SANTA YNEZ WEST SEWER AREA STUDY

Prepared for
Santa Ynez Community Services District

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Date
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Common Acronyms and Abbreviations

AAD	Annual Average Demand (Recycled Water Annual Flow Volume in Acre-Feet per Year)
AADF	Average Annual Daily Flow
ADMM	Average Day Maximum Month Flow
BOD	Biochemical Oxygen Demand
CCI	Construction Cost Index
CCR	California Code of Regulations (see also Title 22)
CDPH	California Department of Public Health
CFM	Cubic Feet per Minute
CF of cuft	cubic feet
CWA	Clean Water Act
DIP	Ductile Iron Pipe
DWR	(California) Department of Water Resources
EDU	Equivalent Dwelling Unit
EIR	Environmental Impact Report
ENR	Engineering News Record
FEMA	Federal Emergency Management Agency
FMP	Facilities Master Plan
GMF	Granular Media Filtration
fps	Feet Per Second
gpcd	Gallons Per Capita Per Day
gpd	Gallons Per Day
gpm	Gallons Per Minute
HDPE	High-Density Polyethylene
hr	Hour
I&I	Inflow and Infiltration
In	Inches
LAFCO	Local Agency Formation Commission
LF or lf	Linear Feet
MCL	Maximum Contaminant Level
MG	Million Gallons
mgd	Million Gallons Per Day
mg/L	Milligram Per Liter (aka “Part Per Million”)(i.e., Concentration of a Constituent in Water)
ml/L	Milliliter Per Liter(i.e., Volume of Constituent in Water)
MSL	Mean Sea Level
NIC	Not Included or Not In Contract
NPDES	National Pollution Discharge Elimination System (Regulatory Framework for Permitting Discharges to Surface Water)
NPSHA	Net Positive Suction Head Available
NPSHR	Net Positive Suction Head Required
NTU	Nephelometric Turbidity Unit (i.e., Measure of Light-Transmitting Property of Waters to Indicate the Quality With Respect to Colloidal and Residual Suspended Matter)
PDWF	Peak Dry Weather Flow
PHF	Peak Hour Flow (Recycled Water Delivery Rate in gpm)
ppm	Part Per Million (aka Milligram Per Liter)
PS	Pump station
PVC	Polyvinyl Chloride
RW	Recycled (or Reclaimed) Water
RWQCB	Regional Water Quality Control Board
SRF	State Revolving Fund (loan program)
sqft or SF	Square Feet
SWP	State Water Project

SWRCB	(California) State Water Resources Control Board
SYCSD	Santa Ynez Community Services District
TDS	Total Dissolved Solids (aka Salinity)
TF	Tertiary Filter
Title 22	Title 22 of California Code of Regulations (Especially, Division 4. Environmental Health, Chapter 3. Water Recycling Criteria)
TSS	Total Suspended Solids
UWMP	Urban Water Management Plan
WDR	Waste Discharge Requirements (RWQCB Permits for Discharges to Land or Groundwater)
WWTP	Wastewater Treatment Plant

