



August 15, 2023

Town of Castle Rock
100 North Wilcox Street
Castle Rock, CO 80104

RE: Utility Conformance Letter for Plum Creek Subdivision – SDP23-0014

To whom it may concern,

The proposed project is located on Tract B, Block 2, The Estate Above Plum Creek, Subdivision Filing No. 4 of Sections 22 and 23, Township 8 South, Range 67 West of the Sixth Principal Meridian, Town of Castle Rock, County of Douglas, State of Colorado. The existing use of the site is Vacant land and it has recently been rezoned to SF-LD and Private Open Space. Refer to the Appendix for the Vicinity Map.

The proposed improvements associated with this project will include over-lot grading the site and installing an asphalt driveway that will serve three single family lots. In addition to the surface improvements, an 8-inch sanitary sewer main will be extended from an existing 12-inch stub that serves the site. A reducer will be utilized at the point of connection. The sewer main will extend to the end of the shared drive and be terminated with a manhole. A 4-inch sanitary sewer service stub will extend 5 feet past the edge of the proposed drive for each proposed lot. There is an existing water meter on-site that currently serves the golf course bathroom. This meter will remain for that sole purpose. We are proposing an 8-inch PVC water main that will connect to the existing 10-inch DIP main in Mount Royal Drive. The water main the project site is tapping into is located within the Tank 4 Blue pressure zone. This will extend to the end of the drive and be terminated by a fire hydrant. Coordination with the Fire Department has determined that the required fire flow for the hydrant is 1000 GPM for a duration of 1 hour. Refer to Appendix A for the approved Fire Flow Memo. A ¾-inch water service stub will extend 5-feet past the private drive for each lot. A utility easement will be provided for the two proposed mains with the subdivision plat that will be provided with this project. When the lots are eventually purchased, it shall be the responsibility of the Homeowners to extend the water and sanitary services to the buildings. It will also be their responsibility to install and maintain irrigation for their lot. Refer to the Appendix for the Overall Utility Plan.

This project conforms to the original utility design that was outlined in the “Water Transmission and Wastewater Collection System for Plum Creek Development, prepared by Futura Engineering Inc.” dated March 3, 1983. Herein referred to as the Master Report. According to the Master Report, the

site is along Loop 1 for water and is in Basin F for wastewater. Refer to the Appendix for pages from the Master report.

Loop 1 in the report was designed to supply up to 1,493 people. This number was based on 200 gpcd for townhomes/condominium which amounts to 2.5 persons per household, and 450 gpcd for single family homes which amounts to 3.5 persons per household. The built conditions for Loop 1 have a total of 172 townhome units and 237 single family homes, which equals a total of 1259.5 people. With the addition of 3 single-family homes (10.5 persons), the system will be serving 1,270 people, 223 below the maximum demand of the system.

According to the sanitary sewer basin map in the Master Report, Basin F was designed to accommodate 100 Townhome units, or 250 people. The built conditions have resulted in 51 single-family homes, or 178.5 persons. The addition of three single-family homes will bring the total to 189 people, 61 under the maximum demand.

The proposed project complies with the design demand of the original report. As stated above, the addition of the three single-family homes will bring the total water demand to 1,270 persons and total sanitary demand to 189 persons. Both values well under the maximum demand for the systems. Any future development of the existing water and wastewater infrastructure needed to serve this site is the responsibility of the developer.

