# Appendix C

## Placer Ranch Recycled Water
## Final Reports

PLACER Ranch

# Recycled Water Final Reports

- Technical Memorandum, dated October 29, 2018
- Recycled 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 Use Designation** | | **Revised Project** | **Original Project** | **Difference** | **Revised Project** | **Original Project** | **Difference** |
| **Residential 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 |
| *Subtotal* | | 801.4 ac | 764.2 ac | 37.3 ac | 5,636 du | 5,827 du | -191 du |
| **Commercial 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 | 0 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 | 0 sf |
| *Subtotal* | | *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 | | | |
| *Subtotal* | | *377.5 ac* | *360.9 ac* | *16.6 ac* | | | |
| **Other** | | | | | | | |
| ROW | Placer Parkway | 158.5 ac | 158.5 ac | 0.0 ac | | | |
| ROW | Major Roadways & Landscape | 168.1 ac | 158.5 ac | 9.6 ac | | | |
| *Subtotal* | | *326.6 ac* | *317.0 ac* | *9.6 ac* | | | |
| **Total** | | **2,213.3 ac** | **2,213.3 ac** | **0.0 ac** | **5,636 du**<br>**8,440,513 sf** | **5,827 du**<br>**9,356,803 sf** | **-191 du**<br>**-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 | CP | 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** |

Notes:
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 | CP | 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** |

Notes:
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 | CP | -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** |

Notes:

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.

PR PLACER RANCH
SPECIFIC PLAN

# Recycled Water Master Plan

**July 18, 2017**

**FINAL**

***Prepared for***

Placer County
Community Development Resource Agency
3091 County Center Drive
Auburn, California 95603

***Prepared by***

MacKay & Somps
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# Placer Ranch Specific Plan
# Recycled Water Master Plan

**July 18, 2017**

Prepared for

Mackay and Somps Civil Engineers, Inc.

Submitted by

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HydroScience

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# APPENDICES

Appendix A INFOWATER Hydraulic Modeling Output Reports

Appendix B Placer Ranch Recycled Water Market Assessment Table by Parcel

Appendix C Placer Ranch Phasing Plan

# SECTION 1 – INTRODUCTION

This Placer Ranch Recycled Water Master Plan (Master Plan) was prepared by HydroScience Engineers (HydroScience) for Mackay and Somps Civil Engineers, Inc. (Mackay and 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 will provide an evaluation of methods to supply and distribute recycled water to the Placer Ranch Specific Plan (Placer Ranch) located in Placer County, CA. The purpose of the Master Plan is to:

- Develop a demand summary for recycled water uses within Placer Ranch;
- Identify the required recycled water infrastructure to serve Placer Ranch with recycled water; and
- 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.**

The City of Roseville, who currently treats and produces recycled water at their two wastewater treatment plants, has stated that they will wholesale recycled water to another entity to retail to Placer Ranch. However, this is not a commitment or a will-serve letter from the City of Roseville, and the City and retailer will have to confirm the availability of recycled water, design details, delivery pressures, diurnal supply availability, and other considerations at the time the project is being designed. For the purpose of this document, it is assumed that all recycled water to Placer Ranch originates from the City of Roseville.

The recycled water retailer is expected to either be the Placer County Water Agency or Placer County. Coordination by the retailer with the City of Roseville will be required to finalize delivery pressures and delivery periods so as to not impact current recycled water customers.

It is anticipated that the existing City of Roseville North Zone Tank and Pump Station will supply recycled water to a storage tank at Placer Ranch at a nominal pressure during off-peak periods, which are typically between 6:00 am and 9:00 pm. The Placer Ranch Pump Station will pump out of the Placer Ranch Storage Tank to provide recycled water to customers within Placer Ranch and other portions of the Sunset Area.

## 1.3 Existing Documents

Several documents about the existing recycled water distribution systems and calculations of water demands were utilized in the development of the Placer Ranch RWMP. These documents included the following:

**Placer County Water Agency (PCWA) 2015 Urban Water Management Plan (UWMP), adopted June 2, 2016 (June 2016):** 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 normal year reference crop evapotranspiration rate and precipitation rates to determine the irrigation demand.

**South Placer Regional Wastewater and Recycled Water Systems Evaluation (June 2007 and various 2008 updates):** This document, a regional planning update of the City's wastewater and recycled water system identified the current and buildout wastewater and recycled water flow projections. Within this document are technical memoranda (TMs) that provide more detailed information about their subject matter. This document is referred to in this text as RMC, 2007.

**Placer Ranch Specific Plan – University Water Demand Estimate (July 2016):** This document estimates the overall water demand for the proposed University to be located on the Placer Ranch Specific Plan. Using this method, the University's projected total, potable, and recycled water demand were recalculated and are shown in **Table 3-1**.

## 1.4 Report Organization

This Master Plan provides a description of the recycled water supply options and facilities required for Placer Ranch. The sections contained in this report are:

- Section 1 – Introduction
- Section 2 – Planning and Modeling Criteria
- Section 3 – Recycled Water Customers and Demands
- Section 4 – Recycled Water Supply
- Section 5 – Results and Recommendations
- Section 6 – References
- Appendices

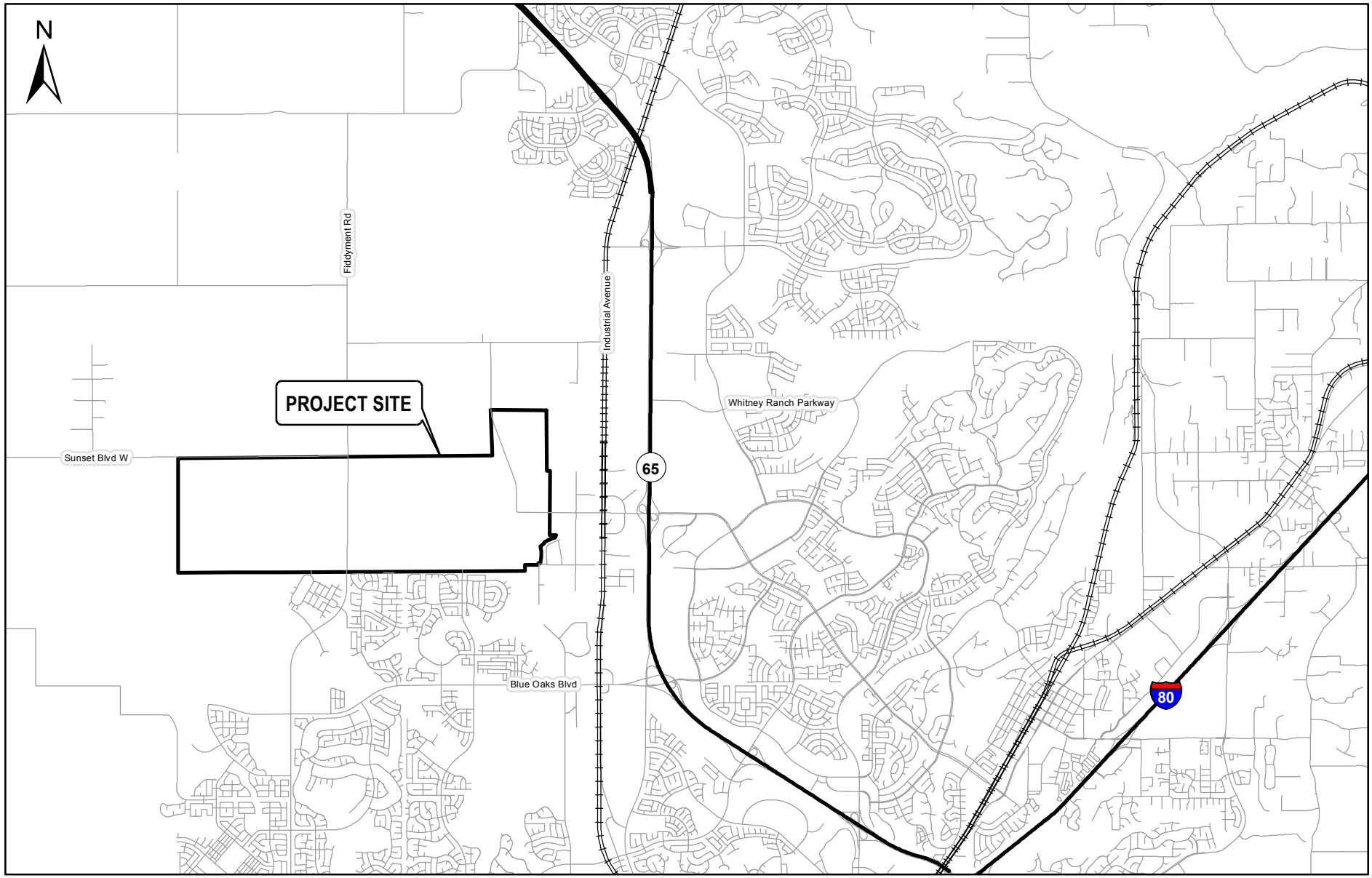


**FIGURE 1-1**
MACKAY & SOMPS CIVIL ENGINEERS, INC.
PLACER RANCH RECYCLED WATER MASTER PLAN
PROJECT LOCATION MAP

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**FIGURE 1-2**
MACKAY & SOMPS CIVIL ENGINEERS
PLACER RANCH RECYCLED WATER MASTER PLAN
PLACER RANCH LAND USE PLAN

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# SECTION 2 – PLANNING AND MODELING CRITERIA

This section presents planning and modeling criteria and assumptions used to develop the recycled water demands.

## 2.1 Planning Criteria

The primary planning criteria to determine recycled water demands per acre of irrigated area are evapotranspiration (ET) rates and precipitation. Previous studies [(HydroScience, 2011) and (HydroScience, 2009)] have estimated standard evapotranspiration rates and rainfall for the County. A summary of how these criteria are used is included below.

**ET Rates:** ET is a measure of water usage by a particular plant or crop, and is a function of the net solar radiation, air temperature, wind speed, and vapor pressure in a particular location. Evapotranspiration rates for a specific crop in a specific location are calculated on a monthly basis by the following equation:

$$ET = ET_o * k_c$$

where:

$ET_0$ = *Normal year reference crop evapotranspiration rate for a given geographic location [California Department of Water Resources (DWR), California Irrigation Management Information System (CIMIS) database]*

$k_c$ = *Crop coefficient for a given crop (University of California – Cooperative Extension, California Turfgrass Culture Leaflet)*

For this study, reference crop normal year evapotranspiration rates ($ET_0$) for the PCWA service area were obtained from the DWR CIMIS database at Fair Oaks Station 131 during 1998-2015 as provided in the PCWA 2015 UWMP, adopted June 2, 2016 (2016). Crop coefficients for cool weather turf grasses were obtained from the California Turfgrass Culture leaflet (University of California, 1997). Calculated ET rates and irrigation demands are shown in **Table 2-1**.

**Precipitation:** Monthly precipitation data for the Placer Ranch area was obtained from the Western Regional Climate Center (WRCC) at Rocklin, CA (Station 047516) from 1971-2000 as provided in the PCWA 2015 UWMP, adopted June 2, 2016 (2016).

**Estimated Unit Irrigation Demands:** Typical monthly unit irrigation demands for turf grasses are summarized in **Table 2-1** and were calculated using the following formula:

$$ID = \frac{(ET - Pe_p)l_r}{e_i}$$

where:

*ID* = *Irrigation demand in inches*

*ET* = *Evapotranspiration for turf grasses in the County*

*P* = *Average precipitation, DWR*

$e_p$ = *Precipitation irrigation efficiency, 0.8. Assumes 20% of rainfall during growing season is lost to evaporation, runoff, etc.*

$l_r$ = *Loss Rate, equal to 1.1. This assumes that approximately 10% of the applied water passes through the grass root zone and is lost.*

$e_i$ = *Irrigation efficiency, equal to 0.8 - 0.9 depending on season. This assumes that 10 – 20% of the applied irrigation water is lost to the environment.*

**Table 2-1: Typical Irrigation Demands for Placer Ranch Turf Grasses**

| Month | ET (Inches) | P (Inches) | ID (Inches) | ID (Feet) |
|---|---|---|---|---|
| January | 1.12 | 3.65 | 0.00 | 0.00 |
| February | 1.70 | 3.09 | 0.00 | 0.00 |
| March | 3.29 | 2.89 | 0.41 | 0.03 |
| April | 4.49 | 1.56 | 3.03 | 0.25 |
| May | 6.36 | 0.29 | 6.29 | 0.52 |
| June | 7.40 | 0.26 | 7.39 | 0.62 |
| July | 7.95 | 0.31 | 7.91 | 0.66 |
| August | 7.05 | 0.05 | 7.25 | 0.60 |
| September | 5.17 | 0.37 | 4.97 | 0.41 |
| October | 3.37 | 1.83 | 1.60 | 0.13 |
| November | 1.63 | 3.84 | 0.00 | 0.00 |
| December | 1.05 | 3.21 | 0.00 | 0.00 |
| Average | | | 3.24 | 0.27 |
| **Total** | **50.58** | **21.35** | **38.85** | **3.24** |

As shown in **Table 2-1,** the total annual unit irrigation demand for grasses is estimated at 38.85 inches. A peak monthly irrigation demand of 7.91 inches is projected for July. The irrigation demand for a winter month is assumed to never fall below zero. For months during which the irrigation demand is positive, additional water is applied from the irrigation system. The typical season for irrigation demands stretches between April and October, with a small amount of irrigation necessary in March. No irrigation demands are projected between November and February.

