Appendix O

Sewer Service Analysis for the Harmon Ranch Project

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

SEWER SERVICE ANALYSIS
FOR THE
HARMON RANCH PROJECT
IN THE
CITY OF POWAY

September 5, 2023

2234 FARADAY AVENUE • CARLSBAD, CA • (760) 438-4422

SEWER SERVICE ANALYSIS
FOR THE
HARMON RANCH PROJECT
IN THE
CITY OF POWAY

September 5, 2023

9-5-23

Prepared by:
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Job No. 663-079

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September 5, 2023

663-079

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16465 Via Esprillo, Suite 150
San Diego, CA 92127

Attention: David Shepherd, Director of Entitlements

Subject: Sewer Service Analysis for the Harmon Ranch Project in the City of Poway

Introduction

This report provides an analysis of sewer service for the Harmon Ranch project. The project is located along Oak Knoll Road, south of Poway Road, and west of Carriage Road in the southwest portion of the City of Poway. Figure 1 provides a vicinity map for the project.

The project encompasses 11.5 acres and includes 64 single family detached dwelling units. Primary access to the project site is planned via existing Oak Knoll Road, and secondary emergency access is planned via Roca Grande Drive. Four of the dwelling units will be located south of Oak Knoll Road and the remaining 60 dwelling units will be located north of Oak Knoll Road. Pad elevations for the project range from 448 feet to 469 feet. Sewer service to the Harmon Ranch project will be provided by the City of Poway.

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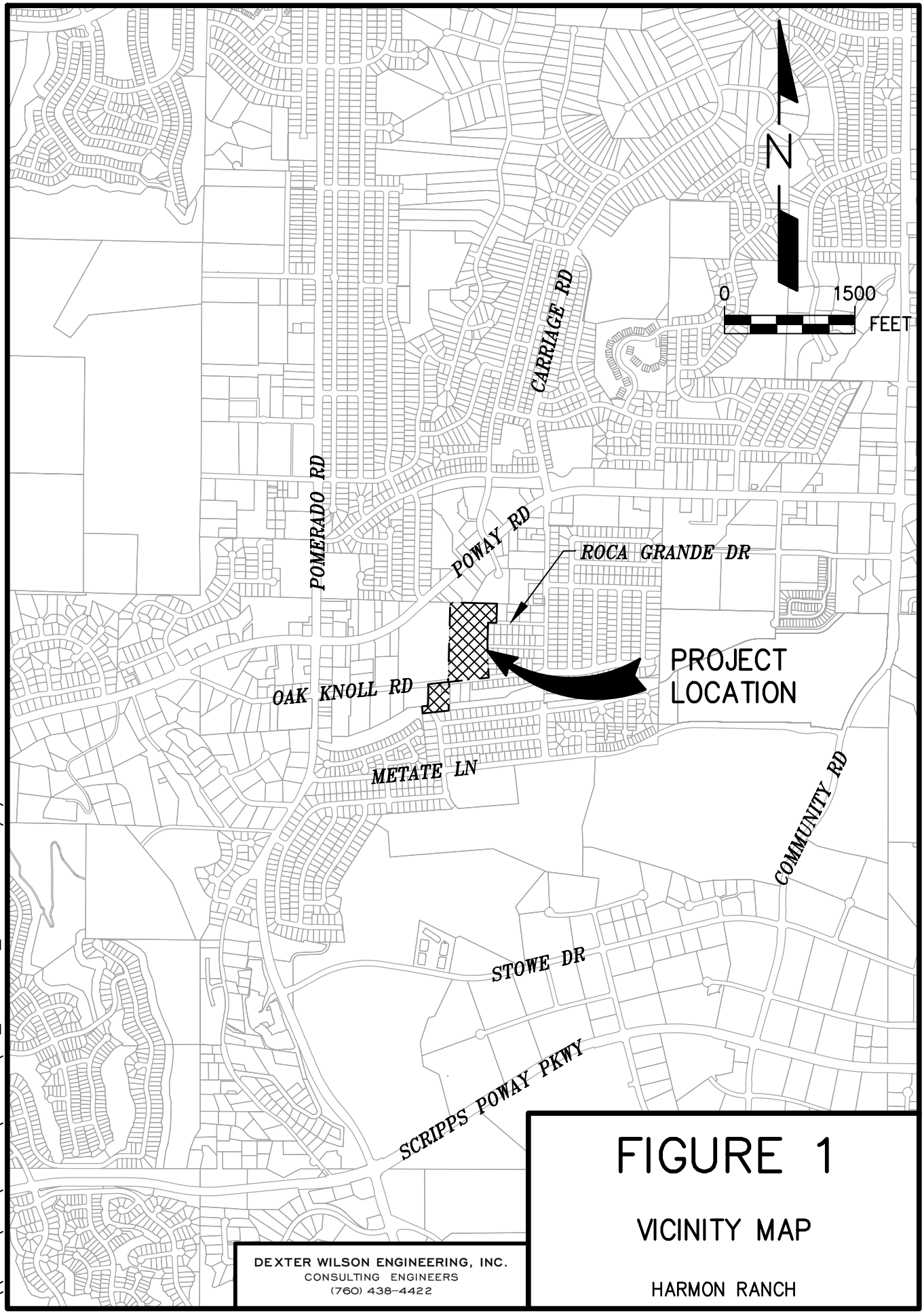

\\ARTIC\DWG\663079\REPORT\OK_FIGURE-1_VCMAP.DWG 9/5/2023 3:16:44 PM LAYOUT:8x11 USER:Fernando

DEXTER WILSON ENGINEERING, INC.
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(760) 438-4422

FIGURE 1

VICINITY MAP

HARMON RANCH

Sewer System Planning Criteria

The planning criteria used to evaluate the sewer system requirements for the Harmon Ranch project are in accordance with the City of Poway Sanitary Sewer Master Plan, dated February 2013 (City of Poway 2013 Sewer Master Plan).

Gravity Sewers. Public gravity sewer lines are to be 8-inch in diameter minimum and are to be designed for a minimum velocity of 2.0 feet per second at peak flow. Where a velocity of 2.0 feet per second cannot be achieved, a minimum pipe slope of 1.0 percent is recommended. Gravity sewer lines are evaluated using Manning's Equation with a roughness coefficient "n" of 0.013. Gravity sewers that are smaller than 18-inches in diameter are sized to convey peak dry weather flows with a maximum depth-to-diameter (d/D) radio of 0.50 and peak wet weather flows with a maximum depth-to-diameter (d/D) ratio of 0.90.

Sewer Generation and Peaking Factors

Sewer generation for the Harmon Ranch project was estimated using the sewer generation factors provided in the City of Poway 2013 Sewer Master Plan. Table 1 summarizes the sewer generation factor utilized in this study.

TABLE 1
HARMON RANCH
SEWER GENERATION FACTOR

Land Use	Sewer Generation Factor
Single Family Residential	215 gpd/DU

The City of Poway 2013 Sewer Master Plan does not have peaking factor curves. Peaking factors were determined using metering data provided in the City of Poway 2013 Sewer Master Plan as described in the subsections below.

Peak Dry Weather Peaking Factor. To convert average dry weather flow to peak dry weather flow a peaking factor of 1.67 is used. The peaking factor is based on Temporary Meter Basin B flow monitoring data which encompasses the study area of this report. Table 2 presents the calculation of the peak dry weather flow peaking factor of 1.67.

