide mark on the spigot end to enable checking of adequate seating into bell.
 - e. The manufacturer shall provide a factory representative skilled in the installation of the type of pipe purchased to instruct the Contractor's personnel in the proper procedures for connecting and laying the pipe. This instruction is to be given at the beginning of pipe laying operations.
 5. Fittings for Pipe. Fittings for plastic pipe shall be ductile iron as specified. Ductile iron fittings for plastic pipe shall have a pressure rating not less than the pipe.
- C. Polyvinyl Chloride (PVC) Gravity Pipe and Fittings:
1. PVC sewer pipe and fittings, sizes 4-inch through 15-inch, shall conform to ASTM D-3034, SDR 35. PVC sewer pipe and fittings, sizes 18-inch through 27-inch, shall conform to ASTM F-679, T-1. PVC sewer pipe and fittings, sizes 8-inch through 36-inch, can also conform to ASTM F-949.

2. All PVC sewer pipe and fittings shall be made of PVC plastic having a cell classification of 12454-B or 12454-C, as defined by ASTM D1784.
 3. Joints shall be of the bell and spigot type. The bell shall contain a factory-installed elastomeric gasket which is positively retained. Joint shall be in conformance with ASTM D3212.
 4. The gasket shall be molded or extruded and spliced from a high-grade, properly vulcanized elastomeric compound, consisting of a synthetic rubber and shall meet the low head requirements of ASTM F477.
 5. Molded fittings shall be supplied with factory-installed gaskets and shall be suitable for use with SDR-35 gravity sewer pipe. Fittings shall not deflect more than pipe when loaded and bedded in the same manner.
- D. Copper Tube and Fittings:
1. Copper tube shall conform to ASTM B88 - Type L for above ground installations. Buried pipe may be Type K.
 2. Fittings shall be wrought copper with solder joints in accordance with ANSI B16.22.

PART 3.0 - EXECUTION

3.01 Installation

- A. Install pipe in accordance with Section 18160.

3.02 Inspection

- A. Inspection for acceptance of pipe will be conducted by the Engineer as soon as practical after arrival of pipe and fittings at the job site.
- B. Job site inspection takes precedence over any prior inspection.

3.03 Acceptance

- A. Pipe will be inspected by Engineer for acceptance by owner at the construction site. Acceptance at the job site shall be paramount. Prior approval or payment for pipe rejected at the job site shall be null and void. Acceptance by Engineer at a point in the sequence of manufacture, delivery and installation will not relieve the Contractor of his responsibilities as set forth in the Contract Documents. Manufacturing defects that prohibit installed pipe from successfully passing leakage tests shall constitute rejection of the defective pipe.

END OF SECTION

**SECTION 18130
MANHOLES AND THRUST BLOCKS****PART 1.0 - GENERAL**1.01 Summary

- A. This Section includes manholes, thrust blocks, and related appurtenances.

1.02 References

- A. Standards:

1. American Society for Testing and Materials (ASTM):

- A48 - Gray Iron Castings.
- C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- C150 - Portland Cement.
- C478 - Precast Reinforced Concrete Manhole Sections.
- C923 - Flexible Manhole Connections.

1.03 Compliance Submittals

- A. Specifications.
- B. Fabrication and installation details.

PART 2.0 - PRODUCTS2.01 Materials

- A. Concrete: Reinforced, 4000 psi.
- B. Manhole Frames and Covers:
1. Units cast of gray iron, free of defects, conforming to ASTM A48.
 2. Machine bearing surfaces to provide even seating.
 3. Coat with coal-tar pitch varnish.
 4. Non-bolt down lids shall be Clay and Bailey No. 2007, Deeter 1315 with concealed pick hole or approved equal.
- C. Waterproofing:
1. Manhole/vault exteriors will require a coating of Tnemec Series 46-465 or approved equal.

D. Joint Sealers:

1. E-Z STIK with primer or approved equal.
2. KOR-N-SEAL with primer.
3. Sealant material must comply with physical properties of Federal Specification SS-S-00210. Minimum width of sealant strips shall be 1 inch.
4. All joints must be wrapped with a 12-inch wide ConSeal CS-212 or approved equivalent.

2.02 Fabrication

A. Manholes:

1. Design: Construct as follows:
 - a. Precast manholes shall conform to ASTM C-478 except as specified herein. Minimum circumferential reinforcement per linear foot shall be as follows:

Manhole I.D.	Wall Thickness	Minimum Circumferential Reinforcement per Lineal Foot
48"	5"	0.18 sq. in.
60"	6"	0.21 sq. in.
72"	6"	0.28 sq. in.

- b. Cement shall be ASTM C150, Type II.
 - c. Manhole adjustment rings 4" or less in height shall be fiber reinforced.
2. Connections:
 - a. Manhole entry pipe gasket system shall be Kor-N-Seal, Press Seal PSX, or approved equal flexible boot which allows pipe movement within the boot. Materials and leakage testing shall conform to ASTM C923.
 - b. Place pipe stub in manhole wall with bell or coupling outside manhole wall to provide flexible joint as indicated.
3. Joint Sealers:
 - a. Apply per manufacturer's instructions.
4. Manhole Frames and Covers:
 - a. Embedded into concrete construction where indicated on plans.

- b. Set on double ring of mastic on top of manholes and grouted in place.
- c. Install items level and in alignment.

PART 3.0 - EXECUTION**3.01 Manholes**

- A. Excavate, install, and backfill manholes per the latest edition of the American Public Works Association Standard specifications.

3.02 Concrete Anchor and Thrust Blocks

- A. Install at all buried tees, elbows, bends, and dead ends on force main.
- B. Place against undisturbed earth.
- C. Of design indicated or specified.
 - 1. Bearing surface area may be adjusted should field conditions be in variance with design assumption. Engineer shall be contacted to inspect actual conditions prior to placement of thrust block.

END OF SECTION

**SECTION 18160
PIPE INSTALLATION****PART 1.0 - GENERAL**1.01 Summary

- A. This section includes fabrication, handling, installation and testing of buried and interior pipe, fittings, valves, specials and appurtenances as indicated on the drawings and as specified herein.
- B. This section does not include installation of storm and sanitary drains or plumbing.
- C. Install all small piping to cooling or sealing water connections, vents, drains, control tubing, etc., required to complete the installation of each unit of mechanical equipment.

1.02 References

- A. American Society for Testing and Material (ASTM):
 - 1. C12 - Installation of Vitrified Clay Pipe Lines.
 - 2. C828 - Low Pressure Air Test of Vitrified Clay Pipe Lines.
 - 3. D2774-04 - Standard Practice for Underground Installation of Thermoplastic Pressure Pipe
 - 4. D2321-04 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- B. American Society of Mechanical Engineers (ASME):
 - 1. B31 - Code for Pressure Piping.
 - 2. B31.1 - Power Piping Section.
 - 3. Boiler Code - Section 1.
- C. American Water Works Association (AWWA):
 - 1. C105 - Polyethylene Encasement for Gray and Ductile Cast-Iron Piping for Water and Other Liquids.
 - 2. C206 - Field Welding of Steel Water Pipe.
 - 3. C600 - Installation of Gray and Ductile Cast Iron Water Mains and Appurtenances.
 - 4. C651 - Disinfecting Watermains.
 - 5. M11 - Steel Pipe Design and Installation.

1.03 Delivery, Storage, and Handling

- A. Handle pipe, valves, and fittings in a manner to insure installation in an undamaged condition.

1. Do not drop or bump.
 2. Use slings, hooks and other devices designed to protect pipe, fittings, joint elements and coating when moving sections of pipe from storage area to installation location.
- B. Handle pipe and fittings with equipment having an adequate factor of safety against overturning.

PART 2.0 - PRODUCTS

2.01 As Specified in Division 18

PART 3.0 - EXECUTION

3.01 Installation – Below Ground Piping

- A. Belowground Piping
1. Utilize equipment, methods, and materials ensuring installation to lines and grades indicated.
 - a. Maintain within tolerances specified or acceptable laying schedule.
 - 1) Alignment: 2 inches.
 - 2) Grade: +1 inch per 100 feet.
 - b. Do not lay on blocks unless pipe is to receive total concrete encasement.
 - c. Accomplish horizontal and vertical curve alignments with fittings and pipe deflections. Limit joint deflection with ductile-iron pipe and fittings to conform to AWWA C600. Deflection may, with approval, exceed standard deflections by utilizing machined bells. Deflections for PVC pipe joints shall not exceed the manufacturer's recommendations.
 - d. Obtain acceptance of method proposed for transfer of line and grade from control to the work.
 2. Install pipe of size, materials, strength class, and joint type with embedment indicated for plan location.
 3. Insofar as possible, commence laying at downstream end of line and install pipe with spigot ends in direction of flow.
 4. Clean interior of all pipe, fittings, and joints prior to installation. Exclude entrance of foreign matter if work is suspended or stopped.
 - a. Close open ends of pipe with snug-fitting closures.

- b. Do not let water fill trench. Include provisions to prevent flotation should water control measures prove inadequate.
 - c. Remove water, sand, mud and other undesirable material from trench before removal of end cap.
 5. Brace or anchor as required to prevent displacement after establishing final position.
 6. Perform only when weather and trench conditions are suitable. Do not lay in water.
 7. Separation of Water Mains, Sanitary Sewers, and Combined Sewers:
 - a. Horizontal Separation. Whenever possible, any sanitary sewer, storm sewer, or manhole shall be laid at least 10 feet, horizontally, from a water main. The distance shall be measured from edge-to-edge. When local conditions prevent a lateral separation of 10 feet, a sanitary or storm sewer may be laid closer than 10 feet to a water main provided that the sanitary or storm sewer is laid at least 18 inches below the bottom of the water line. The water main or sewer must be constructed of mechanical joint ductile iron pipe where the lateral separation is less than 10 feet.
 - b. Vertical Separation: Whenever sanitary sewers, house sewers, or storm sewers must cross water mains, the sewer or drain shall be laid at such an elevation that the outside bottom of the water main is no closer than 18 inches above the outside of the top of the drain or sewer. This vertical separation shall be maintained for that portion of the sanitary sewer, house sewer, or storm sewer located within 10 feet, horizontally, of any water line it crosses. The crossing shall be arranged so that the sewer joints will be equal distance and as far as possible from the water main joints. In areas where the recommended separations cannot be obtained, either the water line or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing that extends no less than 10 feet on both sides of the crossing.
 - c. Separation to Force Mains: There shall be at least a 10-foot horizontal separation between water mains and sanitary sewer force mains, and they shall be in separate trenches. In areas where these separations cannot be obtained, either the water line or the sewer line shall be cased in a continuous casing.
 - d. Separation to Disposal Facilities: No water line shall be located closer than 25 feet to any on-site wastewater disposal facility, agricultural waste disposal facility, or landfill.
 8. Sewer Manholes: No water pipe shall be located closer than 10 feet to any part of a sewer or sewer manhole.

- B. Jointing:
1. General Requirements:
 - a. Locate joint to provide for differential movement at changes in type of pipe embedment, impervious trench checks, and structures. Joint to be not more than 2 feet from structure wall, unless supported by concrete cradle structurally continuous with base slab or footing.
 - b. Perform in accordance with manufacturer's recommendations.
 - c. Clean and lubricate all joint and rubber gasket surfaces with lubricant recommended.
 - d. Utilize methods and equipment capable of fully homing or making up joints without damage.
 - e. Check joint opening and deflection for specification limits.
 2. Special Provisions for Jointing Ductile Iron Pipe:
 - a. Conform to AWWA C600.
 - b. Visually examine while suspended and before lowering into trench.
 - 1) Paint bell, spigot, or other suspected portions with turpentine and dust with cement to check for cracks invisible to the eye.
 - 2) Remove turpentine and cement by washing when test is satisfactorily completed.
- C. Cutting Pipe:
1. Cut in neat manner without damage to pipe.
 2. Ductile iron and steel pipe to be cut with a carborundum blade saw or other acceptable methods.
 3. Remove burrs and sharp edges and smooth the pipe end by grinding.
 4. Repair lining where required and as approved.
- D. Closure Pieces:
1. Connect two segments of pipeline or a pipeline segment and structure with short sections of pipe fabricated for the purpose.
 2. Location of joints, types of joints, and pipe materials and strength classifications shall comply with specifications.
 3. May be accomplished with sleeve couplings:

- a. Of length, such that gaskets are not less than 3" from pipe ends.
 - b. Include spacer ring identical to pipe end such that clear space in closure does not exceed 1/4".
- E. Remove plugs from existing pipe as indicated in order to complete connections to existing pipe. Removed plugs shall become the property of the Contractor.
- F. Furnish and install test plugs where necessary to properly complete required testing.
- 1. Test plugs shall be as manufactured by pipe supplier.
 - 2. Plugs shall be push-on, flanged, mechanical joint or restrained as required for ductile iron pipe and shall be watertight against heads equal to the specified test pressure.
 - 3. Secure plugs in place to facilitate removal when required to connect pipe.
 - 4. Restrain plugs to fittings where indicated.
- G. Restrained joints or thrust blocks shall be installed where required to counteract internal pressure forces.
- H. Install thrust blocks in accordance with Section 18130, Manholes and Thrust Blocks.

END OF SECTION

PUMP SPECIFICATION

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SECTION: 2.50.010

FM1478

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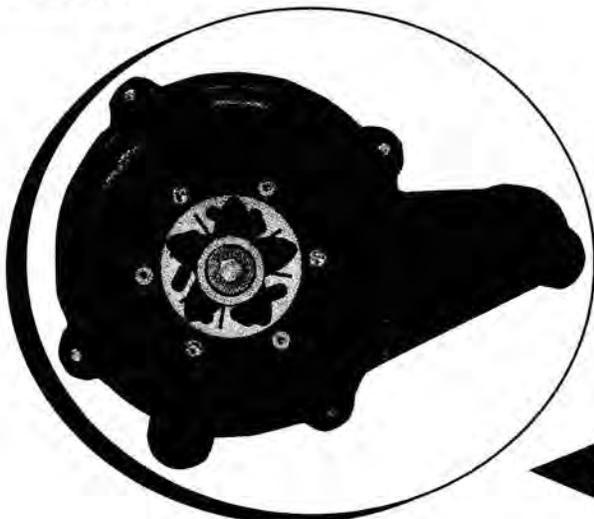
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PREPACKAGED AND JOB READY SYSTEMS

INDOOR		
REQ.		
1	Grinder (Auto or Nonauto)	P/N _____ (A)
1	Alarm System (Optional)	P/N _____ (B)
1	Weight Only (Required if alarm is used)	P/N 10-0689 (C)
1	Junction Box (Optional)	P/N 10-0666 (E)
1	Basin, Cover and Hardware	P/N _____ (F)

OUTDOOR		
REQ.		
1	Grinder (Auto or Nonauto)	P/N _____ (A)
1	Control Panel/Alarm System	P/N _____ (B)
1	Float Switch/es (if required)	P/N _____ (C)
1	Weight/s and Bracket/s	P/N _____ (C)
1	Junction Box	P/N _____ (E)
1	Basin, Cover and Rail System	P/N _____ (G)

FIELD MOUNT SYSTEMS

SIMPLEX		
REQ.		
1	Grinder (Auto or Nonauto)	P/N _____ (A)
1	Alarm System (Optional)	P/N _____ (B)
1	Variable Level Fl. Sw. Assm. ⁽²⁾ (Not required for auto pumps)	P/N _____ (C)
1	Weight and Bracket Only (2 required if alarm is used)	P/N 10-0661 (C)
1	Junction Box (Optional)	P/N _____ (E)
1	Rail System (Optional)	P/N _____ (H)
1	Angle Arm/Intermediate Bracket ⁽¹⁾	P/N _____ (H)
1	Pull Rod ⁽³⁾	P/N _____ (J)
1	S.S. Cable	P/N _____ (K)

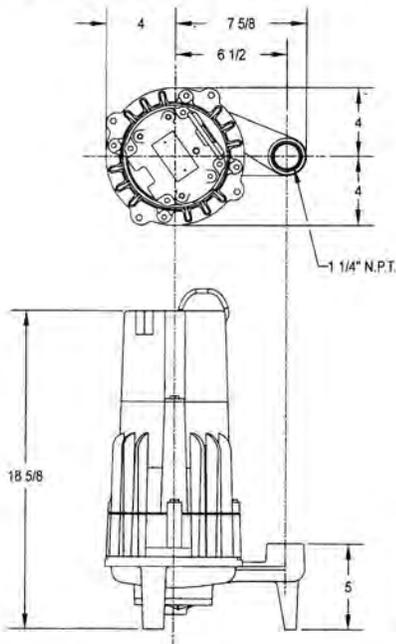
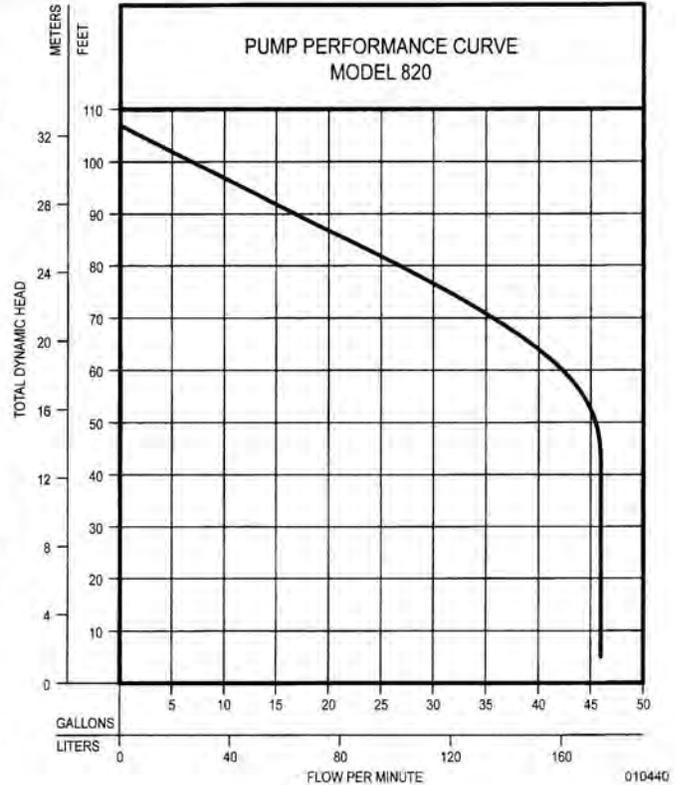
⁽¹⁾ Required for basins over 72" deep (Square Guide Rail) and over 12" (E-Z Out Rail). Allow for overhead clearances.

⁽²⁾ Hardwire pump, float switch, and power supply inside junction box.

⁽³⁾ For Square Guide Rail Only

Note: Contact factory for control panel selection.

Note: Access Doors Available on Field Mount Systems - Consult Factory
Special Basin Configurations - Consult Factory



SK1621

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MODEL 122 Control Panel

Single phase, duplex alternating pump control with override.

The Model 122 control panel is designed to alternately control two 120, 208, or 240 VAC single phase pumps in water and sewage installations. The alternating action equalizes pump wear. In addition to the alternating pump control, this system provides override control should either pump fail. If an alarm condition occurs, an alarm switch activates the audio/visual alarm system. Common applications include pump chambers, sump pump basins, irrigation systems and lift stations.

PANEL COMPONENTS

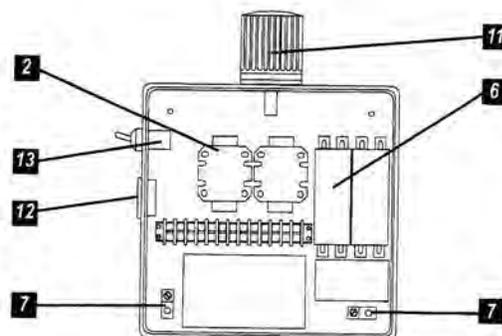
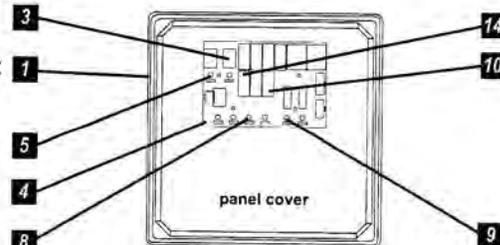
1. **Enclosure** measures 10 X 10 X 6 inches (25.4 X 25.4 X 15.24 cm). Choice of NEMA 1 (steel for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic with removable mounting feet for outdoor or indoor use).
Note: Options selected may increase enclosure size and change component layout.
2. **Magnetic Motor Contactors** control pumps by switching electrical lines.
3. **HOA Switches** for manual pump control (mounted on circuit board).
4. **Control Circuit Board** provides pump control and alternation.
5. **Green pump Run Indicator Lights** (mounted on circuit board).
6. **Circuit Breakers** (optional) provide pump disconnect and branch circuit protection.
7. **Ground Lugs**
8. **Float Status Indicator Lights** (mounted on circuit board).
9. **Control and Alarm Power Indicator Lights** (mounted on circuit board)
10. **Auxiliary Alarm Contact**, form C (mounted on circuit board).

NOTE: Schematic is located inside the panel on enclosure cover.

STANDARD ALARM PACKAGE

11. **Red Alarm Beacon** provides 360° visual check of alarm condition.
Note: NEMA 1 style utilizes a door mounted indicator in lieu of a beacon.
12. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
Note: NEMA 1 style utilizes an internally mounted buzzer in lieu of horn.
13. **Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition is cleared.
14. **Horn Silence Relay** (mounted on circuit board).

NOTE: other options available.



Model Shown 1221W114X6A



FEATURES

- Entire control system (panel and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes three 20' SJE SignalMaster® control switches
- Complete with step-by-step installation instructions
- Three-year limited warranty

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.
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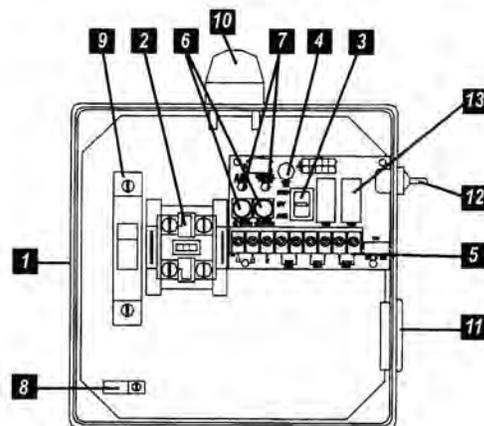
MODEL 112 Control Panel

Single phase, simplex motor contactor control.

The Model 112 control panel provides a reliable means of controlling one 120, 208, or 240 VAC single phase pump in pump chambers, sump pump basins, irrigation systems and lift stations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs, an additional alarm switch activates the audio/visual alarm system.

PANEL COMPONENTS

1. **Enclosure** measures 8 x 8 x 4 inches (20.32 X 20.32 X 10.16 cm). Choice of NEMA 1 (steel for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic with removable mounting feet for outdoor or indoor use).
* Options selected may increase enclosure size and change component layout.
2. **Magnetic Motor Contactor** controls pump by switching electrical lines.
3. **HOA Switch** for manual pump control (mounted on circuit board).
4. **Green Pump Run Indicator Light** (mounted on circuit board).
5. **Float Switch Terminal Block** (mounted on circuit board).
6. **Alarm and Control Fuses** (mounted on circuit board).
7. **Alarm and Control Power Indicators** (mounted on circuit board).
8. **Ground Lug**
9. **Circuit Breaker** (optional) provides pump disconnect and branch circuit protection.



Model Shown 1121W914X



STANDARD ALARM PACKAGE

10. **Red Alarm Beacon** provides 360° visual check of alarm condition.
Note: NEMA 1 style utilizes a door mounted indicator in lieu of a beacon.
11. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
Note: NEMA 1 style utilizes an internally mounted buzzer in lieu of horn.
12. **Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition has been cleared.
13. **Horn Silence Relay** (mounted on circuit board).

NOTE: other options available.

FEATURES

- Entire control system (panel and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes three 20' SJE SignalMaster® control switches
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Float Tree Brackets & Float Holders

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STF-106 FTB Float Tree Bracket

The float tree bracket is used to mount the float tree (length of schedule 40 PVC pipe) directly to the pump chamber riser. Maintenance, inspections and float adjustments can then be performed without entering the pump chamber. Simply unsnap or slide up the float tree, perform the necessary maintenance and snap the float tree back in place. This also keeps the pump discharge pipe clear of floats, wires, and straps for easy pump removal and replacement. Available to fit 1", 1-1/4" to 1-1/2", and 2" tree.

STF-FHHW Float Holder Hard-Wire

The float holder hard-wire has three holes for the float wiring to be threaded through. The holder snaps into place on the float tree hold the float in position. The holder can easily be adjusted to the desired level. The holder keeps the wires organized and away from the effluent pump to virtually eliminate tangled wires and float hang up. Available to fit 1", 1-1/4" to 1-1/2" and 2" tree.

STF-FHPB Float Holder Piggy Back

The float holder piggy back performs the same functions as the float holder hard wire, but can be used in situations when the float wiring can't be threaded through holes. Available to fit 1", 1-1/4" to 1-1/2", and 2" tree.

STF-JHOOK J Hook



STF-JHOOK Wire Organizer J-Hook

The J-Hook is used to organize the excess wire that is needed to allow for the removal of the float tree from the pump chamber. They also come in very handy in any other situation that you are looking to organize wires, cables, ropes, etc.

STF-106FTB Float Tree Bracket

STF-FHHW Float Holder Hard Wire

STF-FHPB Float Holder Piggy Back



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EXHIBIT I – SITE APPLICATION

FALCON MEADOW RV CAMPGROUND

**OUTFALL LIFT STATION
22.7 SITE APPLICATION REPORT**



MARCH 2019

REVISED MAY 2019

LIFT STATION
22.7 SITE APPLICATION REPORT
FOR
FALCON MEADOW RV CAMPGROUND

MARCH 2019
REVISED MAY 2019

EE Job No.: 0055.0001



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*Appendix C Woodmen Hills Agreement to Accept Falcon Meadow Wastewater
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Appendix D Woodmen Hills Metropolitan District Discharge Permit
Appendix E One-Mile Radius Well Map
*Appendix F Geotechnical Study Report
 NRCS Soils Report*
Appendix G Information for Planning and Consultation (IPaC) Report
*Appendix H Lift Station Pump Information
 Lift Station Design Information*
Appendix I Site Posting
Appendix J Agency Transmittals
Attachment 100% Design Plans

1 INTRODUCTION

The Falcon Meadow RV Campground (FMRVC) currently owns and operates two leach fields and two lift stations for wastewater treatment. The campground is located southwest of the intersection of US Highway 24 and Falcon Highway in El Paso County. FMRVC is currently pursuing the construction of an additional lift station and force main to consolidate their wastewater system with neighboring Woodmen Hills Metropolitan District (WHMD). The lift station force main will discharge into a new manhole in the WHMD collection system, located approximately 0.25 miles to the northwest from the proposed lift station site.

The proposed lift station will be located and constructed on previously disturbed lands currently owned by the FMRVC approximately 120 feet to the west of US Highway 24. Maps depicting the proposed site layout are included in Appendix B and in the attached plans.

1.1 APPLICABLE REGULATORY SECTIONS

This *Site Application Engineering Report* will address the requirements set forth in Regulation 22, Section 7. The proposed project includes the construction of a new lift station. The CDPHE Regulation 22.7 Application Form and Completeness Checklist are provided in Appendix A.

In addition to the applicable sections of Regulation 22, the design and facility layout will comply with *State of Colorado Design Criteria for Domestic Wastewater Treatment Works, Section 4*.

1.2 APPLICANT INFORMATION

Applicant:

Falcon Meadow RV Campground
11150 Hwy 24
Peyton, CO 80831
(719) 495-2694

Representative:

David Ozburn
Owner
(719) 421-0604

2 PROJECT BACKGROUND

2.1 PROJECT LOCATION AND SERVICE AREA

The Falcon Meadow RV Campground (FMRVC) is located in central-eastern Colorado, in the uppermost-center portion of El Paso County, approximately 12.5 miles to the northeast of Colorado Springs and directly adjacent to US Highway 24. The service area is located in Section 13, Township 13S, Range 65W, 6th Principal Meridian. A vicinity map of the area is shown in Figure 1.



Figure 1: Vicinity Map

The FMRVC property encloses approximately 12.5 acres and the service area currently includes 43 residential taps generally consisting of RV hookups, as well as other facilities on the site including communal laundry, bathrooms, general store, and swamp coolers. The campground was designed to include 100 hookup sites at full buildout conditions. Existing wastewater infrastructure at the FMRVC includes two drainage and leach fields with associated lift stations. The FMRVC service area and existing drainage piping is shown in Figure 2.



Figure 2: Service Area and Existing Drainage Piping

The proposed lift station and force main will be located entirely within property and easements already obtained by the FMRVC property owner. See the attached plans and Appendix C for details. The force main will discharge to the Woodmen Hills Metropolitan District (WHMD) sanitary sewer system that will be located on land owned by WHMD.

2.2 AREA DISCHARGE PERMITS, DRINKING WATER INTAKES, AND DOMESTIC WELLS

The WHMD owns and operates a wastewater treatment plant (WWTP) located approximately 3.3 miles to the northeast of FMRVC and operates under the discharge permit number CO-0047091. This facility is rated for 1.3 MGD and an organic loading of 3,470 lbs BOD₅/day. According to the WHMD's letter of acceptance to receive the wastewater flow from FMRVC, they are currently operating at approximately 61% design capacity. A copy of the statement from the treatment entity is located in Appendix C, and a copy of their permit in Appendix D.

Water wells within a one-mile radius were located utilizing the Colorado Decision Support System maps. There are 17 wells within this one-mile radius. Locations of these wells are shown in the 1-Mile Radius Map in Appendix E.

2.3 TOPOGRAPHY AND SOIL CHARACTERISTICS

The land of the service area slopes gently to the southwest. The average elevation within the service area is approximately 6,800 feet above mean sea level. A USGS topographical map for the project area is located in Appendix B.

Soils information is available for the Falcon Meadow RV Campground as compiled by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). The primary soil types in the project area consist of Blakeland loamy sand, Blakeland-Fluvaquentic Haplaquolls, and Truckton sandy loam. A soils report is also attached in Appendix F.

A full geotechnical analysis, as required in the CDPHE Design Criteria, has also been completed and is attached in Appendix F.

2.4 LOCAL WATER BODIES, STREAMS, AND RIVERS

One water body near the project site is the East Fork Sandy Creek, that intersects the centermost portion of the FMRVC before flowing southwest. This is a first order stream with a mean annual flow of 0.16 cubic feet per second (cfs) according to the watershed report obtained from EPA WATERS GeoViewer. Other water bodies north of the FMRVC include several unnamed tributaries of the Black Squirrel Creek. Ground water levels in the area are relatively deep. Colorado Division of Water Resources data from the nearest monitoring well estimates water depth to range between 35 and 40 feet below ground surface. Groundwater was not encountered in the 25-foot deep boring as part of the geotechnical study.

2.5 WETLANDS AND FLOODPLAINS

Two types of wetlands exist within the planning area: freshwater emergent wetland and riverine. Force main to connect FMRVC and WHMD will need to be installed through these locations. The locations of these wetlands are seen in the US Fish & Wildlife Service Wetlands map for the project area attached in Appendix B.

The 100-year flood plains of the East Fork Sandy Creek and unnamed tributaries of the Black Squirrel Creek are delineated by the Federal Emergency Management Agency Flood Insurance Rate Map (FEMA FIRM) No. 08041C0561G, as dated December 7, 2018. The proposed lift station and force main will be located outside of these floodplains. The FEMA FIRM for the area is shown in Appendix B.

2.6 ENDANGERED SPECIES

An Information for Planning and Consultation (IPaC) Report was compiled that catalogues the listed and proposed threatened and endangered species and critical habitats found within the planning area. This report can be found in Appendix G. The IPaC report found 3 endangered species, 5 threatened species, and 1 proposed threatened species in the planning area. Several of the listed species included in this report are at risk of being affected by water-related activities/use in the N. Platte, S. Platte, and Laramie River Basins. The planning area does not overlap any of these basins; therefore, the proposed project is not expected to affect these listed species. No critical habitats were found at this location.

2.7 LAND USE PROJECTIONS AND ZONING

No changes are expected with respect to land use designations or zoning over the course of the 20-year planning period.

2.8 POPULATION AND GROWTH PROJECTIONS

Population data for the Falcon Meadow RV Campground was not available for historical analysis, therefore an assumption for average household size was used. According to the *CDPHE Regulation 22 Guidance Document Section 22.7 (1)(c)*, in the absence of reliable data planning values for flow and population, planning values are to be used from the *State Board of Health Guidelines on Individual Sewage Disposal Systems (ISDS)*. From *Chapter V Section D*, the planning value for mobile homes is two persons per bedroom. Assuming a mobile home has only one bedroom, then the average household size is 2 persons. This value was used to estimate current and future populations of the FMRVC.

As of 2019, there are 43 actively occupied campsites hooked up to the current FMRVC wastewater system. The projected 20-year planning period will assume each of the 100 possible campsites are occupied and tapped into the FMRVC sanitary line. This is the campsite’s full-buildout conditions. The estimated current 2019 population of FMRVC is 86, and the 20-year projected population in 2038 is 200. These estimates are summarized below in Table 1.

Table 1: Current and Future Population Estimates

Year	No. of Taps	Persons per Tap	Population
2019	43	2	86
2039	100	2	200

Note: Planning values from State Board of Health Guidelines on ISDS

2.9 HYDRAULIC LOADING ANALYSIS

Flow monitoring of the campground’s existing wastewater production does not exist. Wastewater flow can be estimated based on water usage, provided by the FMRVC staff, as the majority of water used at the campground is utilized indoors, meaning the water will eventually enter the wastewater collection system. The average total water usage from February 2, 2017 to December 2018 for the campground was 1,684 gallons per day (gpd). During peak season, the FMRVC staff reports wastewater flow as high as 2,500 gpd. The provided data equates to an average of 39.2 gallons per day per campsite, and 58.1 gallons per day per campsite during maximum day demand as summarized in Table 2.

Table 2: Average and Maximum Water Use

Condition	Reported Avg. Flow (gpd)	No. of Taps	Per Site Flow (gpd)
Average Day	1,684	43	39.2
Maximum Day	2,500	43	58.1

To compare the accuracy of this data, planning values from the Colorado Department of Public Health and Environment Regulation 43 – On-Site Wastewater Treatment System Regulation were also used to estimate average day flows. These calculations result in a higher estimated total system wastewater flow. In order to remain conservative in the design process, these values for average day flow will be used. The planning values and estimates are summarized below in Table 3.

Table 3: Estimated Current and Future Average Flows

	Component	Quantity	Planning Value (gpd)	Subtotal (gpd)
Current Conditions	RV Camp Sites	43	50	2,150
	General Store (per ft ²)	240	0.1	24
	Laundry Room	1	400	400
	Total:			2,574
Future Conditions	RV Camp Sites	100	50	5,000
	General Store (per ft ²)	240	0.1	24
	Laundry Room	1	400	400
	Total:			5,424

Note: Planning Values from Table 6-2 CDPHE Regulation 43

According to the *State Board of Health Guidelines on ISDS*, a factor of 1.5 is suggested to estimate maximum daily flow. To estimate peak hour flow, a peaking factor of 4 was determined from Figure 3.1 of CDPHE’s Design Criteria, as appropriate based on the service area size. The proposed design values for average day, maximum day, and peak hour flows at current and future (full-buildout) conditions are summarized in Table 4.

Table 4: Design Flow Rates

	Condition	Peaking Factor	Flow Rate (gpd)	Flow Rate (gpm)
Current - 2018	Average Day	-	2,574	1.8
	Maximum Day	1.5	3,861	2.7
	Peak Hour	4	10,296	7.2
Future - 2038	Average Day	-	5,424	3.8
	Maximum Day	1.5	8,136	5.7
	Peak Hour	4	21,696	15.1

Additionally, organic loading was determined using planning values according to the Colorado Department of Public Health and Environment Regulation 43 – On-Site Wastewater Treatment System Regulation as wastewater characteristics are unavailable for FMRVC. The planning values and projected organic loading for the proposed lift station are summarized in Table 5 and Table 6 respectively.

Table 5: Organic Loading Planning Value Estimates

	Component	Quantity	Planning Value (lbs BOD ₅ /person/day)	Subtotal (lbs BOD/day)
Current Conditions	RV Camp Sites	43	0.12	5.2
	General Store (per ft ²)	240	0.01	2.4
	Laundry Room	1	0.75	0.8
	Total:			8.3
Future Conditions	RV Camp Sites	100	0.12	12.0
	General Store (per ft ²)	240	0.01	2.4
	Laundry Room	1	0.75	0.8
	Total:			15.2

Note: Planning Values from Table 6-2 CDPHE Regulation 43

Table 6: Lift Station Organic Loading Values

	Value (lbs BOD ₅ /day)
Average Annual Loading (AAL)	8.3
20-Year Projected Annual Average Loading (Full-Buildout)	15.2
Projected Peak Hour Organic Loading (PHOL)	60.6
Note: PHOL = Projected AAL x 4 (peaking factor)	

2.10 EXISTING TREATMENT

Wastewater flow within the current FMRVC is conveyed through one of two leach fields (southwest and central) and associated lift stations through the network depicted in Figure 2. At the completion of this project, all wastewater in the two collection areas will be conveyed to the new lift station and the existing leach field will be permanently abandoned. The new lift station will pump all wastewater from the FMRVC to the Woodmen Hills Metropolitan District (WHMD) for treatment. All lift stations are equipped with grinder pumps. A summary of each existing field is as follows:

Central Leach Field

The central leach field was the initial infrastructure for FMRVC, consisting of a 10,000-gallon tank, lift station, and associated sanitation piping. The 10,000-gallon tank is the oldest fixture at the site, installed in approximately 1958. Next, the 1,500-gallon lift station (5' diameter manhole with depth 3-4') was installed somewhere between 1985 to 1986. The associated 4" diameter piping in this leach field was completed as of the 1980's. All sites connected to the central leach field are first conveyed through the lift station, before passing through into the 10,000-gallon tank. A new pipe then connects this tank with the proposed lift station vault.

Southwest Leach Field

The southwest leach field was additional infrastructure the FMRVC installed due to expansion of its campsite. This field consists of a series of two (2) 1,500-gallon tanks, lift station, and associated sanitation piping. The two 1,500-gallon tanks and the approximately 150-gallon lift station were installed in the 1990's, and the associated 4" diameter piping has been installed as needed with campsite growth up to the late 2000's. The sites that drain into the southwest leach field first pass through the two 1,500-gallon tanks before conveyance through the 150-gallon lift station.

2.11 PROJECT IMPACT TO TREATMENT ENTITY

Additional hydraulic and organic loading will result at the WHMD WWTP at the completion of this project, as all of the FMRVC wastewater will be conveyed to this treatment plant. At projected peak hour information, consolidating the FMRVC with the WHMD will add approximately 21,700 gpd (0.022 MGD) hydraulic load, and 60.6 lbs. BOD₅/day organic load to the WHMD WWTP. The WHMD currently operates at approximately 61% of their rated capacities of 1.3 MGD and 3,470 lbs. BOD₅/day. The addition of FMRVC wastewater will result in a 1.67% increase to hydraulic load, and 1.75% organic load. These increases are minimal and expected to have little or no impact on the WHMD WWTP capacity or treatment processes now or in the foreseeable future.

2.12 LEGAL CONTROL OF SITE

The proposed lift station will be located within the FMRVC property boundary, and will be owned, operated, and maintained by the FMRVC. See the attached plans and Appendix B for details.

2.13 WASTEWATER TREATMENT ENTITY STATEMENT

WHMD has agreed to accept the FMRVC wastewater flow, conveyed from the proposed lift station and force main that will discharge into the WHMD sanitary sewer collection system approximately 1,600 linear feet to the northwest of the proposed lift station location. A copy of the statement from the treatment entity is located in Appendix C. The required documentation is located in Appendix A.

The proposed force main will tie into a gravity portion of the Woodmen Hills Metropolitan District (WHMD). This gravity portion of the collection system soon flows to a WHMD lift station. All portions of the collection system including gravity pipe, lift stations, and force mains downstream of the proposed Falcon Meadow tie-in location are owned, maintained, and operated by the WHMD.

3 PROJECT DESIGN CONSIDERATIONS

The proposed consolidation of the FMRVC wastewater facilities with the WHMD WWTP will consist of the installation of a lift station wet well, two installed grinder pumps with one shelf spare, and approximately 1,600 LF of 2-inch diameter Schedule 40 PVC. The lift station will be located adjacent to the existing 10,000-gallon water tank of the central leach field. A magnetic flow meter will be installed on the force main prior to discharge to the WHMD collection system. The force main will terminate in a new 5-ft diameter manhole that will be part of the WHMD collection system after the completion of construction.

The proposed lift station pumps will be manufactured by Zoeller Pump Company, The Shark Series, 820 Grinder Pumps. These pumps are 2 HP, 60 Hz, 3450 rpm. The discharger diameter is 1 ¼" NPT. Pump information is attached in Appendix H. The lift station shall be sized to, at a minimum, pump the full buildout peak hour flow with one pump. At the previously discussed full buildout peak hour flow of 21,696 gpd, this equates to a minimum pumping rate of 15.1 gpm. The proposed pumps will not operate on variable frequency drives. Based on system characteristics, the pumps will operate at approximately 34 gpm, well above the required minimum 15.1 gpm. This is illustrated in Figure 3 and detailed in Appendix H.

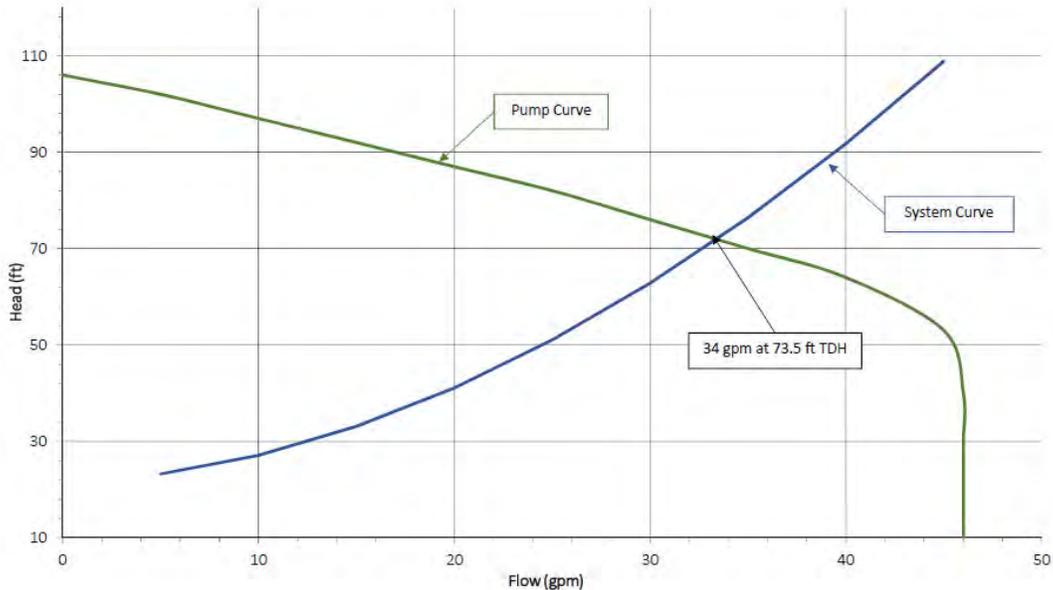


Figure 3: Lift Station Pump and System Curve

The proposed lift station will be designed in accordance with *Colorado Design Criteria for Domestic Wastewater Treatment Works, Chapter 4*. The design criteria for the proposed lift station are as follows:

- Two grinder pumps performing at approximately 34 gpm at an estimated 73.5 ft of total dynamic head (TDH) with an additional identical shelf spare.
- A maximum of 1-hour wet-well detention time at average day flow conditions
- Minimum velocity in the force main shall be greater than 2 feet per second (fps)
- Emergency storage for minimum of 2-hours of peak hour flow conditions
- Magmeter on the force main for flow monitoring

4 EMERGENCY OPERATIONS AND MAINTENANCE

4.1 EMERGENCY OPERATIONS PLAN

The main goals of an emergency operations and maintenance plan for a lift station are to 1) prevent sanitary sewer overflows (SSOs) through routine maintenance, and 2) to clearly establish the procedure to follow if an SSO does occur. A preliminary emergency response plan has been developed as part of this site application and details the following:

- Identification of Potential Causes of Overflow
- Prevention Practices
- Engineering Features to Address Sanitary Sewer Overflows
- Emergency Preparedness

The FMRVC staff will operate and maintain the proposed lift station. All emergency response procedures will be handled by FMRVC staff.

4.1.1 Identification of Potential Causes of Overflow

The lift station will be equipped with pump failure and high wet well alarms that will alert operations staff to equipment failures and/or high wet well levels. Pumping equipment will include overcurrent and high temperature protection. An audible alarm and visual alarm light will activate to alert and draw attention in the surrounding area. The FMRVC has dedicated 24-hour on-call staffing that will quickly respond to emergencies or alarms.

4.1.2 Prevention Practices

Routine operation and maintenance checks are essential to prevent overflows from a lift station. It is recommended that the lift station be inspected daily. This would simply include opening the wet well and control panels to inspect for damage or any potential sources of clogging.

Alarm testing will be completed on a monthly basis upon startup of the lift station to ensure alarms are functioning properly. Valves should be exercised once per quarter to ensure they will work when needed.

Routine pump maintenance as described by the pump manufacturer should be followed during the operational life of the pumps.

4.1.3 Engineering Features to Address Sanitary Sewer Overflows

Two pumps will be installed with an additional shelf spare stored onsite for easy replacement. Each pump will be capable of pumping 100% of the peak hour flow individually.

Emergency storage, as required in the design criteria, will be included in the design to ensure there is adequate time for staff to respond and fix any issues. This emergency storage will also allow room for a portable submersible pump to be utilized if there are issues with the two permanent submersible pumps. Two (2) hours of peak hour flow storage will be provided.

As previously mentioned, an alarm system will be included for the pumps. Alarms will include pump

failure, high wet-well level, overcurrent, and high temperature protection. Alarms will be visual and audible.

4.1.4 Emergency Preparedness

If an SSO occurs, the emergency preparedness and response plan of FMRVC staff is essential. The design criteria require that overflow storage of raw wastewater be provided at the lift station in the event of an extended power outage, electrical failure, or mechanical failure, including force main interruptions. The overflow storage volume required must be sufficient to contain all wastewater during the period of time required to restore pump station operation, install temporary pumping capacity, or haul raw wastewater to an acceptable point of discharge. The overflow storage will be designed to contain a minimum of two-hours of peak hour flow storage, or 1,812 gallons (15.1 gpm x 120 minutes).

FMRVC staff will assess each emergency event and respond accordingly.

4.2 TELEMETRY AND ALARMS

The lift station will feature an alarm system for the pumps. Alarms will include pump failure and high wet well level. Alarms will be visible and audible. Pumps will also include overcurrent and high temperature protection.

4.3 BACKUP POWER SUPPLY

In the event of a power outage at the campground, the water wells will cease operation. Therefore, as no wastewater will be generated during a power outage. However, the campground will be acquiring a portable generator with a minimum of 3 kW output. This output is adequate to operate the lift station pump. The electric supplier for the campground is Mountain View Electric Association, Inc.

4.4 PORTABLE EMERGENCY PUMPING EQUIPMENT

FMRVC has access to portable pumps and generators that will be made available as needed in the event of a mechanical or electrical failure. There are no known cases where there has been an overflow from any of the FMRVC lift stations.

4.5 EMERGENCY STORAGE/OVERFLOW PROTECTION

The proposed lift station will be connected by a new pipe to an existing 10,000-gallon tank that has previously been used as part of the central leach field. If the lift station becomes unoperational, the wastewater will back up into this existing structure. As the minimum required emergency overflow storage is 1,812 gallons, this is more than adequate to provide at least two hour of emergency storage.

The 10,000-gallon tank would provide approximately 11 hours of peak hour flow storage. Given that peak hour flow will not occur for 11 hours straight, the actual available storage time is significantly greater. Due to this available volume of storage, FMRVC will only install one pump for normal operation with a shelf spare available for easy replacement.

4.6 OPERATOR CALL-DOWN LIST AND RESPONSE TIME JUSTIFICATION

The emergency phone number list includes emergency responders and FMRVC personnel. The main point of contact would be (719) 589-5807 which is Colorado State Patrol (CSP) Dispatch. CSP then contacts FMRVC personnel (24/7). All of the maintenance personnel live within or near the FMRVC, making response time brief. The average response time is about 20 minutes after personnel receive the call from dispatch.

The call-down list provided by the FMRVC is as follows:

**EMERGENCY PHONE NUMBERS
FALCON MEADOW RV CAMPGROUND**

FMRVC Owner, ORC – David Ozburn
(719) 421-0604

Colorado State Patrol Dispatch
(970) 848-2819

El Paso County Sheriff's Department
911 or (719) 390-5555

Falcon Fire Department
911 or (719) 495-4050

WQCD 24HR Incident Report Line
1-877-518-5608

5 MANAGEMENT AND FINANCIAL CAPACITY

5.1 MANAGEMENT CAPACITY

The FMRVC plans to manage, operate, and maintain the proposed lift station and associated force main, while WHMD owns, manages, operates and maintains the off-park property sewer lines leading to the WHMD WWTP. There is no need for additional campground staff as the proposed project will reduce the operational intensity required by the FMRVC. Furthermore, there is no need for additional staff at WHMD as a result of the proposed project because the increase to plant capacity is only 1.67% of WHMD's permitted hydraulic capacity and will not affect treatment plant operations.

5.2 FINANCIAL CAPACITY

This project is being undertaken by the campground owner and will be entirely privately funded. The owner is willing to increase lot rent fees as necessary to support this project and any changes to operations and maintenance costs. No increased staffing will be required with the new installation.

5.2.1 Capital Improvement Plan

The construction of a new lift station allows FMRVC to consolidate with the nearest wastewater district. Following completion of these projects, no additional capital improvement projects should be necessary for the wastewater system for many years.

FMRVC has had no major issues or breaks with the pipe in their collection system. Annual inspection and maintenance will be necessary for the collection system to remain in good condition, and to address any emerging issues before they negatively impact system performance.

5.2.2 Rate Structure

FMRVC residents do not pay individual wastewater bills, but instead pay a flat-rate lot fee that accounts for rent as well as utilities. The campground owner is willing to adjust lot fees as necessary to support this project.

6 POSTING OF SITE & LOCAL AGENCY REVIEW

6.1 POSTING OF SITE

As required by Regulation 22, notice has been posted at the proposed site. A photo of the posted site is presented in Appendix I.

6.2 LOCAL AGENCY REVIEW

Regulation 22, Section 7 requires that a copy of the site location application and all supporting and ancillary documentation be submitted to the local review and commenting agencies prior to submission to CDPHE. The applicable agencies for this project are:

- County: El Paso County
- Health Department: El Paso County Department of Health and Environment
- 208/COG, RCOG: Pikes Peak Area Council of Governments

Transmittals showing distribution of this site application document are attached in Appendix J. Comments by the local agency reviewers will be submitted to CDPHE upon receipt.