## 2.2 Distribution System Modeling

The Placer Ranch recycled water hydraulic modeling was conducted using InfoWater by Innovyze, Inc. The Placer Ranch hydraulic model is a stand-alone model based on the land use plan identified in **Section 1.2**. Recycled water demands identified in **Section 3** were used to determine the required recycled water infrastructure.

A discussion of the modeling results is provided in **Section 4.**

## 2.3 Wholesaler/Retailer

The City of Roseville will serve as the recycled water wholesaler. Either Placer County or the Placer County Water Agency will serve as the recycled water retailer. It is expected that regardless of who serves as the recycled water retailer, Placer County and the City of Roseville will negotiate and execute a recycled water operations agreement per the Amended and Restated Agreement Regarding the Operation and Use of the South Placer Regional Wastewater Facilities dated October 1, 2012. This agreement is expected to be modeled similarly to other City agreements to provide recycled water outside of the City limits.

## 2.4 Modeling Criteria

To create and evaluate the Placer Ranch recycled water hydraulic model, a number of assumptions were required. These assumptions are summarized below:

**Infrastructure criteria:** The sizing of recycled water infrastructure requires modeling of recycled water use based on actual projected recycled water demands. Discussions with PCWA staff have indicated that this infrastructure will include the following requirements:

- Use of typical pipeline diameters, namely 6-inch, 8-inch, 12-inch, 18-inch, and 24-inches;
- All pipe velocities must remain below 5 ft/s;
- Provide recycled water storage equivalent to the peak day demand, plus a 20% factor of safety;
- Recycled water distribution system infrastructure was sized without including water conservation in case water conservation is not incorporated into the site design. This provides a significant factor of safety in case demands are higher than expected or additional demands are connected to the system.
- Construction of recycled water pumping facilities to maintain the minimum recycled water distribution system pressure for the July day demands; and
- The primary point of connection will be to connect to the existing City of Roseville recycled water distribution system at Woodcreek Oaks Boulevard. Optional future points of connection can be made to future recycled water pipeline(s) where the Placer Ranch Specific Plan meets the Amoruso Ranch Specific Plan, Sunset Area, and future extensions to the City of Lincoln from either Fiddyment Road or Foothills Boulevard.

**Peak day demands:** Peak day flows are estimated by applying peaking factors to calculated average day demands. Peak day flow rates account for seasonal variations in evapotranspiration rates. Based on the data shown in **Table 2-1**, the average monthly irrigation demand over the year is 3.24 inches. However, the peak monthly irrigation demand occurs in July and is 7.91 inches. Thus, the monthly peak demand factor is:

$$Factor = \frac{7.91\ in}{3.24\ in}$$

$$Peak\ Demand\ Factor = 2.44$$

It is assumed that peak day demand is essentially the same as peak monthly irrigation demand for facility planning purposes. This is reasonable because not all customers will be irrigating during the same period and the system is designed without accounting for recycled water conservation measures. It is further assumed that "true" peak day irrigation demand conditions (all customers irrigating on the same day) would rarely occur, and the cost of providing facilities to meet these demands is not justified. Therefore, a peak day demand factor of 2.44 times the average day demand is assumed.

**Minimum Pressure:** It is assumed that a minimum dynamic pressure during the peak hour of 60 psi would be maintained. This pressure set point was intended to eliminate the need to install booster pumps on individual recycled water services. The Placer Ranch recycled water distribution system was modeled using 60 psi as the target minimum pressure at the recycled water meter. Recycled water services also do not require backflow preventers to be installed, which further increases the pressure on the customer's side of the meter.

Since the Sunset Area recycled water distribution system has not been conceptually laid out, HydroScience assumed that the minimum pressure at any node connecting to the Sunset Area would be 70 psi. This would allow for some head losses and elevation change within the Sunset Area recycled water distribution system, with the intent of having approximately 60 psi at each node. As the Sunset Area distribution is further defined, the modeling for the Sunset Area/Placer Ranch distribution system should be updated to reflect actual needs.

## 2.5 Summary of Assumptions

There are a number of assumptions built into the hydraulic model. These assumptions include:

- InfoWater software calculations, for this model, were based on the Hazen-Williams formula for pressure friction.
- The City of Roseville will wholesale recycled water to a retailer, and that retailer will be either Placer County or the Placer County Water Agency. One of those two agencies will retail recycled water within Placer Ranch and other portions of the Sunset Area.
- The total annual unit irrigation demand for grasses is estimated at 38.5 inches;
- All pipeline velocities must remain below 5 fps at the peak day flow;
- The minimum pressure in the Placer Ranch recycled water distribution system is 60 psi;
- The minimum pressure at the nodes connecting to the Sunset Area will be 70 psi, with the intent of supplying 60 psi at each node in the future Sunset Area recycled water distribution system;
- Pipeline diameters were limited to the nominal sizes that are typically available;
- A storage tank and pump station would be constructed within Placer Ranch. This new tank and pump station would receive recycled water from the City of Roseville during off peak periods, and in turn provide all of the storage and pumping required to reliably deliver recycled water to Placer Ranch and the Sunset Area; and
- Tie-in to the City of Roseville's recycled water system will be at Woodcreek Oaks Blvd. Recycled water will be supplied by the City during off-peak hours at a minimum pressure of 20 psi.

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# SECTION 3 – RECYCLED WATER CUSTOMERS AND DEMANDS

This section provides the market assessment for the recycled water customers and demands for the Placer Ranch land use plan. The demands are based on land use and associated acreage for each land use.

## 3.1 Market Assessment

Placer Ranch will use recycled water to irrigate all non-single family residential landscaping to maximize recycled water use. These land uses include all parks, paseos, streetscapes, schools, commercial, industrial, public facilities, campus park, and high-density residential land uses within Placer Ranch, as well as the University. Recycled water is not planned for irrigation use for single family parcels (LDR and MDR) due to the increased potential for cross-connection with the potable water system.

To estimate recycled water demands, HydroScience utilized the land use plan shown in **Figure 1-2**. HydroScience also determined the approximate percentage of irrigated area within each zoning area based on previous experience with other local recycled water projects. Non-irrigated areas were assumed to include hardscaped surfaces such as sidewalks, buildings, walkways, parking lots, and other non-irrigated areas. It was also assumed that the Placer Parkway was not irrigated. The streetscapes identified along other roads will be irrigated.

**Table 3-1** contains a summary of the recycled water market assessment grouped by land use designation, and includes the percentage of each area irrigated with recycled water. These percentages were used to develop recycled water demands. The table shows the relative magnitude of the various customers within Placer Ranch that are likely to use recycled water both with and without the water conservation measures. A detailed breakdown of each individual site and demand is attached as **Appendix B**.

Recycled water will be supplied to all parcels with the exception of those parcels with LDR, LDR-A, or MDR land use designations. Combined, the other land use areas have an overall average annual recycled water demand of approximately 816 AFY, or 373 AFY with water conservation measures employed.

For a detailed breakdown of the individual water conservation measures proposed for Placer Ranch, and a summary of how the revised recycled water demands were calculated, the reader is referred to the Placer Ranch Water Conservation Plan (HydroScience, 2017). All recycled water infrastructure in Placer Ranch was sized without accounting for water conservation.

It is noted that the actual number of recycled water meter service connections may vary from the number of sites identified in the market assessment. This is due to variations in irrigation system design, the size of parcels, the phasing of construction, and/or the number of meters required.

## Table 3-1: Recycled Water Market Assessment (Grouped by Land Use) – Placer Ranch

| Land Use Designation | | % Area Irrigated with Recycled Water | Total Area | Annual Demand[1] | Annual Demand with Water Cons.[1, 3] | Peak Day Demand[2] |
|---|---|---|---|---|---|---|
| | | | (Acres) | (AFY) | (AFY ) | (MGD) |
| **Low Density Residential** | LDR | Not irrigated with recycled water | 407.9 | 0 | 0 | 0 |
| **Low Density Residential – Age-Restricted** | LDR-A | Not irrigated with recycled water | 131.0 | 0 | 0 | 0 |
| **Medium Density Residential** | MDR | Not irrigated with recycled water | 132.3 | 0 | 0 | 0 |
| **High Density Residential** | HDR | 20% | 93.0 | 60 | 33 | 0.07 |
| **General Commercial** | GC | 15% | 25.6 | 12 | 6 | 0.01 |
| **Commercial Mixed Use** | CMU | 15% | 48.8 | 24 | 11 | 0.02 |
| **Campus Park** | CP | 15% | 395.5 | 192 | 87 | 0.19 |
| **University** | UZ | 24% | 301.3 | 244 | 110 | 0.24 |
| **Public Facilities (Schools)** | PF | 40% | 32.0 | 16 | 7 | 0.02 |
| **Public Facilities (County)** | PF | 15% | 5.5 | 3 | 1 | 0.00 |
| **Parks and Recreation** | PR | 80% | 72.6 | 188 | 85 | 0.18 |
| **Open Space Preserves** | OS | 0% | 250.9 | 0 | 0 | 0.00 |
| **Placer Parkway** | ROW | 0% | 158.5 | 0 | 0 | 0.00 |
| **Major Roadways & Landscape Corridors** | ROW | 15% | 158.5 | 77 | 35 | 0.08 |
| **Total** | | | **2,213.3** | **816** | **373** | **0.81** |

Notes:
1. Annual recycled water demands were rounded off to the nearest AFY.
2. Peak day demand as shown accounts for water conservation, without water conservation the peak day demand is 1.78 MGD.
3. Additional information about how the water conservation demands were calculated in the Placer Ranch Water Conservation Plan (HydroScience, 2017).

## 3.2 Sunset Area Demands

Future demands for the Sunset Area were also included in the analysis based on demand calculations provided to HydroScience by PSOMAS on April 14, 2017. Demands for future Sunset Area buildout 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:

- Node J54 – Fiddyment Road, 327 AFY
- Node J128 – West of Fiddyment Road, 273 AFY
- Node J144 – Foothills Boulevard, 188 AFY
- Node J136 – Campus Park Boulevard at eastern border, 69 AFY
- Node J60 – Sunset Boulevard at eastern border, 78 AFY

Recycled water demands for the Sunset Area total 935 AFY, while Placer Ranch demands total 816 AFY. It was noted that these demands do not include water conservation. Assuming that water conservation measures are employed in the other portions of the Sunset Area similarly to Placer Ranch, the estimated max day demand in the rest of the Sunset Area would total 427 AFY. The combined demand for Placer Ranch and the remainder of the Sunset Area would total 800 AFY, or 2.09 MGD with a 20% factor of safety.

## 3.3 Supplemental Recycled Water Supply

Groundwater from an on-site well will be utilized as a supplemental recycled water supply should recycled water supplies be unavailable. The well would be located on or near Parcel PR-98 within the Placer Ranch Specific Plan. It is expected that the well capacity will exceed the Placer Ranch peak hour recycled water demand, and that the well will be connected to the recycled water storage tank via an air-gapped connection.

As stated in the Placer Ranch PWMP, this supplemental groundwater supply may also be hard plumbed to the potable water distribution system at the discretion of PCWA. This groundwater will have an air-gapped connection to the recycled water storage tank as required by California Title 17 standards.

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# SECTION 4 – RECYCLED WATER SUPPLY

This section describes the methods that recycled water will be supplied to and distributed within Placer Ranch.