TABLE 2 PEAK DRY WEATHER FLOW (PDWF) PEAKING FACTOR CALCULATION
Average Dry Weather Flow [1] = 1.41 mgd
Peak Dry Weather Flow [2] = 2.35 mgd
PDWF Peaking Factor = 2.35/1.41 = 1.67

[1] City of Poway 2013 Master Plan Table 3-1 (see Appendix A)
[2] City of Poway 2013 Master Plan Table 4-2 (see Appendix A)

Peak Wet Weather Peaking Factor. To convert average dry weather flow to peak wet weather flow a peaking factor of 3.25 is used. Monitoring data for peak wet weather flow were not provided for Temporary Meter Basin B as the metering was short term in nature and did not capture wet weather flows. As such, the peak wet weather flow peaking factor is based on the permanent meter basin in which the study area resides, PO2. Table 3 below presents the calculation of the peak wet weather flow peaking factor of 3.25.

TABLE 3 PEAK WET WEATHER FLOW (PWWF) PEAKING FACTOR CALCULATION
Average Dry Weather Flow [1] = 4.60 mgd
Peak Wet Weather Flow [2] = 14.91 mgd
PWWF Peaking Factor = 14.91/4.60 = 3.25

[1] City of Poway 2013 Master Plan Table 3-2 (see Appendix A)
[2] City of Poway 2013 Master Plan Table 4-3 (see Appendix A)

Harmon Ranch Projected Sewer Flows

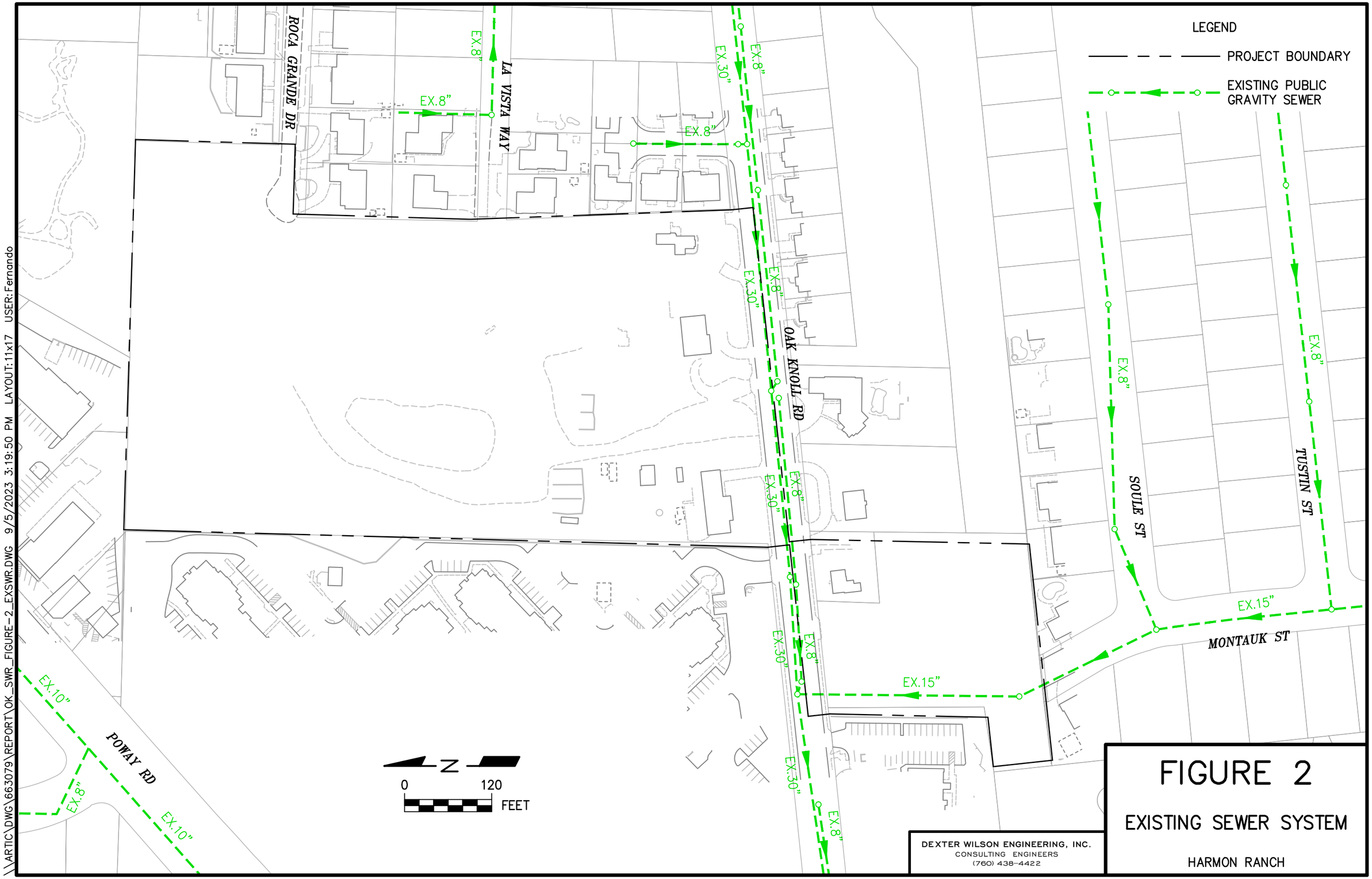
Table 4 provides the sewer flow projection for the Harmon Ranch project. As shown, the projected average flow is 13,760 gpd. The resulting projected peak flow for the project is 44,720 gpd (13,760 gpd x 3.25).

TABLE 4
HARMON RANCH
PROJECTED SEWER FLOWS

Land Use	Quantity	Unit Flow Factor	Total Average Dry Weather Flow, gpd
Residential	64 units	215 gpd/unit	13,760
TOTAL	-	-	**13,760**

Existing Sewer System

Figure 2 presents the existing sewer system in the vicinity of the project. Fronting the project in Oak Knoll Road there are existing 8-inch public gravity sewer lines and a 30-inch public trunk sewer. The existing 8-inch public gravity sewer lines convey sewer flows from existing residences along Oak Knoll Road from east to west and tie into the existing 30-inch public trunk sewer. The 30-inch trunk sewer conveys flow west in Oak Knoll Road to Pomerado Road.



\\ARTIC\DWG\663079\REPORT\OK_SWR_FIGURE-2_EXSWR.DWG 9/5/2023 3:19:50 PM LAYOUT:11x17 USER:Fernando

FIGURE 2

EXISTING SEWER SYSTEM

HARMON RANCH

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Proposed Sewer System

Figure 3 presents the proposed onsite public sewer system for the Harmon Ranch project. As shown in Figure 3, 8-inch public gravity sewer lines are proposed onsite to serve 59 of the 60 dwelling units north of Oak Knoll Road; the last unit north of Oak Knoll Road is an existing Historic Home that will maintain its existing sewer service connection to the existing 8-inch sewer line near the southeast corner of the project in Oak Knoll Road.

The proposed 8-inch public sewer lines onsite will convey sewage south from 59 dwelling units north of Oak Knoll Road to the existing 8-inch public sewer line near the southwest corner of the project in Oak Knoll Road. The 4 lots south of Oak Knoll Road will make individual lateral connections to the same existing 8-inch public sewer line near the southwest corner of the project in Oak Knoll Road. The existing 8-inch public sewer lines near the southeast and southwest corners of the project convey sewage west to the existing 30-inch public trunk sewer in Oak Knoll Road.