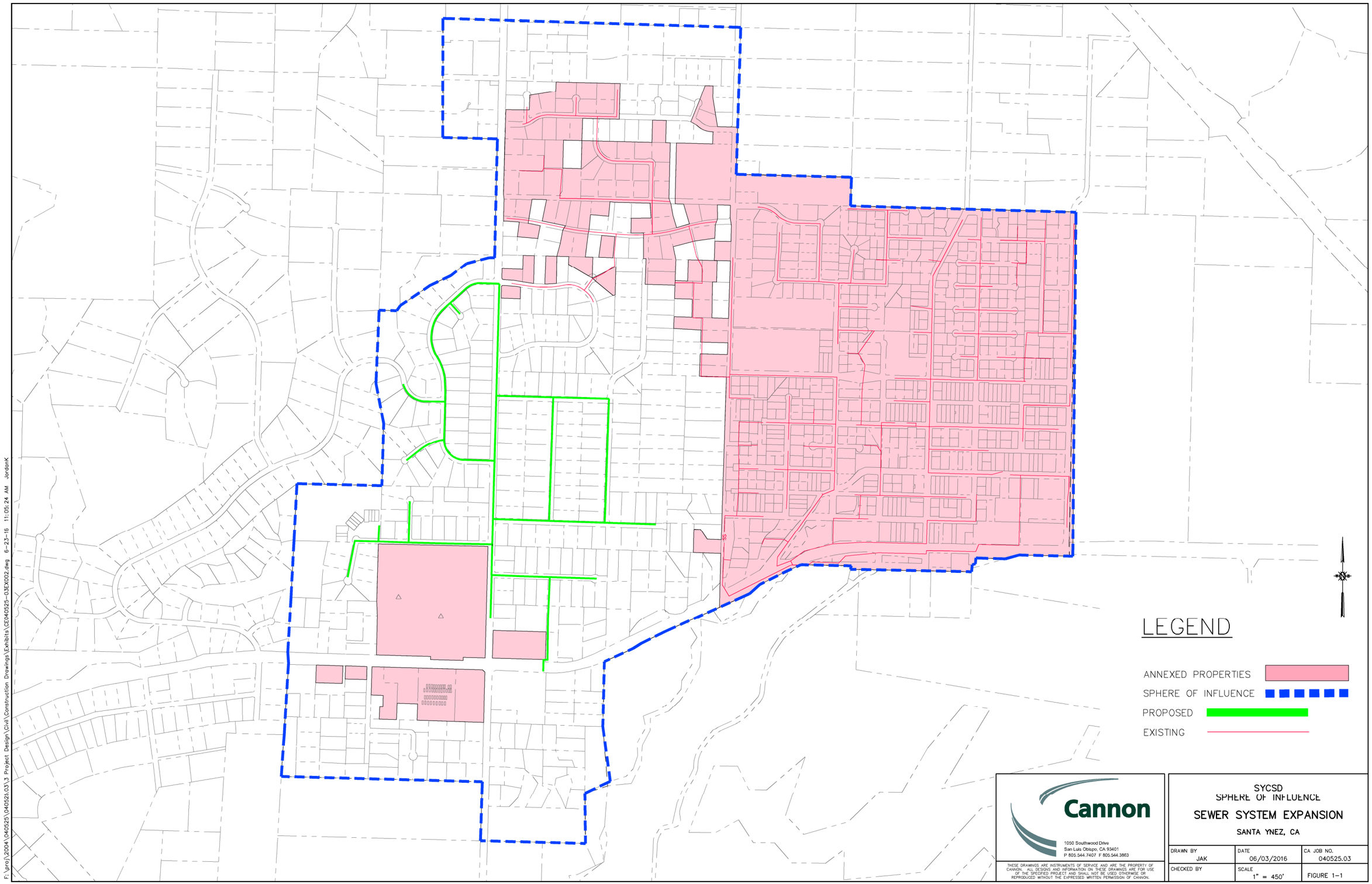
1. INTRODUCTION

The Santa Ynez Services District (District) currently serves half of its approximate 1.75 square mile sphere of influence and maintains approximately 15 miles of sewer lines, see Figure 1-1. The remaining area relies on a septic system due to lack of gravity sewer infrastructure, which the State and County health departments have deemed hazardous in the past as detailed in the Onsite Wastewater Treatment Systems Local Agency Management Program prepared by the Santa Barbara County Public Health Department Environmental Health Services, revision 1 dated 07/21/15. This health concern has prompted the installation of an adequate sewage collection system. The District has retained Cannon as the District engineer to formulate a plan that accommodates the residents and is conducive to the land development trends in this area. The proposed plan adds approximately 5 miles of sewer with the ultimate goal of providing gravity sewers to the District's entire Sphere of Influence.

The sewer area study in this report covers the western Santa Ynez community, with the preliminary focus area along North Refugio Road between State Highway 246 and Samantha Drive and along Deer Trail Lane.

The goal of this engineering study is to establish current sewage generation flows and to determine the future sewer system requirements of the study area. This report sets forth the results of the engineering study prepared in response to the request of the District.

FIGURE 1-1
SPHERE OF INFLUENCE



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SYCSD
SPHERE OF INFLUENCE
SEWER SYSTEM EXPANSION
SANTA YNEZ, CA

DRAWN BY	DATE	CA JOB NO.
JAK	06/03/2016	040525.03
CHECKED BY	SCALE 1" = 450'	FIGURE 1-1

2. OBJECTIVES

The objective of this study is to determine the projected sewer requirements for the tributary areas within the study boundary and to then provide sufficient background information in order to begin detailed engineering design for the construction of the new sphere of influence sewer system expansion along Refugio Road. These sewers will convey sewage from the study area to the existing 12-inch trunk sewer in State Highway 246 via the Golden Inn lift station.

2.1 Scope of Study

2.1.1 Study Area Boundary

Determine the boundaries which include present sewered areas and adjoining areas that will require service under future development.

2.1.2 Background Information

Review all background information such as existing sewer systems and data pertinent to current and proposed land use.

2.1.3 Flow Projections

Determine the present and future sewage generation on the basis of using the peak flow coefficient method as outlined in the SYCSD Standards.

2.1.4 Sewer Facilities Design Criteria

Review and determine the criteria to be followed in the design of trunk sewers, collector sewers, and appurtenances.

2.1.5 Sewer System Development

Determine the size, location and approximate routing of trunk sewers which will convey the sewage from the contributory areas within the study area boundary.

2.1.6 Existing Capacity of the Solvang WWTP

Review the capacity availability of the existing Solvang Waste Water Treatment Plant.

3. STUDY AREA

The study area, as shown in Figure-3-1, consists of the western half of the District's Sphere of Influence (SOI). This area will be serviced by a trunk sewer running mainly south down Refugio Road and a series of branch sewers. There are approximately 5 miles of proposed sanitary sewer lines within the SOI of the Santa Ynez District as determined by the Santa Barbara County Local Agency Formation Commission (LAFCO). However, a large portion of the half square mile proposed sewer area requires annexation, which is currently in process.

