



September 11, 2020

Mr. Ed Houle
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**RE: Preliminary Utility Report Corvallis
Fountain, Colorado**

The purpose of this Preliminary Utility Report is to provide a summary of utility and water resources planning issues impacting the proposed Corvallis Development. This report identifies water and wastewater demands, service plans, fire flow issues, and infrastructure requirements for the proposed development. The report is intended to fulfill the "Preliminary Utility Plan" requirements for an Overall Development Plan (ODP) submittal to the City of Fountain.

Water System

Corvallis development is part of the City of Fountain, but lies within the Widefield Water and Sanitation District (WWSD), specifically in Pressure Zone 5. This plot of land was previously studied in the Draft Technical Memorandum "Pressure Zone 5 Future Demands – Singer Development, City of Fountain," by JDS-Hydro, dated February 18, 2020, which modeled the Singer/Lacy concept development along with the surrounding area's buildout demands to identify impacts on existing WWSD Pressure Zone 5. For the purpose of that study, 1150 single family equivalents were assumed for the Singer/Lacy Development. In addition to supporting this demand and surrounding area buildout demands, the City of Fountain requested a maximum demand of 1800 gpm to be supplied by WWSD system at their connection near the Mesa Ridge Parkway and South Marksheffel Road intersection.

The Corvallis PUD Rezoning and Overall Development Plan Amendment prepared by Matrix Design Group, dated September 2020, identifies a total of 27-acres of regional commercial; 9-acres of village commercial; 9-acre school site; 162-acres of mixed-density residential; and 48-acres of open space. The attached Master Utility Exhibit A contains a breakout of each of these residential and commercial areas with its associated single-family equivalent (SFE) units, for the minimum, average, and maximum range of density per acre. The commercial development and school site are assumed as 4 DU/acre. For this development scenario, the SFE units for the average density per acre is estimated at 1378 SFE, which is slightly above the 1150 SFE units modeled in the study described above. Therefore the model was rerun with the estimated 1378 SFE units.

Preliminary water demand projections have been developed for the Corvallis development based on the flow factor data used in the Singer Development memorandum: Annual Water: 0.35 AF/SFE; Average Daily Flow: 0.22 GPM/SFE; Maximum Daily Flow: 0.47 GPM/SFE; Peak Hour Flow: 0.70 GPM/SFE.

Corvallis Water Demand Summary

Single Family Equivalents: 1378
Annual Water: 482.30 AF
Average Daily Flow: 436,550 GPD
Max Daily Flow: 932,630 GPD
Peak Hour Flow: 965 GPM

The water system plan for the Corvallis development consists of proposed 12" watermains traversing through the site in both the east-west and north-south directions and a proposed 8-inch watermain in Fontaine Boulevard. Connections of these mains will be made to the existing WWSD system at the 16" water distribution main at Marksheffel Road, the 24" water main in Spring Glen Drive, the 12" water stub at Dutch Loop, and the 8" water main at Fontaine Boulevard near Cottonwood Grove. A network of new 8" water distribution mains will loop internally throughout the development providing service taps to each lot. Owners/Builders will purchase water taps from the WWSD at time of building permit.

This entire system will be within Pressure Zone 5. Based on the revised water system model using the 1378 SFE units, with the system internal looping improvements described above, the system pressures are adequate to support the proposed Corvallis Development. In addition, the primary 24-inch Transmission line (with the looped tie-ins described previously) was planned for this load and is capable of handling the Corvallis Development without any upgrades.

Additionally, there is an existing 8" watermain on the northwest side of the site in Fontaine Boulevard which may be available for connection of the commercial lot if higher pressures are required (Pressure Zone 4).

Fire Flow Requirement

Based on the water model with 1378 SFE units, internal loops will be required throughout the site in order to provide the required 3500 GPM fire flow demand throughout the pressure zone. The water system plan includes proposed 12" watermains traversing through the site in both the east-west and north-south directions and a proposed 8-inch watermain in Fontaine Boulevard, with connections to the WWSD existing mains around the site. With these improvements, compliance with fire demands throughout the pressure zone can be achieved. Fire hydrants will be installed to a maximum 500 feet spacing separation with a maximum distance from any point on street or road frontage to a hydrant of 250 feet.

