Appendix A

Placer Ranch Potable Water Final Reports



Potable Water Final Reports

- Technical Memorandum, dated October 29, 2018
- Potable Water Master Plan, dated July 18, 2017

TECHNICAL MEMORANDUM

DATE: October 29, 2018

TO: County of Placer

FROM: Curtis Lam, PE

HydroScience Engineers

SUBJECT: Addendum #1 to the Potable Water, Recycled Water, and Water Conservation Master Plans for

the Placer Ranch Specific Plan

Introduction

This Technical Memorandum functions as an Addendum to the Potable Water, Recycled Water, and Water Conservation Master Plans (Master Plans), dated July 2017, prepared for the Placer Ranch Specific Plan. Its purpose is to evaluate the differences between the Original Project and the Revised Project (based on an updated Land Use Plan, dated October 17, 2018). Together, this Addendum and its associated Master Plan provide the appropriate technical data and analysis to guide buildout of Placer Ranch's backbone infrastructure as depicted on the Revised Project's Land Use Plan.

Background

The Master Plan evaluated the infrastructure requirements for the Original Project, however in October 2018, several refinements were made to the land use plan, which resulted in the Revised Project.

These refinements generally included the following revisions to the land use plan:

- In the area west of Fiddyment Road and north of Sunset Boulevard, several land use parcels were reconfigured to shift residential and school uses outside a 2,000' buffer from the Western Regional Sanitary Landfill's properties. This resulted in the enlargement of Park parcel PR-102, a southerly shift of school parcel PR-92, the conversion of GC and HDR (parcels PR-61 and PR-42) to a Campus Park use.
- Along Maple Park Drive, MDR and HDR uses (parcels PR-32 and PR-42) were converted to LDR and MDR.
- Along Campus Park Boulevard, the PF site for a water tank (parcel PR-100) was enlarged.
- Paseo's have been adjusted in response to land plan refinements in order to maintain the east/west connectivity.
- The alignments of C Street and Maple Park Drive were shifted slightly in response to the land use adjustments described above, while maintaining the prior street pattern and connections.
- Along Fiddyment Road, Campus Park parcel PR-70 was converted to MDR.
- Within the Town Center district south of Sunset Boulevard, HDR parcels PR-50 & 51 were converted to MDR, and MDR parcels PR-35-38 were converted to LDR.
- The allocation of "floating" reserve units in the Town Center district was increased from 150 units to 300 units. These units continue to be factored as HDR units.
- South of Sunset Boulevard, the alignment of Foothills Boulevard has been shifted in an eastward direction to align with the existing Duluth Avenue corridor south of the Plan Area. As a result of this shift, LDR parcel PR-24, CP parcel PR-88, and MDR parcel PR-38 have been slightly enlarged.
- In the area south of Sunset Boulevard and east of Foothills Boulevard, MDR parcel PR-38 was enlarged to provide vehicular access to Sunset Boulevard, per the Foothill Boulevard realignment noted above. This adjustment also resulted in a portion of OS parcel PR-134 being converted to MDR.
- In the area north of Sunset Boulevard and east of Foothills Boulevard, Campus Park parcels PR-86-89 were converted to a low-density, active-adult, residential use (LDR-A), and Campus Park parcels PR-84 and 85 were reduced in size.

- A private park site was added within the active adult community north of Sunset Boulevard and east of Foothills Boulevard.
- A 100'-wide paseo has been added along the east edge of the plan area as a buffer between the active adult residential parcels and offsite industrial uses located in the Sunset Area Plan.
- East of Foothills Boulevard, Campus Park Boulevard was slightly realigned in response to the land use adjustments described above, while maintaining the east/west connectivity to the Sunset Area Plan.
- Park sites were added and/or enlarged (as described above) to increase the plan-wide park acreage in a manner that meet the General Plan's active parkland requirement of 5 ac./1,000 population.

The table below summarizes the differences between the Original Project and the Revised Project.

Table 1: Comparison of Original and Revised Land Uses and Development Assumptions

		Acreage			Dwelling Units/ Square Footage				
Land l	Jse Designation	Revised Project	Original Project	Difference	Revised Project	Original Project	Difference		
Reside	ential Uses								
LDR	Low Density Residential	446.0 ac	407.9 ac	38.2 ac	2,210 du	2,039 du	171 du		
LDR-A	Low Density Res Age-Restricted	183.1 ac	131.0 ac	52.1 ac	1,050 du	720 du	330 du		
MDR	Medium Density Residential	112.3 ac	132.3 ac	-20.0 ac	872 du	1,057 du	-185 du		
HDR	High Density Residential*	60.0 ac	93.0 ac	-33.0 ac	1,504 du	2,011 du	-507 du		
Subtote	al	801.4 ac	764.2 ac	37.3 ac	5,636 du	5,827 du	-191 du		
Comm	ercial and Employment Uses								
GC	General Commercial	22.7 ac	25.6 ac	-2.9 ac	296,513 sf	334,933 sf	-38,420 sf		
CMU	Commercial Mixed Use	48.8 ac	48.8 ac	0.0 ac	637,718 sf	637,718 sf	O sf		
CP	Campus Park	335.0 ac	395.5 ac	-60.6 ac	4,506,282 sf	5,384,152 sf	-877,870 sf		
UZ	University	301.3 ac	301.3 ac	0.0 ac	3,000,000 sf	3,000,000 sf	O sf		
Subtote	al	707.7 ac	771.2 ac	-63.5 ac	8,440,513 sf	9,356,803 sf	-916,290 sf		
Open	Space and Public Uses								
PF	Public Facilities (Schools)	32.7 ac	32.0 ac	0.7 ac					
PF	Public Facilities (County Facilities)	10.3 ac	5.5 ac	4.8 ac					
PR	Parks and Recreation	69.8 ac	50.7 ac	19.1 ac					
OS	Open Space (Preserves/Paseos)	264.8 ac	272.8 ac	-8.0 ac					
Subtote	al	377.5 ac	360.9 ac	16.6 ac					
Other									
ROW	Placer Parkway	158.5 ac	1 <i>5</i> 8.5 ac	0.0 ac					
ROW	Major Roadways & Landscape	168.1 ac	1 <i>5</i> 8.5 ac	9.6 ac					
Subtote	al	326.6 ac	317.0 ac	9.6 ac		<u> </u>			
Total		2,213.3 ac	2,213.3 ac	0.0 ac	5,636 du 8,440,513 sf	5,827 du 9,356,803 sf	-191 du -916,290 sf		

^{*} includes 300 reserve units within the Town Center district

Analysis

An evaluation of the differences between the Original Project and the Revised Project, as described in the Background section above, was conducted to determine if changes in overall project demands occurred. If warranted, additional adjustments to the Master Plan will be made when the project's first Small Lot Tentative Subdivision Map is processed by Placer County. The Original Project potable water and recycled water demands are shown in Table 2, both with and without water conservation. The potable water and recycled water demands for the Revised Project is presented in Table 3, both with and without water conservation. The difference between the values in Tables 2 and 3 is presented in Table 4.

Table 2: Potable and Recycled Water Demands - Original Project

Land Use Designation	Abbrev.	Total Area (acres)	Dwelling Units	Water Use Factor (gpd/DU-acre)	Total Demand (AFY)	Potable Demand (AFY) ¹	Potable w/ cons. (AFY) ²	RW Demand (AFY) ^{3,4}	RW w/ cons. (AFY) ^{3,4}
Residential									
Low Density Residential	LDR	407.9	2,039	429	980	980	755	0	0
Low Density Residential - Age-Restricted	LDR-A	131.0	720	429	346	346	267	0	0
Medium Density Residential	MDR	132.3	1,057	312	369	369	285	0	0
High Density Residential	HDR	93.0	2,011	143	322	262	245	60	33
Non-Residential							-		
General Commercial	GC	25.6	0	1,116	32	20	20	12	6
Commercial Mixed Use	CMU	48.8	0	1,116	61	37	37	24	11
Campus Park	СР	395.5	0	1,482	657	464	464	192	87
University (CSU Campus)	UZ	301.3	0	Varies	1,398	1,154	1,154	244	110
Public Facilities (Schools)	PF	32.0	0	1,785	64	48	48	16	7
Public Facilities (County Facilities)	PF	5.5	0	1,785	11	8	8	3	1
Parks and Recreation	PR	72.6	0	1,071	87	9	9	188	85
Open Space Preserves	OS	250.9	0	0	0	0	0	0	0
Placer Parkway	ROW	158.5	0	0	0	0	0	0	0
Major Roadways & Landscape Corridors	ROW	158.5	0	1,116	29	0	0	77	35
Totals		2,213.3	5,827		4,355	3,698	3,292	816	373

- 1. Demand removes recycled water.
- 2. Demands include total water demand minus water conservation measures for all water sources, as outlined in the Placer Ranch WCP (HydroScience, 2016).
- 3. A detailed summary of Recycled Water demand and Recycled Water conservation efforts are elaborated upon in the Placer Ranch Recycled Water Master Plan and Placer Ranch Water Conservation Plan. (HydroScience, 2016).
- 4. Recycled water demands are calculated as outlined in the DRAFT Placer Ranch Recycled Water Master Plan and differ from the methods employed in the calculation of potable water demands.
- 5. HDR land uses include 150 units that are a density bonus but not physically assigned to a specific parcel. These units were distributed amongst the Village Center parcels for modeling purposes.
- 6. Parks and Recreation includes the total acreage for this land use, not the credited acreage

Table 3: Potable and Recycled Water Demands - Revised Project

Land Use Designation	Abbrev.	Total Area (acres)	Dwelling Units	Water Use Factor (gpd/DU-acre)	Total Demand (AFY)	Potable Demand (AFY) ¹	Potable w/ cons. (AFY) ²	RW Demand (AFY) ^{3,4}	RW w/ cons. (AFY) ^{3,4}
Residential			•	•			•		
Low Density Residential	LDR	442.1	2,210	429	1,062	1,062	940	0	0
Low Density Residential - Age-Restricted	LDR-A	187.0	1,050	429	505	505	267	0	0
Medium Density Residential	MDR	112.2	872	312	305	305	235	0	0
High Density Residential	HDR	60.2	1,504	143	241	202	189	39	21
Non-Residential				•			•		
General Commercial	GC	22.7	0	1,116	28	17	17	11	5
Commercial Mixed Use	CMU	48.8	0	1,116	61	37	37	24	11
Campus Park	СР	331.0	0	1,482	556	393	393	163	73
University (CSU Campus)	UZ	301.3	0	Varies	1,398	1,154	1,154	244	110
Public Facilities (Schools)	PF	32.7	0	1,785	65	49	49	16	7
Public Facilities (County Facilities)	PF	10.3	0	1,785	21	16	16	5	2
Paseo/Greenbelt	PASEO/GB	25.9	0	1,785	31	3	3	67	30
Parks and Recreation	PR	69.8	0	1,071	84	8	8	181	81
Open Space Preserves	OS	250.7	0	0	0	0	0	0	0
Placer Parkway	ROW	158.5	0	0	0	0	0	0	0
Major Roadways & Landscape Corridors	ROW	160.1	0	1,071	30	0	0	82	37
Totals		2213.3	5636		4,386	3,752	3,309	831	378

- 1. Demand removes recycled water.
- 2. Demands include total water demand minus water conservation measures for all water sources, as outlined in the Placer Ranch WCP (HydroScience, 2016).
- 3. A detailed summary of Recycled Water demand and Recycled Water conservation efforts are elaborated upon in the Placer Ranch Recycled Water Master Plan and Placer Ranch Water Conservation Plan. (HydroScience, 2016).
- 4. Recycled water demands are calculated as outlined in the DRAFT Placer Ranch Recycled Water Master Plan and differ from the methods employed in the calculation of potable water demands.
- 5. HDR land uses include 150 units that are a density bonus but not physically assigned to a specific parcel. These units were distributed amongst the Village Center parcels for modeling purposes.
- 6. Parks and Recreation includes the total acreage for this land use, not the credited acreage

Table 4: Potable and Recycled Water Demands - Comparison of Revised and Original Project

Land Use Designation	Abbrev.	Total Area (acres)	Dwelling Units	Water Use Factor (gpd/DU-acre)	Total Demand (AFY)	Potable Demand (AFY) ¹	Potable w/ cons. (AFY) ²	RW Demand (AFY) ^{3,4}	RW w/ cons. (AFY) ^{3,4}
Low Density Residential	LDR	34.2	171	0	82	82	185	0	0
Low Density Residential - Age-Restricted	LDR-A	56	330	0	159	159	0	0	0
Medium Density Residential	MDR	-20.1	-185	0	-64	-64	-50	0	0
High Density Residential	HDR	-32.8	-507	0	-81	-60	-56	-21	-12
Non-Residential					0	0	0	0	0
General Commercial	GC	-2.9	0	0	-4	-3	-3	-1	-1
Commercial Mixed Use	CMU	0	0	0	0	0	0	0	0
Campus Park	СР	-64.5	0	0	-101	-71	-71	-29	-14
University (CSU Campus)	UZ	0	0	Varies	0	0	0	0	0
Public Facilities (Schools)	PF	0.7	0	0	1	1	1	0	0
Public Facilities (County Facilities)	PF	4.8	0	0	10	8	8	2	1
Paseo/Greenbelt	PASEO/GB	25.9	0	1785	31	3	3	67	30
Parks and Recreation	PR	-2.8	0	0	-3	-1	-1	-7	-4
Open Space Preserves	OS	-0.2	0	0	0	0	0	0	0
Placer Parkway	ROW	0	0	0	0	0	0	0	0
Major Roadways & Landscape Corridors	ROW	1.6	0	-45	1	0	0	5	2
Totals			-191		31	54	17	15	5

- 1. Demand removes recycled water.
- 2. Demands include total water demand minus water conservation measures for all water sources, as outlined in the Placer Ranch WCP (HydroScience, 2016).
- 3. A detailed summary of Recycled Water demand and Recycled Water conservation efforts are elaborated upon in the Placer Ranch Recycled Water Master Plan and Placer Ranch Water Conservation Plan. (HydroScience, 2016).
- 4. Recycled water demands are calculated as outlined in the DRAFT Placer Ranch Recycled Water Master Plan and differ from the methods employed in the calculation of potable water demands.
- 5. HDR land uses include 150 units that are a density bonus but not physically assigned to a specific parcel. These units were distributed amongst the Village Center parcels for modeling purposes.
- 6. Parks and Recreation includes the total acreage for this land use, not the credited acreage

Conclusions

Based on the analysis above, it was determined that, after water conservation, potable demands increased by approximately 0.52% when comparing the Revised Project to the Original Project. Recycled water demands increased by 1.3% after water conservation when comparing the Revised Project to the Original Project. The impact of the change in land use within Placer Ranch is negligible. There are no expected impacts for the ability to supply either potable water or recycled water to the project. The total demand is also less than the demand allocated in the updated SB610 Water Supply Assessment issued by the Placer County Water Agency on August 2, 2017.

In summary, the analysis demonstrates that the changes in potable water and recycled water demand between the Original Project and the Revised Project are not significant.



Potable Water Master Plan

July 18, 2017



Prepared for

Placer County

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Prepared by

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Placer Ranch Specific Plan Potable Water Master Plan

July 18, 2017

Prepared for

Mackay and Somps Civil Engineers, Inc.

Submitted by

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TABLE OF CONTENTS

SECTION	ON 1 - INTRODUCTION	1
1.1	Purpose	
1.2	Background	
1.3	Existing Documents	2
1.4	Report Organization	
SECTION	ON 2 – DESIGN CRITERIA AND WATER DEMANDS	3
2.1	Planning Criteria	
2.2	Modeling	
2.3	Summary of Assumptions	
SECTION	ON 3 – POTABLE WATER CONVEYANCE	15
3.1	Transmission Main	15
3.2	System Points of Connection	
3.3	Water Reliability and Emergency Interties	
3.4	Water Storage	
SECTION	ON 4 – MODELING RESULTS AND FIRE FLOW ANALYSIS	19
4.1	Modeling Results	19
4.2	Fire Flow Analysis	
4.3	Phasing	
SECTION	ON 5 – CONCLUSIONS	23
SECTION	ON 6 – REFERENCES	25

LIST OF TABLES

Table 2-1: Potable Water Use Factors	3
Table 2-2: University Water Use Factors	4
Table 2-3: Campus Park Water Use Factors	
Table 2-4: PCWA Peaking Factors	
Table 2-5: Placer Ranch Potable Water Use	
Table 2-6: Minimum and Maximum Pressure Constraints	11
Table 3-1: Placer Ranch Backbone Water Distribution Pipeline Quantity Taked	offs16
Table 4-1: PRV Station Settings	20
Table 4-2: Fire Flow Hydrants Failing Criteria	20
LIST OF FIGURES	
Figure 1-1: Project Location Map	after page 2
Figure 1-2: Land Use Plan	after page 2
	_
Figure 3-1: System Intertie and PRV Locations	
Figure 3-2: Potable Water Facility – Preliminary Site Plan	after page 18
Figure 4-1: Placer Ranch Potable Water Distribution System	ofter page 20
Figure 4-1: Placer Ranch Potable Water Distribution System Figure 4-2: Hydrants Failing Fire Flow Velocity Criteria	
rigure 4-2. Tryurants railing rife riow velocity Criteria	aitei page 20

APPENDICES

Appendix A – Placer Ranch Detailed Potable Water Demand Summary

Appendix B – InfoWater Water Model Junction and Pipe Output Reports

Appendix C – University Water Demand Summary

Appendix D – Placer Ranch Phasing Plan

SECTION 1 – INTRODUCTION

This Placer Ranch Potable Water Master Plan (Master Plan) was prepared by HydroScience Engineers (HydroScience) for MacKay & Somps Civil Engineers, Inc. (MacKay & Somps) in support of the Placer Ranch development. This section summarizes the purpose, background, and scope for this Master Plan.

1.1 Purpose

This document evaluates the methods to convey potable water to Placer Ranch to meet the potable water demand. The purpose of the Master Plan is to:

- Develop a demand summary for potable water customers within Placer Ranch.
- Develop a functional and reliable potable water infrastructure.
- Determine oversizing requirements for pipelines within Placer Ranch to supply demands in the Sunset Area outside of Placer Ranch

1.2 Background

Placer Ranch is a 2,213± acre project located in unincorporated Placer County and the Sunset Area, south of the Western Regional Sanitary Landfill (WRSL), east of the Amoruso Ranch Specific Plan, and north of the City of Roseville's city limits. It is expected that the Placer Ranch development will be developed within the jurisdiction of Placer County. A map showing Placer Ranch and the vicinity is provided as **Figure 1-1**.