Sincerely,

Mitchell Shearer, PE
Point Consulting, LLC
PE # 59277

Appendix

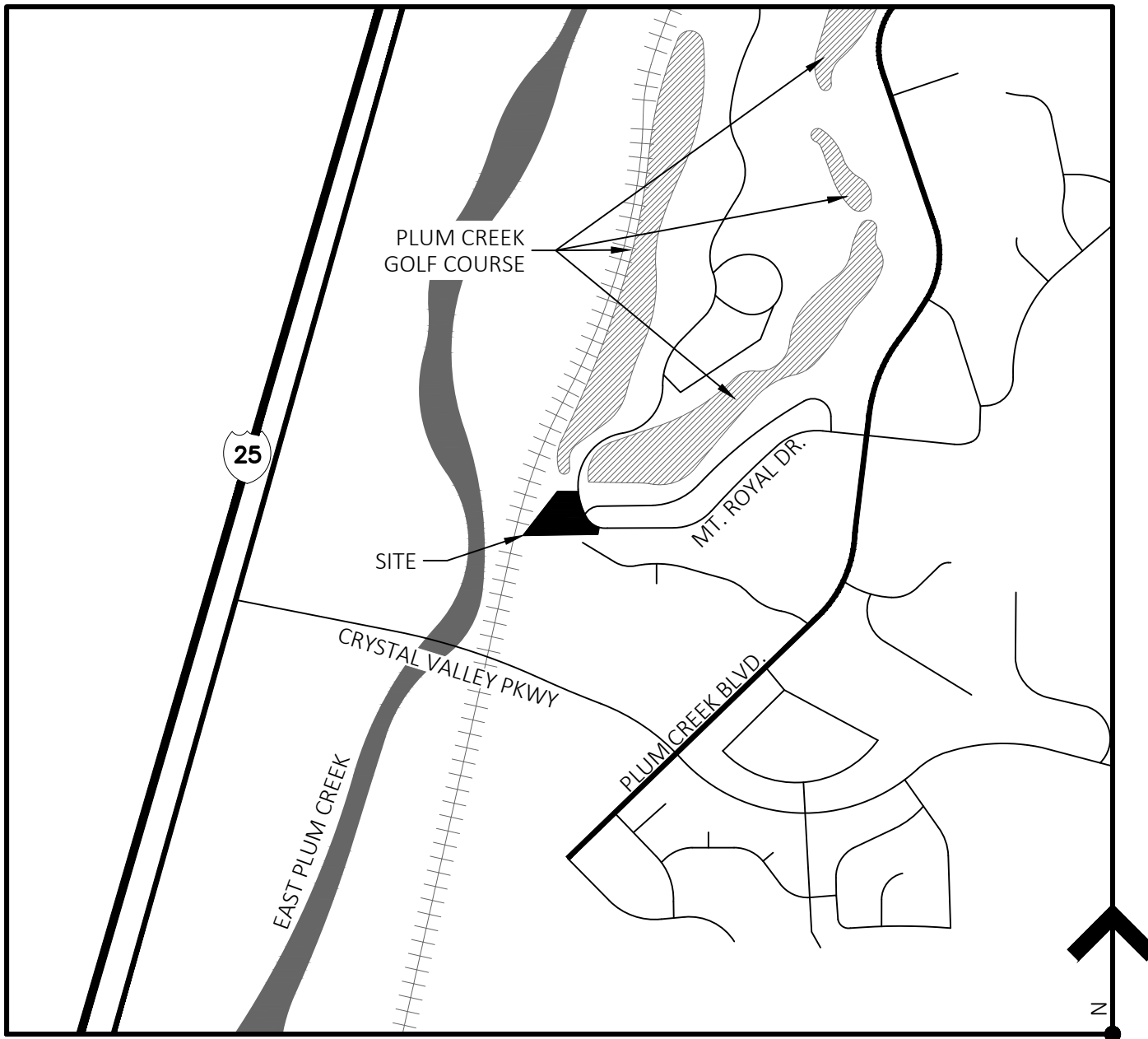
Vicinity Map

Fire Flow Confirmation Form

Water Zone Map

Master Report

Overall Utility Plan



VICINITY MAP

SCALE: 1" = 1000'



August 11, 2023

Castle Rock Fire and Rescue Department
300 Perry Street
Castle Rock, CO 80104



RE: Confirmation Memo for Required Fire Flow – Plum Creek Subdivision

To whom it may concern,

Point Consulting, LLC, on behalf of Douglas Group Inc., is requesting confirmation of the required fire flow for a proposed project referred to as Plum Creek Subdivision. The project site is located on a vacant lot on the southwest corner of the Mount Royal Drive and W Prestwick Way intersection, the lot is known as Tract B, Block 2, The Estate Above Plum Creek, Subdivision Filing No. 4. The project involves subdividing a tract of land into three single family lots. No building construction is related to this project, only the introduction of the core infrastructure will be provided. Elements to be installed include a private asphalt drive, a sanitary sewer main with three service stubs, a water main with three service stubs and a fire hydrant, and over lot grading for the building envelopes. In addition to the proposed hydrant, there is an existing hydrant located North of the site and one located to the South, both of which are within range of the lots.