Sewer System Analysis

To analyze the impact of the Harmon Ranch project on the existing offsite sewer system the sewer system was analyzed under existing flow conditions and under existing flows plus proposed flow from the Harmon Ranch project. The proposed onsite public sewer lines were not evaluated in this report as improvement plans are not available at this time. The proposed onsite public sewer lines will be designed to maintain a velocity of 2.0 feet per second at peak flow. If 2.0 feet per second cannot be achieved, a minimum pipe slope of 1.0 percent will be provided. Analysis of the existing 30-inch public trunk sewer is outside of the scope of this report.

Existing flows analyzed for the existing system include three single family homes with an estimated average sewer generation of 215 gpd/unit. Existing sewer system as-builts provided in Appendix B were utilized for the analysis.

LEGEND

PROJECT BOUNDARY

EXISTING PUBLIC GRAVITY SEWER

PROPOSED PUBLIC GRAVITY SEWER

ROCA GRANDE DR

LA VISTA WAY

EX.8"

EX.30"

PVT ST 'A'

PVT ST 'B'

PVT ST 'C'

PVT ST 'D'

8"

OAK KNOLL RD

CONNECT TO EXISTING 8" SEWER LINE

SOULE ST

TUSTIN ST

EX.15"

MONTAUK ST

POWAY RD

EX.10"

N

0 120 FEET

FIGURE 3

PROPOSED SEWER SYSTEM

HARMON RANCH

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

Existing System Under Existing Flows. Appendix C presents the results of the existing sewer system analysis under existing flows. Exhibit A presents a Manhole Diagram for the system. The results for this analysis show that under existing flows the existing 8-inch public sewer line in Oak Knoll Road has a maximum depth-to-diameter ratio of 0.04. Flow velocities range from 0.6 fps to 0.8 fps.

Existing System Under Existing Plus Project Flows. Appendix D presents the results of the existing and proposed sewer system analysis under existing flow plus project flow. Exhibit A presents a Manhole Diagram for the system. The results for this analysis show that under existing plus project flows the existing 8-inch public sewer line in Oak Knoll Road increase from a maximum depth-to-diameter ratio of 0.04 to a maximum depth-to-diameter ratio of 0.16. Flow velocities in the existing system range from 1.8 fps to 1.9 fps under existing plus project flows.

Based on the results of the sewer analysis, the existing 8-inch public sewer line in Oak Knoll Road has adequate capacity for the Harmon Ranch project.

Conclusions and Recommendations

The following conclusions and recommendations are presented based on the sewer system analysis prepared for the Harmon Ranch project.

1. Sewer service to the Harmon Ranch project will be provided by the City of Poway.

2. The proposed sewer system for the Harmon Ranch project is presented in Figure 2.

3. To serve 59 of the 60 dwelling units north of Oak Knoll Road, 8-inch public gravity sewer lines are proposed onsite; the last unit north of Oak Knoll Road is an existing Historic Home that will maintain its existing sewer service connection to the existing 8-inch sewer line near the southeast corner of the project.

4. The 4 lots south of Oak Knoll Road will make individual lateral connections to the existing 8-inch public sewer line near the southwest corner of the project in Oak Knoll Road.

5. The existing offsite gravity sewer system analysis shows that the existing 8-inch public sewer line in Oak Knoll Road has adequate capacity for the Harmon Ranch project.

6. The proposed public sewer lines onsite shall be designed to meet all City of Poway requirements. Final design will be reflected on the improvement plans to be submitted for review and approval.

Thank you for the opportunity to provide sewer system planning services for this project. Please feel free to contact us to further discuss any aspect of the information presented in this sewer service analysis for the Harmon Ranch project.

Dexter Wilson Engineering, Inc.

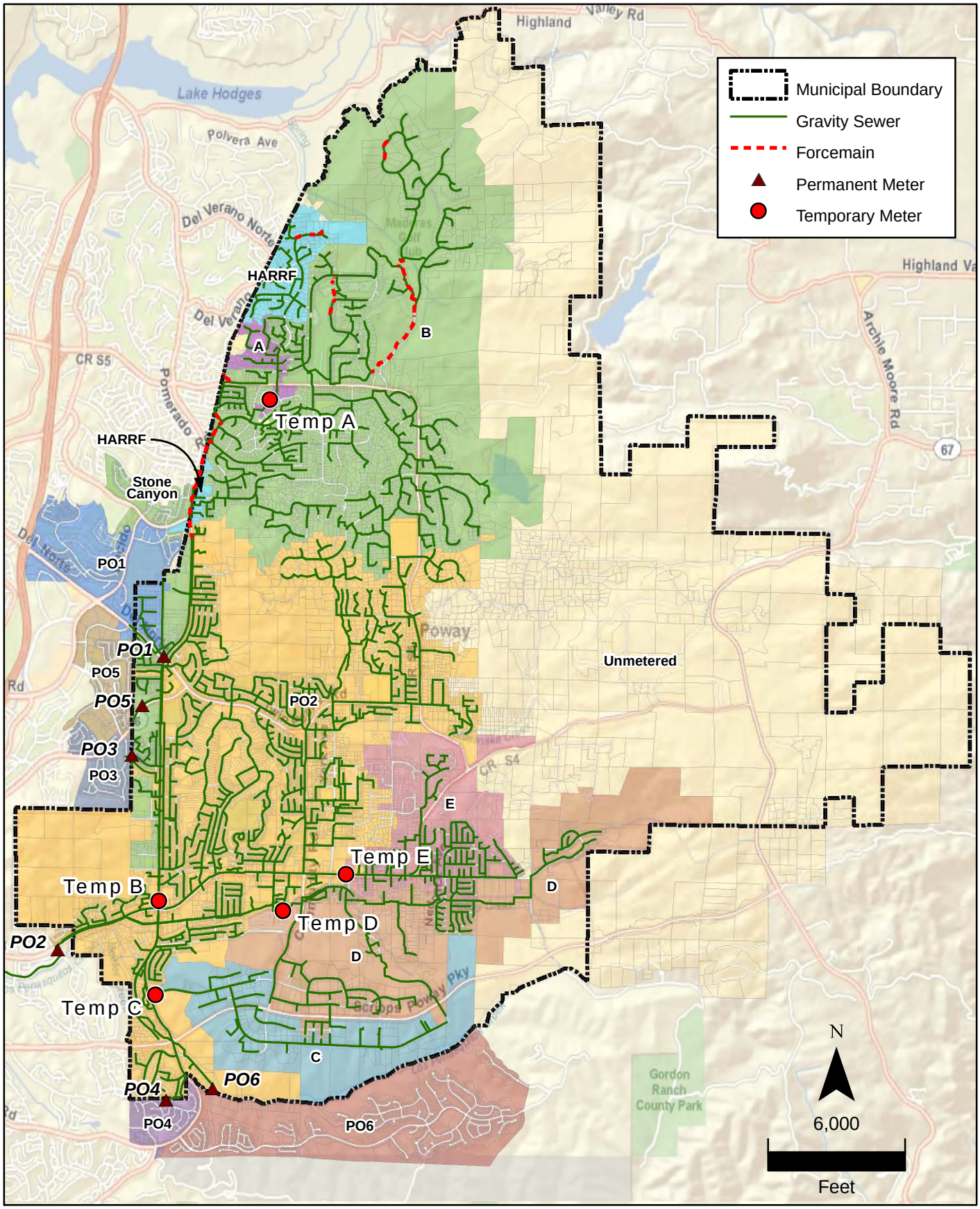
Fernando Fregoso, P.E.