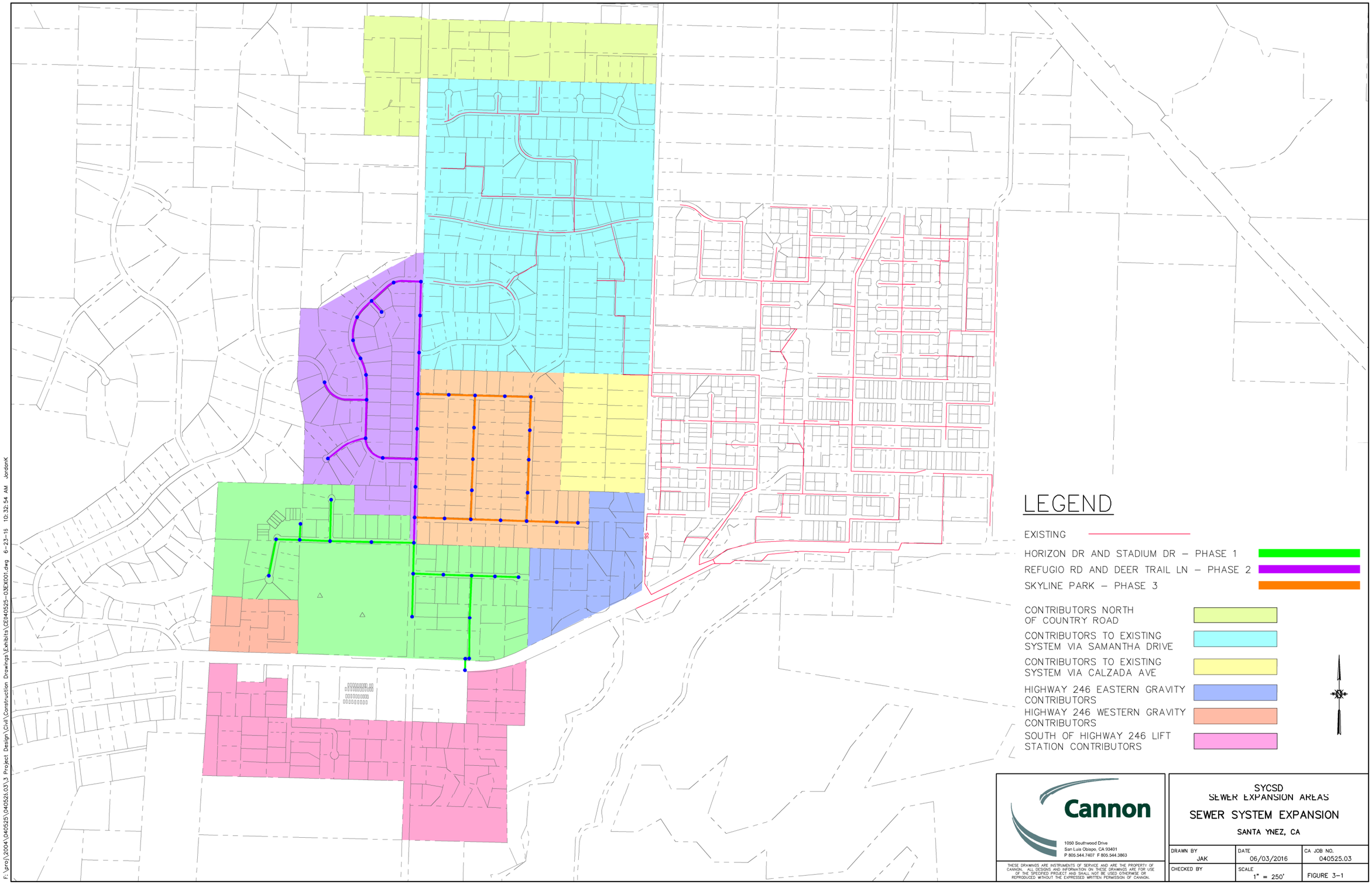
The formulation of the sewer study area boundary is based on the following criteria:

1. Area topography
2. Existing sewer areas
3. Property annexation

There are several areas that can drain by gravity to the trunk sewer in Refugio Road. For ease of planning purposes, these areas were split into 3 different phases as shown in Figure 3-1. The remaining areas in the SOI will either require a lift station to connect to the Refugio Road trunk sewer, or will connect to the existing gravity sewer system in another location. These areas are generally isolated due to the topography of the area.

FIGURE 3-1

PHASES OF SEWER EXPANSION AREA



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SYCSD
SEWER EXPANSION AREAS

SEWER SYSTEM EXPANSION

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	1" = 250'	FIGURE 3-1

3.1 Existing Topographic Considerations

Development of the most economical facilities was based on the existing topographic makeup of central Santa Ynez. The study area as a whole drains in a southern direction. Therefore, slopes of all proposed sewers were attempted to mirror the existing surface drainage pattern thus keeping sewer depths to a minimum. All maps utilized for this study were drawn superimposed on topographical maps to determine existing contours and drainage patterns for the proposed sewer layout. Phases 1 through 3 are easily serviced by a gravity system, while other areas require more infrastructure or planning to make a connection.