Placer Ranch is classified as a mixed-use development that includes various land use types including low, medium, and high-density residential housing, commercial areas, light industrial, schools, parks, open space, and satellite campus's for both the California State University, Sacramento and Sierra College. The Placer Ranch property is currently undeveloped rolling grassland and agricultural lands. The area has topographical elevations ranging from 90 to 145 ft., and generally slopes from east to west. The proposed land use plan for Placer Ranch, dated June 24, 2016, is shown in **Figure 1-2.**

Placer County Water Agency supplies water from a large service area extending to the west to Sutter County, south to Sacramento County, north to Yuba County and the Nevada Irrigation District boundary, and east along Interstate 80 to Alta. Depending on the location within PCWA's service area, PCWA either retails treated water, wholesales treated water, or wholesales untreated water within their service area. PCWA receives its water supply primarily from the Middle Fork Project, PG&E, and a CVP contract. Additional supply comes from pre-1914 water appropriations, recycled water, and groundwater.

Placer Ranch is located within the Zone 1 service area of PCWA, which extends from Auburn to Lincoln and south to the Sacramento County line. PCWA operates four water treatment plants, 16 storage tanks, and 496 miles of treated water pipelines within this area. Placer Ranch is a planning sub area within the Lower Zone 1. The primary water supply for Lower Zone 1 is PG&E water from the Drum-Spaulding hydroelectric system. PCWA can also pump

water from the Auburn Tunnel up to its Ophir WTP, which is currently being designed and expanded. From Ophir, water can flow to the PCWA Foothill WTP. From the Foothill WTP, the primary conveyance method from Foothill to Placer Ranch is an existing 42-inch transmission main via English Colony Way and Whitney Ranch Parkway. This transmission main is being extended in phases across Highway 65 as three 24-inch mains. On the west side of Highway 65, these 24-inch mains will manifold back together into the 42-inch main that will serve as the primary Placer Ranch treated water supply.

1.3 Existing Documents

In order to ensure that this Master Plan is coordinated with other planning efforts, previous studies were reviewed and utilized in the planning and design of the potable water system for the Placer Ranch Specific Plan. Each of these studies are summarized below:

Placer County Water Agency (PCWA) 2015 Urban Water Management Plan, adopted June 2, 2016 (UWMP): PCWA prepared the UWMP to comply with the Urban Water Management Planning Act to meet the water supply demands over the next 30 years. This plan provided the water demand factors for new retail customers based on location and land use classification (PCWA, 2016).

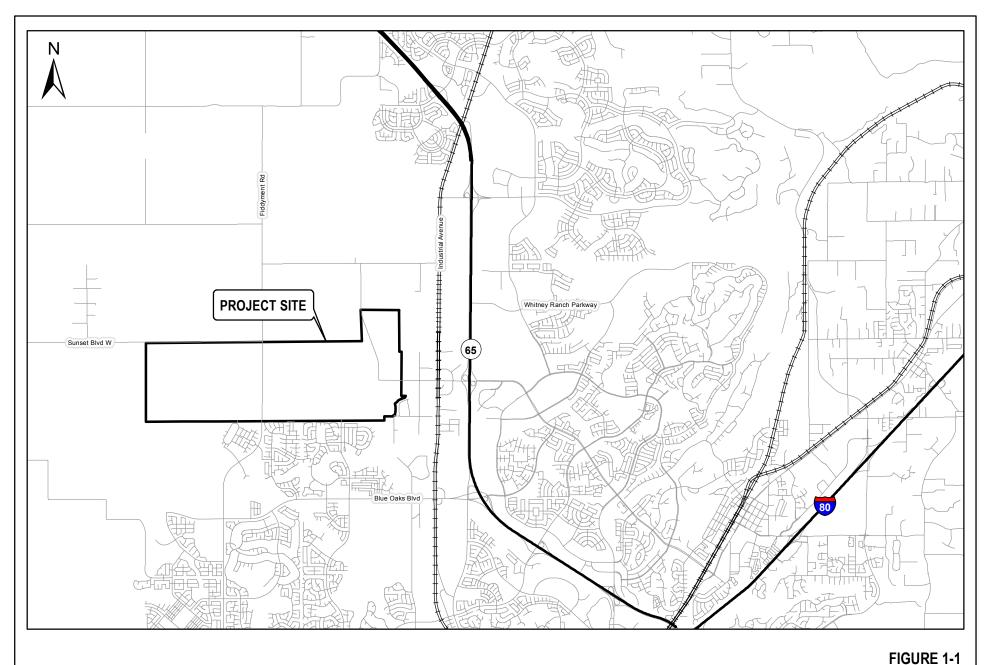
Technical Memorandum – Water Supply – Placer Ranch and Phasing of Supply: This technical memorandum summarized the existing infrastructure available to supply potable water to Placer Ranch and identified key factors involved with reprioritizing existing assets to meet the expected build-out demands of Placer Ranch (Municipal Consulting Group, 2015).

Technical Memorandum – Placer Ranch Specific Plan – University Water Demand Estimate: This technical memorandum compared the various methods utilized to estimate the overall water demand for the proposed University to be located on the Placer Ranch Specific Plan. This TM was updated to analyze the Universities projected demand using PCWA water use factors for similar types of land uses. Using this method, the University's projected total, potable, and recycled water demand were recalculated and are shown in **Table 2-3** (HydroScience, 2015).

1.4 Report Organization

This report provides a description of the potable water facilities required for the proposed Placer Ranch development. The sections contained in this report are:

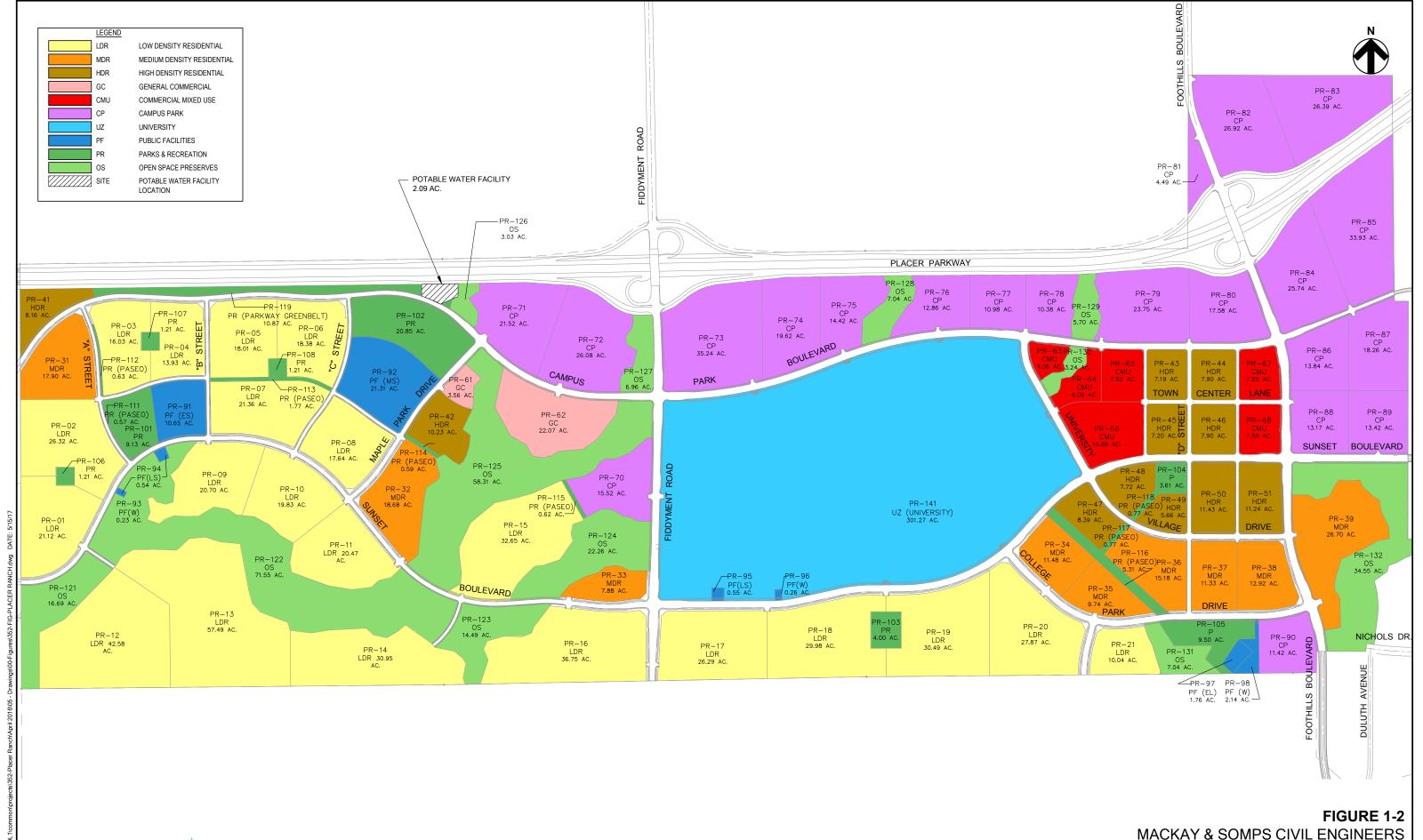
- Section 1 Introduction
- Section 2 Design Criteria and Water Demands
- Section 3 Potable Water Conveyance
- Section 4 Modeling Results and Fire Flow Analysis
- Section 5 Conclusions
- Section 6 References
- Appendices





MACKAY & SOMPS CIVIL ENGINEERS, INC.

PLACER RANCH POTABLE WATER MASTER PLAN
PROJECT LOCATION MAP



HydroScience

MACKAY & SOMPS CIVIL ENGINEERS
PLACER RANCH POTABLE WATER MASTER PLAN
PLACER RANCH LAND USE PLAN

SECTION 2 – DESIGN CRITERIA AND WATER DEMANDS

This section presents the planning criteria, modeling criteria, and assumptions used to develop the potable water demands and to size the water distribution infrastructure for Placer Ranch.

2.1 Planning Criteria

The water use factors used in this Master Plan are identified in **Table 2-1**. These water use factors are based on the new retail customer demand factors for the Lower Zone 1 in the PCWA 2015 UWMP, adopted June 2, 2016.

Table 2-1: Potable Water Use Factors

Land Use Designation	Abbreviation	Water Use Factor ¹	Average Day Demand Factor ²
Residential			
Low Density Residential (5 du/ac)	LDR	429 gpd/DU	0.48 AFY/ac
Low Density Residential – Age-Restricted (5.5 du/ac)	LDR-A	429 gpd/DU	0.48 AFY/ac
Medium Density Residential (8 du/ac)	MDR	312 gpd/DU	0.35 AFY/ac
High Density Residential (> 20 du/ac)	HDR	143 gpd/DU	0.16 AFY/ac
Non-Residential			
General Commercial	GC	1,116 gpd/acre	1.25 AFY/ac
Commercial Mixed Use	СМИ	1,116 gpd/acre	1.25 AFY/ac
Campus Park	CP	1,482 gpd/acre	1.66 AFY/ac
University (CSU Campus)	UZ	See Appendix C	See Appendix C
Public Facilities (Schools)	Р	1,785 gpd/acre	2.00 AFY/ac
Public Facilities (County Facilities)	PF	1,785 gpd/acre	2.00 AFY/ac
Parks and Recreation	PR	1,071 gpd/acre	1.2 AFY/ac
Open Space Preserves	os	0	0
Placer Parkway	ROW	0	0
Major Roadways & Landscape Corridors	ROW	1,071 gpd/acre	1.20 AFY/ac

Notes:

- 1. Potable water use factors are converted from the average day demand factor column.
- 2. Potable water use factors are based on the PCWA 2015 UWMP, adopted June 2, 2016 (2016) Table 4-6.

The potable water demand analysis for Placer Ranch was conducted based upon the water use factors in **Table 2-1** and the June 24, 2016 Placer Ranch land use plan. The land use designation, acreage, number of dwelling units, PCWA standard unit demand factors, and PCWA peaking factors were used to calculate the average day potable water demands. There were two situations where new land uses, the University and Campus Park, required calculation of new water use factors. How these water use factors were developed is described below.

University Water Use Factor(s): Because of the large area and relatively unique land uses associated with the California State University, Sacramento (CSUS) campus, University water demands were analyzed using a combination of typical PCWA water use factors. Interior and exterior irrigation water demands were calculated for each of the University's individual land uses to develop a total water demand.

Interior water demands for the University land uses were calculated by applying the following PCWA water use factors to similar University land uses as outlined below.

Table 2-2: University Water Use Factors

University Land Use Designation	PCWA Land Class	Water Use Factor ¹	Average Day Demand Factor ²
Academic	Commercial	1,116 gpd/acre	1.25 AFY/ac
Joint Development	Commercial	1,116 gpd/acre	1.25 AFY/ac
Recreation Center	Commercial	1,116 gpd/acre	1.25 AFY/ac
Physical Education	Commercial	1,116 gpd/acre	1.25 AFY/ac
Performing Arts	Commercial	1,116 gpd/acre	1.25 AFY/ac
Dining Hall	Commercial	1,116 gpd/acre	1.25 AFY/ac
Union	Commercial	1,116 gpd/acre	1.25 AFY/ac
Facilities	Commercial	1,116 gpd/acre	1.25 AFY/ac
Library	Commercial	1,116 gpd/acre	1.25 AFY/ac
Student Housing	Multi Family 20.1+ DU/Ac	179 gpd/bed	0.20 AFY/ac
Staff and Faculty Housing	Multi Family 20.1+ DU/Ac	179 gpd/bed	0.20 AFY/ac
Parking Structure ³	-	0	0
Surface Parking ³	-	0	0
Play Fields	Landscape-Greenbelt	1,071 gpd/acre	1.20 AFY/ac
Sierra College Buildings	Commercial	1,116 gpd/acre	1.25 AFY/ac

Notes:

- 1. Potable water use factors are converted from the average day demand factor column.
- 2. Potable water use factors are based on the PCWA 2015 UWMP, adopted June 2, 2016 (2016) Table 4-6.
- 3. Interior water use for parking areas is assumed to be zero. Exterior irrigation is assumed to be done with recycled water.

According to the *Placer Ranch Recycled Water Master Plan* (HydroScience, 2017), irrigation demand based on local evapotranspiration (ET) rates and precipitation rates is approximately 3.24 ft/year, or 2,892 gpd/acre. All exterior irrigation was generally assumed to be 20-40% of the total area for most of the individual land uses, except for the parking structure, surface parking, play fields, and open space preserve. The parking structures and surface parking were assumed to irrigate 15% of the total area. The open space preserve was assumed to have no irrigation demand. The play fields were assumed to have approximately 80% of their acreage irrigated.

The University's overall water demand is presented in **Table 2-3** and a detailed breakdown of the demand calculations is included in **Appendix C**.

Campus Park Water Use Factor: PCWA does not have an established land use demand factor that is representative of the Campus Park land use type. To calculate water demand projections for the Campus Park parcels, the Campus Park land use type was broken into the component land uses based on a percentage of the total area. These component land use types were associated with the respective PCWA water demand factor and weighted to create a new composite Campus Park water demand factor. Per the June 24, 2016 Placer Ranch Land Use Plan, the percentage of area associated with each land use and the associated water use factor is as follows:

Table 2-3: Campus Park Water Use Factors

Campus Park Land Use	PCWA Land Class	Water Use Factor ¹	Average Day Demand Factor ²
Office (20%)	Commercial	1,116 gpd/acre	1.25 AFY/ac
Research and Development (25%)	Industrial	1,785 gpd/acre	2.00 AFY/ac
Commercial (25%)	Commercial	1,116 gpd/acre	1.25 AFY/ac
Light Industrial (20%)	Industrial	1,785 gpd/acre	2.00 AFY/ac
Warehouse (10%)	Industrial	1,785 gpd/acre	2.00 AFY/ac

Notes:

- 1. Potable water use factors are converted from the average day demand factor column.
- 2. Potable water use factors are based on the PCWA 2015 UWMP, adopted June 2, 2016 (2016) Table 4-6.

Applying the individual PCWA water use factors to the percentage of area associated with each type of land use resulted in a weighted average water use factor for the Campus Park land use of 1,482 gpd/acre (1.66 AFY/ac).

Peaking Factors: Average day potable water demands were calculated based on either the number of dwelling units in residential parcels, or the total acreage for that type of land use. Maximum day potable water demands (MDD) were calculated by applying a peaking factor to the Average Day Demands (ADD). A peaking factor of 2.1 was applied to the Placer Ranch average day demands.

The MDD is used to size potable water infrastructure such as tanks and reservoirs to meet operational, and fire flow requirements. There must be adequate storage to convey water to Placer Ranch during fire flow events and when potable water use exceeds the MDD.

The Peak Hour Demand (PHD) represents the highest flow rate Placer Ranch will require at any time throughout the day. This demand is used to size transmission mainlines. Transmission mainlines must be sized to minimize pressure and head loss while maintaining adequate water transport during peak hour conditions. This PHD was calculated by applying a peaking factor of 1.6 to the MDD.

Table 2-4: PCWA Peaking Factors

Demand Type	Peaking Factor			
Annual Average Day	1.0			
Maximum Day Demand	Annual Average Day x 2.1			
Peak Hour Demand	Maximum Day x 1.6			

Table 2-5 summarizes the potable water use for Placer Ranch categorized by land use type. Each land use designation is summarized to show the total acreage it represents, the number of dwelling units located within it, and potable and recycled water demands with and without water conservation measures.

It should be noted that the recycled water demands are calculated differently from potable water demands in that they account for evapotranspiration rates, crop coefficients, etc. Thus, the total project demand does not exactly equal the potable water demand plus the recycled water demand. For more information on how the recycled water demands for the project were calculated, the reader is referred to the *Placer Ranch Recycled Water Master Plan* (HydroScience, 2017).

^{1.} Per PCWA, peaking factors are based on recent similar development's Master Facilities Agreements.