Wastewater System

The Corvallis development is also within the WWSD boundary for wastewater. The wastewater system plan for the Corvallis development will direct flows west of the internal ridge in the site to an existing WWSD 12" sanitary main that will connect to the sanitary system at the Glen at

Widfield residential development to the south. A portion of this existing WWSD 12" sewer main will be rerouted around a proposed detention pond to its future connection at the Glen at Widfield. Flows to the east of the ridge will be directed to an existing 24" sanitary sewer main at the Marksheffel Road/Lorson Boulevard intersection near the southeast corner of the site. Throughout the development, new 8" collection mains will be installed generally down the centerline of local streets, providing service taps to each lot. Owners/Builders will purchase taps from WWSD at time of application for sanitary sewer service permit issuance.

Preliminary wastewater flow projections have been developed based on a unit flow factor of 250 gallons per day (gpd) per single-family equivalent (SFE) units and a peaking factor of 2.5 for peak hour flows.

The Corvallis PUD Rezoning and Overall Development Plan Amendment prepared by Matrix Design Group, dated September 2020, identifies a total of 1378 single-family unit equivalents. The projected wastewater flows are summarized as follows:

Corvallis Wastewater Flow Summary

Single Family Equivalents: 1378
Average Daily Flow: 344,500 GPD
Peak Hour Flow: 598 GPM

The attached Master Utility Exhibit A contains a breakout of each of these residential and commercial areas with its associated wastewater demands and proposed pipe capacities. In all locations, the pipe capacity exceeded the demands associated with the 1378 SFE units utilizing 8" or 12" diameter pipes at 1.04% minimum slope. Therefore, the Corvallis projected flow rates are within the pipe capacities and it is anticipated 8" or 12" sewer pipe will be utilized within the neighborhood development.

Electric, Gas and Communications

The Corvallis project is part of the City of Fountain, but lies within Mountain View Electric service area. Some coordination between Mountain View Electric and Fountain Electric may be necessary if Fountain Electric requires services to be brought up to the project area. There are overhead lines in Fontaine Boulevard to the north and also along the west property line. Underground electric service is provided to the adjacent residential neighborhoods to the south and east of the property. Electric service will be provided by extending underground electric throughout the Corvallis development for residential and commercial services.

Gas service to the proposed development will be provided by Black Hills Energy through the extension of existing gas main infrastructure. An existing gas easement with 2 gas mains runs north-south through the property which will remain.

Multiple service providers are available in the area to provide telephone service to the Corvallis development. Service will be provided underground from the nearby area.

Summary

The proposed Corvallis development will connect to the Widefield Water and Sanitation District (WWSD) for water and sanitary service. WWSD has adequate water supply and treatment capacity to serve the development.

Conceptual utility improvements for the Corvallis project are depicted in the attached Master Utility Exhibit A. Water and wastewater improvements will be designed and constructed in accordance with the Standards and Specifications of the Widefield Water Service District (WWSD) and will be dedicated to WWSD upon satisfactory completion and acceptance.

Electric service will be provided by Mountain View Electric or Fountain Electric, gas by Black Hills Energy, and telephone by multiple providers.