FF:ah

Attachments

APPENDIX A

CITY OF POWAY
2013 SEWER MASTER PLAN EXCERPTS
PEAKING FACTOR BACKUP DATA



Flow Meter Locations

Figure 3-1

2/5/2013 LH SD Z:\Projects\IS\Poway\mxd\21812_PSMP_FlowMonitorLoc_F3-1.mxd

ATKINS

City of Poway
Sanitary Sewer Master Plan
February 2013

Chapter 3 Wastewater Generation Analysis

This chapter provides a description of the wastewater generation including:

- Existing flow meter data summary;
- Methodology for developing unit generation rates;
- Recommended unit generation rates;
- Estimated future wastewater flows; and
- Metro capacity needs.

3.1 Flow Meters

As described in Section 2.6, most of Poway's sewer flows are conveyed within the City of San Diego Metro System for disposal at either the NCWRP and/or the PLWTP. Poway's current contracted conveyance capacity within the Metro System is 5.05 million gallons per day (mgd). Sewage generated in the Pomerado and Old Winery basins are conveyed north westerly into Muni's East Bernardo Trunk Sewer and are ultimately conveyed to HARRF. Poway has 5.894 mgd of contracted treatment capacity within the Metro system, including 0.05 mgd of treatment capacity at HARRF.

The existing sanitary sewer system has one permanent flow meter located at the downstream end of the Poway system (Meter PO-2) and five permanent flow meters where City of San Diego flows are metered into the Poway sanitary sewer system. The permanent meters are maintained by the City of San Diego through their contractor ADS Environmental Services (ADS). To help characterize wastewater flows throughout the system, five temporary flow meters were placed strategically throughout Poway's sanitary sewer system to monitor flows from internal Poway areas. ADS monitored these locations for a 14-day period, from November 11 through November 24, 2011. Table 3-1 summarizes the average daily metered flow at the permanent and the temporary meters with viable data. Figure 3-1 presents the locations of the permanent and temporary meters. The ADS flow metering report and meter data are included in Appendix B.

Table 3-1 Sanitary Sewer Flows by Meter

Meter Name	Monitoring Period	Metered Average Flow (mgd)
PO1	Dec 1, 2010 - Nov 30, 2011	0.44
PO3	Dec 1, 2010 - Nov 30, 2011	0.12
PO5	Dec 1, 2010 - Nov 30, 2011	0.23
PO4	Dec 1, 2010 - Nov 30, 2011	0.15
PO6	Dec 1, 2010 - Nov 30, 2011	0.19
Meter C	Nov 11, 2011 - Nov 24, 2011	0.14
Meter D	Nov 11, 2011 - Nov 24, 2011	0.36
Meter E	Nov 11, 2011 - Nov 24, 2011	0.26
Meter B	Nov 11, 2011 - Nov 24, 2011	1.41
Meter A	Nov 11, 2011 - Nov 24, 2011	0.06
PO2	Dec 1, 2010 - Nov 30, 2011	4.60

mgd = million gallons per day

3.1.1 Metered Sewer Basins

Meter basins were delineated for all of the installed temporary and permanent flow meters and encompass all of Poway's existing connected wastewater customers. Wastewater flows generated within each meter basin were estimated from the average flows observed at each meter. In some basins, this required the deduction of flows from upstream meters. Table 3-2 summarizes the meter basins, the estimated average flow and a description of each basin. Figure 3-2 presents a flow schematic of the meter basins and flow meters in Poway's sanitary sewer system.

Table 3-2 Poway Metered Sewer Flows by Basin

Meter Name	Description	Metered Average Flow (mgd)
San Diego Basin		
PO1	San Diego West (includes La Manda area)	0.44
PO3	San Diego West	0.12
PO4	San Diego West	0.15
PO5	San Diego South	0.23
PO6	San Diego South	0.19
City Metro Basin		
Meter C	Poway Business Park	0.14
Meter D	South East Poway/ Business Park	0.36
Meter E	South East Poway	0.26
Meter B	Pomerado/ North Poway	1.41
Camino del Valle	Camino del Valle LS (pumps to Meter B)	0.62
Meter A	North Poway	0.06
PO2	Central Poway	4.60

mgd = million gallons per day
Note: Flow meter data from November 11-25, 2011.

The study area is comprised of three major sewer basins, shown in Figure 3-3: San Diego flows to Poway (San Diego Basin), Poway flows treated by HARRF (Poway HARRF Basin), and Poway flows to the Metro System (City Metro Basin). The San Diego Basin is monitored by three flow meters along the western portion of Poway (PO-1, PO-3, and PO-5) and two additional meters along the southern boundary of Poway (PO-4 and PO-6). The Poway HARRF Basin is not metered but includes two house count areas for estimating flow contributions, Old Winery and Pomerado. The Poway Metro Basin is monitored at meter PO-2, located on Poway Road west of Poway's boundary prior to entering the City of San Diego's Penasquitos Trunk Sewer.

4.8 Model Calibration

The model was calibrated by refining estimated model parameters under dry and wet weather conditions so that the simulated model flow conditions reasonably approximated the measured flow conditions. Diurnal curves were adjusted for the dry weather calibration such that simulated and recorded wastewater flow and depth hydrographs matched to within a reasonable level of accuracy. Infiltration and routing coefficients were adjusted in the wet weather calibration such that simulated and recorded wastewater peak flows matched to within a reasonable level of accuracy.

4.8.1 Dry Weather Calibration

The model was calibrated to dry-weather meter data recorded during the temporary monitoring period of November 11-25, 2011 at both the permanent and temporary flow meters. November 11, 2011 was chosen for calibration since no rain events were observed and flows were indicative of typical dry weather flow patterns. Peak flow calibration was based on the highest observed flow recorded in that month. Simulated flow hydrographs at each meter location were compared with recorded discharge measurements. The purpose of the comparison was to allow for refinement of estimated model parameters so that the simulated flow conditions reasonably approximated the measured flow conditions. These parameters generally include diurnal curve patterns and peak to average flow ratios (peaking factors).

Results of the dry weather calibration are best presented graphically, and are shown in Figures 4-4 through 4-14. The typical range of sewer volume and peak flows for dry weather model calibration is within +/– 10 percent of field measurements for master planning purposes. Table 4-2 summarizes the results of the dry weather calibration.

Table 4-2 Dry Weather Calibration Summary

Meter Name	Description	Observed Peak Flow (mgd)	Modeled Peak Flow (mgd)
San Diego Basin			
PO1	San Diego West (includes La Manda area)	0.96	0.80
PO3	San Diego West	0.25	0.27
PO4	San Diego West	0.43	0.49
PO5	San Diego South	0.28	0.29
PO6	San Diego South	0.37	0.34
Poway Metro Basin			
Meter C	Poway Business Park	0.13	0.14
Meter D	South East Poway/ Business Park	0.48	0.55
Meter E	South East Poway	0.49	0.46
Meter B	Pomerado/ North Poway	2.35	2.37
Meter A	North Poway	0.09	0.10
PO2	Central Poway	6.89	6.32

mgd = million gallons per day

Table 4-3 Wet Weather Calibration Summary

Meter Name	Description	Observed Peak Flow (mgd)	Modeled Flow (mgd)
PO1	San Diego West (includes La Manda area)	1.22	1.22
PO3	San Diego West	0.30	0.31
PO4	San Diego West	1.11	1.11
PO5	San Diego South	0.33	0.34
PO6	San Diego South	1.31	1.31
PO2	Central Poway	14.91	14.86

mgd = million gallons per day

Based on typical master planning calibration criteria, the hydraulic model is within acceptable ranges when compared to metered flow data and observed rainfall data. The model is considered a calibrated model and can be used for future planning scenarios.