Table 2-5: Placer Ranch Potable Water Use

Land Use Designation	Abbrev.	Total Area (acres)	Dwelling Units	Water Use Factor (gpd/DU-acre)	Total Demand (AFY)	Potable Demand (AFY) ¹	Potable w/ cons. (AFY) ²	RW Demand (AFY) ^{3,4}	RW w/ cons. (AFY) ^{3,4}
Residential									
Low Density Residential	LDR	407.9	2,039	429	980	980	755	0	0
Low Density Residential - Age-Restricted	LDR-A	131.0	720	429	346	346	267	0	0
Medium Density Residential	MDR	132.3	1,057	312	369	369	285	0	0
High Density Residential	HDR	93.0	2,011	143	322	262	245	60	33
Non-Residential									
General Commercial	GC	25.6	0	1,116	32	20	20	12	6
Commercial Mixed Use	CMU	48.8	0	1,116	61	37	37	24	11
Campus Park	СР	395.5	0	1,482	657	464	464	192	87
University (CSU Campus)	UZ	301.3	0	Varies	1,398	1,154	1,154	244	110
Public Facilities (Schools)	PF	32.0	0	1,785	64	48	48	16	7
Public Facilities (County Facilities)	PF	5.5	0	1,785	11	8	8	3	1
Parks and Recreation	PR	72.6	0	1,071	87	9	9	188	85
Open Space Preserves	os	250.9	0	0	0	0	0	0	0
Placer Parkway	ROW	158.5	0	0	0	0	0	0	0
Major Roadways & Landscape Corridors	ROW	158.5	0	1,116	29	0	0	77	35
Totals		2,213.3	5,827		4,355	3,698	3,292	816	373

- 1. Demand removes recycled water.
- 2. Demands include total water demand minus water conservation measures for all water sources, as outlined in the Placer Ranch Water Conservation Plan (HydroScience, 2016).
- 3. A detailed summary of Recycled Water demand and Recycled Water conservation efforts are elaborated upon in the Placer Ranch Recycled Water Master Plan and Placer Ranch Water Conservation Plan. (HydroScience, 2016).
- 4. Recycled water demands are calculated as outlined in the DRAFT Placer Ranch Recycled Water Master Plan and differ from the methods employed in the calculation of potable water demands.
- 5. HDR land uses include 150 units that are a density bonus but not physically assigned to a specific parcel. These units were distributed amongst the Village Center parcels for modeling purposes.
- 6. Parks and Recreation includes the total acreage for this land use, not the credited acreage.

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Sunset Area Demands: Future demands for the Sunset Area were also included in the analysis based on demand calculations provided by PSOMAS. Demands for the future Sunset Area buildout that draw water from pipelines within the Placer Ranch project were placed at nodes in the hydraulic model to ensure infrastructure is oversized to sufficiently supply the future Sunset Area demands. The Sunset Area demands and node locations and are as follows:

Within Placer Ranch:

Node PR-03 – West of Fiddyment Road, 1,591 AFY

Node PR-70 – Fiddyment Road, 1,498 AFY

Node PR-19 – Foothills Boulevard, 1,491 AFY

Not served from pipelines within Placer Ranch:

Node N/A - Campus Park Boulevard at eastern border, 418 AFY

Node N/A – Sunset Boulevard, 438 AFY

It should be noted that Campus Park Blvd and Sunset Blvd Sunset Area demands are outside of the eastern boundary of Placer Ranch and thus do not affect the infrastructure requirements for the project.

Use of recycled water: Recycled water will be utilized as part of the Placer Ranch water supply portfolio. Recycled water will be used to irrigate all landscape areas within Placer Ranch except for landscape irrigation of both low-density residential and medium density residential land uses. Recycled water for landscape irrigation reduces potable water demands.

The use of recycled water has not adjusted the potable water use factors to be consistent with previous land use efforts and to add a factor of safety to the planning of the potable water system infrastructure. It is expected that once the Placer Ranch model is incorporated into the PCWA model, that PCWA will adjust the Placer Ranch water demands to reflect the use of recycled water. Not adjusting the potable water demands to account for recycled water use results in the modeling of potable water demands at a level higher than the projected demand for the Placer Ranch development. Not accounting for recycled water in the sizing of potable water infrastructure also provides a factor of safety that ensures that minor changes in water demands will not generally require upsizing of pipeline infrastructure.

For the purposes of this modeling effort, recycled water accounts for approximately 19% (816 AFY) of the overall Placer Ranch potable demand after the comprehensive recycled water system is adopted as described in the Placer Ranch Recycled Water Master Plan (HydroScience, 2017). If the full water conservation measures described in the Placer Ranch Water Conservation Plan (HydroScience, 2017) are implemented, recycled water would account for 11% (373 AFY) of the total Placer Ranch water demand. Typical conservation methods associated with this water conservation include the reduction of turf and utilization of smart irrigation controllers.

Water conservation: Water conservation measures implemented within the Placer Ranch development can reduce potable water demands and increase the volume of available supply. Proposed conservation efforts vary according to land use designation and new construction BMP's can establish an improved water consumption base line for the proposed development. Typical methods for reducing water consumption include the implementation

of turf reduction, drip irrigation systems, re-circulating hot water systems, and smart irrigation controllers. Water conservation values were incorporated into the potable water demand calculations, located in **Table 2-5**, and preliminary approximations indicate that 19.5% (850 AFY) of the projected potable water demand can be eliminated under the proposed conservation methodologies. However, in order to be conservative, water conservation was not employed in the calculation of water pipeline sizing or water storage.

For additional information about water conservation, the reader is referred to the Placer Ranch Water Conservation Plan (HydroScience, 2017).

2.2 Modeling

The Placer Ranch potable water hydraulic modeling was conducted using InfoWater by Innovyze, Inc. The Placer Ranch hydraulic model was constructed by HydroScience to be a stand-alone model based on the land use plan identified in **Section 1.2**. Potable water demands and fire flow requirements were used to determine the required potable water infrastructure and evaluate the performance of the proposed infrastructure both with and without the future Sunset Area demands.

Placer Ranch includes the proposed construction of a potable water tank and pump station. These facilities were sized to store and transmit potable water within the lower zone of the proposed project, and would be located at the eastern boundary of parcel PR-119 (Placer Parkway Greenbelt) next to Parcel PR-126.

The transmission main infrastructure is intended to follow the major roadway alignments and service all potable water customers based on the potable water demands discussed in **Section 2.1**. Since Placer Ranch will become part of PCWA's Lower Zone, the diurnal flow pattern from PCWA's existing potable water hydraulic model was utilized in the Placer Ranch stand-alone hydraulic model. This flow pattern encompasses the peaking factors used in determining the water demands and simulates potable water usage over the course of three day extended period simulation built into the existing PCWA hydraulic model.

Two on-site wells will be constructed as part of the Placer Ranch project; one on the 0.23-acre parcel PR-93, and one to be co-located on the 2.14-acre parcel PR-98 with the recycled water tank and pump station (**Figure 1-2**). The wells are strategically located with one on the west side of the project, and one on the east side of the project. The well associated with Parcel PR-93 was intended to provide a backup water supply for the potable water distribution system. This backup water supply would be hard plumbed directly into the potable water distribution system and split by a normally closed valve.

The well proposed for Parcel PR-98 was intended to provide a backup water supply for the recycled water distribution system and would be conveyed via an air-gapped connection directly to the recycled water storage tank. Additionally, the PR-98 well will be plumbed to connect to the potable water distribution system so that this well could provide a backup water supply to both the potable or recycled water distribution systems.

It is the intent of this section (and the Parties) that the groundwater wells at Parcels PR-93 and PR-98 would each have a projected capacity of 1.0 MGD, or approximately 695 GPM, and groundwater is of such quality that only disinfection will be required to meet California

Drinking Water Quality Standards. If the available capacity or water quality does not achieve these objectives, the Landowner shall, at its own costs, work with the PCWA to relocate the well site within the Project to an alternate mutually agreeable site until these objectives are satisfied.

Modeling Criteria: The modeling criteria used to model the potable water distribution system is the standard PCWA distribution system criteria. This criteria is used for all proposed projects within the PCWA's service area. These criteria include infrastructure, maximum day demands, peak hour demands, velocity, minimum and maximum pressure, and fire flow demand requirements. These criteria are summarized below.

Transmission Main Design Criteria: The sizing of potable water transmission mains requires modeling of water use within Placer Ranch based on projected land uses and the associated potable water demands to meet two essential parameters: pressure and velocity. Pressure in the transmission mains must stay within a set minimum and maximum range, as specified in **Table 2-6**, throughout the three day extended period analysis. A pressure minimum during fire flow events is also required to ensure sufficient flow can be attained at the hydrant while maintaining the required pressure throughout the system. A maximum velocity is required in order to minimize head loss in the transmission mains throughout the system. These criteria are summarized below.

- All pipe velocities must remain below 5 ft/s during the peak hour;
- All pipe velocities during fire flow events must remain below 7 ft/s; and
- Fire flow demands are allocated to each hydrant (junction) within the system based on adjacent land use designation.

Table 2-6: Minimum and Maximum Pressure Constraints

Pressure	Criteria	
Minimum Operational Pressures		
Max Day Demand	40 psi	
Peak Hour Demand	40 psi	
Max Day plus Fire Flow Demand	20 psi	
Maximum Operational Pressures		
Static Pressure	130 psi	
Individual PRVs required where static pressure is greater than 80 psi		

It should be noted that per PCWA staff direction, the minimum desired operational pressure within Placer Ranch is 60 psi.

Water Storage Criteria: PCWA evaluates storage requirements for their water system on having one full day of water storage at max day demands available within each pressure zone. The on-site potable water storage tank was sized based on the actual max day potable water deliveries after accounting for water conservation and recycled water within the Placer Ranch lower pressure zone. This was calculated by calculating the total water demand within

the parcels within this pressure zone, subtracting out demand conserved through potable water conservation, then subtracting out the portion of the remaining demand that would be supplied with recycled water.

Ample storage exists and/or is planned within the PCWA 350 ft pressure zone to provide potable water storage to the portion of Placer Ranch that will reside in the 350 ft pressure zone. Delineation of the pressure zone boundaries, pressure settings and operational control of the pressure zone is discussed in greater detail in **Section 4.1**.

Pressure Zones: Due to the Placer Ranch project bordering the northern boundary of the City, PCWA staff requested that Placer Ranch be separated into its own lower pressure zone to approximately match the HGL of the City potable water distribution system. This will facilitate the ability of PCWA to accept water from the City distribution system during emergency conditions. For operational convenience, the three PRV stations separating the PCWA 350 ft pressure zone from the new lower Placer Ranch pressure zone are located along Foothills Blvd approximately at the intersections of Campus Park Blvd, Sunset Blvd, and Nichols Dr. These PRV station locations are shown in **Figure 3-1**. It should be noted that approximately nine land use areas on the eastern side of Foothills will be located in the PCWA 350 ft pressure zone.

The pressure of the lower PCWA pressure zone was discussed with PCWA staff. The outcome of these discussions resulted in PRV set points at each of the three Placer Ranch PRV stations to be set to maintain a minimum operating pressure of 60 psi in the new lower pressure zone while remaining below PCWA upper pressure limits without the need for a pressure regulator. This resulted in the new Placer Ranch pressure zone having an approximate HGL of 280 ft.

It was also noted that PCWA would like to have ample space for a future pump station located adjacent to the Campus Park Blvd PRV station that would allow water to be pumped by PCWA from the lower pressure zone, around the Campus Park Blvd PRV, and back into the PCWA 350 ft pressure zone. This facility was not separately modeled in this report, since this facility would be primarily a manually operated facility that operates during non-typical conditions.

Fire Flow Criteria: Fire flow demands are allocated to all junctions throughout the development in order to ensure that the designed main transmission infrastructure can sustain the required flow at the hydrant while maintaining the minimum residual pressure throughout the system. The minimum residual pressure to be maintained throughout the distribution system is 35 psi. The minimum pressure required at the node flowing is 20 psi. Fire flow demands are broken down into five major categories. These categories are summarized below:

Residential: 1,500 gpmMulti-Family: 2,500 gpm

Commercial/Office: 2,500 gpm

Campus Park: 4,000 gpm

University/School: 4,000 gpm

The residential, multi-family, and Commercial/Office fire requirements are based on typical requirements associated with these types of land uses in the California Fire Code. For the Campus Park and University/School land uses, which have a blending of land uses, it was assumed that the maximum fire flow associated with the Campus Park and University component land use types be applied to the whole area. Thus, the fire flow for these land uses was assumed to be 4,000 gpm (equivalent to 8,000 gpm, reduced by 50% assuming sprinklers are used) over 4 hours.

Additionally, PCWA also has maximum velocity criteria during fire flow. During peak demand periods, pipeline velocities are not to exceed 7 ft/s.

2.3 Summary of Assumptions

There are a number of assumptions associated with the Placer Ranch potable water modeling. These assumptions include:

- Pipeline diameters for new pipelines are limited to standard sizes such as 12, 18, 24-inches, etc.;
- All future pipes have a Hazen-Williams roughness coefficient consistent with PVC with a C value equal to 130;
- The peaking factor for MDD is 2.1 of the ADD and the peaking factor for PHD is 3.4 of the ADD, or 1.6 times the MDD (2.1 x 1.6 = 3.4);
- The minimum pressure allowed in the Placer Ranch potable water distribution system is 60 psi during MDD at the lowest pressure node, and 20 psi during fire flow events at the flowing node;
- Placer Ranch will maximize use of recycled water for irrigation purposes. However, the Placer Ranch potable water distribution system is to be sized to convey potable water to all land uses for all purposes in the event that recycled water is not available;
- System points of connection will provide adequate capacity and pressure to convey water to Placer Ranch at low flow conditions;
- Storage facility size is based on the criteria listed in Section 2.2;
- All potable water infrastructure, including the storage tank, pump station, and distribution system, was sized assuming that there was no use of recycled water and no utilization of water conservation. This provides a factor of safety into the planning of this infrastructure.
- Per conversations with PCWA staff, all tie-ins to the PCWA 350 ft pressure zone were
 modeled as fixed head reservoirs at 300 ft. This lower HGL was selected based on the
 PCWA input, what pressures PCWA has seen in the field and estimated for the zone at
 buildout, and to account for head losses associated with water conveyance. The
 subsequent PRV station set points are as specified in Table 4-1;
- The fire flow requirements associated with the California Fire Code were modeled based on the land use adjacent to each node. For land uses without specific fire flow requirements in the California Fire Code, the highest fire flow requirement within that land use was used.

- The maximum pipeline velocity was assumed to be 5 ft/s for normal operation, and 7 ft/s during fire flow conditions.
- The 42-inch main transmission pipeline upstream of the on-site Placer Ranch water storage tank was proposed to be located within Placer Ranch in Campus Park Blvd. This main was oversized to serve both Placer Ranch and the water transmission needs of PCWA. If water transmission for PCWA was not required for this main, this main would instead be 18-inches in diameter;
- Per the water demand calculations provided by PSOMAS, 4,581 AFY of demand for the future Sunset Area buildout was placed on the northern boundary of the project at Foothills Blvd, Fiddyment Road and west of Fiddyment Road (1,491, 1,498 and 1,591 AFY respectively). This demand was placed as an MDD demand and the standard PCWA Lower Zone diurnal pattern was applied; and
- Per PCWA direction, 15 MGD of demand was placed as a point demand at the end of the 36-inch main transmission pipeline where it leaves the Placer Ranch project. This demand is to simulate future development/water transmission needs of PCWA to the west of the Project. This demand was placed as an ADD demand without a diurnal pattern to simulate a constant flow of 15 MGD to the west.

SECTION 3 – POTABLE WATER CONVEYANCE

This section provides information on the potable water conveyance, how it will be supplied to Placer Ranch, and how it will be distributed within Placer Ranch.

3.1 Transmission Main

The transmission mainline infrastructure is designed to be a looped system with points of connection between Placer Ranch and the existing and proposed PCWA transmission and distribution system. The main transmission backbone is a 42-inch pipe that runs east to west through Placer Ranch within Campus Park Blvd. This 42-inch pipe downsizes to 36-inches at the potable water tank site west of Fiddyment Rd. Additional 18-inch pipelines travel east west through the property along Sunset Blvd and College Park Dr. The two main north south alignments are 18-inches located in Fiddyment Rd and Foothills Blvd respectively. The pipeline in Foothills Blvd north of Placer Parkway was upsized to 24-inch to provide water supply to the Sunset Area. The University is bordered with a minimum of 18-inch mainlines on all sides. Multiple laterals from the main loop alignments extend along roadways to serve customers outside of the primary loops, these pipelines are mainly 12-inch. The pipeline in Sunset Blvd. east of "A" Street was upsized to an 18-inch pipe to serve the planned well. Optionally, the pipeline in Sunset Blvd east of "A" Street could be upsized to 18-inch all the way to the system intertie to serve 3 mgd of max day demands to the Amoruso Ranch project. Assuming this water fills a tank and does not peak off of the PCWA system, the main transmission pipelines through Placer Ranch see an approximately 0.4 fps increase. See Figure 4-1 for a map showing the backbone infrastructure for the Placer Ranch potable water distribution system.

As part of the Placer Ranch project, the PCWA backbone transmission main in Whitney Ranch Parkway and/or Placer Ranch Parkway, will be extended from its current location at Whitney Ranch Parkway and University Avenue in phases west to Placer Ranch. Upon reaching the Placer Ranch eastern boundary, the 42-inch line will continue through Placer Ranch to the tank site west of Fiddyment Road. Downstream of the tank site, this transmission main will continue west as a 36-inch transmission main (42-inch with Sunset Area demands) within Campus Park Blvd, extending west to the Placer Ranch boundary at Placer Parkway to provide at least 15 MGD of conveyance capacity to future developments to the west and south. Even though a 36-inch pipeline would be sufficient to meet velocity requirements, a 42-inch is suggested to accommodate peaking of developments west of Placer Ranch. A demand of 15 MGD is a max day demand and developments west of Placer Ranch may peak off of the Placer Ranch tank. The on-site transmission main will provide transmission capacity for PCWA regional facilities, future Sunset Area development, and for transmission of potable water to Placer Ranch. Construction of the Placer Ranch distribution system will generally coincide with the Placer Ranch Phasing Plan (see Appendix D), but may require advance construction of select infrastructure elements.

Table 3-1 provides quantity takeoffs for the backbone infrastructure required for the Placer Ranch potable water distribution system. It should be noted that additional distribution system pipelines above and beyond the lengths shown in this backbone infrastructure will be required within or adjacent to each land use area as the plans for those areas are defined.

Table 3-1: Placer Ranch Backbone Water Distribution Pipeline Quantity Takeoffs

Pipeline Diameter	Length of Pipe to Service Placer Ranch + Sunset Area ¹	Length of Pipe to Serve Placer Ranch Only ¹
12-inch	19,000	19,400
18-inch	13,900	14,200
24-inch	700	0
36-inch	0	1,800
42-inch	7,800	6,000
Total LF	41,500	41,500

3.2 System Points of Connection

Placer Ranch will connect into the PCWA's existing 350 ft pressure zone to receive potable water. The PCWA distribution system/350 ft pressure zone will convey water to Placer Ranch through three system points of connection. These points of connection are listed below and shown on **Figure 3-1**.

- One point of connection with the planned 42-inch main in Placer Parkway;
- One point of connection to the existing 16-inch pipeline in Sunset Blvd; and
- One point of connection to the existing 16-inch pipeline in Nichols Rd.