3.2 Study Area Non-Contributors

The following are a list of areas in the SOI that will not connect to the proposed collection system on the west side, but could be added to the existing sewer system at a future date with additional infrastructure:

- North of Country Road - The section north of Country Rd within the area of influence which is either un-serviced or un-annexed could be provided if new sewer lines are placed and a lift station is installed in order to deliver the wastewater to the existing sewer system at the intersection of Country Rd. and N Refugio Rd. Alternatively, these potential contributors could feed into the trunk line on North Refugio Rd. The trunk line has enough capacity to incorporate all of these northern properties not currently serviced considering future expansion and incorporation.
- Samantha Drive - Due to topography the section colored in light blue in figure 3-1 will likely be tied into the existing sewer on Samantha Dr.
- Calzada Avenue - The homes on Camino Arroyo and Mustang Drive were not included in the study flowrates, but can be connected to the existing District sewer system at a future date.
- Highway 246 Eastern End - The homes along Highway 246 in this area are too low to flow by gravity into this system, and were not considered in the final flow amounts for the study. They will need to connect to the existing gravity system to the east.
- Highway 246 Western End - The properties on Echo Lane and the long driveway just to the west are both able to contribute to the gravity main on Highway 246, so the flows were not considered in the scope of this study.
- South of Highway 246 - The properties south of Highway 246, with the exception of the Golden Inn and Valley Gardens, were not part of this effort and will require a lift station to tie into the gravity line on Highway 246. A separate capacity study will have to be prepared should those areas decide to move forward with a gravity sewer system and a lift station.
- Stadium Place - Due to topography the homes at the south end of Stadium Place will require a sump pump to contribute to the proposed sewer system. For conservative reasons, the tributary calculations were preformed including these properties, and assuming private pumps connecting them to the gravity line. The homes on this street are currently included in Phase 1, but if the homes south of Stadium Place ultimately connect to the gravity sewer on Highway 246, the

homes could possibly be routed to the south and connect via an easement agreement to the Highway 246 sewer.

- Calle Pico Court - The homes at the end of Calle Pico Ct were too low to connect to Refugio Road, but can connect to the easement sewer at the rear of their property. These homes were accounted for in the final flow amounts in the study via the easement pipeline south of Horizon.

Even though all of the above contributors may not connect to the ultimate installed sewer, the areas that could potentially connect were all accounted for in the volumetric flowrate calculations to ensure that the flow would not surpass the capacity of the system at a later date.

4. EXISTING FACILITIES

There currently exists a 12-inch trunk sewer in State Highway 246 at Refugio Road which provides for a point of connection for the proposed sewer system in this study. This trunk sewer flows west for approximately 4 miles and eventually terminates at a lift station that pumps to the Solvang waste water treatment plant on Alisal Road. The waste water treatment plant currently operates at 0.68 MGD, of which Santa Ynez contributes approximately 0.144 MGD.

The District has an existing collection system on the east side of town that consists of approximately 12 miles of pipe. This flows by gravity to a wet well in the lift station on State Highway 246.

The District operates the lift station that conveys sewage to the 12-in trunk sewer along State Highway 246. The lift station is located near the entrance to the Chumash Casino, adjacent to Hwy 246. The casino entrance is located just east of Cuesta Street along Hwy 246. An 8-inch force main extends from the lift station to Refugio Road, where it terminates in a manhole and flows by gravity down to the Solvang WWTP.

The Chumash Casino also has facilities that are maintained by the District. Specifically these facilities are a gravity collection system and lift station discharge to an onsite Wastewater Treatment Plant, which is operated by District personnel. The Chumash are allotted 0.088 MGD capacity in the City of Solvang WWTP and continue to maintain a physical connection to the District to convey it for them should there ever be a need. This allows them the ability to discharge up to this amount of wastewater to the City of Solvang WWTP. Both the District and the Chumash Tribe benefit from this emergency connection for sewage bypass in the case of any event or need for assistance that could affect either entity.

The District will utilize the Golden Inn lift station and wet well to convey sewage from the SOI area to the gravity sewer line in Highway 246. The District will own, operate and maintain this lift station once the Golden Inn project is complete. The District also has easements for the 8” gravity lines within the Golden Inn property. The proposed gravity sewer for the study area will ultimately connect to the Golden Inn’s pipeline via a jack and bore under state Highway 246 which is currently being constructed. Everything will flow by gravity to the wet well, and get pumped up to the manhole in the intersection of Refugio Road and Highway 246. The pumping capacity of the lift station is 135 gpm, and the total volume of the wet well is 7,135 gallons, of which 6,288 gallons is emergency storage. This gives the District approximately 47 minutes to evacuate the emergency storage volume in the event of a power failure.

5. SEWAGE GENERATION

Sewage Generation and most developed flow rate quantities were determined by using the peak flow coefficient method. For all properties with dwelling units, the sewer expansion flowrate were developed using the guidelines spelled out in the “Design and Construction Standards for Public Sewage System Improvements for Santa Ynez”, dated January 2012. Average Dry Weather Flows (ADWF) were calculated based on the 100 gallons per person per day. Each dwelling unit was accounted for a based on the 2014 US Census data for the City of Solvang, 2.15 persons per dwelling unit was used.
The final results with pipe sizes and alignments were developed using the Peak Wet Weather Flows (PWWF). The PWWF are calculated by multiplying the ADWF by an inflow and infiltration factor of 3. Using the PWWF flow values the pipe sizes are more conservative for the wet year event.
Please note two potential sewage contributors not included in the study are the Santa Ynez Valley Union High School and the Santa Ynez Valley YMCA, as they are already annexed into the existing system on Highway 246. One other exception had to be made for the study for the Sanja Cota Motor Lodge on Hwy 246. Each room of the Motor Lodge was considered a dwelling unit and the peak flow coefficient assumptions were used to develop tributary flow for this property.