7 CONSISTENCY WITH WATER QUALITY MANAGEMENT PLAN

The proposed project includes the construction of a new lift station and approximately 1,600 feet of force main. This project will provide wastewater disposal without vector nuisances and will eliminate untreated discharges in the leach fields, which is consistent with Colorado’s Statewide Water Quality Management Plan. This project is also consistent with Section 3.6 of the Pikes Peak Area Council of Governments Water Quality Management Plan 2010 Update regarding the adequate collection, treatment, and disposal of wastewater.

8 IMPLEMENTATION SCHEDULE

The implementation schedule for the proposed project is shown in Table 7. Note that this schedule is preliminary and is subject to change at the campground’s request or as a result of construction-related activities.

Table 7: Preliminary Project Schedule

Task	Start Date	End Date
Complete and Submit 22.7 Site Application to CDPHE	-	3/31/2019
Complete and Submit Revised 22.7 Site Application to CDPHE	-	5/31/2019
CDPHE Review and Approval of Site Application	3/31/2019	8/1/2019
Complete and Submit Basis of Design Report, 100% Plans and Specs to CDPHE	3/31/2019	8/1/2019
CDPHE Review and Approval of Basis of Design Report, 100% Plans and Specs	4/30/2019	7/30/2019
Project Completion	-	12/31/2019

**APPENDIX A
REGULATION 22.7 APPLICATION FORM
REGULATION 22.7 APPLICATION COMPLETENESS CHECKLIST**



Water Quality Control Division Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Colorado Department
of Public Health
and Environment

Regulation 22 Application Form

Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

A. Project and System Information							
System Name	Falcon Meadow RV Campground						
Project Title	Falcon Meadow RV Campground Lift Station						
County	El Paso						
Date Fee Paid or payment attached		Invoice Number and Check Number					
Design Company Name	Element Engineering, LLC						
Design Engineer	Alice Arsenault	CO License Number	53350				
Address	12687 West Cedar Drive, Suite 300						
	Lakewood, CO 80228						
Email	alicea@elementengineering.net						
Phone	(303) 981-0453	Fax					
Applicant / Entity	Falcon Meadow RV Campground						
Representative Name/Title	David Ozburn, Owner						
Address	11150 Hwy 24						
	Peyton, CO 80831						
Email	davidozburn@hotmail.com						
Phone	(719) 421-0604	Fax					
B. Project Information							
<i>Location (existing or proposed site)</i>			<i>Proposed Project Capacity</i>				
Brief location description	11150 Hwy 24		Maximum Month Average Hydraulic Capacity in million gallons per day (MGD)	0.0081 MGD			
Legal Description (e.g., Township, Range)	S2SW4NW4		Peak Hour Hydraulic Capacity in million gallons per day (MGD)	0.0217 MGD			
County	El Paso		Organic Capacity (lbs. BOD ₅ /day) – Treatment Facility Only	15.2 lbs. BOD ₅ /day			
Latitude	38°55'27.30" N						
Longitude	-104°37'11.13" W						
Funding Process	Will a State or Federal grant or loan be sought to finance any portion of the project (e.g., State Revolving Fund)?		No	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	If yes, please list project number
Project Schedule and Cost Estimate							
Estimated Bid Opening Date							
Estimated Completion Date	12/31/2019						
Estimated Project Cost							

Regulation 22 Application Form

Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

Project and System Information	
Project Title	Falcon Meadow RV Campground Lift Station
System Name	Falcon Meadow RV Campground
County	El Paso
Interceptor/Lift Station Design Information	
1.	a) Name and address of wastewater treatment facility providing treatment (Receiving wastewater facility must fill out "Receiving Wastewater Entity Certification") Woodmen Hills Metropolitan District Wastewater Treatment Plant, 9503 Meridian Ranch Boulevard, Falcon, CO 80831
Site Information	
2.	Vicinity maps of facility location which includes the following: a) 1 mile radius map: habitable buildings, location of public and private potable water wells, an approximate indication of the topography, and neighboring land uses See Site Application Appendices
3.	Site Location Zoning a) Present zoning of the site location? Residential Rural (5 acres) b) Zoning within a one (1) mile radius of the site? For New Lift Stations Only. Residential Rural (5 acres), PUD, Unzoned
4.	Floodplain or Natural Hazards a) Is the facility located in a 100-year floodplain or other natural hazard area? If so, what precautions are being taken? No, N/A b) Has the floodplain been designated by the Colorado Water Conservation Board, Department of Natural Resources or other agency? If so, please list agency name and the designation. N/A
5.	Land Ownership a) Who owns the land upon which the facility will be constructed? Please attach copies of the document(s) creating authority for the applicant to construct the proposed facility at this site. See Appendix B
Lift Station Facility Only	
6.	Please describe the period during which service area build-out will occur. The campground has been to projected to be at full buildout conditions within the next 20 years. No expansion of the service area will occur beyond the full buildout conditions.
7.	Please describe the flows expected in the first five years and ten years of operation. Flows are expected to be at current average day flow of 0.0026 MGD in the first 5 years. Flows are expected to increase to a maximum average day flow of 0.0054 MGD at full build out conditions in 10 to 20 years.
8.	Will the proposed lift station replace an existing lift station? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Yes, please describe the current flows and loadings that will be switched to the proposed lift station.

9.	Describe emergency back-up system in case of lift station and/or power failure. See Site Application
Project Information	
10.	a) What entity is financially responsible for the construction of the facility? Falcon Meadow RV Campground
11.	a) What entity has the financial responsibility for owning and long term operating expense of the proposed facility? Falcon Meadow RV Campground
12.	a) What entity has the responsibility for managing and operating the proposed facility after construction? Falcon Meadow RV Campground
Additional Factors	
13.	Please identify any additional factors that might help the Water Quality Control Division make an informed decision on your site location application.



Water Quality Control Division Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Colorado Department
of Public Health
and Environment

Applicant Certification and Review Agencies Recommendation

Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

A. Project and System Information	
System Name	Falcon Meadow RV Campground
Project Title	Falcon Meadow RV Campground Lift Station
County	El Paso

1. Applicant Certification

I certify that I am familiar with the requirement of *Regulation 22 - Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works*, and have posted the site in accordance with the Regulations. An engineering report, as described by the regulations, has been prepared and is enclosed.

Applicant Legal Representative (e.g. Public Works Director)	Date	Typed Name	Signature
Owner	3/20/19	David Ozburn	

The system legal representative is the legally responsible agent and decision-making authority (e.g. mayor, president of a board, public works director, owner). The Consulting Engineer is not the legal representative and cannot sign this form.

2. Recommendation of Review Agencies

As required in Section 22.7(2 and 3), the application and the engineering report must be submitted to all appropriate local governments, 208 planning agencies and State agencies for review and comment prior to submittal to the Division. By signing below, the entity or agency: 1) acknowledges receipt of the proposed site location application, 2) has reviewed the proposed site location application and may elect to provide comments, and 3) has provided a recommendation to the Division. The recommendation should be based on the consistency of the proposed site location application with the local comprehensive plan(s) as they relate to water quality and any adopted water quality management plans(s). *Please note: If a governmental authority does not recommend approval then the authority must attached a letter describing the reason for their decision or comment on the next page.*

Signature of County, if proposed facility is located in unincorporated areas of a county				
Role	Date	Typed Name / Agency	Signature	
		El Paso County		
			Recommend Approval?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Signature of City or Town, if site is located within three miles of the City/Town boundary				
Role	Date	Typed Name / Agency	Signature	
			Recommend Approval?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Signature of Local Health Authority				
Role	Date	Typed Name / Agency	Signature	
		El Paso County Department of Health & Environment		
			Recommend Approval?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Signature of 208 Planning Agency				
Role	Date	Typed Name / Agency	Signature	
		Pike's Peak Area Council of Local Governments		
			Recommend Approval?	Yes <input type="checkbox"/> No <input type="checkbox"/>

Signature of Other State or Federal Agencies, if facility is located on or adjacent to a site that is owned or managed by a federal or state agency.

Role	Date	Typed Name / Agency	Signature

Recommend Approval? Yes No

Signature of Other Basin Water Quality Authority, Watershed Association, Watershed Authority, etc., if facility is located in a Water Quality Control Commission Watershed Protection Control Area.

Role	Date	Typed Name / Agency	Signature

Recommend Approval? Yes No

Review Agency Comments:



Water Quality Control Division Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Colorado Department
of Public Health
and Environment

Wastewater Receiving Entity Certification

Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

Project and System Information	
System Name	Falcon Meadow RV Campground
Project Title	Falcon Meadow RV Campground Lift Station
County	El Paso

Receiving Wastewater Entity – Certification of Available Treatment Capacity

Receiving wastewater treatment entity information			
Receiving wastewater treatment entity and facility	Woodmen Hills Metropolitan District Wastewater Treatment Plant		
County	El Paso		
CDPS discharge permit number and expiration date	CO0047091 1/31/20	CDPS discharge permit capacity	1.3 MGD
Site location approval number and date (please attach a copy of approval letter)	4512	Site location approved capacity	1.3 MGD

Proposed facility capacity impacts on receiving wastewater treatment facility (projected at buildout or 20-years)

Proposed project hydraulic capacity: maximum month average	0.0081 million gallons per day
Proposed project hydraulic capacity: peak hour	0.0217 million gallons per day
Proposed project organic capacity: maximum month average	15 lbs BOD ₅ /day
Proposed project will increase the receiving treatment facility's hydraulic loading capacity to (% of total capacity):	1.67%
Proposed project will increase the receiving treatment facility's organic loading capacity to (% of total capacity):	0.43%

Treatment Certification (22.7 (1)(f) (i))

I certify that the receiving wastewater treatment facility will treat the wastewater from the proposed wastewater facility project.

Yes, will provide treatment No, will not provide treatment

Capacity Certification (22.7 (1)(f) (ii))

I certify that the receiving wastewater treatment facility is not presently receiving wastes (hydraulic and organic loads) in excess of the above listed site location approval and discharge permit to treat the projected discharge from the new interceptor sewer or from the new or expanded lift station, as listed above (initial in box).

OR

I certify that the receiving wastewater treatment facility does not currently have the capacity to serve the proposed project flows but is under construction, or will be in a phased construction of new or expanded facilities and will have the necessary capacity to treat the projected discharge from the new interceptor sewer or from the new or expanded lift station, as listed above (initial in box).

Estimated date capacity will be available

Note: Projections of flow and loading to the treatment facility over the period during which build out of the service area will occur or twenty years, whichever is less, as well as current and future plant capacity information must be provided to demonstrate the plan for maintaining adequate treatment capacity. Any proposed treatment plant phased construction must be shown in the Water Quality Management Plan (reference, attach), or by appropriate planning and engineering studies (reference, attach).

Compliance Status Certification (22.7 (1)(f) (iii))

I certify that the receiving wastewater treatment facility has not been in violation of any effluent limitations in its discharge permit for the last two years (initial in box).

I certify that the receiving wastewater treatment facility is not operating under a Notice of Violation and/or Cease and Desist Order from the Division resulting from discharge permit violations (initial in box).

Note: If there have been effluent violations or if the receiving wastewater treatment facility is operating under a Notice of Violation and/or Cease and Desist Order from the Division, please provide additional description of the situation and the treatment entity's proposed corrective measures to achieve consistent compliance. The Division will evaluate information provided and determine if approval should be granted, granted with conditions, or denied.

I hereby certify that the information presented above is accurate and complete.

Receiving Treatment Facility Representative	Date	Typed Name and Title	Signature
Jerry Jacobson	3/1/19	Jerry Jacobson General Manager	

WOODMEN HILLS

METROPLITAN DISTRICT

March 1, 2019

Colorado Department of Public Health and Environment
Water Quality Control Division
WQ Engineering Review
4300 Cherry Creek Drive South
Denver, CO 80246-1530

RE: Corrective action for effluent violations

Woodmen Hills Metropolitan District Regional Water Reclamation Facility, CO0047091, is our new wastewater treatment facility and went on line January 21, 2019. Start up in cold weather has slowed the new plant's performance but is definitely outperforming the old facility. The area the plant struggles with right now is Nitrogen removal. BOD and TSS removal are performing very well. We expect treatment to continue to improve as the plant process stabilizes and as outside temperatures improve.

Please contact me with any questions or concerns. Thank you.

Respectfully,



Jerry Jacobson
Operations Manager



Water Quality Control Division Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

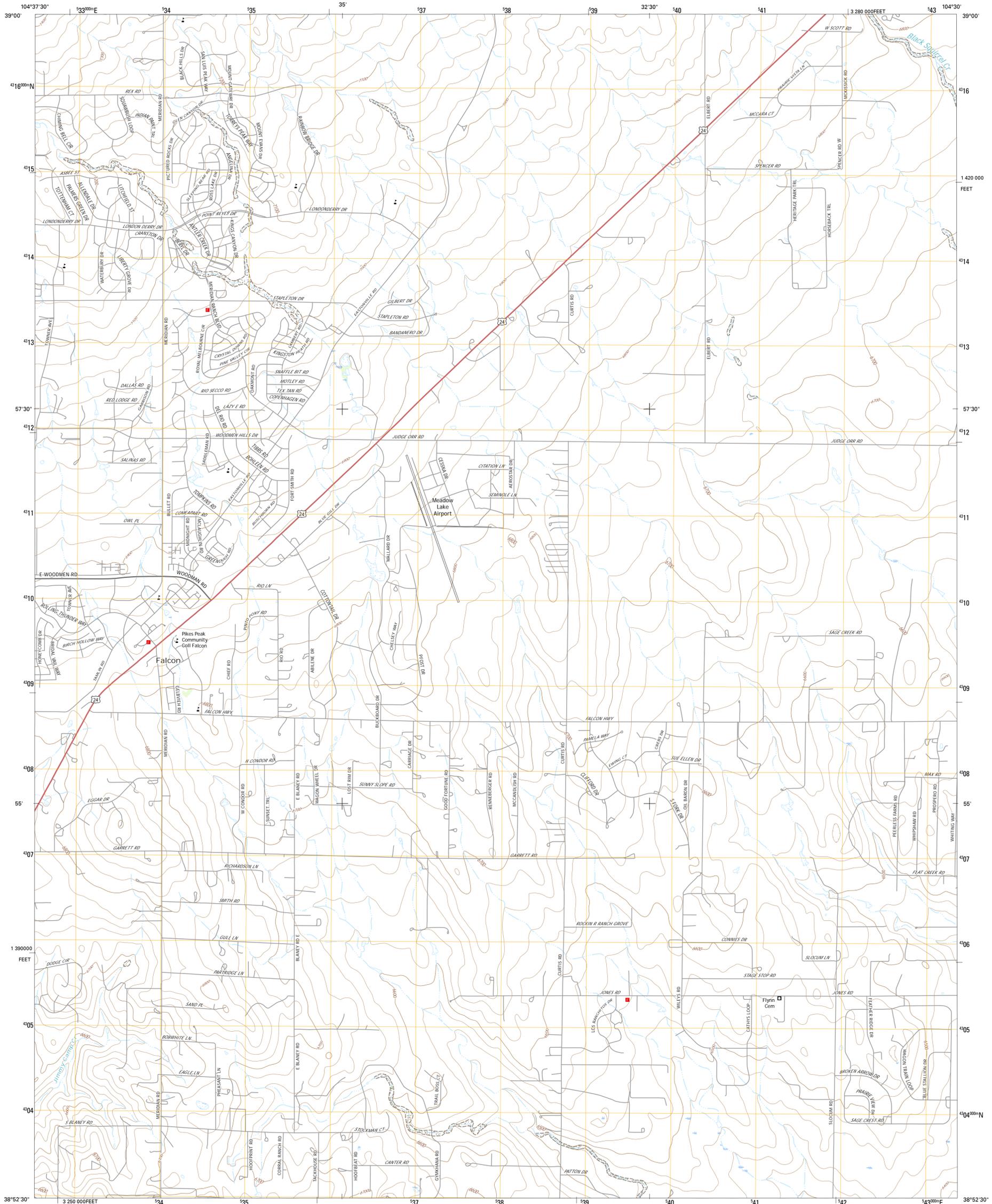
Colorado Department
of Public Health
and Environment

Regulation 22 Completeness Checklist

Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

Project and System Information			
Project Title	Falcon Meadow RV Campground Lift Station		
System Name	Falcon Meadow RV Campground		
County	El Paso		
Regulation 22 Citation	Submittal Requirements	Included/Addressed in Site Location Submittal? Yes/No/NA	Location in Submittal (page)
22.7(1)	Site Application Forms including: - Signature of local authorities and 208 planning agency (see 22.7(2) and 22.7(3)) - Signature of responsible party of the proposed facility	Yes	Apndx A
22.7 (1)	Engineering Report including		
	22.7 (1)(a) Name and Address of Applicant	Yes	Sect 1
	22.7 (1)(b) A map identifying the proposed facilities site including area topography, and neighboring land uses	Yes	Sect 2 Apndx B
	22.7 (1)(c) Service Area including: - Existing and project population - 20 year flow/loading projections	Yes	Sect 2
		Yes	Sect 2
	22.7 (1)(d) Identification of the treatment entity responsible for receiving and treating the wastewater	Yes	Sect 2
	22.7 (1)(e) Control of site or right of way legal arrangements for project life	Yes	Apndx C Plans
	22.7 (1)(f) Written confirmation that the receiving wastewater treatment entity (use form page	Yes	Apndx C
	22.7 (1)(g) Evidence that the facility will be properly operated and maintained	Yes	Sect 5
	22.7 (1)(h) Management capabilities for controlling the wastewater loading within the capacity limitation of the proposed facility (e.g., user contracts, operating agreements)	Yes	Sect 5
	22.7 (1)(i) Financial system which has been developed to provide for necessary capital, O&M, and replacement cost through the life of the project. This would include: - Anticipated annual budget - Fee and rate structure	Yes	Sect 5
	22.7 (1)(j) Demonstration of the owner's capacity to operate and maintain the facility including - Emergency operations plan	Yes	Sect 4 Sect 5
22.7 (1)(k) Implementation plan and schedule, including: - Estimated construction time - Estimated start up date	Yes	Sect 8	
22.7 (1)(l) Site Location Posting Documentation (e.g., photo of the public notification sign) – For New Lift Stations Only	Yes	Sect 6	
22.7 (2-3)	Site Application Review and Comments from: (a) County (b) City or Town (c) Local Health (d) 208 Planning Agency (e) Other state or federal agencies	Yes	Sect 6 Apndx J

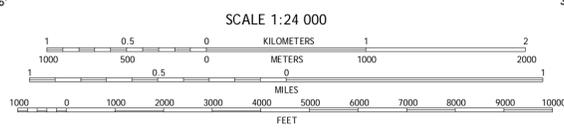
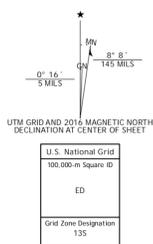
**APPENDIX B
PROJECT MAPS**



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84) Projection and
1 000-meter grid; Universal Transverse Mercator, Zone 13S
10 000-foot ticks; Colorado Coordinate System of 1983 (central
zone)

This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery: NAIP, July 2013
Roads: U.S. Census Bureau, 2015 - 2016
Names: GNIS, 2016
Hydrography: National Hydrography Dataset, 2013
Contours: National Elevation Dataset, 2007
Boundaries: Multiple sources; see metadata file 1972 - 2016
Public Land Survey System: BLM, 2011
Wetlands: FWS National Wetlands Inventory 1977 - 2014



CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.19



ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
	State Route

ADJOINING QUADRANGLES

1	2	3
4	5	6
7	8	

- 1 Black Forest
- 2 Eastonville
- 3 Peyton
- 4 Falcon NW
- 5 Haegler Ranch
- 6 Elsmere
- 7 Corral Bluffs
- 8 Ellicott

FALCON, CO
2016



NOTES TO USERS

is for use in administering the National Flood Insurance Program. It does not identify areas subject to flooding, particularly from local drainage of small size. The community map repository should be consulted for updated or additional flood hazard information.

more detailed information in areas where **Base Flood Elevations (BFEs)** have been determined, users are encouraged to consult the Flood Floodway Data and/or Summary of Stillwater Elevations tables contained in the Flood Insurance Study (FIS) report that accompanies this FIRM. Users are advised that BFEs shown on the FIRM represent rounded whole-foot values. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, elevation data presented in the FIS report should be utilized in conjunction with other data for purposes of construction and/or floodplain management.

Base Flood Elevations shown on this map apply only to landward of 0.7' from the mean high water mark. Users of this FIRM should refer to the coastal flood elevations also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations in the Summary of Stillwater Elevations table should be used for construction floodplain management purposes when they are higher than the elevations in this FIRM.

Floodway Data were computed at cross sections and interpolated cross sections. The floodways were based on hydraulic considerations with requirements of the National Flood Insurance Program. Floodway widths and pertinent floodway data are provided in the Flood Insurance Study report section.

not in Special Flood Hazard Areas may be protected by flood control structures. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

action used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD83, GRS80 spheroid. In datum, spheroid, projection or UTM zones zones used in the preparation of this FIRM for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

ations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD83)**. These flood elevations must be compared to structure and elevation data referenced to the same vertical datum. For information regarding datum conversions, users are encouraged to consult the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. The National Geodetic Survey website at www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following phone number: 1-800-853-7376.

ation Services:
NCS12
Geodetic Survey
#9202
West Highway
Fg, MD 20910-3282

current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at <http://www.ngs.noaa.gov/>.

information shown on this FIRM was provided in digital format by El Paso Colorado Springs Utilities, City of Fountain, Bureau of Land Management, Oceanic and Atmospheric Administration, United States Geological Survey, and Consulting Engineers, Inc. These data are current as of 2006.

reflects more detailed and up-to-date **stream channel configurations and floodway data** than those shown on the previous FIRM for this jurisdiction. Floodway Data and Floodway Tables were transferred from the previous FIRM may not adjusted to conform to these new stream channel configurations. As a result, Flood Profiles and Floodway Data tables in the Flood Insurance Study report may not reflect the most current stream channel configurations. Floodway Data Tables (if applicable, in the FIS report. As a result, the profile may deviate significantly from the new base map channel representation shown outside of the floodplain.

limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred since this map was published, map users should contact appropriate officials to verify current corporate limit locations.

to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

EMA Map Service Center (MSC) via the FEMA Map Information eXchange (EMIX) for information on available products associated with this FIRM. This service may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may be reached by Fax at 1-800-358-9620 and its website at www.msc.fema.gov/.

questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfip/>.

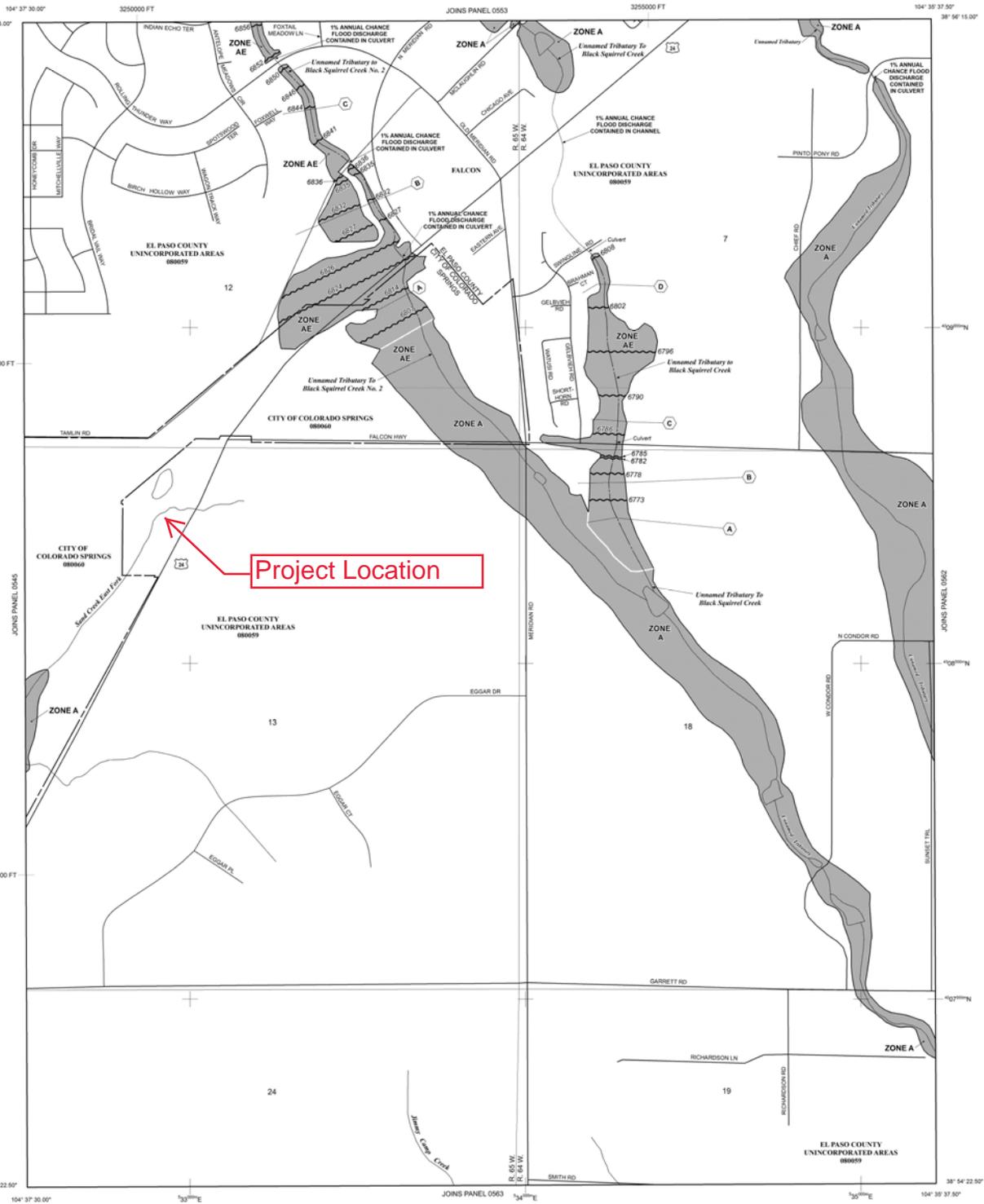
El Paso County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY REPORT FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map

Digital Flood Insurance Rate Map (DFIRM) was produced through a Strategic Technical Partner (CTP) agreement between the State of Colorado Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 SOUTH, RANGE 64 WEST, AND TOWNSHIP 13 SOUTH, RANGE 65 WEST.

LEGEND

- SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone AE, Zone A, Zone X, and Zone V. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AD** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of shallow fan flooding, velocities are determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently deteriorated. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; Base Flood Elevation determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- ZONE X** FLOODWAY AREAS IN ZONE AE
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than one square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are understood, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- Floodplain boundary
- Floodway boundary
- Zone D boundary
- Zone V boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet* (EL 567)
- Base Flood Elevation value where uniform within zone; elevation in feet*
- * Referenced to the North American Vertical Datum of 1988 (NAVD 88)
- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPS CODE 5002), Lambert Conformal Conic Projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- River Mile
- MAP REPOSITORIES
- Refer to Map Repositories list on Map Index
- EFFECTIVE DATE OF COUNTRYWIDE FLOOD INSURANCE RATE MAP: MARCH 17, 1997
- EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL: DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and incorporate previously issued Letters of Map Revision.

NFIP PANEL 0561G

FIRM FLOOD INSURANCE RATE MAP EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 561 OF 1300
(SEE MAP INDEX FOR FIRM PANEL LIST)

CONTAINS:

COMMUNITY	NUMBER	PANEL
COLORADO SPRINGS CITY OF	08600	081
EL PASO COUNTY	08609	081

Notes to User: The Map Number shown below should only be used when placing map orders. The Community Number shown above should be used on insurance applications and other community.

MAP NUMBER 08041C0

MAP REVISION DECEMBER 7, 2018
Federal Emergency Management Agency



December 13, 2018

Wetlands

- | | | | | | |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland |  | Lake |
|  | Estuarine and Marine Wetland |  | Freshwater Forested/Shrub Wetland |  | Other |
| | |  | Freshwater Pond |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX C
WOODMEN HILLS AGREEMENT TO ACCEPT FALCON MEADOW WASTEWATER
PROPERTY & EASEMENT DOCUMENTS

WOODMEN HILLS

METROPOLITAN DISTRICT

May 16, 2018

David Ozburn
11150 Hwy 24
Peyton, CO 80831

SUBJECT: Service for Falcon Meadow RV Campground

Dear Mr. Ozburn,

Woodmen Hills agrees to receive for treatment the sanitary sewer for your campground. The WHMD WRRF is currently at about 61% of the design capacity. The treatment facility is currently under a Compliance Order on Consent from the Colorado Department of Public Health and Environment. JDS Hydro Consulting Engineers has designed a new treatment plant and is currently under construction. Completion scheduled for October 2018.

The wastewater will be conveyed to Woodmen Hills Metropolitan District through a lift station owned and operated by Falcon Meadow RV Campground. The connection can be made upon receiving approval of the lift station from Colorado Department of Public Health and Environment. Engineered plans of the connection designed as per Woodmen Hills Specifications and approved by Woodmen Hills Metropolitan District are also required.



Jerry Jacobson
Operations Manager

EL PASO COUNTY - COLORADO5313000006
11150 E HIGHWAY 24Total Market Value
\$383,470**OVERVIEW**

Owner:	OZBURN JAMES C & DELIA L
Mailing Address:	11150 E US HIGHWAY 24 PEYTON CO, 80831-8106
Location:	11150 E HIGHWAY 24
Tax Status:	Taxable
Zoning:	RR-5
Plat No:	-
Legal Description:	TRACT IN NE4NW4 SEC 13-13-65 AS FOLS, BEG AT A PT ON W LN OF NE4NW4 SEC 13 THAT IS 725.5 FT S OF NW COR THEREOF, TH S ON SD W LN 594.5 FT TO SW COR OF NE4NW4, TH E ON S LN 358.25 FT TO A PT OF INTSEC WITH NWLY LN OF HWY 24, TH ANG L 62<17' + RUN NELY ON HWY LN 671.5 FT, TH W PARA TO S LN OF NE4NW4 670.5 FT TO POB

MARKET & ASSESSMENT DETAILS

	2018 Market Value	2018 Assessed Value
Land	\$201,313	\$45,310
Improvement	\$182,157	\$18,040
Total	\$383,470	\$63,350

RESIDENTIAL - RANCH (1)Market Value **\$148,871**

Assessment Rate	7.20	Above Grade Area	1,227
Bldg #	3	First Floor Area	1,227
Style Description	RANCH	Above First Floor Area	0
Property Description	MASONRY AVERAGE QUALITY	Lower Level Living Area	0
Year Built	1960	Total Basement Area	704
Dwelling Units	1	Finished Basement Area	
Number of Rooms	-	Garage Description	Multiple Types
Number of Bedrooms	2	Garage Area	944
Number of Baths	2.50	Carport Area	-

COMMERCIAL - STORAGE WAREHOUSE (1)Market Value **\$8,003**

Assessment Rate	29.00	Sprinkler	N
Bldg #	1	Elevator	N
Use	STORAGE WAREHOUSE	Occup 1	406
Year Built	1956	Occup 2	
Area	676	HVA 1	3
Class	C	HVA 2	
Quality	1.0	Wall Height	8
Stories	1	Land Size	309711
Perimeter	104	Neigh #	201
# Units			

COMMERCIAL - CONVENIENCE MARKET (2)Market Value **\$14,633**

Assessment Rate	29.00	Sprinkler	N
Bldg #	2	Elevator	N
Use	CONVENIENCE MARKET	Occup 1	419
Year Built	1983	Occup 2	
Area	1236	HVA 1	11
Class	D	HVA 2	
Quality	1.0	Wall Height	8.5
Stories	1	Land Size	309711
Perimeter	110	Neigh #	201
# Units			

COMMERCIAL - MOBILE HOME PARK (3)Market Value **\$7,399**

Assessment Rate	7.20	Sprinkler	N
Bldg #	3	Elevator	N
Use	MOBILE HOME PARK	Occup 1	999
Year Built	1960	Occup 2	
Area	625	HVA 1	
Class	A	HVA 2	
Quality	1.0	Wall Height	14
Stories	1	Land Size	309711
Perimeter	175	Neigh #	201
# Units	33		

COMMERCIAL - SHEDS/MISCL (4)Market Value **\$3,251**

Assessment Rate	7.20	Sprinkler	N
Bldg #	4	Elevator	N
Use	Sheds/Miscl	Occup 1	477
Year Built	2004	Occup 2	
Area	1000	HVA 1	
Class	S	HVA 2	
Quality	1.0	Wall Height	10
Stories	1	Land Size	309711
Perimeter	130	Neigh #	201
# Units			

LAND DETAILS

Sequence Number	Land Use	Assessment Rate	Area	Market Value
1	SINGLE FAMILY RES.	7.200	1 Acres	\$27,484
2	WELL AND SEPTIC	7.200	0	\$5,000
3	MOBILE HOME PARKS	7.200	1 Acres	\$27,484
4	WAREHOUSE/STORAGE	29.000	5.11 Acres	\$141,345

SALES HISTORY

	Sale Date	Sale Price	Sale Type	Reception
+	02/01/1986	\$0	Other	-

TAX ENTITY AND LEVY INFORMATION

County Treasurer Tax Information

Tax Area Code: **SBB** Levy Year: **2018** Mill Levy: **69.998**

Taxing Entity	Levy	Contact Name/Organization	Contact Phone
EL PASO COUNTY	7.738	FINANCIAL SERVICES	(719) 520-6498
EPC ROAD & BRIDGE (UNSHARED)	0.330	-	(719) 520-6498
EL PASO COUNTY SCHOOL NO 49	43.044	BRETT RIDGWAY	(719) 495-1130
PIKES PEAK LIBRARY	4.000	MIKE VARNET	(719) 531-6333
FALCON FIRE PROTECTION	14.886	TRENT HARWIG	(719) 495-4050



Disclaimer

We have made a good-faith effort to provide you with the most recent and most accurate information available. However, if you need to use this information in any legal or official venue, you will need to obtain official copies from the Assessor's Office. Do be aware that this data is subject to change on a daily basis. If you believe that any of this information is incorrect, please call us at (719) 520-6600.

EL PASO COUNTY - COLORADO5313000094
13-13-65Total Market Value
\$106,710**OVERVIEW**

Owner:	OZBURN JAMES C & DELIA L
Mailing Address:	11150 E US HIGHWAY 24 PEYTON CO, 80831-8106
Location:	13-13-65
Tax Status:	Taxable
Zoning:	RR-5
Plat No:	-
Legal Description:	THAT PART OF NE4NW4 LY WLY OF HWY 24 EX SLY 594.5 FT, EX RR R/W SEC 13-13-65

MARKET & ASSESSMENT DETAILS

	2018 Market Value	2018 Assessed Value
Land	\$102,100	\$29,610
Improvement	\$4,610	\$1,340
Total	\$106,710	\$30,950

COMMERCIAL - MINOR STRUCTURES VACANT LAND (1)Market Value **\$1,971**

Assessment Rate	29.00	Sprinkler	N
Bldg #	1	Elevator	N
Use	MINOR STRUCTURES VACANT LAND	Occup 1	117
Year Built	1920	Occup 2	
Area	800	HVA 1	
Class	D	HVA 2	
Quality	1.0	Wall Height	12
Stories	1	Land Size	426888
Perimeter	132	Neigh #	99
# Units			

COMMERCIAL - MINOR STRUCTURES VACANT LAND (2)Market Value **\$715**

Assessment Rate	29.00	Sprinkler	N
Bldg #	2	Elevator	N
Use	MINOR STRUCTURES VACANT LAND	Occup 1	477
Year Built	1920	Occup 2	
Area	528	HVA 1	
Class	D	HVA 2	
Quality	1.0	Wall Height	7
Stories	1	Land Size	426888
Perimeter	112	Neigh #	99
# Units			

COMMERCIAL - MINOR STRUCTURES VACANT LAND (3)Market Value **\$1,207**

Assessment Rate	29.00	Sprinkler	N
Bldg #	3	Elevator	N
Use	MINOR STRUCTURES VACANT LAND	Occup 1	102
Year Built	1920	Occup 2	
Area	400	HVA 1	
Class	D	HVA 2	
Quality	1.0	Wall Height	7
Stories	1	Land Size	426888
Perimeter	82	Neigh #	99
# Units			

COMMERCIAL - MINOR STRUCTURES VACANT LAND (4)Market Value **\$717**

Assessment Rate	29.00	Sprinkler	N
Bldg #	4	Elevator	N
Use	MINOR STRUCTURES VACANT LAND	Occup 1	117
Year Built	1920	Occup 2	
Area	272	HVA 1	
Class	D	HVA 2	
Quality	1.0	Wall Height	8
Stories	1	Land Size	426888
Perimeter	66	Neigh #	99
# Units			

LAND DETAILS

Sequence Number	Land Use	Assessment Rate	Area	Market Value
1	RES LAND AT 29%	29.000	9.8 Acres	\$102,100

SALES HISTORY

	Sale Date	Sale Price	Sale Type	Reception
+	03/01/1991	\$49,950	Good sale	2007559

TAX ENTITY AND LEVY INFORMATION

County Treasurer Tax Information

Tax Area Code: **SBB** Levy Year: **2018** Mill Levy: **69.998**

Taxing Entity	Levy	Contact Name/Organization	Contact Phone
EL PASO COUNTY	7.738	FINANCIAL SERVICES	(719) 520-6498
EPC ROAD & BRIDGE (UNSHARED)	0.330	-	(719) 520-6498
EL PASO COUNTY SCHOOL NO 49	43.044	BRETT RIDGWAY	(719) 495-1130
PIKES PEAK LIBRARY	4.000	MIKE VARNET	(719) 531-6333
FALCON FIRE PROTECTION	14.886	TRENT HARWIG	(719) 495-4050



No Photo Available



Disclaimer

We have made a good-faith effort to provide you with the most recent and most accurate information available. However, if you need to use this information in any legal or official venue, you will need to obtain official copies from the Assessor's Office. Do be aware that this data is subject to change on a daily basis. If

you believe that any of this information is incorrect, please call us at (719) 520-6600.

EXHIBIT A**Legal Description – 10 Foot Utility Easement**

A strip of land 10 feet wide over and across a portion of the former Chicago, Rock Island and Pacific Railroad Company right-of-way located in the Northeast Quarter of the Northwest Quarter of Section 13, Township 13 South, Range 65 West of the 6th P.M., El Paso County, Colorado. The centerline of said strip is described as follows:

The basis of bearings is a portion of said northwesterly right-of-way line, monumented at each end with a 1 1/2" aluminum cap marked "DB & CO PLS 17664". Said line is assumed to bear North 50 degrees 04' 28 seconds East, 369.68 feet.

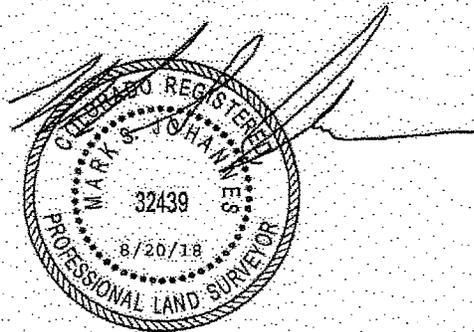
Commencing at the point of intersection of the west line of said Northeast Quarter of the Northwest Quarter with the northwesterly line of said right-of-way, thence along said northwesterly right-of-way line North 50 degrees 04 minutes 28 Seconds East 173.65 feet to the point of beginning of the centerline to be described:

- 1) thence South 61 degrees 39 minutes 23 seconds East 97.79 feet;
- 2) thence South 64 degrees 53 minutes 38 seconds East, 141.17 feet;
- 3) thence South 36 degrees 30 minutes 33 seconds East, 16.70 feet;
- 4) thence South 18 degrees 20 minutes 36 seconds East, 69.47 feet to the southeasterly line of said right-of-way and said centerline there terminating.

The sidelines of said easement are to be prolonged or shortened to terminate at said northwesterly and southeasterly right-of-way lines.

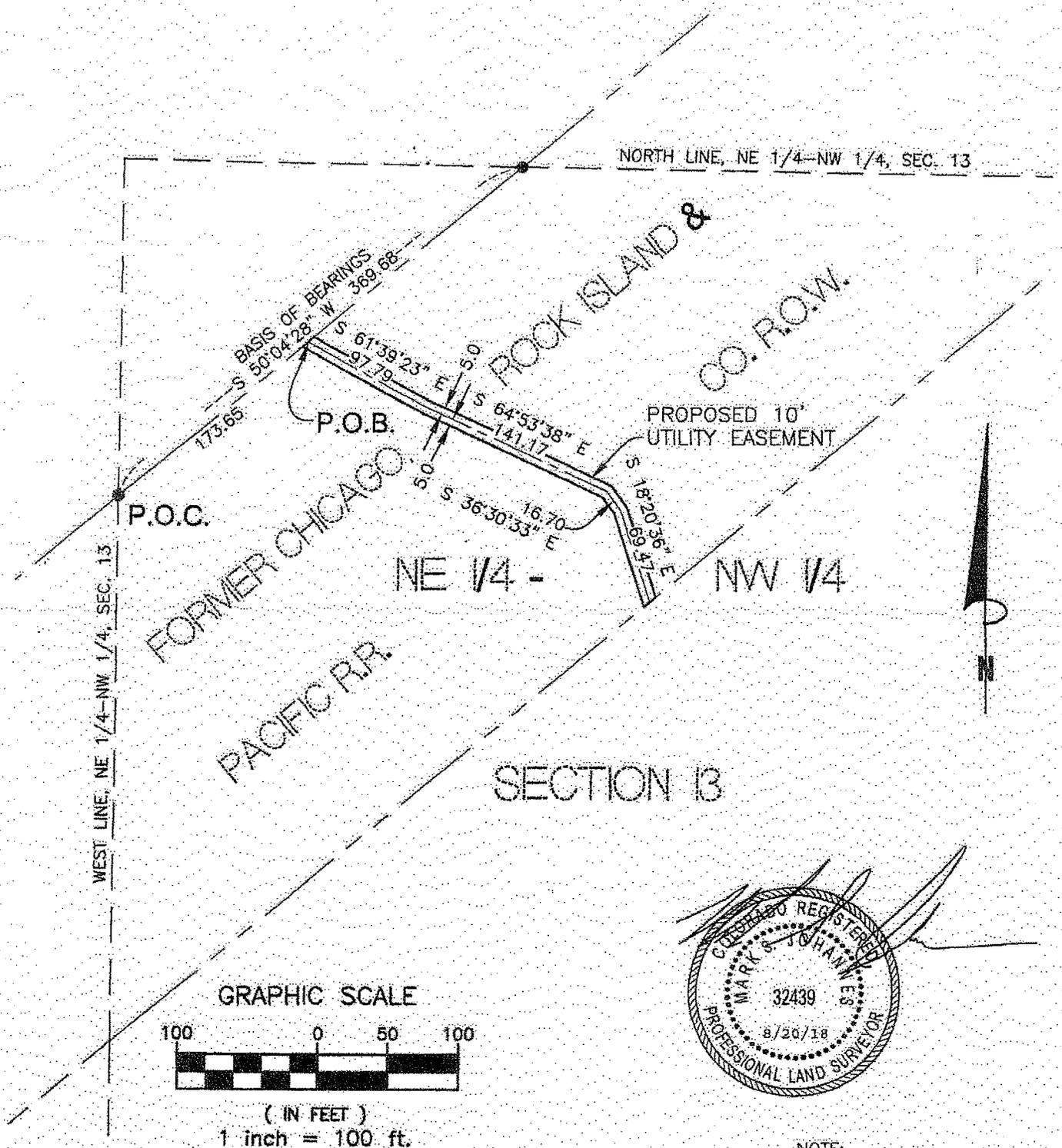
This legal description and exhibit was prepared by me or under my direct supervision and checking and is true and correct to the best of my knowledge, information and belief.

The above statement is neither a warranty or guarantee, either expressed or implied.



Mark S. Johannes, PLS, CFedS
 Colorado Professional Land Surveyor No. 32439
 For and on behalf of Compass Surveying & Mapping, LLC

EXHIBIT B



COMPASS SURVEYING & MAPPING, LLC
 721 SOUTH 23RD STREET, SUITE B
 COLORADO SPRINGS, CO 80904
 719-354-4120
 WWW.CSAMLLC.COM

PROJECT No. 18064
 AUGUST 20, 2018



PERMIT TO WORK IN THE RIGHT-OF-WAY

Permit No: 35239
Issue Date: 8/29/2018
Release Date:

- Permit Type:** Encroachment Permit Excavation Permit
 Obstruction Permit Annual Permit
 Telecommunications/Cable Provider

Permit Fee: \$426.25

The undersigned applicant, being familiar with the requirements of the El Paso County resolution of July 1, 2008, does hereby agree to perform all work in compliance with the regulations and specifications as set forth in said resolution and to adhere to the requirements specified below.

ESQCP Permit No.

Company: Falcon Meadow Campground

Telephone: 719-495-2694 Address: 11150 Hwy 24 City: Falcon State: CO Zip Code: 80831

Name of Applicant: David Osburn

Cell Phone:

E-Mail:

Project Address: Tamlin Rd 5545 (2x30)

Date of Application: 8/29/2018 Date to begin work: 10/1/2018 Date of completion: 10/31/2018

Work being performed for: Falcon Meadow Campground List of Subcontractors:

- For the purpose of:** Installing Repairing Removing Replacing
Type of work: Curb/Gutter Sidewalk Electric Gas Telephone Water Wastewater Cable Television
 Other Description:

Road #	Material	Hot Mix Asphalt	Bore	Cut	Width	Length	Age of HMA
Road #1: Tamlin Rd	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input checked="" type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	30		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
Road #2:	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
Road #3:	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
Road #4:	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
Road #5:	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		

REQUIREMENTS:

- State Law requires that notice of commencement, extent, and duration of any excavation work, be given to the owner or operator of underground facilities (utilities) at least two (2) business days in advance.
- Work zone traffic control shall be provided in accordance with the approved Traffic Control Plan.
- It is the responsibility of the contractor to contact Emergency Services, School Districts (if bus route), and other interested parties if road closure has been approved
- All backfill shall be compacted to 90% of AASHTO T-180 unless otherwise specified.
- All work sites shall be left clean and orderly.
- Contractor must call inspector 48 hours prior to start of work.

Additional Requirements: Select Backfill Flowable Fill Restore/Reseed Regravel Cold Mix patch immediately Bore
 Hot Mix Patch within 7 days Overlay Compaction Test(s) Remove all locate flags associated with project

EPC Remarks: Please contact Sarah McCormick (520-7847 or 330-5904) for inspection. ROW permit must be on site during project construction. County Engineer approval needed for closures of roads.

NOTICE:

- It is understood that should it become necessary for El Paso County to provide sign, light and barricade hazardous areas or restore the Right-of-Way to its original condition, that all costs of said work shall be borne by the Applicant
- Issuance of this permit does not relieve the applicant from satisfying El Paso County Land Development Code and Engineering Critical Manual requirements. In the event of conflict, this permit shall be considered NULL and VOID.
- Utilities or other facilities installed under this permit are subject to relocation, adjustment and modification at the owner's expense, in the event El Paso County determines such is necessary in order to perform road, bridge, drainage repairs, or any modifications and/or improvements.
- All permanent road repairs shall be completed within seven (7) calendar days of initial disturbance.
- Roadway closure will not be permitted unless approved by El Paso County Traffic Engineer at the time of application.
- All underground utility installations are to be at a thirty (30) inch minimum depth.
- All overhead utility installations are to be at a nineteen (19) foot minimum height.

SUMMARY OF CHARGES

Degradation Fee:	\$7.50
Traffic Management Fee:	\$3.75
Administration fee:	\$390.00
Surcharge:	\$25.00
Investigation Fee:	\$0.00
Total Permit Fee:	\$426.250
(Incentive) / Disincentive	\$0.000
Adjusted Permit Fee:	\$426.25

Applicant: *[Signature]*

Issued by: *Maggie Stack*

Date: *8/29/18*

WOODMEN HILLS

METROPOLITAN DISTRICT

August 22, 2018

David Ozburn
11150 Hwy 24
Peyton, CO 8031

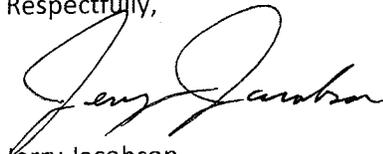
SUBJECT: Easement

Dear Mr. Ozburn,

Woodmen Hills is actively seeking to acquire an easement that would accommodate the wastewater line from your lift station. The easement would be on the north side of Tamlin, future Dublin, and would extend all the way to Antelope Meadows Drive. There is a force main in this area and because of the force main an easement must be secured to allow access for maintenance. The easement would also provide an area for you project. The easement would extend to Tamlin Road securing access to the Falcon Highlands Lift Station off of Tamlin Road. Currently access is off of Antelope Meadows Drive.

Please contact me with any questions or concerns.

Respectfully,



Jerry Jacobson
General Manager
Woodmen Hills Metropolitan District

APPENDIX D
WOODMEN HILLS METROPOLITAN DISTRICT DISCHARGE PERMIT



Colorado Department
of Public Health
and Environment

**AUTHORIZATION TO DISCHARGE UNDER THE
COLORADO DISCHARGE PERMIT SYSTEM
PERMIT NUMBER CO0047091**

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended), for both discharges to surface and ground waters, and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), for discharges to surface waters only, the

Woodmen Hills Metropolitan District

is authorized to discharge from the Woodmen Hills Metropolitan District Regional Wastewater Treatment Facility wastewater treatment plant located **in the SE 1/4 of the SW 1/4 of S30, T12S, R64W; 9503 Meridian Ranch Boulevard in Falcon, CO; at 38. ° 58' 13" latitude North and 104. ° 35' 59" longitude West.**

to an unnamed tributary to Black Squirrel Creek

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

The applicant may demand an adjudicatory hearing within thirty (30) calendar days of the date of issuance of the final permit determination, per the Colorado State Discharge Permit System Regulation 61.7(1). Should the applicant choose to contest any of the effluent limitations, monitoring requirements or other conditions contained herein, the applicant must comply with Section 24-4-104 CRS 1973 and the Colorado State Discharge Permit System Regulations. Failure to contest any such effluent limitation, monitoring requirement, or other condition, constitutes consent to the condition by the applicant.

This permit and the authorization to discharge shall expire at midnight, January 31, 2020

Issued and Signed this 31st day of December, 2014

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Janet Kieler, Permits Section Manager
Water Quality Control Division

ISSUED AND SIGNED: DECEMBER 31, 2014

EFFECTIVE: FEBRUARY 1, 2015

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PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Permitted Feature(s)

Beginning no later than the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from, and self monitoring samples taken in accordance with the monitoring requirements shall be obtained from permitted feature(s):

001A following disinfection and prior to mixing with the receiving stream. 38° 58' 12" N, 104° 35' 31" W

001P following disinfection and prior to mixing with the receiving stream. 38° 58' 12" N, 104° 35' 31" W

The location(s) provided above will serve as the point(s) of compliance for this permit and are appropriate as they are located after all treatment and prior to discharge to the receiving water. Any discharge to the waters of the State from a point source other than specifically authorized by this permit is prohibited.

In accordance with the Water Quality Control Commission Regulations for Effluent Limitations, Section 62.4, and the Colorado Discharge Permit System Regulations, Section 61.8(2), 5 C.C.R. 1002-61, the permitted discharge shall not contain effluent parameter concentrations which exceed the following limitations specified below or exceed the specified flow limitation.