## 4.1 Recycled Water Distribution System

Distribution system pipelines were located primarily in proposed roadways with nodes extending to any land uses with recycled water demands. Additional pipelines were extended the edge of the project for future service the Sunset Area and surrounding areas. The intent of the distribution system layout was to meet all recycled water demands while minimizing pipe lengths and diameters and maintaining pipe velocities below 5 ft/s. Pipeline sizes within Placer Ranch were optimized through iterations of up- and downsizing until all pipelines and nodes met the modeling design criteria described in **Section 2.2**. To be conservative, pipeline sizing was implemented without accounting for water conservation.

Once the layout was configured to meet all recycled water demands, the Placer Ranch recycled water distribution system was evaluated to determine whether further infrastructure improvements would be necessary to supply recycled water to Placer Ranch. Modeling showed that the 24-inch recycled water pipeline in Woodcreek Oaks Blvd supplying recycled water to the project has velocity of 3.1 ft/s, well within City and County velocity design criteria when set to refill the tank during off hours at a minimum supply pressure of 20 psi.

The main transmission pipeline supplying recycled water to Placer Ranch enters at Woodcreek Oaks Blvd and continues north on Woodcreek Oaks Blvd, east on College Park Drive, and then south to the PR-98 tank and pump station parcel. The transmission pipeline will supply recycled water to the recycled water storage tank located at Parcel PR-98. The transmission pipeline will be designed to fill the tank during either peak or off-peak hours through a PRV and metering station located at the Roseville City limit. All infrastructure outside of the City will not be City owned. Within Parcel PR-98, a new recycled water tank and pump station will be constructed to pump recycled water to the Placer Ranch recycled water distribution system at pressure.

The Placer Ranch distribution system is primarily comprised of a 30-inch pipeline from the tank site to College Park Dr, then 24 inch pipelines in each direction of College Park Dr. From these points, pipelines down size as demands decrease moving further away from the pump station. The University and the eastern half of Placer Ranch are looped to provide reliability and redundancy. The western half of Placer Ranch is not looped due to the lack of recycled water demand along Sunset Blvd west of Fiddyment Rd, and is supplied by 18-inch and 12-inch pipelines located on Campus Park Blvd, Maple Park Drive, and an interior unnamed street and Paseo. Additional smaller pipelines will extend from the primary distribution system pipeline locations to individual land uses within Placer Ranch.

**Figure 4-1** shows the proposed alignment for the Placer Ranch distribution system. All pressures and pipeline velocities remain within City standards. Pipeline sizes and pumping requirements were optimized to maintain a minimum pressure of 60 psi at all nodes and a maximum velocity of 5 ft/s within pipe sections.

A summary of the pipeline infrastructure associated with the Placer Ranch distribution system is provided as **Table 4-1.** The table includes the pipe sizes and the total lengths of each pipe size required for the system.

**Table 4-1: Summary of Recycled Water Pipeline Infrastructure**

| Pipe Size (Diameter) | Pipeline Total Length Placer Ranch Only (ft.)[1] | Pipeline Total Length with Sunset Area Demands (ft.)[1] |
|---|---|---|
| 6-inch | 8,100 | 6,500 |
| 8-inch | 4,500 | 3,500 |
| 12-inch | 9,700 | 6,000 |
| 18-inch | 2,800 | 7,200 |
| 24-inch | 300 | 3,800 |
| 30-inch | 0 | 300 |
| **Total[2]** | **25,400** | **27,300** |

Notes:
1. Pipeline lengths were rounded to the nearest 100.
2. Total pipeline lengths are not equal due to extra pipelines added to extend system to the edge of the Placer Ranch Project boundary.

Construction of the recycled water distribution system will generally coincide with the Placer Ranch Phasing Plan (see **Appendix C**), but may require advance construction of select infrastructure elements. Output data for the Placer Ranch recycled water hydraulic model runs can be found in **Appendix A**.

## 4.2 Storage Tank and Pump Station

A recycled water storage tank and pump station will be located in Placer Ranch within Parcel PR-98. From this storage tank, recycled water will be pumped out to recycled water demands within Placer Ranch. It is understood that oversizing of some infrastructure may be desired to serve other land uses, such as the remaining areas of the Sunset Area, and to potentially interconnect the recycled water distribution system with the City of Lincoln.

The on-site storage tank will be designed to have one max day of capacity, plus a 20% factor of safety. This tank was sized both with and without being oversized to serve other Sunset Area demands.

**Without oversizing:** At the estimated max day recycled water demand of 0.81 MGD, the required recycled water storage would be 0.98 MG. A 0.98 MG storage tank can come in a variety of configurations. At this volume, the Placer Ranch recycled water storage tank is conceptually being planned to have a diameter of 73 feet, an operating height of 32 feet, a hard plumbed connection to the City recycled water distribution system connected by an altitude valve, meter, and an air gapped connection from an on-site groundwater well.

**With oversizing:** At the estimated max day recycled water demand of 1.74 MGD, the required recycled water storage would be 2.09 MG. At this volume, the Placer Ranch recycled water storage tank is conceptually being planned to have a diameter of 110 feet, an operating height of 30 feet, a hard plumbed connection to the City recycled water distribution

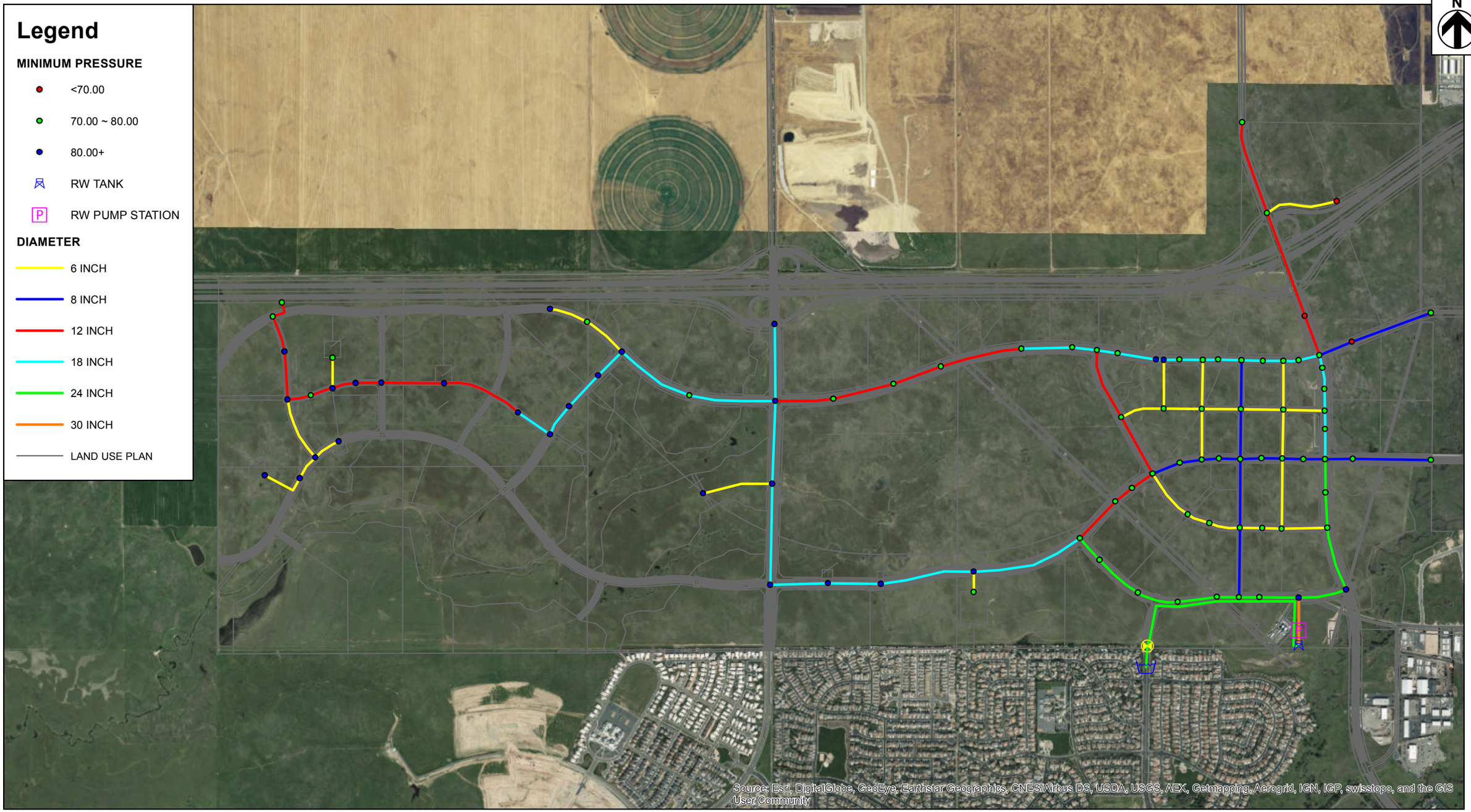


**FIGURE 4-1**
MACKAY AND SOMPS CIVIL ENGINEERS, INC.
PLACER RANCH RECYCLED WATER MASTER PLAN
RECYCLED WATER DISTRIBUTION SYSTEM

HydroScience

system connected by an altitude valve, and an air gapped connection from an on-site groundwater well.

Coordination with the City of Roseville (wholesaler) will be required to finalize delivery pressures and delivery periods so as to not impact existing recycled water customers. This is likely to include a PRV station on the main supply line from City of Roseville to ensure that regardless of whether the Placer Ranch tank is filled during peak or off-peak periods, pressure within the City recycled water system can be maintained such that normal operating conditions are unaffected. The most recent hydraulic model for the Roseville recycled water system shows approximately 64 psi at the northern termination point of the 24-inch mainline in Woodcreek Oaks Blvd.

It is anticipated that the existing north zone tank and pump station will supply recycled water to the Placer Ranch recycled water storage tank at a nominal pressure during off-peak periods, which are typically between 6:00 am and 9:00 pm . It is assumed that a new 18-inch (without oversizing) or 24-inch (with oversizing) recycled water pipeline will connect to the existing 24-inch recycled water pipeline terminus on Woodcreek Oaks Blvd, extend north on Woodcreek Oaks and west on College Park Drive to Parcel PR-98. This recycled water transmission pipeline will have no services off of it, and will only fill the Placer Ranch recycled water storage tank.

The Placer Ranch recycled water pump station must supply recycled water to Placer Ranch in accordance with the modeling criteria specified in **Section 2**. To supply these demands, this pump station must have a capacity of approximately 3,300 gpm and a total discharge head of approximately 145 ft without oversizing for the Sunset Area, or 7,500 gpm at 170 TDH with oversizing for the Sunset Area. The higher TDH requirement for the pump station when the Sunset Area demands are added to the system both accounts for higher flow rates, but also to provide 70 psi at the boundary of the Placer Ranch project for supplying Sunset Area demands. Once a distribution system for the Sunset Area has been determined, it is recommended that this tie-in pressure be re-evaluated.

It is expected that the pump station facility will have four duty pumps and a standby pump. Two jockey pumps, one for reliability, should be designed into the pump station as well to convey lower flows during off-peak hours or seasonally when demands are lower. A preliminary site plan is provided as **Figure 4-2**.

## 4.3 Supply and Implementation

It should be noted that the recycled water supply for the project would be generated either at the Dry Creek or Pleasant Grove WWTPs, though the majority of the recycled water sources are assumed to be from the Dry Creek WWTP. This is because there is limited capacity to convey flows from the Pleasant Grove WWTP to the North Zone tank and pump station.

It is expected that there is ample capacity to wholesale recycled water to Placer Ranch for recycled water demands. Should additional reliability be required for the recycled water distribution system, the backup groundwater supply from the groundwater well located at PR-98 can be utilized.

While no improvements to City recycled water infrastructure are anticipated to serve the Placer Ranch project, it should be noted that City of Roseville will require a re-evaluation of recycled water availability at the time of connection. If improvements are required, it will be up to the developer (both Sunset Area and/or Placer Ranch) and the City to determine cost sharing for the improvements.

N

TO COLLEGE PARK DRIVE

NOTES

1. THE FENCED IN AREA OF THE RECYCLED WATER FACILITY IS APPROXIMATELY 0.92 ACRE.
2. THE AREA NORTH OF THE NORTH FENCE LINE WITHIN PR-98 PARCEL IS 1.22 ACRES.
3. ONLY MAJOR ABOVEGROUND FEATURES ARE SHOWN ON THIS CONCEPTUAL SITE PLAN. THE INTENT IS TO SHOW HOW THE FACILITIES WOULD FIT WITHIN THE PROJECT SITE.

PR-105
P
9.50 AC.

ACCESS DRIVEWAY

PR-98
PF (W)
2.14 AC.

PR-90
CP
11.42 AC.

PR-97
PF (EL)
1.76 AC.