3.3 Water Reliability and Emergency Interties

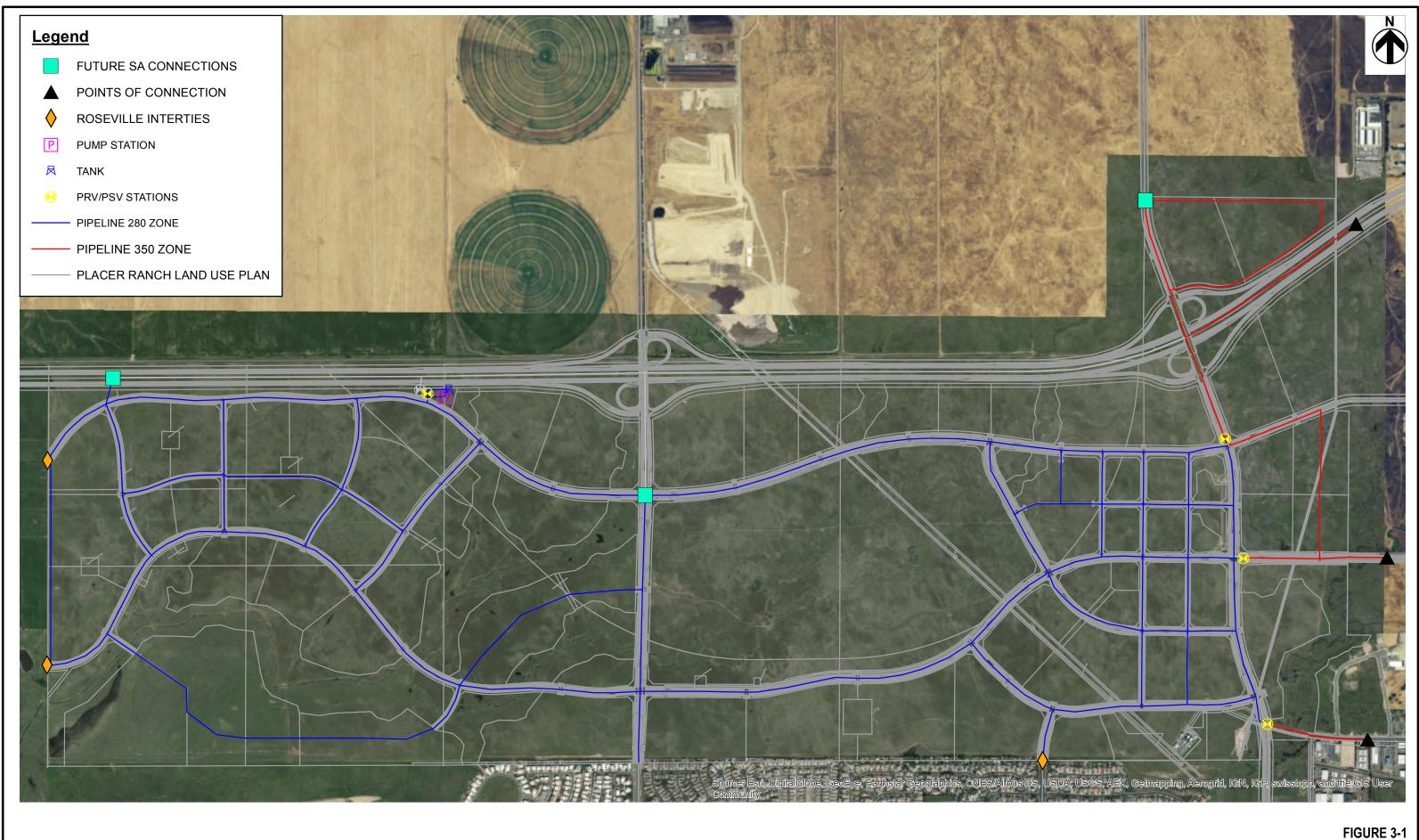
The Placer Ranch project will have three planned water reliability and emergency interties to the City. Each connection is to have a bidirectional meter, isolation valves, and telemetry to both PCWA and Roseville. Each intertie is listed below and shown on **Figure 3-1**.

- 12-inch connection at Woodcreek Oaks Blvd to the existing City potable water distribution system
- 12-inch connection at Campus Park Drive to the future Amoruso Ranch
- 12-inch connection at Sunset Blvd to the future Amoruso Ranch

3.4 Water Storage

Placer Ranch west of Foothills Road will reside within a new pressure zone. This new pressure zone will require the construction of a new on-site storage tank and pump station next to Parcel PR-126 to provide potable water system reliability. Based on the land uses within the limits of the project and within the new pressure zone, as well as the MDD demands associated with those land uses, HydroScience calculated the storage volume required for the project within the new pressure zone. The total storage required for new pressure zone is 5.16 MG tank. Potential dimensions for a tank with this volume would result in a storage tank with a diameter of 150 ft and a sidewall height of 40 ft, though further analysis to

^{1.} Pipeline total lengths were rounded up to the nearest 100 ft.



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SYSTEM INTERTIE AND PRV STATION LOCATIONS

determine optimum tank dimensions will be required prior to detailed design. A preliminary site plan showing the water storage and pumping facilities is provided as **Figure 3-2**. It should be noted that the preliminary design for the tank and pump station site allows for the potential expansion of the site to co-locate an additional storage tank to accommodate future PCWA projects (Sunset Area, Regional University, Placer Vineyards, etc.).

It was assumed that the new storage tank would be located at grade. A geotechnical investigation should be performed to confirm that the proposed site is suitable to locate a water storage tank and the soil and foundation requirements for this tank. At this volume, either a pre-stressed concrete tank or a welded steel tank is feasible, though it is understood that PCWA's preferred storage tank material is pre-stressed concrete.

Ample storage is existing or proposed in the PCWA 350 ft pressure zone. As a result, no additional storage was required for the additional Placer Ranch water demands in this area. Pumping requirements for the booster pump station pumping out of this tank is further discussed in **Section 4.1**.

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PLACER RANCH POTABLE WATER MASTER PLAN
JULY 18, 2017
PAGE 18 OF 26

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SECTION 4 - MODELING RESULTS AND FIRE FLOW ANALYSIS

This section summarizes the results of modeling for the Placer Ranch potable water distribution system.

4.1 Modeling Results

An extended period analysis was run on the stand-alone Placer Ranch potable water distribution system. A summary of these results is provided below.

Distribution infrastructure: The mainline infrastructure for the Placer Ranch development was calibrated and optimized to meet all of the development's calculated demand requirements, including the 15 MGD to the west and future Sunset Area demands. These requirements are the calculated MDD, PHD, and MDD plus Fire Flow demands. The infrastructure identified in **Figure 4-1** maintains pressure and velocity requirements for the full duration of the extended period analysis. In general, pipeline sizing for 18-inch and smaller pipelines were governed by fire flow requirements for the adjacent parcels. Pipelines larger than 18-inch as well as some 18-inch pipelines were governed by MDD and pipeline velocity requirements.

InfoWater provides full output reports for all elements in the network at the conclusion of each successful run of the model. This ensures that pressure and velocity requirements are maintained during the entire analysis at all critical points. A full set of these reports for the stand-alone Placer Ranch hydraulic modeling effort can be found in **Appendix B**.

Tank Pump Station: Due to the oversizing of the 42-inch transmission main, as well as the 300 ft HGL (minimum) supplied by the PCWA 350 ft zone, pressure within new Placer Ranch pressure zone during normal operating conditions varies by approximately +/-2 psi. These conditions do not require the pump station to operate. Per PCWA recommendations, the pump station shall be designed to account for the highest fire flow within the development, while allowing for future expansion to serve all future developments in the Sunset Area. This requires an initial capacity of 4,500 gpm plus a factor of safety. As shown on **Figure 3-2**, the preliminary site plan for the tank and pump station allows for the expansion of the pump station and the addition of a second storage tank to serve Sunset Area and other future development demands.

PRV Stations: Due to the extension of the PCWA 350 ft pressure zone to Placer Ranch, PRV stations are required to lower the HGL of the new lower pressure zone so that the HGL of the lower zone is comparable to the adjacent City of Roseville distribution system, at approximately 280ft.

Per PCWA staff direction, the Placer Ranch PRV's were set such that a minimum 60 psi is maintained at the lowest pressure node within Placer Ranch. Due to the natural elevation of the project site, pressure increases in the system as water travels east to west and north to south. Therefore, the PRV station setting for the northeast PRV station (intersection of Foothills Blvd and Campus Park Blvd) is set to approximately the minimum pressure required. **Table 4-1**lists the PRV stations, pipeline size, and settings.

Table 4-1: PRV Station Settings

PRV Station ¹	Pipeline Diameter ²	Setting (psi)
Campus Park Blvd	42-inch	62.0
Sunset Blvd	16-inch	65.0
Nichols Dr	16-inch	73.0

- 1. All PRV Station are located along Foothills Blvd, the street listed is the cross street.
- 2. Each PRV station is modeled as a single large PRV. It is assumed that during detailed design this will be re-evaluated to provide for the potential of multiple smaller PRV's.

4.2 Fire Flow Analysis

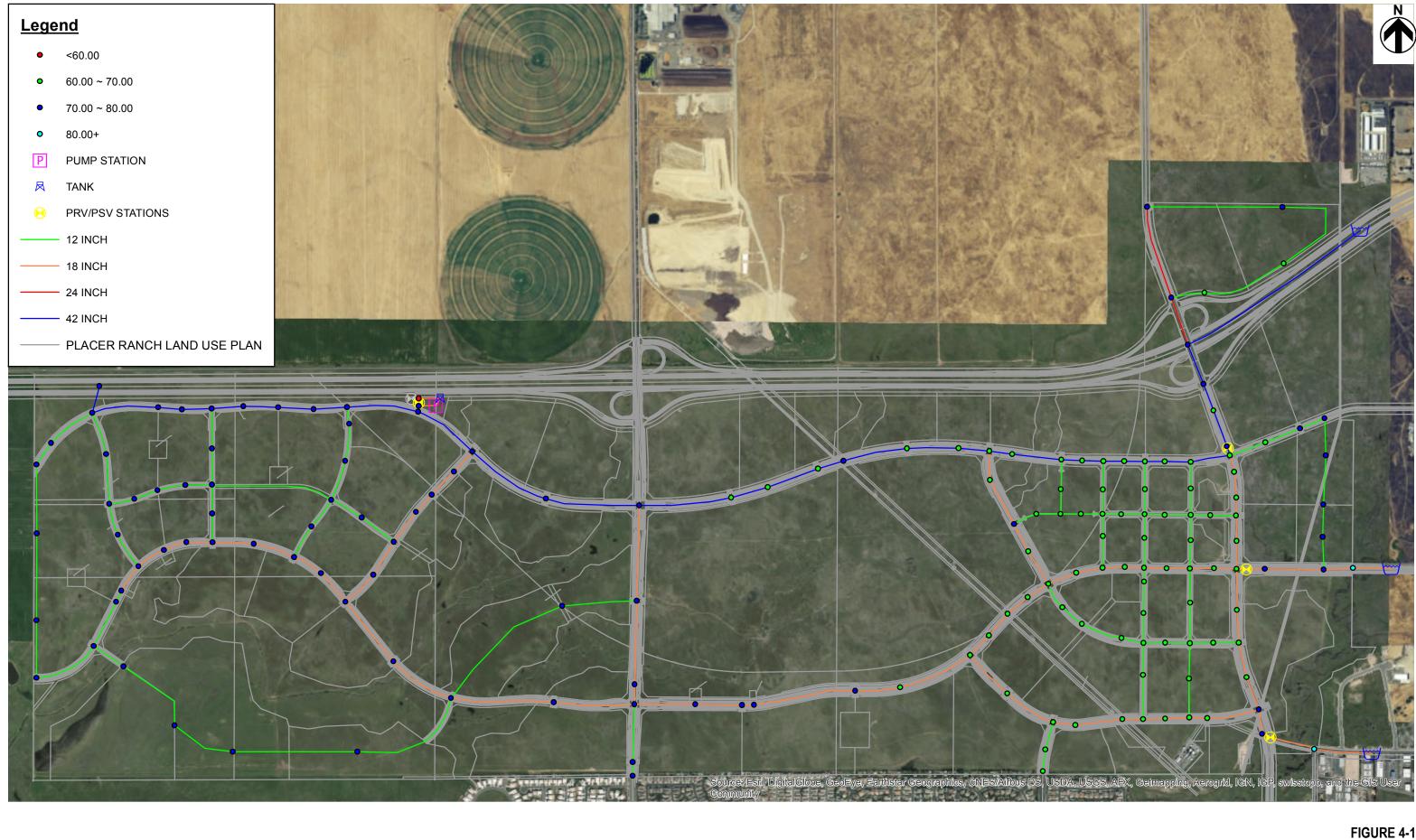
A full fire flow analysis was conducted to verify adequate flow could be sustained at all junctions (hydrants) throughout Placer Ranch. Fire flow demands were allocated to each junction within Pacer Ranch based on the adjacent land use with the highest potential fire flow demand, and the criteria listed in **Section 2.2**. Additionally, the fire flow analysis was run during the peak demand period and low flow condition in order to simulate the most limiting conditions. Additionally, per PCWA standards, a maximum of 7 ft/s velocity was implemented on all pipelines.

The modeling for the Placer Ranch distribution system showed that ample flow is available at all but 10 fire flow junctions while limiting velocities in all pipelines to less than 7 ft/s. All junctions have ample pressure above the minimum required flow pressure of 20 psi at the hydrant. **Table 4-2** lists the hydrants that fail the fire flow criteria due to pipeline velocity and their location. **Figure 4-2** shows the locations of the hydrants failing the fire flow velocity criteria.

Table 4-2: Fire Flow Hydrants Failing Criteria

Hydrant ID	Street - Parcel Served	Fire Flow + MDD (gpm)	Available Flow (gpm)	Flow Deficit (gpm)
PR-26	Sunset Blvd – PR-89	4,004	2,844	1,160
PR-91	Sunset Blvd – PR-89	4,000	2,896	1,104
PR-22	Foothills Blvd – PR-82	4,047	3,033	1,014
PR-92	Sunset Blvd – PR-89	4,051	3,210	841
PR-154	Un-named Rd – PR-91	4,504	3,739	765
PR-90	Sunset Blvd – PR-89	4,000	3,459	551
PR-93	Sunset Blvd – PR-88	4,027	3,532	495
PR-86	Campus Park Blvd, PR-86	4,073	3,805	269
PR-57	Paseo 115 – PR-70	4,110	4,027	83
PR-21	Foothills Blvd – PR-83	4,046	4,014	32

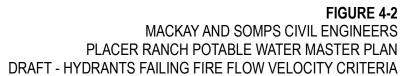
It should be noted that all 10 junctions that fail the fire flow criteria due so based on pipeline velocity, are within approximately 1,000 gpm of the required fire flow, and other hydrants bordering the same property meet the fire flow requirements. Rather than upsize a pipeline strictly to allow for a nominal additional amount of fire flow to be achieved while maintaining





MACKAY AND SOMPS CIVIL ENGINEERS
PLACER RANCH POTABLE WATER MASTER PLAN
POTABLE WATER DISTRIBUTION SYSTEM





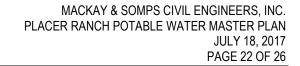
7 ft/s, it is assumed that velocities in these situations would be mitigated by one or more of the following methods:

- Addition of distribution pipeline looping within each parcel The hydraulic model is a transmission main backbone model. Each multi-acre parcel will be developed with smaller looped pipelines to serve each individual building/parcel/water service.
- Splitting fire flow demands over multiple hydrants It is common for fire flow demands for parcels requiring 4,000+ gpm to be split over multiple hydrants due to flow limitations on both individual hydrants and fire department pumper trucks. Allowing for a slightly elevated pipeline velocity in select areas in lieu of oversizing the pipelines and inducing an unnecessary water age issue.

It should be further noted that each of these junctions has an assumed fire flow requirement equivalent to the maximum required by the California Fire Code.

4.3 Phasing

Construction of the Placer Ranch project is planned to take place in four separate phases, the first three of which have sub phases. The Placer Ranch Phasing plan is included as **Appendix D**. Prior to the construction of the 42-inch pipeline in Campus Park Blvd, phases 1A and 2A can be constructed. With additional looping distribution pipelines within the parcels, phase 1B and phase 2B can be constructed as well. However, further modeling is recommended to ensure adequate fire flow can be achieved once parcel improvement plans become available.

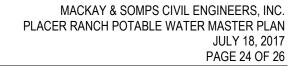


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SECTION 5 – CONCLUSIONS

Conclusions from this potable water master plan are listed below.

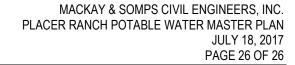
- Placer Ranch will be located within two PCWA pressure zones the first is an extension
 of the PCWA 350 ft pressure zone, and the second will be designed to have a pressure
 similar to the City of Roseville Zone 4 at an approximate HGL of 280 ft. PRVs will connect
 the PCWA 350 ft pressure zone and the Placer Ranch (280 ft) pressure zone.
- PCWA has requested ample space for a future pump station that would pump water from the Placer Ranch (280 ft) pressure zone back into the PCWA 350 ft pressure zone at the PRV located near the intersection of Foothills Boulevard and Campus Park Boulevard.
- It is expected that the PCWA 42-inch transmission main will provide the main source of supply to Placer Ranch. This transmission pipeline will provide transmission capacity for flows to Placer Ranch, other portions of the Sunset Area, and 15 MGD of excess capacity for PCWA to convey west and south.
- Of the total Placer Ranch potable water demand of 3,698 AFY (3,292 AFY with water conservation), the 42-inch transmission main on Campus Park Boulevard will supply approximately 79.9% of that demand under this modeled scenario. This is equivalent to supplying 2,953 AFY (2,630 AFY with water conservation). This 42-inch transmission main will also provide 4,581 AFY of potable water to other portions of the Sunset Area, and 15 MGD (16,803 AFY) to other PCWA service areas to the west and south. This transmission pipeline is expected to be cost shared amongst multiple parties based on the required flow in the pipeline.
- The pipelines on Foothills Boulevard north of the PCWA turnout and Fiddyment Rd north of the PCWA turnout will be oversized for the benefit of other portions of the Sunset Area.
- Initial phases of Placer Ranch can be connected to two existing 16-inch PCWA pipelines in the Sunset Area located on Nichols Drive and Sunset Blvd.
- A 5.16 MG storage tank and pump station will provide system reliability for the Placer Ranch (280 ft) pressure zone. It is expected that PCWA will finance the tank and pump station through connection charges to customers in the zone.
- Three water reliability and emergency interties between PCWA and the City of Roseville will be located within the Placer Ranch distribution system.
- A telemetry study should be performed to determine necessary infrastructure to connect all new infrastructure into PCWA existing SCADA Network system; the nearest existing PCWA SCADA tower is located near the Sunset Water Treatment Plant.