2. Limitations, Monitoring Frequencies and Sample Types for Effluent Parameters

In order to obtain an indication of the probable compliance or noncompliance with the effluent limitations specified in Part I.A, the permittee shall monitor all effluent parameters at the frequencies and sample types specified below. Such monitoring will begin immediately and last for the life of the permit unless otherwise noted. The results of such monitoring shall be reported on the Discharge Monitoring Report form (See Part I.D.)

Self-monitoring sampling by the permittee for compliance with the effluent monitoring requirements specified in this permit, shall be performed at the location(s) noted in Part I.A.1 above. If the permittee, using an approved analytical method, monitors any parameter more frequently than required by this permit, then the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (DMRs) or other forms as required by the Division. Such increased frequency shall also be indicated.

Percentage Removal Requirements (BOD₅ Limitations) - If noted in the limits table(s), the arithmetic mean of the BOD₅ concentrations for effluent samples collected during the DMR reporting period shall demonstrate a minimum of eighty-five percent (85%) removal of BOD₅, as measured by dividing the respective difference between the mean influent and effluent concentrations for the DMR monitoring period by the respective mean influent concentration for the DMR monitoring period, and multiplying the quotient by 100.

Oil and Grease Monitoring: For every outfall with oil and grease monitoring, in the event an oil sheen or floating oil is observed, a grab sample shall be collected and analyzed for oil and grease, and reported on the appropriate DMR under parameter 03582. In addition, corrective action shall be taken immediately to mitigate the discharge of oil and grease. A description of the corrective action taken should be included with the DMR.

Total Residual Chlorine: Monitoring for TRC is required only when chlorine is in use.

Flow Recording Device: For this facility, flow recording devices are provided and located at the points of inflow to and discharge from the treatment plant. Reported effluent flows will be used to monitor hydraulic loading to the plant.

Metals: Metals concentrations measured in compliance with the effluent monitoring requirements listed in Part I.A of this permit may be used to satisfy any pretreatment or industrial waste management metals monitoring requirements listed in Part I.B.7.g, if the metals are in the same form (i.e. total). The special sampling procedures (e.g. 24-hour composite samples) specified in Part I.B.7.g must be followed.

Permitted Feature/Limit Set 001A

<u>ICIS Code</u>	<u>Effluent Parameter</u>	<u>Effluent Limitations Maximum Concentrations</u>				<u>Monitoring Requirements</u>	
		<u>30-Day Average</u>	<u>7-Day Average</u>	<u>Daily Maximum</u>	<u>2 Year Rolling Average</u>	<u>Frequency</u>	<u>Sample Type</u>
50050	Effluent Flow (MGD)	1.3		Report		Daily	Recorder
00400	pH (su)			6.5-9		Daily	Grab
51040	E. coli (#/100 ml)	126	252			2 Days/Week	Grab
50060	TRC (mg/l)	0.011		0.019		Daily	Grab
00640	Total Inorganic Nitrogen (mg/l) Until 10/31/2018			Report		2 Days/Week	Grab
00640	Total Inorganic Nitrogen (mg/l) Beginning 11/01/2018			10		2 Days/Week	Grab
00610	Total Ammonia as N (mg/l) Until 10/31/2018	65		91		2 Days/Week	Grab
00610	Total Ammonia as N (mg/l) Beginning 11/01/2018						
	January	6.3		15.9		2 Days/Week	Grab
	February	6.5		16.3		2 Days/Week	Grab
	March	5.4		15.4		2 Days/Week	Grab
	April	3.6		14.6		2 Days/Week	Grab
	May	3.6		17.5		2 Days/Week	Grab
	June	3.3		22.3		2 Days/Week	Grab
	July	2.8		22.3		2 Days/Week	Grab
	August	2.9		22.0		2 Days/Week	Grab
	September	3.4		24.2		2 Days/Week	Grab
	October	3.7		18.7		2 Days/Week	Grab
	November	4.2		13.9		2 Days/Week	Grab
	December	5.8		15.7		2 Days/Week	Grab
00310	BOD5, effluent (mg/l)	30	45			2 Days/Week	Grab
81010	BOD5 (% removal)	85 (min)				2 Days/Week	Calculated
00530	TSS, effluent (mg/l)	75	110			2 Days/Week	Grab
84066	Oil and Grease (visual)			Report		Daily	Visual
03582	Oil and Grease (mg/l)			10		Contingent	Grab
70295	TDS (mg/l)			Report		Quarterly	Grab
00900	Total Hardness			Report		Annually	Grab
00978	As, TR (µg/l)	Report				Quarterly	Grab
01313	Cd, PD (µg/l)	0.95		6.9	0.14	Monthly	Grab
01314	Cr+3, PD (µg/l)	Report		Report		Semiannually	Grab
01220	Cr+6, Dis (µg/l)	10		16		Monthly	Grab
01306	Cu, PD (µg/l)	22		37		Monthly	Grab
00718	CN, WAD (µg/l)			14		Monthly	Grab

	Until 12/31/2016				
00718	CN, WAD (µg/l) Beginning 01/01/2017		5	Monthly	Grab
00980	Fe, TR (µg/l)	585		Monthly	Grab
01318	Pb, PD (µg/l)	1.4	201	Monthly	Grab
01319	Mn, PD (µg/l)	Report	Report	Semiannually	Grab
01129	Mo, TR (µg/l)	Report		Quarterly	Grab
50092	Hg, Tot (µg/l) (Low-level)	0.01		Monthly	Grab
01322	Ni, PD (µg/l)	Report	Report	Semiannually	Grab
01323	Se, PD (µg/l)	2.5	18.4	Monthly	Grab
01304	Ag, PD (µg/l)	Report	Report	Quarterly	Grab
01303	Zn, PD (µg/l)	82	439	Monthly	Grab
51568	Nonylphenol (µg/l)	Report	Report	Semiannually	Grab
	*WET, chronic				
	Until 12/31/2015				
TKP6C	Static Renewal 7 Day Chronic <i>Pimephales promelas</i>		Report NOEC or IC25 ≥ IWC	Quarterly	3 Composites / Test
TKP3B	Static Renewal 7 Day Chronic <i>Ceriodaphnia dubia</i>		Report NOEC or IC25 ≥ IWC	Quarterly	3 Composites / Test
	Beginning 1/1/2016				
TKP6C	Static Renewal 7 Day Chronic <i>Pimephales promelas</i>		NOEC or IC25 ≥ IWC	Quarterly	3 Composites / Test
TKP3B	Static Renewal 7 Day Chronic <i>Ceriodaphnia dubia</i>		NOEC or IC25 ≥ IWC	Quarterly	3 Composites / Test

* Since the IWC is 100%, NOEC and IC25 = IWC.

Permitted Feature/Limit Set 001P

<u>ICIS Code</u>	<u>Effluent Parameter</u>	<u>Effluent Maximum Concentrations, Daily Max</u>	<u>Frequency</u>	<u>Sample Type</u>
01002	Total Arsenic, µg/l	Report	Annually	Grab
01027	Total Cadmium, µg/l	Report	Annually	Grab
01034	Total Chromium, µg/l	Report	Annually	Grab
01042	Total Copper, µg/l	Report	Annually	Grab
01051	Total Lead, µg/l	Report	Annually	Grab
71900	Total Mercury, µg/l	Report	Annually	Grab
01062	Total Molybdenum, µg/l	Report	Annually	Grab
01067	Total Nickel, µg/l	Report	Annually	Grab
01147	Total Selenium, µg/l	Report	Annually	Grab
01077	Total Silver, µg/l	Report	Annually	Grab
01092	Total Zinc, µg/l	Report	Annually	Grab
00720	Total Cyanide, µg/l	Report	Annually	Grab
03604	Total Phenols, µg/l	Report	Annually	Grab

3. Monitoring Frequency and Sample Type Influent Parameters

Regardless of whether or not an effluent discharge occurs and in order to obtain an indication of the current influent loading as compared to the approved capacity specified in Part I.A.3 and Part I.B.2; the permittee shall monitor influent parameters at the following required frequencies, the results to be reported on the Discharge Monitoring Report (See Part I.D):

If the permittee monitors any parameter more frequently than required by the permit, using an approved test procedure or as specified in the permit, the result of this monitoring shall be included in the calculation and reporting of data to the Division.

Self-monitoring samples taken in compliance with the monitoring requirements specified below shall be taken at the following location(s): **Outfall 300I, at a representative point prior to biological treatment.**

Permitted Feature 300I

ICIS Code	Parameter	Discharge Limitations Maximum Concentrations			Monitoring Frequency	Sample Type
		30-Day Average	7-Day Average	Daily Max.		
50050 G	Flow, mgd	Report		Report	Continuous ¹	Recorder ¹
00180 G	Plant Capacity (% of Capacity - Hydraulic) ¹	Report			Monthly	Calculated ¹
00310 G	BOD ₅ , mg/l	Report	Report		Monthly	Composite
00310 G	BOD ₅ , lbs/day	Report	Report		Monthly	Calculated
00180 G	Plant Capacity (% of Capacity - Organic) ¹	Report			Monthly	Calculated ¹
00530G	Total Suspended Solids, mg/l	Report	Report		Monthly	Composite

¹ The % capacity is to be reported against the listed capacities of 1.3 for the hydraulic capacity and 3470 for the organic capacities as noted in Site Approval 4512. The percentage should be calculated using the 30-day average values divided by the corresponding capacity, times 100.

B. TERMS AND CONDITIONS

1. Service Area

All wastewater flows contributed in the service area may be accepted by the Woodmen Hills Metropolitan District for treatment at the permittee's wastewater treatment plant provided that such acceptance does not cause or contribute to an exceedance of the throughput or design capacity of the treatment works or the effluent limitations in Part I.A, or constitute a substantial impact to the functioning of the treatment works, degrade the quality of the receiving waters, or harm human health, or the environment.

In addition, the permittee shall enter into and maintain service agreements with any municipalities that discharge into the wastewater treatment facility. The service agreements shall contain all provisions necessary to protect the financial, physical, and operational integrity of the wastewater treatment works.

2. Design Capacity

Based on Site Approval **4512**, the design capacity of this domestic wastewater treatment works is **1.3 million gallons per day (MGD)** for hydraulic flow (30-day average) and **3470 lbs. BOD₅ per day** for organic loading (30-day average).

3. **Expansion Requirements**

Pursuant to Colorado Law, C.R.S. 25-8-501 (5 d & e), the permittee is required to initiate engineering and financial planning for expansion of the domestic wastewater treatment works whenever throughput reaches eighty (80) percent of the treatment capacity. Such planning may be deemed unnecessary upon a showing that the area served by the domestic wastewater treatment works has a stable or declining population; but this provision shall not be construed as preventing periodic review by the Division should it be felt that growth is occurring or will occur in the area.

The permittee shall commence construction of such domestic wastewater treatment works expansion whenever throughput reaches ninety-five (95) percent of the treatment capacity or, in the case of a municipality, either commence construction or cease issuance of building permits within such municipality until such construction is commenced; except that building permits may continue to be issued for any construction which would not have the effect of increasing the input of wastewater to the sewage treatment works of the municipality involved.

Where unusual circumstances result in throughput exceeding 80% of treatment capacity, the permittee may, in lieu of initiating planning for expansion, submit a report to the Division that demonstrates that it is unlikely that the event will reoccur, or even if it were to reoccur, that 95% of the treatment capacity would not be exceeded.

Where unusual circumstances result in throughput exceeding 95% of the treatment capacity, the permittee may, in lieu of initiating construction of the expansion, submit a report to the Division that demonstrates that the domestic wastewater treatment works was in compliance at all times during the events and that it is extremely unlikely that the event will reoccur.

Where the permittee submits a report pursuant to unusual circumstances, and the Division, upon review of such report, determines in writing to the permittee that the report does not support the required findings, the permittee shall initiate planning and/or construction of the domestic wastewater treatment works as appropriate.

4. **Facilities Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control including all portions of the collection system and lift stations owned by the permittee (and related appurtenances) which are installed or used by the permittee as necessary to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes effective performance, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems when installed by the permittee only when necessary to achieve compliance with the conditions of the permit.

Any sludge produced at the wastewater treatment facility shall be disposed of in accordance with State and Federal regulations. The permittee shall take all reasonable steps to minimize or prevent any discharge of sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. As necessary, accelerated or additional monitoring to determine the nature and impact of the noncomplying discharge is required.

5. **Chronic WET Testing -Outfall: 001A**

a. General Chronic WET Testing and Reporting Requirements

The permittee shall conduct the chronic WET test using *Ceriodaphnia dubia* and *Pimephales promelas*, as a static renewal 7-day test using three separate composite samples. The permittee shall conduct each chronic WET test in accordance with the 40 CFR Part 136 methods described in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition, October 2002 (EPA-821-R-02-013) or the most current edition.

The following minimum dilution series should be used: 0% effluent (control), 20%, 40%, 60%, 80%, and 100% effluent. If the permittee uses more dilutions than prescribed, and accelerated testing is to be performed, the same dilution series shall be used in the accelerated testing (if applicable) as was initially used in the failed test.

Tests shall be done at the frequency listed in Part I.A.2. Test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting period when the sample was taken. (i.e., WET testing

results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, etc.) The permittee shall submit all laboratory statistical summary sheets, summaries of the determination of a valid, invalid or inconclusive test, and copies of the chain of custody forms, along with the DMR for the reporting period.

If a test is considered invalid, the permittee is required to perform additional testing during the monitoring period to obtain a valid test result. Failure to obtain a valid test result during the monitoring period shall result in a violation of the permit for failure to monitor.

b. Violations of the Permit Limit, Failure of One Test Statistical Endpoint and Division Notification

A chronic WET test is considered a violation of a permit limitation when both the NOEC and the IC25 are at any effluent concentration less than the IWC. The IWC for this permit has been determined to be **100%** effluent.

A chronic WET test is considered to have failed one of the two statistical endpoints when either the NOEC or the IC25 are at any effluent concentration less than the IWC. The IWC for this permit has been determined to be **100%** effluent.

In the event of a permit violation, or when two consecutive reporting periods have resulted in failure of one of the two statistical endpoints (regardless of which statistical endpoints are failed), the permittee must provide written notification to the Division. Such notification should explain whether it was a violation or two consecutive failures of a single endpoint, and must indicate whether accelerated testing or a Toxicity Identification Evaluation or Toxicity Reduction Evaluation (TIE or TRE) is being performed, unless otherwise exempted, in writing, by the Division. **Notification must be received by the Division within 14 calendar days of the permittee receiving notice of the WET testing results.**

c. Automatic Compliance Response

The permittee is responsible for implementing the automatic compliance response provisions of this permit when one of the following occurs:

- there is a violation of the permit limit (both the NOEC and the IC25 endpoints are less than the applicable IWC)
- two consecutive monitoring periods have resulted in failure of one of the two statistical endpoints (either the IC25 or the NOEC)
- the permittee is otherwise informed by the Division that a compliance response is necessary

When one of the above listed events occurs, the following automatic compliance response shall apply. The permittee shall either:

- conduct accelerated testing using the single species found to be more sensitive
- conduct a Toxicity Identification Evaluation (TIE) or a Toxicity Reduction Evaluation (TRE) investigation as described below.

i. Accelerated Testing

If accelerated testing is being performed, testing will be at least once every two weeks for up to five tests with only one test being run at a time, using only the IC25 statistical endpoint to determine if the test passed or failed at the appropriate IWC. Accelerated testing shall continue until; 1) two consecutive tests fail or three of five tests fail, in which case a pattern of toxicity has been demonstrated or 2) two consecutive tests pass or three of five tests pass, in which case no pattern of toxicity has been found. Note that the same dilution series should be used in the accelerated testing as was used in the initial test(s) that result in the accelerated testing requirement.

If accelerated testing is required due to failure of one statistical endpoint in two consecutive monitoring periods, and in both of those failures it was the NOEC endpoint that was failed, then the NOEC shall be the only statistical endpoint used to determine whether the accelerated testing passed or failed at the appropriate IWC. Note that the same dilution series should be used in the accelerated testing as was used in the initial test(s) that result in the accelerated testing requirement.

If no pattern of toxicity is found the toxicity episode is considered to be ended and routine testing is to resume. If a pattern of toxicity is found, a TIE/TRE investigation is to be performed. If a pattern of toxicity is not demonstrated but

a significant level of erratic toxicity is found, the Division may require an increased frequency of routine monitoring or some other modified approach. The permittee shall provide written notification of the results within 14 calendar days of completion of the Pattern of Toxicity/No Toxicity demonstration.

ii. Toxicity Identification Evaluation (TIE) or Toxicity Reduction Evaluation (TRE)

If a TIE or a TRE is being performed, the results of the investigation are to be received by the Division within 180 calendar days of the demonstration chronic WET in the routine test, as defined above, or if accelerated testing was performed, the date the pattern of toxicity is demonstrated. A status report is to be provided to the Division at the 60 and 120 calendar day points of the TIE or TRE investigation. The Division may extend the time frame for investigation where reasonable justification exists. A request for an extension must be made in writing and received prior to the 180 calendar day deadline. Such request must include a justification and supporting data for such an extension.

Under a TIE, the permittee may use the time for investigation to conduct a preliminary TIE (PTIE) or move directly into the TIE. A PTIE consists of a brief search for possible sources of WET, where a specific parameter(s) is reasonably suspected to have caused such toxicity, and could be identified more simply and cost effectively than a formal TIE. If the PTIE allows resolution of the WET incident, the TIE need not necessarily be conducted in its entirety. If, however, WET is not identified or resolved during the PTIE, the TIE must be conducted within the allowed 180 calendar day time frame.

The Division recommends that the EPA guidance documents regarding TIEs be followed. If another method is to be used, this procedure should be submitted to the Division prior to initiating the TIE.

If the pollutant(s) causing toxicity is/are identified, and is/are controlled by a permit effluent limitation(s), this permit may be modified upon request to adjust permit requirements regarding the automatic compliance response.

If the pollutant(s) causing toxicity is/are identified, and is/are not controlled by a permit effluent limitation(s), the Division may develop limitations the parameter(s), and the permit may be reopened to include these limitations.

If the pollutant causing toxicity is not able to be identified, or is unable to be specifically identified, or is not able to be controlled by an effluent limit, the permittee will be required to perform either item 1 or item 2 below.

1) Conduct an investigation which demonstrates actual instream aquatic life conditions upstream and downstream of the discharge, or identify, for Division approval, and conduct an alternative investigation which demonstrates the actual instream impact. This should include WET testing and chemical analyses of the ambient water. Depending on the results of the study, the permittee may also be required to identify the control program necessary to eliminate the toxicity and its cost. Data collected may be presented to the WQCC for consideration at the next appropriate triennial review of the stream standards;

2) Move to a TRE by identifying the necessary control program or activity and proceed with elimination of the toxicity so as to meet the WET effluent limit.

If toxicity spontaneously disappears in the midst of a TIE, the permittee shall notify the Division within 10 calendar days of such disappearance. The Division may require the permittee to conduct accelerated testing to demonstrate that no pattern of toxicity exists, or may amend the permit to require an increased frequency of WET testing for some period of time. If no pattern of toxicity is demonstrated through the accelerated testing or the increased monitoring frequency, the toxicity incident response will be closed and normal WET testing shall resume.

The control program developed during a TRE consists of the measures determined to be the most feasible to eliminate WET. This may happen through the identification of the toxicant(s) and then a control program aimed specifically at that toxicant(s) or through the identification of more general toxicant treatability processes. A control program is to be developed and submitted to the Division within 180 calendar days of beginning a TRE. Status reports on the TRE are to be provided to the Division at the 60 and 120 calendar day points of the TRE investigation.

If toxicity spontaneously disappears in the midst of a TRE, the permittee shall notify the Division within 10 calendar days of such disappearance. The Division may require the permittee to conduct accelerated testing to demonstrate that no pattern of toxicity exists, or may amend the permit to require an increased frequency for some period of time. If no

pattern of toxicity is demonstrated through the accelerated testing or the increased monitoring frequency, the toxicity incident response will be closed and normal WET testing shall resume.

d. Toxicity Reopener

This permit may be reopened and modified to include additional or modified numerical permit limitations, new or modified compliance response requirements, changes in the WET testing protocol, the addition of both acute and chronic WET requirements, or any other conditions related to the control of toxicants.

6. Compliance Schedule(s)

a. Activities to Meet Total Ammonia, Total Nitrate as Total Inorganic Nitrogen – In order to meet Total Ammonia and Nitrate and Total Inorganic Nitrogen final limits, the following schedule for construction is included in the permit.

Code	Event	Description	Due Date
06599	Hire a Consultant/Professional Engineer	Submit a letter of notification that a Colorado licensed engineering consultant has been obtained and funding has been secured for planning aspects	1/31/2015
CS011	Plan, Report, or Scope of Work	If a site approval is required and/or if changes to the most recent WQA are necessary, submit a letter of notification that Preliminary Effluent Limits (PELs) have been received and report progress in obtaining funding for design and construction aspects	8/31/2015
73905	Engineering Plan	Submit a letter of notification that funding has been obtained for design and construction aspects, and final plans specifications have been submitted to the Division. Note that a Site Application and a preliminary design must be submitted and approved by the Division prior to final plans and specifications.	8/31/2016
CS015	Commence Required Work or On-Site Construction	Submit a letter of notification that Final Design Approval has been received from the Division and construction has commenced.	5/31/2017
CS010	Status/Progress Report	Submit a construction progress report summarizing the progress in construction or other activities.	12/31/2017
CS016	Complete Required Work or On-Site Construction	Complete construction of facilities or other appropriate actions, which will allow the permittee to meet the final limitations.	10/31/2018

b. Activities to Meet Cyanide Final Limits – In order to meet the cyanide limitations, the following schedule is included in the permit.

Code	Event	Description	Due Date
43699	Facility Evaluation Plan	Submit a report that identifies sources of cyanide to the wastewater treatment facility and identifies strategies to control these sources or treatment alternatives such that compliance with the final limitations may be attained.	7/31/2015
00899	Implementation Schedule	Submit a progress report summarizing the progress in implementing the strategies to control sources such that compliance with the final Cyanide limitations may be attained.	12/31/2015

CS017	Achieve Final Compliance with Discharge Limits	Submit study results that show compliance has been attained with the final and Cyanide limitations.	12/31/2016
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Regulation 61.8(3)(n)(i) states that a report should be submitted to the Division no later than 14 calendar days following each date identified in the schedule of compliance. The 14 days have already been incorporated into the above dates and therefore all reports are due on or before the date listed in the table.

7. **Industrial Waste Management**

- a. The Permittee has the responsibility to protect the Domestic Wastewater Treatment Works (DWTW), as defined at section 25.8.103(5) of the Colorado Water Quality Control Act, or the Publicly-Owned Treatment Works (POTW), as defined at 40 CFR section 403.3(q) of the federal pretreatment regulations, from pollutants which would cause pass through or interference, as defined at 40 CFR 403.3(p) and (k), or otherwise be incompatible with operation of the treatment works including interference with the use or disposal of municipal sludge.
- b. Pretreatment Standards (40 CFR Section 403.5) developed pursuant to Section 307 of the Federal Clean Water Act (the Act) require that the Permittee shall not allow, under any circumstances, the introduction of the following pollutants to the DWTW from any source of non-domestic discharge:
 - i. Pollutants which create a fire or explosion hazard in the DWTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than sixty (60) degrees Centigrade (140 degrees Fahrenheit) using the test methods specified in 40 CFR Section 261.21;
 - ii. Pollutants which will cause corrosive structural damage to the DWTW, but in no case discharges with a pH of lower than 5.0 s.u., unless the treatment facilities are specifically designed to accommodate such discharges;
 - iii. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the DWTW, or otherwise interfere with the operation of the DWTW;
 - iv. Any pollutant, including oxygen demanding pollutants (e.g., BOD), released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with any treatment process at the DWTW;
 - v. Heat in amounts which will inhibit biological activity in the DWTW resulting in Interference, but in no case heat in such quantities that the temperature at the DWTW treatment plant exceeds forty (40) degrees Centigrade (104 degrees Fahrenheit) unless the Approval Authority, upon request of the DWTW, approves alternate temperature limits;
 - vi. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause Interference or Pass Through;
 - vii. Pollutants which result in the presence of toxic gases, vapors, or fumes within the DWTW in a quantity that may cause acute worker health and safety problems;
 - viii. Any trucked or hauled pollutants, except at discharge points designated by the DWTW; and
 - ix. Any specific pollutant that exceeds a local limitation established by the Permittee in accordance with the requirements of 40 CFR Section 403.5(c) and (d).
 - x. Any other pollutant which may cause Pass Through or Interference.
- c. EPA shall be the Approval Authority and the mailing address for all reporting and notifications to the Approval Authority shall be: USEPA 1595 Wynkoop St. 8ENF-W-NP, Denver, CO 80202-1129. Should the State be delegated

authority to implement and enforce the Pretreatment Program in the future, the Permittee shall be notified of the delegation and the state permitting authority shall become the Approval Authority.

- d. In addition to the general limitations expressed above, more specific Pretreatment Standards have been and will be promulgated for specific industrial categories under Section 307 of the Act (40 CFR Part 405 et. seq.).
- e. The Permittee must notify the state permitting authority and the Approval Authority, of any new introductions by new or existing industrial users or any substantial change in pollutants from any industrial user within sixty (60) calendar days following the introduction or change. Such notice must identify:
 - i. Any new introduction of pollutants into the DWTW from an industrial user which would be subject to Sections 301, 306, or 307 of the Act if it were directly discharging those pollutants; or
 - ii. Any substantial change in the volume or character of pollutants being introduced into the DWTW by any industrial user;
 - iii. For the purposes of this section, adequate notice shall include information on:
 - (A) The identity of the industrial user;
 - (B) The nature and concentration of pollutants in the discharge and the average and maximum flow of the discharge to be introduced into the DWTW; and
 - (C) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from or biosolids or sludge produced at such DWTW.
 - iv. For the purposes of this section, an industrial user shall include:
 - (A) Any discharger subject to Categorical Pretreatment Standards under Section 307 of the Act and 40 CFR chapter I and subchapter N;
 - (B) Any discharger which has a process wastewater flow of 25,000 gallons or more per day;
 - (C) Any discharger contributing five percent or more of the average dry weather hydraulic or organic capacity of the DWTW treatment plant;
 - (D) Any discharger who is designated by the Approval Authority as having a reasonable potential for adversely affecting the DWTW's operation or for violating any Pretreatment Standard or requirements;
- f. At such time as a specific Pretreatment Standard or requirement becomes applicable to an industrial user of the Permittee, the state permitting authority and/or Approval Authority may, as appropriate:
 - i. Amend the Permittee's CDPS discharge permit to specify the additional pollutant(s) and corresponding effluent limitation(s) consistent with the applicable national Pretreatment Standards;
 - ii. Require the Permittee to specify, by ordinance, order, or other enforceable means, the type of pollutant(s) and the maximum amount which may be discharged to the Permittee's DWTW for treatment. Such requirement shall be imposed in a manner consistent with the program development requirements of the General Pretreatment Regulations at 40 CFR Part 403; and/or,
 - iii. Require the Permittee to monitor its discharge for any pollutant which may likely be discharged from the Permittee's DWTW, should the industrial user fail to properly pretreat its waste.

The state permitting authority and the Approval Authority retains, at all times, the right to take legal action against any source of nondomestic discharge, whether directly or indirectly controlled by the Permittee, for violations of a permit, order or similar enforceable mechanism issued by the Permittee, violations of any Pretreatment Standard or requirement, or for failure to discharge at an acceptable level under national standards issued by EPA under 40 CFR, chapter I, subchapter N. In those cases where a CDPS permit violation has occurred because of the failure of the Permittee to properly develop and enforce

Pretreatment Standards and requirements as necessary to protect the DWTW, the state permitting authority and/or Approval Authority shall hold the Permittee and/or industrial user responsible and may take legal action against the Permittee as well as the Industrial user(s) contributing to the permit violation.

g. The Permittee shall analyze the treatment facility effluent for the presence of the following pollutants:

Total Arsenic	Total Nickel
Total Cadmium	Total Selenium
Total Chromium	Total Silver
Total Copper	Total Zinc
Total Lead	Total Cyanide
Total Mercury	Total Phenols
Total Molybdenum	

The sampling shall commence within thirty (30) days of the effective date of this permit and continue at the following frequency: **1 per year**.

Sampling methods shall be those defined in 40 CFR Part 136, 40 CFR Part 403, as defined in this permit, or as specified by the Approval Authority. Where sampling methods are not specified, the effluent samples collected shall be composite samples consisting of at least twelve (12) aliquots collected at approximately equal intervals over a representative 24-hour period and composited according to flow. Where automated composite sampling is inappropriate, at least four (4) grab samples shall be manually taken at equal intervals over a representative 24-hour period, and composited prior to analysis using approved methods; alternatively, the individual grab samples may be analyzed separately and the results from the respective grab samples mathematically combined based on flow (i.e., flow weighted) for the final result.

The state permitting authority and the Approval Authority retains, at all times, the right to take legal action against any source of nondomestic discharge, whether directly or indirectly controlled by the Permittee, for violations of a permit, order or similar enforceable mechanism issued by the Permittee, violations of any Pretreatment Standard or requirement, or for failure to discharge at an acceptable level under national standards issued by EPA under 40 CFR, chapter I, subchapter N. In those cases where a CDPS permit violation has occurred because of the failure of the Permittee to properly develop and enforce Pretreatment Standards and requirements as necessary to protect the DWTW, the state permitting authority and/or Approval Authority shall hold the Permittee and/or industrial user responsible and may take legal action against the Permittee as well as the Industrial user(s) contributing to the permit violation.

C. DEFINITION OF TERMS

1. "Acute Toxicity" - The acute toxicity limitation is exceeded if the LC50 is at any effluent concentration less than or equal to the IWC indicated in this permit.
2. "Antidegradation limits" – See "Two (2) - Year Rolling Average".
3. "Chronic toxicity", which includes lethality and growth or reproduction, occurs when the NOEC and IC25 are at an effluent concentration less than the IWC indicated in this permit.
4. "Composite" sample is a minimum of four (4) grab samples collected at equally spaced two (2) hour intervals and proportioned according to flow. For a SBR type treatment system, a composite sample is defined as sampling equal aliquots during the beginning, middle and end of a decant period, for two consecutive periods during a day (if possible).
5. "Continuous" measurement, is a measurement obtained from an automatic recording device which continually measures the effluent for the parameter in question, or that provides measurements at specified intervals.
6. "Daily Maximum limitation" for all parameters (except temperature, pH and dissolved oxygen) means the limitation for this parameter shall be applied as an average of all samples collected in one calendar day. For these parameters the DMR shall include the highest of the daily averages. For pH and dissolved oxygen, this means an instantaneous maximum (and/or instantaneous minimum) value. The instantaneous value is defined as the analytical result of any individual sample. For pH and dissolved oxygen, DMRs shall include the maximum (and/or minimum) of all instantaneous values within the calendar month. Any value beyond the noted daily maximum limitation for the indicated parameter shall be considered a violation of this permit. For temperature, see Daily Maximum Temperature.

7. "Daily Maximum Temperature (DM)" is defined in the Basic Standards and Methodologies for Surface Water 1002-31, as the highest two-hour average water temperature recorded during a given 24-hour period. This will be determined using a rolling 2-hour maximum temperature. If data is collected every 15 minutes, a 2 hour maximum can be determined on every data point after the initial 2 hours of collection. Note that the time periods that overlap days (Wednesday night to Thursday morning) do not matter as the reported value on the DMR is the greatest of all the 2-hour averages.

For example data points collected at:

08:15, 08:30, 08:45, 09:00, 09:15, 09:30, 09:45, 10:00, would be averaged for a single 2 hour average data point

08:30, 08:45, 09:00, 09:15, 09:30, 09:45, 10:00, 10:15, would be averaged for a single 2 hour average data point

08:45, 09:00, 09:15, 09:30, 09:45, 10:00, 10:15, 10:30, would be averaged for a single 2 hour average data point

This would continue throughout the course of a calendar day. The highest of these 2 hour averages over a month would be reported on the DMR as the daily maximum temperature. At the end/beginning of a month, the collected data should be used for the month that contains the greatest number of minutes in the 2-hour maximum. Data from 11 pm to 12:59 am, would fall in the previous month. Data collected from 11:01 pm to 1:00 am would fall in the new month.

8. "Dissolved (D) metals fraction" is defined in the Basic Standards and Methodologies for Surface Water 1002-31, as that portion of a water and suspended sediment sample which passed through a 0.40 or 0.45 UM (micron) membrane filter. Determinations of "dissolved" constituents are made using the filtrate. This may include some very small (colloidal) suspended particles which passed through the membrane filter as well as the amount of substance present in true chemical solution.
9. "Geometric mean" for *E. coli* bacteria concentrations, the thirty (30) day and seven (7) day averages shall be determined as the geometric mean of all samples collected in a thirty (30) day period and the geometric mean of all samples taken in a seven (7) consecutive day period respectively. The geometric mean may be calculated using two different methods. For the methods shown, a, b, c, d, etc. are individual sample results, and n is the total number of samples.

Method 1:

Geometric Mean = $(a*b*c*d*...)^{(1/n)}$ "*" - means multiply

Method 2:

Geometric Mean = antilog ([log(a)+log(b)+log(c)+log(d)+...]/n)

Graphical methods, even though they may also employ the use of logarithms, may introduce significant error and may not be used.

In calculating the geometric mean, for those individual sample results that are reported by the analytical laboratory to be "less than" a numeric value, a value of 1 should be used in the calculations. If all individual analytical results for the month are reported to be less than numeric values, then report "less than" the largest of those numeric values on the monthly DMR. Otherwise, report the calculated value.

For any individual analytical result of "too numerous to count" (TNTC), that analysis shall be considered to be invalid and another sample shall be promptly collected for analysis. If another sample cannot be collected within the same sampling period for which the invalid sample was collected (during the same month if monthly sampling is required, during the same week if weekly sampling is required, etc.), then the following procedures apply:

- i. A minimum of two samples shall be collected for coliform analysis within the next sampling period.
- ii. If the sampling frequency is monthly or less frequent: For the period with the invalid sample results, leave the spaces on the corresponding DMR for reporting coliform results empty and attach to the DMR a letter noting that a result of TNTC was obtained for that period, and explain why another sample for that period had not been collected.

If the sampling frequency is more frequent than monthly: Eliminate the result of TNTC from any further calculations, and use all the other results obtained within that month for reporting purposes. Attach a letter noting that a result of TNTC was obtained, and list all individual analytical results and corresponding sampling dates for that month.

10. "Grab" sample, is a single "dip and take" sample so as to be representative of the parameter being monitored.
11. "IC25" or "Inhibition Concentration" is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal biological measurement (e.g. growth or reproduction) calculated from a continuous model (i.e. interpolation method). IC25 is a point estimate of the toxic concentration that would cause a 25-percent reduction in a non-lethal biological measurement.
12. "In-situ" measurement is defined as a single reading, observation or measurement taken in the field at the point of discharge.
13. "Instantaneous" measurement is a single reading, observation, or measurement performed on site using existing monitoring facilities.
14. "LC50" or "Lethal Concentration" is the toxic or effluent concentration that would cause death in 50 percent of the test organisms over a specified period of time.
15. "Maximum Weekly Average Temperature (MWAT)" is defined in the Basic Standards and Methodologies for Surface Water 1002-31, as an implementation statistic that is calculated from field monitoring data. The MWAT is calculated as the largest mathematical mean of multiple, equally spaced, daily temperatures over a seven-day consecutive period, with a minimum of three data points spaced equally through the day. For lakes and reservoirs, the MWAT is assumed to be equivalent to the maximum WAT from at least three profiles distributed throughout the growing season (generally July-September).

The MWAT is calculated by averaging all temperature data points collected during a calendar day, and then averaging the daily average temperatures for 7 consecutive days. This 7 day averaging period is a rolling average, i.e. on the 8th day, the MWAT will be the averages of the daily averages of days 2-8. The value to be reported on the DMR is the highest of all the rolling 7-day averages throughout the month. For those days that are at the end/beginning of the month, the data shall be reported for the month that contains 4 of the 7 days.

Day 1: Average of all temperature data collected during the calendar day.

Day 2: Average of all temperature data collected during the calendar day.

Day 3: Average of all temperature data collected during the calendar day.

Day 4: Average of all temperature data collected during the calendar day.

Day 5: Average of all temperature data collected during the calendar day.

Day 6: Average of all temperature data collected during the calendar day.

Day 7: Average of all temperature data collected during the calendar day.

1st MWAT Calculation as average of previous 7 days

Day 8: Average of all temperature data collected during the calendar day.

2nd MWAT Calculation as average of previous 7 days

Day 9: Average of all temperature data collected during the calendar day.

3rd MWAT Calculation as average of previous 7 days

16. "NOEC" or "No-Observed-Effect-Concentration" is the highest concentration of toxicant to which organisms are exposed in a full life cycle or partial life cycle (short term) test, that causes no observable adverse effects on the test organisms (i.e. the highest concentration of toxicant in which the values for the observed responses are not statistically different from the controls). This value is used, along with other factors, to determine toxicity limits in permits.
17. "Potentially dissolved (PD) metals fraction" is defined in the Basic Standards and Methodologies for Surface Water 1002-31, as that portion of a constituent measured from the filtrate of a water and suspended sediment sample that was first treated with nitric acid to a pH of 2 or less and let stand for 8 to 96 hours prior to sample filtration using a 0.40 or 0.45-UM (micron) membrane filter. Note the "potentially dissolved" method cannot be used where nitric acid will interfere with the analytical procedure used for the constituent measured.
18. "Practical Quantitation Limit (PQL)" means the minimum concentration of an analyte (substance) that can be measured with a high degree of confidence that the analyte is present at or above that concentration. The use of PQL in this document may refer to those PQLs shown in Part I.D of this permit or the PQLs of an individual laboratory.

19. "Quarterly measurement frequency" means samples may be collected at any time during the calendar quarter if a continual discharge occurs. If the discharge is intermittent, then samples shall be collected during the period that discharge occurs.
20. "Recorder" requires the continuous operation of a chart and/or totalizer (or drinking water rotor meters or pump hour meters where previously approved.)
21. SAR and Adjusted SAR - The equation for calculation of SAR-adj is:

$$SAR-adj = \frac{Na^+}{\sqrt{\frac{Ca_x + Mg^{++}}{2}}}$$

Where:

- Na+ = Sodium in the effluent reported in meq/l
- Mg++ = Magnesium in the effluent reported in meq/l
- Ca_x = calcium (in meq/l) in the effluent modified due to the ratio of bicarbonate to calcium

The values for sodium (Na⁺), calcium (Ca⁺⁺), bicarbonate (HCO₃⁻) and magnesium (Mg⁺⁺) in this equation are expressed in units of milliequivalents per liter (meq/l). Generally, data for these parameters are reported in terms of mg/l, which must then be converted to calculate the SAR. The conversions are:

$$\text{meq/l} = \frac{\text{Concentration in mg/l}}{\text{Equivalent weight in mg/meq}}$$

Where the equivalent weights are determined based on the atomic weight of the element divided by the ion's charge:

- Na⁺ = 23.0 mg/meq (atomic weight of 23, charge of 1)
- Ca⁺⁺ = 20.0 mg/meq (atomic weight of 40.078, charge of 2)
- Mg⁺⁺ = 12.15 mg/meq (atomic weight of 24.3, charge of 2)
- HCO₃⁻ = 61 mg/mep (atomic weight of 61, charge of 1)

The EC and the HCO₃⁻/Ca⁺⁺ ratio in the effluent (calculated by dividing the HCO₃⁻ in meq/l by the Ca⁺⁺ in meq/l) are used to determine the Ca_x using the following table.

Table – Modified Calcium Determination for Adjusted Sodium Adsorption Ratio

		HCO ₃ /Ca Ratio And EC 1, 2, 3											
		Salinity of Effluent (EC)(dS/m)											
		0.1	0.2	0.3	0.5	0.7	1.0	1.5	2.0	3.0	4.0	6.0	8.0
Ratio of HCO ₃ /Ca	.05	13.20	13.61	13.92	14.40	14.79	15.26	15.91	16.43	17.28	17.97	19.07	19.94
	.10	8.31	8.57	8.77	9.07	9.31	9.62	10.02	10.35	10.89	11.32	12.01	12.56
	.15	6.34	6.54	6.69	6.92	7.11	7.34	7.65	7.90	8.31	8.64	9.17	9.58
	.20	5.24	5.40	5.52	5.71	5.87	6.06	6.31	6.52	6.86	7.13	7.57	7.91
	.25	4.51	4.65	4.76	4.92	5.06	5.22	5.44	5.62	5.91	6.15	6.52	6.82
	.30	4.00	4.12	4.21	4.36	4.48	4.62	4.82	4.98	5.24	5.44	5.77	6.04
	.35	3.61	3.72	3.80	3.94	4.04	4.17	4.35	4.49	4.72	4.91	5.21	5.45
	.40	3.30	3.40	3.48	3.60	3.70	3.82	3.98	4.11	4.32	4.49	4.77	4.98
	.45	3.05	3.14	3.22	3.33	3.42	3.53	3.68	3.80	4.00	4.15	4.41	4.61
	.50	2.84	2.93	3.00	3.10	3.19	3.29	3.43	3.54	3.72	3.87	4.11	4.30
	.75	2.17	2.24	2.29	2.37	2.43	2.51	2.62	2.70	2.84	2.95	3.14	3.28
	1.00	1.79	1.85	1.89	1.96	2.01	2.09	2.16	2.23	2.35	2.44	2.59	2.71

1.25	1.54	1.59	1.63	1.68	1.73	1.78	1.86	1.92	2.02	2.10	2.23	2.33
1.50	1.37	1.41	1.44	1.49	1.53	1.58	1.65	1.70	1.79	1.86	1.97	2.07
1.75	1.23	1.27	1.30	1.35	1.38	1.43	1.49	1.54	1.62	1.68	1.78	1.86
2.00	1.13	1.16	1.19	1.23	1.26	1.31	1.36	1.40	1.48	1.54	1.63	1.70
2.25	1.04	1.08	1.10	1.14	1.17	1.21	1.26	1.30	1.37	1.42	1.51	1.58
2.50	0.97	1.00	1.02	1.06	1.09	1.12	1.17	1.21	1.27	1.32	1.40	1.47
3.00	0.85	0.89	0.91	0.94	0.96	1.00	1.04	1.07	1.13	1.17	1.24	1.30
3.50	0.78	0.80	0.82	0.85	0.87	0.90	0.94	0.97	1.02	1.06	1.12	1.17
4.00	0.71	0.73	0.75	0.78	0.80	0.82	0.86	0.88	0.93	0.97	1.03	1.07
4.50	0.66	0.68	0.69	0.72	0.74	0.76	0.79	0.82	0.86	0.90	0.95	0.99
5.00	0.61	0.63	0.65	0.67	0.69	0.71	0.74	0.76	0.80	0.83	0.88	0.93
7.00	0.49	0.50	0.52	0.53	0.55	0.57	0.59	0.61	0.64	0.67	0.71	0.74
10.00	0.39	0.40	0.41	0.42	0.43	0.45	0.47	0.48	0.51	0.53	0.56	0.58
20.00	0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.32	0.33	0.35	0.37
30.00	0.18	0.19	0.20	0.20	0.21	0.21	0.22	0.23	0.24	0.25	0.27	0.28

- 1 Adapted from Suarez (1981).
- 2 Assumes a soil source of calcium from lime (CaCO₃) or silicates; no precipitation of magnesium, and partial pressure of CO₂ near the soil surface (PCO₂) is 0.0007 atmospheres.
- 3 Cax, HCO₃⁻, Ca are reported in meq/l; EC is in dS/m (deciSiemens per meter).

Because values will not always be quantified at the exact EC or HCO₃⁻/Ca⁺⁺ ratio in the table, the resulting Cax must be determined based on the closest value to the calculated value. For example, for a calculated EC of 2.45 dS/m, the column for the EC of 2.0 would be used. However, for a calculated EC of 5.1, the corresponding column for the EC of 6.0 would be used. Similarly, for a HCO₃⁻/Ca⁺⁺ ratio of 25.1, the row for the 30 ratio would be used.

The Division acknowledges that some effluents may have electrical conductivity levels that fall outside of this table, and others have bicarbonate to calcium ratios that fall outside this table. For example, some data reflect HCO₃⁻/Ca⁺⁺ ratios greater than 30 due to bicarbonate concentrations reported greater than 1000 mg/l versus calcium concentrations generally less than 10 mg/l (i.e., corresponding to HCO₃⁻/Ca⁺⁺ ratios greater than 100). Despite these high values exceeding the chart's boundaries, it is noted that the higher the HCO₃⁻/Ca⁺⁺ ratio, the greater the SAR-adj. Thus, using the Cax values corresponding to the final row containing bicarbonate/calcium ratios of 30, the permittee will actually calculate an SAR-adj that is less than the value calculated if additional rows reflecting HCO₃⁻/Ca⁺⁺ ratios of greater than 100 were added.

22. "Seven (7) day average" means, with the exception of fecal coliform or *E. coli* bacteria (see geometric mean), the arithmetic mean of all samples collected in a seven (7) consecutive day period. Such seven (7) day averages shall be calculated for all calendar weeks, which are defined as beginning on Sunday and ending on Saturday. If the calendar week overlaps two months (i.e. the Sunday is in one month and the Saturday in the following month), the seven (7) day average calculated for that calendar week shall be associated with the month that contains the Saturday. Samples may not be used for more than one (1) reporting period. **(See the "Analytical and Sampling Methods for Monitoring and Reporting Section in Part I.D.5 for guidance on calculating averages and reporting analytical results that are less than the PQL).**
23. "Thirty (30) day average" means, except for fecal coliform or *E. coli* bacteria (see geometric mean), the arithmetic mean of all samples collected during a thirty (30) consecutive-day period, which represents a calendar month. The permittee shall report the appropriate mean of all self-monitoring sample data collected during the calendar month on the Discharge Monitoring Reports. Samples shall not be used for more than one (1) reporting period. **(See the "Analytical and Sampling Methods for Monitoring and Reporting Section in Part I.D.5 for guidance on calculating averages and reporting analytical results that are less than the PQL).**
24. Toxicity Identification Evaluation (TIE) is a set of site-specific procedures used to identify the specific chemical(s) causing effluent toxicity.
25. "Total Inorganic Nitrogen (T.I.N.)" is an aggregate parameter determined based on ammonia, nitrate and nitrite concentrations. To determine T.I.N. concentrations, the facility must monitor for total ammonia and total nitrate plus nitrite (or nitrate and nitrite individually) on the same days. The calculated T.I.N. concentrations in mg/L shall then be determined

as the sum of the analytical results of same-day sampling for total ammonia (as N) in mg/L, and total nitrate plus nitrite (as N) in mg/L (or nitrate as N and nitrite as N individually). From these calculated T.I.N. concentrations, the daily maximum and thirty (30) day average concentrations for T.I.N. shall be determined in the same manner as set out in the definitions for the daily maximum and thirty (30) day average. **(See the “Analytical and Sampling Methods for Monitoring and Reporting Section in Part I.D.5 for guidance on calculating averages and reporting analytical results that are less than the PQL).**

26. "Total Metals" means the concentration of metals determined on an unfiltered sample following vigorous digestion (Section 4.1.3), or the sum of the concentrations of metals in both the dissolved and suspended fractions, as described in Manual of Methods for Chemical Analysis of Water and Wastes, U.S. Environmental Protection Agency, March 1979, or its equivalent.
27. “Total Recoverable Metals” means that portion of a water and suspended sediment sample measured by the total recoverable analytical procedure described in Methods for Chemical Analysis of Water and Wastes, U.S. Environmental Protection Agency, March 1979 or its equivalent.
28. Toxicity Reduction Evaluation (TRE) is a site-specific study conducted in a step-wise process to identify the causative agents of effluent toxicity, isolate the source of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity after the control measures are put in place.
29. "Twenty four (24) hour composite" sample is a combination of at least eight (8) sample aliquots of at least 100 milliliters, collected at equally spaced intervals during the operating hours of a facility over a twenty-four (24) hour period. For volatile pollutants, aliquots must be combined in the laboratory immediately before analysis. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the wastewater or effluent flow at the time of sampling or the total wastewater or effluent flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically.
30. "Twice Monthly" monitoring frequency means that two samples shall be collected each calendar month on separate weeks with at least one full week between the two sample dates. Also, there shall be at least one full week between the second sample of a month and the first sample of the following month.
31. “Two (2) -Year Rolling Average” (Antidegradation limits)- the average of all monthly average data collected in a two year period. Collection of the data required to calculate a two-year rolling average shall start immediately upon the effective date of the permit, but the data is not reported on a DMR until two years after the effective date of the permit. To calculate a two-year rolling average, add the current monthly average to the previous 23 monthly averages and divide the total by 24. This methodology continues on a rolling basis for the permit term (ie., in the first reporting period use data from month 1 to month 24, in the second reporting period use data from month 2 to month 25, then month 3 to month 26, etc).

Example: Two year rolling average = $(MA_C + MA_1 + MA_2 + \dots + MA_{23}) \div 24$

MA_C = Current monthly average

MA_1 = First prior month's monthly average

MA_2 = Second prior month's monthly average

MA_{23} = Twenty third prior month's monthly average

Note, if there is not a discharge from the facility in a month during a two year period **do not use zero (0) to represent the data for that month in the calculation**, but do consider that month as part of the two year time span. The denominator in the two-year rolling average calculation will change to represent the actual number of months there was a discharge.

Example: Two year rolling average = $(30 + 45 + \dots + 25) \div 22$

Current monthly average= 30 mg/l

First prior month's monthly average= no discharge

Second prior month's monthly average= no discharge

Third prior month's monthly average=45 mg/l

Twenty third prior month's monthly average= 25 mg/l

For ammonia, two-year rolling averages may be set up for individual months, or may be grouped together for several months. When individual months have a specific limit, calculate the two-year rolling average as follows:

Example: Permit is effective Jan 2010 and there is a two-year rolling average limit specific to the month of January.

January 2010 DMR – Nothing to Report

January 2011 DMR – Two-year rolling average = $(MA_C + MA_1) \div 2$

MA_C = January 2011 monthly average

MA_1 = January 2010 monthly average
January 2012 DMR – Two-year rolling average = $(MA_C + MA_1) \div 2$
 MA_C = January 2012 monthly average
 MA_1 = January 2011 monthly average

Where several months are grouped together and have the same limit, calculate the two-year rolling average as follows:

Example: Permit is effective January 2010 and there is a two-year rolling average limit specific to the months of January, February, and June.

January, February, June 2010 DMR- Nothing to Report

1st Reportable DMR – June 2011 DMR:

Two year rolling average = $(MA_C + MA_1 + MA_2 + MA_3 + MA_4 + MA_5) \div 6$

MA_C = June 2011 monthly average

MA_1 = February 2011 monthly average

MA_2 = January 2011 monthly average

MA_3 = June 2010 monthly average

MA_4 = February 2010 monthly average

MA_5 = January 2010 monthly average

2nd Reportable DMR – January 2012 DMR:

Two year rolling average = $(MA_C + MA_1 + MA_2 + MA_3 + MA_4 + MA_5) \div 6$

MA_C = January 2012 monthly average

MA_1 = June 2011 monthly average

MA_2 = February 2011 monthly average

MA_3 = January 2011 monthly average

MA_4 = June 2010 monthly average

MA_5 = February 2010 monthly average

(See the “Analytical and Sampling Methods for Monitoring and Reporting Section in Part I.D.5 for guidance on calculating averages and reporting analytical results that are less than the PQL).

