VALLECITOS WATER DISTRICT

VILLA SERENA APARTMENTS WATER AND SEWER STUDY

WORK ORDER # 152424

FINAL TECHNICAL MEMORANDUM

February 3, 2016

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PROJECT DESCRIPTION

The proposed Villa Serena Apartments project (Project) is a multi-family residential development north of Richmar Avenue, between Liberty Drive and Fitzpatrick Road within the City of San Marcos. The 4.06-acre project proposes 148 multi-family residential units (Residential (30-40 du/ac). Prior to this proposed project, the 4.06 acre site had a Residential (20-30 du/ac) land use designation.

The Project property is located within the Vallecitos Water District (VWD) water and sewer service boundaries. Both water and wastewater services are to be provided by VWD. Projects, such as the Villa Serena Apartments, that propose to increase land use density above that identified in VWD's 2008 Master Plan undergo evaluation by VWD to determine if the current water and sewer infrastructure is sufficient to accommodate the increased water demands and sewage generation.

This study considers water demand and sewage generation from the project to determine if the current water and sewer infrastructure is sufficient to accommodate the Project and provides recommendations for needed capital improvements to provide service. The study will evaluate the following items:

- Water distribution system, including the need to upsize pipelines, install new pipelines, or install flow control facilities
- Water storage, including the need for additional storage and the adequacy of existing storage tanks and reservoirs to serve the proposed development
- Water pump stations, including the need to install new pump stations or upsize existing pump stations to serve the proposed development
- Wastewater collection system, including the need to upsize pipelines and manholes, or the need to install new pipelines and manholes
- Wastewater lift stations, including the need to install new lift stations or upsize existing lift stations to serve the proposed development
- Wastewater land outfall, including the need to construct a parallel land outfall to serve this and other proposed developments

- Wastewater treatment facilities, including the need for obtaining additional capacity at the Encina Water Pollution Control Facility (EWPCF) or for expanding the Meadowlark Water Reclamation Facility (MRF)

WATER SYSTEM ANALYSIS

The Project consists of 4.06-acres which lie completely within VWD's 920 Pressure Zone. Figures 1 and 2 show the Project's location in relation to pressure zone boundaries, identify pipelines within the vicinity of the development, and identify storage reservoirs that supply the development area.

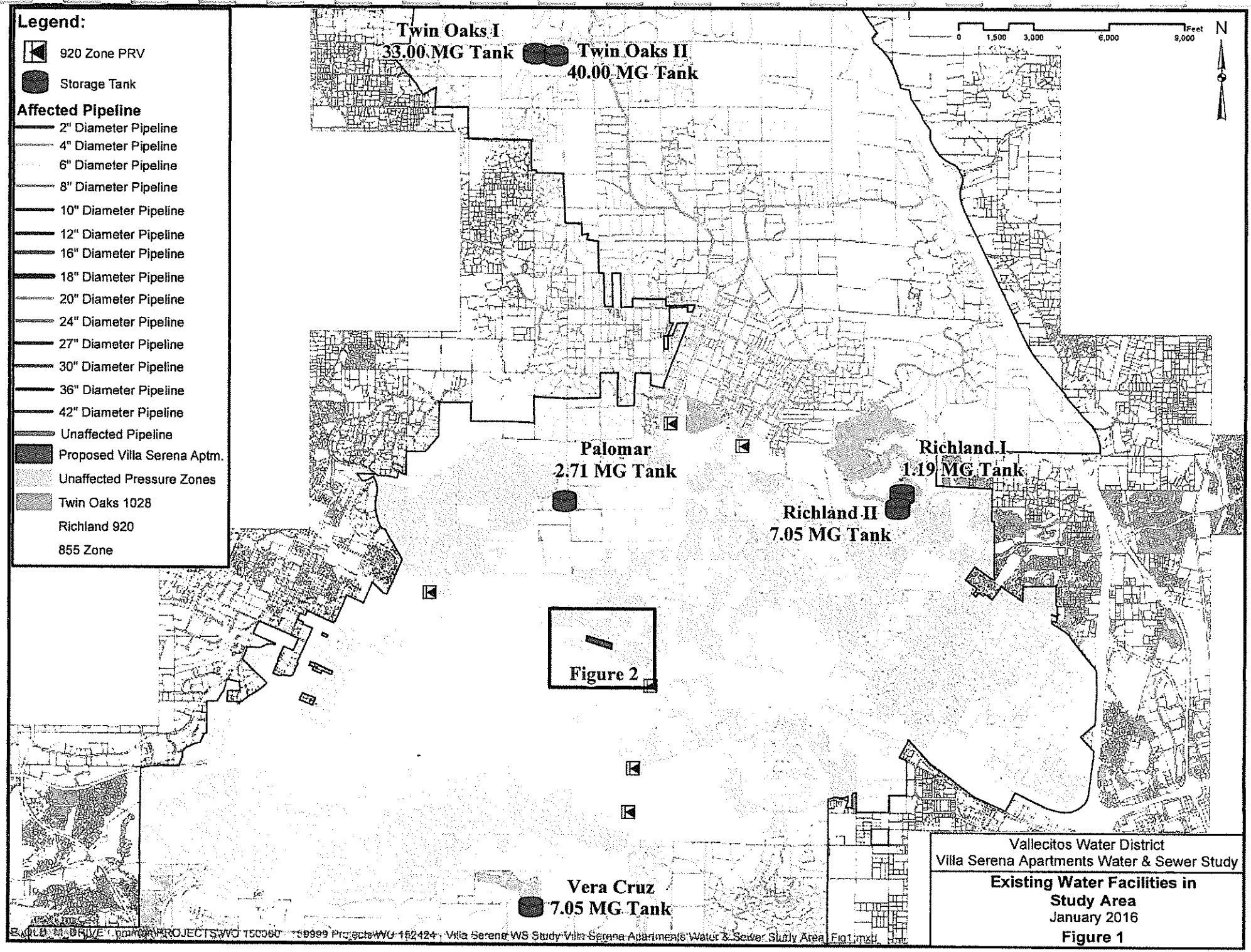
Water Demand Projections

Land use for the 4.06 acre Project is designated Residential (20-30 du/ac) in the VWD 2008 Master Plan. The Project proposes 148 multi-family residential units on 4.06 acres (Residential 30-40 du/ac).

Table 1 – Project Estimated Water Demands

Land Use Type	Area (acres)	Multi-Family Residential Units	Duty Factor (gpd/acre)	Water Demand (gpd)
2008 Master Plan Land Use Demand				
Residentail (20-30 du/ac)	4.06		5,000	20,300
Total	**4.06**	**-**		**20,300**
Proposed Project Demand				
Residential (30-40 du/ac)	4.06	148	7,000	28,420
Total	**4.06**	**-**		**28,420**
Additional Water Demand				**8,120**

Table 1 provides the average water demand calculation under the density planned for in the 2008 Master Plan and under the proposed Project. The table shows that the Project will increase the projected average water demand from the 2008 Master Plan land use by approximately 8,120 gallons per day.