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SECTION 6 – REFERENCES

- 1. HydroScience Engineers, Technical Memorandum 1; *Placer Ranch Specific Plan University Water Demand Estimate*; February 11, 2015.
- 2. HydroScience Engineers, Placer Ranch DRAFT Recycled Water Master Plan, May 2017.
- 3. HydroScience Engineers, Placer Ranch DRAFT Water Conservation Plan, May 2017.
- 4. MacKay & Somps Civil Engineers, Inc., *Placer Ranch Land Use Plan DRAFT,* June 24, 2016.
- 5. MacKay & Somps Civil Engineers, Inc., *Placer Ranch Sunset Industrial Area General Plan Land Use*, March 2015.
- 6. Municipal Consulting Group, Technical Memorandum 1; *Water Supply Placer Ranch and Phasing of Supply*, March 30, 2015.
- 7. Placer County Water Agency, 2015 Urban Water Management Plan, June 2016.
- 8. West Yost Associates, City of Roseville Critical Dry Year Water Supply and Infrastructure Needs Assessment, May 14, 2015.
- 9. West Yost Associates, Technical memorandum 1; *Transmittal of Final PCWA Lower Zone 1 Hydraulic Model*, June 30, 2016.



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APPENDIX A Placer Ranch Detailed Potable Water Demand Summary HydroScience Engineers, Inc.

N	o. ID	Land Use	Total Area	Dwelling Units	Density	Water Demand Factor	Land Class	Water Demand Factor	Average Day Demand (24 Hours)	Average Day Demand w/o RW	Average Day Demand	Average Annual Demand w/o	Average Annual Demand	Max Day Demand	Peak Day Demand	Peak Hour Demand	Water Conservation Factor	Reduced Demand with Water Conservation
	1 PR-01	LDR	(Acres) 21.12	(du) 106	(du/ac)	(afy/acre) 0.48	8679	(gpd/acres) 429	(GPD) 45,474	(gpm) 31.58	(gpm) 31.58	(AFY) 50.94	(AFY) 50.94	(gpm) 66.32	(gpm) 106.11	(gpm) 106.11	% reduction	(AFY) 39.2
F	2 PR-02 3 PR-03	LDR LDR	26.32	132	5	0.48 0.48	8686 8728	429 429	56,628 34,320	39.33 23.83	39.33 23.83	63.43 38.44	63.43 38.44	82.58 50.05	132.13	132.13	23%	48.9 29.6
	4 PR-04 5 PR-05	LDR LDR	13.93 18.01	70 90	5	0.48 0.48	8668 8717	429 429	30,030 38,610	20.85 26.81	20.85 26.81	33.64 43.25	33.64 43.25	43.79 56.31	70.07 90.09	70.07 90.09	23%	25.9 33.3
_	6 PR-06 7 PR-07	LDR LDR	18.38 21.36	92 107	5	0.48 0.48	8703 8696	429 429	39,468 45,903	27.41 31.88	27.41 31.88	44.21 51.42	44.21 51.42	57.56 66.94	92.09 107.11	92.09 107.11	23% 23%	34.1 39.6
E	8 PR-08 9 PR-09	LDR LDR	17.64 20.7	88 104	5 5	0.48 0.48	8732 8670	429 429	37,752 44,616	26.22 30.98	26.22 30.98	42.29 49.98	42.29 49.98	55.06 65.07	88.09 104.10	88.09 104.10	23% 23%	32.6 38.5
_	0 PR-10 1 PR-11	LDR LDR	19.83 20.47	99 102	5 5	0.48 0.48	8725 8742	429 429	42,471 43,758	29.49 30.39	29.49 30.39	47.57 49.02	47.57 49.02	61.94 63.81	99.10 102.10	99.10 102.10	23% 23%	36.6 37.8
1	2 PR-15 3 PR-16	LDR LDR	32.65 36.75	163 184	5 5	0.48 0.48	8725 8700	429 429	69,927 78,936	48.56 54.82	48.56 54.82	78.33 88.42	78.33 88.42	101.98 115.12	163.16 184.18	163.16 184.18	23% 23%	60.3 68.1
1	4 PR-17 5 PR-18	LDR LDR	26.29 29.98	131 150	5 5	0.48 0.48	8742 8706	429 429	56,199 64,350	39.03 44.69	39.03 44.69	62.95 72.08	62.95 72.08	81.96 93.84	131.13 150.15	131.13 150.15	23% 23%	48.5 55.5
1	6 PR-19 7 PR-20	LDR LDR	30.49 27.87	152 139	5 5	0.48 0.48	8738 8734	429 429	65,208 59,631	45.28 41.41	45.28 41.41	73.04 66.80	73.04 66.80	95.10 86.96	152.15 139.14	152.15 139.14	23% 23%	56.3 51.5
1	9 PR-12	LDR LDR	10.04 42.58	50 234	5.5	0.48	8747 7926	429 429	21,450 100,386	14.90 69.71	14.90 69.71	24.03 112.45	24.03 112.45	31.28 146.40	50.05 234.23	50.05 234.23	23%	18.5 86.6
2	0 PR-13 1 PR-14 2 PR-31	LDR LDR MDR	57.49 30.95 17.9	316 170 143	5.5 5.5 8	0.48 0.48 0.35	7925 7930 5453	429 429 312	135,564 72,930 44,616	94.14 50.65 30.98	94.14 50.65 30.98	151.85 81.69 49.98	151.85 81.69 49.98	197.70 106.36 65.07	316.32 170.17 104.10	316.32 170.17 104.10	23% 23% 23%	117.0 62.9 38.5
2	3 PR-32 4 PR-33	MDR MDR	18.68 7.88	149	8	0.35 0.35 0.35	5461 5448	312 312 312	46,488 19,656	32.28 13.65	32.28 13.65	52.07 22.02	52.07 22.02	67.80 28.67	104.10 108.47 45.86	108.47 45.86	23%	40.1 17.0
2	5 PR-34 6 PR-35	MDR MDR	11.48	92 78	8	0.35 0.35	5436 5439	312 312	28,704	19.93	19.93	32.15 27.26	32.15 27.26	41.86	66.98 56.78	66.98	23%	24.8
2	7 PR-36 8 PR-37	MDR MDR	15.18	121	8	0.35 0.35	5465 5423	312 312	37,752 28,392	26.22	26.22	42.29 31.80	42.29 31.80	55.06 41.41	88.09 66.25	88.09 66.25	23%	32.6 24.5
_	9 PR-38 0 PR-39	MDR MDR	12.92 27.17	103 217	8	0.35 0.35	5464 5454	312 312	32,136 67,704	22.32 47.02	22.32 47.02	36.00 75.84	36.00 75.84	46.87 98.74	74.98 157.98	74.98 157.98	23% 23%	27.8 58.5
_	1 PR-41 2 PR-42	HDR HDR	8.16 10.23	163 205	20 20	0.16 0.16	2181 2174	143 143	23,309 29,315	12.91 16.25	16.19 20.36	20.82 26.21	26.11 32.84	33.99 42.75	54.39 68.40	54.39 68.40	6% 6%	19.5 24.5
3	3 PR-43 4 PR-44	HDR HDR	7.19 7.9	161 175	20 20	0.16 0.16	1945 1966	143 143	23,023 25,025	13.10 14.20	15.99 17.38	21.13 22.91	25.79 28.03	33.58 36.49	53.72 58.39	53.72 58.39	6% 6%	19.8 21.4
3	5 PR-45 6 PR-46	HDR HDR	7.2 7.9	161 175	20 20	0.16 0.16	1948 1966	143 143	23,023 25,025	13.10 14.20	15.99 17.38	21.12 22.91	25.79 28.03	33.58 36.49	53.72 58.39	53.72 58.39	6% 6%	19.8 21.4
3	7 PR-47 8 PR-48	HDR HDR	8.39 7.72	185 171	20	0.16 0.16	1976 1967	143 143	26,455 24,453	15.00 13.88	18.37 16.98	24.20	29.63 27.39	38.58 35.66	61.73 57.06	61.73 57.06	6% 6%	22.6
-	9 PR-49 0 PR-50	HDR HDR HDR	5.66 11.43	129 245	20	0.16 0.16	1911 2032 2032	143 143	18,447 35,035	10.54 19.74	12.81 24.33	17.00 31.84	20.66 39.24	26.90 51.09	43.04 81.75	43.04 81.75	6% 6%	15.9 29.8
4	1 PR-51 2 PR-52 3 PR-61	HDR HDR GC	11.24 0 3.56	241 0	20 20 0	0.16 0.16 1.25	2032	143 143 1116	34,463 0 3,973	19.42 0.00 1.69	23.93 0.00 2.76	31.32 0.00 2.72	38.60 0.00 4.45	50.26 0.00 5.79	80.41 0.00 9.27	80.41 0.00 9.27	6% 6% 0%	29.3 0.0 2.7
4	4 PR-62 5 PR-63	GC GC CMU	22.07 4.06		0	1.25 1.25 1.25		1116 1116 1116	3,973 24,630 4,531	1.69 10.45 1.92	2.76 17.10 3.15	16.86 3.10	27.59 5.08	5.79 35.92 6.61	9.27 57.47 10.57	9.27 57.47 10.57	0% 0% 0%	16.9 3.1
4	6 PR-64 7 PR-65	CMU	6.09 7.92		0	1.25 1.25 1.25		1116 1116 1116	6,796 8,839	2.88	4.72 6.14	4.65 6.05	7.61 9.90	9.91	15.86 20.62	15.86 20.62	0% 0%	4.7
4	8 PR-66 9 PR-67	CMU	15.68 7.55		0	1.25 1.25		1116 1116	17,499 8,426	7.43 3.58	12.15 5.85	11.98 5.77	19.60 9.44	25.52 12.29	40.83 19.66	40.83 19.66	0%	12.0 5.8
Ę	0 PR-68 1 PR-70	CMU CP	7.5 15.52		0	1.25 1.66		1116 1482	8,370 23,001	3.55 11.30	5.81 15.97	5.73 18.22	9.38 25.76	12.21 33.54	19.53 53.67	19.53 53.67	0%	5.7 18.2
	2 PR-71 3 PR-72	CP CP	21.52 26.08		0	1.66 1.66		1482 1482	31,893 38,651	15.66 18.98	22.15 26.84	25.27 30.62	35.72 43.29	46.51 56.37	74.42 90.18	74.42 90.18	0% 0%	25.3 30.6
	4 PR-73 5 PR-74	CP CP	35.24 19.62		0	1.66 1.66		1482 1482	52,226 29,077	25.65 14.28	36.27 20.19	41.37 23.04	58.50 32.57	76.16 42.40	121.86 67.85	121.86 67.85	0% 0%	41.4 23.0
	6 PR-75 7 PR-76	CP CP	14.42 12.86		0	1.66 1.66		1482 1482	21,370 19,059	10.50 9.36	14.84 13.24	16.93 15.10	23.94 21.35	31.17 27.79	49.86 44.47	49.86 44.47	0% 0%	16.9 15.1
Ę	8 PR-77 9 PR-78	CP CP	10.98 10.38		0	1.66 1.66		1482 1482	16,272 15,383	7.99 7.56	11.30 10.68	12.89 12.19	18.23 17.23	23.73 22.43	37.97 35.89	37.97 35.89	0%	12.9 12.2
6	0 PR-79 1 PR-80	CP CP	23.75 17.58		0	1.66		1482 1482	35,198 26,054	17.29 12.80	24.44 18.09	27.88	39.43 29.18	51.33 37.99	82.13 60.79	82.13 60.79	0%	27.9
6	2 PR-81 3 PR-82 4 PR-83	CP CP	4.49 26.92		0	1.66 1.66		1482 1482	6,654 39,895	3.27 19.59	4.62 27.71	5.27 31.61	7.45 44.69	9.70 58.18	15.53 93.09	15.53 93.09	0% 0%	5.3 31.6
6	5 PR-84 6 PR-85	CP CP	26.39 25.74 33.93		0 0	1.66 1.66 1.66		1482 1482 1482	39,110 38,147 50,284	19.21 18.74 24.70	27.16 26.49 34.92	30.98 30.22 39.84	43.81 42.73 56.33	57.04 55.63 73.33	91.26 89.01 117.33	91.26 89.01 117.33	0% 0% 0%	31.0 30.2 39.8
6	7 PR-86 8 PR-87	CP CP	13.84		0	1.66 1.66		1482 1482	20,511	10.07	14.24	16.25 21.44	22.98	29.91 39.46	47.86 63.14	47.86 63.14	0%	16.2 21.4
6	9 PR-88 0 PR-89	CP CP	13.17		0	1.66 1.66		1482 1482	19,518	9.59	13.55	15.46 15.76	21.86	28.46	45.54 46.41	45.54 46.41	0%	15.5 15.8
_	1 PR-90 2 PR-91	CP PF	11.42 10.65		0	1.66 2.00		1482 1785	16,924 19,010	8.31 9.99	11.75 13.20	13.41 16.12	18.96 21.29	24.68 27.72	39.49 44.36	39.49 44.36	0% 0%	13.4 16.1
	3 PR-92 4 PR-93	PF PF	21.31 0.23		0	2.00 2.00		1785 1785	38,038 411	20.00 0.22	26.42 0.29	32.25 0.35	42.61 0.46	55.47 0.60	88.76 0.96	88.76 0.96	0% 0%	32.3 0.3
_	5 PR-94 6 PR-95	PF PF	0.54 0.55		0	2.00 2.00		1785 1785	964 982	0.51 0.52	0.67 0.68	0.82 0.83	1.08 1.10	1.41 1.43	2.25 2.29	2.25 2.29	0% 0%	0.8
7	7 PR-96 8 PR-97	PF PF	0.26 1.76		0	2.00 2.00		1785 1785	464 3,142	0.24 1.65	0.32 2.18	0.39 2.66	0.52 3.52	0.68 4.58	1.08 7.33	1.08 7.33	0% 0%	0.4 2.7
8	9 PR-98 0 PR-101	PF PR	2.14 9.13		0	2.00 1.2		1785 1071	3,820 9,778	2.01 0.68	2.65 6.79	3.24 1.10	4.28 10.95	5.57 14.26	8.91 22.82	8.91 22.82	0%	3.2 1.1
8	1 PR-102 2 PR-103	PR PR	20.85		0	1.2		1071 1071	22,330 4,284	1.55 0.30	15.51 2.98	2.50 0.48	25.01 4.80	32.57 6.25	52.10 10.00	52.10 10.00	0% 0%	2.5 0.5
8	3 PR-104 4 PR-105 5 PR-106	PR PR PR	3.61 9.5 1.21		0 0	1.2 1.2 1.2		1071 1071 1071	3,866 10,175 1,296	0.27 0.71 0.09	2.68 7.07 0.90	0.43 1.14 0.15	4.33 11.40 1.45	5.64 14.84 1.89	9.02 23.74 3.02	9.02 23.74 3.02	0% 0% 0%	0.4 1.1 0.1
8	6 PR-106 7 PR-108	PR PR PR	1.21 1.21 1.21		0	1.2 1.2 1.2		1071 1071 1071	1,296 1,296 1,296	0.09	0.90 0.90 0.90	0.15 0.15 0.15	1.45 1.45 1.45	1.89 1.89 1.89	3.02 3.02 3.02	3.02 3.02 3.02	0% 0% 0%	0.1 0.1 0.1
8	8 PR-111 9 PR-112	PR PR	0.57		0	1.2 1.2 1.2		1071 1071 1071	610 675	0.04	0.42	0.07	0.68	0.89	1.42	1.42	0% 0% 0%	0.1
9	0 PR-113 1 PR-114	PR PR	1.77		0	1.2		1071	1,896 632	0.13 0.04	1.32	0.21	2.12 0.71	2.76 0.92	4.42	4.42 1.47	0%	0.2
9	2 PR-115 3 PR-116	PR PR	0.62 5.31		0	1.2 1.2		1071 1071	664 5,687	0.05 0.39	0.46 3.95	0.07 0.64	0.74 6.37	0.97 8.29	1.55 13.27	1.55 13.27	0% 0%	0.1 0.6
(4 PR-117 5 PR-118	PR PR	0.77 0.77		0	1.2 1.2		1071 1071	825 825	0.06 0.06	0.57 0.57	0.09 0.09	0.92 0.92	1.20 1.20	1.92 1.92	1.92 1.92	0% 0%	0.1 0.1
(6 PR-119 7 PR-121	PR OS	10.87 16.69		0	1.2 0.0		1071	11,642 0	0.81	0.00	0.00	13.04 0.00	16.98	27.16 0.00	27.16 0.00	0%	0.0
9	9 PR-123	OS OS	71.55 14.49		0	0.0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0% 0%	0.0
10	0 PR-124 11 PR-125 12 PR-126	0S 0S	22.26 58.31		0 0	0.0 0.0 0.0		0 0	0 0	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.00 0.00 0.00	0.00	0.00	0% 0% 0%	0.0 0.0 0.0
10	2 PR-126 3 PR-127 4 PR-128	OS OS	3.03 6.96 7.04		0 0	0.0 0.0 0.0		0 0	0 0	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.00 0.00 0.00	0.00 0.00 0.00	0% 0% 0%	0.0
10	5 PR-129 6 PR-130	OS OS	5.7 3.24		0	0.0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0% 0% 0%	0.0
10	7 PR-131 8 PR-132	OS OS	7.04		0	0.0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0% 0%	0.0
10	9 PR-141 0 PR-200	UZ (Univ) Placer Pkwy	301.27 158.51		0	Varies 1.20		Varies 0	1,247,890	715.33 0.00	866.59 0.00	1153.83	1397.81	1819.84 0.00	2911.74 0.00	2,911.74 0.00	0%	1,153.8 0.0
11	1 PR-201 Subtotal	ROW/LSE	158.46 2,213	5,827	0	1.20		1071	25,457 3,888,160	0.00 2,292	17.68 2,700	0.00 3,698	28.51 4,355	37.12 5,670	59.40 9,072	59.40 9,072	0%	0.0 3,292
	<u> </u>	I	<u> </u>	<u> </u>	1	ı	I	I		TOTALS	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	1		
F		LDR LDR-A	407.86 131.02	2039.00 720.00	5 5.5	0.48 0.48	8713 7927	429 429	874731 308880	607 215	607 215	980 346	980 346	1276 450	2041 721	2041 721	23.0% 22.9%	755 267
F		MDR HDR	132.28	1057.00 2011.00	8 20	0.35 0.16	5451 2015	312 143	329784 287573	229 162	229 200	369 262	369 322	481 419	769 671	769 671	6.5%	285 245
F		GC CMU	25.63 48.80	0.00		1.25 1.25		1116 1116	28603 54461	12 23	20 38	20 37	32 61	42 79	67 127	67 127	0.0%	20 37
E		CP UZ	395.53 301.27	0.00 0.00		1.66 Varies		1482 Varies	586175 1247890	288 715	407 867	464 1154	657 1398	855 1820	1368 2912	1368 2912	0.0% 0.0%	464 1154
E		PF PF	31.96 5.48	0.00		2.00 2.00		1785 1785	57049 9782	30 5	40 7	48 8	64 11	83 14	133 23	133 23	0.0%	48 8
Ī	1	PR	72.62	0.00	1	1.20	ı	1071	77776	5	54	9	87	113	181	181	0.0%	9