Three building envelopes will be platted with an area of 3,600 square feet for each envelope. With the size of the future homes unknown at this time, it is assumed that the largest size allowed will be 3,600 square feet. All homes are anticipated to be Type V construction. The buildings will not be sprinkled. Please advise on the required fire flow and fire flow duration.

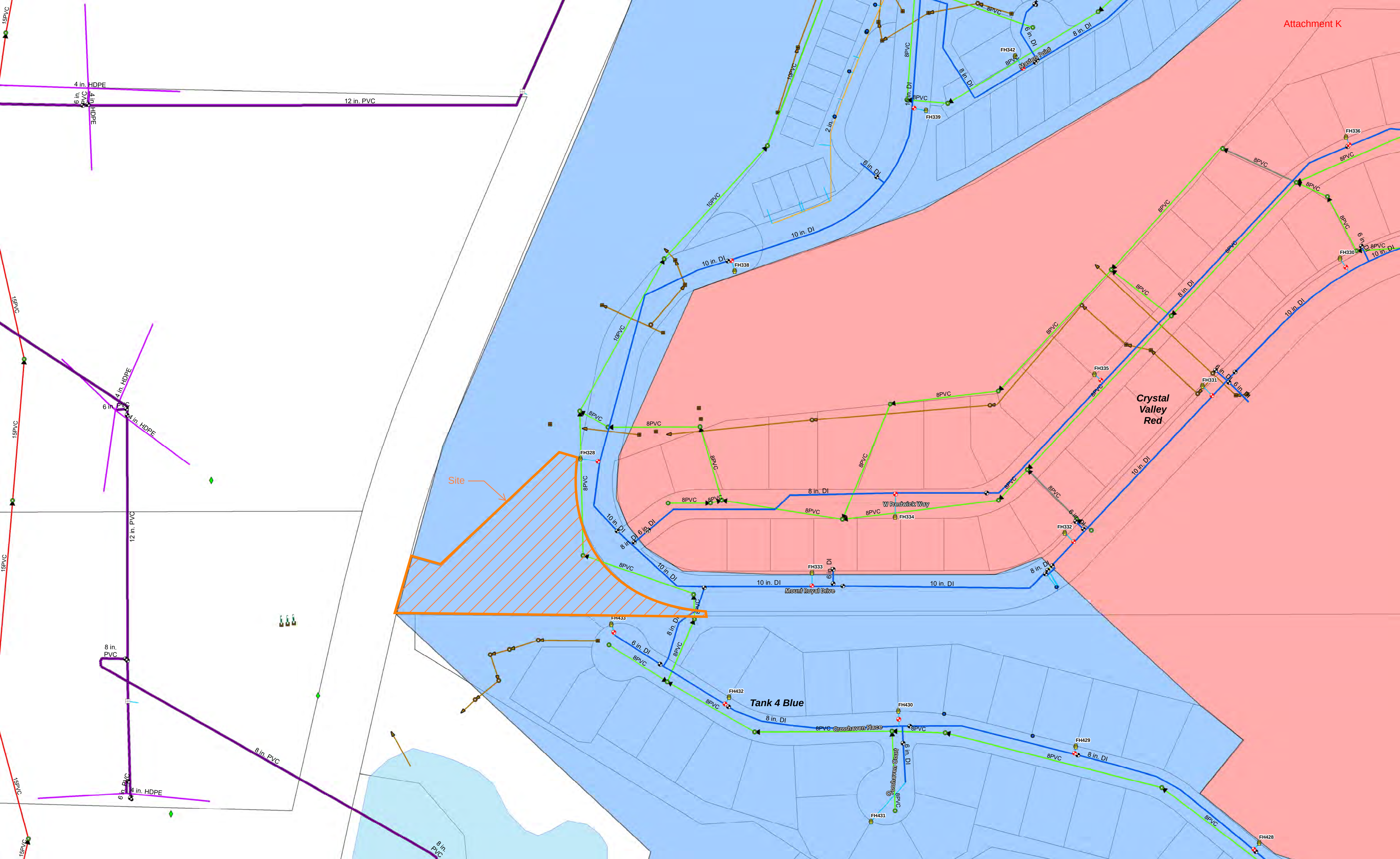
Thank you,

Michael Tollefson, PLA
Point Consulting, LLC

Required Fire Flow: **1000 GPM**

Required Duration: **1 hour**

Castle Rock Fire and Rescue Department



ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF CASTLE ROCK STANDARD SPECIFICATIONS

APPROVED FOR ONE YEAR FROM THIS DATE

Town Engineer

Date

Director of Public Works

Date

Fire Department

Date

WATER TRANSMISSION AND WASTEWATER
COLLECTION SYSTEM

FOR

PLUM CREEK DEVELOPMENT
COUNTY: DOUGLAS COUNTY
STATE: COLORADO

November 16, 1982
Revised March 3, 1983

Prepared for:

Yale Properties
2675 S. Abilene
Aurora, Colorado 80014
303-755-3377

Prepared by:

Futura Engineering Inc.
10691 E. Bethany Dr., Suite 400
Aurora, Colorado 80014
303-751-4040

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WATER TRANSMISSION SYSTEM

I. PURPOSE OF REPORT

The purpose of this report is only to determine the water transmission line sizes and coordinate the water transmission system with the available and future wells located within Plum Creek Development.

The transmission system shown on the master water plan, enclosed, is designed to accomodate both fire flows and domestic flows. The existing eight inch water mains presently located in East Lake Gulch Road and Wilcox Street are not intended to supply domestic and fire flows to the Plum Creek Development. This development is to be totally self supporting in regard to irrigation for the golf course and supply of fire and domestic flows.

II. PROPERTY DESCRIPTION