184'

20'
SLIDE
GATE

213'

20'

NEW 2.09MG

155'

WELL
(BY OTHERS)

TELEMETRY TOWER
20'x20'

TRANSFORMER

NEW FENCE/PARCEL
BOUNDARY 0.92 AC.

NEW PUMP
STATION
48'x32'

20'

329'

CITY OF
ROSEVILLE

0 50 100 Feet

HydroScience

**FIGURE 4-2**
MACKAY & SOMPS CIVIL ENGINEERS
PLACER RANCH RECYCLED WATER MASTER PLAN
RECYCLED WATER FACILITY - PRELIMINARY SITE PLAN

\\hse-vm-dc4\VOL1\common\projects\352-Placer Ranch\April 2016\05 - Drawings\00-Figures\352-FIG-PLACER RANCH Rev 1.dwg DATE: 7/14/17

# SECTION 5 – RESULTS AND RECOMMENDATIONS

This master plan identifies the requirements for and includes the following results and recommendations with respect to recycled water supply, operational storage and pumping, and recycled water infrastructure.

Placer Ranch may choose to design and construct the recycled water infrastructure to only serve Placer Ranch. Should this occur, it is assumed that the Sunset Area would secure its own source of recycled water and build an independent recycled water system including a recycled water storage tank and pump station located within the Sunset Area.

## 5.1 Recycled Water Supply and Demand

The following results and recommendations pertain to the recycled water supply and the Placer Ranch recycled water demand.

- **Recycled water supply:** Recycled water will be supplied by the wholesaler to the Placer Ranch recycled water storage tank during off-peak demand periods. Recycled water will be pumped out of the Placer Ranch recycled water storage tank by the on-site recycled water pump station and delivered to users within Placer Ranch at pressure. Should the recycled water supply be limited for any reason, groundwater from a well co-located at Parcel PR-98 with the recycled water storage tank and pump station will be supplied to the recycled water storage tank through an air-gapped connection.
- **Recycled water demand:** The intent of the recycled water system analysis was to maximize recycled water use through a semi-aggressive water use strategy. This strategy states that all non-potable uses of water for landscape irrigation of non-single family residences will be supplied with recycled water. Potential demands for the Sunset Area may also be conveyed through Placer Ranch to the Sunset Area.
- **Recycled water availability:** Since recycled water is being supplied by the wholesaler during off-peak periods, existing City of Roseville peak hour recycled water demands should not be affected, but additional coordination with the City of Roseville as well as the execution of a recycled water operations agreement per the Amended and Restated Agreement Regarding the Operation and Use of the South Placer Regional Wastewater Facilities dated October 1, 2012 will be required. Additionally, on-site recycled water storage will be 120% of one max day of demands, therefore it is expected that recycled water will be available from the wholesaler.

## 5.2 Operational Storage and Pumping

The following results and recommendations pertain to the operational storage and pumping requirements for Placer Ranch.

- **Construct a new recycled water storage tank:** A new recycled water storage tank will be constructed within Placer Ranch at Parcel PR-98. This storage tank will be designed to fill during off-peak periods and be drawn down during peak hour periods. This tank will have two supply pipelines – the primary supply is recycled water from the wholesaler,

and the backup supply is groundwater from a new on-site well. The size of the tank will depend on whether or not it is oversized to serve other portions of the Sunset Area.

- **Construct a new recycled water pump station:** The new Placer Ranch Recycled Water Pump Station will pump out of the new Placer Ranch Recycled Water Storage Tank. The Placer Ranch recycled water pump station must be designed to supply the flow and TDH required for Placer Ranch and possibly other portions of the Sunset Area.

## 5.3 Recycled Water Distribution

The following results and recommendations pertain to the distribution system designed to meet the recycled water demands and modeling criteria for Placer Ranch.

- **Distribution system:** Recycled water pipelines in Placer Ranch will be 6, 8, 12, 18, and 24-inches in diameter (30-inches with oversizing for Sunset Area demands). Pipelines will be located either within the proposed streets or proposed paseos.
- **Modeling criteria:** All recycled water infrastructure was sized to meet the minimum 60 psi pressure requirement at every node (and 70 psi at Sunset Area interties) and not exceed a 5 ft/s velocity during peak day within any on-site or off-site recycled water pipeline.

# SECTION 6 – REFERENCES

1. HydroScience Engineers, Recycled Water Study for the West Roseville Specific Plan Area, May 2003 and updated 2004.
2. HydroScience Engineers, Placer Ranch Water Conservation Plan, May 2017.
3. MacKay & Somps Civil Engineers, Inc., Land Use Map - Placer, June 2016.
4. MacKay & Somps Civil Engineers, Inc., *Placer Ranch Sunset Industrial Area General Plan Land Use,* March 2015.
5. Placer County Water Agency, *2015 Urban Water Management Plan*, June 2016.
6. University of California – Cooperative Extension, California Turfgrass Culture: Using $ET_0$ (Reference Evapotranspiration) for Turfgrass Irrigation Efficiency, 1997.

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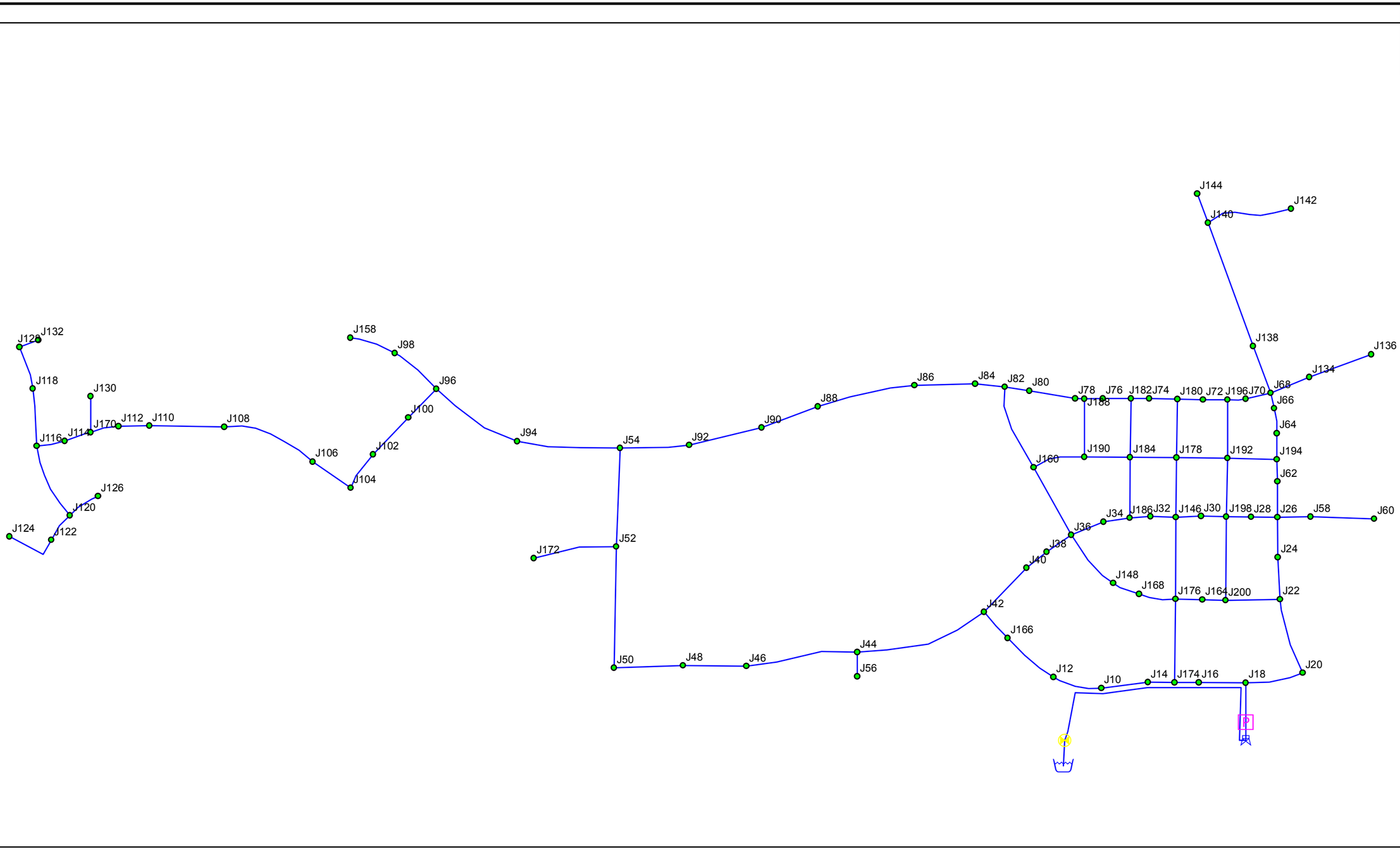
# APPENDIX A

InfoWater Hydraulic Modeling Output Reports



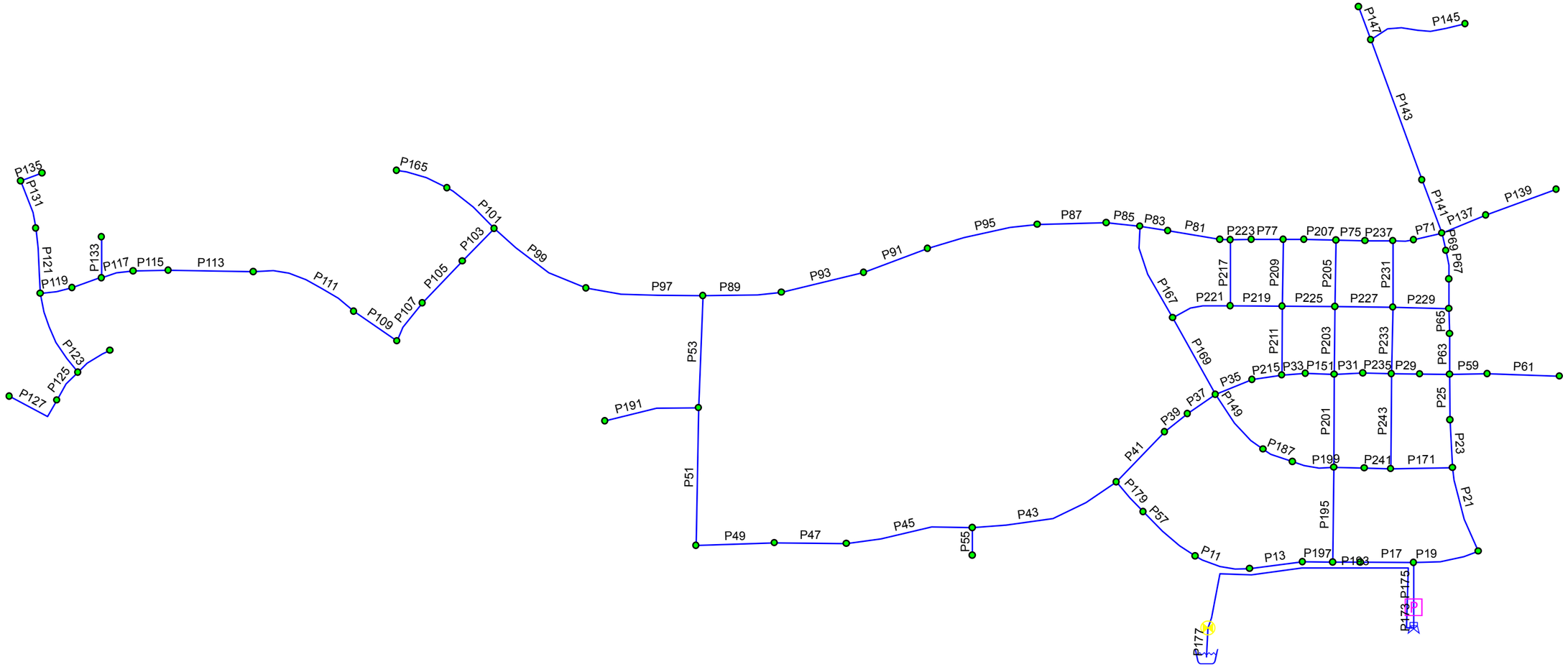

**APPENDIX A**
MACKAY AND SOMPS CIVIL ENGINEERS, INC.
PLACER RANCH RECYCLED WATER MASTER PLAN
INFOWATER WATER MODEL - JUNCTION ID'S