Placer Ranch

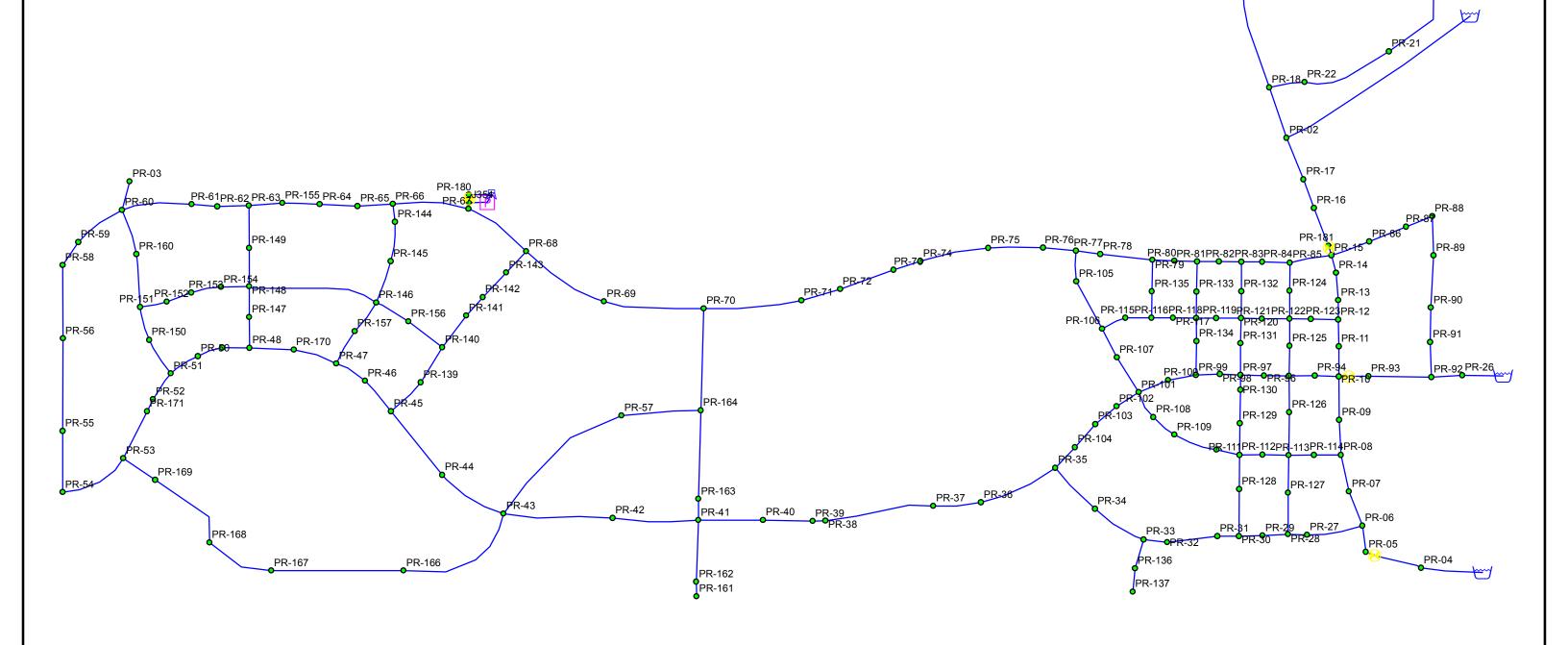
1.20 0.00 1.20 1.20

72.62 250.9 158.51 0.00 0.00 0.00

77776 0 0







APPENDIX B

MACKAY AND SOMPS CIVIL ENGINEERS PLACER RANCH POTABLE WATER MASTER PLAN INFOWATER WATER MODEL - JUNCTION ID'S



Placer Ranch PWMP - InforWater Output Report - Junction Pressure

 	-	Man Time		Min Time	A	D:#
ID	Max.Value (psi)	Max.Time (hrs.)	Min.Value (psi)	Min.Time (hrs.)	Average (psi)	Difference (psi)
J354	72.17	34:30	70.86	06:00	71.71	1.30
PR-02	72.03	34:30	71.41	06:00	71.82	0.62
PR-03	73.97	34:30	72.48	06:00	73.44	1.49
PR-04	81.67	34:30	81.56	06:00	81.63	0.10
PR-05	72.97	34:30	72.95	06:00	72.96	0.02
PR-06	71.57	34:30	71.51	06:00	71.55	0.06
PR-07	69.81	34:30	69.76	06:00	69.79	0.05
PR-08	65.45	34:30	65.41	06:00	65.43	0.04
PR-09	64.58	34:30	64.54	06:00	64.56	0.04
PR-10	64.57	34:30	64.54	06:00	64.56	0.03
PR-100	65.27	34:30	64.92	06:00	65.15	0.34
PR-101	66.53	34:30	66.13	06:00	66.39	0.40
PR-102	66.96	34:30	66.53	06:00	66.81	0.43
PR-103	69.11	34:30	68.66	06:00	68.95	0.45
PR-104	68.67	34:30	68.18	06:00	68.50	0.48
PR-105	69.06	34:30	68.60	06:00	68.90	0.46
PR-106	70.83	34:30	70.39	06:00	70.68	0.44
PR-107	69.55	34:30	69.12	06:00	69.40	0.42
PR-108	65.69	34:30	65.32	06:00	65.56	0.37
PR-109	63.55	34:30	63.22	06:00	63.43	0.33
PR-11	65.87	34:30	65.84	06:00	65.86	0.03
PR-110	64.02	34:30	63.76	06:00	63.93	0.27
PR-111	65.78	34:30	65.56	06:00	65.70	0.22
PR-112	62.77	34:30	62.59	06:00	62.71	0.19
PR-113	66.26	34:30	66.12	06:00	66.22	0.14
PR-114	68.02	34:30	67.93	06:00	67.99	0.10
PR-115	69.55	34:30	69.16	06:00	69.41	0.39
PR-116	68.27	34:30	67.93	06:00	68.15	0.34
PR-117	67.00	34:30	66.69	06:00	66.89	0.31
PR-118	65.73	34:30	65.45	06:00	65.63	0.28
PR-119	65.75	34:30	65.50	06:00	65.66	0.24
PR-12	66.74	34:30	66.71	06:00	66.73	0.03
PR-120	63.61	34:30	63.41	06:00	63.54	0.20
PR-121	61.47	34:30	61.30	06:00	61.41	0.17
PR-122	64.10	34:30	63.98	06:00	64.06	0.12
PR-123	66.28	34:30	66.20	06:00	66.25	0.08
PR-124	63.23	34:30	63.12	06:00	63.20	0.11
PR-125	62.79	34:30	62.67	06:00	62.75	0.12
PR-126	62.36	34:30	62.23	06:00	62.32	0.13
PR-127	64.53	34:30	64.39	06:00	64.48	0.15
PR-128	64.92	34:30	64.69	06:00	64.84	0.23
PR-129	63.61	34:30	63.39	06:00	63.54	0.22
PR-13	63.71	34:30	63.68	06:00	63.70	0.03
PR-130	63.61	34:30	63.40	06:00	63.54	0.22
PR-131	61.44	34:30	61.24	06:00	61.37	0.21
PR-132	62.74	34:30	62.55	06:00	62.68	0.20
PR-133	64.43	34:30	64.16	06:00	64.33	0.27
PR-134	67.46	34:30	67.18	06:00	67.36	0.28
PR-135	66.54	34:30	66.20	06:00	66.42	0.34
PR-136	65.27	34:30	64.89	06:00	65.14	0.38

Placer Ranch PWMP - InforWater Output Report - Junction Pressure

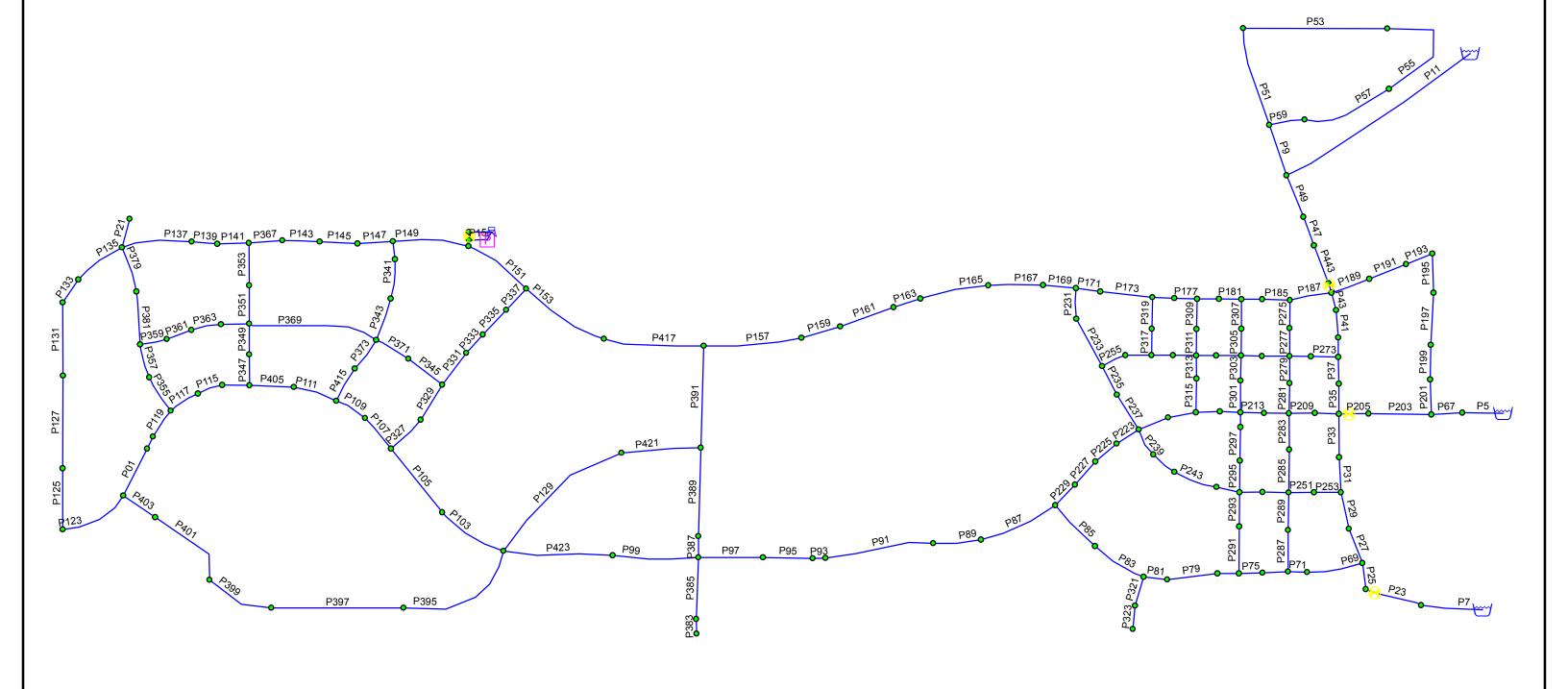
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PR-139	DD 127	,			1 1		,, ,
PR-14							
PR-140							
PR-141							
PR-142 72.21 34:30 70.90 06:00 71.75 1.31 PR-143 73.96 34:30 72.67 06:00 72.05 1.28 PR-144 72.54 34:30 71.18 06:00 72.05 1.35 PR-145 71.67 34:30 70.31 06:00 71.19 1.37 PR-146 73.85 34:30 72.47 06:00 73.36 1.38 PR-147 78.55 34:30 77.10 06:00 78.03 1.44 PR-148 78.10 34:30 76.66 06:00 77.59 1.44 PR-149 77.63 34:30 76.66 06:00 77.59 1.44 PR-149 77.63 34:30 76.20 06:00 77.12 1.43 PR-150 77.22 34:30 75.74 06:00 76.69 1.48 PR-151 77.63 34:30 76.15 06:00 76.69 1.48 PR-151 77.63 34:30 76.15 06:00 74.95 1.47 PR-152 75.47 34:20 74.00 06:00 74.95 1.47 PR-153 74.18 34:30 72.72 06:00 73.66 1.46 PR-154 75.92 34:30 74.49 06:00 75.41 1.45 PR-155 75.90 34:30 72.52 06:00 73.40 1.37 PR-156 73.88 34:30 72.52 06:00 73.40 1.37 PR-157 73.42 34:30 72.03 06:00 72.93 1.39 PR-158 74.19 34:30 73.02 06:00 73.98 1.49 PR-160 74.51 34:30 73.37 06:00 74.16 1.22 PR-161 74.59 34:30 73.37 06:00 74.16 1.22 PR-162 74.59 34:30 73.37 06:00 75.41 1.50 PR-163 75.99 34:30 74.42 06:00 75.43 1.57 PR-166 76.94 34:30 73.37 06:00 75.43 1.57 PR-167 75.99 34:30 73.37 06:00 75.43 1.57 PR-168 76.94 34:30 73.37 06:00 75.43 1.57 PR-169 80.27 34:30 75.44 06:00 75.43 1.57 PR-160 74.51 34:30 75.75 06:00 73.46 0.71 PR-167 75.99 34:30 75.75 06:00 75.40 1.40 PR-168 76.94 34:30 75.75 06:00 76.41 1.50 PR-169 80.27 34:30 75.75 06:00 76.41 1.50 PR-160 76.94 34:30 75.75 06:00 76.41 1.50 PR-161 74.59 34:30 75.75 06:00 76.41 1.50 PR-167 75.99 34:30 75.75 06:00 76.41 1.50 PR-169 80.27 34:30 76.60 06:00 76.41 1.50 PR-160 76.94							
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PR-18 72.02 34:30 71.31 06:00 71.78 0.71 PR-180 13.00 28:10 13.00 00:00 13.00 0.00 PR-181 71.45 34:30 70.60 06:00 71.16 0.85 PR-19 71.56 34:30 70.72 06:00 71.28 0.84 PR-20 72.87 34:30 72.06 06:00 72.60 0.81 PR-21 69.84 34:30 69.07 06:00 69.58 0.77 PR-22 68.98 34:30 68.25 06:00 68.73 0.73 PR-26 81.44 34:30 81.23 06:00 81.37 0.20 PR-27 68.90 34:30 68.77 06:00 68.85 0.13 PR-28 64.54 34:30 64.38 06:00 64.48 0.15 PR-29 67.54 34:30 67.35 06:00 65.71 0.23 PR-31 68.37 34:30<	PR-171	77.24	34:30	75.75	06:00	76.71	1.49
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PR-29 67.54 34:30 67.35 06:00 67.48 0.20 PR-30 65.79 34:30 65.56 06:00 65.71 0.23 PR-31 68.37 34:30 68.10 06:00 68.28 0.26 PR-32 67.89 34:30 67.55 06:00 67.77 0.34		64.54	34:30	64.38	06:00	64.48	0.15
PR-30 65.79 34:30 65.56 06:00 65.71 0.23 PR-31 68.37 34:30 68.10 06:00 68.28 0.26 PR-32 67.89 34:30 67.55 06:00 67.77 0.34		67.54	34:30	67.35	06:00	67.48	0.20
PR-32 67.89 34:30 67.55 06:00 67.77 0.34	PR-30	65.79	34:30	65.56	06:00	65.71	0.23
	PR-31	68.37	34:30	68.10	06:00	68.28	0.26
PR-33 66.14 34:30 65.76 06:00 66.01 0.38	PR-32	67.89	34:30	67.55	06:00	67.77	0.34
	PR-33	66.14	34:30	65.76	06:00	66.01	0.38

Placer Ranch PWMP - InforWater Output Report - Junction Pressure

	ID	Max.Value (psi)	Max.Time (hrs.)	Min.Value (psi)	Min.Time (hrs.)	Average (psi)	Difference (psi)
	PR-34	63.93	34:30	63.48	06:00	63.77	0.45
	PR-35	69.09	34:30	68.58	06:00	68.91	0.51
	PR-36	68.92	34:30	68.13	06:00	68.65	0.79
	PR-37	71.87	34:30	70.93	06:00	71.54	0.94
	PR-38	73.89	34:30	72.80	06:00	73.51	1.09
	PR-39	74.74	34:30	73.64	06:00	74.35	1.10
	PR-40	73.81	34:30	72.66	06:00	73.40	1.15
	PR-41	74.59	34:30	73.38	06:00	74.17	1.21
	PR-42	76.26	34:30	74.98	06:00	75.81	1.28
	PR-43	77.04	34:30	75.71	06:00	76.57	1.34
	PR-44	77.00	34:30	75.64	06:00	76.52	1.35
	PR-45	76.95	34:30	75.59	06:00	76.47	1.36
	PR-46	76.92	34:30	75.53	06:00	76.43	1.38
	PR-47	74.29	34:30	72.89	06:00	73.79	1.39
	PR-48	77.70	34:30	76.25	06:00	77.19	1.45
	PR-49	78.99	34:30	77.54	06:00	78.48	1.45
Ħ	PR-50	76.39	34:30	74.92	06:00	75.87	1.46
	PR-51	78.98	34:30	77.51	06:00	78.45	1.47
	PR-52	77.25	34:30	75.77	06:00	76.72	1.48
	PR-53	77.23	34:30	75.68	06:00	76.68	1.55
	PR-54	78.92	34:30	77.38	06:00	78.37	1.54
	PR-55	73.68	34:30	72.15	06:00	73.14	1.54
	PR-56	73.64	34:30	72.11	06:00	73.09	1.52
	PR-57	73.23	34:30	71.96	06:00	72.79	1.27
	PR-58	74.04	34:30	72.54	06:00	73.50	1.50
	PR-59	74.89	34:30	73.40	06:00	74.36	1.50
	PR-60	74.03	34:30	72.53	06:00	73.48	1.48
	PR-61	73.21	34:30	71.76	06:00	72.70	1.45
	PR-62	73.67	34:30	72.23	06:00	73.16	1.43
		75.43	34:30	74.01	06:00	74.93	1.43
	PR-63	75.43	34:30	73.68	06:00	74.93	1.42
	PR-64	74.67	34:30	73.30	06:00	74.37	1.37
	PR-65 PR-66	72.97	34:30	71.62	06:00	74.16	1.35
		72.97	34:30	70.86	06:00	71.71	1.30
	PR-67	73.53		70.86			
	PR-68		34:30		06:00	73.09	1.26
	PR-69	71.90	34:30	70.70	06:00	71.47	1.20
	PR-70	74.17	34:30	73.05	06:00	73.77	1.12
	PR-71	67.36	34:30	66.40	06:00	67.02	0.96
	PR-72	69.15	34:30	68.25	06:00	68.83	0.90
	PR-73	70.09	34:30	69.29	06:00	69.81	0.81
	PR-74	73.16	34:30	72.40	06:00	72.90	0.76
	PR-75	68.92	34:30	68.29	06:00	68.70	0.63
	PR-76	67.70	34:30	67.17	06:00	67.51	0.53
	PR-77	67.75	34:30	67.27	06:00	67.58	0.47
	PR-78	68.21	34:30	67.78	06:00	68.06	0.43
	PR-79	70.01	34:30	69.66	06:00	69.89	0.34
	PR-80	68.30	34:30	67.99	06:00	68.19	0.30
	PR-81	67.46	34:30	67.19	06:00	67.37	0.26
	PR-82	65.32	34:30	65.09	06:00	65.24	0.23
	PR-83	63.61	34:30	63.43	06:00	63.55	0.19