4.9 Capacity Analysis

A capacity analysis of the existing collection system was performed under existing and forecasted dry and wet weather flow conditions. Model simulations were performed for the recommended 2030 wastewater generation, discussed in Chapter 3, in order to identify potential improvement projects. The identified improvement projects were then sized to accommodate the 2050 flow projections. Projects were evaluated under the existing wastewater flows to identify project priority and phasing. Identified improvement projects were also evaluated against operational concerns, such as lift station deficiencies, odor problems, and known high-frequency maintenance areas. These projects and operational concerns are presented in Chapter 5 to form the Capital Improvement Plan presented in Chapter 6.

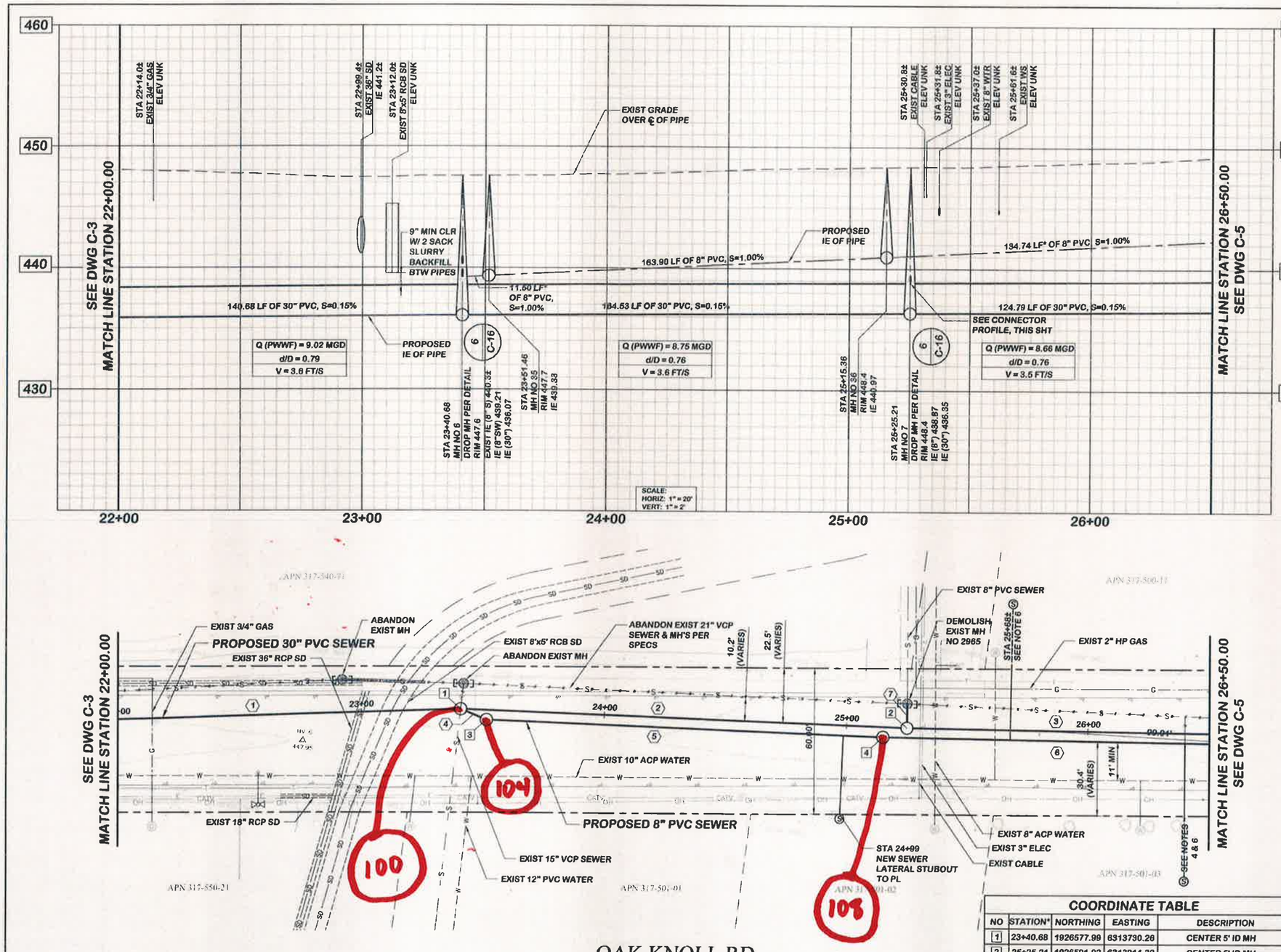
4.9.1 Lift Stations and Force Mains

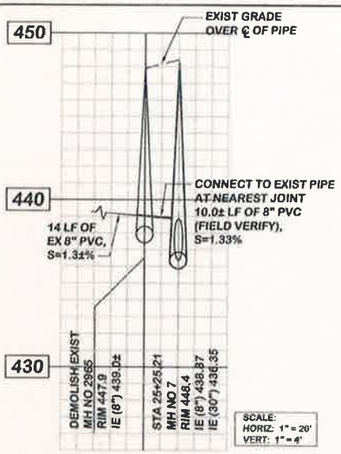
The lift stations and force mains owned and operated by Poway were evaluated under existing and projected wastewater flows based upon the criteria listed in Table 4-1. Table 4-4 summarizes the existing and future lift station pump capacities. Table 4-5 summarizes the existing and future lift station force main capacities.

Atkins reviewed lift station SCADA data for the November 11-25, 2011 and December 20-22, 2010 periods to evaluate pump performance and determine the firm pumping capacity of each lift station. Firm capacity is considered to be the maximum pumping capacity observed from SCADA data at a lift station with one pump out of service. Most of the lift stations were found to operate within the expected system head curves; however, the Camino del Valle LS data showed that pumps were operating at nearly twice the design point flows during the storm event. System head curves were compared to pump curves for each lift station and are presented in Appendix E.

APPENDIX B

EXISTING SEWER SYSTEM AS-BUILT DRAWINGS





CONNECTOR PROFILE
TO MH NO 7

NOTES:

1. UTILITY INFORMATION OBTAINED FROM AVAILABLE RECORD DRAWINGS OR UTILITY MAPS. VERTICAL ELEVATIONS ARE UNKNOWN. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATIONS AND BEARING AND INCLINATIONS SUFFICIENTLY AHEAD OF SCHEDULE TO ALLOW TIME FOR DESIGN REVISIONS IF NECESSARY. SEE ADDITIONAL POTHOLING REQUIREMENTS ON SHEET G-2.
2. UTILITY INFORMATION OBTAINED FROM POTHOLING. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATIONS AND BEARING AND INCLINATIONS SUFFICIENTLY AHEAD OF SCHEDULE TO ALLOW TIME FOR DESIGN REVISIONS IF NECESSARY. SEE ADDITIONAL POTHOLING REQUIREMENTS ON SHEET G-2.
3. LOCATION OF EXIST GAS SERVICES ARE UNKNOWN. CONTRACTOR SHALL CALL USA DIG ALERT FOR MARKOUTS AND SHALL COORDINATE WITH UTILITY OWNERS AS NECESSARY AND SHALL POTHOLE TO VERIFY HORIZONTAL AND VERTICAL LOCATIONS PRIOR TO PERFORMING THE WORK.
4. LOCATION OF SEWER LATERAL IS UNKNOWN. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATIONS AND BEARING AND INCLINATIONS SUFFICIENTLY AHEAD OF SCHEDULE TO ALLOW TIME FOR DESIGN REVISIONS IF NECESSARY.
5. CONTRACTOR SHALL RECONNECT ALL EXIST SEWER LATERALS TO NEW 8" COLLECTOR SEWER PER CITY OF POWAY STD DWG PS-13. CONTRACTOR SHALL INSTALL ALL NEW LATERALS AND MATERIALS FROM THE NEW COLLECTOR MAIN TO THE PROPERTY LINE AND SHALL MAKE CONNECTIONS TO EXISTING LATERALS WITH NEW ROMAC COUPLING, OR EQUAL, WITH 316 SS HARDWARE AND FUSION BONDED EPOXY LINING AND COATING.
6. EXIST SEWER LATERALS FROM THE PROPERTIES ALONG THE SOUTH OF OAK KNOLL ROAD MAY REQUIRE TEMPORARY RELOCATIONS PER DETAIL 2 ON SHEET C-17 TO ALLOW THE NEW CONSTRUCTION OF THE NEW TRUNK SEWER AND COLLECTOR MAINS. OTHERWISE, ALL EXISTING SEWER LATERALS SHALL BE PROTECTED IN PLACE AND SHALL REMAIN IN SERVICE AT ALL TIMES UNTIL THEY ARE RECONNECTED TO NEW COLLECTOR MAIN PER THE PHASING PLAN ON SHEET G-3.