HydroScience

PLACER RANCH RWMP - JUNCTION REPORT

| ID | Demand (gpm) | Elevation (ft) | Head (ft) | Pressure (psi) |
|---|---|---|---|---|
| J10 | 3.87 | 118.00 | 300.46 | 79.06 |
| J100 | 11.07 | 106.00 | 292.73 | 80.91 |
| J102 | 30.51 | 103.00 | 292.55 | 82.13 |
| J104 | 6.75 | 105.00 | 292.42 | 81.21 |
| J106 | 45.63 | 106.00 | 292.27 | 80.71 |
| J108 | 25.47 | 105.00 | 290.08 | 80.20 |
| J110 | 3.87 | 93.00 | 288.47 | 84.70 |
| J112 | 24.75 | 99.00 | 287.81 | 81.81 |
| J114 | 98.91 | 103.00 | 286.67 | 79.58 |
| J116 | 6.75 | 96.00 | 286.17 | 82.40 |
| J118 | 7.47 | 92.00 | 285.22 | 83.72 |
| J12 | 3.87 | 124.00 | 300.25 | 76.37 |
| J120 | 3.87 | 95.00 | 286.13 | 82.82 |
| J122 | 4.59 | 95.00 | 286.12 | 82.81 |
| J124 | 16.11 | 97.00 | 286.11 | 81.94 |
| J126 | 4.59 | 98.00 | 286.13 | 81.52 |
| J128 | 25.47 | 100.00 | 284.50 | 79.94 |
| J130 | 16.11 | 104.00 | 287.21 | 79.39 |
| J132 | 1,166.44 | 104.00 | 284.07 | 78.02 |
| J134 | 54.27 | 140.00 | 298.48 | 68.67 |
| J136 | 385.53 | 134.00 | 297.02 | 70.64 |
| J138 | 72.76 | 139.00 | 298.72 | 69.20 |
| J14 | 31.59 | 119.00 | 300.65 | 78.71 |
| J140 | 3.87 | 134.00 | 297.49 | 70.84 |
| J142 | 55.71 | 136.00 | 297.35 | 69.91 |
| J144 | 821.49 | 132.00 | 296.56 | 71.30 |
| J146 | 3.87 | 130.00 | 299.63 | 73.50 |
| J148 | 19.71 | 130.00 | 299.63 | 73.50 |
| J158 | 66.64 | 105.00 | 290.86 | 80.54 |
| J16 | 102.51 | 124.00 | 300.88 | 76.64 |
| J160 | 3.87 | 119.00 | 299.06 | 78.02 |
| J164 | 33.39 | 123.00 | 300.05 | 76.71 |
| J166 | 3.87 | 119.00 | 300.01 | 78.43 |
| J168 | 18.27 | 127.00 | 299.77 | 74.86 |
| J170 | 3.87 | 102.00 | 287.22 | 80.26 |
| J172 | 6.75 | 108.00 | 294.76 | 80.92 |
| J174 | 0.00 | 127.00 | 300.77 | 75.29 |
| J176 | 0.00 | 127.00 | 300.02 | 74.97 |
| J178 | 0.00 | 131.00 | 299.37 | 72.95 |
| J18 | 11.79 | 115.00 | 301.12 | 80.65 |
| J180 | 0.00 | 128.00 | 299.10 | 74.14 |
| J182 | 0.00 | 124.00 | 298.99 | 75.82 |
| J184 | 0.00 | 125.00 | 299.21 | 75.49 |
| J186 | 0.00 | 128.00 | 299.44 | 74.28 |
| J188 | 0.00 | 114.00 | 298.88 | 80.11 |
| J190 | 0.00 | 117.00 | 299.06 | 78.89 |
| J192 | 0.00 | 124.00 | 299.57 | 76.07 |
| J194 | 0.00 | 125.00 | 299.80 | 75.74 |
| J196 | 0.00 | 131.00 | 299.19 | 72.88 |
| J198 | 0.00 | 137.00 | 299.89 | 70.58 |

| ID | Demand (gpm) | Elevation (ft) | Head (ft) | Pressure (psi) |
|---|---|---|---|---|
| J20 | 26.19 | 112.00 | 300.90 | 81.85 |
| J200 | 0.00 | 122.00 | 300.11 | 77.17 |
| J202 | 1,319.07 | 104.00 | 293.68 | 82.19 |
| J22 | 3.87 | 126.00 | 300.61 | 75.66 |
| J24 | 3.87 | 128.00 | 300.46 | 74.73 |
| J26 | 3.87 | 129.00 | 300.32 | 74.23 |
| J28 | 33.39 | 134.00 | 300.08 | 71.96 |
| J30 | 24.75 | 138.00 | 299.74 | 70.08 |
| J32 | 60.03 | 127.00 | 299.50 | 74.74 |
| J34 | 54.99 | 125.00 | 299.42 | 75.58 |
| J36 | 3.87 | 123.00 | 299.42 | 76.44 |
| J38 | 25.47 | 122.00 | 299.52 | 76.92 |
| J40 | 31.59 | 117.00 | 299.61 | 79.13 |
| J42 | 210.04 | 116.00 | 299.86 | 79.67 |
| J44 | 3.87 | 110.00 | 298.44 | 81.65 |
| J46 | 4.59 | 104.00 | 297.30 | 83.76 |
| J48 | 4.59 | 105.00 | 296.67 | 83.05 |
| J50 | 3.87 | 103.00 | 295.97 | 83.62 |
| J52 | 240.28 | 107.00 | 294.76 | 81.36 |
| J54 | 3.87 | 104.00 | 293.93 | 82.30 |
| J56 | 45.63 | 114.00 | 298.41 | 79.91 |
| J58 | 29.79 | 123.00 | 299.87 | 76.64 |
| J60 | 345.15 | 123.00 | 298.76 | 76.16 |
| J62 | 18.27 | 124.00 | 300.00 | 76.26 |
| J64 | 31.23 | 129.00 | 299.59 | 73.92 |
| J66 | 3.87 | 134.00 | 299.38 | 71.66 |
| J68 | 3.87 | 134.00 | 299.26 | 71.61 |
| J70 | 18.27 | 130.00 | 299.22 | 73.32 |
| J72 | 24.75 | 130.00 | 299.15 | 73.29 |
| J74 | 68.67 | 126.00 | 299.03 | 74.97 |
| J76 | 18.99 | 119.00 | 298.92 | 77.96 |
| J78 | 16.11 | 113.00 | 298.85 | 80.53 |
| J80 | 31.95 | 119.00 | 298.73 | 77.88 |
| J82 | 3.87 | 120.00 | 298.66 | 77.41 |
| J84 | 25.47 | 120.00 | 298.51 | 77.35 |
| J86 | 647.55 | 118.00 | 298.20 | 78.08 |
| J88 | 31.95 | 114.00 | 296.56 | 79.11 |
| J90 | 42.03 | 116.00 | 295.62 | 77.83 |
| J92 | 279.16 | 119.00 | 294.53 | 76.06 |
| J94 | 98.19 | 109.00 | 293.36 | 79.88 |
| J96 | 45.63 | 105.00 | 292.87 | 81.40 |
| J98 | 221.31 | 109.00 | 290.97 | 78.85 |




**APPENDIX A**
MACKAY AND SOMPS CIVIL ENGINEERS, INC.
PLACER RANCH RECYCLED WATER MASTER PLAN
INFOWATER WATER MODEL - PIPE ID'S

HydroScience

PLACER RANCH RWMP - PIPE REPORT

| ID | Length (ft) | Diameter (in) | Roughness | Flow (gpm) | Velocity (ft/s) | Headloss (ft) | HL/1000 (ft/k-ft) | Status |
|---|---|---|---|---|---|---|---|---|
| P101 | 256.34 | 6.00 | 130.00 | 287.95 | 3.27 | 1.90 | 7.39 | Open |
| P103 | 187.17 | 18.00 | 130.00 | 1,502.29 | 1.89 | 0.14 | 0.75 | Open |
| P105 | 236.48 | 18.00 | 130.00 | 1,491.21 | 1.88 | 0.17 | 0.74 | Open |
| P107 | 189.58 | 18.00 | 130.00 | 1,460.70 | 1.84 | 0.13 | 0.71 | Open |
| P109 | 215.11 | 18.00 | 130.00 | 1,453.95 | 1.83 | 0.15 | 0.70 | Open |
| P11 | 233.34 | 24.00 | 130.00 | 3,503.50 | 2.48 | 0.21 | 0.88 | Open |
| P111 | 456.91 | 12.00 | 130.00 | 1,408.31 | 4.00 | 2.18 | 4.78 | Open |
| P113 | 348.75 | 12.00 | 130.00 | 1,382.84 | 3.92 | 1.61 | 4.62 | Open |
| P115 | 144.22 | 12.00 | 130.00 | 1,378.97 | 3.91 | 0.66 | 4.60 | Open |
| P117 | 132.76 | 12.00 | 130.00 | 1,354.21 | 3.84 | 0.59 | 4.44 | Open |
| P119 | 133.36 | 12.00 | 130.00 | 1,235.31 | 3.50 | 0.50 | 3.75 | Open |
| P121 | 268.80 | 12.00 | 130.00 | 1,199.38 | 3.40 | 0.95 | 3.55 | Open |
| P123 | 364.12 | 6.00 | 130.00 | 29.17 | 0.33 | 0.04 | 0.11 | Open |
| P125 | 144.95 | 6.00 | 130.00 | 20.71 | 0.23 | 0.01 | 0.06 | Open |
| P127 | 254.57 | 6.00 | 130.00 | 16.11 | 0.18 | 0.01 | 0.04 | Open |
| P129 | 160.45 | 6.00 | 130.00 | 4.59 | 0.05 | 0.00 | 0.00 | Open |
| P13 | 218.50 | 24.00 | 130.00 | 3,507.37 | 2.49 | 0.19 | 0.88 | Open |
| P131 | 205.08 | 12.00 | 130.00 | 1,191.91 | 3.38 | 0.72 | 3.51 | Open |
| P133 | 168.67 | 6.00 | 130.00 | 16.11 | 0.18 | 0.01 | 0.04 | Open |
| P135 | 127.09 | 12.00 | 130.00 | 1,166.44 | 3.31 | 0.43 | 3.37 | Open |
| P137 | 194.57 | 8.00 | 130.00 | 439.81 | 2.81 | 0.78 | 3.99 | Open |
| P139 | 468.09 | 8.00 | 130.00 | 385.53 | 2.46 | 1.46 | 3.13 | Open |
| P141 | 233.12 | 12.00 | 130.00 | 953.84 | 2.71 | 0.54 | 2.32 | Open |
| P143 | 610.70 | 12.00 | 130.00 | 881.08 | 2.50 | 1.22 | 2.00 | Open |
| P145 | 405.62 | 6.00 | 130.00 | 55.71 | 0.63 | 0.14 | 0.35 | Open |
| P147 | 529.55 | 12.00 | 130.00 | 821.49 | 2.33 | 0.93 | 1.76 | Open |
| P149 | 301.17 | 6.00 | 130.00 | -81.51 | 0.92 | 0.22 | 0.71 | Open |
| P15 | 113.43 | 24.00 | 130.00 | 3,834.55 | 2.72 | 0.12 | 1.04 | Open |
| P151 | 117.57 | 8.00 | 130.00 | 219.30 | 1.40 | 0.13 | 1.10 | Open |
| P165 | 219.89 | 6.00 | 130.00 | 66.64 | 0.76 | 0.11 | 0.49 | Open |
| P167 | 407.63 | 12.00 | 130.00 | -599.81 | 1.70 | 0.40 | 0.98 | Open |
| P169 | 359.57 | 12.00 | 130.00 | 602.25 | 1.71 | 0.36 | 0.99 | Open |
| P17 | 218.55 | 24.00 | 130.00 | 3,937.07 | 2.79 | 0.24 | 1.10 | Open |
| P171 | 252.71 | 6.00 | 130.00 | 141.69 | 1.61 | 0.50 | 1.99 | Open |
| P173 | 86.96 | 30.00 | 130.00 | 7,319.88 | 3.32 | 0.10 | 1.17 | Open |
| P175 | 181.50 | 30.00 | 130.00 | 7,319.88 | 3.32 | 0.21 | 1.17 | Open |
| P177 | 118.45 | 24.00 | 130.00 | 0.00 | 0.00 | 0.00 | 0.00 | Open |
| P179 | 163.40 | 24.00 | 130.00 | 3,495.75 | 2.48 | 0.14 | 0.88 | Open |
| P185 | 126.20 | 6.00 | 130.00 | -37.47 | 0.43 | 0.02 | 0.17 | Open |
| P187 | 131.25 | 6.00 | 130.00 | 101.23 | 1.15 | 0.14 | 1.07 | Open |
| P189 | 127.33 | 12.00 | 130.00 | 1,334.22 | 3.78 | 0.55 | 4.32 | Open |
| P19 | 270.30 | 24.00 | 130.00 | 3,371.02 | 2.39 | 0.22 | 0.82 | Open |
| P191 | 389.69 | 6.00 | 130.00 | 6.75 | 0.08 | 0.00 | 0.01 | Open |
| P193 | 1,278.70 | 24.00 | 130.00 | 0.00 | 0.00 | 0.00 | 0.00 | Open |
| P195 | 387.29 | 8.00 | 130.00 | 295.59 | 1.89 | 0.74 | 1.91 | Open |
| P197 | 123.38 | 24.00 | 130.00 | 3,538.97 | 2.51 | 0.11 | 0.90 | Open |
| P199 | 173.01 | 6.00 | 130.00 | -119.50 | 1.36 | 0.25 | 1.45 | Open |
| P201 | 380.65 | 8.00 | 130.00 | 213.56 | 1.36 | 0.40 | 1.05 | Open |
| P203 | 278.30 | 8.00 | 130.00 | 199.57 | 1.27 | 0.26 | 0.92 | Open |
| P205 | 272.55 | 8.00 | 130.00 | 206.62 | 1.32 | 0.27 | 0.98 | Open |

