# Sanitary Sewer Demand Study

**TTM 38495**
**2523 Garretson Avenue**
**Corona, CA 92878**

## Prepared for:

Warmington Residential
3090 Pullman Street
Costa Mesa, CA 92626
T: (714) 557-5511

## Prepared by:

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January 2024

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# Appendices

## Project Description:

The project is located at 2523 Garretson Avenue, in the city of Corona California. The existing site is currently vacant and zoned as Estate Residential per the City of Corona General Plan. It is bounded by an existing residential community to the south, a religious use institution to the north, Garretson Avenue and an existing residential community to the west, and an existing residential community to the east. The total land area is approximately 9.326 acres. Refer to Appendix A for the vicinity map and tributary map. Warmington Residential is proposing to replace the existing vacant area with 35 low density residential townhomes.

The goal of this sewer analysis is to determine the existing and proposed average daily sewer demands of the project site. This analysis will follow the procedures of The City of Corona - Department of Water and Power Design Policy 2012. These demands will be used by the City of Corona to analyze the sufficiency of the existing downstream sewer lines to direct the proposed sewage flow.

## Methodology:

The City of Corona GIS Zoning map was utilized to determine the land use of the site. Department of Water and Power Design Policy 2012 was then utilized for estimating the average daily sewer demand of the existing and proposed conditions of the site. The table below provides the average daily flow rate for each development type, per the Department of Water and Power Design Policy 2012.

| | **Land Use Category (Subcategory)** | **Average Daily Flow Rate** |
|---|---|---|
| Existing Condition | Low Density Residential (R1-14.4) | 1,000 gpd/acre |
| Proposed Condition | Low Density Residential | 1,000 gpd/acre |

See Appendix B for the Existing and Proposed Sewer Demand summary tables. The proposed project site is calculated to have a density of 3.75 dwelling units/acre, and therefore was determined to be within low density residential zoning. The peak factor was assumed to be 2.5. This peak factor was applied to determine the final existing and proposed sewer demands to be used in the sewer pipe analysis performed by the City of Corona.

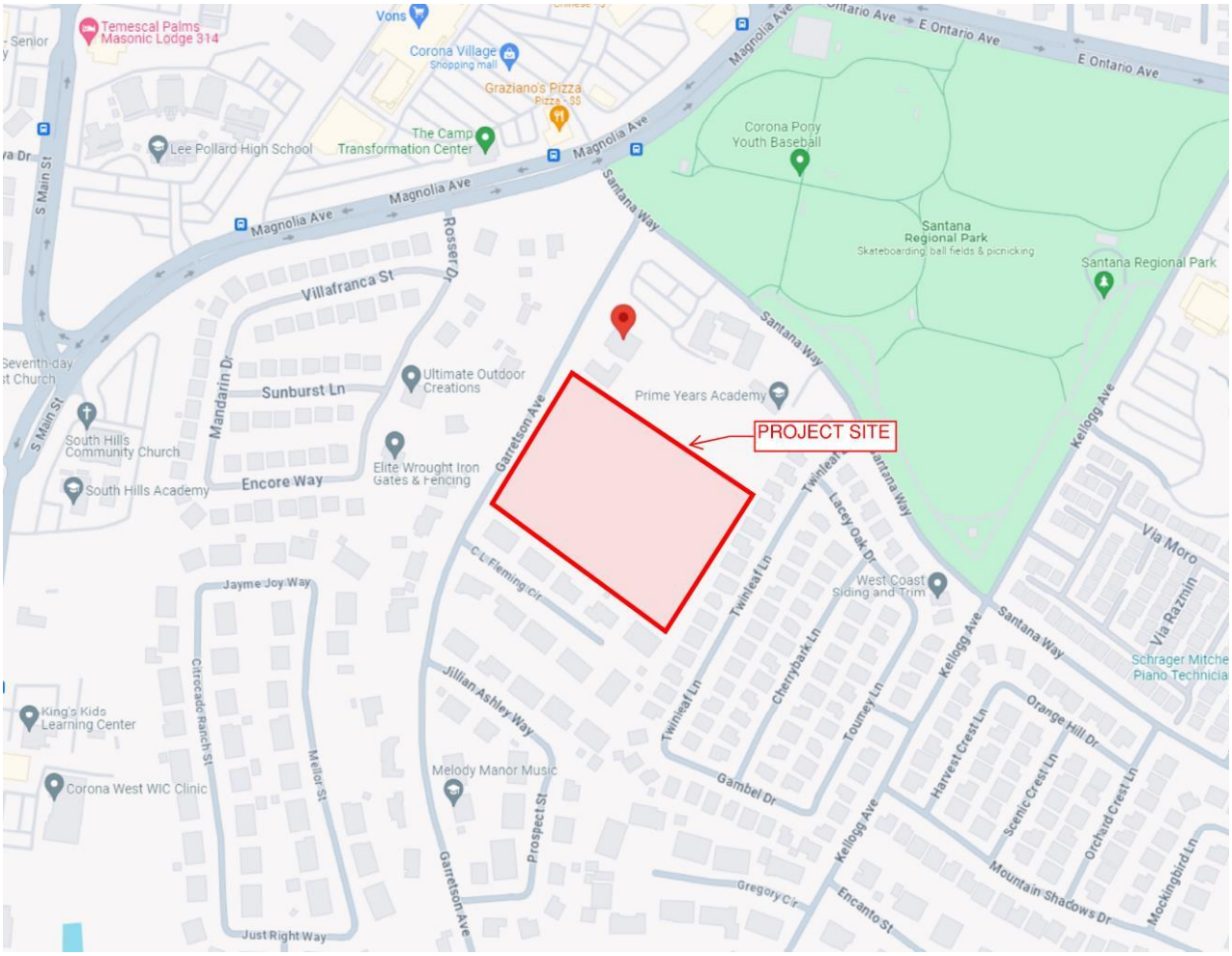
## Conclusion:

The existing sewer demand was determined to be approximately 23,315 gallons per day and the proposed sewer demand was also determined to be approximately 23,315 gallons per day.

# Appendix A

Vicinity and Tributary Maps

# Vicinity Map



# Sewer Atlas Map

# Appendix B

Sewer Demand Tables and Calculations

# Table 1 - Existing Sewer Demand

WARM-011 TTM 38495
2523 Garretson Avenue
Corona, CA 92878

| Tributary Area Name | Tributary Area # | Tributary Area (Acres) | Land Use Category (Subcategory) | Corona Flow Rate (gpd/ac) (1) | Calculated Flow Rate (gpd) | Calculated Flow Rate (cfs) | Total Flow Rate with Peak Factor (gpd) (2) | Total Flow Rate with Peak Factor (cfs) (2) |
|---|---|---|---|---|---|---|---|---|
| Existing Project Site | 1 | 9.326 | R1-14.4 (Low-Density) | 1,000 | 9,326 | 0.01443 | 23,315 | 0.03608 |

(1) Per City of Corona Department of Water and Power Deisng Policy 2012
(2) Assumed Peak Factor of 2.5

# Table 2 - Proposed Sewer Demand

WARM-011 TTM 38495
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Corona, CA 92878

| Tributary Area Name | Tributary Area # | Tributary Area (Acres) | Land Use Category (Subcategory) | Corona Flow Rate (gpd/ac) (1) | Calculated Flow Rate (gpd) | Calculated Flow Rate (cfs) | Total Flow Rate with Peak Factor (gpd) (2) | Total Flow Rate with Peak Factor (cfs) (2) |
|---|---|---|---|---|---|---|---|---|
| Proposed Project Site | 1 | 9.326 | Residential (Low-Density) | 1,000 | 9,326 | 0.01443 | 23,315 | 0.03608 |

(1) Per City of Corona Department of Water and Power Deisng Policy 2012

(2) Assumed Peak Factor of 2.5

# Appendix C

Reference Material


# CITY OF CORONA

# DEPARTMENT OF WATER AND POWER
# DESIGN POLICY

# NOVEMBER 2012

Tom Koper

Tom Koper, PE
District Engineer
R.C.E. No. 50258

11-28-2012
Date

# C. WATER RECLAMATION (SEWER) COLLECTION SYSTEM

## 1. GENERAL

The following sections provide criteria to be used in the design of water reclamation collection (sewer) systems. The developer and his engineer shall be responsible to ensure all design work is in conformance with this Design Policy, the City of Corona Standard Plans and Specifications for sewer systems, State of California Department of Health Services Criteria for the Separation of Water Mains and Sanitary Sewers, as shown on City Standard Drawings 419, and generally accepted standards of good engineering practice. Two sets of calculations are required with first plan check.

## 2. PIPELINE DESIGN CRITERIA

a. Velocity - Design Engineer shall calculate the velocity of flow under proposed conditions. Velocity shall not be less than 2 fps a minimum of once per day to provide sufficient scouring action for self-cleaning. Maximum velocity shall not be greater than 8 fps at design flow. Where 2 fps velocity cannot be provided at least once per day, the slope shall be at least 0.01 ft/ft unless approved in writing by DWP.

b. Use a Manning's "n" of 0. 013 for sewer design.

c. Maximum allowable depth of flow (d/D) at peak flows, is as follows:

   1) 10-inch and smaller 50 percent

   2) 12-inch and larger 67 percent

d. For more information refer to the engineering report in the Sewer Master Plan for Trunk Line Sewers.

e. Minimum slope(s) shall be:

   S = 0.0040 for 8-inch sewer

   S = 0.0025 for 10-inch sewer

   S = 0.0020 for 12-inch sewer

   S = 0.0012 for 15-inch sewer

   S = 0.0010 for 18-inch sewer

   S = 0.0008 for 21-inch sewer

   S = 0.0007 for 24-inch sewer

   Design slopes conforming to the minimum and maximum velocity criteria described in section 2(a) above.