This development is located south of Castle Rock between East Lake Gulch Road and Wilcox Street. More particularly, it is located in Section 14 and 23, Township 8 South, Range 67 West, 6th Principal Meridian. The difference in elevation from the North end of the property to the South end varies from 6235 at the intersection of Miller Boulevard and Denver and Rio Grande Railroad to elevation 6490 at the most Southeastern corner of the development.

III. DESIGN CRITERIA

The following criteria was utilized in the design of the transmission system shown on the enclosed map.

- A) C = 130 Roughness Factor
- B) 10 PSI Minimum Residual Pressure

- C) Establishment of an upper and lower zone within the development; upper zone being controlled by the booster pump whose total dynamic head equals 100 feet.
- D) The lower zone being controlled by gravity from the establishment of a 1.5 million gallon reservoir at elevation 6485.

The fire flows used for design are as follows:

- A) 1500 GPM-single family residence
- B) 2000 GPM-townhome
- C) 3000 GPM medium density and commercial areas.

The fire flows were reviewed with Randy Stagner, Castle Rock Fire Chief, and were also taken from the report completed by Parker and Associates in 1980 for the Town of Castle Rock which established the fire flows as follows:

- A) 1250 for residential, single family
- B) 2000 gallons/minute for townhomes
- C) 3000 gallons/minute for residential condominiums

IV. POTABLE WATER AND FIRE FLOW STORAGE

The peak hour demand storage was developed utilizing 3000 gallons per minute for two hours which is equal to 360,000 gallons plus a peak hour to average day ratio for single family of 5.8 which will account for intensive evening lawn irrigation demands and domestic demand. The peak hour to average day ratio for townhomes and condominiums is 4.0. The peak hour demand storage is equal to 541,000 gallons which is added to the 360,000 gallons for a total of 901,000 gallons and rounded off to one million gallons for total volume of treated water storage to serve the proposed Plum Creek Development. However, since the original submittal of this report in November 1982 the Town has increased the domestic reservoir capacity to 1.5 million gallons.