32. "Visual" observation is observing the discharge to check for the presence of a visible sheen or floating oil.
33. "Water Quality Control Division" or "Division" means the state Water Quality Control Division as established in 25-8-101 et al.)

Additional relevant definitions are found in the Colorado Water Quality Control Act, CRS §§ 25-8-101 et seq., the Colorado Discharge Permit System Regulations, Regulation 61 (5 CCR 1002-61) and other applicable regulations.

D. GENERAL MONITORING, SAMPLING AND REPORTING REQUIREMENTS

1. Routine Reporting of Data

Reporting of the data gathered in compliance with Part I.A or Part I.B shall be on a **monthly** basis. Reporting of all data gathered shall comply with the requirements of Part I.D. (General Requirements). Monitoring results shall be summarized for each calendar month and reported on Division approved discharge monitoring report (DMR) forms (EPA form 3320-1).

The permittee must submit these forms either by mail, or by using the Division's Net-DMR service (when available). If mailed, one form shall be mailed to the Division, as indicated below, so that the DMR is received no later than the 28th day of the following month (for example, the DMR for the first calendar quarter must be received by the Division by April 28th). If no discharge occurs during the reporting period, "No Discharge" shall be reported.

The original signed copy of each discharge monitoring report (DMR) shall be submitted to the Division at the following address:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2

4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

The Discharge Monitoring Report forms shall be filled out accurately and completely in accordance with requirements of this permit and the instructions on the forms. They shall be signed by an authorized person as identified in Part I.D.8.

2. Annual Biosolids Report

The permittee shall provide the results of all biosolids monitoring and information on management practices, land application sites, site restrictions and certifications. Such information shall be provided no later than **February 19th** of each year. Reports shall be submitted addressing all such activities that occurred in the previous calendar year. If no biosolids were applied to the land during the reporting period, "no biosolids applied" shall be reported. Until further notice, biosolids monitoring results shall be reported on forms, or copies of forms, provided by the Division. Annual Biosolids Reports required herein, shall be signed and certified in accordance with the Signatory Requirements, Part I.D.1, and submitted as follows:

The original copy of each form shall be submitted to the following address:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT,
WATER QUALITY CONTROL DIVISION
WQCD-PERMITS-B2
4300 CHERRY CREEK DRIVE SOUTH
DENVER, COLORADO 80246-1530

A copy of each form shall be submitted to the following address:

WATER PROGRAM REGIONAL BIOSOLIDS PROGRAM
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION VIII,
1595 WYNKOOP STREET
DENVER, CO 80202-2466

ATTENTION: BIOSOLIDS PROGRAM MANAGER

3. Representative Sampling

Samples and measurements taken for the respective identified monitoring points as required herein shall be representative of the volume and nature of: 1) all influent wastes received at the facility, including septage, biosolids, etc.; 2) the monitored effluent discharged from the facility; and 3) biosolids produced at the facility. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the influent, effluent, or biosolids wastestream joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to and prior approval by the Division.

4. Influent and Effluent Sampling Points

Influent and effluent sampling points shall be so designed or modified so that: 1) a sample of the influent can be obtained after preliminary treatment and prior to primary or biological treatment and 2) a sample of the effluent can be obtained at a point after the final treatment process and prior to discharge to state waters. The permittee shall provide access to the Division to sample at these points.

5. Analytical and Sampling Methods for Monitoring and Reporting

The permittee shall install, calibrate, use and maintain monitoring methods and equipment, including biological and indicated pollutant monitoring methods. All sampling shall be performed by the permittee according to specified methods in 40 C.F.R. Part 136; methods approved by EPA pursuant to 40 C.F.R. Part 136; or methods approved by the Division, in the absence of a method specified in or approved pursuant to 40 C.F.R. Part 136.

Numeric Limits

If the permit contains a numeric effluent limit for a parameter, the analytical method and PQL selected for all monitoring conducted in accordance with this permit for that parameter shall be the one that can measure at or below the numeric effluent limit. If all specified analytical methods and corresponding PQLs are greater than the numeric effluent limit, then the analytical method with the lowest PQL shall be used.

When the analytical method which complies with the above requirements has a PQL greater than the permit limit, and the permittee's analytical result is less than the PQL (the PQL achieved by the lab), the permittee shall report "BDL" on the DMR. Such reports will not be considered as violations of the permit limit, as long as the PQL obtained is lower or equal to the PQL in the table below.

When the analytical method which complies with the above requirements has a PQL that is equal to or less than the permit limitation, and the permittee's analytical result is less than the PQL, "< X" (where X = the actual PQL achieved by the laboratory) shall be reported on the DMR. For parameters that have a report only limitation, and the permittee's analytical result is less than the PQL, "< X" (where X = the actual PQL achieved by the laboratory) shall be reported on the DMR.

Report Only Limits

If the permit contains a report only requirement for a parameter, the analytical method and PQL chosen shall be one that can measure at or below the potential numeric effluent limit(s) (maximum allowable pollutant concentration as shown in the WQA or fact sheet). If all analytical methods and corresponding PQLs are greater than the potential numeric effluent limit(s), then the analytical method with the lowest PQL shall be used.

When the analytical method which complies with the above requirements has a PQL that is equal to or less than the permit limitation, and the permittee's analytical result is less than the PQL, "< X" (where X = the actual PQL achieved by the laboratory) shall be reported on the DMR. For parameters that have a report only limitation, and the permittee's analytical result is less than the PQL, "< X" (where X = the actual PQL achieved by the laboratory) shall be reported on the DMR.

Interim Report Only Followed By a Numeric Limit

If the permit contains an interim effluent limitation (a limit is report until such time as a numeric effluent limit becomes effective) for a parameter, the analytical method and PQL chosen for all monitoring conducted in accordance with this permit for the parameter shall be one that can measure to the final numeric effluent limit. If all analytical methods and corresponding PQLs are greater than the final numeric effluent limit (s), then the analytical method with the lowest PQL shall be used.

While the report only limit is effective, the reporting requirements shall follow those under the Report Only Limits section. Once the numeric limit is effective, the reporting requirements shall follow the numeric limits reporting requirements.

T.I.N.

For parameters such as TIN, the analytical methods chosen shall be those that can measure to the potential or final numeric effluent limit, based on the sum of the PQLs for nitrate, nitrite and ammonia.

Calculating Averages

In the calculation of average concentrations (i.e. daily average, 7- day average, 30-day average, 2-year rolling average) any individual analytical result that is less than the PQL shall be considered to be zero for the calculation purposes. When reporting:

If all individual analytical results are less than the PQL, the permittee shall report either "BDL" or "<X" (where X = the actual PQL achieved by the laboratory), following the guidance above.

If one or more individual results is greater than the PQL, an average shall be calculated and reported. Note

that it does not matter if the final calculated average is greater or less than the PQL, **it must be reported as a value.**

Note that when calculating T.I.N. for a single sampling event, any value less than the PQL (for total ammonia, total nitrite, or total nitrate) shall be treated as zero. The T.I.N. concentration for a single sampling event shall then be determined as the sum of the analytical results (zeros if applicable) of same day sampling for total ammonia and total nitrite and total nitrate. From these calculated T.I.N. concentrations, the daily maximum and thirty day average concentrations shall be calculated and must be reported as a value.

PQLs

The PQLs for specific parameters, as determined by the State Laboratory (November 2008) are provided below for reference. If the analytical method cannot achieve a PQL that is less than or equal to the permit limit, then the method, or a more precise method, must achieve a PQL that is less than or equal to the PQL in the table below. A listing of the PQLs for further organic parameters that must meet the above requirement can be found in the Division's Practical Quantitation Limitation Guidance Document, July 2008. This document is available on the Division's website at www.coloradowaterpermits.com.

These limits apply to the total recoverable or the potentially dissolved fraction of metals.

For hexavalent chromium, samples must be unacidified so dissolved concentrations will be measured rather than potentially dissolved concentrations.

Effluent Parameter	Practical Quantitation Limits	Effluent Parameter	Practical Quantitation Limits
Aluminum	50 µg/l		
Arsenic	1 µg/l	N-Ammonia	1 mg/l
Barium	5 µg/l	N-Ammonia (low-level)	50 µg/l
Beryllium	1 µg/l	N-Nitrate/Nitrite	0.5 mg/l
BOD / CBOD	1 mg/l	N-Nitrate	0.5 mg/l
Boron	50 µg/l	N-Nitrite	10 µg/l
Cadmium	1 µg/l	Total Nitrogen	0.5 mg/l
Calcium	20 µg/l	Total Phosphorus	10 µg/l
Chloride	2 mg/l		
Chlorine	0.1 mg/l	Radium 226	1 pCi/l
Total Residual Chlorine		Radium 228	1 pCi/l
DPD colorimetric	0.10 mg/l	Selenium	1 µg/l
Amperometric titration	0.05 mg/l	Silver	0.5 µg/l
Chromium	20 µg/l	Sodium	0.2 mg/l
Chromium, Hexavalent	20 µg/l	Sulfate	5 mg/l
Copper	5 µg/l	Sulfide	0.2 mg/l
Cyanide (Direct / Distilled)	10 µg/l	Total Dissolved Solids	10 mg/l
Cyanide, WAD+A47	10 µg/l	Total Suspended Solids	10 mg/l
Fluoride	0.1 mg/l	Thallium	1 µg/l
Iron	10 µg/l	Uranium	1 µg/l
Lead	1 µg/l	Zinc	10 µg/l
Magnesium	20 µg/l		
Manganese	2 µg/l	Phenols	15 µg/l
Mercury	0.1 µg/l	Nonylphenol D7065	10 µg/l
Mercury (low-level)	0.003 µg/l	Nonylphenol D7485	0.33 µg/l
Nickel	50 µg/l		

6. Records

- a. The permittee shall establish and maintain records. Those records shall include, but not be limited to, the following:
 - i. The date, type, exact place, and time of sampling or measurements;
 - ii. The individual(s) who performed the sampling or measurements;
 - iii. The date(s) the analyses were performed;
 - iv. The individual(s) who performed the analyses;
 - v. The analytical techniques or methods used; and
 - vi. The results of such analyses.
 - vii. Any other observations which may result in an impact on the quality or quantity of the discharge as indicated in 40 CFR 122.44 (i)(1)(iii).
- b. The permittee shall retain for a minimum of three (3) years records of all monitoring information, including all original strip chart recordings for continuous monitoring instrumentation, all calibration and maintenance records, copies of all reports required by this permit and records of all data used to complete the application for this permit. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the permittee or when requested by the Division or Regional Administrator.

7. Flow Measuring Devices

Unless exempted in Part I.A of this permit, flow metering at the headworks shall be provided to give representative values of throughput and treatment of the wastewater system. The metering device shall be equipped with a local flow indication

instrument and a flow indication-recording-totalization device suitable for providing permanent flow records, which should be in the plant control building.

For mechanical facilities, where influent flow metering is not practical and the same results may be obtained from metering at the effluent end of the treatment facility, this type of flow metering arrangement will be considered, and if approved, noted in Part I.A of this permit. For lagoons, an instantaneous or continuous effluent flow measuring device shall be required in addition to the above described influent flow measuring device.

At the request of the Division, the permittee must be able to show proof of the accuracy of any flow-measuring device used in obtaining data submitted in the monitoring report. The flow-measuring device must indicate values within ten (10) percent of the actual flow being measured.

8. Signatory Requirements

- a. All reports and other information required by the Division, shall be signed and certified for accuracy by the permittee in accord with the following criteria:
 - i) In the case of corporations, by a responsible corporate officer. For purposes of this section, the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the form originates;
 - ii) In the case of a partnership, by a general partner;
 - iii) In the case of a sole proprietorship, by the proprietor;
 - iv) In the case of a municipal, state, or other public facility, by either a principal executive officer, or ranking elected official. For purposes of this section, a principal executive officer has responsibility for the overall operation of the facility from which the discharge originates;
 - v) By a duly authorized representative of a person described above, only if:
 - 1) The authorization is made in writing by a person described in i, ii, iii, or iv above;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and,
 - 3) The written authorization is submitted to the Division.
- b. If an authorization as described in this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of this section must be submitted to the Division prior to or together with any reports, information, or applications to be signed by an authorized representative.

The permittee, or the duly authorized representative shall make and sign the following certification on all such documents:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

PART II

A. NOTIFICATION REQUIREMENTS

1. Notification to Parties

All notification requirements under this section shall be directed as follows:

- a. Oral Notifications, during normal business hours shall be to:

Water Quality Protection Section - Domestic Compliance Program
Water Quality Control Division
Telephone: (303) 692-3500

- b. Written notification shall be to:

Water Quality Protection Section - Domestic Compliance Program
Water Quality Control Division
Colorado Department of Public Health and Environment
WQCD-WQP-B2
4300 Cherry Creek Drive South
Denver, CO 80246-1530

2. Change in Discharge

The permittee shall give advance notice to the Division, in writing, of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- a. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged, or;
- b. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported pursuant to an approved land application plan.

Whenever notification of any planned physical alterations or additions to the permitted facility is required pursuant to this section, the permittee shall furnish the Division such plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge, the stream, or ground water. If the Division finds that such new or altered discharge might be inconsistent with the conditions of the permit, the Division shall require a new or revised permit application and shall follow the procedures specified in Sections 61.5 through 61.6, and 61.15 of the Colorado Discharge Permit System Regulations.

3. Noncompliance Notification

The permittee shall give advance notice to the Division, in writing, of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

- a. If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitations or standards specified in this permit, the permittee shall, at a minimum, provide the Division with the following information:
- i) A description of the noncompliance and its cause;
- ii) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and
- iii) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.
- b. The permittee shall report the following circumstances **orally within twenty-four (24) hours** from the time the permittee becomes aware of the circumstances, and shall mail to the Division a written report containing the information requested in Part II.A.4 (a) **within five (5) working days** after becoming aware of the following circumstances:

- i) Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident;
 - ii) Circumstances leading to any unanticipated bypass which exceeds any effluent limitations in the permit;
 - iii) Circumstances leading to any upset which causes an exceedance of any effluent limitation in the permit;
 - iv) Daily maximum violations for any of the pollutants limited by Part I.A of this permit as specified in Part III of this permit. This includes any toxic pollutant or hazardous substance or any pollutant specifically identified as the method to control any toxic pollutant or hazardous substance.
- c. Unless otherwise indicated in this permit, the permittee shall report instances of non-compliance which are not required to be reported within 24-hours at the time Discharge Monitoring Reports are submitted. The reports shall contain the information listed in sub-paragraph (a) of this section.

4. Transfer of Ownership or Control

The permittee shall notify the Division, in writing, thirty (30) calendar days in advance of a proposed transfer of the permit.

- a. Except as provided in paragraph b. of this section, a permit may be transferred by a permittee only if the permit has been modified or revoked and reissued as provided in Section 61.8(8) of the Colorado Discharge Permit System Regulations, to identify the new permittee and to incorporate such other requirements as may be necessary under the Federal Act.
- b. A permit may be automatically transferred to a new permittee if:
 - i) The current permittee notifies the Division in writing 30 calendar days in advance of the proposed transfer date; and
 - ii) The notice includes a written agreement between the existing and new permittee(s) containing a specific date for transfer of permit responsibility, coverage and liability between them; and
 - iii) The Division does not notify the existing permittee and the proposed new permittee of its intent to modify, or revoke and reissue the permit.
 - iv) Fee requirements of the Colorado Discharge Permit System Regulations, Section 61.15, have been met.

5. Other Notification Requirements

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in the permit, shall be submitted on the date listed in the compliance schedule section. The fourteen (14) calendar day provision in Regulation 61.8(4)(n)(i) has been incorporated into the due date.

The permittee's notification of all anticipated noncompliance does not stay any permit condition.

All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Division as soon as they know or have reason to believe:

- a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - i) One hundred micrograms per liter (100 µg/l);
 - ii) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and one milligram per liter (1.0 mg/l) for antimony;
 - iii) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with Section 61.4(2)(g).

- iv) The level established by the Division in accordance with 40 C.F.R. § 122.44(f).
- b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - i) Five hundred micrograms per liter (500 µg/l);
 - ii) One milligram per liter (1 mg/l) for antimony; and
 - iii) Ten (10) times the maximum concentration value reported for that pollutant in the permit application.
 - iv) The level established by the Division in accordance with 40 C.F.R. § 122.44(f).

6. **Bypass Notification**

If the permittee knows in advance of the need for a bypass, a notice shall be submitted, at least ten (10) calendar days before the date of the bypass, to the Division. The bypass shall be subject to Division approval and limitations imposed by the Division. Violations of requirements imposed by the Division will constitute a violation of this permit.

7. **Bypass**

- a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
- b. Bypasses are prohibited and the Division may take enforcement action against the permittee for bypass, unless:
 - i) The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;
 - ii) There were no feasible alternatives to bypass such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - iii) Proper notices were submitted in compliance with Part II.A.5.
- c. "Severe property damage" as used in this Subsection means substantial physical damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- d. The permittee may allow a bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance or to assure optimal operation. These bypasses are not subject to the provisions of paragraph (a) above.
- e. The Division may approve an anticipated bypass, after considering adverse effects, if the Division determines that the bypass will meet the conditions specified in paragraph (a) above.

8. **Upsets**

- a. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.
- b. Effect of an Upset

An upset constitutes an affirmative defense to an action brought for noncompliance with permit effluent limitations if the requirements of paragraph (b) of this section are met. No determination made during administrative review of claims

that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that:

- i) An upset occurred and that the permittee can identify the specific cause(s) of the upset; and
- ii) The permitted facility was at the time being properly operated and maintained; and
- iii) The permittee submitted proper notice of the upset as required in Part II.A.4. of this permit (24-hour notice); and
- iv) The permittee complied with any remedial measure necessary to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

In addition to the demonstration required above, a permittee who wishes to establish the affirmative defense of upset for a violation of effluent limitations based upon water quality standards shall also demonstrate through monitoring, modeling or other methods that the relevant standards were achieved in the receiving water.

d. Burden of Proof

In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

9. Submission of Incorrect or Incomplete Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Division, the permittee shall promptly submit such facts or information.

B. RESPONSIBILITIES

1. Reduction, Loss, or Failure of Treatment Facility

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the effluent limitations of the permit. Upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, control sources of wastewater, or all discharges, until the facility is restored or an alternative method of treatment is provided. This provision also applies to power failures, unless an alternative power source sufficient to operate the wastewater control facilities is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Inspections and Right to Entry

The permittee shall allow the Division and/or the authorized representative, upon the presentation of credentials:

- a. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and
- c. To enter upon the permittee's premises in a reasonable manner and at a reasonable time to inspect and/or investigate, any actual, suspected, or potential source of water pollution, or to ascertain compliance or non compliance with the Colorado Water Quality Control Act or any other applicable state or federal statute or regulation or any order promulgated by the Division. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing of any person having knowledge related to the discharge permit or

alleged violation, access to any and all facilities or areas within the permittee's premises that may have any affect on the discharge, permit, or alleged violation. Such entry is also authorized for the purpose of inspecting and copying records required to be kept concerning any effluent source.

- d. The permittee shall provide access to the Division to sample the discharge at a point after the final treatment process but prior to the discharge mixing with state waters upon presentation of proper credentials.

In the making of such inspections, investigations, and determinations, the Division, insofar as practicable, may designate as its authorized representatives any qualified personnel of the Department of Agriculture. The Division may also request assistance from any other state or local agency or institution.

3. Duty to Provide Information

The permittee shall furnish to the Division, within a reasonable time, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

4. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and the Colorado Discharge Permit System Regulations 5 CCR 1002-61, Section 61.5(4), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division and the Environmental Protection Agency.

The name and address of the permit applicant(s) and permittee(s), permit applications, permits and effluent data shall not be considered confidential. Knowingly making false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Clean Water Act, and Section 25-8-610 C.R.S.

5. Modification, Suspension, Revocation, or Termination of Permits By the Division

The filing of a request by the permittee for a permit modification, revocation and reissuance, termination or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

- a. A permit may be modified, suspended, or terminated in whole or in part during its term for reasons determined by the Division including, but not limited to, the following:
 - i) Violation of any terms or conditions of the permit;
 - ii) Obtaining a permit by misrepresentation or failing to disclose any fact which is material to the granting or denial of a permit or to the establishment of terms or conditions of the permit; or
 - iii) Materially false or inaccurate statements or information in the permit application or the permit.
 - iv) A determination that the permitted activity endangers human health or the classified or existing uses of state waters and can only be regulated to acceptable levels by permit modifications or termination.
- b. A permit may be modified in whole or in part for the following causes, provided that such modification complies with the provisions of Section 61.10 of the Colorado Discharge Permit System Regulations:
 - i) There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.
 - ii) The Division has received new information which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of different permit conditions at the time of issuance. For permits issued to new sources or new dischargers, this cause includes information derived from effluent testing required under Section 61.4(7)(e) of the Colorado Discharge Permit System Regulations. This provision allows a modification of the permit to include conditions that are less stringent than the existing permit only to the extent allowed under Section 61.10 of the Colorado Discharge Permit System Regulations.

- iii) The standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Permits may be modified during their terms for this cause only as follows:
 - (A) The permit condition requested to be modified was based on a promulgated effluent limitation guideline, EPA approved water quality standard, or an effluent limitation set forth in 5 CCR 1002-62, § 62 et seq.; and
 - (B) EPA has revised, withdrawn, or modified that portion of the regulation or effluent limitation guideline on which the permit condition was based, or has approved a Commission action with respect to the water quality standard or effluent limitation on which the permit condition was based; and
 - (C) The permittee requests modification after the notice of final action by which the EPA effluent limitation guideline, water quality standard, or effluent limitation is revised, withdrawn, or modified; or
 - (D) For judicial decisions, a court of competent jurisdiction has remanded and stayed EPA promulgated regulations or effluent limitation guidelines, if the remand and stay concern that portion of the regulations or guidelines on which the permit condition was based and a request is filed by the permittee in accordance with this Regulation, within ninety (90) calendar days of judicial remand.
 - iv) The Division determines that good cause exists to modify a permit condition because of events over which the permittee has no control and for which there is no reasonable available remedy.
 - v) Where the Division has completed, and EPA approved, a total maximum daily load (TMDL) which includes a wasteload allocation for the discharge(s) authorized under the permit.
 - vi) The permittee has received a variance.
 - vii) When required to incorporate applicable toxic effluent limitation or standards adopted pursuant to § 307(a) of the Federal act.
 - viii) When required by the reopener conditions in the permit.
 - ix) As necessary under 40 C.F.R. 403.8(e), to include a compliance schedule for the development of a pretreatment program.
 - x) When the level of discharge of any pollutant which is not limited in the permit exceeds the level which can be achieved by the technology-based treatment requirements appropriate to the permittee under Section 61.8(2) of the Colorado Discharge Permit System Regulations.
 - xi) To establish a pollutant notification level required in Section 61.8(5) of the Colorado Discharge Permit System Regulations.
 - xii) To correct technical mistakes, such as errors in calculation, or mistaken interpretations of law made in determining permit conditions, to the extent allowed in Section 61.10 of the Colorado State Discharge Permit System Regulations.
 - xiii) When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
 - xiv) When another State whose waters may be affected by the discharge has not been notified.
 - xv) For any other cause provided in Section 61.10 of the Colorado Discharge Permit System Regulations.
- c. At the request of a permittee, the Division may modify or terminate a permit and issue a new permit if the following conditions are met:
- i) The Regional Administrator has been notified of the proposed modification or termination and does not object in writing within thirty (30) calendar days of receipt of notification,

- ii) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modifications or termination;
 - iii) Requirements of Section 61.15 of the Colorado Discharge Permit System Regulations have been met, and
 - iv) Requirements of public notice have been met.
- d. For permit modification, termination, or revocation and reissuance, the Division may request additional information from the permittee. In the case of a modified permit, the Division may require the submission of an updated application. In the case of revoked and reissued permit, the Division shall require the submission of a new application.
- e. Permit modification (except for minor modifications), termination or revocation and reissuance actions shall be subject to the requirements of Sections 61.5(2), 61.5(3), 61.6, 61.7 and 61.15 of the Colorado Discharge Permit System Regulations. The Division shall act on a permit modification request, other than minor modification requests, within 180 calendar days of receipt thereof. Except for minor modifications, the terms of the existing permit govern and are enforceable until the newly issued permit is formally modified or revoked and reissued following public notice.
- f. Upon consent by the permittee, the Division may make minor permit modifications without following the requirements of Sections 61.5(2), 61.5(3), 61.7, and 61.15 of the Colorado Discharge Permit System Regulations. Minor modifications to permits are limited to:
- i) Correcting typographical errors; or
 - ii) Increasing the frequency of monitoring or reporting by the permittee; or
 - iii) Changing an interim date in a schedule of compliance, provided the new date of compliance is not more than 120 calendar days after the date specific in the existing permit and does not interfere with attainment of the final compliance date requirement; or
 - iv) Allowing for a transfer in ownership or operational control of a facility where the Division determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new permittees has been submitted to the Division; or
 - v) Changing the construction schedule for a discharger which is a new source, but no such change shall affect a discharger's obligation to have all pollution control equipment installed and in operation prior to discharge; or
 - vi) Deleting a point source outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.
 - vii) Incorporating conditions of a POTW pretreatment program that has been approved in accordance with the procedures in 40 CFR 403.11 (or a modification thereto that has been approved in accordance with the procedures in 40 CFR 403.18) as enforceable conditions of the POTW's permits.
- g. When a permit is modified, only the conditions subject to modification are reopened. If a permit is revoked and reissued, the entire permit is reopened and subject to revision and the permit is reissued for a new term.
- h. The filing of a request by the permittee for a permit modification, revocation and reissuance or termination does not stay any permit condition.
- i. All permit modifications and reissuances are subject to the antibacksliding provisions set forth in 61.10(e) through (g).
- j. If cause does not exist under this section, the Division shall not modify or revoke and reissue the permit.

6. **Oil and Hazardous Substance Liability**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the Clean Water Act.

7. **State Laws**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act. Nothing in this permit shall be construed to prevent or limit application of any emergency power of the division.

8. Permit Violations

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Except as provided elsewhere in this permit, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance (40 CFR 122.41(a)(1)).

9. Severability

The provisions of this permit are severable. If any provisions or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

10. Confidentiality

Any information relating to any secret process, method of manufacture or production, or sales or marketing data which has been declared confidential by the permittee, and which may be acquired, ascertained, or discovered, whether in any sampling investigation, emergency investigation, or otherwise, shall not be publicly disclosed by any member, officer, or employee of the Commission or the Division, but shall be kept confidential. Any person seeking to invoke the protection of this Subsection (12) shall bear the burden of proving its applicability. This section shall never be interpreted as preventing full disclosure of effluent data.

11. Fees

The permittee is required to submit payment of an annual fee as set forth in the 2005 amendments to the Water Quality Control Act. Section 25-8-502 (l) (b), and the Colorado Discharge Permit System Regulations 5 CCR 1002-61, Section 61.15 as amended. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action pursuant to Section 25-8-601 et. seq., C.R.S. 1973 as amended.

12. Duration of Permit

The duration of a permit shall be for a fixed term and shall not exceed five (5) years. If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least one hundred eighty (180) calendar days before this permit expires. Filing of a timely and complete application shall cause the expired permit to continue in force to the effective date of the new permit. The permit's duration may be extended only through administrative extensions and not through interim modifications. If the permittee anticipates there will be no discharge after the expiration date of this permit, the Division should be promptly notified so that it can terminate the permit in accordance with Part II.B.4.

13. Section 307 Toxics

If a toxic effluent standard or prohibition, including any applicable schedule of compliance specified, is established by regulation pursuant to Section 307 of the Federal Act for a toxic pollutant which is present in the permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in the discharge permit, the Division shall institute proceedings to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition.

14. Effect of Permit Issuance

- a. The issuance of a permit does not convey any property or water rights in either real or personal property, or stream flows or any exclusive privilege.
- b. The issuance of a permit does not authorize any injury to person or property or any invasion of personal rights, nor does it authorize the infringement of federal, state, or local laws or regulations.

- c. Except for any toxic effluent standard or prohibition imposed under Section 307 of the Federal act or any standard for sewage sludge use or disposal under Section 405(d) of the Federal act, compliance with a permit during its term constitutes compliance, for purposes of enforcement, with Sections 301, 302, 306, 318, 403, and 405(a) and (b) of the Federal act. However, a permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in Section 61.8(8) of the Colorado Discharge Permit System Regulations.
- d. Compliance with a permit condition which implements a particular standard for biosolid use or disposal shall be an affirmative defense in any enforcement action brought for a violation of that standard for biosolid use or disposal.

PART III
CATEGORICAL INDUSTRIES

Aluminum Forming	Meat Products
Asbestos Manufacturing	Metal Finishing
Battery Manufacturing	Metal Molding and Casting (Foundries)
Builders' Paper and Board Mills	Mineral Mining and Processing
Canned & Preserved Fruits and Vegetables Processing	Nonferrous Metals Manufacturing
Canned & Preserved Seafood Processing	Nonferrous Metals Forming and Metal Powders
Carbon Black Manufacturing	Oil and Gas Extraction
Cement Manufacturing	Organic Chemicals, Plastics, and Synthetic Fibers
Coal Mining	Ore Mining and Dressing
Coil Coating	Paint Formulation
Copper Forming	Paving and Roofing Materials (Tars and Asphalt)
Dairy Products Processing	Pesticide Chemicals
Electrical and Electronic Components	Petroleum Refining
Electroplating	Pharmaceutical Manufacturing
Explosives Manufacturing	Phosphate Manufacturing
Feedlots	Photographic
Ferroalloy Manufacturing	Plastics Molding and Forming
Fertilizer Manufacturing	Porcelain Enameling
Glass Manufacturing	Pulp, Paper, and Paperboard Manufacturing
Grain Mills	Rubber Manufacturing
Gum and Wood Chemicals Manufacturing	Soap and Detergent Manufacturing
Hospital	Steam Electric Power Generating
Ink Formulation	Sugar Processing
Inorganic Chemicals Manufacturing	Textile Mills
Iron and Steel Manufacturing	Timber Products Processing
Leather Tanning and Finishing	

PRIORITY POLLUTANTS AND HAZARDOUS SUBSTANCES

ORGANIC TOXIC POLLUTANTS IN EACH OF FOUR FRACTIONS
IN ANALYSIS BY GAS CHROMATOGRAPHY/MASS SPECTROSCOPY (GC/MS)

Volatiles

acrolein
acrylonitrile
benzene
bromoform
carbon tetrachloride
chlorobenzene
chlorodibromomethane
chloroethane
2-chloroethylvinyl ether
chloroform
dichlorobromomethane
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethylene
1,2-dichloropropane
1,3-dichloropropylene
ethylbenzene
methyl bromide
methyl chloride
methylene chloride

Base/Neutral

acenaphthene
acenaphthylene
anthracene
benzidine
benzo(a)anthracene
benzo(a)pyrene
3,4-benzofluoranthene
benzo(ghi)perylene
benzo(k)fluoranthene
bis(2-chloroethoxy)methane
bis(2-chloroethyl)ether
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
butylbenzyl phthalate
2-chloronaphthalene
4-chlorophenyl phenyl ether
chrysene
dibenzo(a,h)anthracene
1,2-dichlorobenzene

Acid Compounds

2-chlorophenol
2,4-dichlorophenol
2,4-dimethylphenol
4,6-dinitro-o-cresol
2,4-dinitrophenol
2-nitrophenol
4-nitrophenol
p-chloro-m-cresol
pentachlorophenol
phenol
2,4,6-trichlorophenol

Pesticides

aldrin
alpha-BHC
beta-BHC
gamma-BHC
delta-BHC
chlordane
4,4'-DDT
4,4'-DDE
4,4'-DDD
dieldrin
alpha-endosulfan
beta-endosulfan
endosulfan sulfate
endrin
endrin aldehyde
heptachlor
heptachlor epoxide
PCB-1242
PCB-1254
PCB-1221

PRIORITY POLLUTANTS AND HAZARDOUS SUBSTANCES
ORGANIC TOXIC POLLUTANTS IN EACH OF FOUR FRACTIONS
IN ANALYSIS BY GAS CHROMATOGRAPHY/MASS SPECTROSCOPY (GC/MS)

<u>Volatiles</u>	<u>Base/Neutral</u>	<u>Acid Compounds</u>	<u>Pesticides</u>
1,1,2,2-tetrachloroethane	1,3-dichlorobenzene		PCB-1232
tetrachloroethylene	1,4-dichlorobenzene		PCB-1248
toluene	3,3-dichlorobenzidine		PCB-1260
1,2-trans-dichloroethylene	diethyl phthalate		PCB-1016
1,1,1-trichloroethane	dimethyl phthalate		toxaphene
1,1,2-trichloroethane	di-n-butyl phthalate		
trichloroethylene	2,4-dinitrotoluene		
vinyl chloride	2,6-dinitrotoluene		
	di-n-octyl phthalate		
	1,2-diphenylhydrazine (as azobenzene)		
	fluorene		
	fluoranthene		
	hexachlorobenzene		
	hexachlorobutadiene		
	hexachlorocyclopentadiene		
	hexachloroethane		
	indeno(1,2,3-cd)pyrene		
	isophorone		
	naphthalene		
	nitrobenzene		
	N-nitrosodimethylamine		
	N-nitrosodi-n-propylamine		
	N-nitrosodiphenylamine		
	phenanthrene		
	pyrene		
	1,2,4-trichlorobenzene		

OTHER TOXIC POLLUTANTS
(AMMONIA, METALS AND CYANIDE) AND TOTAL PHENOLS

Antimony, Total
Arsenic, Total
Beryllium, Total
Cadmium, Total
Chromium, Total
Copper, Total
Lead, Total
Mercury, Total
Nickel, Total
Selenium, Total
Silver, Total
Thallium, Total
Zinc, Total
Cyanide, Total
Phenols, Total

TOXIC POLLUTANTS AND HAZARDOUS SUBSTANCES

REQUIRED TO BE IDENTIFIED BY EXISTING DISCHARGERS
IF EXPECTED TO BE PRESENT

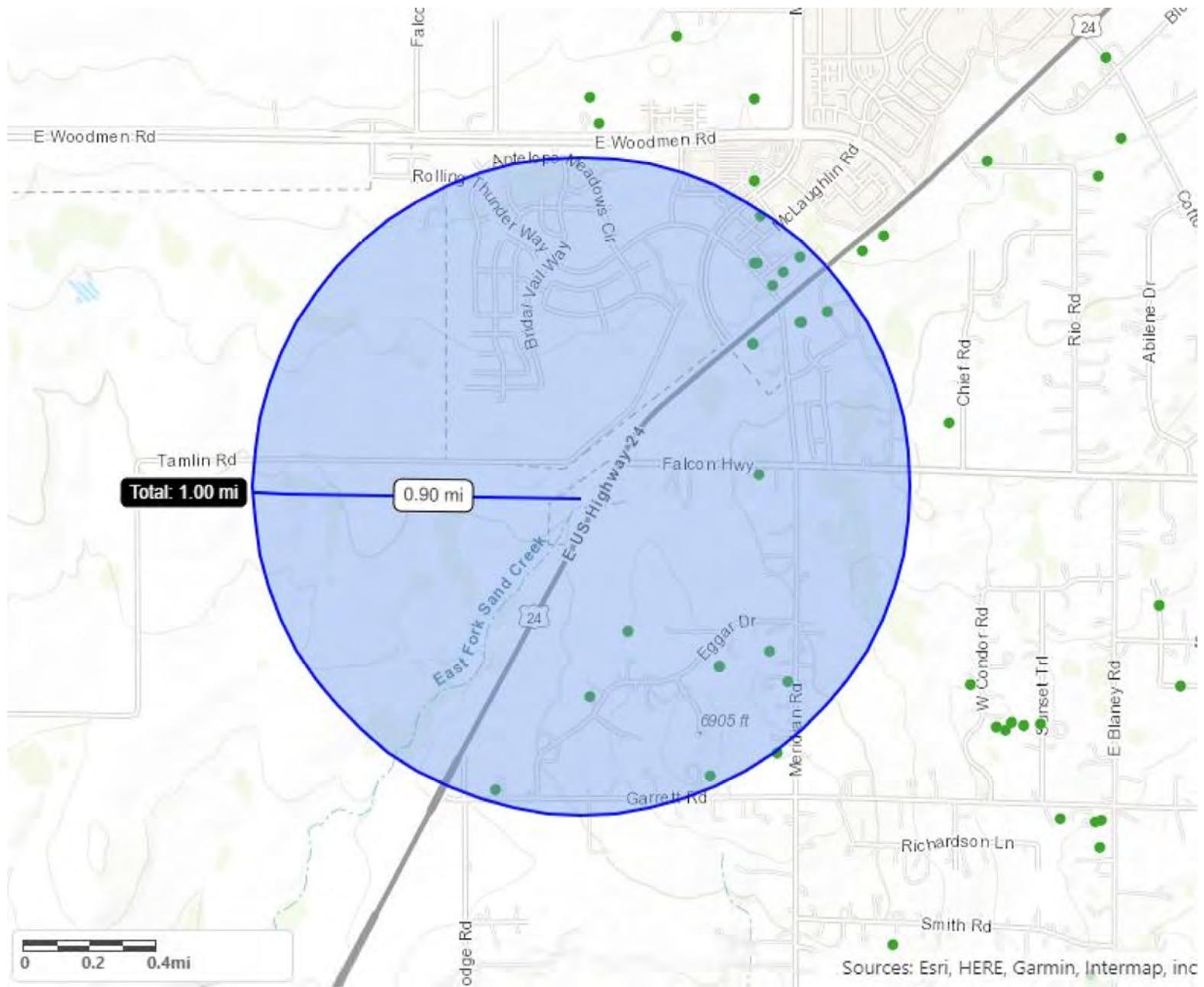
Toxic Pollutants

Asbestos

Hazardous Substances

Acetaldehyde	Isoprene
Allyl alcohol	Isopropanolamine
Allyl chloride	Keithane
Amyl acetate	Kepone
Aniline	Malathion
Benzonitrile	Mercaptodimethur
Benzyl chloride	Methoxychlor
Butyl acetate	Methyl mercaptan
Butylamine	Methyl methacrylate
Captan	Methyl parathion
Carbaryl	Mexacarbate
Carbofuran	Monoethyl amine
Carbon disulfide	Monomethyl amine
Chlorpyrifos	Naled
Coumaphos	Napthenic acid
Cresol	Nitrotoluene
Crotonaldehyde	Parathion
Cyclohexane	Phenolsulfanate
2,4-D(2,4-Dichlorophenoxy acetic acid)	Phosgene
Diazinon	Propargite
Dicamba	Propylene oxide
Dichlobenil	Pyrethrins
Dichlone	Quinoline
2,2-Dichloropropionic acid	Resorcinol
Dichlorvos	Strontium
Diethyl amine	Strychnine
Dimethyl amine	Styrene
Dinitrobenzene	TDE (Tetrachlorodiphenylethane)
Diquat	2,4,5-T (2,4,5-Trichlorophenoxy acetic acid)
Disulfoton	2,4,5-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]
Diuron	Trichlorofan
Epichlorohydrin	Triethylamine
Ethanolamine	Trimethylamine
Ethion	Uranium
Ethylene diamine	Vandium
Ethylene dibromide	Vinyl Acetate
Formaldehyde	Xylene
Furfural	Xylenol
Guthion	Zirconium

APPENDIX E
ONE-MILE RADIUS WELL MAP



**APPENDIX F
GEOTECHNICAL STUDY REPORT
NRCS SOILS REPORT**



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**GEOTECHNICAL ENGINEERING STUDY
OUTFALL LIFT STATION
FALCON MEADOWS RV PARK
PEYTON, COLORADO**

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Project No. 18-8-370

January 25, 2018

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FIGURE 1	SITE LOCATION
FIGURE 2	BORING LOCATION
FIGURE 3	BORING LOG WITH LEGEND AND NOTES
FIGURE 4	SWELL COMPRESSION TEST RESULTS

TABLE 1 - SUMMARY OF LABORATORY TEST RESULT

PURPOSE AND SCOPE OF STUDY

This report presents the results of a geotechnical engineering study for a proposed Outfall Lift Station located at the Falcon Meadows RV Park at 11150 Highway 24 Peyton, CO. The site location is shown on Figure 1. The subsurface study was conducted to develop foundation design recommendations. The study was conducted in accordance with the scope of work in our Proposal No. P8-18-265 to Element Engineering dated December 6, 2018.

A field exploration program consisting of one boring was conducted to obtain information on subsurface conditions. Samples of the soils obtained during the field exploration were tested in the laboratory to determine their classification and engineering characteristics. The results of the field exploration, and laboratory testing were analyzed to develop recommendations for foundation types, depths and allowable pressures for the proposed construction. The results of the analysis are presented in this report.

PROPOSED CONSTRUCTION

The proposed construction is for a sanitary lift station. The construction consists of a prefabricated concrete unit. It will be about 15 feet deep. Loads are expected to be light. Grading for the proposed construction is anticipated to be relatively minor. If the proposed construction varies significantly from that described above or depicted in this report, we should be notified to reevaluate the recommendations provided in this report.

SITE CONDITIONS

The location for the proposed lift station is approximately 200 feet to the southwest of the main entrance of the Falcon Meadows RV park at 11150 Highway 24 in Peyton, CO. Open land can be found to the south and west. An industrial facility is directly to the east and a new residential development currently under construction to the north. Mobile homes surround the site with unpaved roads and pathways. The topography is relatively flat but slopes mildly down to the west and mildly up to the east. Vegetation consists of natural trees and grasses.

SUBSURFACE CONDITIONS

The subsurface conditions at the site were explored by drilling one boring for the lift station. Figure 2 shows the approximate boring location. A graphic log of the boring is presented on Figure 3 with a legend and notes describing the soils encountered. The boring was advanced with 4-inch

diameter continuous flight augers powered by a truck mounted drill rig. The boring was logged by a representative of Kumar and Associates.

Samples of the soils were taken with a nominal 2-inch I.D "California" sampler. The sampler was driven into the soils with blows from a 140-pound hammer falling 30 inches. This test is similar to the standard penetration test described by ASTM Method D 1586. Penetration resistance values, when properly evaluated, indicate the relative density of cohesionless soils or consistency of cohesive soils. Depths at which the samples were taken and the penetration resistance values are shown on the right side of the log on Figure 3.

Laboratory tests included natural moisture content, unit weight, percent passing the # 200 sieve (silt and clay fraction), gradation analyses, Atterberg limits, standard proctor, and swell/compression. The test results are shown on the boring log, Figure 4 and summarized in Table 1. Testing was in accordance with ASTM standards.

Under a thin layer of top soil, silty sand was found to a depth of three feet. The silty sand had a moisture content of 2.3 percent and a dry density of 108 pcf. Fat clay with sand was then found below the upper three feet of silty sand. The Fat clay with sand had a high moisture content of 24.5 percent and a dry density of 98 pcf. Claystone was then found at depth 8 feet. The claystone had moisture content of 19.2 percent and a dry density of 110 pcf. Below the claystone, sandstone was found to a maximum depth drilled of 25 feet.

Swell-compression tests were performed on samples of the silty sand and fat clay with sand. The results are shown on Figure 4. The samples were wetted under a surcharge pressure of 1,000 psf. The results show that the silty sand and fat clay with sand to have a low swell potential ranging from -0.6 to 0.3 percent.

WATER-SOLUBLE SULFATES

The concentration of water-soluble sulfates measured in a sample of the fat clay with a sand was 0.02 percent. This concentrations of water-soluble sulfates represent a Class 0 severity exposure to sulfate attack on concrete exposed to these materials. The degree of attack is based on a

range of Class 0, Class 1, Class 2, and Class 3 severity exposure as presented in ACI 201. Based on the laboratory test results, we believe Type I/II cement will be satisfactory.

SEISMIC CONSIDERATION

The following parameters are based on the 2012/2015 IBC Provisions and USGS Seismic Design Map. The lift station was considered to be a Category I, II, III facility. The site is considered a seismic Class C.

GEOTECHNICAL ENGINEERING CONSIDERATIONS

Based on the data obtained during the field and laboratory studies, we recommend that the foundations be supported on spread footing or a mat foundation bearing on the native overburden soils or sandstone bedrock.

FOUNDATIONS

The following details should be followed for a footing or mat foundation.

1. The foundation may be designed for a maximum allowable bearing pressure of 2,000 psf if bearing on the soils or 4,000 if bearing on the sandstone. Settlement is not expected to exceed one inch and differential settlement less than $\frac{3}{4}$ inch.
2. Any loose or unsuitable soil or bedrock should be removed and replaced compacted.
3. Lateral resistance of footings or mat may be calculated on the basis of a coefficient of friction of 0.35. Passive resistance of 250 pcf for compacted backfill against the sides of footings may be used. Both values are unfactored.
4. Footings below unheated areas should be below frost depth, taken as 36 inches in this area.
5. A representative of the geotechnical engineer should observe all footing excavations prior to fill and concrete placement.

RETAINING AND FOUNDATION WALLS

Foundation walls and retaining structures which are laterally supported and can be expected to undergo only a slight amount of deflection should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 50 pcf for backfill consisting of properly compacted, approved, on-site soil. Cantilevered retaining structures

which are separate from the building and can be expected to deflect sufficiently to mobilize the full active earth pressure condition should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 40 pcf for backfill consisting of properly compacted on-site soil.

The lateral resistance of retaining wall footings will be a combination of the sliding resistance of the footing on the foundation materials and passive earth pressure against the side of the footing as discussed in the SPREAD FOOTING section above. Care should be taken not to over-compact the wall backfill since this could cause excessive lateral pressures on the walls. Some settlement of foundation wall backfill could occur even if the backfill is placed correctly.

All retaining structures should be designed for appropriate hydrostatic and surcharge pressures such as adjacent footings, traffic, construction materials and equipment. The pressures recommended above assume drained conditions behind the walls and a horizontal backfill surface. The buildup of water behind a wall or an upward sloping backfill surface will increase the lateral pressure imposed on a foundation wall or retaining structure. An underdrain or weep holes should be provided to prevent hydrostatic pressure buildup behind retaining walls.

SITE GRADING

General:

The following recommendations should be followed for grading, site preparation, and fill compaction.

1. All import and onsite backfill should be approved by the geotechnical engineer.
2. Where fill is to be placed, loose or otherwise unsuitable material, including topsoil vegetation and should be removed prior to placement of new fill.
3. Soils should be compacted with appropriate equipment for the lift thickness placed, typically 8-inches loose, or less.
4. The following compaction requirements should be used:

TYPE OF FILL PLACEMENT	MOISTURE CONTENT	SOIL TYPE - Compaction Percent (ASTM D-698 Standard Proctor)
Below Footings,	2% to +2% of Optimum	Suitable on site, Import Fill (min – 98%)
Concrete Flatwork	2% to +2% of Optimum	Suitable on site, Import Fill (min – 95%)
Landscape Areas	0% to +3% of Optimum	Suitable onsite (min – 90%)or
Utility Trenches	As they apply to the finished area	

Suitability of On-site Soil:

The silty sand and sandstone are suitable for structural fill. The fat clay or claystone are not suitable for structural fill or wall backfill.

Import Structural Fill:

If import structural fill is needed it should be non-expansive, and should consist of minus 2-inch material having less than 35 percent passing the No. 200 sieve, a liquid limit less than 30, and a plasticity index less than 15. Import materials should be approved by the geotechnical engineer before placement. CDOT Class 1 structural backfill or Class 5 or 6 aggregate materials will meet the above specifications, and are suitable as structural fill.

Excavation:

The excavation can be made with conventional equipment, however the sandstone is hard and may require extra effort in a confined excavation. Excavation slopes should be in compliance with OSHA criteria. The upper soils are Type B soils with maximum slope of 1:1. The bedrock should be stable on steeper slopes. The contractor's "competent person" should make the judgement on safe slopes. If there is any doubt about safe slopes, the geotechnical engineer should visit the site.

SURFACE DRAINAGE

Proper surface drainage is very important for acceptable performance of the structure during construction and after the construction has been completed. Drainage recommendations provided by local, state and national entities should be followed based on the intended use of the structure. Exterior backfill should be adjusted to near optimum moisture content and compacted to at least 95 % of the ASTM D 698 (standard Proctor) maximum dry density. We recommend a slope of 8 inches in the first 10 feet away from the structure in unpaved areas and 3 percent in

paved areas. This may be adjusted where necessary to accommodate ADA criteria.

DESIGN AND CONSTRUCTION SUPPORT SERVICES

Kumar and Associates should be retained to review the project plans and specifications for conformance with the recommendations provided in our report. We are also available to assist the design team in preparing specifications for geotechnical aspects of the project, and performing additional studies if necessary to accommodate possible changes in the proposed construction. We recommend that Kumar and Associates be retained to provide construction observation and testing services to document that the intent of this report and the requirements of the plans and specifications are being followed during construction. This will allow us to identify possible variations in subsurface conditions from those encountered during this study and to allow us to re-evaluate our recommendations, if needed. We will not be responsible for implementation of the recommendations presented in this report by others, if we are not retained to provide construction observation and testing services.

LIMITATIONS

This study has been conducted in accordance with generally accepted geotechnical engineering practices in this area for exclusive use by the client for design purposes. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory boring at the location indicated on Figure 2, and the proposed type of construction. This report may not reflect subsurface variations that occur, and the nature and extent of variations across the site may not become evident until site grading and excavation is performed. If during construction, fill, soil, rock or water conditions appear to be different from those described herein, Kumar and Associates should be advised at once so that a re-evaluation of the recommendations presented in this report can be made. The scope of services for this project does not include any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken. Kumar and Associates is not responsible for liability associated with interpretation of subsurface data by others.

