



# CONCEPTUAL WATER & WASTEWATER IMPACT DEMAND ANALYSIS

## FARRO FIRST ADDITION LOVELAND, COLORADO

January 20, 2025

AVANT CIVIL GROUP

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January 20, 2025

City of Loveland  
Water and Power Department  
200 N. Wilson Ave.  
Loveland, Colorado 80537

**RE: CONCEPTUAL WATER AND WASTEWATER IMPACT DEMAND ANALYSIS FOR  
FARRO FIRST ADDITION  
AVANT PROJECT NUMBER: 2312**

Dear Staff:

Avant Civil Group is pleased to submit this Conceptual Water and Wastewater Impact Demand Analysis for the proposed Farro First Addition project. This report accompanies the annexation/PUD/comprehensive plan submittal for this project.

This report has been prepared in accordance with City of Loveland Water and Wastewater Development Standards (WWDS) and serves to document the impacts associated with the proposed Farro development. We understand that review by the City is to assure general compliance with standard criteria presented in the WWDS.

If you have any questions as you review this report, please feel free to contact us.

Sincerely,

AVANT CIVIL GROUP

A handwritten signature in black ink, appearing to read "Austin Snow", with a stylized, looping initial "A" and a cursive "S".

Austin Snow, PE

Project Engineer

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## General Location & Description

The Farro project site is located in the vicinity of north-central Loveland. The project site is bordered to the north by private undeveloped land and E 71st Street (CR 30), to the east by undeveloped land and N CR 13, to the south by private land and the Horseshoe View Estates neighborhood, and to the west by the proposed Farro development. The proposed development includes approximately 366 single-family units. The project site is presented in Figure 1, below:

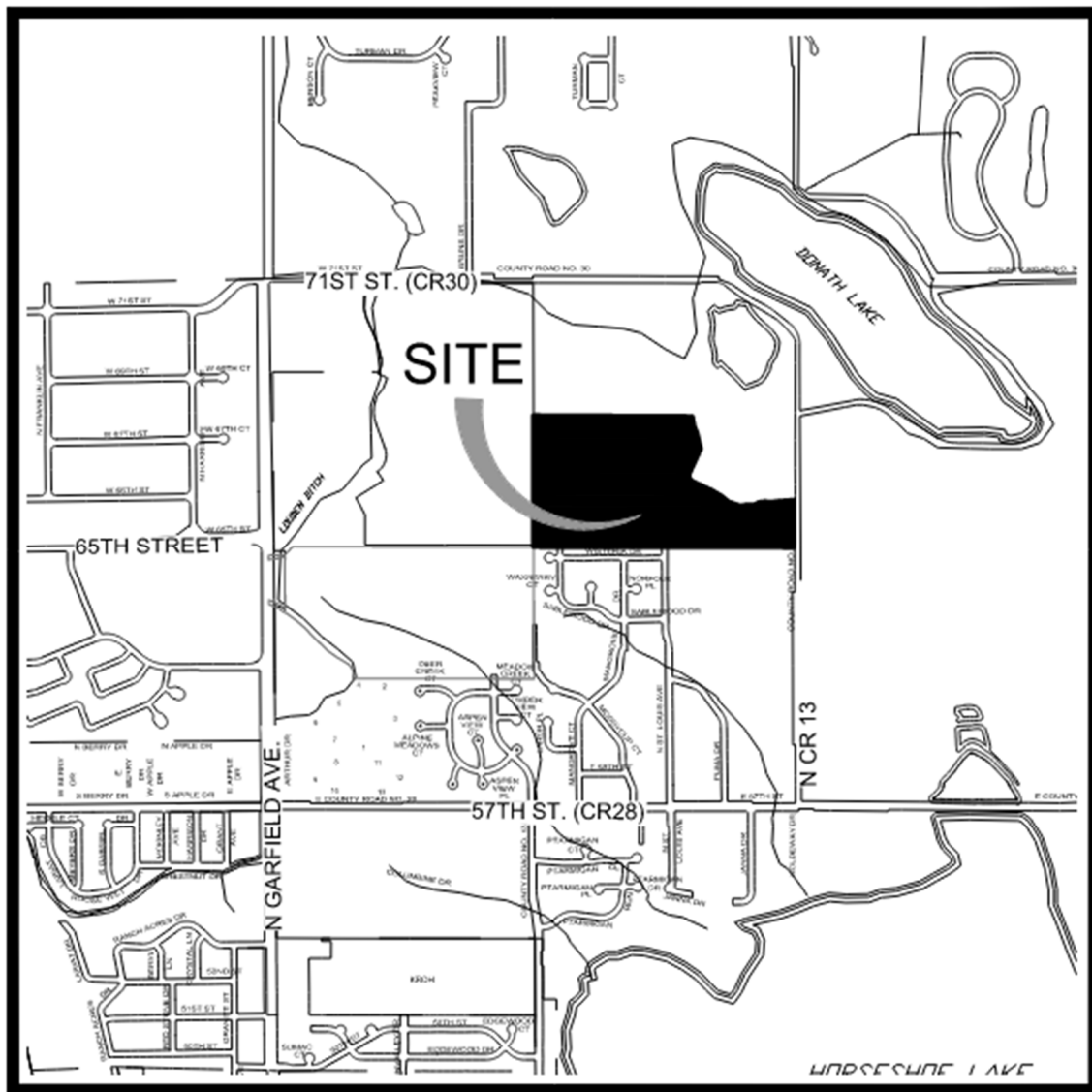


Figure 1 - Project Location

## Design Scope

This preliminary analysis has been prepared for the Farro development and is intended to document the methodologies and assumptions used in the utility system design. The report addresses the following:

