

# Water and Sanitation Report

for

## Aspire Subdivision

Located at  
885 Speedway Ave. and 110 Sommers St., Missoula, MT  
Section 19, T13N, R18W, PMM  
Missoula County, Montana

May, 3 2023

**Prepared For:**  
DeNova Homes  
1500 Willow Pass Court  
Concord, CA 94520

**Prepared By:**  
406 Engineering, Inc.  
1201 South 6<sup>th</sup> Street West, Suite 102  
Missoula, MT 59801

### GENERAL

The Aspire Subdivision is a proposed multi-phased, 182-lot major subdivision in the City of Missoula. The subdivision will consist of 172 single-family lots and 10 multi-family lots. The Project is located between existing residential neighborhoods and the Clark Fork River in East Missoula. The new development will be served by a City of Missoula sewer main extension, as well as a new Missoula Water main that will extend into the site. Each Phase of the subdivision will require its own main extensions for both sewer and water. The project will be completed in 6 phases with most phases starting about 2 years after the other. Currently, the site is vacant with the exception of 2 homes. There is an existing sewer main that runs along the west property line.

### WATER

The site does not currently have any water main or water supply from the City of Missoula Public Water System. Aspire Subdivision is proposing two connection points to the Missoula Water infrastructure. The first water tie-in will be at the 8" D.I.P. stub located at the end of Stoneybrook Way on the north end of the proposed subdivision. The second connection point will be at the existing 8" PVC stub located at the end of Sommer Street near the intersection with Angels Court.

The new water mains will be extended from the existing stubs discussed above. The proposed water mains will run through all streets in the Aspire Subdivision fronting the proposed homes. All water mains in Aspire Subdivision will be constructed with 8" ductile iron pipe. Construction of the proposed water mains will be constructed in 6 phases providing efficient distribution for domestic and fire supply to the new buildings and fire hydrants. A total of 13 fire hydrants are proposed for fire protection in the subdivision. See the Utility Plan in Section A for exact main locations and tie in points.

The projected average daily domestic demand for the fully developed site is estimated to be 65,500 gpd. Maximum daily demand is projected to be 2 times the average daily domestic. See calculations attached with this report for projected water demands.

## SEWER

The subdivision will use the existing 8" sewer main along the western property line to serve 42 of the proposed lots. This sewer main will flow from south to north and turn east on Aspire Loop where it is proposed to connect to a new 8" sewer main near the intersection of Aspire Loop and Heartwood Place. This new sewer main will replace existing sewer main along proposed lots 39, 10, and 1-4. The new sewer main then continues east on Aspire Loop, and then turns north on Waterside Drive and continues to the existing lift station. This design avoids a second connection to the lift station vault from the same sewer service area.

The remaining 130 single family lots and multifamily areas are proposed to be served by new 8" sewer mains installed on Heartwood Place, Waterside Drive, Bent Brand Road, Aspire Loop, Junction Way, and Crosscut Way. An 8" sewer main is also proposed in the alley between multifamily buildings. Construction of the proposed sewer mains will be constructed in 6 phases providing services for new residence. See the utility plan in Section A for exact main locations and tie in point.

Using the Missoula County census estimate that the average population per household is 2.5 persons, a total of 655 people are assumed to be living in the proposed subdivision after all phases are complete. In accordance with DEQ Circular 2, 11.243, assuming 100 gpcd for an average daily flow, a total of 65,500 gallons per day will be contributed to the City sewer system. Taking 2 times the average daily flow, a projected maximum daily rate of 131,000 gallons will be contributed to the system. See calculations attached with this report for projected sewer demands. There are also approximately 192 existing connections to the 8" sewer that is proposed to be rerouted. The projected average daily flow and maximum daily demand are 113,500 gallons per day and 227,000 gallons per day respectively. The proposed 8" sewer mains have capacity for the proposed sewer demand.

PROJECTED SEWER DEMAND						
<p align="center"><b>PROJECT: DeNova Homes - Aspire Subdivision</b>  <b>PREPARED BY: 406 Engineering, Inc</b>  April 17, 2023</p>						
USE TYPE	Value	Existing Neighborhood	Aspire	Totals	Units	Equations and Notes
<b>DOMESTIC FLOWS:</b>						
Ave. Annual Daily Demand per Capita, Qr:	100	100	100	100.0	gpcd	Per Montana DEQ Standard
No. of Persons per Home (2000 census/residential):	2.5	2.5	2.5		persons	
Additional Wastewater Flow (Commercial or other), Qc:	0	0	0	0.0	gpd	
Number of Connections, Nc:		192	262	454	connec.	172 homes, up to 90 multifamily units
Calculated Population:		480	655.00	1,135	people	Calculated
Assume a Population, P, of:		480	655	1135	people	Manual Input
<b>Design: Total Ave. Annual Daily Demand, Q:</b>		<b>48,000</b>	<b>65,500</b>	113,500.0	gpd	= P X Qr or = Nc X Qc
<b>WasteWater Flows:</b>						
Average Annual Daily Domestic Demand, Qave:		<b>48,000</b>	<b>65,500</b>	<b>113,500</b>	gpd	
Total Ave. Annual Daily Demand, Qadd:		<b>33.3</b>	<b>45.5</b>	<b>79</b>	gpm	= Qave/1440 minutes
Maximum Day Demand, Qmax-day:		<b>96,000</b>	<b>131,000</b>	<b>227,000</b>	gpd	= 200% Qave DEQ Cir 2
Maximum Day Demand, Qmax:		<b>66.7</b>	<b>91.0</b>	<b>158</b>	gpm	= Qmax-day/1440 minutes
Peaking Factor (PF):		3.98	3.91	3.76		= $(18 + (P/1000)^{0.5}) / (4 + (P/1000)^{0.5})$ DEQ Cir 2
Peak Instantaneous Demand, Qp:		<b>132.78</b>	<b>177.90</b>	<b>296.67</b>	gpm	= Qave/(1440 min/day) X PF