KUMAR & ASSOCIATES



NOT TO SCALE

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Kumar & Associates

VICINITY MAP

Fig. 1

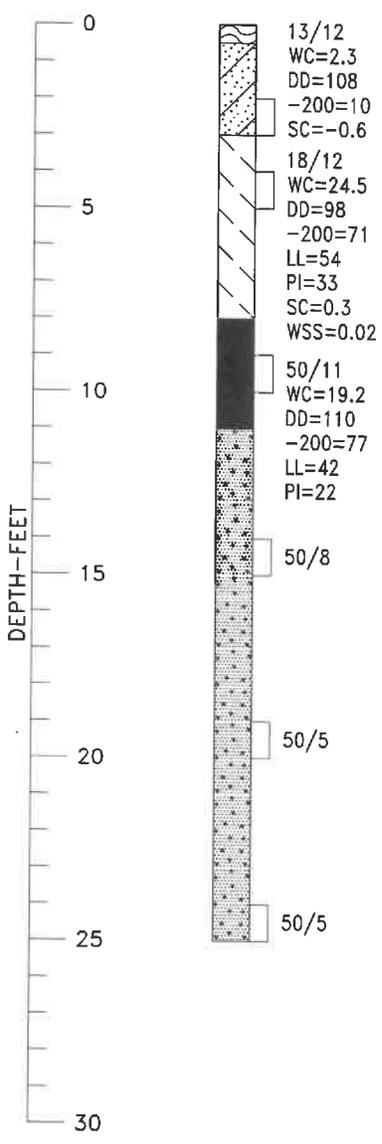


APPROXIMATE SCALE—FEET

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18-8-370	Kumar & Associates	LOCATION OF EXPLORATORY BORING	Fig. 2
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BORING 1



LEGEND

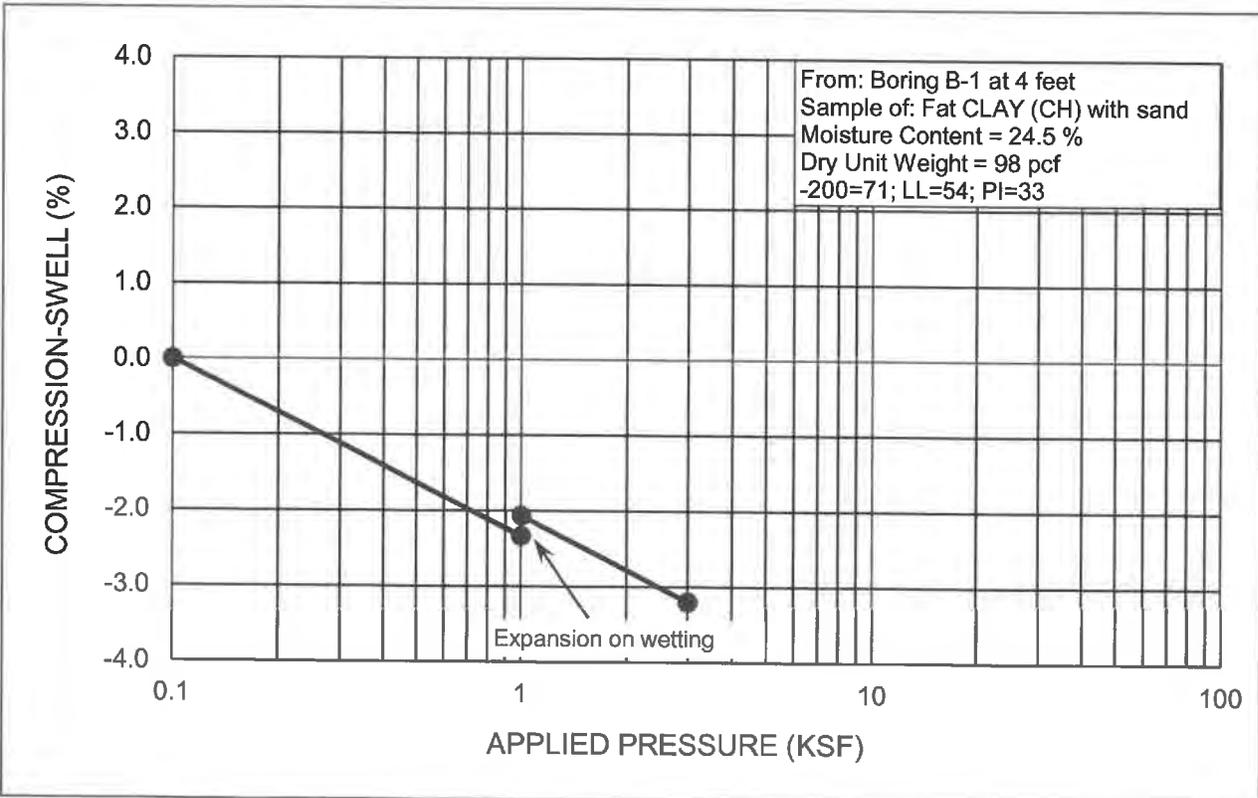
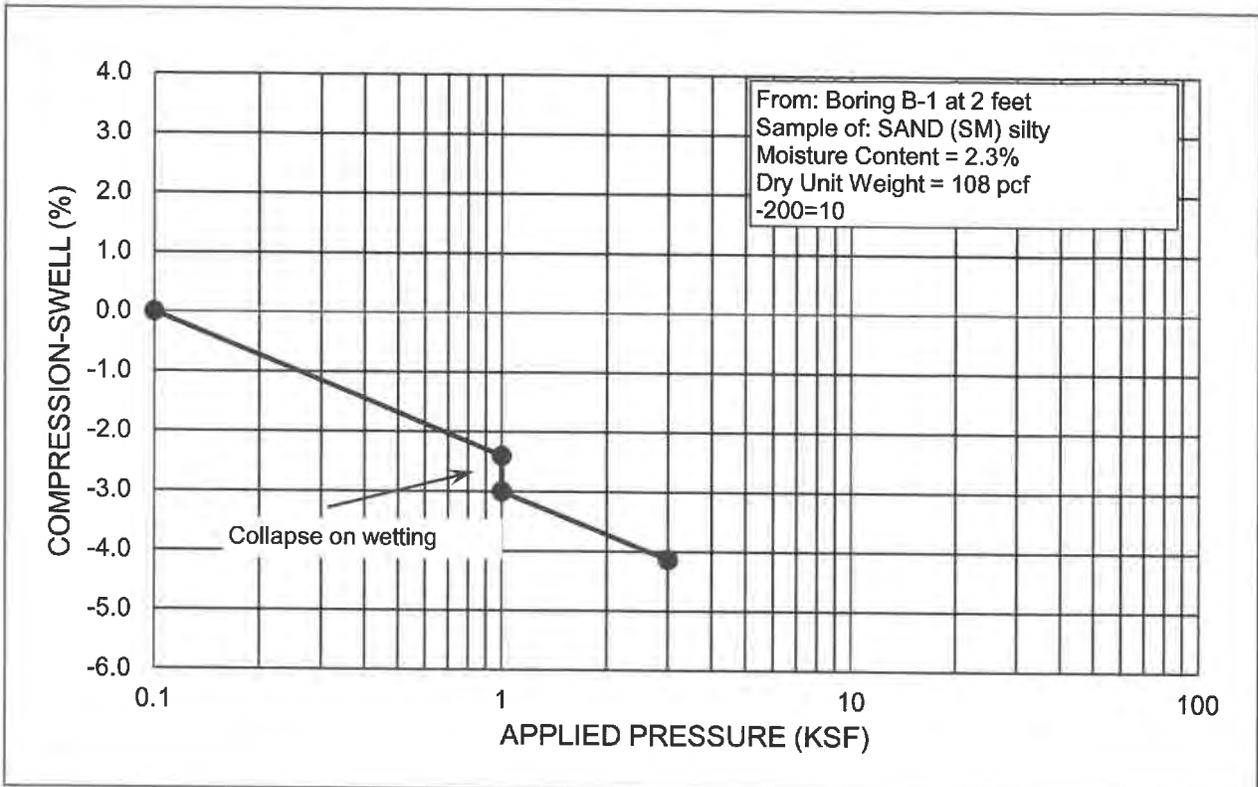
- TOPSOIL.
- SAND, SILTY, MEDIUM DENSE, FINE TO MEDIUM GRAINED, MOIST, LIGHT BROWN.
- FAT CLAY WITH SAND, VERY STIFF, HIGH PLASTICITY, MOIST, ORANGE YELLOW, FERROUS OXIDE.
- CLAYSTONE, HARD, MEDIUM PLASTICITY, MOIST, GRAY, FERROUS OXIDE.
- SANDSTONE, VERY HARD, LOW TO MEDIUM PLASTICITY, FINE TO MEDIUM GRAINED, MOIST, GREEN/BLUE, FERROUS OXIDE.
- DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLE.

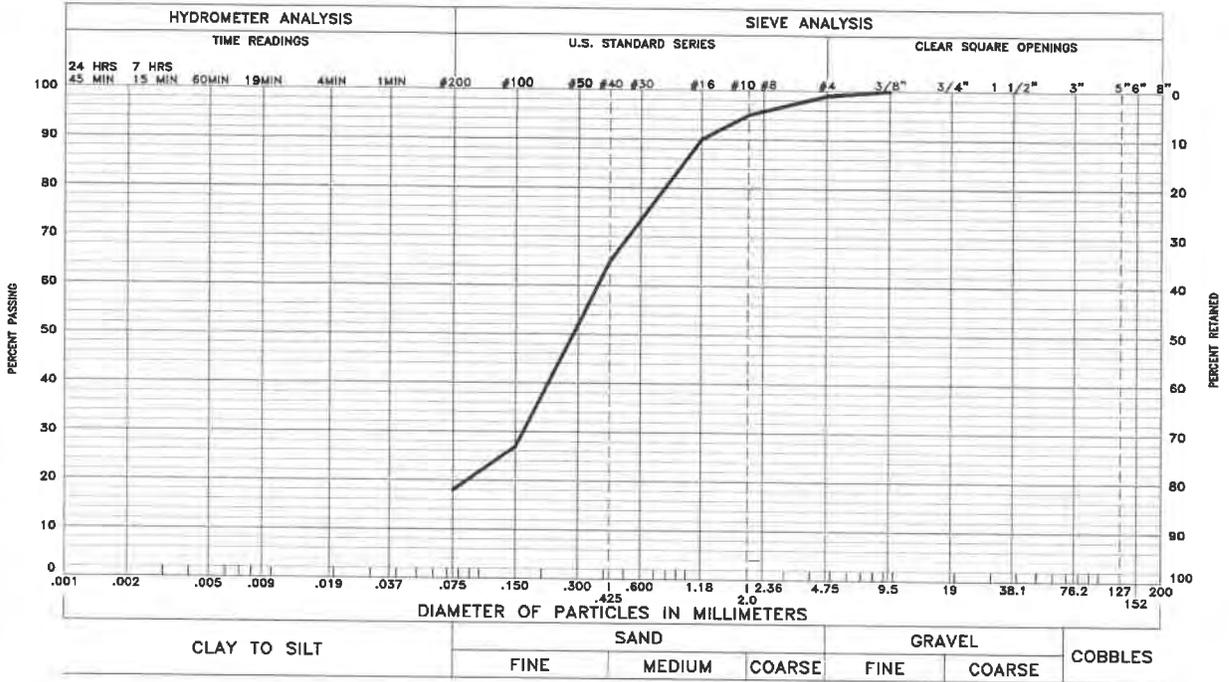
13/12 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 13 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.

NOTES

1. THE EXPLORATORY BORING WAS DRILLED ON DECEMBER 21, 2018 WITH A 4-INCH DIAMETER CONTINUOUS FLIGHT POWER AUGER.
2. THE LOCATION OF THE EXPLORATORY BORING WAS MEASURED APPROXIMATELY BY PACING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.
3. THE ELEVATION OF THE EXPLORATORY BORING WAS NOT MEASURED AND THE LOG OF THE EXPLORATORY BORING IS PLOTTED TO DEPTH.
4. THE EXPLORATORY BORING LOCATION SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOG REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
6. GROUNDWATER WAS NOT ENCOUNTERED IN THE BORING AT THE TIME OF DRILLING.
7. LABORATORY TEST RESULTS:
 WC = WATER CONTENT (%) (ASTM D 2216);
 DD = DRY DENSITY (pcf) (ASTM D 2216);
 -200 = PERCENTAGE PASSING NO. 200 SIEVE (ASTM D 1140);
 LL = LIQUID LIMIT (ASTM D 4318);
 PI = PLASTICITY INDEX (ASTM D 4318);
 WSS = WATER SOLUBLE SULFATES (%) (AASHTO T 290);
 SC = PERCENT SWELL (+) OR CONSOLIDATION (-) UPON WETTING UNDER CONSTANT LOAD (ASTM D 4546, METHOD B);

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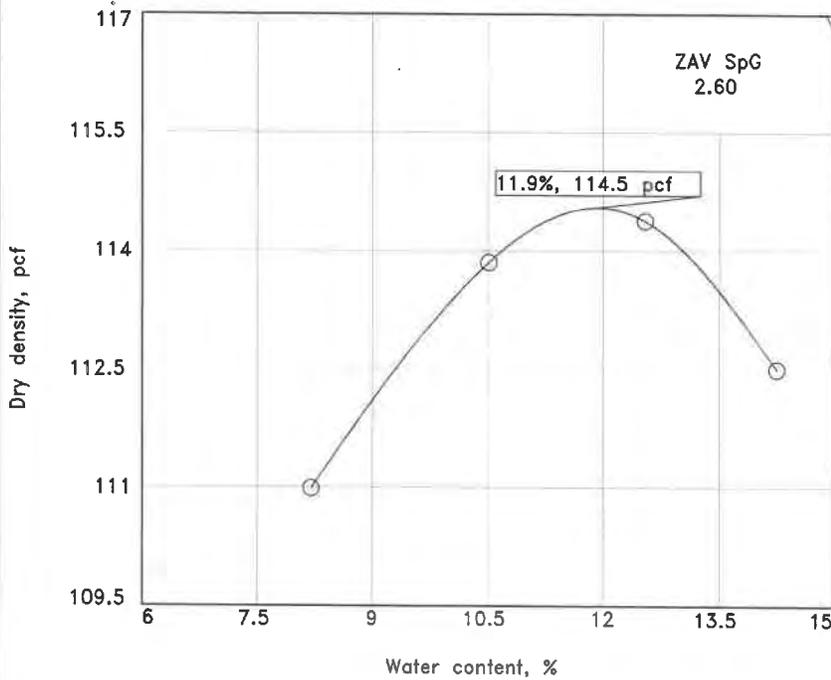
GRAVEL - % SAND - % SILT AND CLAY - %
 LIQUID LIMIT - PLASTICITY INDEX -
 SAMPLE OF: - FROM: -

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

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COMPACTION TEST REPORT

Curve No. 264



Preparation Method _____	
Rammer: Wt. <u>10 lb.</u>	Drop <u>18 in.</u>
Type _____	
Layers: No. <u>five</u>	Blows per <u>25</u>
Mold Size <u>0.03333 cu. ft.</u>	
Test Performed on Material	
Passing <u>#4</u> Sieve	
%>#4 _____ %<No.200 _____	
Atterberg (D 4318): LL _____ PI _____	
NM (D 2216) _____ Sp.G. (D 854) <u>2.6</u>	
USCS (D 2487) _____	
AASHTO (M 145) _____	
Date: Sampled _____	<u>12-21-19</u>
Received _____	
Tested _____	
Tested By _____	

COMPACTION TESTING DATA
ASTM D 1557-12 Method A Modified

	1	2	3	4	5	6
WM + WS	6088.5	6175.1	6219.1	6216.1		
WM	4272.9	4272.9	4272.9	4272.9		
WW + T #1	312.9	332.1	426.4	546.5		
WD + T #1	289.9	301.4	379.9	479.5		
TARE #1	9.4	9.3	9.2	9.3		
WW + T #2						
WD + T #2						
TARE #2						
MOIST.	8.2	10.5	12.5	14.2		
DRY DENS.	111.0	113.9	114.4	112.5		

SIEVE TEST RESULTS

Opening Size	% Passing	Specs.

TEST RESULTS

Maximum dry density = 114.5 pcf
Optimum moisture = 11.9 %

Material Description

Project No. _____ Client: _____
Project: _____
Location: Outfall Lift Sample Number: 264

Remarks:

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar and Associates, Inc. Moisture/density relationships performed in accordance with ASTM D698, D1557. Atterberg limits performed in accordance with ASTM D4318 sieve analysis performed in accordance with ASTM D422, D1140.

Checked by: _____

Title: _____

18-8-370

Kumar & Associates

MOISTURE-DENSITY RELATIONSHIPS

Fig. 6

Kumar & Associates, Inc.

TABLE I SUMMARY OF LABORATORY TEST RESULTS

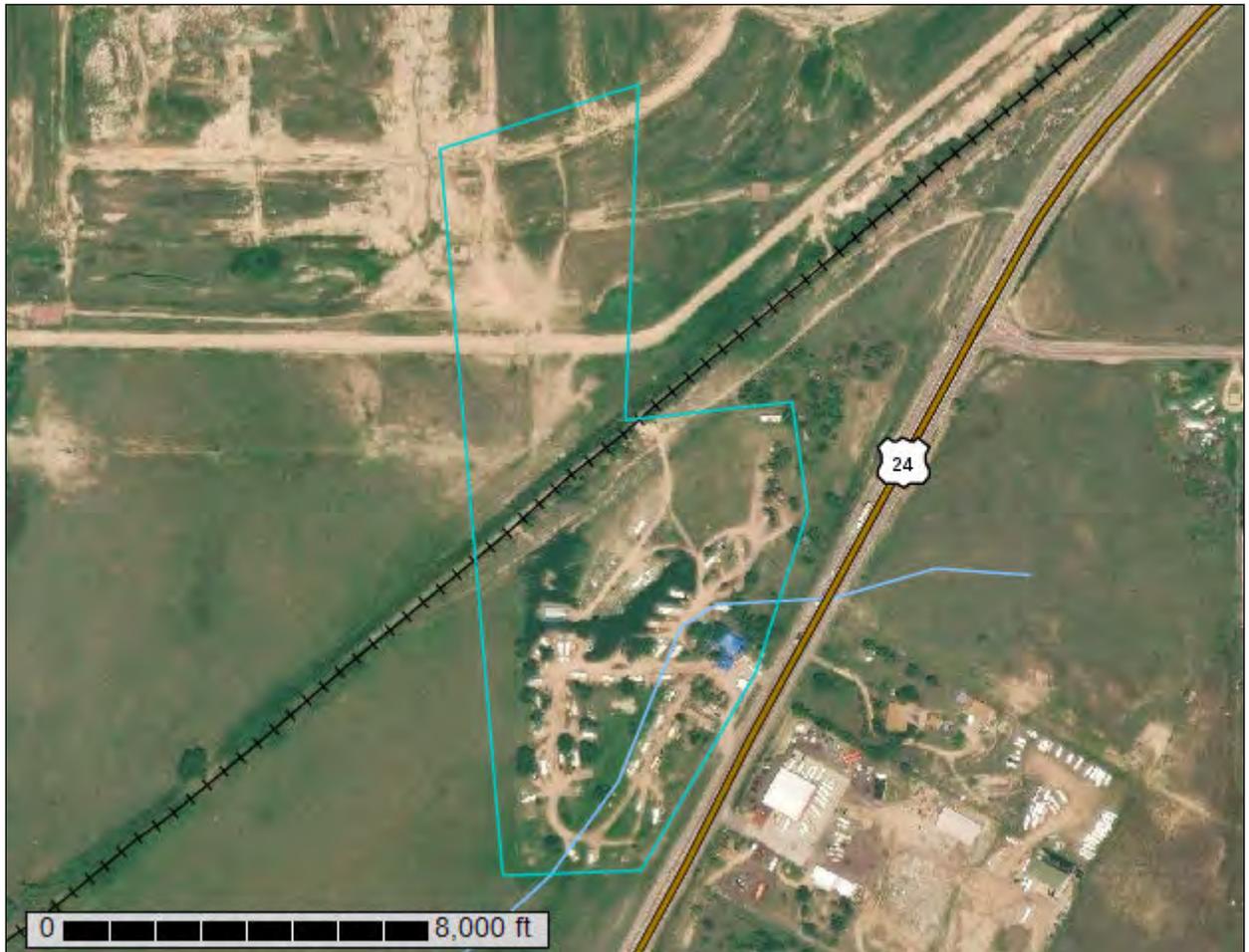
Project No.: 18-8-370

Project Name: Outfall Lift Station Falcon Meadows RV Park

BORING	SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		SILT & CLAY (%)	ATTERBERG LIMITS		SWELL WITH 1000 PSF SURCHARGE (%)	WATER SOLUBLE SULFATES (%)	SOIL OR BEDROCK TYPE (Unified Soil Classification)
	DEPTH (ft)				GRAVEL (%)	SAND (%)		LIQUID LIMIT	PLASTICITY INDEX			
B1	2		2.3	108			10			-0.6		SAND silty (SM)
B1	4		24.5	98			71	54	33	0.3	0.02	Fat CLAY (CH) with sand
B1	9		19.2	110			77	42	22			Claystone

Custom Soil Resource Report for El Paso County Area, Colorado

Falcon Meadow Campground



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

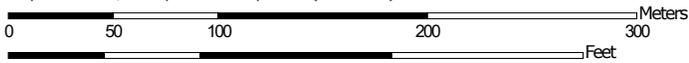
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.

Map Scale: 1:3,590 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
 Survey Area Data: Version 16, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 7, 2016—Aug 17, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	14.6	55.4%
9	Blakeland-Fluvaquentic Haplaquolls	7.3	27.6%
96	Truckton sandy loam, 0 to 3 percent slopes	4.5	17.0%
97	Truckton sandy loam, 3 to 9 percent slopes	0.0	0.1%
Totals for Area of Interest		26.3	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

Custom Soil Resource Report

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369v
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:

Landform: Depressions

Hydric soil rating: Yes

9—Blakeland-Fluvaquentic Haplaquolls

Map Unit Setting

National map unit symbol: 36b6

Elevation: 3,500 to 5,800 feet

Mean annual precipitation: 13 to 17 inches

Mean annual air temperature: 46 to 55 degrees F

Frost-free period: 110 to 165 days

Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 60 percent

Fluvaquentic haplaquolls and similar soils: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Hills, flats

Landform position (three-dimensional): Side slope, talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy alluvium derived from arkose and/or eolian deposits
derived from arkose

Typical profile

A - 0 to 11 inches: loamy sand

AC - 11 to 27 inches: loamy sand

C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95
to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Custom Soil Resource Report

Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Description of Fluvaquentic Haplaquolls

Setting

Landform: Swales
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 12 inches: variable

Properties and qualities

Slope: 1 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Interpretive groups

Land capability classification (irrigated): 6w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

96—Truckton sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 36bf
Elevation: 6,000 to 7,000 feet
Mean annual precipitation: 14 to 15 inches

Custom Soil Resource Report

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 125 to 145 days

Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Truckton and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Flats

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 8 inches: sandy loam

Bt - 8 to 24 inches: sandy loam

C - 24 to 60 inches: coarse sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: A

Ecological site: Sandy Foothill (R049BY210CO)

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:

Hydric soil rating: No

Pleasant

Percent of map unit:

Landform: Depressions

Hydric soil rating: Yes

97—Truckton sandy loam, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2x0j2
Elevation: 5,300 to 6,850 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 85 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Truckton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Interfluves, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Re-worked alluvium derived from arkose

Typical profile

A - 0 to 4 inches: sandy loam
Bt1 - 4 to 12 inches: sandy loam
Bt2 - 12 to 19 inches: sandy loam
C - 19 to 80 inches: sandy loam

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline (0.1 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)

Custom Soil Resource Report

Hydric soil rating: No

Minor Components

Blakeland

Percent of map unit: 8 percent

Landform: Interfluves, hillslopes

Landform position (two-dimensional): Shoulder, backslope, summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Ecological site: Sandy Foothill (R049BY210CO)

Hydric soil rating: No

Bresser

Percent of map unit: 7 percent

Landform: Interfluves, low hills

Landform position (two-dimensional): Foothill, toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

Ecological site: Sandy Foothill (R049BY210CO)

Hydric soil rating: No

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- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

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APPENDIX G
INFORMATION FOR PLANNING AND CONSULTATION (IPAC) REPORT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

El Paso County, Colorado



Local office

Colorado Ecological Services Field Office

☎ (303) 236-4773

📠 (303) 236-4005

MAILING ADDRESS

Denver Federal Center

P.O. Box 25486

Denver, CO 80225-0486

PHYSICAL ADDRESS

134 Union Boulevard, Suite 670
Lakewood, CO 80228-1807

<http://www.fws.gov/coloradoES>

<http://www.fws.gov/platteriver>

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME

STATUS

North American Wolverine *Gulo gulo luscus*
 No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/5123>

Proposed Threatened

Birds

NAME

STATUS

Least Tern *Sterna antillarum*

Endangered

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/8505>

Mexican Spotted Owl *Strix occidentalis lucida*

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/8196>

Piping Plover *Charadrius melodus*

Threatened

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/6039>

Whooping Crane *Grus americana*

Endangered

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/758>

Fishes

NAME

STATUS

Greenback Cutthroat Trout *Oncorhynchus clarkii stomias*

Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2775>

Pallid Sturgeon *Scaphirhynchus albus***Endangered**

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/7162>

Flowering Plants

NAME

STATUS

Ute Ladies'-tresses *Spiranthes diluvialis***Threatened**

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2159>

Western Prairie Fringed Orchid *Platanthera praeclara***Threatened**

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/1669>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Golden Eagle *Aquila chrysaetos*

Breeds Jan 1 to Aug 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
<https://ecos.fws.gov/ecp/species/1680>

Lark Bunting *Calamospiza melanocorys*

Breeds May 10 to Aug 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

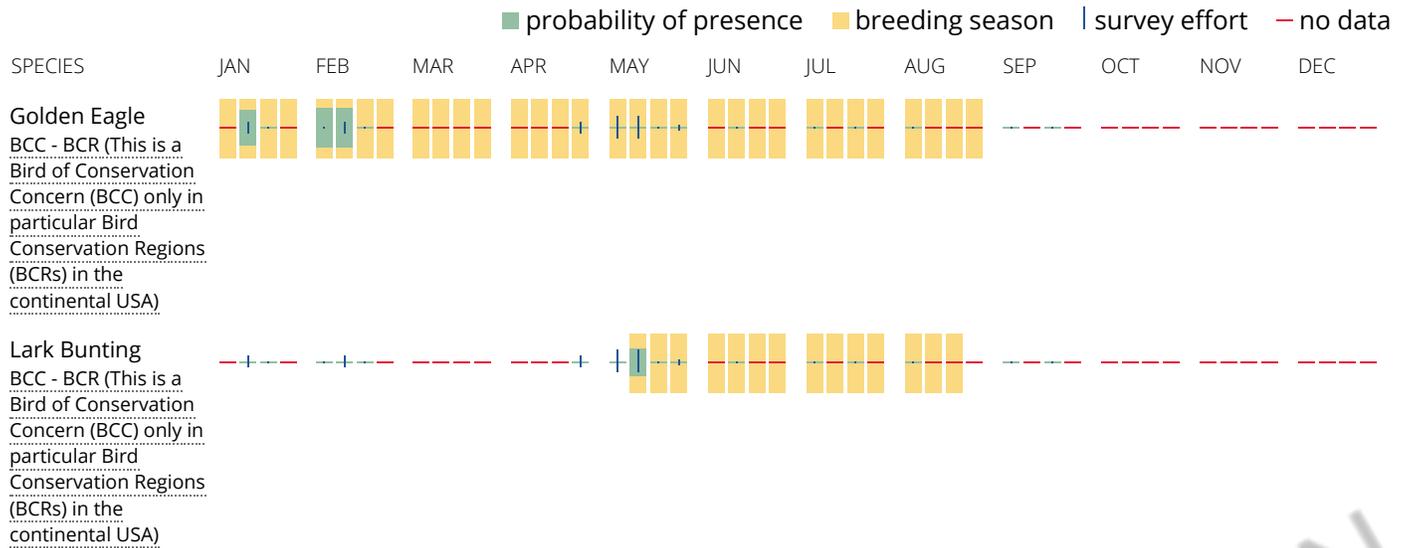
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to

confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1C](#)

RIVERINE

[R4SBC](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX H
LIFT STATION PUMP INFORMATION
LIFT STATION DESIGN INFORMATION

Table of Contents

1. Flow Conditions
2. Determine Appropriate Wet Well Diameter
3. System Curve Inputs
4. System Curve Data
5. Pump Curve Data

1. Flow Conditions

Lift Station Influent Flow	MGD	gpm	Notes
Average Day Flow (ADF)	0.0054	3.8	Existing
Max Month Flow (MMF)	0.01	5.6	Permitted Hydraulic Influent Flow
Peak Hour Flow (PHF)	0.0217	15.1	Lift station shall be sized to pump peak hour flow

2. Determine Appropriate Wet Well Diameter

Wet Well Size						
Wet Well Width (ft)	Area (ft ²)	Volume/1-ft Depth (ft ³)	Volume/1-ft Depth (gallon)	Depth from Pump off to Lead Pump on (ft)	Volume from Pump off to Lead Pump on (ft ³)	Volume from Pump off to Lead Pump on (gal)
6	60.00	60	449	0.5	30	224

Notes: Depth from pump off to lead pump on can be changed to increase or decrease normal pumping volume. Normal range is between 2 ft and 4 ft, but is ultimately determined based on pump run time.

System Cycle Time						
$t = \frac{V}{D} \left(\frac{1}{1 - \frac{Q}{D}} + \frac{1}{\frac{Q}{D}} \right)$						
D = rated pump delivery, gpm V = Storage volume between lead pump on and lag pump on, gallons Q = inflow to wetwell, gpm t = time between successive pump starts (operating cycle)						
Flow Condition	V	D _{opt}	Q _{in}	t	System Cycles/hr	Cycles/hr per Pump
Average Day Flow (ADF)	224	34	3.8	67.3	0.89	0.45
Max Month Flow (MMF)	224	34	5.6	47.8	1.26	0.63
Peak Hour Flow (PHF)	224	34	15.1	26.7	2.24	1.12

Notes: D_{opt} is the operating point of the pump (See System Curve)
 Notes: Typical t (time between successive pump starts - operating cycle) should be eight (8) to ten (10) minutes at average day flow, or roughly six (6) system cycles per hour. Design pump starts should be approved by the chosen pump manufacturer. For duplex pumping stations, individual pump cycles per hour will be half of the system cycles per hour.

Individual Pump Run Time						
Flow Condition	V	D _{opt}	Q _{in}	Run Time (min)	Ind. Pump Idle Time (min)	System Idle Time/Storage Time (min)
Average Day Flow (ADF)	224	34	4	7.42	127.10	59.84
Max Month Flow (MMF)	224	34	6	7.91	87.70	39.89
Peak Hour Flow (PHF)	224	34	15	11.85	41.64	14.89

Notes: Per CDPHE design criteria, maximum detention time at average day flow shall be one hour.

3. System Curve Inputs

Parameter	Value	Units
Elevation 1	6,798.74	ft
Elevation 2	6,820.50	ft
Force Main Diameter	2.047	in
Force Main Length	1,615	ft
Force Main Material	SCHD 40 PVC	
Hazen-Williams Coefficient	120	

Resistance Coefficient - K			
Fitting	No. Fittings	K Value	Total K Value
Entrance	1	0.78	0.78
Exit	1	1.00	1.00
90 deg Bend	4	0.57	2.28
45 deg Bend	8	0.30	2.40
Tee - Thru Flow		0.38	0.00
Tee - Branch Flow	1	1.14	1.14
Check Valve	1	1.90	1.90
Plug Valve	1	0.34	0.34
		Sum	9.84

4. System Curve Data

System Curve					
Flow (gpm)	Velocity (fps)	Static Head (ft)	H _s (ft)	H _t (ft)	TDH (ft)
5	0.49	21.76	0.04	1.44	23.24
10	0.97	21.76	0.15	5.21	27.11
15	1.46	21.76	0.33	11.03	33.11
20	1.95	21.76	0.58	18.77	41.11
25	2.44	21.76	0.91	28.37	51.04
30	2.92	21.76	1.31	39.75	62.81
35	3.41	21.76	1.78	52.86	76.40
40	3.90	21.76	2.32	67.68	91.76
45	4.39	21.76	2.94	84.15	108.86
34	3.31	21.76	1.68	50.10	73.54

Note: Typical velocities at the design peak hour flow should be approximately 6 fps to 9 fps

5. Pump Curve Data

Influent Pump Information		
Pump Make	Zoeller	
Pump Model	820 Grinder	
Discharge Diameter	1.25	in
Rated Power	2	HP

Pump Curve	
One Pump Flow (gpm)	TDH (ft)
0	106
5	102
10	97
15	92
20	87
25	82
30	76
35	70
40	64
45	53
46	40
46	30
46	20
46	10

Table of Contents

1. Equations and Terms used in the Calculations
2. Static Head
3. Minor Losses
4. Friction Losses
5. Total Dynamic Head

1. Equations and Terms used in the Calculations

$TDH = Elev2 - Elev1 + H_f$
 TDH = Total Dynamic Head
 Elev1 = Low water elevation of pumping wetwell
 Elev2 = Discharge Elevation
 H_m = Minor loss in piping due to friction and fittings
 H_f = Friction loss in piping
 C = Hazen-Williams Coefficient
 V = Velocity (ft/s)
 g = 32.2 ft/s²
 D = Pipe Diameter in Feet
 Pipe Diameter in Inches

2. Static Head

Elevation 1 6,798.74 ft
 Elevation 2 6,820.50 ft

 Static Head 21.76 ft

3. Minor Losses

$$H_m = K \frac{V^2}{2g}$$

Parameter	Value	Units
Force Main Diameter	2	in
Force Main Area	0.02	sf
Force Main Length	1,615	ft
Force Main Material	SCHD 40 PVC	
Hazen-Williams Coefficient	120	
Resistance Coefficient - K	9.84	

Flow (gpm)	Flow (cfs)	Velocity (fps)	H _m (ft)
5	0.011	0.487	0.036
10	0.022	0.975	0.145
15	0.033	1.462	0.327
20	0.045	1.950	0.581
25	0.056	2.437	0.908
30	0.067	2.925	1.307
35	0.078	3.412	1.779
40	0.089	3.900	2.324
45	0.100	4.387	2.941
34	0.076	3.315	1.679

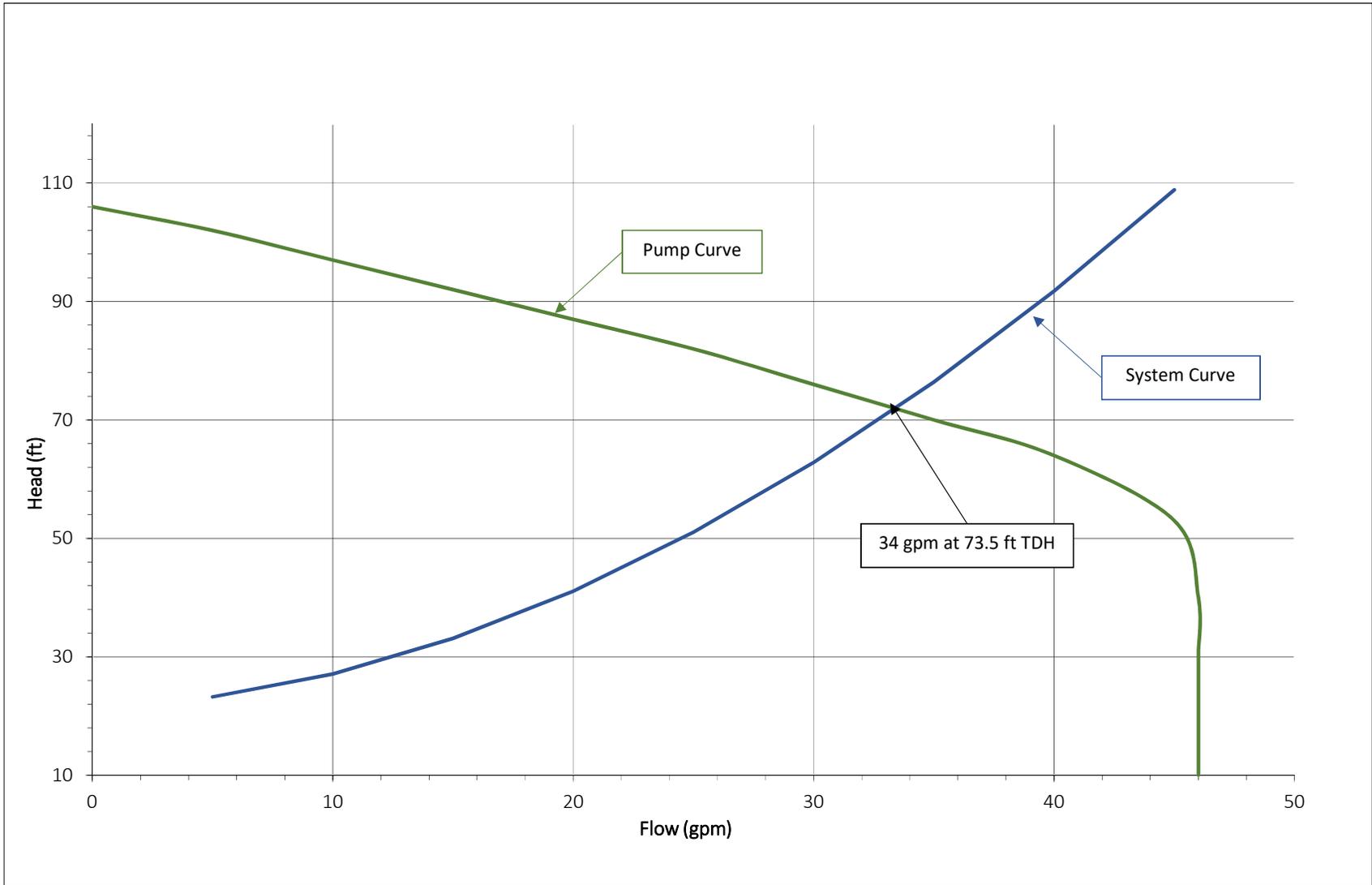
4. Friction Losses

$$H_f = 0.002083 \times L \times \left(\frac{100}{C}\right)^{1.85} \times \frac{gpm^{1.85}}{d^{4.8655}}$$

Flow (gpm)	H _f (ft)
5	1.44
10	5.21
15	11.03
20	18.77
25	28.37
30	39.75
35	52.86
40	67.68
45	84.15
34	50.10

5. Total Dynamic Head

Flow (gpm)	Static Head (ft)	H _m (ft)	H _f (ft)	TDH (ft)
5	21.76	0.04	1.44	23.24
10	21.76	0.15	5.21	27.11
15	21.76	0.33	11.03	33.11
20	21.76	0.58	18.77	41.11
25	21.76	0.91	28.37	51.04
30	21.76	1.31	39.75	62.81
35	21.76	1.78	52.86	76.40
40	21.76	2.32	67.68	91.76
45	21.76	2.94	84.15	108.86
34	21.76	1.68	50.10	73.54



Your Peace of Mind is Our Top Priority®



SECTION: 2.50.010

FM1478

0414

Supersedes

0609

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

PUMP COMPANY

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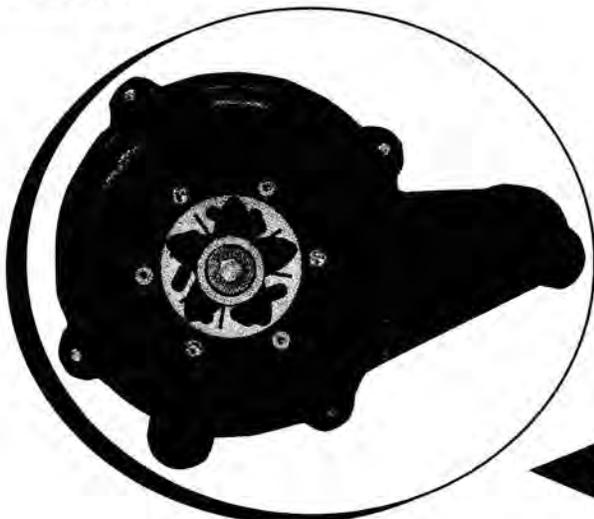
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THE SHARK Series 820 GRINDER PUMP

UNIQUELY DESIGNED PUMP WITH INTEGRAL CONTROL
(For Pump Prefix Identification see News & Views 0052)

FEATURES:

- Automatic with Integral Control, Nonautomatic available.
- UL Listed.
- Durable Heavy Duty Finned Cast Iron Construction.
- Legs provide for free standing installation.
- Motor - 2 HP, 60 Hz, 3450 RPM, Oil-filled, Hermetically Sealed with Class B Insulation, Automatic Reset Thermal Overload Protected.
- Upper and Lower Ball Bearings Running in Bath of Oil.
- Hardened Stainless Steel Cutter and Disc.
- Cutters Protected from Abrasive Solids.
- Stainless Steel Lifting Handle, Screws, and Bolts.
- Easily adapts to Rail Systems.
- Mechanical Shaft Seal - Carbon/Ceramic.
- Control panels are not required.
- Simplex Grinder Package Systems (Unassembled and Job Ready/Assembled) available.
- Corrosion resistant powder coated epoxy finish.
- Maximum operating temperature 130°F (54°C).
- 20' Power Cord.



Tested to UL Standard UL778



(Tested to UL778 and CSA22.2 108 Standards)



WD820/WH820 AUTOMATIC

POWDER COATED TOUGH™

E820/I820 NONAUTOMATIC



Submersible Wastewater Pump Association
SWPA MEMBER

Product may not be exactly as pictured.

PREPACKAGED AND JOB READY SYSTEMS

INDOOR		
REQ.		
1	Grinder (Auto or Nonauto)	P/N _____ (A)
1	Alarm System (Optional)	P/N _____ (B)
1	Weight Only (Required if alarm is used)	P/N 10-0689 (C)
1	Junction Box (Optional)	P/N 10-0666 (E)
1	Basin, Cover and Hardware	P/N _____ (F)

OUTDOOR		
REQ.		
1	Grinder (Auto or Nonauto)	P/N _____ (A)
1	Control Panel/Alarm System	P/N _____ (B)
1	Float Switch/es (if required)	P/N _____ (C)
1	Weight/s and Bracket/s	P/N _____ (C)
1	Junction Box	P/N _____ (E)
1	Basin, Cover and Rail System	P/N _____ (G)

FIELD MOUNT SYSTEMS

SIMPLEX		
REQ.		
1	Grinder (Auto or Nonauto)	P/N _____ (A)
1	Alarm System (Optional)	P/N _____ (B)
1	Variable Level Fl. Sw. Assm. ⁽²⁾ (Not required for auto pumps)	P/N _____ (C)
1	Weight and Bracket Only (2 required if alarm is used)	P/N 10-0661 (C)
1	Junction Box (Optional)	P/N _____ (E)
1	Rail System (Optional)	P/N _____ (H)
1	Angle Arm/Intermediate Bracket ⁽¹⁾	P/N _____ (H)
1	Pull Rod ⁽³⁾	P/N _____ (J)
1	S.S. Cable	P/N _____ (K)

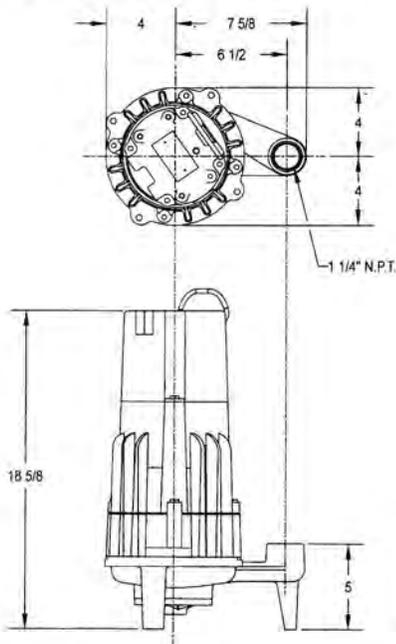
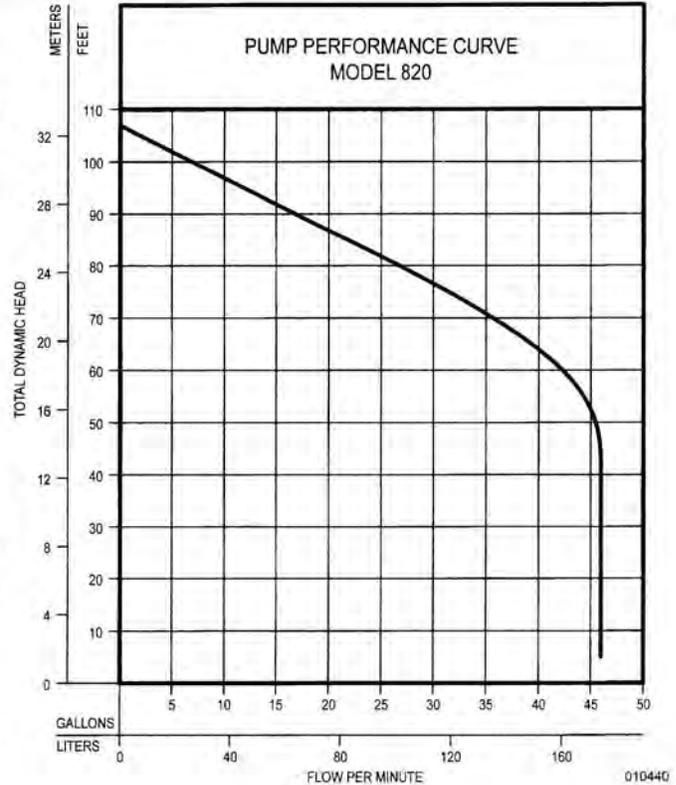
⁽¹⁾ Required for basins over 72" deep (Square Guide Rail) and over 12" (E-Z Out Rail). Allow for overhead clearances.

⁽²⁾ Hardwire pump, float switch, and power supply inside junction box.

⁽³⁾ For Square Guide Rail Only

Note: Contact factory for control panel selection.

Note: Access Doors Available on Field Mount Systems - Consult Factory
Special Basin Configurations - Consult Factory



SK1621

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MODEL 122 Control Panel

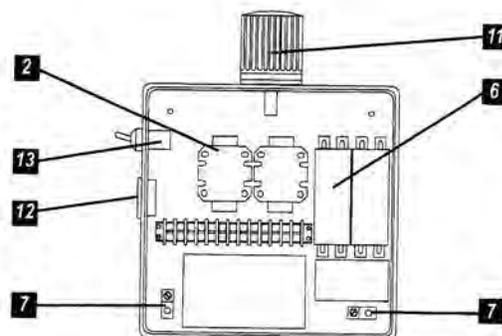
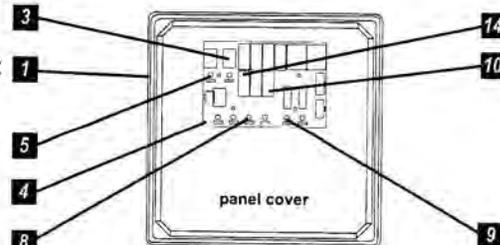
Single phase, duplex alternating pump control with override.

The Model 122 control panel is designed to alternately control two 120, 208, or 240 VAC single phase pumps in water and sewage installations. The alternating action equalizes pump wear. In addition to the alternating pump control, this system provides override control should either pump fail. If an alarm condition occurs, an alarm switch activates the audio/visual alarm system. Common applications include pump chambers, sump pump basins, irrigation systems and lift stations.

PANEL COMPONENTS

- Enclosure** measures 10 X 10 X 6 inches (25.4 X 25.4 X 15.24 cm). Choice of NEMA 1 (steel for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic with removable mounting feet for outdoor or indoor use).
Note: Options selected may increase enclosure size and change component layout.
- Magnetic Motor Contactors** control pumps by switching electrical lines.
- HOA Switches** for manual pump control (mounted on circuit board).
- Control Circuit Board** provides pump control and alternation.
- Green pump Run Indicator Lights** (mounted on circuit board).
- Circuit Breakers** (optional) provide pump disconnect and branch circuit protection.
- Ground Lugs**
- Float Status Indicator Lights** (mounted on circuit board).
- Control and Alarm Power Indicator Lights** (mounted on circuit board)
- Auxiliary Alarm Contact**, form C (mounted on circuit board).

NOTE: Schematic is located inside the panel on enclosure cover.



Model Shown 1221W114X6A



STANDARD ALARM PACKAGE

- Red Alarm Beacon** provides 360° visual check of alarm condition.
Note: NEMA 1 style utilizes a door mounted indicator in lieu of a beacon.
- Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
Note: NEMA 1 style utilizes an internally mounted buzzer in lieu of horn.
- Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition is cleared.
- Horn Silence Relay** (mounted on circuit board).

NOTE: other options available.

FEATURES

- Entire control system (panel and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes three 20' SJE SignalMaster® control switches
- Complete with step-by-step installation instructions
- Three-year limited warranty

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.
SEE PRICE BOOK FOR LIST PRICE.

SJE Rhombus

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1-218-847-4617 Fax
email: sje@sjerhombus.com
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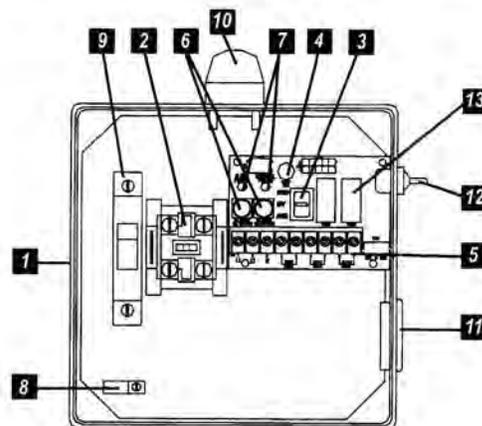
MODEL 112 Control Panel

Single phase, simplex motor contactor control.

The Model 112 control panel provides a reliable means of controlling one 120, 208, or 240 VAC single phase pump in pump chambers, sump pump basins, irrigation systems and lift stations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs, an additional alarm switch activates the audio/visual alarm system.

PANEL COMPONENTS

1. **Enclosure** measures 8 x 8 x 4 inches (20.32 X 20.32 X 10.16 cm). Choice of NEMA 1 (steel for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic with removable mounting feet for outdoor or indoor use).
* Options selected may increase enclosure size and change component layout.
2. **Magnetic Motor Contactor** controls pump by switching electrical lines.
3. **HOA Switch** for manual pump control (mounted on circuit board).
4. **Green Pump Run Indicator Light** (mounted on circuit board).
5. **Float Switch Terminal Block** (mounted on circuit board).
6. **Alarm and Control Fuses** (mounted on circuit board).
7. **Alarm and Control Power Indicators** (mounted on circuit board).
8. **Ground Lug**
9. **Circuit Breaker** (optional) provides pump disconnect and branch circuit protection.



Model Shown 1121W914X



STANDARD ALARM PACKAGE

10. **Red Alarm Beacon** provides 360° visual check of alarm condition.
Note: NEMA 1 style utilizes a door mounted indicator in lieu of a beacon.
11. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
Note: NEMA 1 style utilizes an internally mounted buzzer in lieu of horn.
12. **Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition has been cleared.
13. **Horn Silence Relay** (mounted on circuit board).

NOTE: other options available.

FEATURES

- Entire control system (panel and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes three 20' SJE SignalMaster® control switches
- Complete with step-by-step installation instructions
- Three-year limited warranty

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.
SEE PRICE BOOK FOR LIST PRICE.

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Office: 231-582-1020



Website: www.gag-simtech.com
Email: sales@gag-simtech.com
Fax: 231-582-7324
Toll Free: 888-999-3290

Float Tree Brackets & Float Holders

Sim/Tech Filter's float tree accessories create a safer, easier to service, more organized, and better working float system. A separate float tree means no more climbing into tanks to adjust or replace floats. No more tie straps that swell with water and break. No more wires or floats tangling. Make your pump chamber a breeze to service with Sim/Tech's float tree accessories.

STF-106 FTB Float Tree Bracket

The float tree bracket is used to mount the float tree (length of schedule 40 PVC pipe) directly to the pump chamber riser. Maintenance, inspections and float adjustments can then be performed without entering the pump chamber. Simply unsnap or slide up the float tree, perform the necessary maintenance and snap the float tree back in place. This also keeps the pump discharge pipe clear of floats, wires, and straps for easy pump removal and replacement. Available to fit 1", 1-1/4" to 1-1/2", and 2" tree.

STF-FHHW Float Holder Hard-Wire

The float holder hard-wire has three holes for the float wiring to be threaded through. The holder snaps into place on the float tree hold the float in position. The holder can easily be adjusted to the desired level. The holder keeps the wires organized and away from the effluent pump to virtually eliminate tangled wires and float hang up. Available to fit 1", 1-1/4" to 1-1/2" and 2" tree.