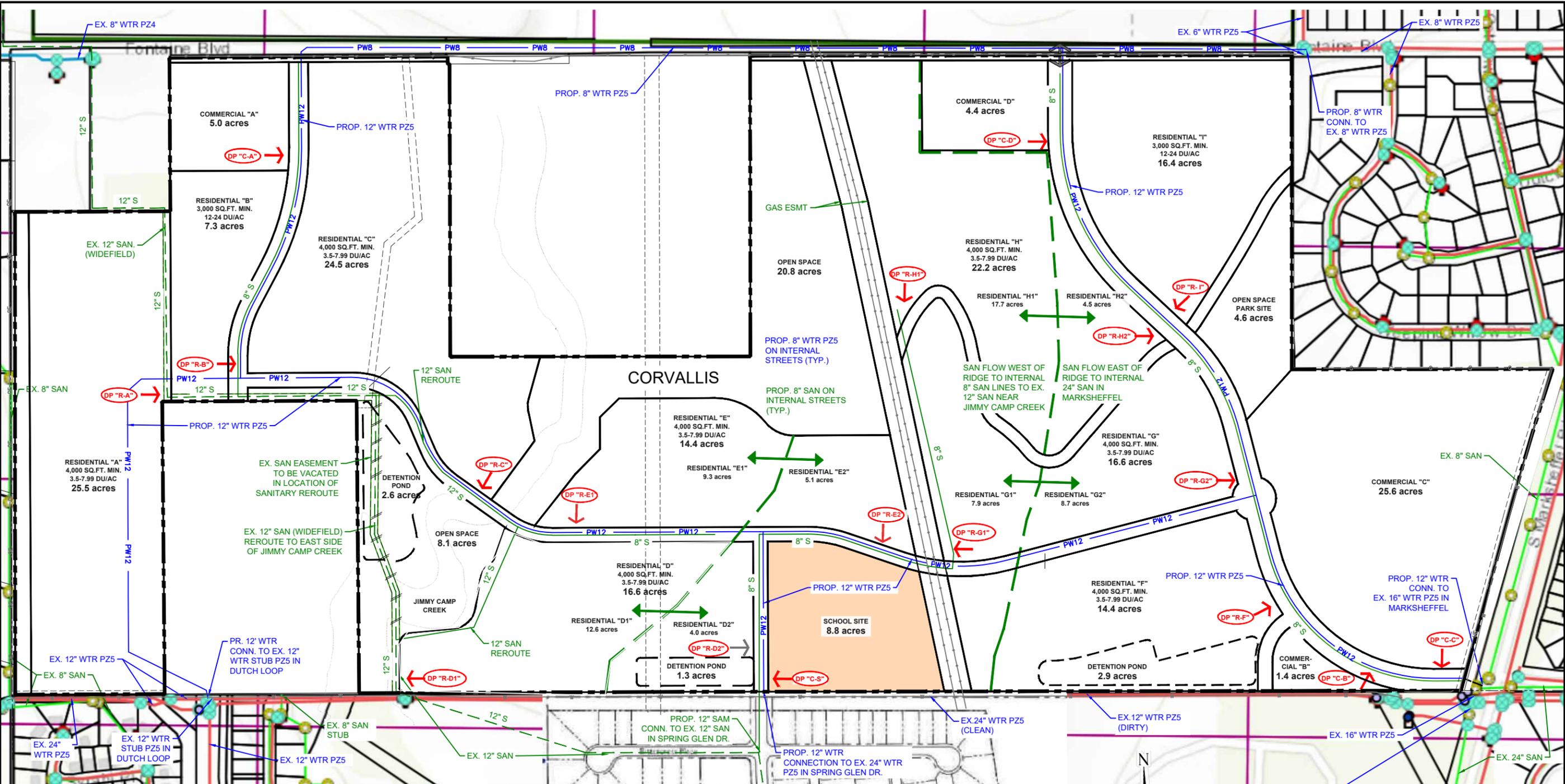
Please feel free to contact me directly if you have any questions regarding this preliminary utility report or its findings.

Matrix Design Group



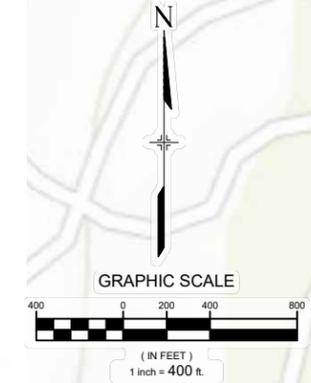
Colleen Monahan, PE
Associate of Development Services