Legend:
920 Zone PRV
Storage Tank
Affected Pipeline
2" Diameter Pipeline
4" Diameter Pipeline
6" Diameter Pipeline
8" Diameter Pipeline
10" Diameter Pipeline
12" Diameter Pipeline
16" Diameter Pipeline
18" Diameter Pipeline
20" Diameter Pipeline
24" Diameter Pipeline
27" Diameter Pipeline
30" Diameter Pipeline
36" Diameter Pipeline
42" Diameter Pipeline
Unaffected Pipeline
Proposed Villa Serena Aptm.
Unaffected Pressure Zones
Twin Oaks 1028
Richland 920
855 Zone
Twin Oaks I
33.00 MG Tank
Twin Oaks II
40.00 MG Tank
Palomar
2.71 MG Tank
Richland I
1.19 MG Tank
Richland II
7.05 MG Tank
Vera Cruz
7.05 MG Tank
Figure 2
0 1,500 3,000 6,000 9,000 Feet
N
Vallecitos Water District
Villa Serena Apartments Water & Sewer Study
Existing Water Facilities in Study Area
January 2016
Figure 1
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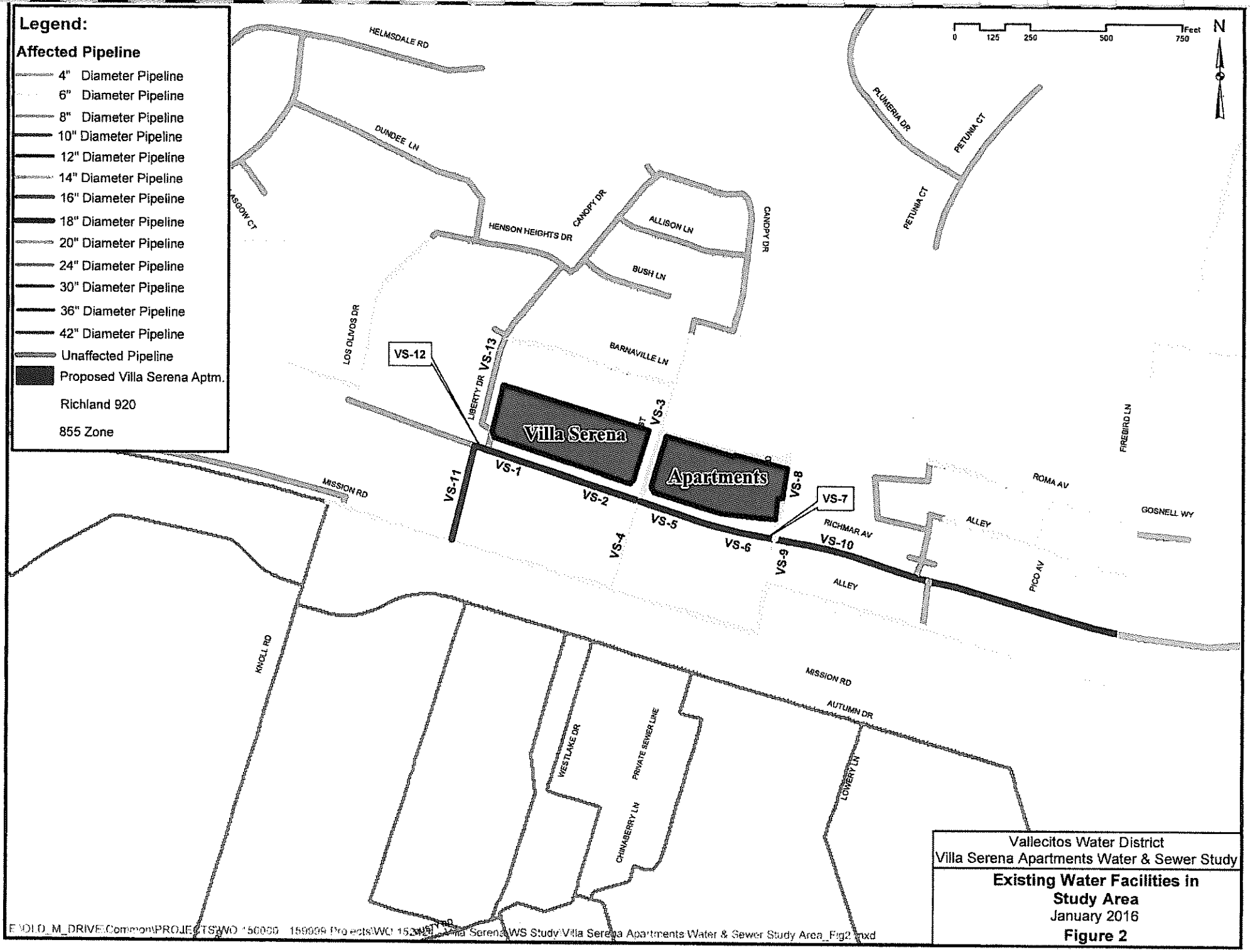

Legend:
Affected Pipeline
4" Diameter Pipeline
6" Diameter Pipeline
8" Diameter Pipeline
10" Diameter Pipeline
12" Diameter Pipeline
14" Diameter Pipeline
16" Diameter Pipeline
18" Diameter Pipeline
20" Diameter Pipeline
24" Diameter Pipeline
30" Diameter Pipeline
36" Diameter Pipeline
42" Diameter Pipeline
Unaffected Pipeline
Proposed Villa Serena Aptm.
Richland 920
855 Zone
0 125 250 500 750 Feet
N
HELMSDALE RD
DUNDEE LN
HENSON HEIGHTS DR
CANOPY DR
ALLISON LN
BUSH LN
BARNAVILLE LN
LOS OLIVOS DR
LIBERTY DR
PLUMERIA DR
PETUNIA CT
FIREBIRD LN
ROMA AV
ALLEY
GOSNELL WY
RICHMAR AV
PICO AV
MISSION RD
KNOLL RD
AUTUMN DR
WESTLAKE DR
PRIVATE SEWER LINE
CHINABERRY LN
LOWERY LN
VS-1
VS-2
VS-3
VS-4
VS-5
VS-6
VS-7
VS-8
VS-9
VS-10
VS-11
VS-12
VS-13
Villa Serena
Apartments
Vallecitos Water District
Villa Serena Apartments Water & Sewer Study
Existing Water Facilities in Study Area
January 2016
Figure 2
E:\OLD_M_DRIVE\Common\PROJECTS\WO 150000 - 159999 Projects\WO 152[illegible] Villa Serena\WS Study\Villa Serena Apartments Water & Sewer Study Area_Fig2.mxd

Water Distribution System Analysis

The 2008 Master Plan water system distribution design and pressure criteria are as follows

Water Distribution Infrastructure Criteria

The water service pressure criteria to be met by this development are as follows:

- Minimum allowable pressure at peak hour demand: 40 psi
- Minimum allowable pressure at max day plus fire demand: 20 psi
- Maximum allowable pressure: 150 psi

The City of San Marcos Fire Marshall has set the required fire demand for this development at 1500 gpm.