STF-FHPB Float Holder Piggy Back

The float holder piggy back performs the same functions as the float holder hard wire, but can be used in situations when the float wiring can't be threaded through holes. Available to fit 1", 1-1/4" to 1-1/2", and 2" tree.

STF-JHOOK J Hook



STF-JHOOK Wire Organizer J-Hook

The J-Hook is used to organize the excess wire that is needed to allow for the removal of the float tree from the pump chamber. They also come in very handy in any other situation that you are looking to organize wires, cables, ropes, etc.

STF-106FTB Float Tree Bracket

STF-FHHW Float Holder Hard Wire

STF-FHPB Float Holder Piggy Back



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**APPENDIX I
SITE POSTING**

**NOTICE OF PROPOSED
LIFT STATION**

NOTICE IS HEREBY GIVEN THAT THE PROPERTY UPON WHICH THIS SIGN IS POSTED SHALL BE CONSIDERED FOR THE CONSTRUCTION OF A LIFT STATION. ADDITIONAL INFORMATION MAY BE OBTAINED BY CONTACTING THE APPLICANT, FALCON MEADOWN RV CAMPGROUND AT 719-495-2694 OR THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY CONTROL DIVISION, 303-692-3500.



**APPENDIX J
AGENCY TRANSMITTALS**



TRANSMITTAL FORM

To:	Pikes Peak Area Council of Governments	Date:	May 31, 2019
	15 South 7 th Street	Re:	Falcon Meadow RV Campground
	Colorado Springs, CO 80905	Job No.:	0055.0001
Attn:	Water Quality Management Committee	From:	Alice M. Arsenault, P.E.
		Phone:	(303) 981-0453

Via:

Mail
 Fax
 FedEx
 Courier
 Other

Item List:

Copies	Description
1	Falcon Meadow RV Campground 22.7 Site Application

These are transmitted:

For your approval
 For your use
 As requested
 For review and comment

Remarks

CDPHE Regulation 22 requires that a copy of the attached 22.7 site application be provided to the local council of government for review and comment. After reviewing please forward comments, if any, by email at alicea@elementengineering.net. If you have no comments please sign at the indicated location on the attached form and email a scan of the form to the listed email address.

This site application was previously submitted with a single pump design. Per the Pikes Peak Area Council of Governments Requirements, the design has been modified to include two installed pumps.

TRANSMITTAL FORM

To:	El Paso County Dept. of Public Health	Date:	May 31, 2019
	1675 W. Garden of the Gods Rd. #2044	Re:	Falcon Meadow RV Campground
	Colorado Springs, CO 80907-2202	Job No.:	0055.0001
Attn:	Mr. Matthew Bondi	From:	Alice M. Arsenault, P.E.
		Phone:	(303) 981-0453

Via:

Mail
 Fax
 FedEx
 Courier
 Other

Item List:

Copies	Description
1	Falcon Meadow RV Campground 22.7 Site Application

These are transmitted:

For your approval
 For your use
 As requested
 For review and comment

Remarks

CDPHE Regulation 22 requires that a copy of the attached 22.7 site application be provided to the county for review and comment. After reviewing please forward comments, if any, by email at alicea@elementengineering.net. If you have no comments please sign at the indicated location on the attached form and email a scan of the form to the listed email address.

This site application was previously submitted with a single pump design. Per the Pikes Peak Area Council of Governments Requirements, the design has been modified to include two installed pumps.



TRANSMITTAL FORM

To: <u>El Paso County Administrator</u> <u>200 S. Cascade Ave., Suite 100</u> <u>Colorado Springs, CO 80903-2202</u>	Date: <u>May 31, 2019</u> Re: <u>Falcon Meadow RV Campground</u> Job No.: <u>0055.0001</u>
Attn: _____ _____	From: <u>Alice M. Arsenault, P.E.</u> Phone: <u>(303) 981-0453</u>

Via:

Mail
 Fax
 FedEx
 Courier
 Other

Item List:

Copies	Description
1	Falcon Meadow RV Campground 22.7 Site Application

These are transmitted:

For your approval
 For your use
 As requested
 For review and comment

Remarks

CDPHE Regulation 22 requires that a copy of the attached 22.7 site application be provided to the county for review and comment. After reviewing please forward comments, if any, by email at alicea@elementengineering.net. If you have no comments please sign at the indicated location on the attached form and email a scan of the form to the listed email address.

This site application was previously submitted with a single pump design. Per the Pikes Peak Area Council of Governments Requirements, the design has been modified to include two installed pumps.

**ATTACHMENT
PLANS**

48 hours before you dig, CALL UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) **811** Gas, Electric, Telephone, CATV and Panhandle Eastern Pipeline Locations

CONSTRUCTION PLANS

FALCON MEADOW RV CAMPGROUND

OUTFALL LIFT STATION

A PORTION OF THE SOUTHWEST QUARTER OF SECTION 12 AND THE NORTHWEST QUARTER OF SECTION 13, TOWNSHIP 13 SOUTH, RANGE 65 WEST OF THE 6TH P.M.
EL PASO COUNTY, COLORADO

ELEMENT ENGINEERING LLC
720.749.4165
WWW.ELEMENTENGINEERING.NET
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80226

PREPARED FOR

FALCON MEADOW RV CAMPGROUND
DAVID OZBURN, OWNER
719.421.0604
11150 HWY 24
PEYTON, CO 80831

ENGINEERING

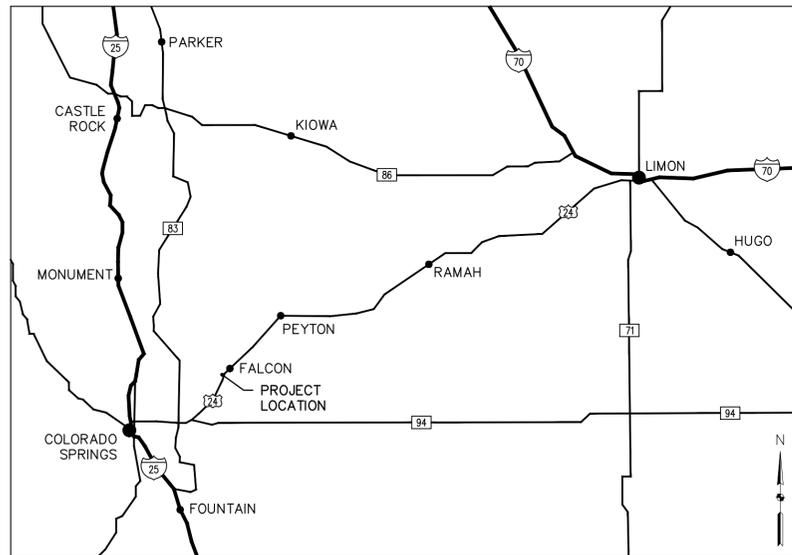
ELEMENT ENGINEERING, LLC
ALICE M. ARSENAULT, P.E. #53350
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
303.981.0453

WOODMEN HILLS METROPOLITAN DISTRICT

JERRY JACOBSON, GENERAL MANAGER
DANNY EVERETT, CHIEF INSPECTOR
8046 EASTONVILLE ROAD
FALCON, CO 80831
719.495.2500

SHEET INDEX

- 1 COVER SHEET
- 2 GENERAL NOTES & DETAILS
- 3 TOPOGRAPHICAL SURVEY
- 4 LIFT STATION
- 5 FORCE MAIN PLAN & PROFILE
- 6 OWNERSHIP & EASEMENTS
- 7 WOODMEN HILLS DETAILS
- 8 EROSION CONTROL DETAILS



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

NO	REVISIONS DESCRIPTION	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
COVER SHEET
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

PREPARED UNDER THE DIRECT SUPERVISION OF

FALCON MEADOW RV CAMPGROUND OWNER _____ DATE _____

THESE PLANS HAVE BEEN APPROVED BY THE FALCON MEADOW RV CAMPGROUND. A CAMPGROUND REPRESENTATIVE WILL OBSERVE THE WORK FOR COMPLIANCE WITH THE APPROVED PLANS, BUT DOES NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION OF THE FACILITIES IN ACCORDANCE WITH THE APPROVED PLANS AND WITH APPLICABLE RULES AND REGULATIONS. WORK NOT PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS WILL NOT BE ACCEPTED. ACCEPTANCE OF THE WORK DOES NOT RELIEVE THE CONTRACTOR OF THEIR OBLIGATIONS UNDER APPLICABLE WARRANTIES.

THE WOODMEN HILLS METROPOLITAN DISTRICT RECOGNIZES THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN AND HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

WOODMEN HILLS METROPOLITAN DISTRICT
WASTEWATER DESIGN APPROVAL
DATE: _____ BY: _____
PROJECT NO. _____

IN CASE OF ERRORS OR OMISSIONS WITH THE WATER DESIGN AS SHOWN ON THIS DOCUMENT THE STANDARDS AS DEFINED IN THE "RULES AND REGULATIONS FOR INSTALLATION OF WASTEWATER MAINS AND SERVICES" SHALL RULE.

APPROVAL EXPIRES 180 DAYS FROM DESIGN APPROVAL.

ONSITE BENCHMARK INFORMATION
CONTROL POINT #100, SET NO. 4 REBAR AS SHOWN HEREON.
NORTHING (Y) 29961.01, EASTING (X) 20058.38, ELEVATION (Z) 6826.05, NAVD 88 (BASED ON NGS MONUMENT E24 WITH AN ELEVATION 6902.30 NAVD 88).

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC
DATE: MARCH 2019
JOB NUMBER: 0055.0001
SCALE: AS SHOWN
DRAWING NAME: COVER
SHEET 1 OF 8

WOODMEN HILLS METROPOLITAN DISTRICT GENERAL NOTES

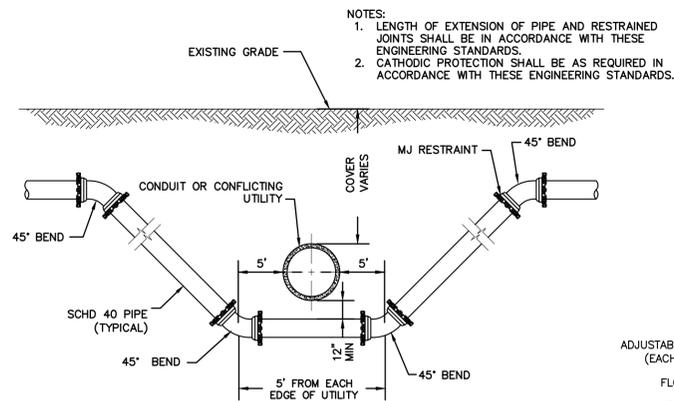
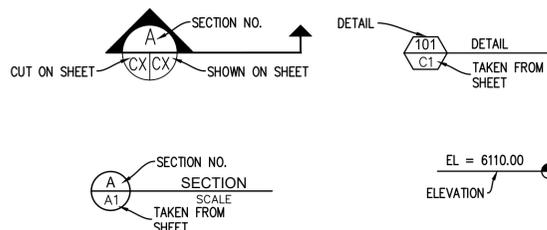
- ALL UTILITY CONSTRUCTION TO BE CONDUCTED IN CONFORMANCE WITH THE CURRENT WOODMEN HILLS METROPOLITAN DISTRICT (WHMD, THE DISTRICT) SPECIFICATIONS.
- ALL PLANS ON THE JOB SITE SHALL BE SIGNED BY THE DISTRICT AND THE DISTRICT'S ENGINEER. ANY REVISIONS TO THE PLANS SHALL BE SO NOTED WITH THE OLD DRAWING MARKED NOT VALID.
- ALL STATIONING IS CENTER LINE UNLESS OTHERWISE NOTED. ALL ELEVATIONS ARE CENTER LINE UNLESS OTHERWISE NOTED.
- ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE DISTRICT. THE DISTRICT RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
- ALL WATER AND SEWER SERVICE LOCATIONS SHALL BE CLEARLY MARKED ON EITHER THE CURB HEAD OR THE FACE OF THE CURB, WITH AN "S" FOR SEWER AND A "W" FOR WATER.
- DUCTILE IRON PIPES, INCLUDING FITTINGS, VALVES, AND FIRE HYDRANTS, SHALL BE WRAPPED WITH POLYETHYLENE TUBING, DOUBLE BONDED AT EACH JOINT, AND ELECTRICALLY ISOLATED. BONDING AND ANODE CONNECTIONS SHALL BE THOROUGHLY COATED WITH BITUMINOUS COATINGS.
- ALL DUCTILE IRON PIPE LESS THAN 12 INCHES AND FITTINGS SHALL HAVE CATHODIC PROTECTION USING TWO NO. 6 WRES WITH 17 LB. MAGNESIUM ANODES EVERY 400 FEET AND 9 LB. MAGNESIUM ANODES AT EACH FITTING. ALL DUCTILE IRON PIPE 12 INCHES AND GREATER AND FITTINGS SHALL HAVE CATHODIC PROTECTION USING TWO NO. 6 WRES WITH 17 LB. MAGNESIUM ANODES EVERY 300 FEET AND 9 LB. MAGNESIUM ANODES AT EACH FITTING.
- ALL PIPE MATERIAL, BACKFILL, AND INSTALLATION SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS, COLORADO DEPARTMENT OF TRANSPORTATION, EL PASO COUNTY DEPARTMENT OF TRANSPORTATION, COLORADO SPRINGS UTILITIES, AND THE GEOTECHNICAL ENGINEER.
- COMPACTION TESTS SHALL BE 95% STANDARD PROCTOR AS DETERMINED BY ASTM D698, UNLESS OTHERWISE APPROVED BY THE DISTRICT OR HIGHER STANDARD AS IMPOSED BY ANOTHER AGENCIES HAVING RIGHT-OF-WAY JURISDICTION. THIS SHALL INCLUDE ALL VALVES, FIRE HYDRANT RUNS, WATER & SEWER SERVICE LINES, AND MANHOLES. ALL REPORTS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.
- THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE LOCATION OF ALL UTILITIES SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE DISTRICT SHALL BE NOTIFIED OF ANY DEVIATIONS TO THE LINE AND/OR GRADE AS DEPICTED ON THE PLANS. CONTRACTOR SHALL SUBMIT TO THE DISTRICT AND THE ENGINEER OF RECORD A REPORT OF THE FIELD VERIFIED INFORMATION PRIOR TO THE START OF CONSTRUCTION.
- ALL BENDS SHALL BE FIELD STAKED PRIOR TO THE START OF CONSTRUCTION.
- BENDS, DEFLECTION, AND CUT PIPE LENGTHS SHALL BE USED TO HOLD HORIZONTAL ALIGNMENT OF SEWER AND WATER LINES TO NO MORE THAN 0.5' FROM THE DESIGNED ALIGNMENT. CONSTRUCTION STAKES TO BE AT 25' INTERVALS ALONG CURVES TO ASSURE LOCATION OF PIPE LINE CONSTRUCTION.
- AT ALL LOCATION WHERE CAP AND STUB IS NOTED ON DRAWINGS, PROVIDE A PLUG AT THE END OF THE PIPE JOINT NEAREST THE SPECIFIED STATION. PROVIDE A REVERSE ANCHOR AT ALL WATER LINE PLUGS.
- ALL UNUSED SALVAGED WATER UTILITY MATERIAL SHALL BE RETURNED TO THE METROPOLITAN DISTRICT AS REQUESTED.
- AT THE CONTRACTOR'S EXPENSE, ALL UTILITY MAINS SHALL BE SUPPORTED AND PROTECTED SUCH THAT THEY SHALL FUNCTION CONTINUOUSLY DURING CONSTRUCTION OPERATIONS. SHOULD A UTILITY MAIN FAIL AS A RESULT OF THE CONTRACTOR'S OPERATION, IT SHALL BE REPLACED IMMEDIATELY BY THE CONTRACTOR OR BY THE DISTRICT AT FULL COST OF LABOR AND MATERIALS TO THE CONTRACTOR/DEVELOPER.
- PUMPING OR BYPASS OPERATIONS SHALL BE REVIEWED AND APPROVED BY BOTH THE DISTRICT AND THE DISTRICT ENGINEER PRIOR TO EXECUTION.
- THE CONTRACTOR SHALL REPLACE OR REPAIR DAMAGE TO ALL SURFACE IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO FENCES, LANDSCAPING, CURB AND GUTTER, AND/OR ASPHALT THAT MAY BE CAUSED DURING CONSTRUCTION.
- ALL CONTRACTORS WORKING ON OR NEAR A WATER OR SEWER FACILITY (TO INCLUDE SERVICE LINES) SHALL HAVE LIABILITY INSURANCE NAMING THE DISTRICT AS AN ADDITIONAL INSURED AND SHALL PROVIDE A CURRENT COPY OF WORKERS COMPENSATION INSURANCE ON FILE WITH THE DISTRICT. NO WORK CAN PROCEED WITHOUT CURRENT CERTIFICATES ON FILE AT THE DISTRICTS' OFFICE.
- THE CONTRACTOR SHALL NOTIFY THE DISTRICT AND ALL AFFECTED UTILITY COMPANIES ADJACENT TO THE PROPOSED UTILITY CONSTRUCTION A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF CONSTRUCTION. A WEEKLY CONSTRUCTION MEETING SHALL BE REQUIRED WITH THE CONTRACTOR, DISTRICT ENGINEER, AND ALL OTHER PARTIES AS DEEMED NECESSARY BY THE DISTRICT.
- COMMENCEMENT OF CONSTRUCTION OF WATER/SEWER SYSTEMS WITHIN METROPOLITAN DISTRICT:
 - PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING IS REQUIRED A MINIMUM OF 48 HOURS IN ADVANCE OF COMMENCEMENT OF WORK. A REPRESENTATIVE OF THE OWNER OR DEVELOPER, A REPRESENTATIVE OF THE CONTRACTOR AND DESIGN ENGINEER ARE REQUIRED TO ATTEND. CONTACT THE DISTRICT TO SCHEDULE THE PRE-CONSTRUCTION MEETING. NO PRE-CONSTRUCTION MEETING CAN BE SCHEDULED PRIOR TO FOUR (4) SIGNED/APPROVED PLAN SETS ARE RECEIVED BY THE DISTRICT.
 - THE CONTRACTOR IS REQUIRED TO NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 2 WEEKS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY AFFECTED UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION ADJACENT TO THE KNOWN UTILITY LINES.
- TESTING OF FACILITIES:
 - THE CONTRACTOR SHALL NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF ANY TESTING.
 - ALL SECTIONS OF WATER LINE ARE TO MEET THE FOLLOWING PRESSURE TESTING REQUIREMENTS:
 - TEST 100% OF ALL LINES
 - MUST PASS PRESSURE TEST TO 200 PSI FOR TWO HOURS (UNLESS OTHERWISE APPROVED ON THE PLANS)
 - ALL SANITARY SEWER FACILITIES ARE TO MEET THE FOLLOWING TESTING REQUIREMENTS:
 - ALL LINES SHALL BE JET CLEANED PRIOR TO VACUUM OR PRESSURE TESTING
 - ALL MANHOLES SHALL BE VACUUM TESTED WITH DISTRICT STAFF PRESENT PRIOR TO CCTV INSPECTION
 - SEWER MAINS TO BE PRESSURE TESTED PRIOR TO CCTV INSPECTION
 - ALL LINES SHALL BE CCTV INSPECTED AND VIDEO SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.

- PRELIMINARY ACCEPTANCE SHALL BE DEFINED AS THE POINT IN TIME THAT THE DISTRICT ACCEPTS THE FACILITY FOR USE. ALL SURFACE IMPROVEMENTS AND RESTORATION SHALL BE COMPLETED WITHIN 30 DAYS OF COMMENCEMENT. SHOULD THE CONTRACTOR FAIL TO COMPLETE ALL SURFACE IMPROVEMENTS AND RESTORATION WITHIN 30 DAYS OF COMMENCEMENT OF SERVICE, THE DISTRICT, AT THEIR DISCRETION, MAY ELECT TO COMPLETE THE IMPROVEMENTS AT THE CONTRACTOR'S COST.
- FINAL ACCEPTANCE BY THE DISTRICT OF ANY LINE OR SYSTEM SHALL NOT OCCUR UNTIL COMPLETION OF FINAL ASPHALT LAYERS AND/OR FINAL COMPLETION AND/OR RESTORATION OF ALL SURFACE IMPROVEMENTS. THE WARRANTY PERIOD FOR ALL FACILITIES PRIOR TO FINAL ACCEPTANCE SHALL BE 24 MONTHS COMMENCING AFTER PRELIMINARY ACCEPTANCE.
- ACCEPTANCE
 - THE DISTRICT MAY GIVE PRELIMINARY ACCEPTANCE ONCE ALL OF THE TESTS ON ALL THE LINES HAVE BEEN COMPLETED AND A WALK-THRU HAS OCCURRED.
 - A SECOND ACCEPTANCE MAY OCCUR ONCE FIRST LIFT OF ASPHALT GOES DOWN AND A SECOND WALK-THRU OF THE SYSTEM OCCURS. IF ALL FACILITIES ARE CLEAN AND ACCESSIBLE, A FINAL ACCEPTANCE MAY OCCUR (THE DISTRICT MAY REQUIRE CLEANING AND RE-VIDEO OF THE SYSTEM, DEPENDING ON THE SEVERITY OF THE CONTAMINATION).
- ALL WATER AND SEWER MAINS, INCLUDING SERVICE LINES, SHALL HAVE "AS-BUILT" DRAWINGS PREPARED AND APPROVED PRIOR TO PRELIMINARY ACCEPTANCE BY THE DISTRICT.
- ALL COMMERCIAL/BUSINESS DEVELOPMENTS SHALL HAVE AN EIGHT INCH (MIN.) WATER MAIN LOOPED THROUGH THE PROPOSED PROPERTY WITH GATE VALVES LOCATED WHERE THE MAIN ENTERS THE PROPERTY LINE. AN EIGHT INCH SEWER MAIN SHALL BE INSTALLED FOR SERVICE TO COMMERCIAL/BUSINESS DEVELOPMENTS, AND A MANHOLE SHALL BE LOCATED WHERE THE MAIN ENTERS THE PROPERTY. THE END OF THE MAINS SHALL BE MARKED WITH THE APPROPRIATE COLORED CARSONITE MARKER ALONG WITH TRACER WIRE.
- AFTER REVIEW AND APPROVAL OF PLANS FOR THE EXTENSION OF LINES, FACILITIES AND/OR SERVICES, CONSTRUCTION MUST BE COMMENCED WITHIN 18 MONTHS FOR RESIDENTIAL SUBDIVISIONS AND 12 MONTHS FOR ANY COMMERCIAL INSTALLATIONS.
- INSPECTION FEES: CALL THE DISTRICT (719-495-2500) FOR FEE SCHEDULE.
- SANITARY SEWER LENGTHS ARE MH CENTER TO MH CENTER. ALL SANITARY SEWER PIPES SHALL BE SDR 35 PVC OR EQUAL SEWER LINES MAY NOT EXCEED 7% GRADE FOR ANY SIZE WITHOUT PRIOR APPROVAL OF THE DISTRICT. ALL NEWLY CONSTRUCTED RESIDENTIAL SANITARY SEWER TAPS SHALL USE PRE-MANUFACTURED IN-LINE PVC PUSH-ON WYES. TAPPING SADDLES MAY ONLY BE USED FOR TAPPING PRE-EXISTING MAINS.
- ALL SANITARY SEWER MANHOLES SHALL BE WRAPPED WITH RU116-RUBR-NEK JOINT WRAP OR EQUIVALENT AND COATED.
- COMMENCEMENT OF USE OF SEWER LINES AND/OR SYSTEMS:
 - NO SANITARY SEWER FACILITY SHALL BE PLACED IN SERVICE UNTIL THE COMPLETION OF ALL JET CLEANING, PRESSURE TESTING, VACUUM TESTING, CCTV INSPECTION, COMPACTION TESTING, AND AS-BUILT DRAWINGS ARE SUBMITTED AND APPROVED BY THE DISTRICT.
 - NO SANITARY SEWER FACILITY SHALL BE PLACED IN SERVICE UNTIL ALL SERVICE LINES ARE COMPLETED AND THE FIRST LIFT OF ASPHALT IS COMPLETED OVER THE LINE. IN THE CASE WHERE NO ASPHALT IS TO BE PLACED OVER THE LINE, ANY REQUIRED SURFACE IMPROVEMENTS SHALL BE COMPLETED PRIOR TO USE OF THE FACILITY.
 - ALL NECESSARY EASEMENTS (PLATTED OR DEEDED) ARE DEDICATED, EXECUTED BY THE DISTRICT, AND RECORDED.
 - DOWNSTREAM PLUG CAN BE REMOVED ONCE FIRST LIFT OF ASPHALT IS DOWN AND THE ABOVE REQUIREMENTS ARE MET.

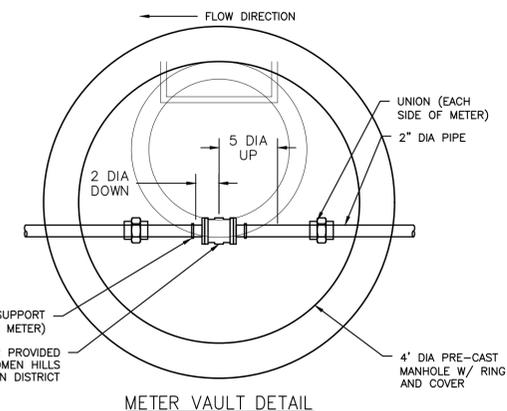
ABBREVIATIONS

ARVB	AIR RELIEF VACUMBREAKER VALVE	MH	MANHOLE
BEG	BELOW EXISTING GRADE	N	NORTH
BFV	BUTTERFLY VALVE	NE	NORTHEAST
CL	CENTERLINE	NW	NORTHWEST
CMP	CORRUGATED METAL PIPE	OH	OVERHEAD
DIA. OR Ø	DIAMETER	PVC	POLYVINYL CHLORIDE
E	EAST	RAD OR R	RADIUS
EA	EACH	RPP	REINFORCED POLYPROPYLENE
ELEC	ELECTRICAL LINE	S	SOUTH
EOA	EDGE OF ASPHALT	SE	SOUTHEAST
EXIST. OR EX.	EXISTING	SW	SOUTHWEST
INV	INVERT	T.O.P.	TOP OF PIPE
LP	LOW POINT	UON	UNLESS OTHERWISE NOTED
FM	FORCE MAIN		

CIVIL/ARCHITECTURAL/PROCESS SYMBOLS LIBRARY

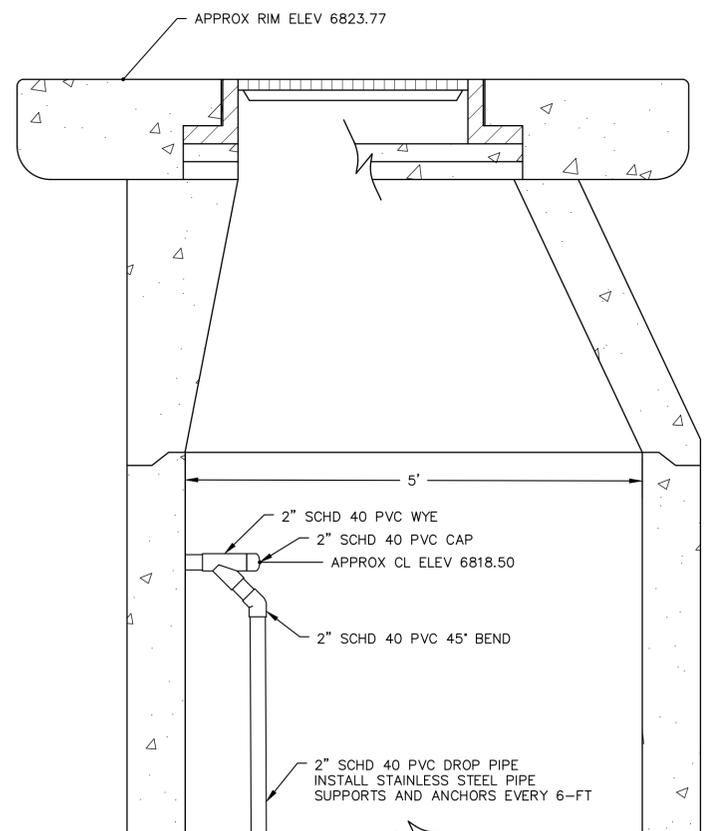


FORCE MAIN LOWERING DETAIL



NOTES:

- DIMENSIONS SHOWN ARE REQUIRED UPSTREAM AND DOWNSTREAM DIAMETERS OF STRAIGHT PIPE.
- DETAIL FOR SCHEMATIC PURPOSES ONLY, CONFIRM DIMENSIONS AND FITTINGS AS NECESSARY.
- INSTALL METER PER MANUFACTURER'S REQUIREMENTS.
- FLOW METER 18" MIN ABOVE MANHOLE FLOOR.



INSIDE DROP DETAIL APPROX. TO SCALE

NO	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
GENERAL NOTES & DETAILS
 FALCON MEADOW RV CAMPGROUND
 11150 HWY 24
 PEYTON, CO 80831

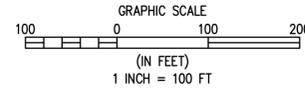
PREPARED UNDER THE DIRECT SUPERVISION OF

DATE	MARCH 2019
JOB NUMBER	0055.0001
SCALE	NTS
DRAWING NAME	NOTES
SHEET	2 OF 8

- NOTES:
- BENCHMARK: CONTROL POINT #100, SET NO. 4 REBAR AS SHOWN HEREON. NORTHING (Y) 29961.01, EASTING (X) 20058.38, ELEVATION (Z) 6826.05, NAVD 88 (BASED ON NGS MONUMENT E24 WITH AN ELEVATION 6902.30 NAVD 88).
 - THIS IS AN ALIGNMENT AND TOPOGRAPHIC MAP. IT IS NOT A LAND SURVEY PLAT OR IMPROVEMENT SURVEY PLAT.
 - THE FIELDWORK FOR THIS SURVEY WAS COMPLETED ON DECEMBER 26, 2018 BY FORTH LAND SURVEYING, INC.
 - ANY UNDERGROUND OR ABOVE GROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AS OBSERVED IN THE FIELD. UNDERGROUND LINES SHOWN HEREON ARE SHOWN APPROXIMATELY. WHERE ADDITIONAL OR MORE DETAIL IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION MAY BE NECESSARY.
 - SANITARY SEWER MANHOLES 1 & 2 (SSMH 1 & 2) ARE MAINTAINED BY WOODMEN HILLS METROPOLITAN DISTRICT AND WERE OPENED AND CLOSED BY A WOODMEN HILLS METROPOLITAN DISTRICT REPRESENTATIVE.

LEGEND

- FOUND PLSS MONUMENT AS NOTED
- FOUND MONUMENT AS NOTED
- △ SET SITE BENCHMARK AS NOTED
- ▲ FOUND 60D NAIL
- (R) RECORD VALUE per Land Survey Plat El Paso County Rec. # 205900052
- (R1) RECORD VALUE per Land Survey Plat El Paso County Rec # 217900138
- (R2) RECORD VALUE per Warranty Deed El Paso County Rec # 206055833
- (M) MEASURED VALUE
- CPP CORRUGATED PLASTIC PIPE
- ⊕ SANITARY SEWER MANHOLE
- SANITARY SEWER VENT PIPE
- ⊗ ELECTRIC TRANSFORMER
- ⊕ UTILITY POLE
- GUY WIRE
- OHE OVERHEAD ELECTRIC LINE
- X — X — CHAIN-LINK FENCE
- APPROX ROAD/TRAIL AREA



SSMH 1
WOODMEN HILLS MH
4 FT DIA CONCRETE
RIM ELEV 6822.90
INV IN N (10") ELEV 6799.62
INV IN E (10") ELEV 6799.62
INV OUT S (10") ELEV 6799.62

SSMH 2
WOODMEN HILLS MH
4 FT DIA CONCRETE
RIM ELEV 6824.11
DEPTH 23.03 FT
INV IN E (10") ELEV 6801.08
INV OUT W (10") ELEV 6801.08

OWNER: CHALLENGER COMMUNITIES LLC

OWNER: FALCON HIGHLANDS METRO DISTRICT

APPROXIMATE EXISTING 6" WOODMEN HILLS FORCE MAIN
ACTUAL LOCATION SHALL BE FIELD VERIFIED DURING CONSTRUCTION

WOODMEN HILLS FALCON HIGHLAND LIFT STATION
SEE DETAIL C THIS SHEET

WEST 1/16 CORNER OF SECTION 12, FOUND NO. 6 REBAR WITH A 3.25" ALUMINUM CAP, PLS 30829, 0.3' BELOW GRADE

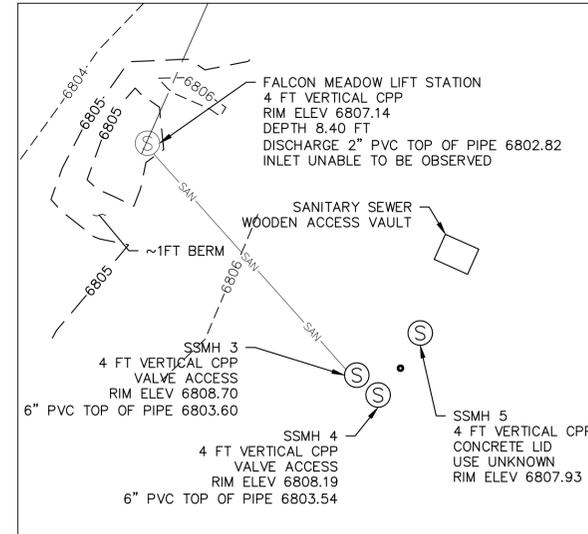
TERMINATION OF INSTALLED FORCE MAIN

FOUND NO. 4 REBAR WITH ILLEGIBLE 1.25" ALUMINUM CAP 0.3' BELOW GRADE

FOUND NO. 5 REBAR WITH 1.5" ALUMINUM CAP PLS 30118 FLUSH WITH GRADE

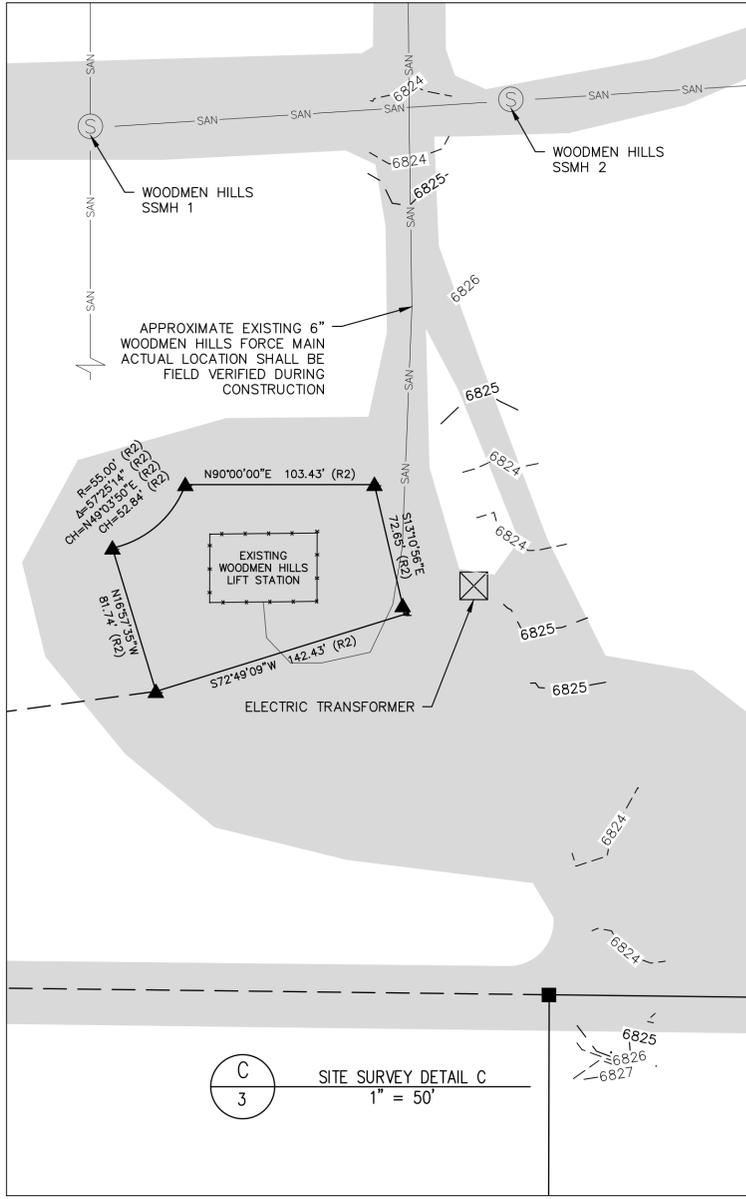
TAMLIN ROAD
N82°20'56"E 1,122.86' (R2)
S89°18'34"E 1,328.13' (M)
S89°18'34"E 1,328.02' (R)
BASIS OF BEARINGS
S89°18'39"E 282.89' (R1)
S89°18'46"E 461.28' (R1)
S89°18'17"E 234.83' (R1)

SW CORNER OF SECTION 12 FOUND 2" PIPE WITH A 3.25" ALUMINUM CAP, PLS 38256, 0.1' BELOW GRADE
S89°18'34"E 1,328.13' (M)
S89°18'34"E 1,328.02' (R)
BASIS OF BEARINGS
S89°18'39"E 282.89' (R1)
S89°18'46"E 461.28' (R1)
S89°18'17"E 234.83' (R1)

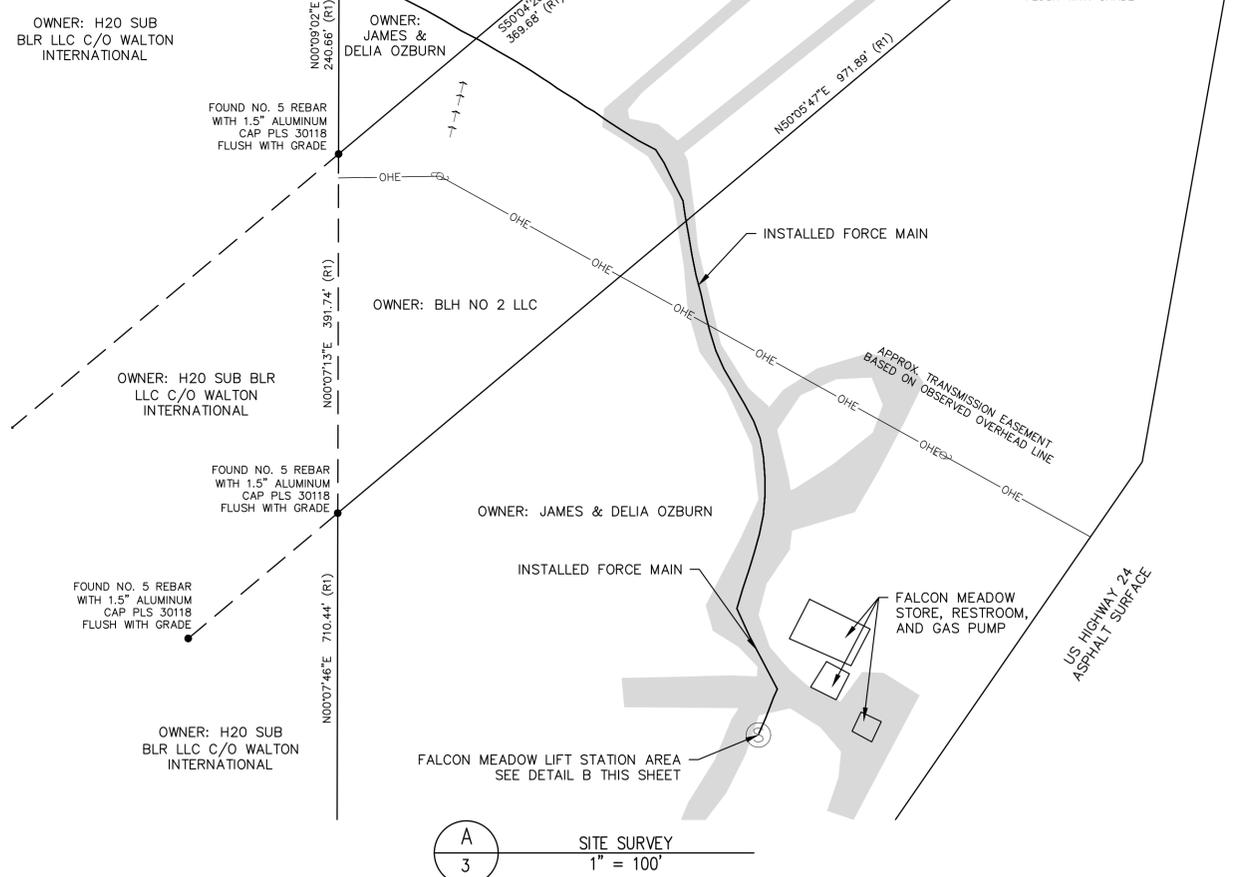


B
3 SITE SURVEY DETAIL B
1" = 10'

NOTE: ALL WASTEWATER FROM FALCON MEADOW CAMPGROUND SERVICE AREA IS DIRECTED THROUGH SSMH 3 TO THE PROPOSED LIFT STATION.



C
3 SITE SURVEY DETAIL C
1" = 50'



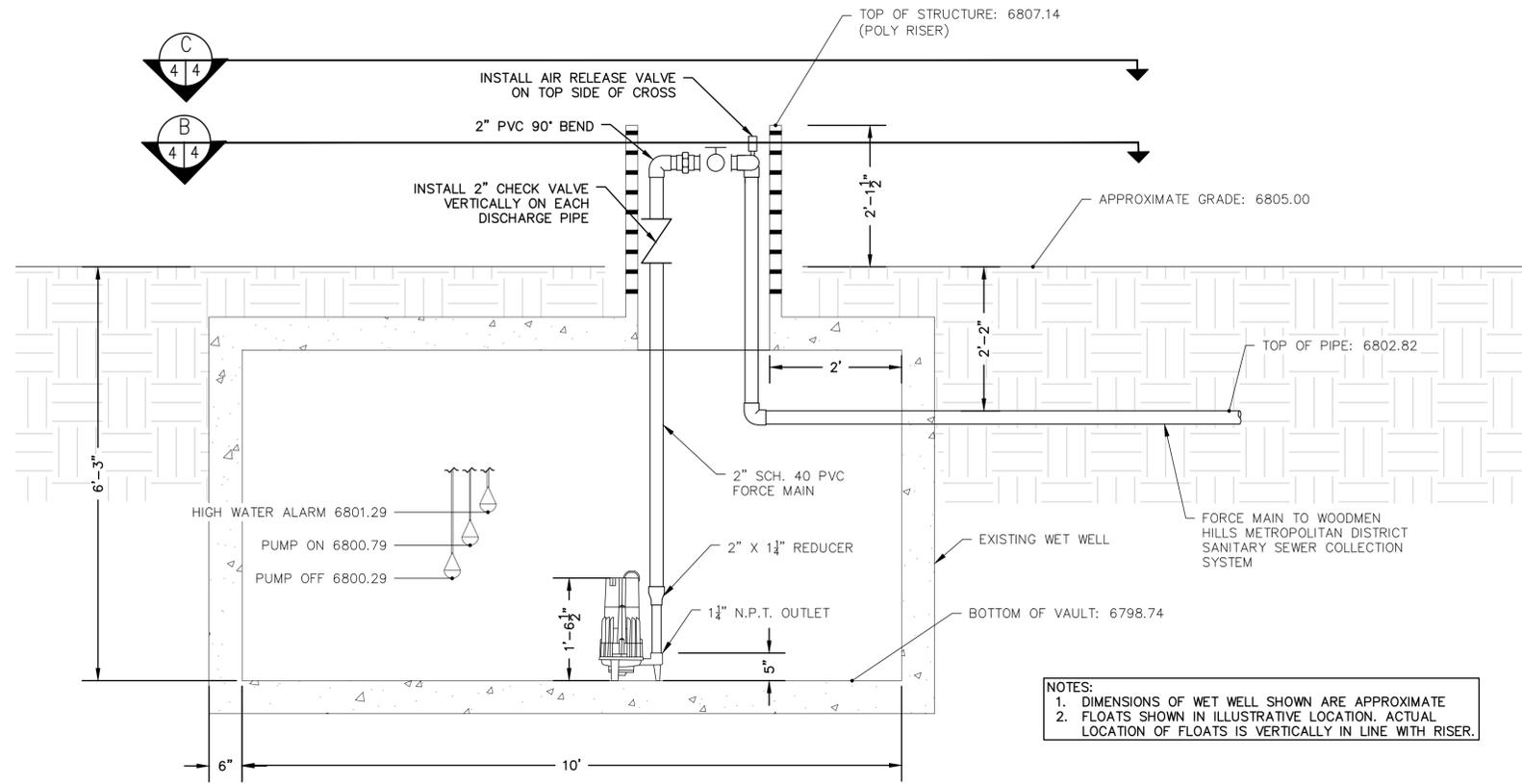
A
3 SITE SURVEY
1" = 100'

NO	REVISIONS	DESCRIPTION	DATE	BY
1	MODIFY TO TWO PUMPS		5/19	AA

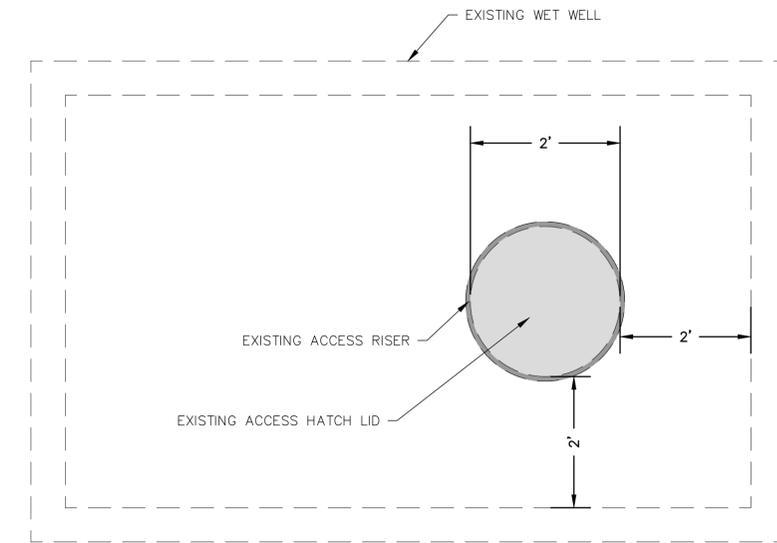
LIFT STATION - CONSOLIDATION
TOPOGRAPHICAL SURVEY
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

PREPARED UNDER THE DIRECT SUPERVISION OF

DATE	MARCH 2019
JOB NUMBER	0055.0001
SCALE	AS SHOWN
DRAWING NAME	SURVEY
SHEET	3 OF 8



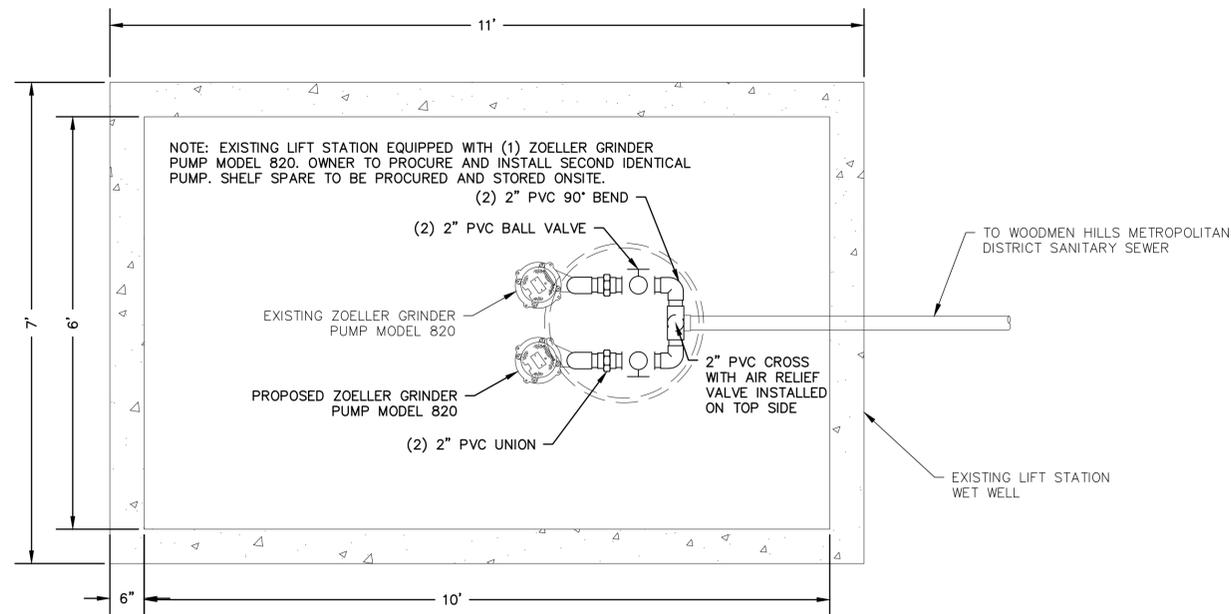
A
4 LIFT STATION PROFILE VIEW
3/4" = 1'



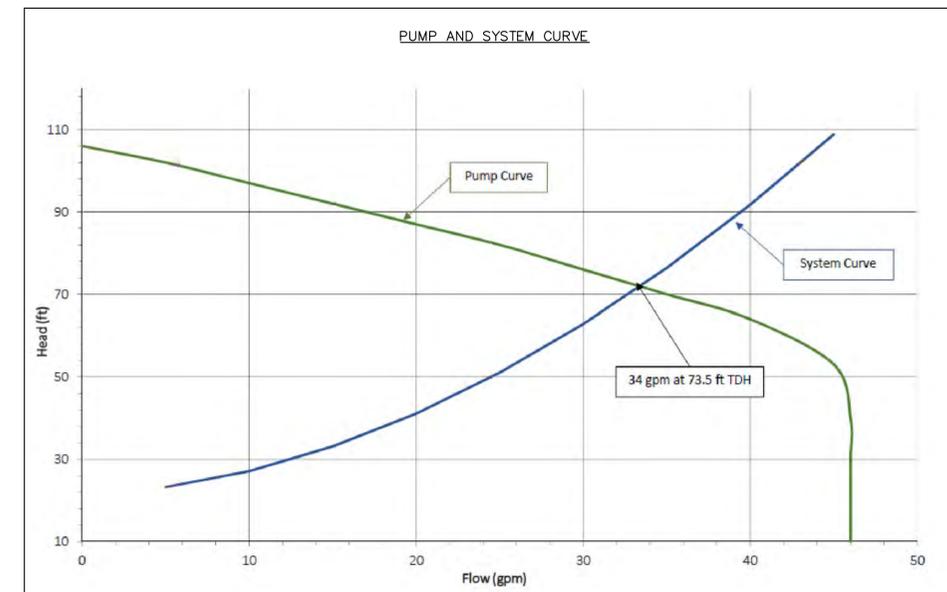
C
4 LIFT STATION GRADE VIEW
3/4" = 1'

NOTES:
 1. DIMENSIONS OF WET WELL SHOWN ARE APPROXIMATE
 2. FLOATS SHOWN IN ILLUSTRATIVE LOCATION. ACTUAL LOCATION OF FLOATS IS VERTICALLY IN LINE WITH RISER.