6. SEWER DESIGN

Design of sewer facilities contained in this study is in accordance with the criteria set forth in the “Design and Construction Standards for Public Sewage System Improvements” published by the District in January 2012. All sizing, routing and location, and associated costs are reasonable approximations since design of the sewer facilities presented in this study are preliminary in nature. As the project develops, adjustments and fine-tuning to the final design may be made during the preparation of final drawings and specifications.

6.1 Basis of Planning

The projection of sewage flows developed in the sewage generation tables reflect an estimate of the total sewage flow contributory by each phase assuming that each phase is developed to capacity. Therefore all sewer facilities presented in this study are appropriately sized for planned maximum development based on those flow projections.

6.2 Layout of Projects

All elements of the sewer master plan described within this report are laid out to serve the planned maximum development of the areas under consideration. In this context, the term “maximum development” refers to the conditions of complete utilization of the land within the study area in accordance with the planned zoning development.

6.3 Use of Existing Facilities

The layout of all proposed sewer facilities is designed such that they may transport and dispose of all accumulated sewage into the existing trunk sewer. Consideration has been given as to not exceed the trunk sewer capacities per the guideline given in “Design and Construction Standards for Public Sewage System Improvements for Santa Ynez”, dated January 2012.

6.4 Design Criteria

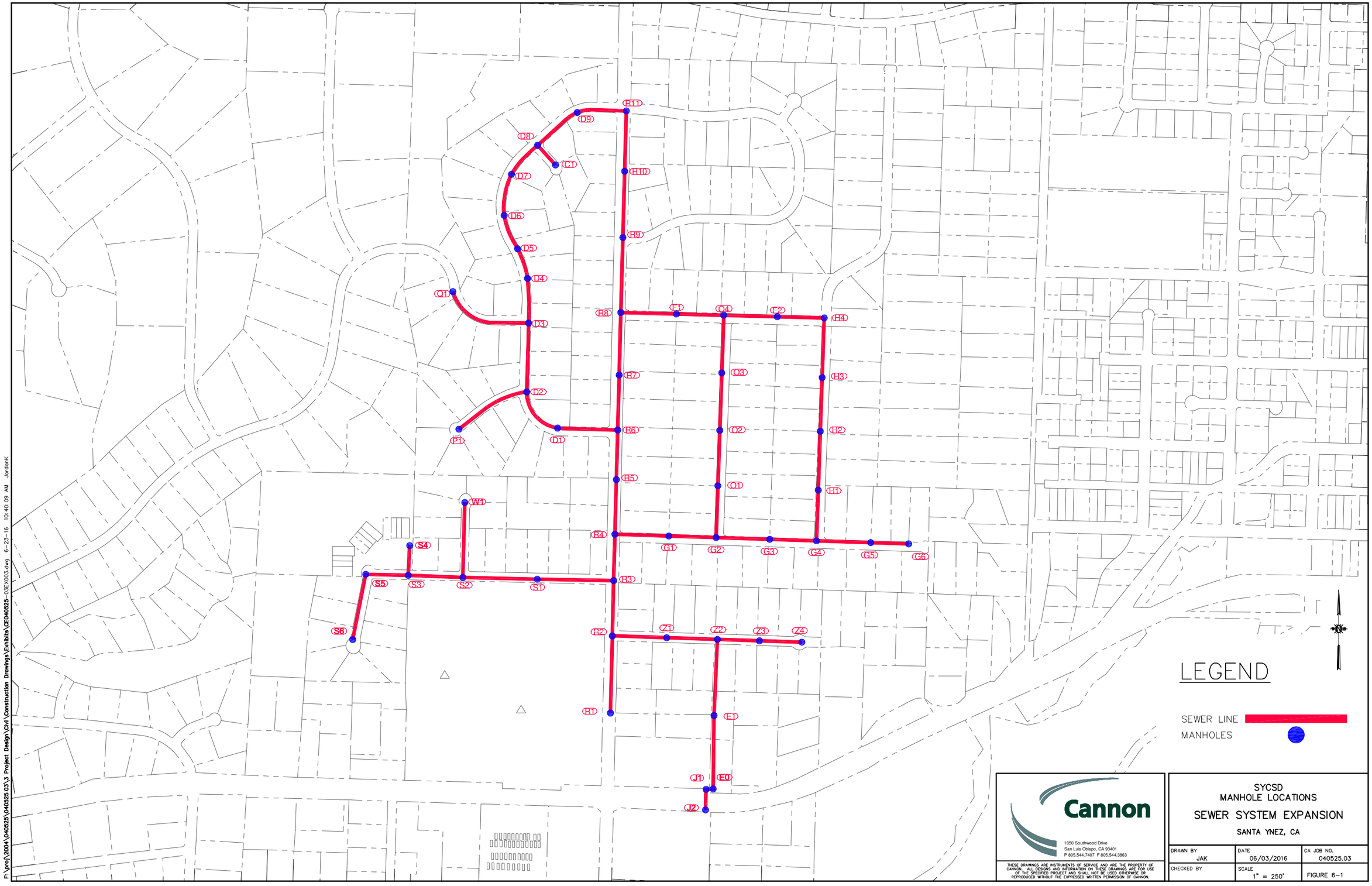
The ability of a sewer to transport suspended solids contained in sewage is dependent upon the velocities of flow within the sewer. Velocities of 2 feet per second are considered to be the minimum which will prevent deposition and to keep the pipe self-cleansed. Maximum velocities limited to 9 feet per second in order to safeguard the pipe against grit erosion.