To avoid excessive velocity and headloss within the distribution system, the following pipeline design criteria was also utilized:

- Maximum allowable velocity: 7 feet per second
- Maximum allowable headloss gradient: 15 feet per 1,000 feet
- Hazen-Williams C-factor: 130

Water Model Scenarios

The following scenarios were modeled to identify system impacts that may be created by the proposed water demands, and to recommend any improvements required to provide service to the Project:

- Average Day Demand with existing demands at the Project site
- Average Day Demand with the proposed Project
- Maximum Day Demand with existing demands at the Project site
- Maximum Day Demand with the proposed Project
- Peak Hour Demand with existing demands at the Project site
- Peak Hour Demand with the proposed Project
- Maximum Day Demand plus Fire Flow with existing demands at the Project site
- Maximum Day Demand plus Fire Flow with the proposed Project

Per the 2008 Master Plan, maximum day demands for this Project are 300% of average day demands, and peak hour demands are 620% of average day demands.

Water Model Results

Modeling focused on the infrastructure in the direct vicinity of the Project, as shown in Figure 2. Table 2 presents a summary of the modeling results from this analysis. The modeling results showed that no system deficiencies appeared under maximum day plus fire flow demand conditions.

Table 2 – Potable Water Pipeline Results under Maximum Day Demand plus Fire Flow Conditions

Pipe ID Number	Length (ft)	Existing Pipe Diameter (in)	Velocity under Average Day Demand (ft/s)	Velocity under Maximum Day + Fire Flow (ft/s)	Upsized Pipe Diameter (in)	Velocity under Maximum Day + Fire Flow w/ Upsized Pipe (ft/s)
VS1	160	12	0.20	0.51		
VS2	374	12	0.20	3.74		
VS3	242	6	0.11	0.61		
VS4	307	6	0.01	0.78		
VS5	261	12	0.29	3.97		
VS6	150	12	0.29	4.31		
VS7	55	12	0.29	4.31		
VS8	270	6	0.17	2.10		
VS9	64	6	0.04	1.19		
VS10	251	12	0.34	4.41		
VS11	322	12	0.00	0.46		
VS12	45	12	0.11	0.29		
VS13	413	8	0.13	0.65		

Water Storage Analysis

The 2008 Master Plan outlines VWD's potable water storage reservoirs for each pressure zone criteria as follows:

> 1.5 times ADD (operational storage) + 3.0 times ADD (emergency storage) + fire flow demand = 4.5 times ADD + fire flow demand
>
> OR
>
> 5.0 times ADD, whichever is greater.

The Project is located entirely within the VWD 920 pressure zone. Water storage for this zone is located within the 920 Richland and 1028 Twin Oaks pressure zones, as shown in Figure 1. Table 3 shows the required storage in the 855, 920 Richland, and 1028 Twin Oaks pressure zones for Year 2015 (current) and Year 2030 (Master Plan) relative to the existing storage provided within each zone.

Table 3 – Existing Reservoir Storage Capacity and Requirements

Pressure Zone	Year 2015 ADD (MGD)	Year 2015 Storage Requirement (MG)	Year 2030 ADD (MGD)	Year 2030 Storage Requirement (MG)	Existing Storage Available (MG)
855	6.33	31.7	6.33	31.7	0
920 Richland	9.66	48.3	9.66	48.3	18
1028 Twin Oaks	1.41	7.1	2.34	11.7	73
Totals	17.40	**87.1**	18.33	**91.7**	**91**

The proposed Project will increase the projected average water demand by approximately 8,120 gallons per day as shown in Table 1.

Therefore, the amount of additional reservoir storage required is 500% of the VWD portion of the Subdivision's average day demand, or:

8,120 gallons * 500% = **40,600 gallons**

Master Plan projects address and accommodate the existing storage deficiency and Water Capital Facility Fees paid by this Project will be used for any increase in facility size necessitated by the Project's demand calculated above. The analysis finds that water storage capacity is currently available to serve the Project's increased storage requirements.

Water Pump Station Analysis

Since the proposed Project is located in a pressure zone that is not served by pumping, there are no impacts to existing or proposed pump stations by this Project.

WASTEWATER SYSTEM ANALYSIS

The Project consists of 4.06-acres which lie completely within VWD sewer shed 16C. Figures 3 - 5 show the development's location in relation to sewer shed boundaries, identify wastewater infrastructure within the vicinity of the development, propose connection points and identify the downstream collection infrastructure providing service to the Project.