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BASIN ID	AREA (ACRES)	WATER DEMAND										WASTEWATER DEMAND									
		DWELLING UNIT PER ACRE RANGE PER ZONING		SINGLE FAMILY EQUIVALENT (DU/ACRE * AREA)		MAX DAILY FLOW (GPD) (0.47 GPM/SFE)			PEAK HOUR FLOW (GPM) (0.7 GPM/SFE)			AVE. DAILY DEMAND (GPD) (250 GPD/SFE)			PEAK HOUR FLOW (GPM) (2.5 PEAK FACTOR)			SANITARY PIPE PIPE DIA. (INCH)	PIPE SLOPE (%)	ACCUM. AVE FLOW (GPM)	PIPE 70% CAPACITY (GPM)
		MIN	AVE	MAX	MIN	AVE	MAX	MIN	AVE	MAX	MIN	AVE	MAX	MIN	AVE	MAX					
RESIDENTIAL	DP "R-A"	25.50	3.50	5.75	7.99	89	146	204	60,404	99,150	137,895	62	103	143	22,313	36,624	50,936	8	1.04	64	547
	DP "R-B"	7.30	12.00	18.00	24.00	88	131	175	59,268	88,932	118,575	61	92	123	21,900	32,850	43,800	37	61	85	124
	DP "R-C"	24.50	3.50	5.75	7.99	86	141	196	58,036	95,261	132,487	60	99	137	21,438	35,188	48,939	37	61	85	124
	DP "R-D1"	12.60	3.50	5.75	7.99	44	72	101	29,847	48,992	68,136	31	51	70	11,025	18,097	25,169	19	31	44	124
	DP "R-D2"	4.00	3.50	5.75	7.99	14	23	32	9,475	15,553	21,631	10	16	22	3,500	5,745	7,990	6	10	14	87
	DP "R-E1"	9.30	3.50	5.75	7.99	33	53	74	22,030	36,160	50,291	23	37	52	8,138	13,357	18,577	14	23	32	87
	DP "R-E2"	5.10	3.50	5.75	7.99	18	29	41	12,081	19,830	27,579	12	21	29	4,463	7,325	10,187	8	13	18	87
	DP "R-G1"	7.90	3.50	5.75	7.99	28	45	63	18,714	30,717	42,720	19	32	44	6,913	11,346	15,780	12	20	27	87
	DP "R-H1"	17.70	3.50	5.75	7.99	62	102	141	41,928	68,821	95,715	43	71	99	15,488	25,422	35,356	27	44	61	87
COMMERCIAL	DP "C-A"	5.00	-	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DP "C-S"	8.80	-	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL TO GLEN AT WIDEFIELD	127.70					461	799	1,027	311,802	540,775	695,029	322	559	719	115,175	199,754	256,734	200	347	446	12
RESIDENTIAL	DP "R-F"	14.40	3.50	5.75	7.99	50	83	115	34,111	55,990	77,870	35	58	81	12,600	20,682	28,764	22	36	50	87
	DP "R-G2"	8.70	3.50	5.75	7.99	30	50	70	20,609	33,827	47,046	21	35	49	7,613	12,495	17,378	13	22	30	87
	DP "R-H2"	4.50	3.50	5.75	7.99	16	26	36	10,660	17,497	24,334	11	18	25	3,938	6,463	8,989	7	11	16	87
	DP "R-I"	16.40	12.00	18.00	24.00	197	295	394	133,194	199,791	266,388	138	207	276	40,200	73,800	98,400	85	128	171	124
COMMERCIAL	DP "C-B"	1.40	-	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DP "C-C"	25.60	-	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DP "C-D"	4.40	-	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL TO MARKSHEFFEL	75.40					293	579	614	198,573	302,112	415,639	205	406	430	73,350	144,841	153,531	127	251	267	8
TOTAL	203.10					754	1,378	1,641	510,375	932,887	1,110,668	528	965	1,149	188,525	344,595	410,265	327	598	712	

GLEN AT WIDEFIELD FILING NO. 9



CORVALLIS

Matrix
Excellence by Design

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MASTER UTILITY EXHIBIT A