In general, the gravity sewers discussed in this report are laid out to provide the required minimum velocity of 2 feet per second. Capacities of the proposed sewers were determined by means of the Manning's Formula using a roughness coefficient of 0.009. Pipe sizes are established such that pipes 12 inches in diameter and smaller are limited to flowing half-full, and pipes 15 inches in diameter and larger are limited to flowing three-quarters full under peak flow conditions. Pipe flow calculations using Manning’s Equation are included in Appendix A. All proposed sewer pipe material to be comprised of Polyvinyl Chloride (PVC) per the District Standards. Manhole design criteria are based on District Standards and Standard Drawings.

6.5 Manholes

The manholes were strategically placed at intersections following the criteria spelled out in the Design and Construction Standards for Public Sewage System Improvements for Santa Ynez. Where possible the manholes were spaced no more than 400 ft. apart. The following exhibit (Figure 6-1) shows the preliminary manhole locations.

FIGURE 6-1
MANHOLE KEY



LEGEND

SEWER LINE

MANHOLES

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SYCSD
MANHOLE LOCATIONS
SEWER SYSTEM EXPANSION
SANTA YNEZ, CA

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CHECKED BY	SCALE	FIGURE 6-1
	1" = 250'	

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7. CONCLUSIONS

Based the information developed, sewer service can be provided to the entire area of study. There are a number of pockets, as identified in figure 3-1, which will require additional planning and facility development to make a reality. The central portion of the study area lends itself well to a gravity sewer system, and can be developed immediately by connecting to the Golden Inn lift station. In final design the details of the sewer design and layout can be finalized.

Other areas outlined in Figure 3-1 will have to find alternate methods to provide sewer to those properties as mentioned in section 3.2.

8. ADDITIONAL CONSIDERATIONS

This study has many components and considerations that will influence the direction forward. When the west side of Santa Ynez is connected to the existing system the additional tributary flows identified will affect existing systems.

There are three main considerations that need to be accounted for to determine the capability of the entire system to handle the new flows. They are as follows:

- Capacities of the Golden Inn lift station.
- If the Highway 246 gravity main can adequately handle the additional flows safely and effectively.
- Capacity limitations for the District's discharge to the City of Solvang Waste Water Treatment Plant.

8.1 Capacities of the Golden Inn lift station

Seeing the need for a regional facility to collect tributary flows form the west side of Santa Ynez, the District coordinated with the Golden Inn to size a facility that could serve this purpose. The Golden Inn has an anticipated sewage output of 35 gpm (0.050 MGD). Based on the results of the study the west side of Santa Ynez has a max flowrate of approximately 96 gpm (0.138 MGD) therefore the lift station of 135 gpm (0.193 MGD) is adequately sized at peak wet weather flowrates to handle the combined flow.

8.2 Capacity of the existing infrastructure

The 12" gravity line from Hwy 246 and Refugio Rd. to the City of Solvang WWTP has a few limitations to note shown in the below table:

Highway 246 Gravity Sewer Limitations

	½ Capacity Max. Flow Rate	¾ Capacity
1,000 ft. section of pipe with a slope of .004.	470 gpm (0.68 MGD)	860 gpm (1.24 MGD)
Remainder of Pipe with a slope of .006.	576 gpm (0.83 MGD)	1,050 gpm (1.51 MGD)

The two contributors to this line are the Golden Inn which has a rated capacity of 135 gpm (.193MGD), and the Hwy 246 lift station which has a rated capacity of 450 gpm (.648 MGD). The total rated capacity of both lift stations is 585 gpm (.842 MGD).

Based on the results of this study an additional 585 gpm (.842 MGD) will exceed the pipe fill criteria of 50% full for the 12" gravity line for the 1,000 ft. section noted above. Please reference the cited record drawings from stations 140+00 to 128+50. Operation of both lift stations simultaneously at rates will compromise the criteria at maximum flow rates. But, the gravity line to Solvang WWTP has no connections or laterals so the pipe could possibly operate at greater than ½ capacity at maximum flow rate. Occasionally running between ½ and ¾ full would not cause any operational concerns for this portion of pipe line.