PLACER RANCH RWMP - PIPE REPORT

| ID | Length (ft) | Diameter (in) | Roughness | Flow (gpm) | Velocity (ft/s) | Headloss (ft) | HL/1000 (ft/k-ft) | Status |
|---|---|---|---|---|---|---|---|---|
| P207 | 130.16 | 18.00 | 130.00 | -1,243.68 | 1.57 | 0.07 | 0.53 | Open |
| P209 | 273.87 | 6.00 | 130.00 | -87.23 | 0.99 | 0.22 | 0.81 | Open |
| P21 | 361.19 | 24.00 | 130.00 | 3,344.83 | 2.37 | 0.29 | 0.81 | Open |
| P211 | 281.78 | 6.00 | 130.00 | -86.50 | 0.98 | 0.22 | 0.80 | Open |
| P213 | 85.53 | 18.00 | 130.00 | -1,175.01 | 1.48 | 0.04 | 0.47 | Open |
| P215 | 123.91 | 8.00 | 130.00 | 72.77 | 0.46 | 0.02 | 0.14 | Open |
| P217 | 271.46 | 6.00 | 130.00 | -79.86 | 0.91 | 0.19 | 0.69 | Open |
| P219 | 212.47 | 6.00 | 130.00 | -81.29 | 0.92 | 0.15 | 0.71 | Open |
| P221 | 247.74 | 6.00 | 130.00 | -1.43 | 0.02 | 0.00 | 0.00 | Open |
| P223 | 86.06 | 18.00 | 130.00 | -1,243.24 | 1.57 | 0.05 | 0.53 | Open |
| P225 | 215.64 | 6.00 | 130.00 | -82.02 | 0.93 | 0.16 | 0.72 | Open |
| P227 | 237.09 | 6.00 | 130.00 | -89.07 | 1.01 | 0.20 | 0.84 | Open |
| P229 | 230.24 | 6.00 | 130.00 | -98.46 | 1.12 | 0.23 | 1.01 | Open |
| P23 | 195.49 | 24.00 | 130.00 | 3,199.26 | 2.27 | 0.15 | 0.75 | Open |
| P231 | 273.05 | 6.00 | 130.00 | -116.58 | 1.32 | 0.38 | 1.39 | Open |
| P233 | 271.50 | 6.00 | 130.00 | -107.19 | 1.22 | 0.32 | 1.19 | Open |
| P235 | 117.79 | 8.00 | 130.00 | -233.95 | 1.49 | 0.15 | 1.24 | Open |
| P237 | 113.44 | 18.00 | 130.00 | -1,061.81 | 1.34 | 0.04 | 0.39 | Open |
| P239 | 121.51 | 18.00 | 130.00 | 2,396.13 | 3.02 | 0.22 | 1.77 | Open |
| P241 | 107.76 | 6.00 | 130.00 | 70.87 | 0.80 | 0.06 | 0.55 | Open |
| P243 | 390.01 | 6.00 | 130.00 | 70.83 | 0.80 | 0.21 | 0.55 | Open |
| P249 | 429.53 | 18.00 | 130.00 | 1,319.07 | 1.66 | 0.25 | 0.59 | Open |
| P25 | 185.74 | 24.00 | 130.00 | 3,195.39 | 2.27 | 0.14 | 0.74 | Open |
| P27 | 122.25 | 8.00 | 130.00 | 303.71 | 1.94 | 0.25 | 2.01 | Open |
| P29 | 115.63 | 8.00 | 130.00 | -270.31 | 1.73 | 0.19 | 1.62 | Open |
| P31 | 117.65 | 8.00 | 130.00 | 209.19 | 1.34 | 0.12 | 1.01 | Open |
| P33 | 96.80 | 8.00 | 130.00 | 159.27 | 1.02 | 0.06 | 0.61 | Open |
| P35 | 162.43 | 8.00 | 130.00 | 17.78 | 0.11 | 0.00 | 0.01 | Open |
| P37 | 139.16 | 12.00 | 130.00 | -506.83 | 1.44 | 0.10 | 0.72 | Open |
| P39 | 119.75 | 12.00 | 130.00 | -532.31 | 1.51 | 0.09 | 0.79 | Open |
| P41 | 284.80 | 12.00 | 130.00 | -563.90 | 1.60 | 0.25 | 0.88 | Open |
| P43 | 634.28 | 18.00 | 130.00 | 2,721.81 | 3.43 | 1.42 | 2.25 | Open |
| P45 | 523.17 | 18.00 | 130.00 | -2,672.30 | 3.37 | 1.14 | 2.17 | Open |
| P47 | 294.37 | 18.00 | 130.00 | 2,667.71 | 3.36 | 0.64 | 2.16 | Open |
| P49 | 320.96 | 18.00 | 130.00 | 2,663.12 | 3.36 | 0.69 | 2.16 | Open |
| P51 | 563.00 | 18.00 | 130.00 | 2,659.24 | 3.35 | 1.21 | 2.15 | Open |
| P53 | 460.73 | 18.00 | 130.00 | 2,412.21 | 3.04 | 0.83 | 1.80 | Open |
| P55 | 112.45 | 6.00 | 130.00 | 45.63 | 0.52 | 0.03 | 0.24 | Open |
| P57 | 281.10 | 24.00 | 130.00 | 3,499.63 | 2.48 | 0.25 | 0.88 | Open |
| P59 | 154.02 | 8.00 | 130.00 | 374.95 | 2.39 | 0.46 | 2.97 | Open |
| P61 | 434.01 | 8.00 | 130.00 | 345.15 | 2.20 | 1.11 | 2.55 | Open |
| P63 | 166.69 | 18.00 | 130.00 | 2,512.86 | 3.17 | 0.32 | 1.94 | Open |
| P65 | 103.96 | 18.00 | 130.00 | 2,494.58 | 3.15 | 0.20 | 1.91 | Open |
| P67 | 117.21 | 18.00 | 130.00 | 2,364.89 | 2.98 | 0.20 | 1.73 | Open |
| P69 | 73.31 | 18.00 | 130.00 | 2,361.02 | 2.98 | 0.13 | 1.73 | Open |
| P71 | 119.62 | 18.00 | 130.00 | 963.50 | 1.21 | 0.04 | 0.33 | Open |
| P73 | 85.96 | 18.00 | 130.00 | -945.23 | 1.19 | 0.03 | 0.32 | Open |
| P75 | 119.69 | 18.00 | 130.00 | -1,037.06 | 1.31 | 0.05 | 0.38 | Open |
| P77 | 130.38 | 18.00 | 130.00 | -1,262.24 | 1.59 | 0.07 | 0.54 | Open |
| P79 | 43.07 | 18.00 | 130.00 | -1,323.10 | 1.67 | 0.03 | 0.59 | Open |

| | ID | Length (ft) | Diameter (in) | Roughness | Flow (gpm) | Velocity (ft/s) | Headloss (ft) | HL/1000 (ft/k-ft) | Status |
|---|---|---|---|---|---|---|---|---|---|
| | P81 | 216.79 | 18.00 | 130.00 | 1,306.99 | 1.65 | 0.13 | 0.58 | Open |
| | P83 | 115.55 | 18.00 | 130.00 | 1,275.03 | 1.61 | 0.06 | 0.55 | Open |
| | P85 | 138.38 | 18.00 | 130.00 | 1,870.97 | 2.36 | 0.16 | 1.12 | Open |
| | P87 | 283.70 | 18.00 | 130.00 | 1,845.49 | 2.33 | 0.31 | 1.09 | Open |
| | P89 | 322.26 | 12.00 | 130.00 | 844.80 | 2.40 | 0.60 | 1.85 | Open |
| | P91 | 279.95 | 12.00 | 130.00 | 1,165.99 | 3.31 | 0.94 | 3.37 | Open |
| | P93 | 346.53 | 12.00 | 130.00 | 1,123.95 | 3.19 | 1.09 | 3.15 | Open |
| | P95 | 460.68 | 12.00 | 130.00 | 1,197.94 | 3.40 | 1.63 | 3.54 | Open |
| | P97 | 480.78 | 18.00 | 130.00 | 1,934.06 | 2.44 | 0.57 | 1.19 | Open |
| | P99 | 453.67 | 18.00 | 130.00 | 1,835.87 | 2.31 | 0.49 | 1.08 | Open |