LIFT STATION DESIGN SUMMARY	
PUMP INFORMATION	ZOELLER PUMP COMPANY SHARK SERIES 820 GRINDER PUMP 2 HP, 60 HZ, 3,450 RPM
MINIMUM FLOWRATE	15.1 GPM (FUTURE PEAK HOUR)
EXPECTED OPERATING POINT	34 GPM AT 73.5 FT TDH
FORCE MAIN	2-INCH SCHD 40 PVC



B
4 LIFT STATION PLAN VIEW
3/4" = 1'

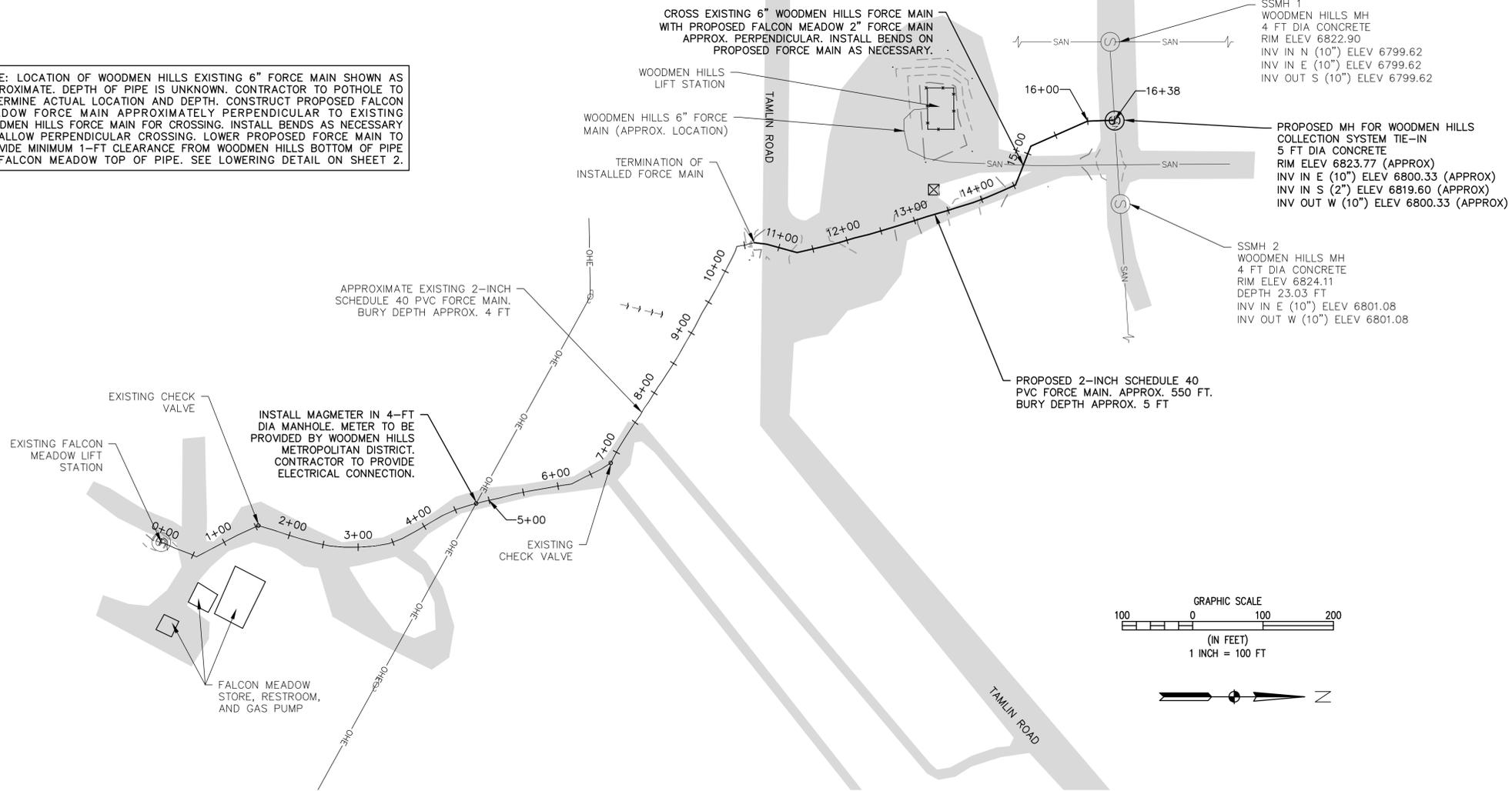


NO.	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

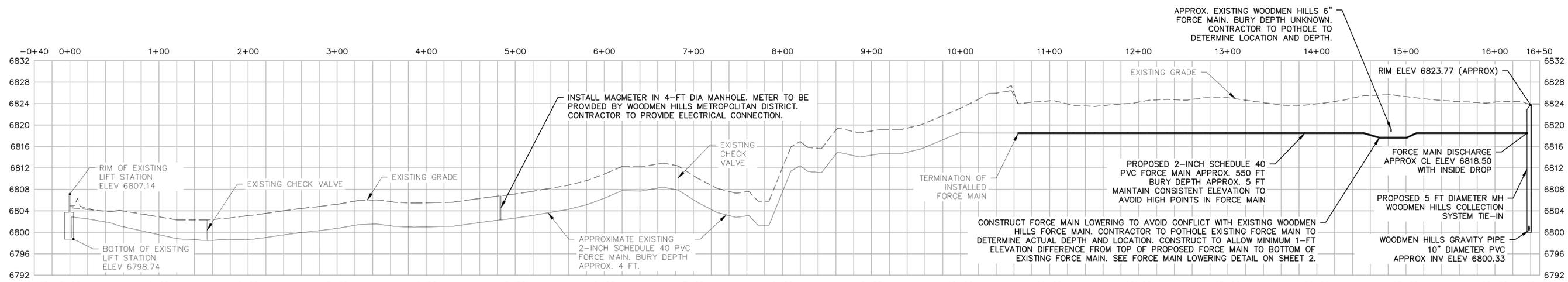
LIFT STATION - CONSOLIDATION
LIFT STATION
 FALCON MEADOW RV CAMPGROUND
 11150 HWY 24
 PEYTON, CO 80831

FOR AND ON BEHALF OF
 ELEMENT ENGINEERING, LLC
 DATE: MARCH 2019
 JOB NUMBER: 0055.0001
 SCALE: AS SHOWN
 DRAWING NAME: LIFT STATION
 SHEET: 4 OF 8

NOTE: LOCATION OF WOODMEN HILLS EXISTING 6" FORCE MAIN SHOWN AS APPROXIMATE. DEPTH OF PIPE IS UNKNOWN. CONTRACTOR TO POTHOLE TO DETERMINE ACTUAL LOCATION AND DEPTH. CONSTRUCT PROPOSED FALCON MEADOW FORCE MAIN APPROXIMATELY PERPENDICULAR TO EXISTING WOODMEN HILLS FORCE MAIN FOR CROSSING. INSTALL BENDS AS NECESSARY TO ALLOW PERPENDICULAR CROSSING. LOWER PROPOSED FORCE MAIN TO PROVIDE MINIMUM 1-FT CLEARANCE FROM WOODMEN HILLS BOTTOM OF PIPE TO FALCON MEADOW TOP OF PIPE. SEE LOWERING DETAIL ON SHEET 2.



A
5 EXISTING AND PROPOSED FORCE MAIN PLAN
1" = 100'



HORIZ. SCALE: 1" = 60'
VERT. SCALE: 1" = 10'

B
5 EXISTING AND PROPOSED FORCE MAIN PROFILE
AS SHOWN

- NOTES:
1. CUT EXISTING SANITARY SEWER PIPE PER WHMD DETAILS.
 2. PROPOSED MANHOLE SHALL BE 5-FT PRECAST WITH CAST IN PLACE BASE. FIELD CORE PIPE PENETRATIONS PER WHMD DETAILS.
 3. PROPOSED MANHOLE SHALL BE COATED, HAVE DOUBLE-RAMNECK INSIDE EACH JOINT, AND JOINT WRAP AROUND EACH JOINT.
 4. INSTALL SEALED PVC WYE WITH CAP AND BEND TO CREATE INSIDE DROP IN PROPOSED MANHOLE (SEE DETAIL SHEET 2). EXTEND 2" SCHD 40 PVC PIPE TO BOTTOM OF MANHOLE AND INSTALL STAINLESS STEEL PIPE BRACKETS AND ANCHOR BOLTS EVERY 6-FT TO SUPPORT DOWN PIPE. EXTEND DROP PIPE INTO THE BENCH OF THE MANHOLE AND DAYLIGHT PIPE INTO A SHAPED CONCRETE TROUGH. INSTALL GROUT TO CHANNELIZE FLOW (SEE WHMD DETAIL).

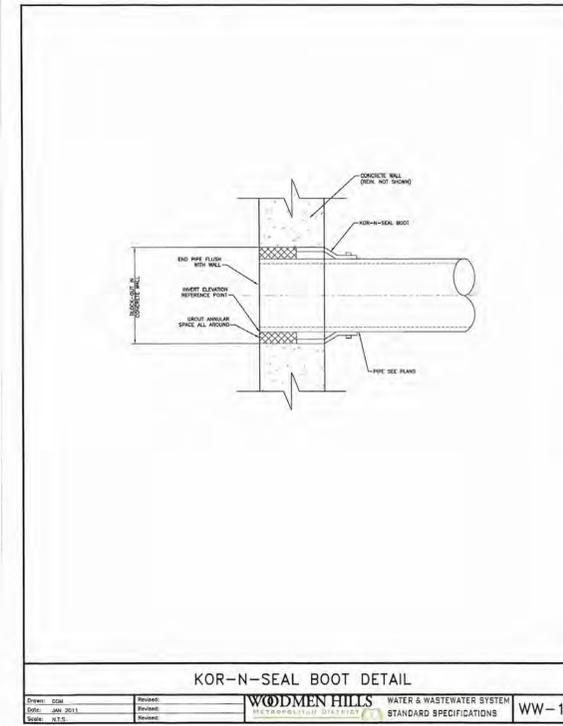
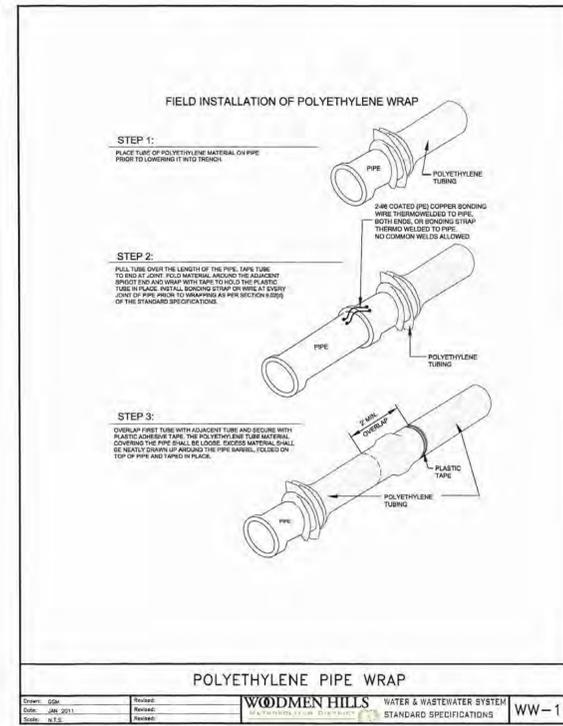
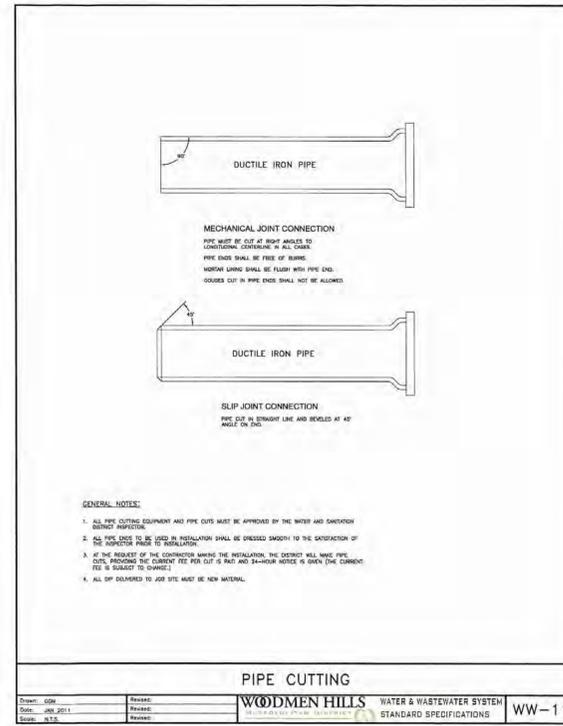
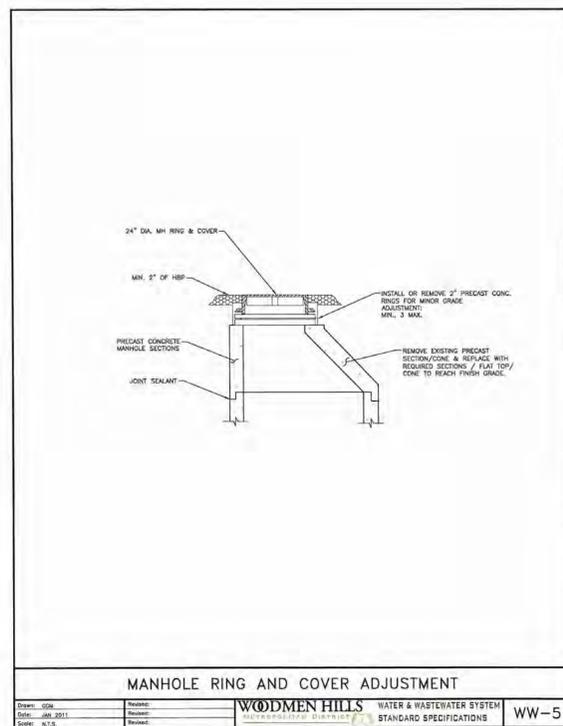
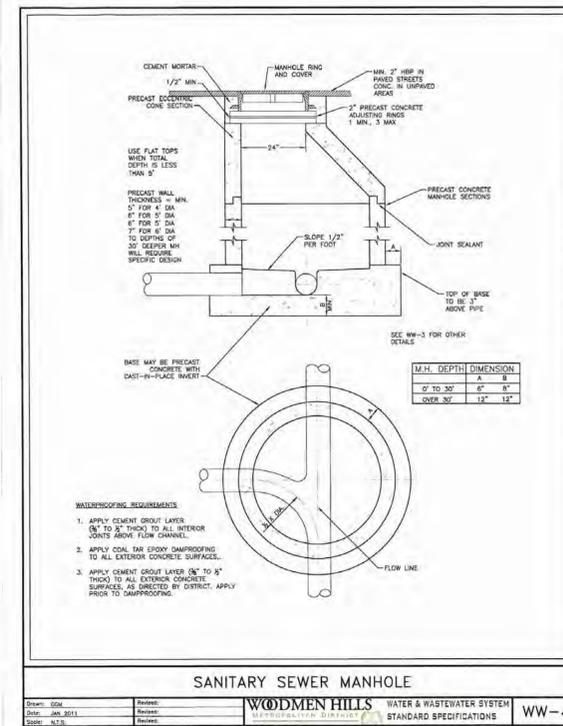
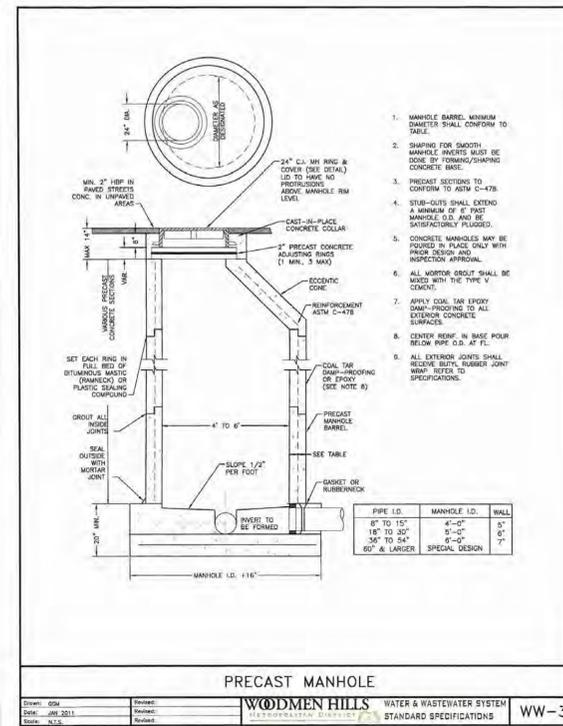
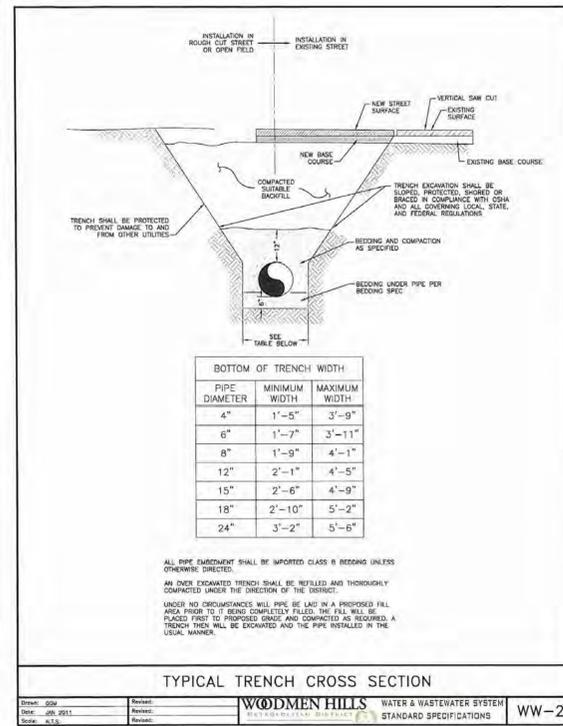
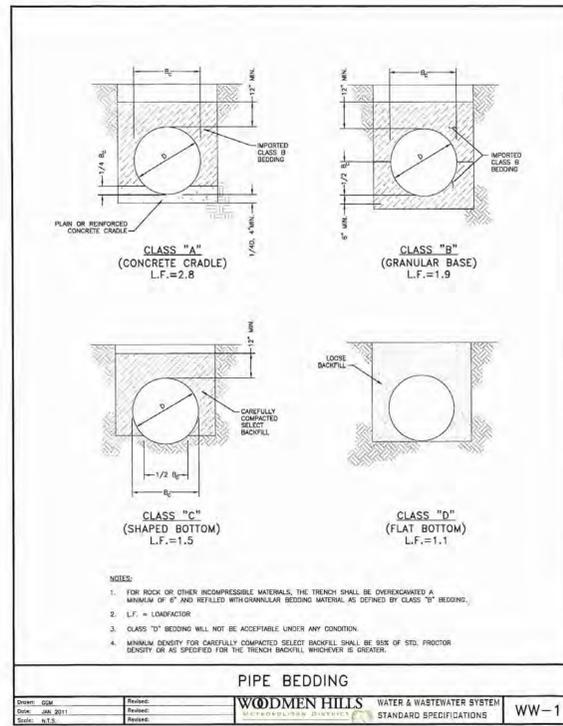
NO.	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
FORCE MAIN PLAN & PROFILE
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

PREPARED UNDER THE DIRECT SUPERVISION OF

DATE	MARCH 2019
JOB NUMBER	0055.0001
SCALE	AS SHOWN
DRAWING NAME	P & P
SHEET	5 OF 8

NOTE: ALL CONSTRUCTION OF INFRASTRUCTURE THAT WILL BE PART OF THE WOODMEN HILLS METROPOLITAN DISTRICT'S COLLECTION SYSTEM SHALL ABIDE BY THE CURRENT WOODMEN HILLS METROPOLITAN DISTRICT WATER AND WASTEWATER SYSTEM STANDARD SPECIFICATIONS



NO.	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
 WOODMEN HILLS
 DETAILS
 FALCON MEADOW RV CAMPGROUND
 11150 HWY 24
 PEYTON, CO 80831

DATE: MARCH 2019
 JOB NUMBER: 0055.0001
 SCALE: NTS
 DRAWING NAME: WHMD DET
 SHEET: 7 OF 8

STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES

GENERAL NOTES

1. THE APPROVED EROSION CONTROL PLAN SHALL BE MAINTAINED FOR THE ENTIRE DURATION OF THIS PROJECT.
2. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.
3. A THOROUGH INSPECTION OF THE STORMWATER MANAGEMENT PLAN BEST MANAGEMENT PRACTICES (BMPs) IS RECOMMENDED EVERY FOURTEEN (14) DAYS AND AFTER ANY PRECIPITATION OR SNOW MELT EVENT.
4. PERIODIC INSPECTIONS SHALL ALSO INCLUDE INSPECTING EQUIPMENT FOR LEAKS AND REVIEWING EQUIPMENT MAINTENANCE PRACTICE. ALL INSPECTIONS AND MAINTENANCE SHALL BE DOCUMENTED BY THE PROJECT EROSION CONTROL SUPERVISOR AND MADE AVAILABLE TO THE OWNER AND COPHE UPON REQUEST. ANY EROSION CONTROL BMP THAT HAS BEEN COMPROMISED OR HAS BEEN DISTURBED SHALL BE REPLACED OR RECONSTRUCTED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL EROSION CONTROL BMPs IN PLACE AND EFFECTIVE PRIOR TO A STORM EVENT.
5. THE STORMWATER MANAGEMENT PLAN LOG BOOK SHALL BE UPDATED EVERY FOURTEEN (14) DAYS. THIS LOG SHALL REMAIN ON SITE AVAILABLE FOR REVIEW BY SAGUACHE COUNTY AND COPHE UPON REQUEST UNTIL AN INACTIVATION NOTICE FOR CONSTRUCTION STORMWATER DISCHARGE GENERAL PERMIT CERTIFICATION HAS BEEN OBTAINED. MAINTENANCE ACTIVITIES TO CORRECT PROBLEMS NOTED DURING INSPECTIONS MUST BE DOCUMENTED AND KEPT IN THE STORMWATER MANAGEMENT PLAN LOG BOOK.
6. ALL STREETS WITHIN AND IMMEDIATELY SURROUNDING A CONSTRUCTION SITE SHALL BE CLEANED OF DIRT AND DEBRIS ON A WEEKLY BASIS. STREETS SHALL BE CLEANED BY SCRAPING AND SWEEPING THE DIRT OFF THE ROADWAYS. SCRAPED OR SWEEPED MATERIAL SHALL NOT BE DEPOSITED IN THE STORM SEWER SYSTEM. DIRT TRACKED ONTO ROADWAYS AND OTHER PAVED SURFACES SHALL BE CLEANED UP BY THE END OF THE WORKDAY.
7. ALL CONSTRUCTION SITE OPERATORS SHALL CONTROL WASTE SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, HAZARDOUS CHEMICALS (TO INCLUDE BUT NOT LIMITED TO HEAVY EQUIPMENT MAINTENANCE FLUIDS, MOTOR OIL, ANTI-FREEZE AND VEHICLE FUEL), LITTER, AND SANITARY WASTE AT THE CONSTRUCTION SITE THAT MAY CAUSE ADVERSE IMPACTS TO STORMWATER QUALITY.
8. ALL POTENTIAL POLLUTION SOURCES ON-SITE SHALL BE IDENTIFIED AND CONTROL MEASURES INSTALLED AND PRACTICED TO MINIMIZE THE LIKELIHOOD OF A RELEASE. REFER TO THE SPILL PREVENTION, CONTROL, AND COUNTERMEASURE (SPCC) PLAN FOR MEASURES TO RESPOND TO ANY SPILLS, LEAKS OR OTHER RELEASES.
9. ALL PORTABLE TOILET FACILITIES SHALL BE LOCATED AWAY FROM GUTTERS, INLETS DITCHES, DRAINAGEWAYS, RECEIVING WATERS AND AREAS SUSCEPTIBLE TO FLOODING OR DAMAGE BY CONSTRUCTION EQUIPMENT.
10. ALL PORTABLE TOILET FACILITIES SHALL BE SECURED IN PLACE BY STAKES INTO THE GROUND TO PREVENT TIPPING.
11. STOCKPILES INCLUDING LANDSCAPING MATERIALS, EARTH MATERIALS AND DIRT FROM GRADING OR EXCAVATION SHALL NOT BE LOCATED ADJACENT TO WATERWAYS; SHALL BE STABILIZED WITHIN FOURTEEN (14) DAYS OF ESTABLISHMENT BY SURFACE ROUGHENING, SEEDING, AND MULCHING; AND SHALL NOT EXCEED TEN FEET IN HEIGHT.
12. SLOPES 3:1 OR STEEPER SHALL BE PROTECTED WITH BIODEGRADABLE EROSION CONTROL BLANKETS.
13. ALL MATERIAL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT THE LOSS OF MATERIAL DURING TRANSPORT. HAUL ROUTES MUST BE PRE-APPROVED BY THE COUNTY. NO MATERIAL SHALL BE TRANSPORTED TO ANOTHER SITE WITHOUT FIRST OBTAINING A HAULING PERMIT FROM THE OWNER.
14. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL CONTAIN ALL WASHOUT WATER. STORMWATER SHALL NOT CARRY WASTES FROM WASHOUT LOCATION.
15. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL BE LOCATED A MINIMUM OF FIFTY (50) FEET HORIZONTAL FROM WATERS OF THE STATE. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL BE SIGNED AS - CONCRETE WASHOUT.
16. PERMANENT SOIL STABILIZATION MEASURES SHALL BE APPLIED WITHIN FOURTEEN (14) DAYS TO DISTURBED AREAS IN WHICH FINAL GRADE IS COMPLETED.

BMP MAINTENANCE NOTES

1. IT IS ANTICIPATED THAT THE BMPs IMPLEMENTED AT THE SITE WILL HAVE TO BE MODIFIED TO ADAPT TO CHANGING CONDITIONS OR TO ENSURE THAT POTENTIAL POLLUTANTS ARE BEING PROPERLY MANAGED AT THE SITE.
2. ALL INLET/OUTLET PROTECTIONS WILL BE CHECKED FOR MAINTENANCE AND FAILURE. SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF ONCE IT HAS ACCUMULATED TO HALF THE DESIGN OF THE TRAP.
3. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY, OR CONTAINED UNTIL APPROPRIATE CLEANUP METHODS CAN BE EMPLOYED. MANUFACTURE'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE FOLLOWED, ALONG WITH PROPER DISPOSAL METHODS.
4. EACH CONCRETE TRUCK OPERATOR SHALL BE AWARE OF THE DESIGNATED CONCRETE WASHOUT AREA.
5. THE CONTRACTOR SHALL CHECK THE CAPACITY FOR ALL CONCRETE WASHOUT AREAS. WASTE MATERIALS MUST BE REMOVED BY THE CONTRACTOR AND LEGALLY DISPOSED OF WHEN ACCUMULATIONS AMOUNT TO TWO-THIRDS OF THE WET STORAGE CAPACITY OF THE STRUCTURE.
6. ALL CONCRETE WASHOUT AREAS SHALL BE CLEARLY MARKED. THE CONCRETE WASHOUT CONTAINMENT DETAIL WILL INCLUDE ORANGE PLASTIC CONSTRUCTION FENCING OR EQUIVALENT AROUND THE WASHOUT STRUCTURE AND A SIGN POSTED WITH THE WORDS "CONCRETE WASHOUT".
7. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND/OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
8. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF AT AN APPROVED WASTE SITE.
9. ALL SEDIMENT SHALL BE REMOVED UPON INITIAL ACCEPTANCE FROM TEMPORARY SEDIMENT BASINS AND STORM SEWER FACILITIES, I.E., PIPES, OUTLETS AND INLETS. THIS SEDIMENT SHALL NOT BE FLUSHED OFF-SITE, BUT SHALL BE CAPTURED ON-SITE AND DISPOSED OF AT AN APPROVED LOCATION.
10. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
11. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
12. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.
2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.
3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.
5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.
6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK". THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').
7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".
2. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.
3. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.
4. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED, AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

ROCK SOCK MAINTENANCE NOTES

1. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.
2. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 1/2 OF THE HEIGHT OF THE ROCK SOCK.
3. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
4. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED, AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

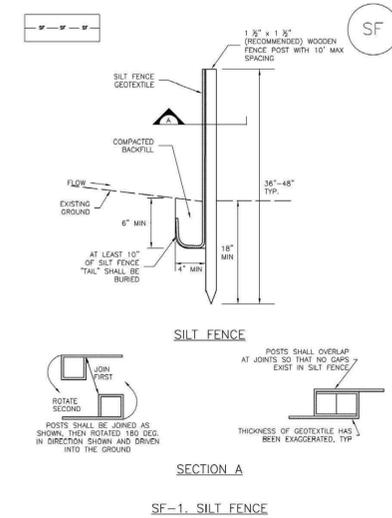
STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
 - 1.1. LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S)
 - 1.2. TYPE OF CONSTRUCTION ENTRANCE(S)/EXIT(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM)
2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.
3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.
4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.
6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

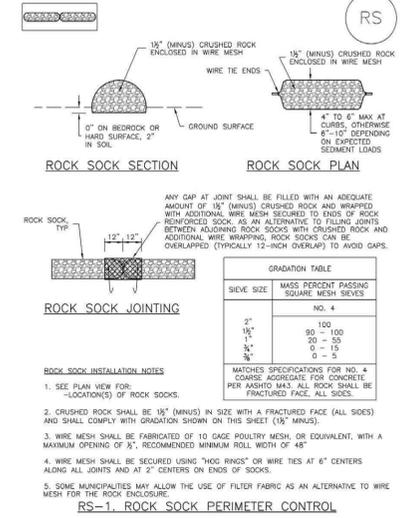
1. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.
2. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

Silt Fence (SF) SC-1



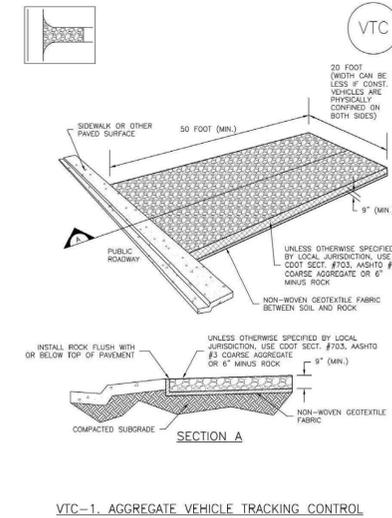
November 2010 Urban Drainage and Flood Control District SF-3
Urban Storm Drainage Criteria Manual Volume 3

SC-5 Rock Sock (RS)



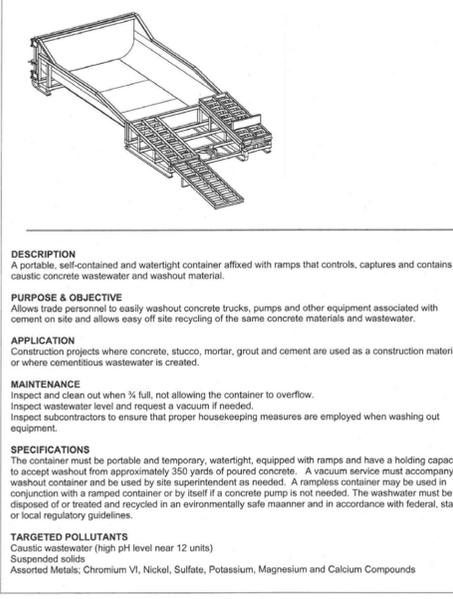
RS-2 Urban Drainage and Flood Control District November 2010
Urban Storm Drainage Criteria Manual Volume 3

Vehicle Tracking Control (VTC) SM-4



November 2010 Urban Drainage and Flood Control District VTC-3
Urban Storm Drainage Criteria Manual Volume 3

PORTABLE CONCRETE WASHOUT CONTAINER



NO.	REVISIONS	DATE	BY
1	MODIFY TO TWO PUMPS	5/19	AA

LIFT STATION - CONSOLIDATION
EROSION CONTROL
FALCON MEADOW RV CAMPGROUND
11150 HWY 24
PEYTON, CO 80831

PREPARED UNDER THE DIRECT SUPERVISION OF

EXHIBIT J – PROPERTY INFORMATION

EL PASO COUNTY - COLORADO5313000006
11150 E HIGHWAY 24Total Market Value
\$383,470**OVERVIEW**

Owner:	OZBURN JAMES C & DELIA L
Mailing Address:	11150 E US HIGHWAY 24 PEYTON CO, 80831-8106
Location:	11150 E HIGHWAY 24
Tax Status:	Taxable
Zoning:	RR-5
Plat No:	-
Legal Description:	TRACT IN NE4NW4 SEC 13-13-65 AS FOLS, BEG AT A PT ON W LN OF NE4NW4 SEC 13 THAT IS 725.5 FT S OF NW COR THEREOF, TH S ON SD W LN 594.5 FT TO SW COR OF NE4NW4, TH E ON S LN 358.25 FT TO A PT OF INTSEC WITH NWLY LN OF HWY 24, TH ANG L 62<17' + RUN NELY ON HWY LN 671.5 FT, TH W PARA TO S LN OF NE4NW4 670.5 FT TO POB

MARKET & ASSESSMENT DETAILS

	2018 Market Value	2018 Assessed Value
Land	\$201,313	\$45,310
Improvement	\$182,157	\$18,040
Total	\$383,470	\$63,350

RESIDENTIAL - RANCH (1)Market Value **\$148,871**

Assessment Rate	7.20	Above Grade Area	1,227
Bldg #	3	First Floor Area	1,227
Style Description	RANCH	Above First Floor Area	0
Property Description	MASONRY AVERAGE QUALITY	Lower Level Living Area	0
Year Built	1960	Total Basement Area	704
Dwelling Units	1	Finished Basement Area	
Number of Rooms	-	Garage Description	Multiple Types
Number of Bedrooms	2	Garage Area	944
Number of Baths	2.50	Carport Area	-

COMMERCIAL - STORAGE WAREHOUSE (1)Market Value **\$8,003**

Assessment Rate	29.00	Sprinkler	N
Bldg #	1	Elevator	N
Use	STORAGE WAREHOUSE	Occup 1	406
Year Built	1956	Occup 2	
Area	676	HVA 1	3
Class	C	HVA 2	
Quality	1.0	Wall Height	8
Stories	1	Land Size	309711
Perimeter	104	Neigh #	201
# Units			

COMMERCIAL - CONVENIENCE MARKET (2)Market Value **\$14,633**

Assessment Rate	29.00	Sprinkler	N
Bldg #	2	Elevator	N
Use	CONVENIENCE MARKET	Occup 1	419
Year Built	1983	Occup 2	
Area	1236	HVA 1	11
Class	D	HVA 2	
Quality	1.0	Wall Height	8.5
Stories	1	Land Size	309711
Perimeter	110	Neigh #	201
# Units			

COMMERCIAL - MOBILE HOME PARK (3)Market Value **\$7,399**

Assessment Rate	7.20	Sprinkler	N
Bldg #	3	Elevator	N
Use	MOBILE HOME PARK	Occup 1	999
Year Built	1960	Occup 2	
Area	625	HVA 1	
Class	A	HVA 2	
Quality	1.0	Wall Height	14
Stories	1	Land Size	309711
Perimeter	175	Neigh #	201
# Units	33		

COMMERCIAL - SHEDS/MISCL (4)Market Value **\$3,251**

Assessment Rate	7.20	Sprinkler	N
Bldg #	4	Elevator	N
Use	Sheds/Miscl	Occup 1	477
Year Built	2004	Occup 2	
Area	1000	HVA 1	
Class	S	HVA 2	
Quality	1.0	Wall Height	10
Stories	1	Land Size	309711
Perimeter	130	Neigh #	201
# Units			

LAND DETAILS

Sequence Number	Land Use	Assessment Rate	Area	Market Value
1	SINGLE FAMILY RES.	7.200	1 Acres	\$27,484
2	WELL AND SEPTIC	7.200	0	\$5,000
3	MOBILE HOME PARKS	7.200	1 Acres	\$27,484
4	WAREHOUSE/STORAGE	29.000	5.11 Acres	\$141,345

SALES HISTORY

	Sale Date	Sale Price	Sale Type	Reception
+	02/01/1986	\$0	Other	-

TAX ENTITY AND LEVY INFORMATION

County Treasurer Tax Information

Tax Area Code: **SBB** Levy Year: **2018** Mill Levy: **69.998**

Taxing Entity	Levy	Contact Name/Organization	Contact Phone
EL PASO COUNTY	7.738	FINANCIAL SERVICES	(719) 520-6498
EPC ROAD & BRIDGE (UNSHARED)	0.330	-	(719) 520-6498
EL PASO COUNTY SCHOOL NO 49	43.044	BRETT RIDGWAY	(719) 495-1130
PIKES PEAK LIBRARY	4.000	MIKE VARNET	(719) 531-6333
FALCON FIRE PROTECTION	14.886	TRENT HARWIG	(719) 495-4050



Disclaimer

We have made a good-faith effort to provide you with the most recent and most accurate information available. However, if you need to use this information in any legal or official venue, you will need to obtain official copies from the Assessor's Office. Do be aware that this data is subject to change on a daily basis. If you believe that any of this information is incorrect, please call us at (719) 520-6600.

EL PASO COUNTY - COLORADO

5313000094
13-13-65

Total Market Value
\$106,710

OVERVIEW

Owner:	OZBURN JAMES C & DELIA L
Mailing Address:	11150 E US HIGHWAY 24 PEYTON CO, 80831-8106
Location:	13-13-65
Tax Status:	Taxable
Zoning:	RR-5
Plat No:	-
Legal Description:	THAT PART OF NE4NW4 LY WLY OF HWY 24 EX SLY 594.5 FT, EX RR R/W SEC 13-13-65

MARKET & ASSESSMENT DETAILS

	2018 Market Value	2018 Assessed Value
Land	\$102,100	\$29,610
Improvement	\$4,610	\$1,340
Total	\$106,710	\$30,950

COMMERCIAL - MINOR STRUCTURES VACANT LAND (1)

Market Value **\$1,971**

Assessment Rate	29.00	Sprinkler	N
Bldg #	1	Elevator	N
Use	MINOR STRUCTURES VACANT LAND	Occup 1	117
Year Built	1920	Occup 2	
Area	800	HVA 1	
Class	D	HVA 2	
Quality	1.0	Wall Height	12
Stories	1	Land Size	426888
Perimeter	132	Neigh #	99
# Units			

COMMERCIAL - MINOR STRUCTURES VACANT LAND (2)

Market Value **\$715**

Assessment Rate	29.00	Sprinkler	N
Bldg #	2	Elevator	N
Use	MINOR STRUCTURES VACANT LAND	Occup 1	477
Year Built	1920	Occup 2	
Area	528	HVA 1	
Class	D	HVA 2	
Quality	1.0	Wall Height	7
Stories	1	Land Size	426888
Perimeter	112	Neigh #	99
# Units			

COMMERCIAL - MINOR STRUCTURES VACANT LAND (3)

Market Value **\$1,207**

Assessment Rate	29.00	Sprinkler	N
Bldg #	3	Elevator	N
Use	MINOR STRUCTURES VACANT LAND	Occup 1	102
Year Built	1920	Occup 2	
Area	400	HVA 1	
Class	D	HVA 2	
Quality	1.0	Wall Height	7
Stories	1	Land Size	426888
Perimeter	82	Neigh #	99
# Units			

COMMERCIAL - MINOR STRUCTURES VACANT LAND (4)Market Value **\$717**

Assessment Rate	29.00	Sprinkler	N
Bldg #	4	Elevator	N
Use	MINOR STRUCTURES VACANT LAND	Occup 1	117
Year Built	1920	Occup 2	
Area	272	HVA 1	
Class	D	HVA 2	
Quality	1.0	Wall Height	8
Stories	1	Land Size	426888
Perimeter	66	Neigh #	99
# Units			

LAND DETAILS

Sequence Number	Land Use	Assessment Rate	Area	Market Value
1	RES LAND AT 29%	29.000	9.8 Acres	\$102,100

SALES HISTORY

	Sale Date	Sale Price	Sale Type	Reception
+	03/01/1991	\$49,950	Good sale	2007559

TAX ENTITY AND LEVY INFORMATION

County Treasurer Tax Information

Tax Area Code: **SBB** Levy Year: **2018** Mill Levy: **69.998**

Taxing Entity	Levy	Contact Name/Organization	Contact Phone
EL PASO COUNTY	7.738	FINANCIAL SERVICES	(719) 520-6498
EPC ROAD & BRIDGE (UNSHARED)	0.330	-	(719) 520-6498
EL PASO COUNTY SCHOOL NO 49	43.044	BRETT RIDGWAY	(719) 495-1130
PIKES PEAK LIBRARY	4.000	MIKE VARNET	(719) 531-6333
FALCON FIRE PROTECTION	14.886	TRENT HARWIG	(719) 495-4050



No Photo Available



Disclaimer

We have made a good-faith effort to provide you with the most recent and most accurate information available. However, if you need to use this information in any legal or official venue, you will need to obtain official copies from the Assessor's Office. Do be aware that this data is subject to change on a daily basis. If

you believe that any of this information is incorrect, please call us at (719) 520-6600.



PERMIT TO WORK IN THE RIGHT-OF-WAY

Permit Type: Encroachment Permit Excavation Permit
 Obstruction Permit Annual Permit
 Telecommunications/Cable Provider

Permit No: 35239
 Issue Date: 8/29/2018
 Release Date:

Permit Fee: \$426.25

The undersigned applicant, being familiar with the requirements of the El Paso County resolution of July 1, 2008, does hereby agree to perform all work in compliance with the regulations and specifications as set forth in said resolution and to adhere to the requirements specified below.

ESQCP Permit No.

Company: Falcon Meadow Campground

Telephone: 719-495-2694 Address: 11150 Hwy 24

City: Falcon

State: CO Zip Code: 80831

Name of Applicant: David Osburn

Cell Phone:

E-Mail:

Project Address: Tamlin Rd 5545 (2x30)

Date of Application: 8/29/2018

Date to begin work: 10/1/2018

Date of completion: 10/31/2018

Work being performed for: Falcon Meadow Campground

List of Subcontractors:

For the purpose of: Installing Repairing Removing Replacing
Type of work: Curb/Gutter Sidewalk Electric Gas Telephone Water Wastewater Cable Television
 Other Description:

Road #	Material	Hot Mix Asphalt	Bore	Cut	Width	Length	Age of HMA
Road #1: Tamlin Rd	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input checked="" type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	30		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
Road #2:	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
Road #3:	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
Road #4:	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
Road #5:	<input type="checkbox"/> Hot Mix Asphalt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	0	0
	<input type="checkbox"/> Low Grade Paving / Gravel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		
	<input type="checkbox"/> Shoulder / Ditch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0		

REQUIREMENTS:

- State Law requires that notice of commencement, extent, and duration of any excavation work, be given to the owner or operator of underground facilities (utilities) at least two (2) business days in advance.
- Work zone traffic control shall be provided in accordance with the approved Traffic Control Plan.
- It is the responsibility of the contractor to contact Emergency Services, School Districts (if bus route), and other interested parties if road closure has been approved
- All backfill shall be compacted to 90% of AASHTO T-180 unless otherwise specified.
- All work sites shall be left clean and orderly.
- Contractor must call inspector 48 hours prior to start of work.

Additional Requirements: Select Backfill Flowable Fill Restore/Reseed Regravel Cold Mix patch immediately Bore
 Hot Mix Patch within 7 days Overlay Compaction Test(s) Remove all locate flags associated with project

EPC Remarks: Please contact Sarah McCormick (520-7847 or 330-5904) for inspection. ROW permit must be on site during project construction. County Engineer approval needed for closures of roads.

NOTICE:

- It is understood that should it become necessary for El Paso County to provide sign, light and barricade hazardous areas or restore the Right-of-Way to its original condition, that all costs of said work shall be borne by the Applicant
- Issuance of this permit does not relieve the applicant from satisfying El Paso County Land Development Code and Engineering Critical Manual requirements. In the event of conflict, this permit shall be considered NULL and VOID.
- Utilities or other facilities installed under this permit are subject to relocation, adjustment and modification at the owner's expense, in the event El Paso County determines such is necessary in order to perform road, bridge, drainage repairs, or any modifications and/or improvements.
- All permanent road repairs shall be completed within seven (7) calendar days of initial disturbance.
- Roadway closure will not be permitted unless approved by El Paso County Traffic Engineer at the time of application.
- All underground utility installations are to be at a thirty (30) inch minimum depth.
- All overhead utility installations are to be at a nineteen (19) foot minimum height.

SUMMARY OF CHARGES

Degradation Fee:	\$7.50
Traffic Management Fee:	\$3.75
Administration fee:	\$390.00
Surcharge:	\$25.00
Investigation Fee:	\$0.00
Total Permit Fee:	\$426.250
(Incentive) / Disincentive	\$0.000
Adjusted Permit Fee:	\$426.25

Applicant: *[Signature]*

Issued by: *Maggie Stack*

Date: 8/29/18

EXHIBIT A**Legal Description – 10 Foot Utility Easement**

A strip of land 10 feet wide over and across a portion of the former Chicago, Rock Island and Pacific Railroad Company right-of-way located in the Northeast Quarter of the Northwest Quarter of Section 13, Township 13 South, Range 65 West of the 6th P.M., El Paso County, Colorado. The centerline of said strip is described as follows:

The basis of bearings is a portion of said northwesterly right-of-way line, monumented at each end with a 1 1/2" aluminum cap marked "DB & CO PLS 17664". Said line is assumed to bear North 50 degrees 04' 28 seconds East, 369.68 feet.

Commencing at the point of intersection of the west line of said Northeast Quarter of the Northwest Quarter with the northwesterly line of said right-of-way, thence along said northwesterly right-of-way line North 50 degrees 04 minutes 28 Seconds East 173.65 feet to the point of beginning of the centerline to be described:

- 1) thence South 61 degrees 39 minutes 23 seconds East 97.79 feet;
- 2) thence South 64 degrees 53 minutes 38 seconds East, 141.17 feet;
- 3) thence South 36 degrees 30 minutes 33 seconds East, 16.70 feet;
- 4) thence South 18 degrees 20 minutes 36 seconds East, 69.47 feet to the southeasterly line of said right-of-way and said centerline there terminating.

The sidelines of said easement are to be prolonged or shortened to terminate at said northwesterly and southeasterly right-of-way lines.

This legal description and exhibit was prepared by me or under my direct supervision and checking and is true and correct to the best of my knowledge, information and belief.

The above statement is neither a warranty or guarantee, either expressed or implied.



Mark S. Johannes, PLS, CFedS
 Colorado Professional Land Surveyor No. 32439
 For and on behalf of Compass Surveying & Mapping, LLC

WOODMEN HILLS

METROPOLITAN DISTRICT

August 22, 2018

David Ozburn
11150 Hwy 24
Peyton, CO 8031

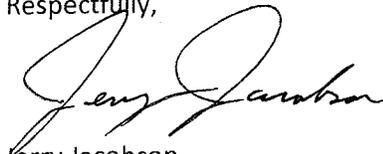
SUBJECT: Easement

Dear Mr. Ozburn,

Woodmen Hills is actively seeking to acquire an easement that would accommodate the wastewater line from your lift station. The easement would be on the north side of Tamlin, future Dublin, and would extend all the way to Antelope Meadows Drive. There is a force main in this area and because of the force main an easement must be secured to allow access for maintenance. The easement would also provide an area for you project. The easement would extend to Tamlin Road securing access to the Falcon Highlands Lift Station off of Tamlin Road. Currently access is off of Antelope Meadows Drive.

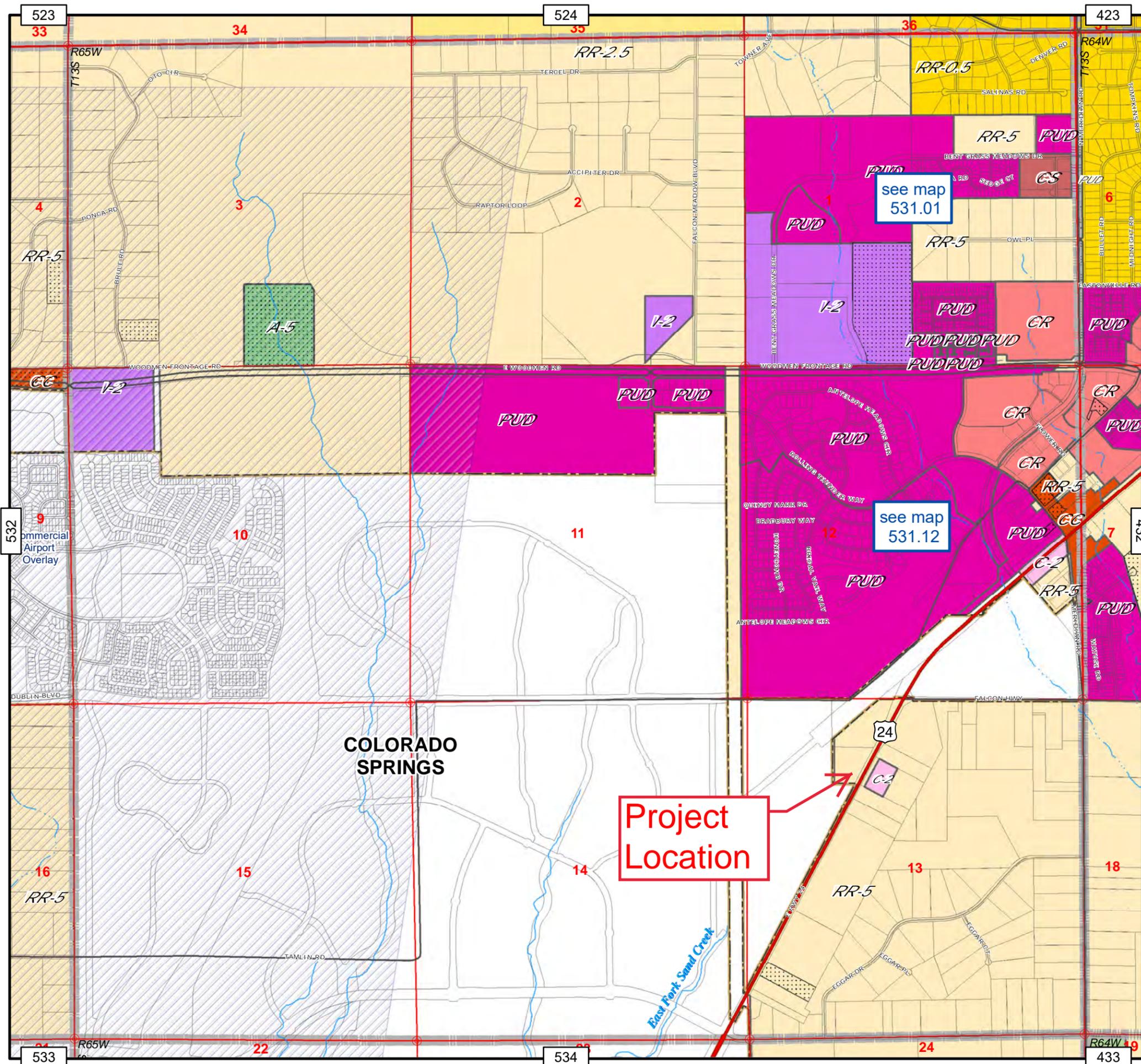
Please contact me with any questions or concerns.