8.3 District Capacity from the City of Solvang

The capacity of the Solvang WWTP has a WDR Permit Capacity of 1.5 MGD. The District currently has the ability to discharge up to 0.300 MGD to the City of Solvang. 0.088 MGD of that is reserved for the Chumash Casino, leaving 0.212 MGD available to the District. In anticipation of adding sewer service to the west side of Santa Ynez the District has requested an additional 0.120 MGD from the City of Solvang. If the City of Solvang were to sell an additional 0.120 MGD to the District, the District would have an available allotment of 0.420 MGD, leaving the City of Solvang with the remainder of 1.08 MGD. There will have to be operational considerations for the lift stations when sending flow to the Solvang WWTP in order to not exceed the pipeline capacity, but the projected flow rates are well within this allotment. Should the City of Solvang elect not to sell additional capacity to the District, they will be limited in how many homes can connect to the system until additional capacity is obtained. The following chart shows the current and projected flows from the District.

Current and Projected District Use

	Current Use	Future Maximum Estimated Use
The District	0.144 MGD	0.144 MGD
Chumash Casino	0.088 MGD	0.088 MGD
Golden Inn	N/A	0.050 MGD
The District west side	N/A	0.138 MGD
Totals	**0.232 MGD**	**0.420 MGD**

This draft study encompasses the initial design of the collection system for the west side of Santa Ynez which has been shown to have adequate capacity with the final tributary amount of 0.138 MGD. Based on the approximate available allotment of .420 MGD there should be sufficient capacity. If the District gets with 5% of their limit they will have to reassess their needs or request additional capacity from the City of Solvang, but based on build-out projections it is not anticipated that the District will surpass their full allotment amount.

Appendix A

Sewage Generation and Sizes

SYCSD

Sewer Capacity Analysis

Downstream MH	Upstream MH	Distance	Size (in.)	Slope	Invert D/S	Invert U/S	DS MH Surface El	Depth	Pipe Capacity (cfs)	Pipe Capacity (gpm)	Homes	Tributary Flow (gpm)	Cumulative Flow (gpm)	% Full
F2	H4	294	8	0.40%	642.47	643.64	656	13.53	0.55	248.39	2	0.90	0.90	0.36%
O4	F2	336	8	0.40%	641.13	642.47	655	13.87	0.55	248.39	2	0.90	1.79	0.72%
F1	O4	297	8	0.40%	639.94	641.13	651	11.06	0.55	248.39	2	0.90	2.69	1.08%
R8	F1	348	8	0.40%	638.55	639.94	655	16.45	0.55	248.39	2	0.90	3.58	1.44%
H3	H4	374	8	0.40%	636.91	638.41	659	22.09	0.55	248.39	5	2.24	2.24	0.90%
H2	H3	337	8	0.40%	635.56	636.91	654	18.44	0.55	248.39	4	1.79	4.03	1.62%
H1	H2	369	8	0.40%	619.09	620.56	645	25.91	0.55	248.39	4	1.79	5.82	2.34%
G4	H1	318	8	0.40%	610.82	612.09			0.55	248.39	3	1.34	7.17	2.89%
O3	O4	361	8	0.40%	634.43	635.87	650	15.57	0.55	248.39	5	2.24	2.24	0.90%
O2	O3	360	8	0.40%	620.99	622.43	646	25.01	0.55	248.39	4	1.79	4.03	1.62%
O1	O2	347	8	0.40%	609.60	610.99	635	25.40	0.55	248.39	5	2.24	6.27	2.52%
G2	O1	324	8	0.40%	608.30	609.60			0.55	248.39	4	1.79	8.06	3.25%
G5	G6	319	8	0.40%	619.18	620.45	639	19.82	0.55	248.39	9	4.03	4.03	1.62%
G4	G5	340	8	0.40%	617.82	619.18	643	25.18	0.55	248.39	4	1.79	5.82	2.34%
G3	G4	293	8	0.40%	609.65	610.82	630	20.35	0.55	248.39	2	0.90	13.89	5.59%
G2	G3	336	8	0.40%	608.30	609.65	632	23.70	0.55	248.39	2	0.90	14.78	5.95%
G1	G2	296	8	0.40%	607.12	608.30	630	22.88	0.55	248.39	2	0.90	23.74	9.56%
R4	G1	338	8	0.40%	605.77	607.12			0.55	248.39	2	0.90	24.64	9.92%
U1	Unannexed and unserviced properties north of Country Road (included for pipeline sizing - will be removed from overall flow total at end)										31	13.89		