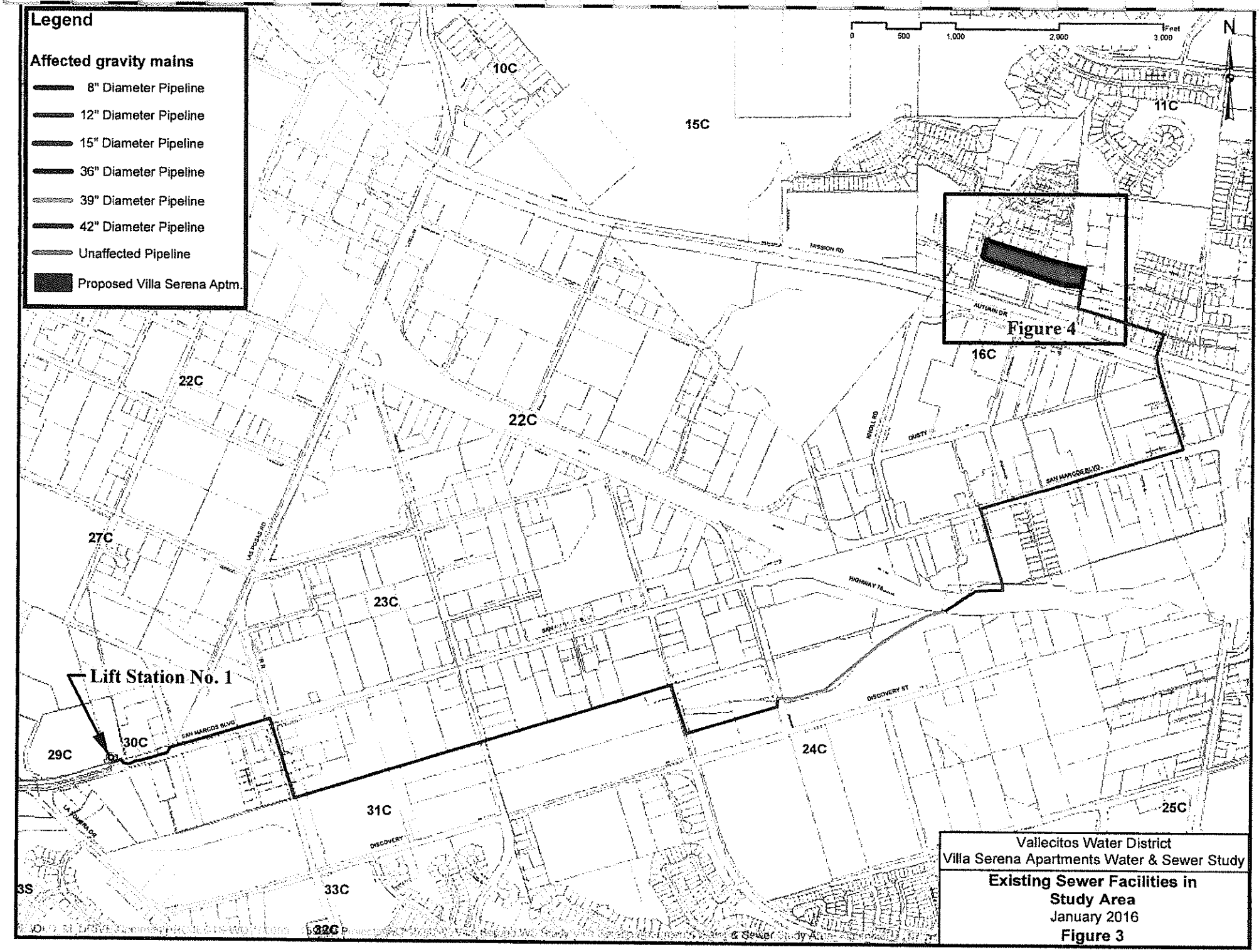
Wastewater Flow Projections

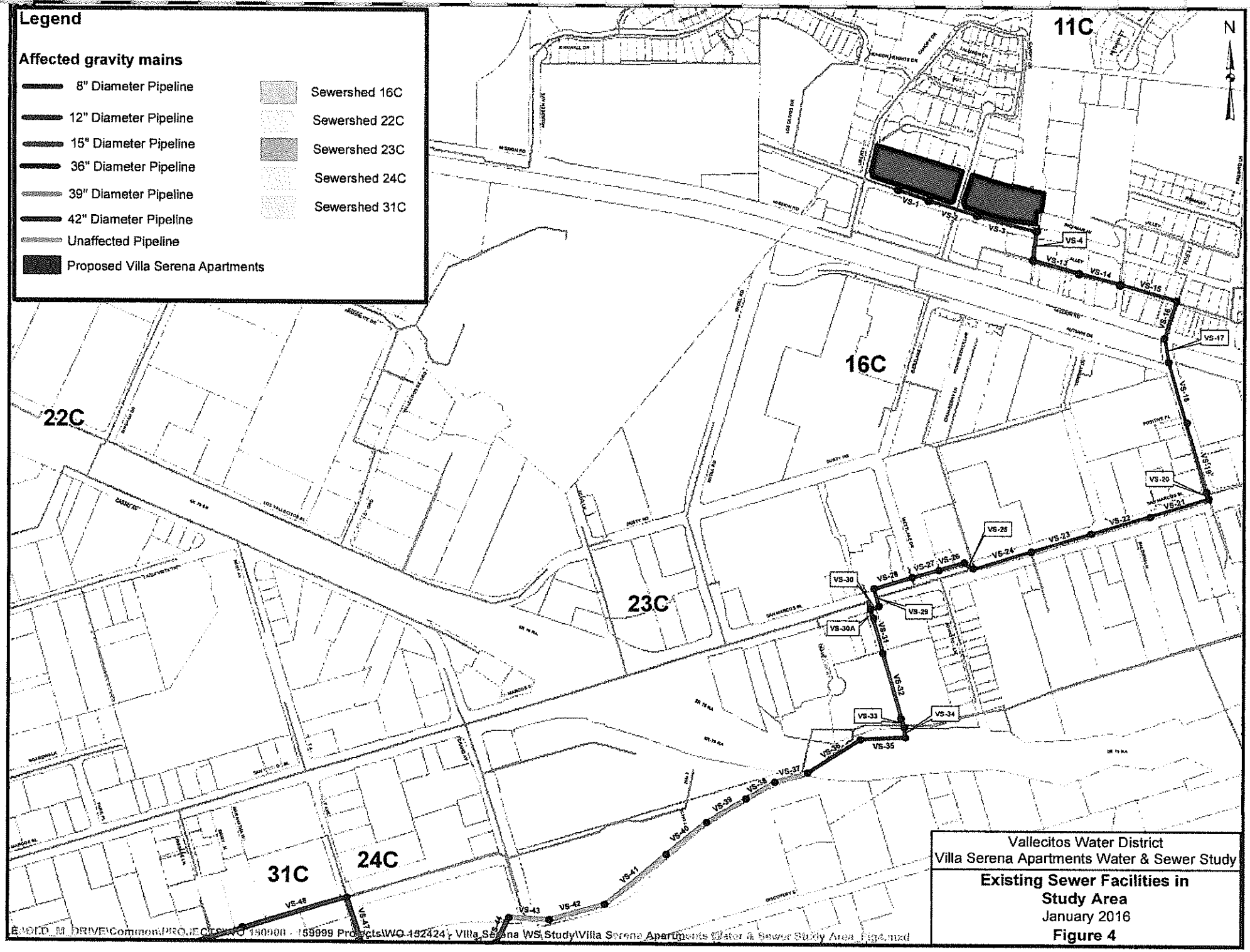
Land use for the 4.06 acre Project is designated Residential (20-30 du/ac) in the 2008 Master Plan. The Project proposes 148 multi-family residential units on 4.06 acres (Residential 30-40 du/ac).