V. OPERATIONAL CHARACTERISTICS

The well head located near the upper Lake is to supply 400 to 500 gallons per minute to a clear well or treated water facility from which water is to be pumped to the potable water reservoir and then back fed through the system in the lower zone. The upper zone is controlled by the elevation of the potable water reservoir and the operation of the booster pump which is to maintain a pressure of 40 psi for domestic use in the upper zone. The well head located in the south portion of the development will pump its water at approximately 200 GPM to the treated water and clear well facility near the 4 well head system in Loop II.

In Loop I, approximately 1493 people will inhabit this area and an average factor of 108* gallons per capita per day was used to establish the domestic demand which is equal to 112 gallons per minute.

Loop II shall include 5242 population, a country club, maintenance facility, and commercial development for a domestic demand flow of 461 gallons per minute. Commercial, Country Club, and maintenance facilities flow rate was based upon 3800 gpd-Ac.

Loop III includes 1006 people for a demand flow of 75 gallons per minute.

VI. HARDY CROSS ANALYSIS

Following this narrative, Hardy Cross analyses have been completed for each Loop I, II, and III. Fire flows in Loop I varies from 1500 gpm to 2000 gpm.

Loop II includes fire flows varying from 1500 gpm to 3000 gpm.

Loop III includes fire flows varying from 1500 gpm to 2000 gpm.

* NOTE: Average flow was based upon 200 gpdc for condominiums (2.5 persons) and 450 gpdc for single family residence (3.5 persons).

Also, please note that domestic flows in excess to those actually required are deducted during a fire occurrence. The range in residual pressures vary from 24 psi at the intersection of Burbank Drive and Sugar Plum Drive to 58 psi at the intersection of Cherry Plum Drive and Mt. Royal Drive.

VII. CONCLUSION

The water transmission system as designed is to provide a minimum residual pressure of 10 psi and in all cases will provide a minimum residual pressure above 20 psi. The fire flows shall be maintained at 1500 gallons per minute for single family residential, 2000 gallons per minute for townhomes, and 3000 gallons per minute for multiple story or medium density condominiums and commercial development.

Due to the developer's ongoing search for additional water supply, it is anticipated the development of the irrigation system will also serve as a supply of water for fire flows on an as needed basis, particularly around the country club and around any townhomes located near the upper and lower lakes.

WASTEWATER COLLECTION SYSTEM

I. PURPOSE OF THE REPORT

The design for the waste water collection system is for the collection line only and is not to be interpreted to relate to the waste water reuse plan or treatment plan which is presently being completed by Wright-McLaughlin Engineers.

The Plum Creek Development is divided into subbasins labeled A-JJ. Each basin is described on the enclosed sanitary sewer basin map.

II. DESIGN CRITERIA

The design criteria utilized for development of the sewer line collection system is as follows:

- 1) Maintain a minimum of two feet per second velocity for minimum flows.
- 2) Pipe slope greater than 15% cannot be exceeded.
- 3) $n = .013$ roughness factor.
- 4) $n = 0.010$ roughness factor for Plastic Pipe

The total number of units for this development is 3025. $3\frac{1}{2}$ persons per unit for single family residential development and $2\frac{1}{2}$ persons per unit for townhome and medium density development were used. In addition, 250 gallons per day per person is utilized for the determination of the sewer line size during peak flows.

III. OFF SITE FACILITIES

Presently, there is an eight inch line in Wilcox Street and an eight inch line in East Lake Gulch Road. As can be seen

on the sewer system map, the 12" line to be installed to Wilcox Street will have to be extended and parallel the 8" line in Wilcox Street and run across Sellers Gulch to the recently completed 12" outfall line installed in 7th Avenue.