ID	Max.Value (psi)	Max.Time (hrs.)	Min.Value (psi)	Min.Time (hrs.)	Average (psi)	Difference (psi)
PR-84	63.64	34:30	63.49	06:00	63.59	0.15
PR-85	63.24	34:30	63.14	06:00	63.20	0.10
PR-86	68.91	34:30	68.10	06:00	68.63	0.81
PR-87	72.43	34:30	71.67	06:00	72.17	0.77
PR-88	72.91	34:30	72.18	06:00	72.66	0.73
PR-89	73.84	34:30	73.20	06:00	73.63	0.64
PR-90	76.97	34:30	76.45	06:00	76.80	0.52
PR-91	77.03	34:30	76.59	06:00	76.88	0.44
PR-92	76.65	34:30	76.29	06:00	76.54	0.36
PR-93	76.65	34:30	76.12	06:00	76.49	0.53
PR-94	61.95	34:30	61.87	06:00	61.92	0.08
PR-95	60.19	34:30	60.07	06:00	60.15	0.13
PR-96	60.60	34:30	60.43	06:00	60.54	0.17
PR-97	63.61	34:30	63.40	06:00	63.54	0.21
PR-98	64.89	34:30	64.64	06:00	64.80	0.25
PR-99	63.99	34:30	63.71	06:00	63.90	0.28





APPENDIX B

MACKAY AND SOMPS CIVIL ENGINEERS PLACER RANCH POTABLE WATER MASTER PLAN INFOWATER WATER MODEL - PIPE ID'S



Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

PIPE: ID (Char)	PIPEHYD: DIAMETER (Real)	RANGE: MAX_VALUE (ft/s)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (ft/s)
P11	42.00	5.61	06:00	3.16
P13	18.00	0.00	00:00	0.00
P15	18.00	0.00	00:00	0.00
P21	42.00	3.22	06:00	2.68
P23	18.00	3.69	06:00	3.00
P25	18.00	3.66	06:00	2.99
P27	18.00	1.24	34:30	1.07
P29	18.00	1.23	34:30	1.01
P31	18.00	0.68	34:30	0.00
P33	18.00	0.66	34:30	0.03
P35	18.00	0.31	34:30	0.13
P37	18.00	0.32	34:30	0.16
P39	18.00	1.03	06:00	0.79
P41	18.00	1.06	06:00	0.80
P43	18.00	1.07	06:00	0.80
P45	42.00	4.92	06:00	3.00
P47	42.00	4.80	06:00	2.90
P49	42.00	4.80	06:00	2.90
P51	24.00	2.24	06:00	0.74
P53	12.00	0.54	06:00	0.18
P55	12.00	0.67	06:00	0.10
P57	12.00	0.80	06:00	0.26
P59				0.31
P67	12.00	0.93	06:00	1.09
	18.00	3.77	06:10	
P69	18.00	2.49	06:00	1.71
P71	18.00	2.43	06:00	1.70
P73	18.00	2.53	06:00	1.54
P75	18.00	2.45	06:00	1.52
P77	18.00	2.41	06:00	1.37
P79	18.00	2.37	06:00	1.36
P81	18.00	2.33	06:00	1.35
P83	18.00	2.16	06:00	1.29
P85	18.00	2.02	06:00	1.25
P87	18.00	3.71	06:00	2.14
P89	18.00	3.51	06:00	2.08
P91	18.00	2.56	06:00	1.76
P93	18.00	2.36	06:00	1.70
P95	18.00	2.35	06:00	1.70
P97	18.00	2.26	06:00	1.67
P99	18.00	1.88	06:00	1.32
P103	18.00	1.36	06:00	1.16
P105	18.00	1.22	06:00	1.11
P107	18.00	1.71	06:00	1.35
P109	18.00	1.65	06:10	1.33
P111	18.00	1.70	06:00	1.16
P113	18.00	1.11	06:00	0.70
P115	18.00	1.10	06:00	0.70
P117	18.00	1.09	06:00	0.70
P119	18.00	0.61	06:00	0.25
P121	12.00	1.36	06:00	0.57

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

PIPE: ID (Char)	PIPEHYD: DIAMETER (Real)	RANGE: MAX_VALUE (ft/s)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (ft/s)
P123	12.00	0.86	14:00	0.80
P125	12.00	0.85	11:30	0.79
P127	12.00	0.80	34:30	0.64
P129	12.00	1.14	06:00	0.85
P131	12.00	0.74	34:30	0.45
P133	12.00	0.74	34:30	0.44
P135	12.00	0.66	34:30	0.20
P137	42.00	3.10	06:00	2.51
P139	42.00	3.10	06:00	2.51
P141	42.00	3.11	06:00	2.51
P143	42.00	3.06	06:00	2.44
P145	42.00	3.07	06:00	2.44
P147	42.00	3.08	06:00	2.44
P149	42.00	3.12	06:00	2.41
P151	42.00	3.14	06:00	2.41
P153	42.00	3.44	06:00	2.58
P157	42.00	4.52	06:10	2.94
P159	42.00	4.55	06:00	2.95
P161	42.00	4.57	06:00	2.95
P163	42.00	4.58	06:00	2.96
P165	42.00	4.75	06:00	3.01
P167	42.00	4.76	06:00	3.02
P169	42.00	4.77	06:00	3.02
P171	42.00	4.51	06:10	2.81
P173	42.00	4.52	06:00	2.81
P175	42.00	4.52	06:00	2.80
P177	42.00	4.53	06:00	2.80
P179	42.00	4.57	06:00	2.79
P181	42.00	4.58	06:00	2.80
P183	42.00	4.64	06:00	2.81
P185	42.00	4.64	06:00	2.81
P187	42.00	4.72	06:00	2.85
P189	12.00	1.71	06:00	1.31
P191	12.00	1.92	06:00	1.38
P193	12.00	1.93	06:00	1.38
P193		2.46		
	12.00	2.46	06:00	1.56
P197	12.00		06:00	1.56
P199	12.00	2.46	06:00	1.56
P201	12.00	2.46	06:00	1.56
P203	18.00	2.61	06:20	0.37
P205	18.00	2.58	06:10	0.36
P207	18.00	2.65	06:00	1.33
P209	18.00	2.58	06:00	1.31
P211	18.00	2.62	06:00	1.51
P213	18.00	2.53	06:00	1.48
P215	18.00	2.57	06:00	1.59
P217	18.00	2.53	06:00	1.57
P219	18.00	2.70	06:00	1.51
P221	18.00	2.64	06:00	1.49
P223	18.00	1.80	06:00	0.94

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

PIPE: ID	PIPEHYD: DIAMETER	RANGE: MAX_VALUE	RANGE: MAX_TIME	RANGE: MIN_VALUE
(Char)	(Real)	(ft/s)	(hrs.)	(ft/s)
P225	18.00	1.76	06:00	0.92
P227	18.00	1.74	06:00	0.91
P229	18.00	1.69	06:00	0.90
P231	18.00	1.45	06:00	1.15
P233	18.00	1.46	06:00	1.15
P235	18.00	1.53	06:00	1.00
P237	18.00	1.56	06:00	1.01
P239	12.00	1.64	06:00	1.04
P241	12.00	1.80	06:00	1.09
P243	12.00	1.83	06:00	1.10
P245	12.00	2.02	06:00	1.16
P247	12.00	1.96	06:00	1.17
P249	12.00	1.97	06:00	1.17
P251	12.00	2.03	06:00	1.15
P253	12.00	2.04	06:00	1.16
P255	12.00	1.97	06:00	1.04
P257	12.00	1.99	06:00	1.04
P259	12.00	1.97	06:10	1.25
P261	12.00	1.97	06:10	1.25
P263	12.00	1.95	06:00	1.22
P265	12.00	2.03	06:00	1.25
P267	12.00	1.97	06:00	1.17
P269	12.00	2.06	06:00	1.20
P271	12.00	1.93	06:00	1.04
P273	12.00	1.97	06:00	1.05
P275	12.00	0.86	06:00	0.44
P277	12.00	0.75	06:00	0.40
P279	12.00	0.60	06:00	0.24
P281	12.00	0.49	06:00	0.20
P283	12.00	0.39	06:00	0.00
P285	12.00	0.29	34:50	0.00
P287	12.00	0.34	34:30	0.00
P289	12.00	0.32	06:00	0.01
P291	12.00	0.32	34:30	0.07
P293	12.00	0.24	34:30	0.00
P295	12.00	0.24	34:30	0.00
P297	12.00	0.30	06:00	0.00
P299	12.00	0.33	06:00	0.00
P301	12.00	0.43	06:00	0.03
P303	12.00	0.51	06:00	0.06
P305	12.00	0.58	06:00	0.14
P307	12.00	0.66	06:00	0.16
P309	12.00	0.47	06:00	0.00
P311	12.00	0.43	06:00	0.01
P313	12.00	0.40	06:00	0.00
P315	12.00	0.38	06:00	0.01
P317	12.00	0.21	34:30	0.00
P319	12.00	0.20	34:30	0.00
P321	12.00	0.29	06:00	0.10
P323	12.00	0.01	06:00	0.00

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

PIPE: ID (Char)	PIPEHYD: DIAMETER (Real)	RANGE: MAX_VALUE (ft/s)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (ft/s)
P327	18.00	0.62	06:00	0.29
P329	18.00	0.75	06:00	0.33
P331	18.00	1.39	06:00	0.83
P333	18.00	1.55	06:00	0.88
P335	18.00	1.57	06:00	0.89
P337	18.00	1.58	06:00	0.89
P339	12.00	0.49	06:00	0.01
P341	12.00	0.48	06:00	0.00
P343	12.00	0.46	34:30	0.00
P345	12.00	1.33	06:00	1.09
P347	12.00	0.88	34:30	0.85
P349	12.00	0.83	34:30	0.71
P351	12.00	1.08	34:30	0.96
P353	12.00	1.00	34:30	0.72
P355	12.00	1.08	06:00	0.99
P357	12.00	0.90	34:30	0.81
P359	12.00	0.80	06:00	0.60
P361	12.00	0.93	06:00	0.65
P363	12.00	0.94	06:00	0.65
P365	12.00	0.95	06:00	0.65
P367	42.00	3.05	06:00	2.43
P369	12.00	1.21	06:00	0.90
P371	12.00	1.32	06:00	1.09
P373	12.00	0.43	06:00	0.00
P379	12.00	1.41	34:30	1.32
P381	12.00	1.60	06:00	1.50
P383	12.00	0.01	06:00	0.00
P385	12.00	0.48	06:00	0.16
P387	18.00	0.40	34:30	0.17
P389	18.00	0.26	34:30	0.13
P391	18.00	1.48	06:00	0.48
P395	12.00	1.71	06:00	1.04
P397	12.00	1.22	06:00	0.88
P399	12.00	0.77	06:00	0.73
P401	12.00	0.62	34:30	0.73
P403	12.00	0.37	06:00	0.43
P403 P405	18.00	1.56	06:00	1.11
P405 P01	12.00	1.34	06:00	0.56
P01 P5				
P7	18.00 18.00	3.77	06:10	1.09
		3.69	06:00	3.01
P9	24.00	2.49	06:00	0.82
P415	12.00	0.33	34:30	0.00
P417	42.00	3.48	06:00	2.59
P421	12.00	1.45	06:00	0.96
P423	18.00	1.73	06:00	1.27
P425	18.00	0.00	00:00	0.00
P427	18.00	0.00	00:00	0.00
P429	18.00	0.00	00:00	0.00
P435	18.00	0.00	00:00	0.00
P437	42.00	4.92	06:00	3.00

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

PIPE: ID (Char)	PIPEHYD: DIAMETER (Real)	RANGE: MAX_VALUE (ft/s)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (ft/s)
P439	18.00	2.58	06:00	0.36
P441	18.00	3.69	06:00	3.00
P443	42.00	4.78	06:00	2.89

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

RANGE: MIN_TIME	RANGE: AVE_VALUE	RANGE: DIFFERENCE
(hrs.)	(ft/s)	(ft/s)
34:30	4.10	2.44
00:00	0.00	0.00
00:00	0.00	0.00
34:30	2.89	0.54
34:30	3.27	0.68
34:30	3.25	0.66
06:00	1.19	0.18
06:00	1.16	0.21
06:10	0.44	0.68
53:30	0.41	0.63
06:00	0.21	0.18
06:00	0.23	0.16
34:30	0.86	0.24
34:30	0.88	0.26
34:30	0.88	0.27
34:30	3.73	1.92
34:30	3.62	1.90
34:30	3.62	1.90
34:30	1.32	1.50
34:30	0.32	0.36
34:30	0.39	0.45
34:30	0.47	0.54
34:30	0.55	0.63
34:40	2.15	2.68
34:30	2.00	0.77
34:30	1.97	0.74
34:30	1.91	0.98
34:30	1.87	0.93
34:30	1.77	1.04
34:30	1.75	1.01
34:30	1.72	0.98
34:30	1.62	0.87
34:30	1.54	0.78
34:30	2.75	1.57
34:30	2.63	1.43
34:30	2.07	0.79
34:30	1.96	0.66
34:30	1.95	0.66
34:30	1.90	0.60
34:30	1.54	0.56
34:30	1.24	0.36
		-
34:30	1.16	0.11
34:30	1.50	0.36
34:30	1.46	0.32
34:30	1.37	0.54
34:30	0.86	0.41
34:30	0.86	0.40
34:30	0.85	0.40
34:30	0.39	0.36
34:30	0.88	0.79

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

RANGE: MIN_TIME	RANGE: AVE_VALUE	RANGE: DIFFERENCE
(hrs.)	(ft/s)	(ft/s)
06:00	0.85	0.06
06:00	0.84	0.06
06:00	0.75	0.16
34:30	0.97	0.28
06:00	0.64	0.29
06:00	0.64	0.30
06:00	0.49	0.46
34:30	2.74	0.59
34:30	2.74	0.59
34:30	2.74	0.60
34:30	2.68	0.63
34:30	2.68	0.63
34:30	2.69	0.64
34:30	2.68	0.71
34:30	2.69	0.72
34:30	2.91	0.72
34:30	3.55	1.58
34:30	3.57	1.60
34:30	3.58	1.61
34:30	3.58	1.62
34:30	3.68	1.74
34:30	3.69	1.75
34:50	3.70	1.75
34:30	3.46	1.70
34:30	3.47	1.70
34:40	3.46	1.72
34:30	3.47	1.73
34:30	3.48	1.78
34:30	3.49	1.79
34:30	3.52	1.83
34:30	3.52	1.83
34:30	3.57	1.87
34:40	1.47	0.40
34:40	1.59	0.54
34:40	1.60	0.54
34:40	1.91	0.90
34:40	1.91	0.90
34:40	1.91	0.90
34:40	1.91	0.90
34:40	1.27	2.24
34:40	1.25	2.21
34:30	1.86	1.32
34:30	1.82	1.27
34:30	1.94	1.11
34:30	1.89	1.05
34:30	1.97	0.98
34:30	1.95	0.96
34:30	1.98	1.19
34:30	1.94	1.15
34:30	1.27	0.87

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

RANGE: MIN_TIME (hrs.)	RANGE: AVE_VALUE (ft/s)	RANGE: DIFFERENCE (ft/s)				
34:30	1.25	0.84				
34:30	1.24	0.82				
34:30	1.21	0.79				
34:30	1.27	0.30				
34:30	1.28	0.31				
34:30	1.21	0.53				
34:50	1.23	0.55				
34:30	1.27	0.60				
34:30	1.37	0.71				
34:30	1.38	0.73				
34:30	1.49	0.73				
	1.49	0.88				
34:30 34:40						
	1.48	0.80				
34:30	1.47	0.87				
34:30	1.48	0.88				
34:30	1.40	0.94				
34:30	1.41	0.95				
34:50	1.54	0.72				
34:50	1.54	0.72				
34:30	1.50	0.73				
34:30	1.55	0.78				
34:30	1.48	0.80				
34:30	1.54	0.86				
34:30	1.39	0.88				
34:30	1.41	0.91				
34:30	0.59	0.42				
34:30	0.52	0.35				
34:30	0.37	0.36				
34:30	0.30	0.29				
56:30	0.17	0.39				
27:30	0.15	0.29				
28:00	0.17	0.34				
32:00	0.17	0.32				
06:00	0.22	0.25				
31:40	0.11	0.24				
68:20	0.12	0.24				
03:50	0.12	0.30				
03:20	0.13	0.33				
34:40	0.19	0.40				
34:30	0.24	0.45				
34:30	0.31	0.44				
34:30	0.36	0.50				
61:30	0.18	0.47				
57:30	0.16	0.42				
09:40	0.15	0.40				
09:40	0.14	0.38				
53:40	0.13	0.20				
29:20	0.12	0.20				
34:30	0.17	0.20				
34:40	0.01	0.01				