DATA TABLE

	△/BEARING	R	L	T	DESCRIPTION
1	N82°05'05"E	-	140.68	-	30" PVC SEWER
2	N85°57'01"E	-	184.53	-	30" PVC SEWER
3	N84°38'20"E	-	124.79	-	30" PVC SEWER
4	S73°41'17"E	-	11.50**	-	8" PVC SEWER
5	N86°01'25"E	-	163.90	-	8" PVC SEWER
6	N84°40'34"E	-	134.74**	-	8" PVC SEWER
7	S05°33'42"E	-	10.00	-	8" PVC SEWER

** ACTUAL LENGTH DOES NOT CORRESPOND TO STATIONING DUE TO OFFSET FROM 30" PVC SEWER

COORDINATE TABLE

NO	STATION*	NORTHING	EASTING	DESCRIPTION
1	23+40.68	1926577.99	6313730.26	CENTER 5' ID MH
2	25+25.21	1926591.02	6313914.32	CENTER 5' ID MH
3	23+51.46	1926574.76	6313741.29	CENTER 5' ID MH
4	25+15.36	1926586.13	6313904.79	CENTER 5' ID MH

* STATIONING SHOWN IS ALONG 30" PVC SEWER

SCALE: 1" = 20'
0 10' 20'

RECORD DRAWING

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. THE INFORMATION IS NOT GUARANTEED AS CORRECT, ACCURATE, OR COMPLETE. USERS OF THIS RECORD DRAWING ARE ADVISED TO PERFORM INDEPENDENT VERIFICATION OF ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

RECORD DRAWING
Review Date
Approved Date

Infrastructure ENGINEERING CORPORATION
14271 Danielson Street
Poway, California 92064
T 858.413.2400 F 858.413.2440
www.iecorporation.com

REGISTERED PROFESSIONAL ENGINEER — KRISTA M. LEMON — No. C62255 Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

CITY APPROVED CHANGES			
No.	Description	Approved By	Date
	RECORD DRAWING REVISIONS	SML	4/09

DESIGNED	RTI	
DRAWN	RTI	
CHECKED	SML	DATE

BENCH MARK
DESCRIPTION: CITY OF POWAY BENCHMARK #A-7, 2" DIA. BRASS DISC STAMPED "POWAY A-7" IN THE TOP OF CURB
LOCATION: NORTH POINT OF CURVE OF NORTHWEST CURB RETURN OF POMERADO ROAD AND OAK KNOLL ROAD APPROXIMATELY 700 FT SOUTHERLY OF POWAY ROAD
RECORDED FROM:
1986 ADJUSTED ELEVATION: 445.325' DATUM: NGVD 29

Sheet C-4 | CITY OF POWAY, Department of Development Services | 7 of 28 Sheets

OAK KNOLL TRUNK SEWER REPLACEMENT
TRUNK & COLECTOR SEWER PLAN AND PROFILE
STA 22+00.00 TO STA 26+50.00
California Coordinate Index

Approved by City Engineer — Date 10/14/09
Frank D. Costeleneto R.C.E. 27748 EXP. 03-31-10

Approved by City Engineer — Date
Frank D. Costeleneto R.C.E. 27748 EXP. 03-31-10

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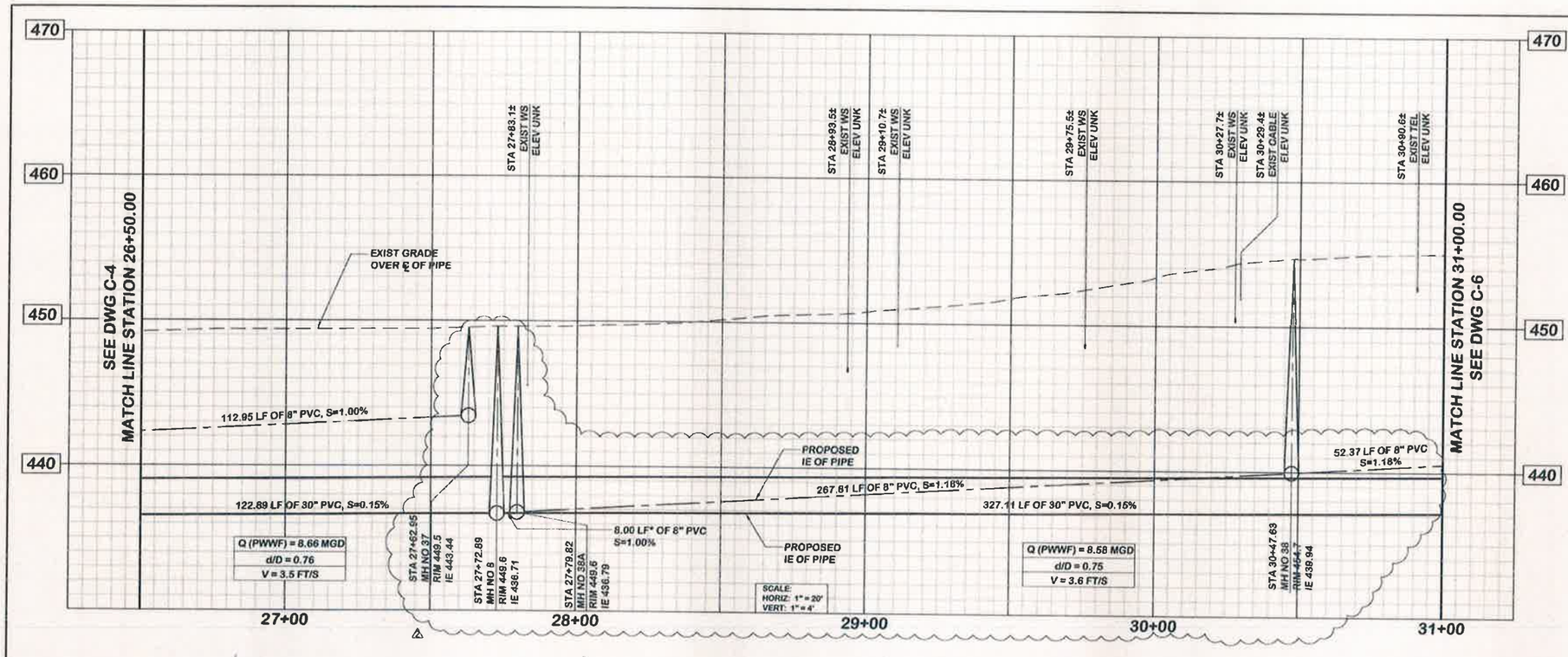
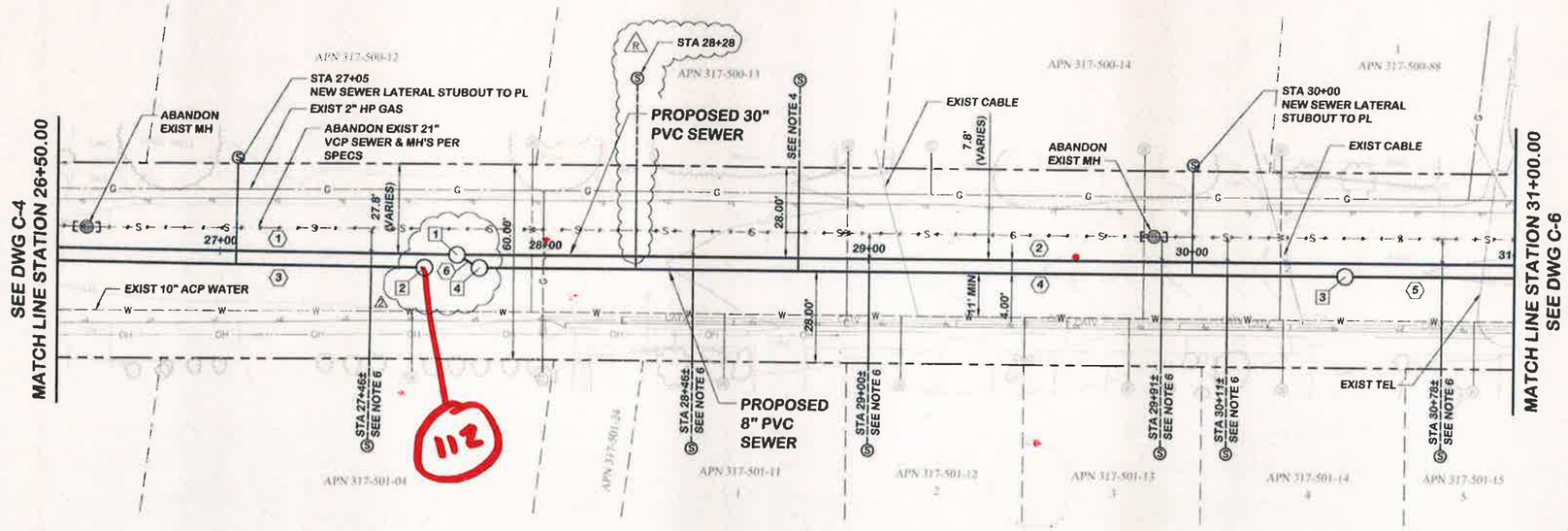
PROJECT NUMBER: 5806