This particular line is capable of handling 17,000 population equivalent. The amount of population equivalent (PE) contributing to this line is 6614 plus 37.8 acres of commercial property. This equates to the following total:

$$\begin{array}{rcl} 6614 \times 250 \text{ gallons per capita per day} & = & 1.653 \text{ MGD} \\ \text{Commercial area: } 37.8 \text{ acres} \times 2800 & & \\ \text{gallons per day per acre} & = & .1058 \text{ MGD} \\ \hline \text{Total} & = & 1.759 \text{ MGD} \end{array}$$

The above effluent is capable of being handled with the 12" outfall line at 1.2% and its total capacity is 2.5 MGD. In addition, there is approximately .67 MGD contributing to the 12" outfall line from property located off site.

The basins labeled Q, R, S, T, U, V, and JJ flow by gravity to Sellers Gulch. At the intersection of the sewer line with Sellers Gulch, a future lift station may be required to lift the effluent beyond Sellers Gulch into East Lake Gulch Road. The total amount of effluent at this location is 0.56 MGD which also accounts for .3 MGD off site effluent.

IV. CONCLUSION

The minimum slope anticipated for installation of sewer lines is 0.4%. The maximum slope is anticipated to be 15%.

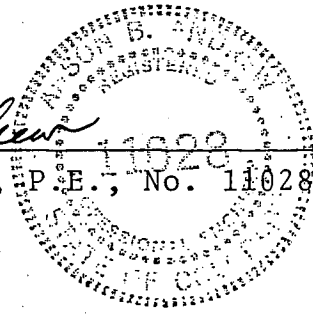
An area which can not be sewered at this time is the public dedicated property at the extreme north end of the development which is set aside for water reuse storage or treatment facility.

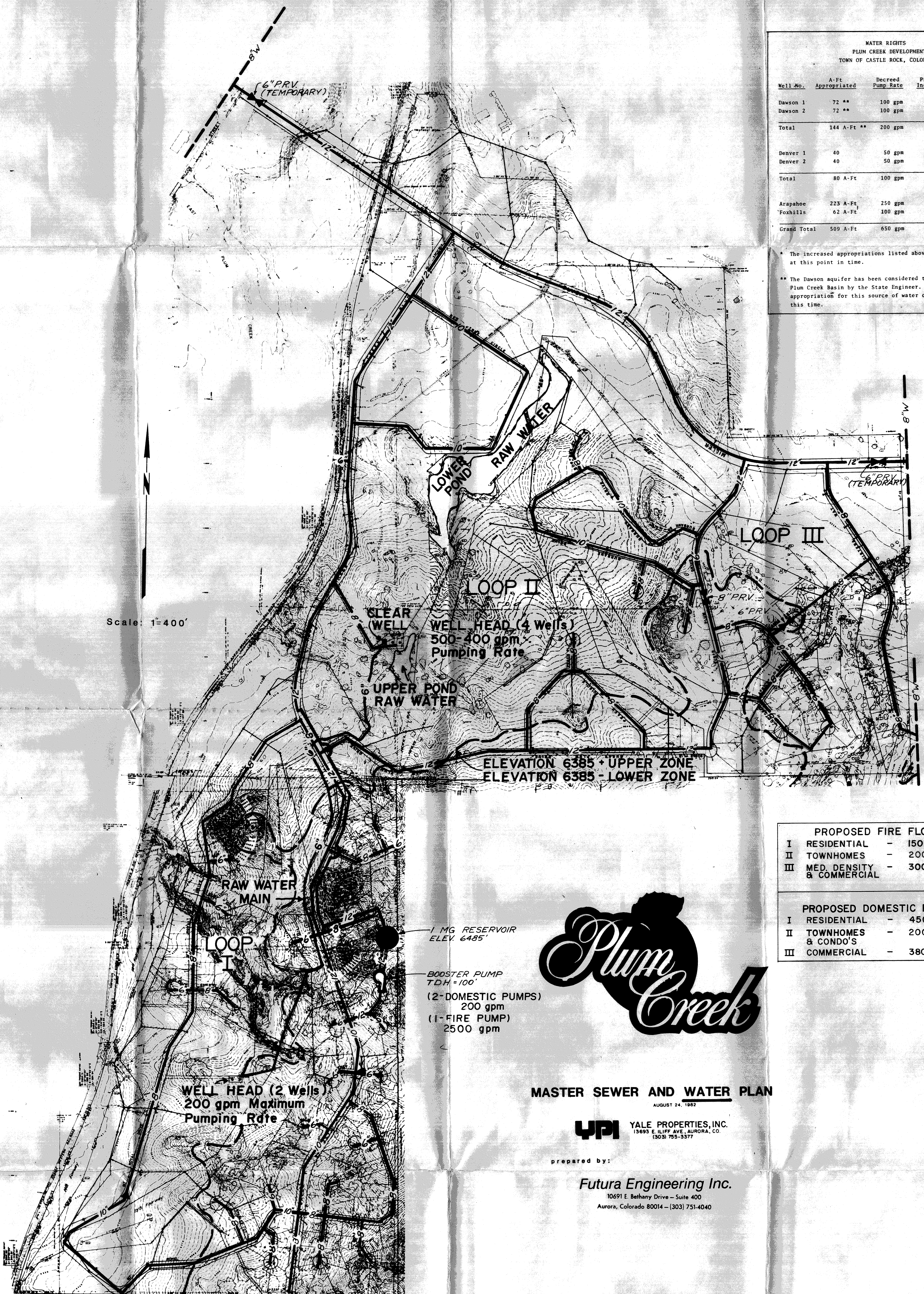
The sewage collection system depicted on the overall basin map is in compliance with the criteria established by the Town of Castle Rock and also takes into account the potential off site property which can be developed into single family units or multi-family units.