Table 4 – Project Estimated Wastewater Flows

Land Use Type	Area (acres)	Multi-Family Residential Units	Duty Factor (gpd/acre)	Wastewater Flow (gpd)
2008 Master Plan Land Use Flows				
Residential (20-30 du/ac)`	4.06	-	4,500	18,270
Total	**4.06**	**-**		**18,270**
Proposed Project Wastewater Flows				
Residential (30-40 du/ac)	4.06	148	6,300	25,578
Total	**4.06**	**148**		**25,578**
Additional Sewer Generation				**7,308**

Table 4 provides the average wastewater flow generated both under the density planned for in the 2008 Master Plan and under the proposed Project density. The table shows that the Project will increase the projected average wastewater flow above the 2008 Master Plan land use by a total of approximately 7,308 gallons per day.


Legend
Affected gravity mains
8" Diameter Pipeline
12" Diameter Pipeline
15" Diameter Pipeline
36" Diameter Pipeline
39" Diameter Pipeline
42" Diameter Pipeline
Unaffected Pipeline
Proposed Villa Serena Aptm.
0
500
1,000
2,000
3,000
Feet
N
Figure 4
Lift Station No. 1
10C
11C
15C
16C
22C
23C
24C
25C
27C
29C
30C
31C
33C
MISSION RD
AUTUMN DR
RIVOLI RD
DUSTY
SAN MARCOS BLVD
HIGHWAY 78
DISCOVERY ST
DISCOVERY
Vallecitos Water District
Villa Serena Apartments Water & Sewer Study
Existing Sewer Facilities in Study Area
January 2016
Figure 3


Legend
Affected gravity mains
8" Diameter Pipeline
12" Diameter Pipeline
15" Diameter Pipeline
36" Diameter Pipeline
39" Diameter Pipeline
42" Diameter Pipeline
Unaffected Pipeline
Proposed Villa Serena Apartments
Sewershed 16C
Sewershed 22C
Sewershed 23C
Sewershed 24C
Sewershed 31C
11C
16C
22C
23C
24C
31C
N
VS-1
VS-2
VS-3
VS-4
VS-13
VS-14
VS-15
VS-16
VS-17
VS-18
VS-19
VS-20
VS-21
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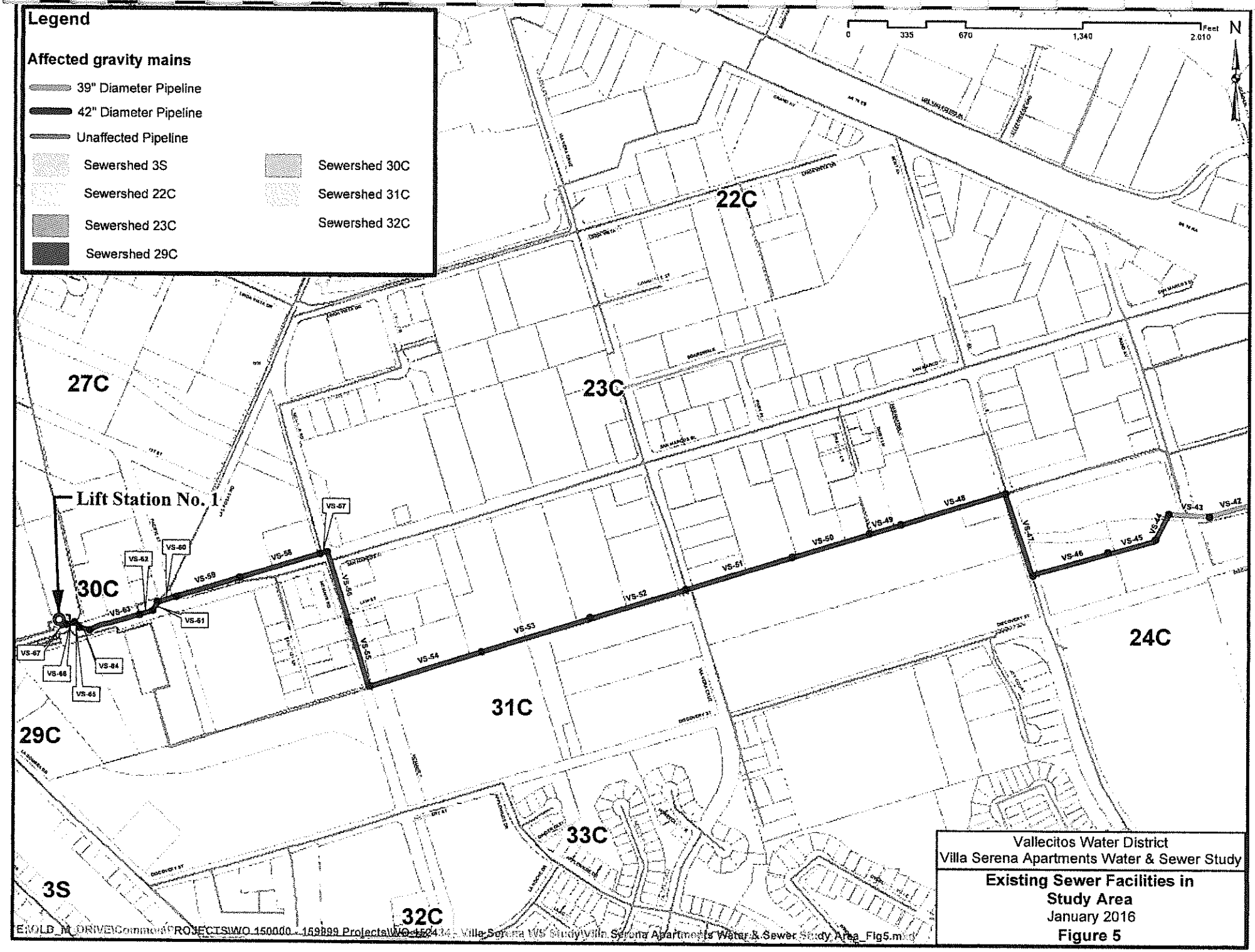
VS-40
VS-41
VS-42
VS-43
VS-47
VS-48
Vallecitos Water District
Villa Serena Apartments Water & Sewer Study
Existing Sewer Facilities in Study Area
January 2016
Figure 4



Vallecitos Water District
Villa Serena Apartments Water & Sewer Study

Existing Sewer Facilities in Study Area

January 2016

Figure 5

Wastewater Collection System Analysis

The 2008 Master Plan outlines VWD's wastewater system design criteria which are as follows:

Wastewater Collection Infrastructure Criteria

The wastewater pipeline criteria to be met both within and downstream of the development are as follows:

- Pipes 12 inches in diameter and smaller: ½ full maximum at peak flow
- Pipes over 12 inches in diameter: ¾ full maximum at peak flow
- Minimum velocity: 2 feet per second
- Maximum velocity: 10 feet per second
- Manning's n for gravity pipes: .013
- Hazen-Williams C-factor for force mains/siphons: 120
- Slope for pipes 12 inches in diameter and smaller: 0.4% minimum
- Slope for pipes over 12 inches in diameter: to be determined by VWD

When flow depth in gravity pipes exceeds maximum levels as stated above, a pipe upsize will be specified.