SYCSD

Sewer Capacity Analysis

Downstream MH	Upstream MH	Distance	Size (in.)	Slope	Invert D/S	Invert U/S	DS MH Surface El	Depth	Pipe Capacity (cfs)	Pipe Capacity (gpm)	Homes	Tributary Flow (gpm)	Cumulative Flow (gpm)	% Full
D8	C1	167	8	0.40%	660.74	661.41	686	25.26	0.55	248.39	3	1.34	1.34	0.54%
D7	D8	246	8	0.40%	659.75	660.74	673	12.82	0.55	248.39	4	1.79	3.14	1.26%
D6	D7	266	8	0.40%	650.69	651.75	660	9.15	0.55	248.39	3	1.34	4.48	1.80%
D5	D6	226	8	0.40%	639.79	640.69	659	18.74	0.55	248.39	3	1.34	5.82	2.34%
D4	D5	197	8	0.40%	636.00	636.79	655	19.18	0.55	248.39	2	0.90	6.72	2.70%
D3	D4	280	8	0.40%	626.88	628.00	645	17.70	0.55	248.39	2	0.90	7.61	3.07%
D3	Q1	591	8	0.40%	626.88	629.24	664		0.55	248.39	6	2.69	2.69	1.08%
D2	D3	432	10	0.28%	625.67	626.88	636	10.22	0.84	376.80	4	1.79	12.09	3.21%
D2	P1	493	10	0.28%	625.67	627.05	0		0.84	376.80	9	4.03	4.03	1.07%
D1	D2	325	10	0.28%	624.76	625.67	639	14.09	0.84	376.80	2	0.90	17.02	4.52%
R6	D1	377	10	0.28%	623.71	624.76	648	23.79	0.84	376.80	3	1.34	18.36	4.87%
R11	D9	310	8	0.40%	659.70	660.94	664	17.10	0.55	248.39	3	1.34	1.34	0.54%
R10	R11	378	8	0.40%	652.19	653.70	669	17.10	0.55	248.39	3	1.34	16.57	6.67%
R9	R10	415	8	0.40%	642.53	644.19	661	18.28	0.55	248.39	3	1.34	17.92	7.21%
R8	R9	496	8	0.40%	638.55	640.53	655	16.10	0.55	248.39	3	1.34	19.26	7.75%
R7	R8	366	8	0.40%	637.08	638.55	654	16.95	0.55	248.39	4	1.79	24.64	9.92%
R6	R7	345	8	0.40%	629.71	631.08	648	17.79	0.55	248.39	5	2.24	26.88	10.82%
R5	R6	311	10	0.28%	622.84	623.71	640	17.41	0.84	376.80	2	0.90	46.14	12.24%
R4	R5	382	10	0.28%	605.77	606.84	633	27.39	0.84	376.80	5	2.24	48.38	12.84%
R3	R4	251	10	0.28%	605.06	605.77	629	23.72	0.84	376.80	0	0.00	73.01	19.38%

SYCSD

Sewer Capacity Analysis

Downstream MH	Upstream MH	Distance	Size (in.)	Slope	Invert D/S	Invert U/S	DS MH Surface El	Depth	Pipe Capacity (cfs)	Pipe Capacity (gpm)	Homes	Tributary Flow (gpm)	Cumulative Flow (gpm)	% Full
S5	S6	418	8	0.40%	611.73	613.40	622	10.27	0.55	248.39	9	4.03	4.03	1.62%
S3	S5	251	8	0.40%	610.62	611.63	624	13.15	0.55	248.39	12	5.38	9.41	3.79%
S3	S4	186	8	0.40%	610.62	611.37	624	13.15	0.55	248.39	1	0.45	0.45	0.18%
S2	S3	342	8	0.40%	609.15	610.52	623	13.60	0.55	248.39	2	0.90	10.75	4.33%
S2	W1	469	8	0.40%	609.15	611.03	624	14.62	0.55	248.39	5	2.24	2.24	0.90%
S1	S2	466	8	0.40%	607.19	609.05	625	17.58	0.55	248.39	3	1.34	14.33	5.77%
R3	S1	481	8	0.40%	605.16	607.09	629	23.62	0.55	248.39	4	1.79	16.13	6.49%
R2	R3	347	10	0.28%	604.09	605.06	625	21.12	0.84	376.80	2	0.90	90.03	23.89%
R2	R1	483	8	0.40%	604.09	606.02	619	14.45	0.55	248.39	5	2.24	2.24	0.90%
Z1	R2	339	10	0.28%	603.05	603.99	619	15.49	0.84	376.80	4	1.79	94.06	24.96%
Z2	Z1	318	10	0.28%	602.05	602.95	617	14.87	0.84	376.80	6	2.69	96.75	25.68%
Z3	Z4	266	8	0.40%	603.21	604.27	619	15.48	0.55	248.39	2	0.90	0.90	0.36%
Z2	Z3	263	8	0.40%	602.05	603.11	617	14.95	0.55	248.39	4	1.79	2.69	1.08%
E1	Z2	477	10	0.28%	600.62	601.95	613	11.91	0.84	376.80	0	0.00	99.44	26.39%
E0	E1	459	10	0.28%	599.23	600.52	606	6.37	0.84	376.80	23	10.30	109.74	29.12%
J1	E0	47	10	0.28%	599.00	599.13	604	5.01	0.84	376.80	0	0.00	109.74	29.12%
		3.49	mi.										-13.89	(U1)
													95.85	gpm

Appendix B

Reference Documents

1. Onsite Wastewater Treatment Systems Local Agency Management Program prepared by the Santa Barbara County Public Health Department Environmental Health Services, revision 1 dated 07/21/15
2. Design and Construction Standards for Public Sewage System Improvements for Santa Ynez, dated 2012.
3. Improvement Plans for the Santa Ynez Community Services District, dated 1979.
4. Golden Inn & Village Public Sewer Improvements, dated June 29, 2015.