- Potable Water Distribution System Design and Demand Criteria
- Existing Water Infrastructure and Proposed Water Network
- Sanitary System Design Criteria
- Existing Sanitary Infrastructure and Proposed Sanitary Network

## Potable Water Distribution System

### Network Analysis & Software

A water distribution network model for the Farro property will be built using EPANET 2.2 (EPANET) during the preliminary plat phase of design.

### Water Design Criteria & Assumptions

Water network design criteria will follow the requirements of the service provider. In the case of this demand analysis, that criteria is Chapter 4 of the Loveland WWDS. This includes typical single family Average Day Demand (ADD) of 400 gpd/unit (320 gpd/unit for multifamily), and multipliers for the Max Day Demand (MDD) and Peak Hour Demand (PHD) of  $2.5 \times \text{ADD}$  and  $6.0 \times \text{ADD}$ , respectively. The acceptable static pressure range is 45-125 psi. The minimum allowable pressure for MDD + Fire Flow and PHD are 20 and 40 psi, respectively.

Should the project

### System Layout

The preliminary system layout has not been designed, but the engineer will work with City staff to determine the most appropriate connection point(s) for the neighborhood's water system layout. At this time, it is anticipated that the network will connect to existing infrastructure in the Sugar Creek development, in the Horseshoe View Estates neighborhood, and possibly in County Road 13 to the east. In general, the system will be designed with multiple connection points and will loop mains where necessary. Fire hydrants will be placed within minimum distances as required by Town code and Loveland Fire Rescue Authority.

### Demands

Projected demands are presented in Table 1, below:

Number of Dwelling Units (DUs)	Average Day Demand Per DU (ADD) (gpd)	Total ADD (gpd)	Max Day Demand (MDD) = $\text{ADD} \times 2.5$ (gpd)	Peak Hour Demand (PHD) = $\text{ADD} \times 6$ (gpm)
366	400	146,400	366,000	610

Notes:

1. Demand #'s taken from Loveland Water and Wastewater Development Standards, June 2024

## Sanitary Sewer Collection System

### Existing Conditions

While the neighborhood's wastewater network has not been laid out yet, the development is slated to connect to existing sanitary infrastructure at the north end of N. Saint Louis Avenue. Utility easements lie between the southern property boundary and the connection point. The connection point is presented in an attachment to this report which shows existing City sanitary infrastructure in the area.

### Wastewater Design Criteria & Assumptions

The sanitary network will be designed to conform with Chapter 5 of the City of Loveland WWDS. The network design will feature, in general, 8" and 12" PVC mains throughout, as is standard for developments of this size. Demand includes typical single family Average Daily Flow (ADF) of 200 gpd/unit (160 gpd/unit for multifamily), and a Peak Design Flow (PDF) of  $ADF * PF + I/I$ , where PF is a peaking factor based on population, and the I/I is an infiltration and inflow allowance.

### Demands

Projected demands are presented in Table 1, below:

Number of Dwelling Units (DUs)	Average Day Demand Per DU (ADF) (gpd)	Total ADF (gpd)	Peaking Factor $(1+14/(4+P^{.5}))$	I/I Allowance $(0.1 * ADF)$	PDF = PF * ADF + I/I
366	200	73,200	3.508	7,320	264,106

Notes:

1. Demand #'s taken from Loveland Water and Wastewater Development Standards, June 2024
2. Assumes 2.5 persons/DU

### Previous Studies/Reports

The property lies within the Old Boyd Sanitary Sewer Basin, as outlined in the 2010 Loveland Wastewater Utility Plan. Further, the South Horseshoe Lift Station Expansion Project Engineering Report, completed (by Stantec) in 2012, outlines anticipated flows to the South Horseshoe Lift Station (and the North Horseshoe Lift Station) from the property. Since the completion of the Stantec report it has been determined that flows from this parcel will exclusively flow to the South Horseshoe Lift Station.

## Conclusions

The water and sanitary network loading calculations have been provided in this preliminary report, and both will be designed to comply with criteria and specifications that are described in the Loveland WWDS.

If you have any questions, please feel free to contact me at your earliest convenience.

Sincerely,

**AVANT CIVIL GROUP, LLC.**



**AUSTIN SNOW, PE**

Project Engineer

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## References

1. Water and Wastewater Development Standards. Loveland Water and Power, 2024 Edition. June 1, 2024.
2. 2021 City of Loveland Wastewater Master Plan. Loveland Water and Power, 2021.
3. South Horseshoe Lift Station Expansion Project Engineering Report. Stantec, 2012.