Wastewater Model Scenarios

The following scenarios were modeled to identify system impacts that may be created by the proposed sewer generation, and to recommend any improvements required to provide service to the Project:

- Average Dry Weather Flow with existing flows at the Project site
- Average Dry Weather Flow with the proposed Project
- Peak Dry Weather Flow with existing flows at the Project site
- Peak Dry Weather Flow with the proposed Project
- Peak Wet Weather Flow with existing flows at the Project site
- Peak Wet Weather Flow with the proposed Project

The peak dry weather curve is:

$$\text{Peak Dry Weather Factor} = 2.16 \times (\text{Average Dry Weather Flow Rate})^{-0.1618}$$

The wet weather peak curve is:

$$\text{Peak Wet Weather Factor} = 2.78 \times (\text{Average Dry Weather Flow Rate})^{-0.087}$$

Wastewater Model Results

Modeling focused not only on the sewer collection infrastructure in the direct vicinity of the Project, but also on all downstream infrastructure from the development to Lift Station No. 1 on San Marcos Boulevard that would be impacted by the Project flows (see Figures 4 and 5). The modeling results showed that the wastewater flow from the proposed Project results in system deficiencies under peak wet weather flows during ultimate build-out conditions. Table 5 presents a summary of the modeling results from this analysis.

Table 5 - Wastewater Model Results and Recommended Gravity Main Improvements

				Wastewater Flows with Existing Density at Project Site				Wastewater Flows with Proposed Project			
Pipe ID Number	Length (ft)	Diameter (in)	Slope	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio
VS-1	211	8	0.0050	0	0.00			1	0.03		
VS-2	211	8	0.0050	0	0.00			1	0.04		
VS-3	350	8	0.0040	0	0.0			18	0.16		
VS-4	200	8	0.0410	26	0.11			44	0.14		
VS-13*	263	8	0.0040	171	0.50	10	0.36	189	0.53	10	0.38
VS-14*	253	8	0.0014	179	0.73	10	0.50	197	0.80	12	0.40
VS-15*	347	8	0.0100	198	0.42	10	0.31	216	0.44	12	0.25
VS-16*	211	8	0.0047	237	0.58	10	0.41	255	0.61	12	0.33
VS-17*	130	8	0.0046	237	0.59	10	0.43	255	0.62	12	0.33
VS-18*	385	8	0.0040	237	0.62	10	0.43	255	0.65	12	0.35
VS-19*	412	8	0.0041	241	0.62	10	0.43	259	0.65	12	0.35
VS-20*	38	8	0.0053	247	0.59	10	0.41	265	0.60	12	0.33
VS-21*	359	8	0.0039	254	0.65	10	0.45	272	0.68	12	0.36
VS-22*	350	8	0.0040	253	0.64	10	0.45	271	0.68	12	0.36
VS-23*	360	8	0.0061	317	0.65	10	0.45	335	0.68	12	0.36
VS-24*	332	8	0.0091	379	0.64	10	0.45	397	0.68	12	0.35
VS-25*	21	8	0.0130	378	0.57	10	0.41	396	0.59	12	0.32
VS-26	210	12	0.0084	550	0.43	-		568	0.44	-	
VS-27	140	12	0.0070	557	0.45	-		575	0.46	-	
VS-28	273	15	0.0074	577	0.33	-		595	0.34	-	
VS-29	49	15	0.0050	577	0.37	-		595	0.37	-	
VS-30	40	15	0.0042	577	0.39	-		595	0.39	-	
VS-30A	24	15	0.0031	590	0.42	-		608	0.43	-	

*These pipe segments have been identified for upsizing in VWD's 2008 Master Plan

Table 5 - Wastewater Model Results and Recommended Gravity Main Improvements (continued)

				Wastewater Flows with Existing Density at Project Site				Wastewater Flows with Proposed Project			
Pipe ID Number	Length (ft)	Diameter (in)	Slope	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio
VS-31	210	15	0.0038	590	0.40	-		608	0.41	-	
VS-32	433	15	0.0042	589	0.39	-		607	0.40	-	
VS-33	59	15	0.1085	588	0.17	-		606	0.18	-	
VS-34	29	15	0.0138	589	0.29	-		607	0.29	-	
VS-35	260	36	0.0069	5956	0.34	-		5974	0.34	-	
VS-36	340	36	0.0047	5948	0.37	-		5966	0.37	-	
VS-37	210	39	0.0105	5991	0.27	-		6009	0.27	-	
VS-38	176	39	0.0028	5985	0.38	-		6003	0.38	-	
VS-39	271	39	0.0022	5977	0.41	-		5995	0.41	-	
VS-40	297	39	0.0024	5966	0.40	-		5984	0.40	-	
VS-41	452	39	0.0024	5952	0.40	-		5970	0.40	-	
VS-42	337	39	0.0024	5937	0.40	-		5955	0.40	-	
VS-43	123	39	0.0024	6032	0.40	-		6050	0.40	-	
VS-44	88	42	0.0060	6039	0.29	-		6057	0.29	-	
VS-45	527	42	0.0026	6021	0.35	-	-	6039	0.35	-	
VS-46	464	42	0.0032	6002	0.33	-	-	6020	0.34	-	
VS-47	493	42	0.0024	6568	0.38	-	-	6586	0.38	-	
VS-48	619	42	0.0042	6573	0.33	-	-	6591	0.33	-	
VS-49	200	42	0.0035	6578	0.34	-	-	6596	0.34	-	
VS-50	450	42	0.0042	6575	0.33	-	-	6593	0.33	-	
VS-51	644	42	0.0040	6561	0.33	-	-	6579	0.33	-	
VS-52	581	42	0.0041	6568	0.33	-	-	6586	0.33	-	
VS-53	650	42	0.0040	6543	0.33	-	-	6561	0.33	-	

Table 5 - Wastewater Model Results and Recommended Gravity Main Improvements (continued