NOTES:

1. UTILITY INFORMATION OBTAINED FROM AVAILABLE RECORD DRAWINGS OR UTILITY MAPS. VERTICAL ELEVATIONS ARE UNKNOWN. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATIONS AND BEARING AND INCLINATIONS SUFFICIENTLY AHEAD OF SCHEDULE TO ALLOW TIME FOR DESIGN REVISIONS IF NECESSARY. SEE ADDITIONAL POTHOLING REQUIREMENTS ON SHEET G-2.
2. UTILITY INFORMATION OBTAINED FROM POTHOLING. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATIONS AND BEARING AND INCLINATIONS SUFFICIENTLY AHEAD OF SCHEDULE TO ALLOW TIME FOR DESIGN REVISIONS IF NECESSARY. SEE ADDITIONAL POTHOLING REQUIREMENTS ON SHEET G-2.
3. LOCATION OF EXIST GAS SERVICES ARE UNKNOWN. CONTRACTOR SHALL CALL USA DIG ALERT FOR MARKOUTS AND SHALL COORDINATE WITH UTILITY OWNERS AS NECESSARY AND SHALL POTHOLE TO VERIFY HORIZONTAL AND VERTICAL LOCATIONS PRIOR TO PERFORMING THE WORK.
4. LOCATION OF SEWER LATERAL IS UNKNOWN. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATIONS AND BEARING AND INCLINATIONS SUFFICIENTLY AHEAD OF SCHEDULE TO ALLOW TIME FOR DESIGN REVISIONS IF NECESSARY.
5. CONTRACTOR SHALL RECONNECT ALL EXIST SEWER LATERALS TO NEW 8" COLLECTOR SEWER PER CITY OF POWAY STD DWG PS-13. CONTRACTOR SHALL INSTALL ALL NEW LATERALS AND MATERIALS FROM THE NEW COLLECTOR MAIN TO THE PROPERTY LINE AND SHALL MAKE CONNECTIONS TO EXISTING LATERALS WITH NEW ROMAC COUPLING, OR EQUAL, WITH 316 SS HARDWARE AND FUSION BONDED EPOXY LINING AND COATING.
6. EXIST SEWER LATERALS FROM THE PROPERTIES ALONG THE SOUTH OF OAK KNOLL ROAD MAY REQUIRE TEMPORARY RELOCATIONS PER DETAIL 2 ON SHEET C-17 TO ALLOW THE NEW CONSTRUCTION OF THE NEW TRUNK SEWER AND COLLECTOR MAINS. OTHERWISE, ALL EXISTING SEWER LATERALS SHALL BE PROTECTED IN PLACE AND SHALL REMAIN IN SERVICE AT ALL TIMES UNTIL THEY ARE RECONNECTED TO NEW COLLECTOR MAIN PER THE PHASING PLAN ON SHEET G-3.

COORDINATE TABLE

NO	STATION*	NORTHING	EASTING	DESCRIPTION
1	27+72.89	1926614.16	6314180.92	CENTER 5' ID MH
2	27+62.95	1926609.11	6314151.41	CENTER 5' ID MH
3	30+47.63	1926639.80	6314434.50	CENTER 5' ID MH
4	27+79.82	1926610.93	6314168.24	CENTER 5' ID MH

* STATIONING SHOWN IS ALONG 30" PVC SEWER

DATA TABLE

	△/BEARING	R	L	T	DESCRIPTION
1	N84°38'20"E	-	122.89	-	30" PVC SEWER
2	N83°48'43"E	-	327.11	-	30" PVC SEWER
3	N84°40'34"E	-	112.95	-	8" PVC SEWER
4	N83°48'43"E	-	284.68	-	8" PVC SEWER
5	N83°48'43"E	-	52.37	-	8" PVC SEWER
6	N66°11'17"W	-	8.00**	-	8" PVC SEWER

** ACTUAL LENGTH DOES NOT CORRESPOND TO STATIONING DUE TO OFFSET FROM 30" PVC SEWER

SCALE: 1" = 20'
0 10' 20'

RECORD DRAWING

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. THE INFORMATION IS NOT GUARANTEED AS CORRECT, ACCURATE, OR COMPLETE. USERS OF THIS RECORD DRAWING ARE ADVISED TO PERFORM INDEPENDENT VERIFICATION OF ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

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REGISTERED PROFESSIONAL ENGINEER — PATRICIA M. LEMON — No. C65255 Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

RECORD DRAWINGS
Checked _____ Date _____
Approved _____ Date _____

CITY APPROVED CHANGES			
No.	Description	Approved By	Date
2	COLLECTOR SEWER REALIGNMENT	IEC	9/17/08
1	RECORD DRAWING REVISIONS	SML	4/09