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

RANGE: MIN_TIME (hrs.)	RANGE: AVE_VALUE (ft/s)	RANGE: DIFFERENCE (ft/s)			
34:30	0.42	0.33			
34:30	0.50	0.42			
34:30	1.05	0.56			
34:30	1.15	0.67			
34:30	1.16	0.68			
34:30	1.16	0.68			
01:10	0.24	0.48			
01:10	0.24	0.48			
31:50	0.24	0.45			
34:30	1.19	0.43			
06:00	0.87	0.03			
06:00	0.79	0.03			
06:00	1.04	0.12			
06:00	0.89	0.28			
34:30	1.02	0.09			
06:00	0.87	0.09			
34:30	0.68	0.20			
34:30	0.76	0.28			
34:30	0.76	0.29			
34:30	0.77	0.30			
34:30	2.67	0.62			
34:30	1.02	0.31			
34:30	1.18	0.24			
25:50	0.18	0.43			
06:00	1.38	0.09			
34:30	1.54	0.10			
34:30	0.01	0.01			
34:30	0.28	0.32			
06:00	0.23	0.11			
06:00	0.21	0.13			
34:30	0.88	1.00			
34:30	1.30	0.67			
34:30	1.02	0.35			
34:30	0.75	0.04			
06:00	0.55	0.18			
08:10	0.17	0.37			
34:30	1.29	0.44			
34:30	0.87	0.78			
34:40	2.16	2.68			
34:40	3.27	0.69			
34:30	1.46	1.67			
47:10	0.18	0.33			
34:30	2.93	0.88			
34:30	1.15	0.49			
34:30	1.45	0.45			
00:00	0.00	0.00			
00:00	0.00	0.00			
00:00	0.00	0.00			
00:00	0.00	0.00			
34:30	3.73	1.92			

Placer Ranch PWMP - InfoWater Output Report - Pipeline Velocity

RANGE: MIN_TIME (hrs.)	RANGE: AVE_VALUE (ft/s)	RANGE: DIFFERENCE (ft/s)
34:30	1.25	2.21
34:30	3.27	0.68
34:30	3.61	1.89

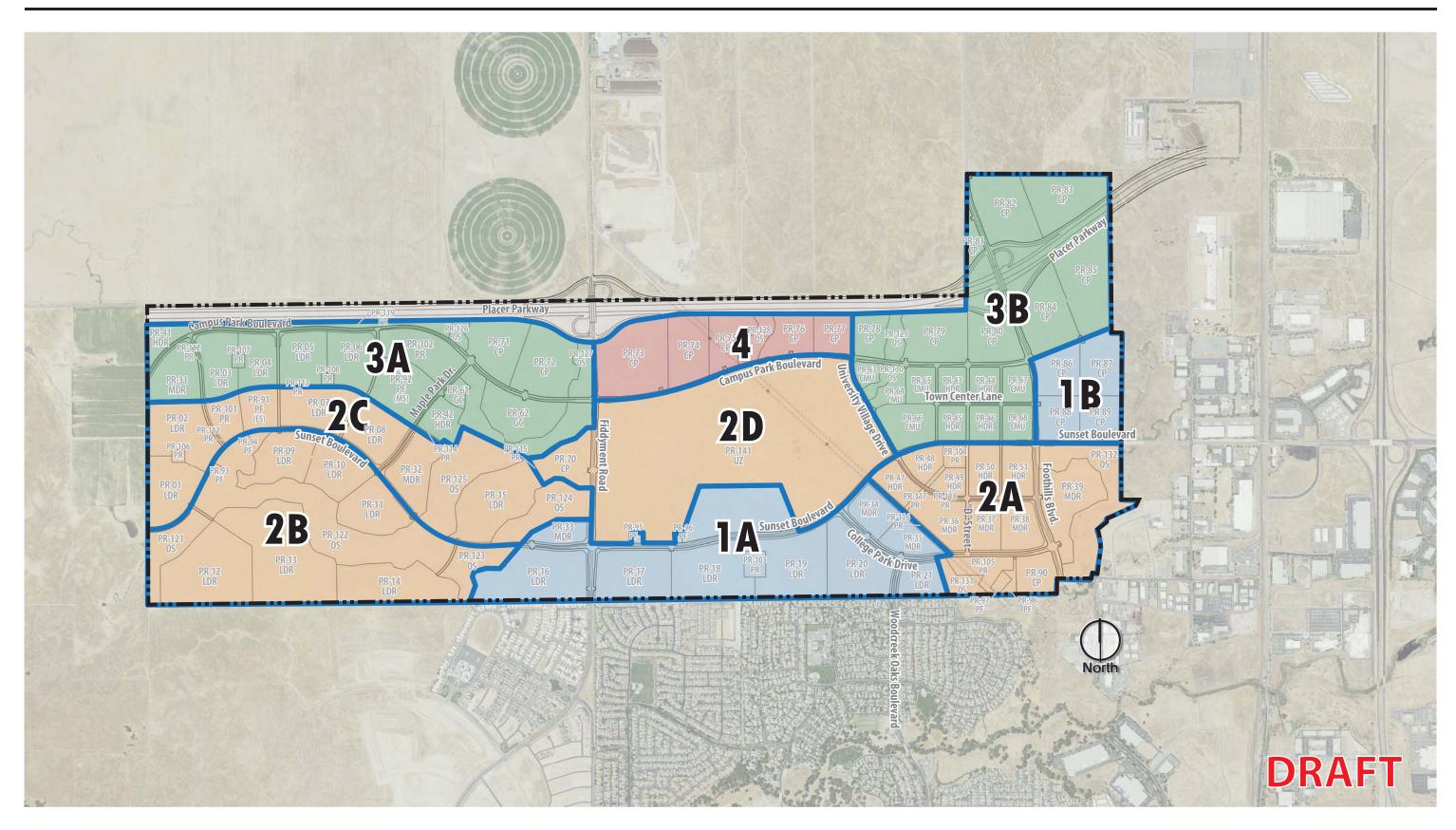
APPENDIX C Placer Ranch University Water Demand Summary

HydroScience Engineers, Inc.

Possible	Overall Placer Ranch University Water Demands						luuimatian V	Noton Fatimata			DC	-\A/A		
Year	_		Footprint		Total	Beds/	Stalls/				WUF			
Automorne	Туре	Building	-	Floors		acı	res	_	•					
Abardemine 2 3710 4 17994 30 mrs 103 2,000 1 1,00 1,10 3,200 0,000 0,000 Abardemine 4 30449 5 152245 35 50 50 2,876 1 125 1,10 5,772 0,000 Abardemine 6 2972 5 4 10300 2,876 1 125 1,10 5,772 0,000 Abardemine 6 2972 5 4 10300 34 570 1 1 1 1 1 1 1 1 1								_		Class))		_
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Campus Housing 3 H3 15432 5 77160 257 beds 0.12 359 300 0.20 179 47,056 47,623	Campus Housing 2	H2	27050	4	108200	361	beds	0.22	629	300	0.20	179	64,619	65,248
Campus Housing 5		Н3	15432	5	77160	257	beds	0.12	359	300	0.20	179	46,003	46,362
Campus Housing 6 H6 21067 4 84268 281 beds 0.17 490 300 0.20 179 50.299 50.789 Campus Housing 7 H7 23441 4 93764 313 beds 0.19 545 300 0.20 179 56.027 56.572 Campus Housing 8 H8 19281 5 98645 321 beds 0.15 448 300 0.20 179 57,459 57,907 Campus Housing 9 H9 18235 5 91175 304 beds 0.15 448 300 0.20 179 54,416 54,840 Campus Housing 10 H10 22043 5 110215 367 beds 0.18 512 300 0.20 179 65,693 66,205 Campus Housing 11 H11 16037 5 8185 27 beds 0.18 512 300 0.20 179 65,693 66,205 Campus Housing 12 H12 14888 4 69552 199 beds 0.13 373 300 0.20 179 47,793 48,166 Campus Housing 13 H13 18135 5 90675 302 beds 0.15 421 300 0.20 179 35,621 35,967 Campus Housing 14 H14 22278 4 93112 310 beds 0.15 421 300 0.20 179 54,058 54,479 Campus Housing 15 H15 28377 5 141885 473 beds 0.23 659 300 0.20 179 55,490 56,031 Campus Housing 16 H16 17493 5 87465 292 beds 0.14 407 300 0.20 179 55,268 52,675 Campus Housing 16 H16 17493 5 87465 292 beds 0.14 407 300 0.20 179 52,268 52,675 Campus Housing 17 H17 29331 4 117324 78 beds 0.23 659 1,504 0.20 179 52,268 52,675 Campus Housing 16 H16 17493 5 87465 292 beds 0.14 407 300 0.20 179 52,268 52,675 Campus Housing 16 H18 10042 4 40168 27 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds 0.08 233 1,488 0.20 179 4,834 0.00 1,190 Staff & Faculty Housing 1 H19 9940 4 39360 26 beds	Campus Housing 4	H4	15813	5	79065	264	beds	0.13	367	299	0.20	179	47,256	47,623
Campus Housing 7 H7 23441 4 93764 313 beds 0.19 545 300 0.20 179 56.027 56.572 Campus Housing 8 H8 19281 5 96405 321 beds 0.15 448 300 0.20 179 57.459 57.907 57.90	Campus Housing 5	H5	27364	5	136820	456	beds	0.22	636	300	0.20	179	81,624	82,260
Campus Housing 8 H8 19281 5 96405 321 beds 0.15 448 300 0.20 179 57,459 57,907 Campus Housing 9 H9 18235 5 91175 304 beds 0.15 424 300 0.20 179 54,416 54,840 Campus Housing 10 H10 22043 5 110215 367 beds 0.18 512 300 0.20 179 65,693 66,205 Campus Housing 11 H11 16037 5 80185 267 beds 0.13 373 300 0.20 179 47,793 48,166 Campus Housing 12 H12 14888 4 59552 199 beds 0.12 346 299 0.20 179 35,621 35,967 Campus Housing 13 H13 18135 5 90675 302 beds 0.15 421 300 0.20 179 54,056 54,479 Campus Housing 14 H14 22278 4 93112 310 beds 0.19 541 300 0.20 179 55,490 56,031 Campus Housing 15 H15 28377 5 141885 473 beds 0.23 659 300 0.20 179 85,490 56,031 Campus Housing 16 H16 17493 5 87465 292 beds 0.14 407 300 0.20 179 85,490 56,031 Campus Housing 16 H16 17493 5 87465 292 beds 0.14 407 300 0.20 179 52,268 52,675 Staff & Faculty Housing 1 H17 29331 4 117324 78 beds 0.24 682 1,504 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9840 4 39360 26 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9840 4 39360 26 beds 0.08 223 1,514 0.20 179 4,833 5,066 Staff & Faculty Housing 2 H20 25933 4 103732 69 beds 0.24 682 1,514 0.20 179 12,351 12,954 Parking Structure 1 PS1 104380 6 626280 1927 stalls 0.36 1,040 0 0 0 1,940 Parking Structure 2 PS2 119463 6 7716778 205 stalls 0.36 1,668 0 0 0 1,668 Parking Structure 4 PS4 154810 7 1083670 334 stalls 0.45 1,542 0 0 1,542 Parking Structure 5 PS5 129606 6 777036 2391 stalls 0.45 1,542 0 0 1,769 Surface Parking 3 PS1 54312 1 54312 167 stalls 0.49 14,602 1 0 0 1,769 Surface Parking 3 PS1 77450 1 177560 547 stalls 0.49 14,602 1 0 0 1,769 Surface Parking 3 PS 3 79405 1 79405 244 stalls 0.49 14,602 1 1 14,602 1 1 14,602 1 1 14,602 Parking Structure 6 PS6 90751 6 544506 1675 stalls 0.49 14,604 1 0 0 1,769 Surface Parking 3 PS1 74405 1 177560 547 stalls 0.49 14,604 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Campus Housing 6	H6	21067	4	84268	281	beds	0.17	490	300	0.20	179	50,299	50,789
Campus Housing 9 H9 18235 5 91175 304 beds 0.15 424 300 0.20 179 54.416 54.840 Campus Housing 10 H10 22043 5 110215 367 beds 0.13 373 300 0.20 179 65.693 66.205 Campus Housing 11 H11 16037 5 80185 267 beds 0.13 373 300 0.20 179 35.621 35.967 A48.168 Campus Housing 12 H12 14888 4 59552 199 beds 0.12 346 299 0.20 179 35.621 35.967 Campus Housing 13 H13 18135 5 90675 302 beds 0.12 346 299 0.20 179 35.621 35.967 Campus Housing 14 H14 23278 4 93112 310 beds 0.19 541 300 0.20 179 54.058 54.479 Campus Housing 15 H15 28377 5 141885 473 beds 0.23 659 300 0.20 179 84.667 85.326 Campus Housing 16 H16 17493 5 87.465 292 beds 0.14 407 300 0.20 179 84.667 85.326 Campus Housing 16 H16 17493 5 87.465 292 beds 0.14 407 300 0.20 179 84.667 85.326 Campus Housing 16 H16 17493 5 87.465 292 beds 0.14 407 300 0.20 179 159.628 52.675 Staff & Faculty Housing 16 H18 10042 4 40168 27 beds 0.8 23 1.488 0.20 179 13.962 14.644 Staff & Faculty Housing 16 H19 9840 4 39360 26 beds 0.08 223 1.548 10 0.20 179 4.833 5.066 Staff & Faculty Housing 17 H19 9840 4 39360 26 beds 0.08 223 1.548 10 0.20 179 4.833 5.066 Staff & Faculty Housing 17 H19 9840 4 39360 26 beds 0.08 223 1.548 0.20 179 4.833 5.066 Staff & Faculty Housing 17 H19 9840 4 39360 26 beds 0.08 223 1.548 0.20 179 4.833 5.066 Parking Structure 1 PS1 104380 6 626280 1927 stalls 0.36 1.040 0 0 1.900 1.900 Parking Structure 2 PS2 119463 6 716778 2255 stalls 0.41 1.190 0 0 0 1.900 Parking Structure 4 PS4 154810 7 1063670 3334 stalls 0.53 1.542 0 0 0 1.968 Parking Structure 5 PS5 129506 6 777036 2391 stalls 0.45 1.290 0 0 0 1.290 Parking Structure 6 PS6 90751 6 544506 1675 stalls 0.41 1.190 0 0 0 1.290 Parking Structure 6 PS6 90751 6 544506 1675 stalls 0.45 1.290 0 0 0 1.290 Parking Structure 6 PS6 90751 6 544506 1675 stalls 0.45 1.290 0 0 0 1.290 Parking Structure 6 PS6 90751 6 544506 1675 stalls 0.45 1.290 0 0 0 1.290 Parking Structure 6 PS6 90751 6 544506 1675 stalls 0.45 1.290 0 0 0 0 1.290 Parking Structure 6 PS6 90751 6 544506 1675 stalls 0.45 1.290 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Campus Housing 7	H7	23441	4	93764	313	beds	0.19	545	300	0.20	179	56,027	56,572
Campus Housing 10 H10 22043 5 110215 367 beds 0.18 512 300 0.20 179 65,693 66,205 Campus Housing 11 H11 16037 5 80185 267 beds 0.13 373 300 0.20 179 47,793 48,166 Campus Housing 12 H12 14888 4 59552 199 beds 0.12 346 299 0.20 179 35,621 35,967 Campus Housing 13 H13 18135 5 90675 302 beds 0.15 421 300 0.20 179 54,058 54,479 Campus Housing 14 H14 23278 4 93112 310 beds 0.19 541 300 0.20 179 55,490 56,031 Campus Housing 15 H15 28377 5 141885 473 beds 0.23 659 300 0.20 179 84,667 85,326 Campus Housing 16 H16 17493 5 87465 292 beds 0.14 407 300 0.20 179 48,667 85,326 Staff & Faculty Housing 1 H17 29331 4 117324 78 beds 0.24 682 1,504 0.20 179 13,962 14,644 Staff & Faculty Housing 1 H18 10042 4 40188 27 beds 0.24 682 1,504 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H18 10042 4 40188 27 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 2 H20 25933 4 103732 69 beds 0.21 603 1,503 1,503 0.20 179 12,351 12,954 Parking Structure 1 PS1 104380 6 6626280 1927 stalls 0.36 1,040	Campus Housing 8	H8	19281	5	96405	321	beds	0.15	448	300	0.20	179	57,459	57,907
Campus Housing 11 H11 16037 5 80185 267 beds 0.13 373 300 0.20 179 47,793 48,166 Campus Housing 12 H12 14888 4 59552 199 beds 0.12 346 299 0.20 179 55,621 35,967 Campus Housing 13 H13 16135 5 90675 302 beds 0.15 421 300 0.20 179 55,621 35,967 Campus Housing 14 H14 23278 4 93112 310 beds 0.19 541 300 0.20 179 55,405 56,479 6.031 Campus Housing 15 H15 28377 5 141885 473 beds 0.23 659 300 0.20 179 85,406 56,031 Campus Housing 16 H16 17493 5 87465 292 beds 0.14 407 300 0.20 179 52,268 52,675 Staff & Faculty Housing 16 H16 17493 4 117324 78 beds 0.24 682 1,504 0.20 179 13,962 14,644 Staff & Faculty Housing 1 H18 10042 4 40168 27 beds 0.08 23 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H18 10042 4 40168 27 beds 0.08 23 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 1 H19 9840 4 39360 26 beds 0.08 229 1,514 0.20 179 4,654 4,883 Staff & Faculty Housing 2 H20 25933 4 103732 69 beds 0.21 603 1,503 0.20 179 4,654 4,883 Staff & Faculty Housing 2 H20 25933 4 103732 69 beds 0.21 603 1,503 0.20 179 12,351 12,954 Parking Structure 1 PS1 104380 6 6 26280 1927 stalls 0.36 1,040	Campus Housing 9	H9	18235	5	91175	304	beds	0.15	424	300	0.20	179	54,416	54,840
Campus Housing 12 H12 14888 4 59552 199 beds 0.12 346 299 0.20 179 35,621 35,967 Campus Housing 13 H13 18135 5 90675 302 beds 0.15 421 300 0.20 179 54,058 54,479 Campus Housing 14 H14 23278 4 93112 310 beds 0.19 541 300 0.20 179 55,490 56,031 Campus Housing 15 H15 23377 5 141885 473 beds 0.23 659 300 0.20 179 84,667 85,266 Campus Housing 16 H16 17493 5 87465 292 beds 0.14 407 300 0.20 179 52,268 52,675 Staff & Faculty Housing 1 H17 29331 4 117324 78 beds 0.24 682 1,504 0.20 179 13,962 14,644 Staff & Faculty Housing 1 H17 29331 4 117324 78 beds 0.24 682 1,504 0.20 179 13,962 14,644 Staff & Faculty Housing 1 H19 9840 4 40168 27 beds 0.08 233 1,488 0.20 179 4,833 5,066 Staff & Faculty Housing 2 H20 25933 4 103732 69 beds 0.08 229 1,514 0.20 179 4,654 4,883 Staff & Faculty Housing 2 H20 25933 4 103732 69 beds 0.08 229 1,514 0.20 179 12,351 12,954 Parking Structure 1 PS1 104380 6 626280 1927 stalls 0.36 1,040	Campus Housing 10	H10	22043	5	110215	367	beds	0.18	512	300	0.20	179	65,693	66,205
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APPENDIX D

Placer Ranch Phasing Plan



Placer Ranch Specific Plan Phasing Plan - April 7, 2017