				Wastewater Flows with Existing Density at Project Site				Wastewater Flows with Proposed Project			
Pipe ID Number	Length (ft)	Diameter (in)	Slope	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio	Peak Wet Weather Flow (gpm)	PWWF Depth-to-Diamter Ratio	Replacement Diamater (in)	Replacement PWWF Depth-to-Diamater Ratio
VS-54	677	42	0.0041	6515	0.33	-	-	6533	0.33	-	
VS-55	373	42	0.0040	6500	0.33	-	-	6518	0.33	-	
VS-56	420	42	0.0036	6485	0.34	-	-	6503	0.34	-	
VS-57	20	42	0.0050	6475	0.31	-	-	6493	0.31	-	
VS-58	486	42	0.0041	6469	0.33	-	-	6487	0.33	-	
VS-59	500	42	0.0040	6448	0.33	-	-	6466	0.33	-	
VS-60	156	42	0.0058	6993	0.31	-	-	7011	0.31	-	
VS-61	15	42	0.0533	9465	0.21	-	-	9483	0.21	-	
VS-62	138	42	0.0029	9461	0.44	-	-	9479	0.44	-	
VS-63	347	42	0.0009	9449	0.62	-	-	9467	0.62	-	
VS-64	18	42	0.0056	9436	0.37	-	-	9454	0.37	-	
VS-65	9	42	0.0333	9435	0.23	-	-	9453	0.23	-	
VS-66	9	42	0.0111	9566	0.31	-	-	9584	0.31	-	
VS-67	73	42	0.0040	10189	0.42	-	-	10207	0.42	-	

Wastewater Lift Station Analysis

Lift stations are sized for peak wet weather flow with manufacturer's recommended cycling times for pumping equipment. Since the proposed Project is not located in a sewer shed that is served by a lift station, there are no lift station upgrade requirements for this project.

Parallel Land Outfall Analysis

VWD's existing land outfall is shown in Figure 6. The outfall is approximately 8 miles in length and consists of 4 gravity pipeline sections and 3 siphon sections varying in diameter from 20 inches to 54 inches. VWD maintains the entire pipeline from Lift Station No. 1 to the Encina Water Pollution Control Facility (EWPCF). From Lift Station No. 1 to El Camino Real, VWD is the sole user of this pipeline. From El Camino Real to the EWPCF, the ownership capacity is as shown in Table 6 below:

Table 6 – Land Outfall Capacity Ownership by Agency

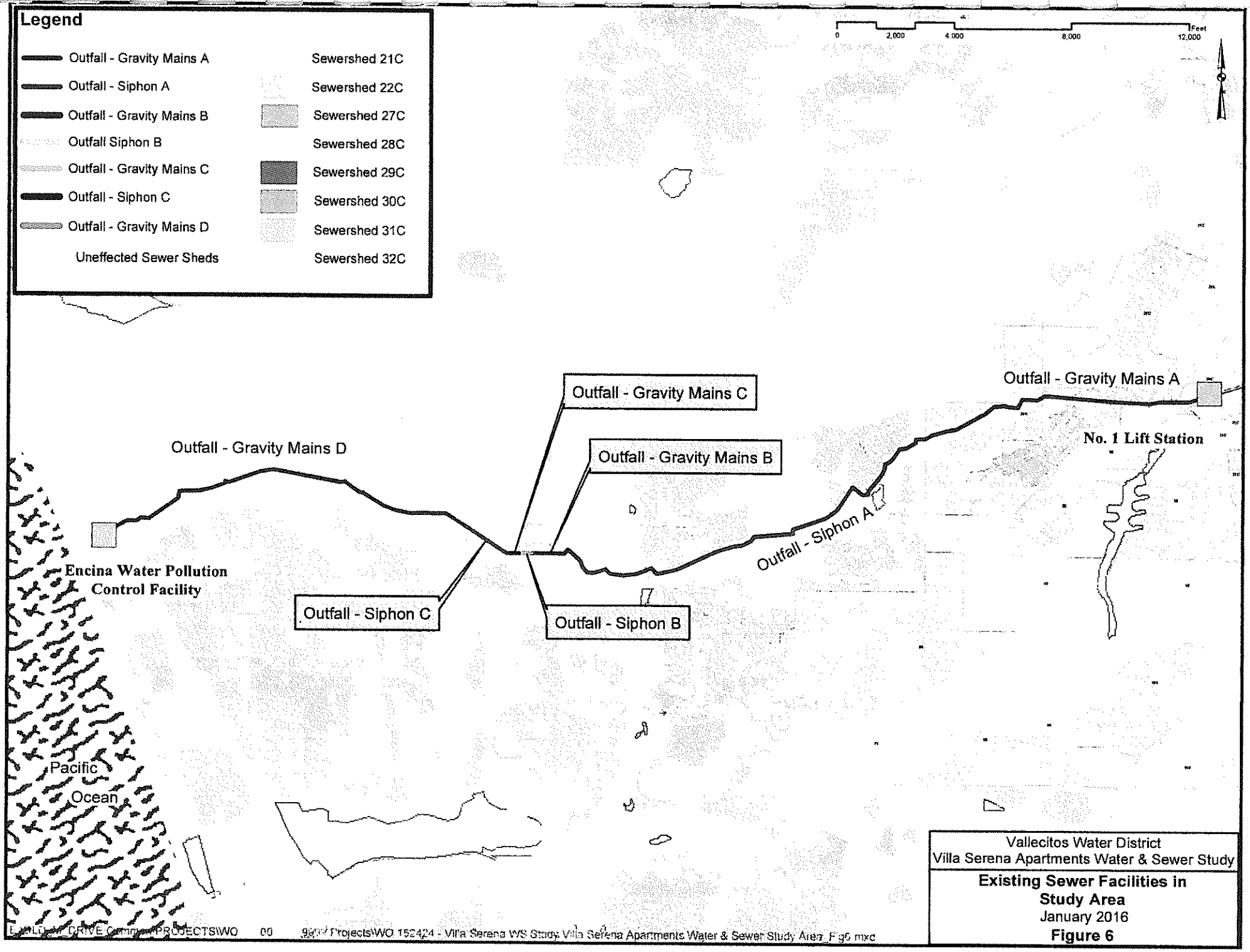
Agency	Ownership Percentage	Capacity (MGD)
Carlsbad	23.98%	5.00
Vista	17.99%	3.75
VWD	58.03%	12.10
Totals	**100.00%**	**20.85**

The Meadowlark Water Reclamation Facility (MRF) has a capacity of 5.0 MGD with a peak wet weather capacity of 8.0 MGD. Therefore, VWD has a combined peak wet weather wastewater collection capacity of 20.10 MGD (12.10 MGD + 8.0 MGD).

VWD's 2014 average daily wastewater flow was 7.2 MGD. This corresponds to a peak wet weather flow of 16.9 MGD, which falls within VWD's combined peak wet weather collection capacity.

The 2008 Master Plan estimated that, under approved land uses, VWD has an ultimate build-out average daily flow of 13.3 MGD. This corresponds to a peak wet weather flow of 29.5 MGD, which exceeds VWD's peak wet weather collection capacity. To accommodate additional wastewater flows from planned development, the 2008 Master Plan recommended conveyance of peak flows to the EWPCF through a parallel land outfall.