# APPENDIX B

Placer Ranch Recycled Water Market Assessment Table by Parcel

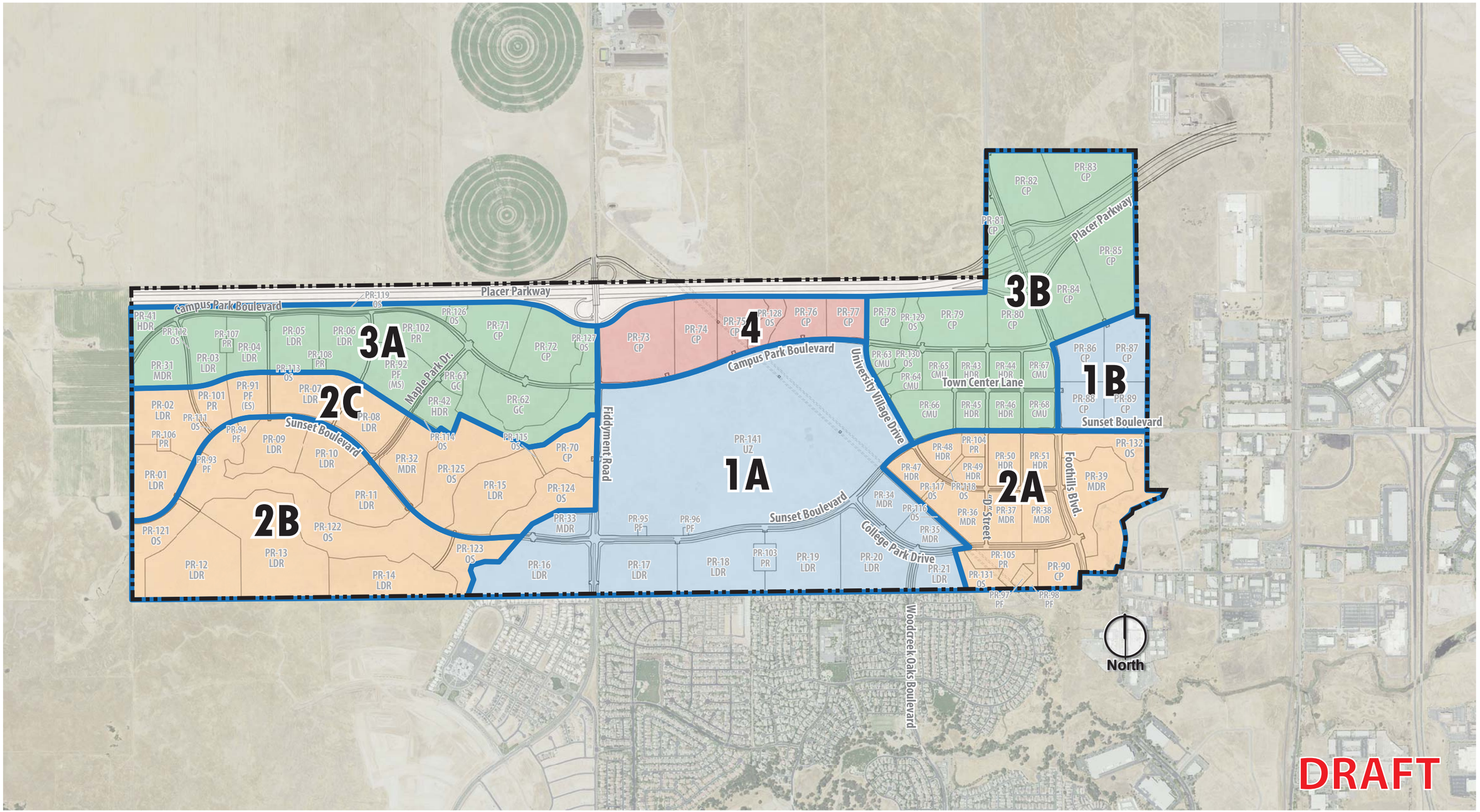
**Placer Ranch**

| | | | | | | | | | Recycled Water | | | | | | | Recycled Water with Water Conservation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | Land Use | Total Area | Dwelling Units | Density | Impervious Surface | Impervious Surface | Irrigated Percentage | Irrigated with RW | RW Irrigated | Annual Demand | Average Day Demand (24 Hours) | Peak Day Demand (24 Hours) | Peak Day Demand (9 Hours) | Peak Hour Delivery Demand | Water Conservation Factor | Reduced Demand with Water Conservation | Reduced Demand with Water Conservation |
| | | | (Acres) | (du) | (du/ac) | (%) | (Acres) | (%) | | (Acres) | (AFY) | (GPD) | (GPD) | (GPM) | (GPM) | % reduction | (AFY) | (MGD) |
| 1 | PR-01 | LDR | 21.12 | 106 | 5 | 60% | 12.67 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 2 | PR-02 | LDR | 26.32 | 132 | 5 | 60% | 15.79 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 3 | PR-03 | LDR | 16.03 | 80 | 5 | 60% | 9.62 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 4 | PR-04 | LDR | 13.93 | 70 | 5 | 60% | 8.36 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 5 | PR-05 | LDR | 18.01 | 90 | 5 | 60% | 10.81 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 6 | PR-06 | LDR | 18.38 | 92 | 5 | 60% | 11.03 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 7 | PR-07 | LDR | 21.36 | 107 | 5 | 60% | 12.82 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 8 | PR-08 | LDR | 17.64 | 88 | 5 | 60% | 10.58 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 9 | PR-09 | LDR | 20.7 | 104 | 5 | 60% | 12.42 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 10 | PR-10 | LDR | 19.83 | 99 | 5 | 60% | 11.90 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 11 | PR-11 | LDR | 20.47 | 102 | 5 | 60% | 12.28 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 12 | PR-15 | LDR | 32.65 | 163 | 5 | 60% | 19.59 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 13 | PR-16 | LDR | 36.75 | 184 | 5 | 60% | 22.05 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 14 | PR-17 | LDR | 26.29 | 131 | 5 | 60% | 15.77 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 15 | PR-18 | LDR | 29.98 | 150 | 5 | 60% | 17.99 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 16 | PR-19 | LDR | 30.49 | 152 | 5 | 60% | 18.29 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 17 | PR-20 | LDR | 27.87 | 139 | 5 | 60% | 16.72 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 18 | PR-21 | LDR | 10.04 | 50 | 5 | 60% | 6.02 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 19 | PR-12 | LDR | 42.58 | 234 | 5.5 | 60% | 25.55 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 20 | PR-13 | LDR | 57.49 | 316 | 5.5 | 60% | 34.49 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 21 | PR-14 | LDR | 30.95 | 170 | 5.5 | 60% | 18.57 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 22 | PR-31 | MDR | 17.9 | 143 | 8 | 60% | 10.74 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 23 | PR-32 | MDR | 18.68 | 149 | 8 | 60% | 11.21 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 24 | PR-33 | MDR | 7.88 | 63 | 8 | 60% | 4.73 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 25 | PR-34 | MDR | 11.48 | 92 | 8 | 60% | 6.89 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 26 | PR-35 | MDR | 9.74 | 78 | 8 | 60% | 5.84 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 27 | PR-36 | MDR | 15.18 | 121 | 8 | 60% | 9.11 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 28 | PR-37 | MDR | 11.33 | 91 | 8 | 60% | 6.80 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 29 | PR-38 | MDR | 12.92 | 103 | 8 | 60% | 7.75 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 30 | PR-39 | MDR | 27.17 | 217 | 8 | 60% | 16.30 | 40% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 31 | PR-41 | HDR | 8.16 | 163 | 20 | 80% | 6.53 | 20% | yes | 1.6 | 5.3 | 4,720 | 11,517 | 21 | 86 | 45.0% | 2.9 | 0.00633 |
| 32 | PR-42 | HDR | 10.23 | 205 | 20 | 80% | 8.18 | 20% | yes | 2.0 | 6.6 | 5,918 | 14,439 | 27 | 107 | 45.0% | 3.6 | 0.00794 |
| 33 | PR-43 | HDR | 7.19 | 161 | 20 | 80% | 5.75 | 20% | yes | 1.4 | 4.7 | 4,159 | 10,148 | 19 | 75 | 45.0% | 2.6 | 0.00558 |
| 34 | PR-44 | HDR | 7.9 | 175 | 20 | 80% | 6.32 | 20% | yes | 1.6 | 5.1 | 4,570 | 11,150 | 21 | 83 | 45.0% | 2.8 | 0.00613 |
| 35 | PR-45 | HDR | 7.2 | 161 | 20 | 80% | 5.76 | 20% | yes | 1.4 | 4.7 | 4,165 | 10,162 | 19 | 75 | 45.0% | 2.6 | 0.00559 |
| 36 | PR-46 | HDR | 7.9 | 175 | 20 | 80% | 6.32 | 20% | yes | 1.6 | 5.1 | 4,570 | 11,150 | 21 | 83 | 45.0% | 2.8 | 0.00613 |
| 37 | PR-47 | HDR | 8.39 | 185 | 20 | 80% | 6.71 | 20% | yes | 1.7 | 5.4 | 4,853 | 11,842 | 22 | 88 | 45.0% | 3.0 | 0.00651 |
| 38 | PR-48 | HDR | 7.72 | 171 | 20 | 80% | 6.18 | 20% | yes | 1.5 | 5.0 | 4,466 | 10,896 | 20 | 81 | 45.0% | 2.8 | 0.00599 |
| 39 | PR-49 | HDR | 5.66 | 129 | 20 | 80% | 4.53 | 20% | yes | 1.1 | 3.7 | 3,274 | 7,989 | 15 | 59 | 45.0% | 2.0 | 0.00439 |
| 40 | PR-50 | HDR | 11.43 | 245 | 20 | 80% | 9.14 | 20% | yes | 2.3 | 7.4 | 6,612 | 16,133 | 30 | 120 | 45.0% | 4.1 | 0.00887 |
| 41 | PR-51 | HDR | 11.24 | 241 | 20 | 80% | 8.99 | 20% | yes | 2.2 | 7.3 | 6,502 | 15,865 | 29 | 118 | 45.0% | 4.0 | 0.00873 |
| 42 | PR-52 | HDR | 0 | 0 | 20 | 80% | 0.00 | 20% | yes | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 45.0% | 0.0 | 0.00000 |
| 43 | PR-61 | GC | 3.56 | | 0 | 85% | 3.03 | 15% | yes | 0.5 | 1.7 | 1,544 | 3,769 | 7 | 28 | 55.0% | 0.8 | 0.00170 |
| 44 | PR-62 | GC | 22.07 | | 0 | 85% | 18.76 | 15% | yes | 3.3 | 10.7 | 9,575 | 23,363 | 43 | 173 | 55.0% | 4.8 | 0.01051 |
| 45 | PR-63 | CMU | 4.06 | | 0 | 85% | 3.45 | 15% | yes | 0.6 | 2.0 | 1,761 | 4,298 | 8 | 32 | 55.0% | 0.9 | 0.00193 |
| 46 | PR-64 | CMU | 6.09 | | 0 | 85% | 5.18 | 15% | yes | 0.9 | 3.0 | 2,642 | 6,447 | 12 | 48 | 55.0% | 1.3 | 0.00290 |
| 47 | PR-65 | CMU | 7.92 | | 0 | 85% | 6.73 | 15% | yes | 1.2 | 3.8 | 3,436 | 8,384 | 16 | 62 | 55.0% | 1.7 | 0.00377 |
| 48 | PR-66 | CMU | 15.68 | | 0 | 85% | 13.33 | 15% | yes | 2.4 | 7.6 | 6,803 | 16,598 | 31 | 123 | 55.0% | 3.4 | 0.00747 |
| 49 | PR-67 | CMU | 7.55 | | 0 | 85% | 6.42 | 15% | yes | 1.1 | 3.7 | 3,276 | 7,992 | 15 | 59 | 55.0% | 1.7 | 0.00360 |
| 50 | PR-68 | CMU | 7.5 | | 0 | 85% | 6.38 | 15% | yes | 1.1 | 3.6 | 3,254 | 7,939 | 15 | 59 | 55.0% | 1.6 | 0.00357 |
| 51 | PR-70 | CP | 15.52 | | 0 | 85% | 13.19 | 15% | yes | 2.3 | 7.5 | 6,733 | 16,429 | 30 | 122 | 55.0% | 3.4 | 0.00739 |
| 52 | PR-71 | CP | 21.52 | | 0 | 85% | 18.29 | 15% | yes | 3.2 | 10.5 | 9,336 | 22,781 | 42 | 169 | 55.0% | 4.7 | 0.01025 |
| 53 | PR-72 | CP | 26.08 | | 0 | 85% | 22.17 | 15% | yes | 3.9 | 12.7 | 11,315 | 27,608 | 51 | 205 | 55.0% | 5.7 | 0.01242 |
| 54 | PR-73 | CP | 35.24 | | 0 | 85% | 29.95 | 15% | yes | 5.3 | 17.1 | 15,289 | 37,304 | 69 | 277 | 55.0% | 7.7 | 0.01679 |
| 55 | PR-74 | CP | 19.62 | | 0 | 85% | 16.68 | 15% | yes | 2.9 | 9.5 | 8,512 | 20,769 | 38 | 154 | 55.0% | 4.3 | 0.00935 |
| 56 | PR-75 | CP | 14.42 | | 0 | 85% | 12.26 | 15% | yes | 2.2 | 7.0 | 6,256 | 15,265 | 28 | 113 | 55.0% | 3.2 | 0.00687 |
| 57 | PR-76 | CP | 12.86 | | 0 | 85% | 10.93 | 15% | yes | 1.9 | 6.2 | 5,579 | 13,613 | 25 | 101 | 55.0% | 2.8 | 0.00613 |
| 58 | PR-77 | CP | 10.98 | | 0 | 85% | 9.33 | 15% | yes | 1.6 | 5.3 | 4,764 | 11,623 | 22 | 86 | 55.0% | 2.4 | 0.00523 |
| 59 | PR-78 | CP | 10.38 | | 0 | 85% | 8.82 | 15% | yes | 1.6 | 5.0 | 4,503 | 10,988 | 20 | 82 | 55.0% | 2.3 | 0.00494 |
| 60 | PR-79 | CP | 23.75 | | 0 | 85% | 20.19 | 15% | yes | 3.6 | 11.5 | 10,304 | 25,141 | 47 | 187 | 55.0% | 5.2 | 0.01131 |
| 61 | PR-80 | CP | 17.58 | | 0 | 85% | 14.94 | 15% | yes | 2.6 | 8.5 | 7,627 | 18,610 | 34 | 138 | 55.0% | 3.8 | 0.00837 |
| 62 | PR-81 | CP | 4.49 | | 0 | 85% | 3.82 | 15% | yes | 0.7 | 2.2 | 1,948 | 4,753 | 9 | 35 | 55.0% | 1.0 | 0.00214 |
| 63 | PR-82 | CP | 26.92 | | 0 | 85% | 22.88 | 15% | yes | 4.0 | 13.1 | 11,679 | 28,497 | 53 | 212 | 55.0% | 5.9 | 0.01282 |