DESIGNED	RTI	
DRAWN	RTI	
CHECKED	SML	DATE

BENCH MARK
DESCRIPTION: CITY OF POWAY BENCHMARK #A-7. 2" DIA. BRASS DISC STAMPED "POWAY A-7" IN THE TOP OF CURB
LOCATION: NORTH POINT OF CURVE OF NORTHWEST CURB RETURN OF POMERADO ROAD AND OAK KNOLL ROAD APPROXIMATELY 700 FT SOUTHERLY OF POWAY ROAD
RECORDED FROM:
1986 ADJUSTED ELEVATION: 445.325' DATUM: NGVD 29

Sheet C-5 R | CITY OF POWAY, Department of Development Services | 8 of 28 Sheets

OAK KNOLL TRUNK SEWER REPLACEMENT
TRUNK & COLECTOR SEWER PLAN AND PROFILE
STA 26+50.00 TO STA 31+00.00
California Coordinate Index

Approved by City Engineer			Date
Frank D. Costeleneto	R.C.E. 27748	EXP. 03-31-10	10/1/09
Approved by City Engineer			Date
Frank D. Costeleneto	R.C.E. 27748	EXP. 03-31-10	

PROJECT NUMBER: 5806

APPENDIX C

SEWER SYSTEM ANALYSIS
EXISTING SEWER SYSTEM
EXISTING FLOWS

DATE: 7/21/2022

SEWER STUDY SUMMARY

FOR: Harmon Ranch - Existing Sewer System, Existing Flows

SHT 1 OF 1

JOB NUMBER: 663-079

BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET

LINE	FROM	TO	LENGTH (ft)	IN-LINE DUs	TOTAL DUs	SEWAGE PER DU/DAY (gpd/DU)	AVG. DRY WEATHER FLOW (gpd)	PEAKING FACTOR	PEAK FLOW (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)
										M.G.D.	C.F.S.							
	112	108		2.00	2.00	215	430	3.25	1,398	0.001	0.002	8	1.0	0.000829	0.02093	0.03	0.0074	0.66
	108	104		1.00	3.00	215	645	3.25	2,096	0.002	0.003	8	1.0	0.001243	0.02524	0.04	0.0097	0.75
	104	100		0.00	3.00	215	645	3.25	2,096	0.002	0.003	8	1.0	0.001243	0.02524	0.04	0.0097	0.75

Total EDUS
3.0

Min Slope
1.00

Max dn/D
0.04

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

APPENDIX D

SEWER SYSTEM ANALYSIS
EXISTING SEWER SYSTEM
EXISTING PLUS PROJECT FLOWS

DATE: 7/21/2022

SEWER STUDY SUMMARY

FOR: Harmon Ranch - Existing Sewer System, Existing plus Project Flows

SHT 1 OF 1

JOB NUMBER: 663-079

BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET

LINE	FROM	TO	LENGTH (ft)	IN-LINE DUs	TOTAL DUs	SEWAGE PER DU/DAY (gpd/DU)	AVG. DRY WEATHER FLOW (gpd)	PEAKING FACTOR	PEAK FLOW (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)
										M.G.D.	C.F.S.							
	112	108		62.00	62.00	215	13,330	3.25	43,323	0.043	0.067	8	1.0	0.025693	0.10665	0.16	0.0811	1.86
	108	104		4.00	66.00	215	14,190	3.25	46,118	0.046	0.071	8	1.0	0.027351	0.10990	0.16	0.0847	1.90
	104	100		0.00	66.00	215	14,190	3.25	46,118	0.046	0.071	8	1.0	0.027351	0.10990	0.16	0.0847	1.90

Total EDUS
66.0

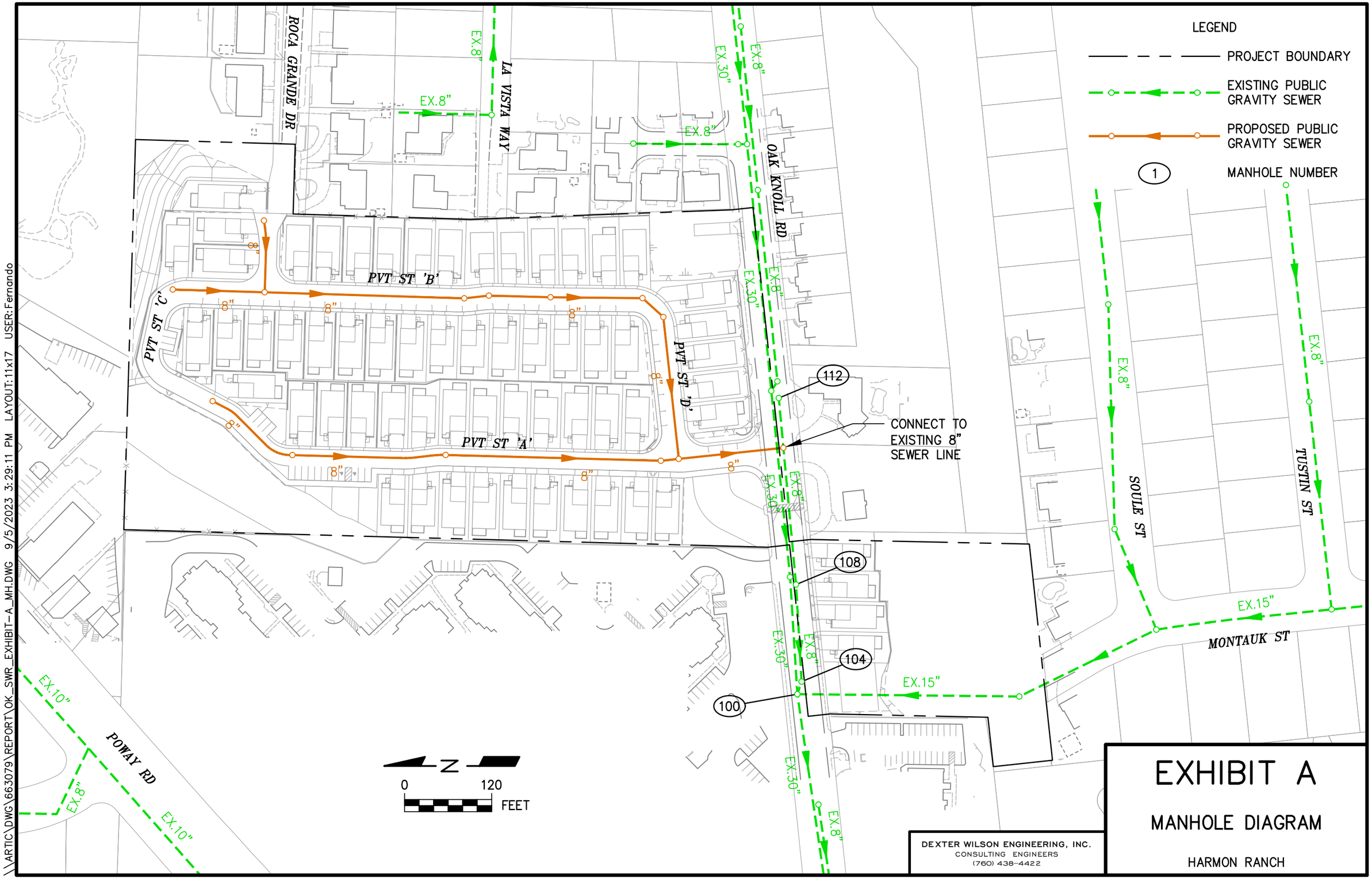
Min Slope
1.00

Max dn/D
0.16

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

EXHIBIT A

MANHOLE DIAGRAM



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