The Project proposes to generate an additional average wastewater flow of 7,308 gpd that was not accounted for in the Land Outfall's capacity studied in the 2008 Master Plan. However, the analysis also finds that outfall capacity is currently available to serve the Project's increased wastewater collection requirements.


Legend
Outfall - Gravity Mains A
Outfall - Siphon A
Outfall - Gravity Mains B
Outfall Siphon B
Outfall - Gravity Mains C
Outfall - Siphon C
Outfall - Gravity Mains D
Uneffected Sewer Sheds
Sewershed 21C
Sewershed 22C
Sewershed 27C
Sewershed 28C
Sewershed 29C
Sewershed 30C
Sewershed 31C
Sewershed 32C
0
2,000
4,000
8,000
12,000
Feet
Outfall - Gravity Mains A
Outfall - Gravity Mains C
Outfall - Gravity Mains B
Outfall - Gravity Mains D
Outfall - Siphon A
No. 1 Lift Station
Encina Water Pollution Control Facility
Outfall - Siphon C
Outfall - Siphon B
Pacific Ocean
Vallecitos Water District
Villa Serena Apartments Water & Sewer Study
Existing Sewer Facilities in Study Area
January 2016
Figure 6

Wastewater Treatment Facility Analysis

VWD utilizes two wastewater treatment facilities to treat wastewater collected within its sewer service area.

- The Meadowlark Reclamation Facility (MRF) has liquids treatment capacity of up to 5.0 MGD with a peak wet weather capacity of 8.0 MGD. MRF does not have solids treatment capacity, and therefore all solids are treated at the Encina Water Pollution Control Facility (EWPCF).
- The EWPCF is located in the City of Carlsbad. This is a regional facility with treatment capacity of up to 40.51 MGD. VWD's current ownership capacity is noted below.

Solids Treatment Capacity
VWD currently owns 10.47 MGD of solids treatment capacity at EWPCF. The ultimate average wastewater flow identified in the 2008 Master Plan is 13.3 MGD, resulting in a projected solids treatment capacity deficiency of 2.83 MGD.

VWD's 2014 average daily wastewater flow was 7.2 MGD. Therefore, the analysis finds that adequate solids treatment capacity exists at this time to serve the Project.

Liquids Treatment Capacity
VWD currently owns 7.67 MGD of liquids treatment capacity at the EWPCF in addition to the liquids treatment capacity of 5.0 MGD at MRF for a total of 12.67 MGD of liquids treatment capacity. The ultimate average wastewater flow identified in the 2008 Master Plan is 13.3 MGD, resulting in a projected liquids treatment capacity deficiency of 0.67 MGD.

VWD's 2014 average daily wastewater flow was 7.2 MGD. Therefore, the analysis finds that adequate liquids treatment capacity exists at this time to serve the Project.

Ocean Disposal Capacity
VWD currently owns 10.47 MGD of ocean disposal capacity at the EWPCF. The ultimate average wastewater flow identified in the 2008 Master Plan is 13.3 MGD, resulting in an ocean disposal deficiency of 2.83 MGD.

VWD's 2014 average daily wastewater flow was 7.2 MGD. Therefore, the analysis finds that adequate ocean disposal capacity exists at this time to serve the Project.

The District has determined that adequate wastewater treatment and disposal capacity exists for the proposed Project at this time subject to the qualifications referenced in the Conclusions and Conditions.

CONCLUSIONS AND CONDITIONS

The proposed Project is expected to increase average daily water demands by 8,120 gallons per day and wastewater flow by 7,308 gallons per day over the ultimate flows projected in the 2008 Master Plan.

The Study concludes that the proposed Project will result in the following:

- An increase of 40,600 gallons of potable water storage demand.
- An increase of 7,308 gpd in solids handling, liquids handling and ocean disposal demand at the Encina Water Pollution Control Facility.
- An increase of 7,308 gpd in the parallel land outfall's demand.

The District has determined that adequate water storage, wastewater treatment/disposal and land outfall capacities exist at this time.

The following items are required as conditions of providing service to the proposed Project:

- Payment of all applicable Water and Wastewater Capital Facility fees in affect at the time service is committed in accordance with District rules and regulations.
- Construction and acceptance of all service connections to existing water and sewer facilities prior to service being provided in accordance with all rules and regulations in affect at the time service is provided.
- Construction and acceptance of all off-site sewer collection facility improvements identified in Table 5 to provide service to the proposed Project, including, but not limited to, the following:
    - Upsizing approximately 263 feet of the existing 8-inch sewer collection pipeline to 10-inch pipeline (VS-13) and 600 feet of the existing 8-inch sewer collection pipeline to 12-inch pipeline (VS-14 and VS-15) to mitigate the project impacts. The existing 8-inch pipeline is located in an existing VWD easement in the alleyway north of Mission Road between Fitzpatrick Road and Pico Avenue. VWD's 2008 Master Plan has identified this section of pipeline for upsizing to 10-inch as part of CIP SP-18, which is to be completely funded by development.
    - Upsizing approximately 1,176 feet of the existing 8-inch sewer collection pipeline in Pico Avenue from the existing VWD easement north of Mission Road to San Marcos Boulevard (VS-16 through VS-20) to 12-inch pipeline to mitigate the project impacts. VWD's 2008 Master Plan has identified this section of pipeline for upsizing to 12-inch as part of CIP SP-8, which is to be completely funded by development.
    - Upsizing approximately 1,422 feet of the existing 8-inch sewer collection pipeline to 12-inch pipeline in San Marcos Boulevard (VS-21 through VS-25) from Pico Avenue west for approximately 1,422 feet until the pipeline becomes 12-inches in diameter to mitigate the project impacts. VWD's 2008 Master Plan has identified this section of pipeline for upsizing to 12-inch pipeline as part of CIP SP-7, which is to be completely funded by development.

The District currently has water and sewer capacity available to serve the Project as proposed. However, the ability to provide water and sewer service in the future depends upon ultimate build-out of the Project and could change depending upon the timing of the build-out, as well as annexations and build-outs of other development projects, continued reliable water supplies from the San Diego County Water Authority, the District's treatment capacity at the EWPCF and other factors affecting growth in the District which may change over time.

This Study is based on the current adopted land use utilized in VWD's 2008 Master Plan. The study addresses the incremental facility impacts of this Project only and does not include or consider any additional projects within VWD's service area that have deviated from adopted Master Plan land uses. Any land use changes upstream and/or downstream of the Study area may necessitate a revision of any onsite and offsite studies. VWD shall determine if and when revisions to the Study are necessary. Costs for revising this Study shall be borne by the Developer.