Respectfully,



Jerry Jacobson
General Manager
Woodmen Hills Metropolitan District

EXHIBIT K – LAND USE MAP



Zone Map 531

- El Paso County -

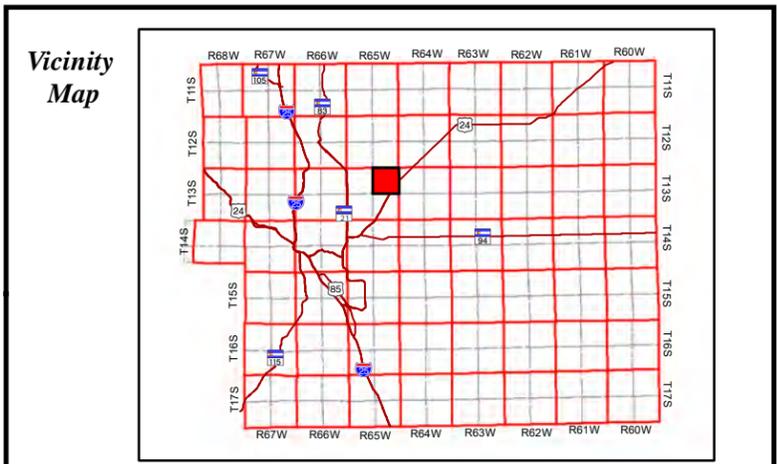
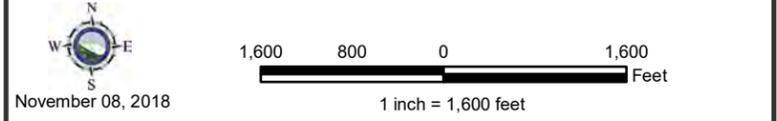
Development Services Department

Zoning Designations

- | | | | |
|--|---|--|------------------------------------|
| | RS-20000: Residential Suburban (20,000 sq. ft.) | | F-5: Forest & Recreation (5 acres) |
| | RS-6000: Residential Suburban (6,000 sq. ft.) | | PUD: Planned Unit Development |
| | RS-5000: Residential Suburban (5,000 sq. ft.) | | CC: Commercial Community |
| | RM-12: Residential Multi-Dwelling (12 DU/acre) | | CR: Commercial Regional |
| | RM-30: Residential Multi-Dwelling (30 DU/acre) | | CS: Commercial Service |
| | RR-0.5: Residential Rural (0.5 acres) | | I-2: Limited Industrial |
| | RR-2.5: Residential Rural (2.5 acres) | | I-3: Heavy Industrial |
| | RR-5: Residential Rural (5 acres) | | A-5: Agricultural (5 acres) |
| | R-T: Residential - Topographic | | A-35: Agricultural (35 acres) |
| | MHP: Mobile Home Park | | C-1: ** Commercial |
| | MHP-R: Mobile Home Park, Rural | | C-2: ** Commercial |
| | MHS: Mobile Home Subdivision | | M: ** Industrial |
| | RVP: Recreational Vehicle Park | | R-4: ** Planned Development |

** Indicates an obsolete designation

- #### Supporting Data
- | | | | | | |
|--|-----------------------|--|----------------------|--|---------------------|
| | Highways | | Sections | | Incorporated Cities |
| | Major Roadways | | Parcels | | Zone Map Boundary |
| | Creeks - Perennial | | Military | | Zoning Overlay |
| | Creeks - Intermittent | | Pike National Forest | | Special Uses |
| | Section Corner Nodes | | | | |



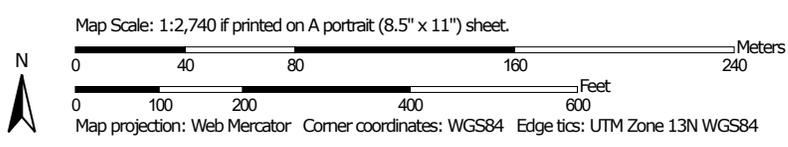
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EXHIBIT L – NRCS SOILS MAP

Soil Map—El Paso County Area, Colorado
(Falcon Meadow RV Campground)



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 16, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 7, 2016—Aug 17, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	12.1	51.3%
9	Blakeland-Fluvaquentic Haplaquolls	7.3	31.2%
96	Truckton sandy loam, 0 to 3 percent slopes	3.9	16.7%
97	Truckton sandy loam, 3 to 9 percent slopes	0.2	0.8%
Totals for Area of Interest		23.5	100.0%

EXHIBIT M – DRAINAGE ANALYSIS

MEMORANDUM

TO: El Paso County
FROM: Element Engineering
DATE: March 19, 2019
SUBJECT: Falcon Meadow RV Campground – Grading and Drainage

PURPOSE:

The purpose of this memorandum is to briefly provide background on the grading and drainage items necessary for the design and construction of the proposed FMRVC lift station.

GRADING AND DRAINAGE

Excavation will be limited to a small area (approximately 10-ft x 10-ft) for the installation of the lift station. A trench with a width of less than three-ft will be excavated for the installation of the force main. No grading or drainage changes are proposed as a part of this project and existing drainage patterns will not be impacted. All excavated areas will be replaced at their current elevation and disturbed areas will either be re-seeded or re-paved (as applicable). Furthermore, no additional impermeable or semi-permeable area will be added or modified as a part of this project. Therefore, no grading or drainage analysis is necessary for this project.

BEST MANAGEMENT PRACTICES (EROSION CONTROL)

Erosion control layout and details have been provided in the plan set. Erosion control measures will be installed to prevent sediment from being carried away from the excavation area and excessive erosion from occurring.

EXHIBIT N – GEOTECHNICAL EVALUATION



Kumar & Associates, Inc.
Geotechnical and Materials Engineers
and Environmental Scientists



10302 South Progress Way
Parker, Colorado 80134
Phone: (303) 841-7119
Fax: (303) 841-7556
Email: hpkparker@kumarusa.com
www.kumarusa.com

Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs and Summit County, Colorado

**GEOTECHNICAL ENGINEERING STUDY
OUTFALL LIFT STATION
FALCON MEADOWS RV PARK
PEYTON, COLORADO**

Prepared By:


Eric Jepperson E. I.

Reviewed By:

Richard C. Hepworth P.E.

Prepared for:
Element Engineering, LLC
Attn: Ms. Alice Arsenault P.E.
12687 W. Cedar Drive, Suite 350
Lakewood, CO 80228



Project No. 18-8-370

January 25, 2018

TABLE OF CONTENTS

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RETAINING AND FOUNDATION WALLS	3
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SURFACE DRAINAGE.....	5
DESIGN AND CONSTRUCTION SUPPORT SERVICES	5
LIMITATIONS	6

FIGURE 1	SITE LOCATION
FIGURE 2	BORING LOCATION
FIGURE 3	BORING LOG WITH LEGEND AND NOTES
FIGURE 4	SWELL COMPRESSION TEST RESULTS

TABLE 1 - SUMMARY OF LABORATORY TEST RESULT

PURPOSE AND SCOPE OF STUDY

This report presents the results of a geotechnical engineering study for a proposed Outfall Lift Station located at the Falcon Meadows RV Park at 11150 Highway 24 Peyton, CO. The site location is shown on Figure 1. The subsurface study was conducted to develop foundation design recommendations. The study was conducted in accordance with the scope of work in our Proposal No. P8-18-265 to Element Engineering dated December 6, 2018.

A field exploration program consisting of one boring was conducted to obtain information on subsurface conditions. Samples of the soils obtained during the field exploration were tested in the laboratory to determine their classification and engineering characteristics. The results of the field exploration, and laboratory testing were analyzed to develop recommendations for foundation types, depths and allowable pressures for the proposed construction. The results of the analysis are presented in this report.

PROPOSED CONSTRUCTION

The proposed construction is for a sanitary lift station. The construction consists of a prefabricated concrete unit. It will be about 15 feet deep. Loads are expected to be light. Grading for the proposed construction is anticipated to be relatively minor. If the proposed construction varies significantly from that described above or depicted in this report, we should be notified to reevaluate the recommendations provided in this report.

SITE CONDITIONS

The location for the proposed lift station is approximately 200 feet to the southwest of the main entrance of the Falcon Meadows RV park at 11150 Highway 24 in Peyton, CO. Open land can be found to the south and west. An industrial facility is directly to the east and a new residential development currently under construction to the north. Mobile homes surround the site with unpaved roads and pathways. The topography is relatively flat but slopes mildly down to the west and mildly up to the east. Vegetation consists of natural trees and grasses.

SUBSURFACE CONDITIONS

The subsurface conditions at the site were explored by drilling one boring for the lift station. Figure 2 shows the approximate boring location. A graphic log of the boring is presented on Figure 3 with a legend and notes describing the soils encountered. The boring was advanced with 4-inch

diameter continuous flight augers powered by a truck mounted drill rig. The boring was logged by a representative of Kumar and Associates.

Samples of the soils were taken with a nominal 2-inch I.D "California" sampler. The sampler was driven into the soils with blows from a 140-pound hammer falling 30 inches. This test is similar to the standard penetration test described by ASTM Method D 1586. Penetration resistance values, when properly evaluated, indicate the relative density of cohesionless soils or consistency of cohesive soils. Depths at which the samples were taken and the penetration resistance values are shown on the right side of the log on Figure 3.

Laboratory tests included natural moisture content, unit weight, percent passing the # 200 sieve (silt and clay fraction), gradation analyses, Atterberg limits, standard proctor, and swell/compression. The test results are shown on the boring log, Figure 4 and summarized in Table 1. Testing was in accordance with ASTM standards.

Under a thin layer of top soil, silty sand was found to a depth of three feet. The silty sand had a moisture content of 2.3 percent and a dry density of 108 pcf. Fat clay with sand was then found below the upper three feet of silty sand. The Fat clay with sand had a high moisture content of 24.5 percent and a dry density of 98 pcf. Claystone was then found at depth 8 feet. The claystone had moisture content of 19.2 percent and a dry density of 110 pcf. Below the claystone, sandstone was found to a maximum depth drilled of 25 feet.

Swell-compression tests were performed on samples of the silty sand and fat clay with sand. The results are shown on Figure 4. The samples were wetted under a surcharge pressure of 1,000 psf. The results show that the silty sand and fat clay with sand to have a low swell potential ranging from -0.6 to 0.3 percent.

WATER-SOLUBLE SULFATES

The concentration of water-soluble sulfates measured in a sample of the fat clay with a sand was 0.02 percent. This concentrations of water-soluble sulfates represent a Class 0 severity exposure to sulfate attack on concrete exposed to these materials. The degree of attack is based on a

range of Class 0, Class 1, Class 2, and Class 3 severity exposure as presented in ACI 201. Based on the laboratory test results, we believe Type I/II cement will be satisfactory.

SEISMIC CONSIDERATION

The following parameters are based on the 2012/2015 IBC Provisions and USGS Seismic Design Map. The lift station was considered to be a Category I, II, III facility. The site is considered a seismic Class C.

GEOTECHNICAL ENGINEERING CONSIDERATIONS

Based on the data obtained during the field and laboratory studies, we recommend that the foundations be supported on spread footing or a mat foundation bearing on the native overburden soils or sandstone bedrock.

FOUNDATIONS

The following details should be followed for a footing or mat foundation.

1. The foundation may be designed for a maximum allowable bearing pressure of 2,000 psf if bearing on the soils or 4,000 if bearing on the sandstone. Settlement is not expected to exceed one inch and differential settlement less than $\frac{3}{4}$ inch.
2. Any loose or unsuitable soil or bedrock should be removed and replaced compacted.
3. Lateral resistance of footings or mat may be calculated on the basis of a coefficient of friction of 0.35. Passive resistance of 250 pcf for compacted backfill against the sides of footings may be used. Both values are unfactored.
4. Footings below unheated areas should be below frost depth, taken as 36 inches in this area.
5. A representative of the geotechnical engineer should observe all footing excavations prior to fill and concrete placement.

RETAINING AND FOUNDATION WALLS

Foundation walls and retaining structures which are laterally supported and can be expected to undergo only a slight amount of deflection should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 50 pcf for backfill consisting of properly compacted, approved, on-site soil. Cantilevered retaining structures

which are separate from the building and can be expected to deflect sufficiently to mobilize the full active earth pressure condition should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 40 pcf for backfill consisting of properly compacted on-site soil.

The lateral resistance of retaining wall footings will be a combination of the sliding resistance of the footing on the foundation materials and passive earth pressure against the side of the footing as discussed in the SPREAD FOOTING section above. Care should be taken not to over-compact the wall backfill since this could cause excessive lateral pressures on the walls. Some settlement of foundation wall backfill could occur even if the backfill is placed correctly.

All retaining structures should be designed for appropriate hydrostatic and surcharge pressures such as adjacent footings, traffic, construction materials and equipment. The pressures recommended above assume drained conditions behind the walls and a horizontal backfill surface. The buildup of water behind a wall or an upward sloping backfill surface will increase the lateral pressure imposed on a foundation wall or retaining structure. An underdrain or weep holes should be provided to prevent hydrostatic pressure buildup behind retaining walls.

SITE GRADING

General:

The following recommendations should be followed for grading, site preparation, and fill compaction.

1. All import and onsite backfill should be approved by the geotechnical engineer.
2. Where fill is to be placed, loose or otherwise unsuitable material, including topsoil vegetation and should be removed prior to placement of new fill.
3. Soils should be compacted with appropriate equipment for the lift thickness placed, typically 8-inches loose, or less.
4. The following compaction requirements should be used:

TYPE OF FILL PLACEMENT	MOISTURE CONTENT	SOIL TYPE - Compaction Percent (ASTM D-698 Standard Proctor)
Below Footings,	2% to +2% of Optimum	Suitable on site, Import Fill (min – 98%)
Concrete Flatwork	2% to +2% of Optimum	Suitable on site, Import Fill (min – 95%)
Landscape Areas	0% to +3% of Optimum	Suitable onsite (min – 90%)or
Utility Trenches	As they apply to the finished area	

Suitability of On-site Soil:

The silty sand and sandstone are suitable for structural fill. The fat clay or claystone are not suitable for structural fill or wall backfill.

Import Structural Fill:

If import structural fill is needed it should be non-expansive, and should consist of minus 2-inch material having less than 35 percent passing the No. 200 sieve, a liquid limit less than 30, and a plasticity index less than 15. Import materials should be approved by the geotechnical engineer before placement. CDOT Class 1 structural backfill or Class 5 or 6 aggregate materials will meet the above specifications, and are suitable as structural fill.

Excavation:

The excavation can be made with conventional equipment, however the sandstone is hard and may require extra effort in a confined excavation. Excavation slopes should be in compliance with OSHA criteria. The upper soils are Type B soils with maximum slope of 1:1. The bedrock should be stable on steeper slopes. The contractor's "competent person" should make the judgement on safe slopes. If there is any doubt about safe slopes, the geotechnical engineer should visit the site.

SURFACE DRAINAGE

Proper surface drainage is very important for acceptable performance of the structure during construction and after the construction has been completed. Drainage recommendations provided by local, state and national entities should be followed based on the intended use of the structure. Exterior backfill should be adjusted to near optimum moisture content and compacted to at least 95 % of the ASTM D 698 (standard Proctor) maximum dry density. We recommend a slope of 8 inches in the first 10 feet away from the structure in unpaved areas and 3 percent in

paved areas. This may be adjusted where necessary to accommodate ADA criteria.

DESIGN AND CONSTRUCTION SUPPORT SERVICES

Kumar and Associates should be retained to review the project plans and specifications for conformance with the recommendations provided in our report. We are also available to assist the design team in preparing specifications for geotechnical aspects of the project, and performing additional studies if necessary to accommodate possible changes in the proposed construction. We recommend that Kumar and Associates be retained to provide construction observation and testing services to document that the intent of this report and the requirements of the plans and specifications are being followed during construction. This will allow us to identify possible variations in subsurface conditions from those encountered during this study and to allow us to re-evaluate our recommendations, if needed. We will not be responsible for implementation of the recommendations presented in this report by others, if we are not retained to provide construction observation and testing services.

LIMITATIONS

This study has been conducted in accordance with generally accepted geotechnical engineering practices in this area for exclusive use by the client for design purposes. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory boring at the location indicated on Figure 2, and the proposed type of construction. This report may not reflect subsurface variations that occur, and the nature and extent of variations across the site may not become evident until site grading and excavation is performed. If during construction, fill, soil, rock or water conditions appear to be different from those described herein, Kumar and Associates should be advised at once so that a re-evaluation of the recommendations presented in this report can be made. The scope of services for this project does not include any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken. Kumar and Associates is not responsible for liability associated with interpretation of subsurface data by others.

KUMAR & ASSOCIATES



NOT TO SCALE

January 22, 2019 - 01:19pm
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18-8-370

Kumar & Associates

VICINITY MAP

Fig. 1

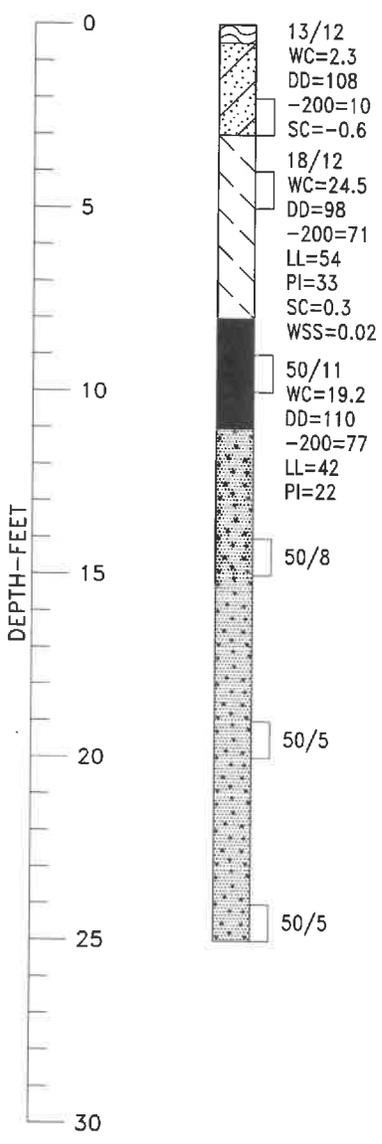


APPROXIMATE SCALE—FEET

January 22, 2019 - 01:19pm
 V:\Projects\2018\18-8-370 Ill. Sta. Felton Meadows_RV Compground\Drafting\188370-01 to 02.dwg

18-8-370	Kumar & Associates	LOCATION OF EXPLORATORY BORING	Fig. 2
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BORING 1



LEGEND

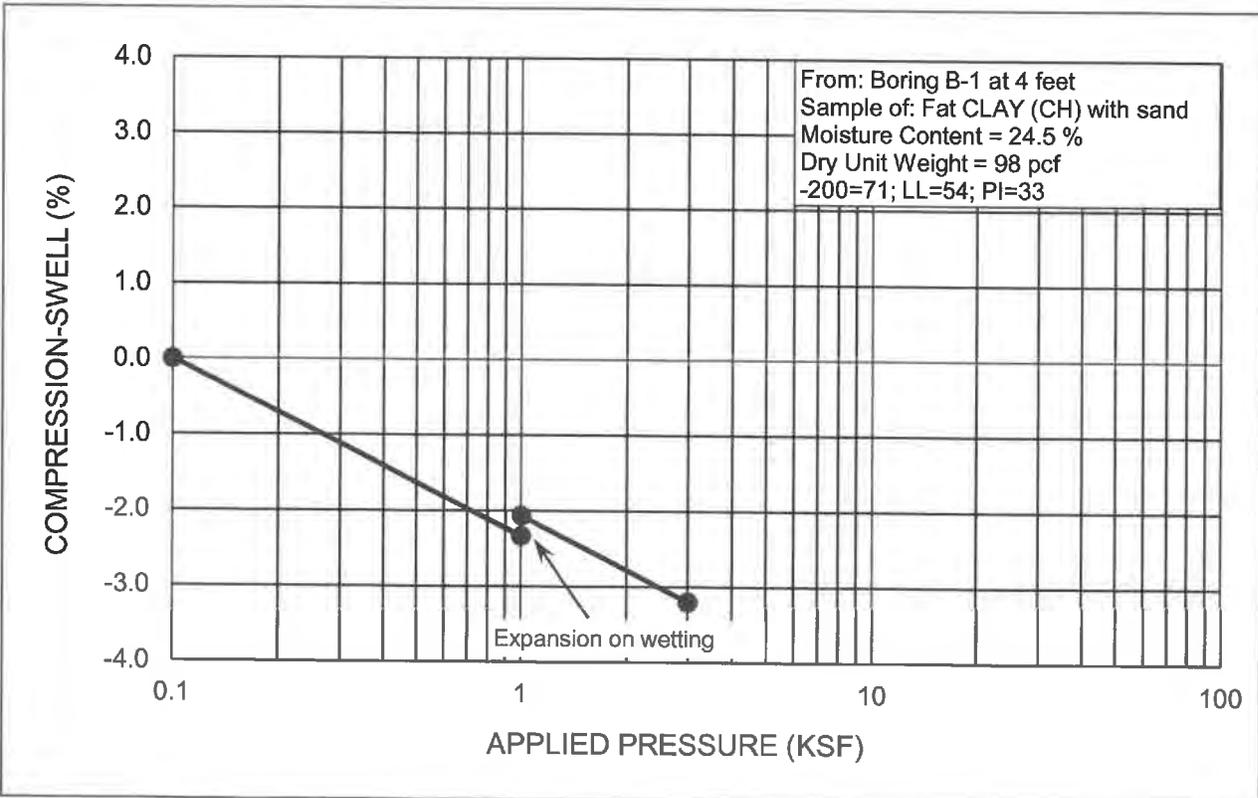
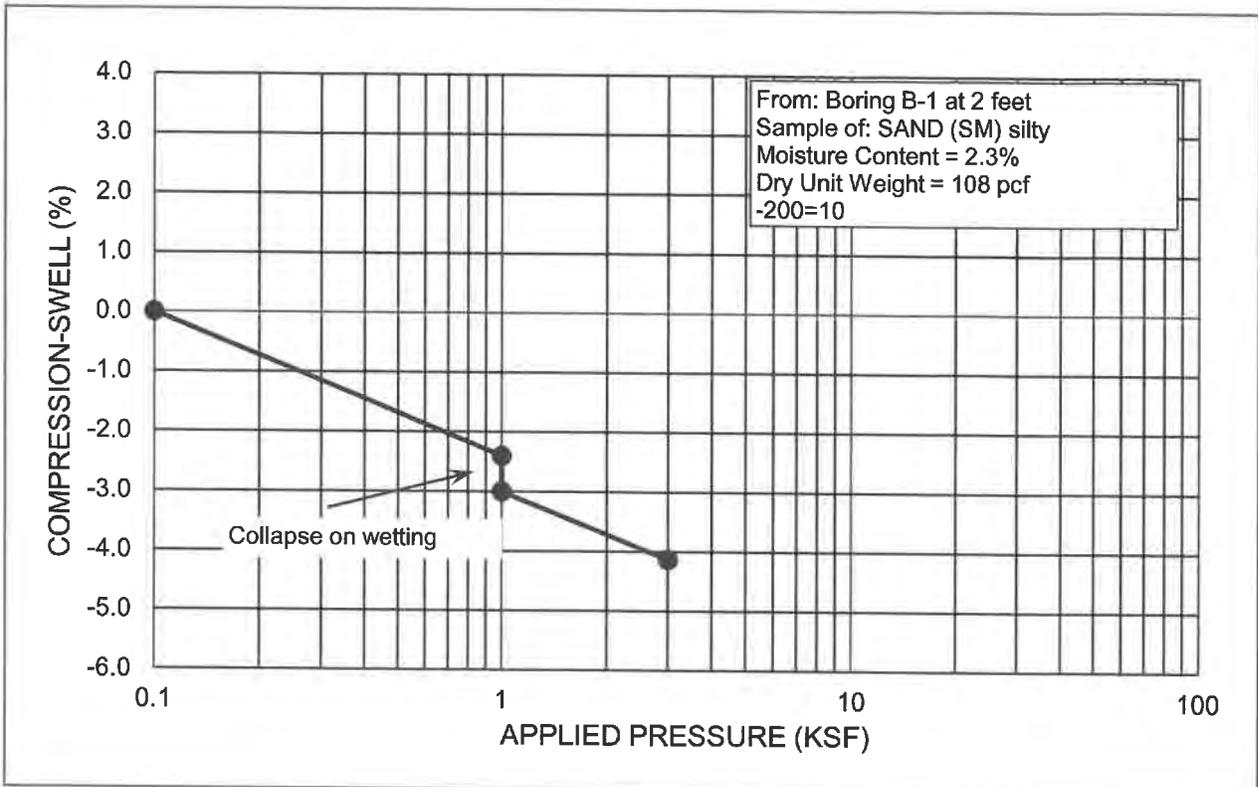
- TOPSOIL.
- SAND, SILTY, MEDIUM DENSE, FINE TO MEDIUM GRANED, MOIST, LIGHT BROWN.
- FAT CLAY WITH SAND, VERY STIFF, HIGH PLASTICITY, MOIST, ORANGE YELLOW, FERROUS OXIDE.
- CLAYSTONE, HARD, MEDIUM PLASTICITY, MOIST, GRAY, FERROUS OXIDE.
- SANDSTONE, VERY HARD, LOW TO MEDIUM PLASTICITY, FINE TO MEDIUM GRANED, MOIST, GREEN/BLUE, FERROUS OXIDE.
- DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLE.

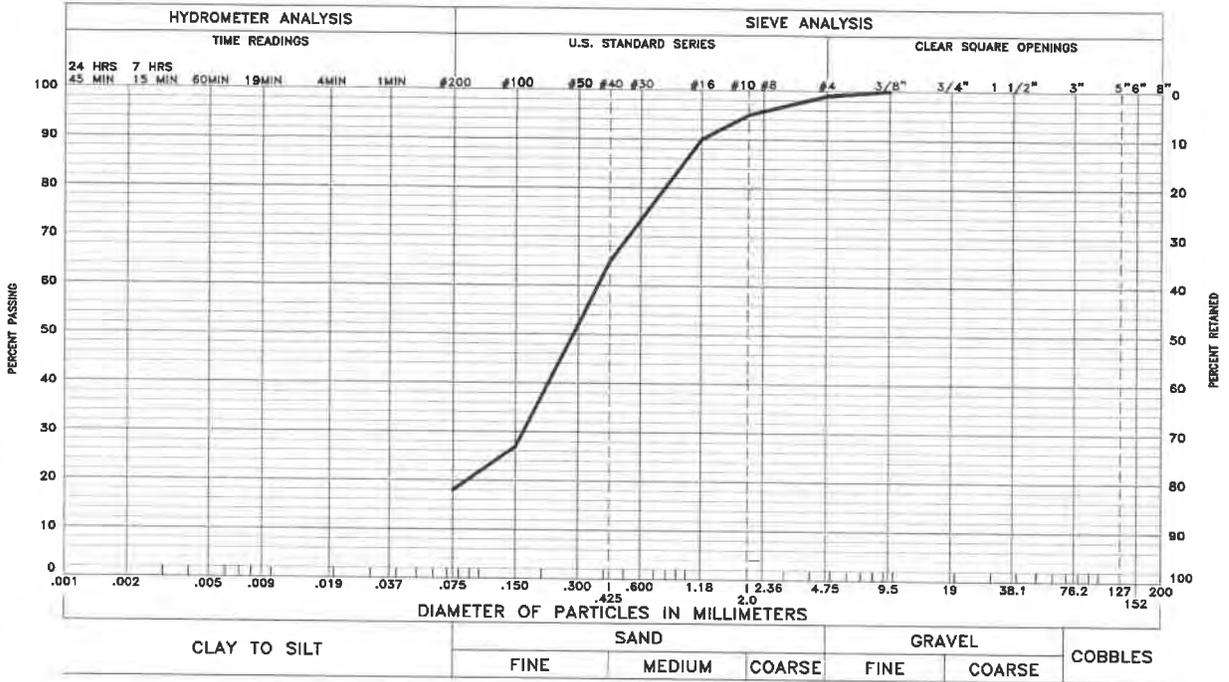
13/12 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 13 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.

NOTES

1. THE EXPLORATORY BORING WAS DRILLED ON DECEMBER 21, 2018 WITH A 4-INCH DIAMETER CONTINUOUS FLIGHT POWER AUGER.
2. THE LOCATION OF THE EXPLORATORY BORING WAS MEASURED APPROXIMATELY BY PACING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.
3. THE ELEVATION OF THE EXPLORATORY BORING WAS NOT MEASURED AND THE LOG OF THE EXPLORATORY BORING IS PLOTTED TO DEPTH.
4. THE EXPLORATORY BORING LOCATION SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOG REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
6. GROUNDWATER WAS NOT ENCOUNTERED IN THE BORING AT THE TIME OF DRILLING.
7. LABORATORY TEST RESULTS:
 WC = WATER CONTENT (%) (ASTM D 2216);
 DD = DRY DENSITY (pcf) (ASTM D 2216);
 -200 = PERCENTAGE PASSING NO. 200 SIEVE (ASTM D 1140);
 LL = LIQUID LIMIT (ASTM D 4318);
 PI = PLASTICITY INDEX (ASTM D 4318);
 WSS = WATER SOLUBLE SULFATES (%) (AASHTO T 290);
 SC = PERCENT SWELL (+) OR CONSOLIDATION (-) UPON WETTING UNDER CONSTANT LOAD (ASTM D 4546, METHOD B);

January 22, 2019 - 01:15pm
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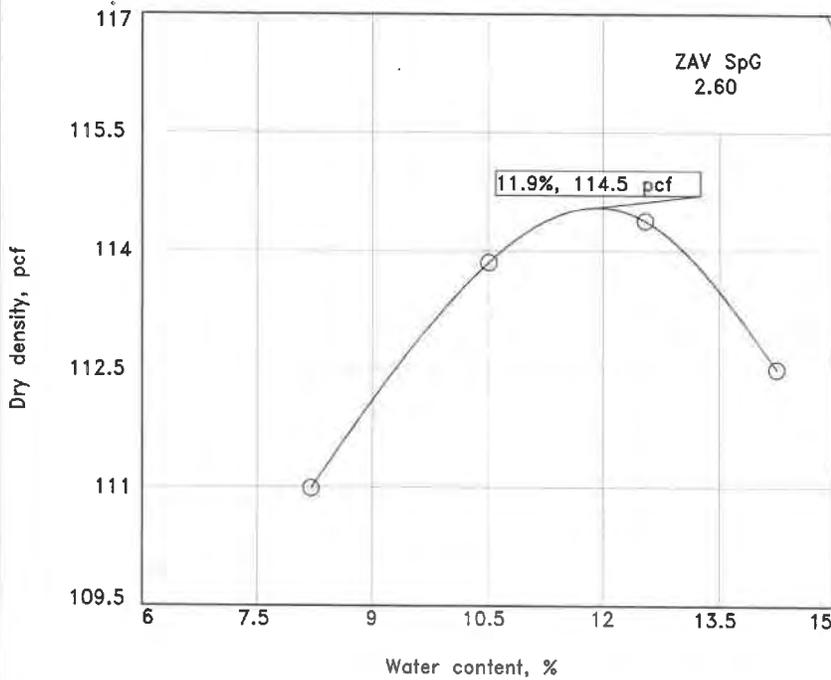
GRAVEL - % SAND - % SILT AND CLAY - %
 LIQUID LIMIT - PLASTICITY INDEX -
 SAMPLE OF: - FROM: -

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

January 26, 2019 - 03:24 PM
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COMPACTION TEST REPORT

Curve No. 264



Preparation Method _____	
Rammer: Wt. <u>10 lb.</u>	Drop <u>18 in.</u>
Type _____	
Layers: No. <u>five</u>	Blows per <u>25</u>
Mold Size <u>0.03333 cu. ft.</u>	
Test Performed on Material	
Passing <u>#4</u> Sieve	
%>#4 _____ %<No.200 _____	
Atterberg (D 4318): LL _____ PI _____	
NM (D 2216) _____ Sp.G. (D 854) <u>2.6</u>	
USCS (D 2487) _____	
AASHTO (M 145) _____	
Date: Sampled <u>12-21-19</u>	
Received _____	
Tested _____	
Tested By _____	

COMPACTION TESTING DATA
ASTM D 1557-12 Method A Modified

	1	2	3	4	5	6
WM + WS	6088.5	6175.1	6219.1	6216.1		
WM	4272.9	4272.9	4272.9	4272.9		
WW + T #1	312.9	332.1	426.4	546.5		
WD + T #1	289.9	301.4	379.9	479.5		
TARE #1	9.4	9.3	9.2	9.3		
WW + T #2						
WD + T #2						
TARE #2						
MOIST.	8.2	10.5	12.5	14.2		
DRY DENS.	111.0	113.9	114.4	112.5		

SIEVE TEST RESULTS

Opening Size	% Passing	Specs.

TEST RESULTS

Maximum dry density = 114.5 pcf
Optimum moisture = 11.9 %

Material Description

Project No. _____ Client: _____
Project: _____
Location: Outfall Lift Sample Number: 264

Remarks:

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar and Associates, Inc. Moisture/density relationships performed in accordance with ASTM D698, D1557. Atterberg limits performed in accordance with ASTM D4318 sieve analysis performed in accordance with ASTM D422, D1140.

Checked by: _____

Title: _____

18-8-370

Kumar & Associates

MOISTURE-DENSITY RELATIONSHIPS

Fig. 6

Kumar & Associates, Inc.

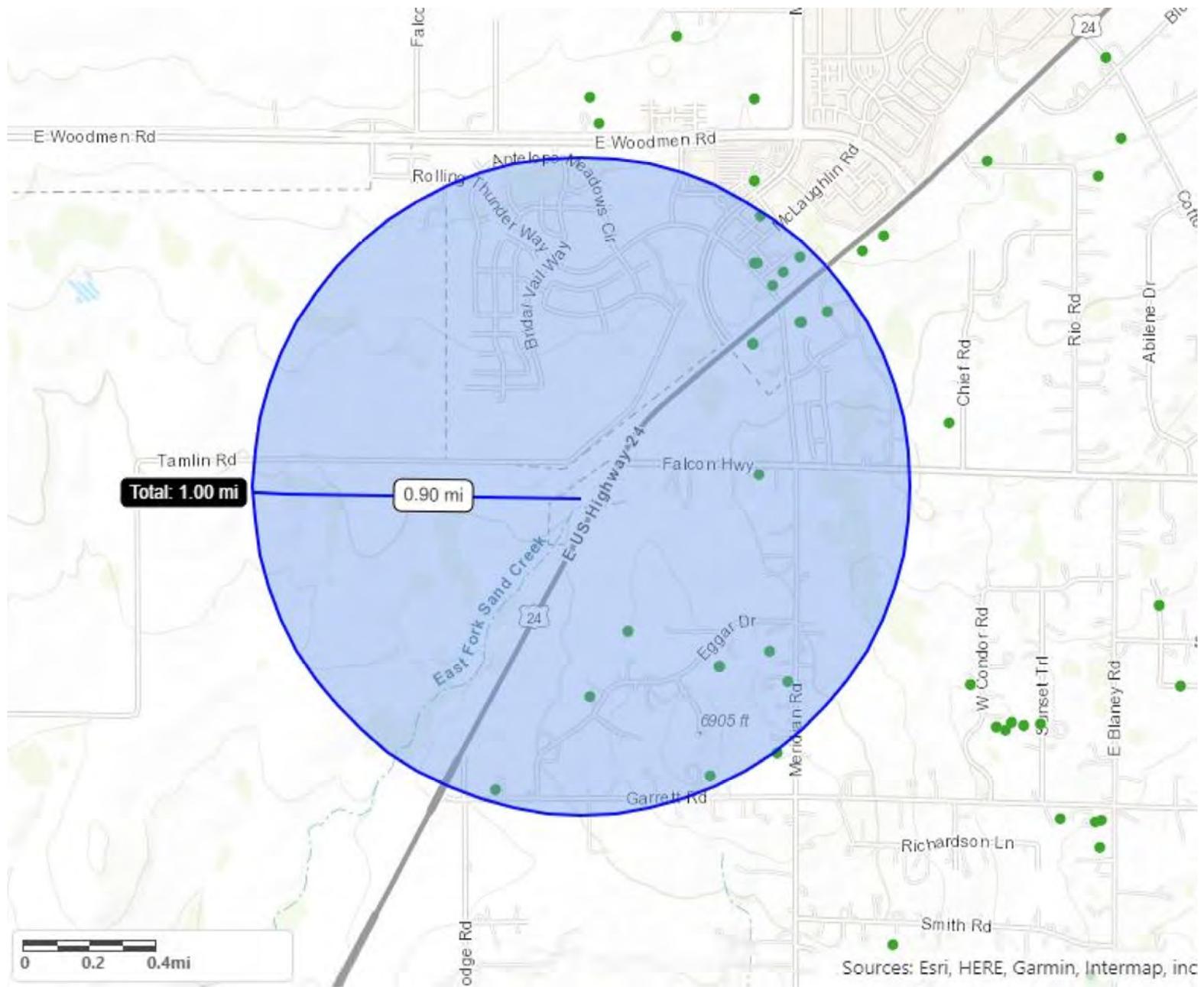
TABLE I SUMMARY OF LABORATORY TEST RESULTS

Project No.: 18-8-370

Project Name: Outfall Lift Station Falcon Meadows RV Park

BORING	SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		SILT & CLAY (%)	ATTERBERG LIMITS		SWELL WITH 1000 PSF SURCHARGE (%)	WATER SOLUBLE SULFATES (%)	SOIL OR BEDROCK TYPE (Unified Soil Classification)
	DEPTH (ft)				GRAVEL (%)	SAND (%)		LIQUID LIMIT	PLASTICITY INDEX			
B1	2		2.3	108			10			-0.6		SAND silty (SM)
B1	4		24.5	98			71	54	33	0.3	0.02	Fat CLAY (CH) with sand
B1	9		19.2	110			77	42	22			Claystone

EXHIBIT O – MAP OF WELLS IN THE VICINITY OF THE PROJECT



**EXHIBIT P – FEMA FIRM MAP
WETLANDS MAP
IPAC RESOURCE LIST**

NOTES TO USERS

is for use in administering the National Flood Insurance Program. It does not identify areas subject to flooding, particularly from local drainage of small size. The community map repository should be consulted for updated or additional flood hazard information.

more detailed information in areas where **Base Flood Elevations (BFEs)** have been determined, users are encouraged to consult the Flood Hazard Data and/or Summary of Stillwater Elevations tables contained in the Flood Insurance Study (FIS) report that accompanies this FIRM. Users are advised that BFEs shown on the FIRM represent rounded values and are not intended for flood insurance rating purposes only and should be used as the sole source of flood elevation information. Accordingly, elevation data presented in the FIS report should be utilized in conjunction with other purposes of construction and/or floodplain management.

Base Flood Elevations shown on this map apply only to landward of 0.7' vertical datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater table in the Flood Insurance Study report for this jurisdiction. Elevations in the Summary of Stillwater table should be used for construction floodplain management purposes when they are higher than the elevations in this FIRM.

Flowlines of the floodways were computed at cross sections and interpolated cross sections. The flowlines were based on hydraulic considerations with requirements of the National Flood Insurance Program. Floodway widths and pertinent floodway data are provided in the Flood Insurance Study report section.

is not in Special Flood Hazard Areas may be protected by flood control structures. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

action used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD83, GRS80 spheroid. In datum, spheroid, projection or UTM zones zones used in the preparation of this FIRM for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

ations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and elevation data referenced to the same vertical datum. For information regarding differences between the National Geodetic Vertical Datum of 1959 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following information Services:
 NGS12
 Geodetic Survey
 #9202
 West Highway
 #g, MD 20910-3282

current elevation, description, and/or location information for **bench marks** on this map, please contact the Information Services Branch of the National Survey at (301) 713-3242 or visit its website at <http://www.ngs.noaa.gov/>.

information shown on this FIRM was provided in digital format by El Paso Colorado Springs Utilities, City of Fountain, Bureau of Land Management, Oceanic and Atmospheric Administration, United States Geological Survey, and Consulting Engineers, Inc. These data are current as of 2006.

reflects more detailed and up-to-date stream channel configurations and definitions than those shown on the previous FIRM for this jurisdiction. Claims and floodways that were transferred from the previous FIRM may not adjusted to conform to these new stream channel configurations. As a result, Flood Profiles and Floodway Data tables in the Flood Insurance Study high contains authoritative hydraulic data) may reflect stream channel that differ from what is shown on this map. The profile baselines depicted to represent the hydraulic modeling baselines that match the flood profiles way Data Tables if applicable, in the FIS report. As a result, the profile may deviate significantly from the new base map channel representation appear outside of the floodplain.

limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate officials to verify current corporate limit locations.

to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Communities table containing National Flood Insurance Program dates for community as well as a listing of the panels on which each community is located.

FEMA Map Service Center (MSC) via the FEMA Map Information eXchange (EMAP) 877-336-2627 for information on available products associated with this FIRM. This product may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may be reached by Fax at 1-800-358-9620 and its website at www.msc.fema.gov/.

questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfip/>.

El Paso County Vertical Datum Offset Table

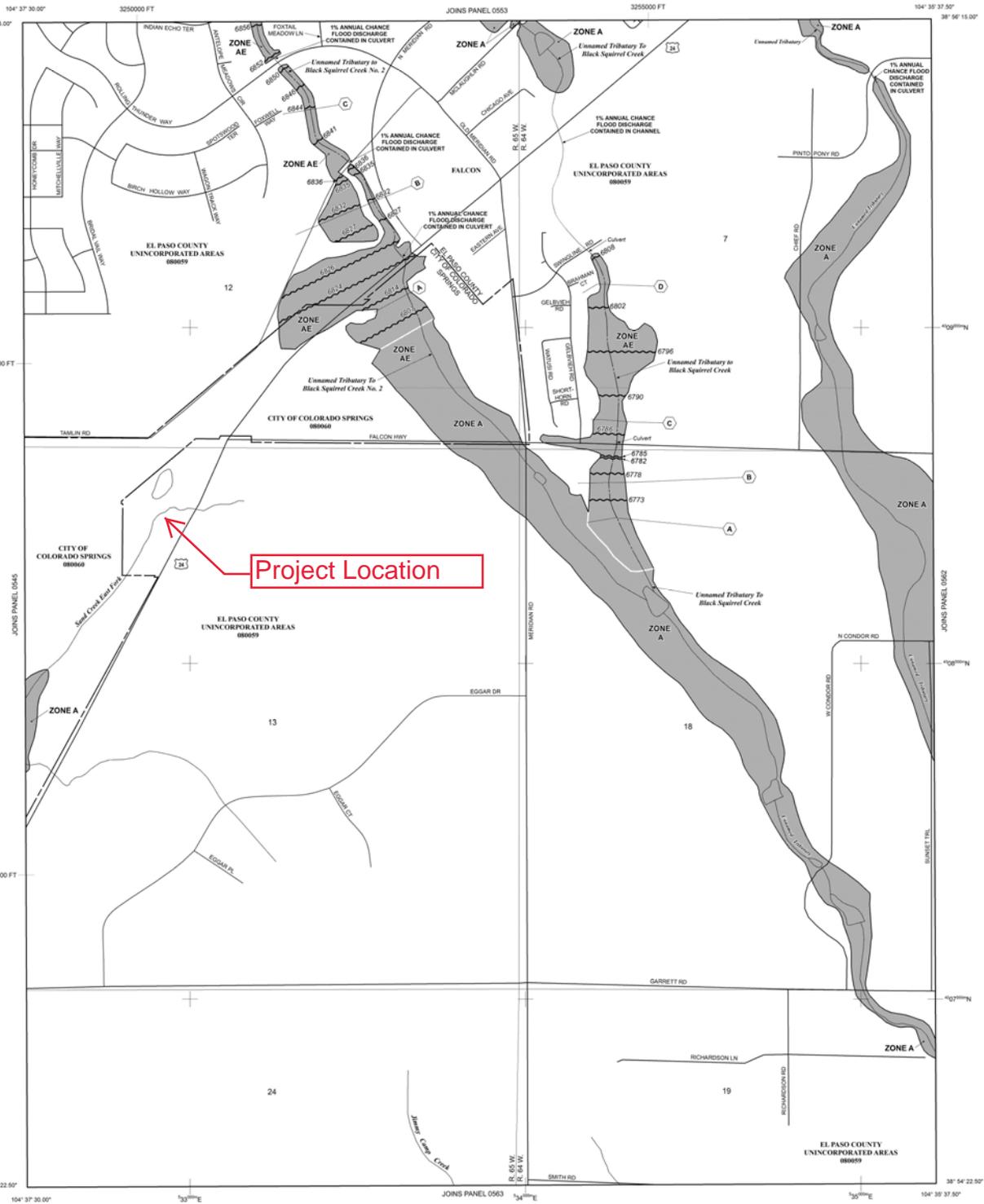
Flooding Source	Vertical Datum Offset (ft)
...	...

REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION



Digital Flood Insurance Rate Map (DFIRM) was produced through a Strategic Technical Partner (CTP) agreement between the State of Colorado Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 SOUTH, RANGE 64 WEST, AND TOWNSHIP 13 SOUTH, RANGE 65 WEST.

LEGEND

- SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone AE, Zone A, Zone X, Zone V, Zone AR, and Zone AR9. The base flood elevation is the water surface elevation of the 1% annual chance flood.
- ZONE AE** No Base Flood Elevations determined.
- ZONE AH** Base Flood Elevations determined. Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AD** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of shallow fan flooding, velocities are determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently deteriorated. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AR9** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- ZONE X** FLOODWAY AREAS IN ZONE AE
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than one square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are understood, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- Floodplain boundary
- Floodway boundary
- Zone D boundary
- Zone A boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet* (EL 567)
- Base Flood Elevation value where uniform within zone; elevation in feet*
- * Referenced to the North American Vertical Datum of 1988 (NAVD 88)
- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPS CODE 5002), Lambert Conformal Conic Projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- DX5510
- M1.5 River Mile
- MAP REPOSITORIES Refer to Map Repositories list on Map Index
- EFFECTIVE DATE OF COUNTRYWIDE FLOOD INSURANCE RATE MAP MARCH 17, 1997
- EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and incorporate previously issued Letters of Map Revision.

NFIP PANEL 0561G

FIRM FLOOD INSURANCE RATE MAP EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 561 OF 1300
(SEE MAP INDEX FOR FIRM PANEL LIST)

CONTAINS:

COMMUNITY	NUMBER	PANEL
COLORADO SPRINGS CITY OF	08600	081
EL PASO COUNTY	08609	081

Notes to User: The Map Number shown below should only be used when placing map orders. The Community Number shown above should be used on insurance applications and other community.

MAP NUMBER 08041C0

MAP REVISION DECEMBER 7, 2018
Federal Emergency Management Agency



December 13, 2018

Wetlands

- | | | | | | |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland |  | Lake |
|  | Estuarine and Marine Wetland |  | Freshwater Forested/Shrub Wetland |  | Other |
| | |  | Freshwater Pond |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

El Paso County, Colorado



Local office

Colorado Ecological Services Field Office

☎ (303) 236-4773

📠 (303) 236-4005

MAILING ADDRESS

Denver Federal Center

P.O. Box 25486

Denver, CO 80225-0486

PHYSICAL ADDRESS

134 Union Boulevard, Suite 670
Lakewood, CO 80228-1807

<http://www.fws.gov/coloradoES>

<http://www.fws.gov/platteriver>

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME

STATUS

North American Wolverine *Gulo gulo luscus*
 No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/5123>

Proposed Threatened

Birds

NAME

STATUS

Least Tern *Sterna antillarum*

Endangered

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/8505>

Mexican Spotted Owl *Strix occidentalis lucida*

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/8196>

Piping Plover *Charadrius melodus*

Threatened

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/6039>

Whooping Crane *Grus americana*

Endangered

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/758>

Fishes

NAME

STATUS

Greenback Cutthroat Trout *Oncorhynchus clarkii stomias*

Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2775>

Pallid Sturgeon *Scaphirhynchus albus***Endangered**

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/7162>

Flowering Plants

NAME

STATUS

Ute Ladies'-tresses *Spiranthes diluvialis***Threatened**

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2159>

Western Prairie Fringed Orchid *Platanthera praeclara***Threatened**

This species only needs to be considered if the following condition applies:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/1669>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Golden Eagle *Aquila chrysaetos*

Breeds Jan 1 to Aug 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
<https://ecos.fws.gov/ecp/species/1680>

Lark Bunting *Calamospiza melanocorys*

Breeds May 10 to Aug 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

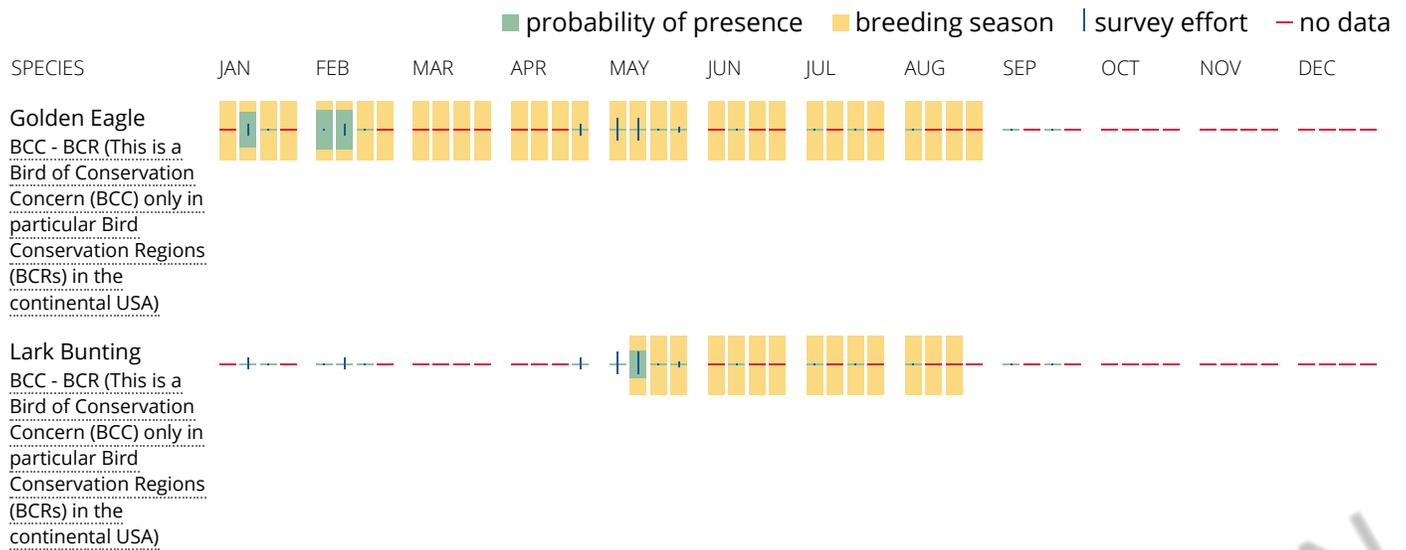
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to

confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1C](#)

RIVERINE

[R4SBC](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.