   The design engineer shall submit calculation including the slopes for each segment of the pipeline. Sewer slope shall not be changed in the field unless approved by the DWP District Engineer as it could negatively impact future capacity.

f. Manholes are required at grade breaks.

g. Provide 0.10-foot drop of invert elevation through manholes. Provide 0.20-foot drop of invert elevation at right angle alignment or bends.

h. Minimum 12-inch vertical separation is required when a sewer line crosses water/reclaimed water lines. Encase the sewer line in concrete in accordance with the City of Corona Standard Detail 419.

i. If separation with a parallel water main is less than 10 feet clear (edge-to-edge), design must meet requirements of City Standard Drawings 419 and be reviewed and approved by CDPH or DWP.

j. A minimum of 1-foot vertical separation is required between potable waterlines and both non-potable waterlines and sewer lines. The potable waterline must be above the non-potable waterlines and sewer lines. Separation criteria must follow current CDPH requirements.

k. The minimum unit flow factors used shall be per the following table or as revised in subsequent Sewer Master Plan Updates:

| Land Use | | *Existing Unit Flow Factor (gpd/ac) | *Ultimate Unit Flow Factor (gpd/ac) | Residential Flow Factors (gpd/du) |
|---|---|---|---|---|
| RR1 | Rural Residential 1 (0.2 to 0.5 du/ac) | 150 | 150 | 300 |
| RR2 | Rural Residential 2 (1 du/ac) | 300 | 300 | 300 |
| E | Residential Estate (1-3 du/ac) | 500 | 500 | 300 |
| LDR | Residential Low Density (3-6 du/ac) | 1,000 | 1,000 | 270 |
| LMDR | Low Medium Density (6-8 du/ac) | 1,200 | 1,200 | 270 |
| MDR | Medium Density (6-15 du/ac) | 1,700 | 1,700 | 240 |
| HDR | High Density (15-36 du/ac) | 2,000 | 2,000 | 200 |
| CBD | Commercial Business District | 1,000 | 1,050 | - |
| C or GCC | General Community Commercial | 1,000 | 1,050 | - |
| CP or OP | Office Professional | 1,200 | 1,260 | - |
| GI | General Industrial | 1,100 | 1,155 | - |
| LI | Light Industrial | 800 | 840 | - |
| I or School | Institutional | 800 | 800 | - |
| OS-R or OS-P | Open Space Recreational | 130 | 130 | - |
| QP or MU | Quasi-Public / Mixed Use | 700 | 700 | - |

**Unit flow factors based on gross acres*

## 3. HORIZONTAL PIPE ALIGNMENT CRITERIA

a. Main Lines

1) Line to be 5.0 feet off centerline of street, and located on the opposite side as the potable water main.

2) Minimum ten (10) feet clear separation from potable and non-potable water mains.

3) Minimum three (3) feet separation with other utilities.

4) Curvilinear alignment will not be permitted except when approved by DWP.

# City of Corona

## Major Zoning Categories and Specific Plans

N
W E
S

## Specific Plans

SP 81-1 Lincoln Business Center Specific Plan
SP 81-2 Northeast Corona Specific Plan
SP 82-1 Township in Corona Specific Plan
SP 82-2 Birtcher Business Center Specific Plan
SP 83-1 Crown Ridge Specific Plan
SP 84-1 Concordia Specific Plan
SP 84-2 Parkview Specific Plan
GDPA85-1 Brookwood Specific Plan
SP 85-1 Prado Point Specific Plan
SP 85-2 Sierra Del Oro Specific Plan
SP 85-3 Corona Ranch Specific Plan
SP 87-1 Westgate Specific Plan
SP 89-1 Mountaingate Specific Plan
SP 89-2 Chase Ranch Specific Plan
SP 90-1 The Plaza on Sixth Street Specific Plan
SP 90-2 Todd Ranch Specific Plan
SP 90-3 Cherokee Ranch Specific Plan
SP 90-4 Empire Homes Specific Plan
SP 90-5 Corona Vista Specific Plan
SP 90-6 Eagle Glen Specific Plan
SP 91-1 Main Street South Plaza Specific Plan
SP 91-2 El Cerrito Specific Plan
SP 95-1 Cimarron Specific Plan
SP 98-1 Downtown Revitalization Specific Plan
SP 99-1 North Main Street District Specific Plan
SP 99-3 Dos Lagos Specific Plan
SP 00-1 Green River Ranch Specific Plan
SP 01-1 Crown Ranch Estates Specific Plan
SP 01-2 Corona Magnolia Specific Plan
SP 04-01 Sierra Bella Specific Plan

## Major Zoning Categories

- Single Family Residential
- Multiple Family Residential
- Commercial/Industrial
- Heavy Industrial
- Commercial
- Office
- Mixed Use
- Utility
- Schools
- Planned Community Development
- Open Space
- Flood Control
- Parks
- Agricultural
- North Main Street Specific Plan
- Garretson Avenue Overlay Zone
- Golf Course
- Corona City Boundary
- Specific Plans Boundaries

Map scale 1" to 4200’



City of Corona
Geographic Information Services
Last Updated On: 02/21/2008

# City of Corona GIS Zoning Map