The total amount of effluent this developemnt will contribute to the Town's sewage treatment facility is approximately 3.017 million gallons per day.

Prepared and Reviewed by

Anson B. Andrew
Anson B. Andrew, P.E., No. 11028





WATER RIGHTS PLUM CREEK DEVELOPMENT TOWN OF CASTLE ROCK, COLORADO				
Well No.	A-Ft Appropriated	Decreed Pump Rate	Proposed Increase A-Ft	Proposed Pump Rate
Dawson 1	72 **	100 gpm	91	100 gpm
Dawson 2	72 **	100 gpm	91	100 gpm
Total	144 A-Ft **	200 gpm	182 A-Ft	200 gpm
Denver 1	40	50 gpm	89	200 gpm
Denver 2	40	50 gpm	89	200 gpm
Total	80 A-Ft	100 gpm	178 A-Ft	400 gpm
Arapahoe	223 A-Ft	250 gpm	287 A-Ft	350 gpm
Foxhills	62 A-Ft	100 gpm	(32 A-Ft)	20 gpm
Grand Total	509 A-Ft	650 gpm	614 A-Ft	970 gpm

* The increased appropriations listed above are purely speculative at this point in time.

** The Dawson aquifer has been considered to be tributary to the Plum Creek Basin by the State Engineer. Consequently, the appropriation for this source of water cannot be resolved at this time.

PROPOSED FIRE FLOWS		
I RESIDENTIAL	-	1500 GPM
II TOWNHOMES	-	2000 GPM
III MED. DENSITY & COMMERCIAL	-	3000 GPM

PROPOSED DOMESTIC FLOWS		
I RESIDENTIAL	-	450 GPD/D.U.
II TOWNHOMES & CONDO'S	-	200 GPD/D.U.
III COMMERCIAL	-	3800 GPD/AC.



MASTER SEWER AND WATER PLAN

AUGUST 24, 1982



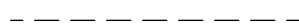
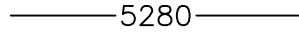
YALE PROPERTIES, INC.
15695 E. ILIFF AVE., AURORA, CO.
80014 (303) 751-3377

prepared by:

Futura Engineering Inc.
10691 E. Bethany Drive - Suite 400
Aurora, Colorado 80014 - (303) 751-4040

TRACT B, BLOCK 2, THE ESTATE ABOVE PLUM CREEK, FILING NO. 4 OF SECTION 23,
TOWNSHIP 8 SOUTH, RANGE 67 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO



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