| 64 | PR-83 | CP | 26.39 | | 0 | 85% | 22.43 | 15% | yes | 4.0 | 12.8 | 11,449 | 27,936 | 52 | 207 | 55.0% | 5.8 | 0.01257 |
| 65 | PR-84 | CP | 25.74 | | 0 | 85% | 21.88 | 15% | yes | 3.9 | 12.5 | 11,167 | 27,248 | 50 | 202 | 55.0% | 5.6 | 0.01226 |
| 66 | PR-85 | CP | 33.93 | | 0 | 85% | 28.84 | 15% | yes | 5.1 | 16.5 | 14,720 | 35,918 | 67 | 267 | 55.0% | 7.4 | 0.01616 |
| 67 | PR-86 | CP | 13.84 | | 0 | 85% | 11.76 | 15% | yes | 2.1 | 6.7 | 6,004 | 14,651 | 27 | 109 | 55.0% | 3.0 | 0.00659 |
| 68 | PR-87 | CP | 18.26 | | 0 | 85% | 15.52 | 15% | yes | 2.7 | 8.9 | 7,922 | 19,330 | 36 | 144 | 55.0% | 4.0 | 0.00870 |
| 69 | PR-88 | CP | 13.17 | | 0 | 85% | 11.19 | 15% | yes | 2.0 | 6.4 | 5,714 | 13,941 | 26 | 104 | 55.0% | 2.9 | 0.00627 |
| 70 | PR-89 | CP | 13.42 | | 0 | 85% | 11.41 | 15% | yes | 2.0 | 6.5 | 5,822 | 14,206 | 26 | 105 | 55.0% | 2.9 | 0.00639 |
| 71 | PR-90 | CP | 11.42 | | 0 | 85% | 9.71 | 15% | yes | 1.7 | 5.6 | 4,954 | 12,089 | 22 | 90 | 55.0% | 2.5 | 0.00544 |
| 72 | PR-91 | PF | 10.65 | | 0 | 85% | 9.05 | 15% | yes | 1.6 | 5.2 | 4,620 | 11,274 | 21 | 84 | 55.0% | 2.3 | 0.00507 |
| 73 | PR-92 | PF | 21.31 | | 0 | 85% | 18.11 | 15% | yes | 3.2 | 10.4 | 9,245 | 22,558 | 42 | 168 | 55.0% | 4.7 | 0.01015 |
| 74 | PR-93 | PF | 0.23 | | 0 | 85% | 0.20 | 15% | yes | 0.0 | 0.1 | 100 | 243 | 0 | 2 | 55.0% | 0.1 | 0.00011 |
| 75 | PR-94 | PF | 0.54 | | 0 | 85% | 0.46 | 15% | yes | 0.1 | 0.3 | 234 | 572 | 1 | 4 | 55.0% | 0.1 | 0.00026 |
| 76 | PR-95 | PF | 0.55 | | 0 | 85% | 0.47 | 15% | yes | 0.1 | 0.3 | 239 | 582 | 1 | 4 | 55.0% | 0.1 | 0.00026 |
| 77 | PR-96 | PF | 0.26 | | 0 | 85% | 0.22 | 15% | yes | 0.0 | 0.1 | 113 | 275 | 1 | 2 | 55.0% | 0.1 | 0.00012 |
| 78 | PR-97 | PF | 1.76 | | 0 | 85% | 1.50 | 15% | yes | 0.3 | 0.9 | 764 | 1,863 | 3 | 14 | 55.0% | 0.4 | 0.00084 |
| 79 | PR-98 | PF | 2.14 | | 0 | 85% | 1.82 | 15% | yes | 0.3 | 1.0 | 928 | 2,265 | 4 | 17 | 55.0% | 0.5 | 0.00102 |
| 80 | PR-101 | PR | 9.13 | | 0 | 20% | 1.83 | 80% | yes | 7.3 | 23.7 | 21,125 | 51,546 | 95 | 383 | 55.0% | 10.6 | 0.02320 |
| 81 | PR-102 | PR | 20.85 | | 0 | 20% | 4.17 | 80% | yes | 16.7 | 54.0 | 48,243 | 117,714 | 218 | 874 | 55.0% | 24.3 | 0.05297 |
| 82 | PR-103 | PR | 4 | | 0 | 20% | 0.80 | 80% | yes | 3.2 | 10.4 | 9,255 | 22,583 | 42 | 168 | 55.0% | 4.7 | 0.01016 |
| 83 | PR-104 | PR | 3.61 | | 0 | 20% | 0.72 | 80% | yes | 2.9 | 9.4 | 8,353 | 20,381 | 38 | 151 | 55.0% | 4.2 | 0.00917 |
| 84 | PR-105 | PR | 9.5 | | 0 | 20% | 1.90 | 80% | yes | 7.6 | 24.6 | 21,981 | 53,635 | 99 | 398 | 55.0% | 11.1 | 0.02414 |
| 85 | PR-106 | PR | 1.21 | | 0 | 20% | 0.24 | 80% | yes | 1.0 | 3.1 | 2,800 | 6,831 | 13 | 51 | 55.0% | 1.4 | 0.00307 |
| 86 | PR-107 | PR | 1.21 | | 0 | 20% | 0.24 | 80% | yes | 1.0 | 3.1 | 2,800 | 6,831 | 13 | 51 | 55.0% | 1.4 | 0.00307 |
| 87 | PR-108 | PR | 1.21 | | 0 | 20% | 0.24 | 80% | yes | 1.0 | 3.1 | 2,800 | 6,831 | 13 | 51 | 55.0% | 1.4 | 0.00307 |
| 88 | PR-111 | PR | 0.57 | | 0 | 20% | 0.11 | 80% | yes | 0.5 | 1.5 | 1,319 | 3,218 | 6 | 24 | 55.0% | 0.7 | 0.00145 |
| 89 | PR-112 | PR | 0.63 | | 0 | 20% | 0.13 | 80% | yes | 0.5 | 1.6 | 1,458 | 3,557 | 7 | 26 | 55.0% | 0.7 | 0.00160 |
| 90 | PR-113 | PR | 1.77 | | 0 | 20% | 0.35 | 80% | yes | 1.4 | 4.6 | 4,095 | 9,993 | 19 | 74 | 55.0% | 2.1 | 0.00450 |
| 91 | PR-114 | PR | 0.59 | | 0 | 20% | 0.12 | 80% | yes | 0.5 | 1.5 | 1,365 | 3,331 | 6 | 25 | 55.0% | 0.7 | 0.00150 |
| 92 | PR-115 | PR | 0.62 | | 0 | 20% | 0.12 | 80% | yes | 0.5 | 1.6 | 1,435 | 3,500 | 6 | 26 | 55.0% | 0.7 | 0.00158 |
| 93 | PR-116 | PR | 5.31 | | 0 | 20% | 1.06 | 80% | yes | 4.2 | 13.8 | 12,286 | 29,979 | 56 | 223 | 55.0% | 6.2 | 0.01349 |
| 94 | PR-117 | PR | 0.77 | | 0 | 20% | 0.15 | 80% | yes | 0.6 | 2.0 | 1,782 | 4,347 | 8 | 32 | 55.0% | 0.9 | 0.00196 |
| 95 | PR-118 | PR | 0.77 | | 0 | 20% | 0.15 | 80% | yes | 0.6 | 2.0 | 1,782 | 4,347 | 8 | 32 | 55.0% | 0.9 | 0.00196 |
| 96 | PR-119 | PR | 10.87 | | 0 | 20% | 2.17 | 80% | yes | 8.7 | 28.2 | 25,151 | 61,369 | 114 | 456 | 55.0% | 12.7 | 0.02762 |
| 97 | PR-121 | OS | 16.69 | | 0 | 100% | 16.69 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 98 | PR-122 | OS | 71.55 | | 0 | 100% | 71.55 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 99 | PR-123 | OS | 14.49 | | 0 | 100% | 14.49 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 100 | PR-124 | OS | 22.26 | | 0 | 100% | 22.26 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 101 | PR-125 | OS | 58.31 | | 0 | 100% | 58.31 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 102 | PR-126 | OS | 3.03 | | 0 | 100% | 3.03 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 103 | PR-127 | OS | 6.96 | | 0 | 100% | 6.96 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 104 | PR-128 | OS | 7.04 | | 0 | 100% | 7.04 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 105 | PR-129 | OS | 5.7 | | 0 | 100% | 5.70 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 106 | PR-130 | OS | 3.24 | | 0 | 100% | 3.24 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 107 | PR-131 | OS | 7.04 | | 0 | 100% | 7.04 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 108 | PR-132 | OS | 34.55 | | 0 | 100% | 34.55 | 0% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0 |
| 109 | PR-141 | UZ (Univ) | 301.27 | | 0 | 75% | 225.96 | 25% | yes | 75.3 | 244.0 | 217,814 | 531,467 | 984 | 3,947 | 55.0% | 109.8 | 0.23916 |
| 110 | PR-200 | Placer Pkwy | 158.51 | | 0 | 95% | 150.58 | 5% | no | 0.0 | 0.0 | 0 | 0 | 0 | 0 | 55.0% | 0.0 | 0.00000 |
| 111 | PR-201 | ROW/LSE | 158.46 | | 0 | 85% | 134.69 | 15% | yes | 23.8 | 77.0 | 68,747 | 167,742 | 311 | 1,246 | 55.0% | 34.7 | 0.07548 |
| | **Subtotal** | | **2,213** | **5,827** | | **-** | **1,685** | **-** | **-** | **252** | **816** | **728,532** | **1,777,617** | **3,292** | **13,200** | **N/A** | **373** | **0.8** |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **TOTALS** | | | | | | | | | | **TOTALS** | | | | | | |
| | | LDR | 407.86 | 2039.00 | 5 | 60% | 245 | 40% | no | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0.00 |
| | | LDR-A | 131.02 | 720.00 | 5.5 | 60% | 79 | 40% | no | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0.00 |
| | | MDR | 132.28 | 1057.00 | 8 | 60% | 79 | 40% | no | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0.00 |
| | | HDR | 93.02 | 2011.00 | 20 | 80% | 74 | 20% | yes | 19 | 60 | 53,808 | 131,292 | 243 | 975 | 45.0% | 33 | 0.07 |
| | | GC | 25.63 | 0.00 | | 85% | 22 | 15% | yes | 4 | 12 | 11,119 | 27,131 | 50 | 201 | 55.0% | 6 | 0.01 |
| | | CMU | 48.80 | 0.00 | | 85% | 41 | 15% | yes | 7 | 24 | 21,172 | 51,659 | 96 | 384 | 55.0% | 11 | 0.02 |
| | | CP | 395.53 | 0.00 | | 85% | 336 | 25% | yes | 59 | 192 | 171,598 | 418,699 | 775 | 3,109 | 55.0% | 87 | 0.19 |
| | | UZ | 301.27 | 0.00 | | 75% | 226 | 25% | yes | 75 | 244 | 217,814 | 531,467 | 984 | 3,947 | 55.0% | 110 | 0.24 |
| | | PF | 31.96 | 0.00 | | 60% | 27 | 40% | yes | 5 | 16 | 13,866 | 33,832 | 63 | 251 | 55.0% | 7 | 0.02 |
| | | PF | 5.48 | 0.00 | | 85% | 5 | 15% | yes | 1 | 3 | 2,377 | 5,801 | 11 | 43 | 55.0% | 1 | 0.00 |
| | | PR | 72.62 | 0.00 | | 20% | 15 | 80% | yes | 58 | 188 | 168,030 | 409,994 | 759 | 3,045 | 55.0% | 85 | 0.18 |
| | | OS | 250.9 | 0.00 | | 100% | 251 | 0% | no | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0 | 0.00 |
| | | ROW | 158.51 | 0.00 | | 95% | 151 | 5% | no | 0 | 0 | 0 | 0 | 0 | 0 | 55.0% | 0 | 0.00 |
| | | ROW | 158.46 | 0.00 | | 85% | 135 | 15% | yes | 24 | 77 | 68,747 | 167,742 | 311 | 1,246 | 55.0% | 35 | 0.08 |
| **Total** | | | **2,213** | **5,827** | | | **1,685** | | | 252 | **816** | **728,532** | **1,777,617** | **3,292** | **13,200** | **N/A** | **373** | **0.813** |

# APPENDIX C

Placer Ranch Phasing Plan




**Placer Ranch Specific Plan**
Phasing Plan - May 31, 2017



PR-82
CP
PR-81
CP
PR-85
CP
PR-84
CP
PR-80
CP
PR-79
CP
PR-129
OS
PR-78
CP
PR-77
CP
PR-76
CP
PR-128
OS
SACRAMENTO
STATE
and
SIERRA COLLEGE
PR-48
HDR
PR-141
UZ (UNIVERSITY)
PR-96
PF(W)
PR-95
PF(LS)
PR-103
PR
PR-19
LDR
PR-124
OS
PR-18
LDR
PR-33
MDR
PR-17
LDR
PR-16
LDR