# APPENDIX E1

## Water Supply Assessment

# WATER SUPPLY ASSESSMENT FOR THE FIDDYMENT RANCH SPECIFIC PLAN AMENDMENT PHASE 3 PROJECT

**Prepared By**

**City or Roseville**

**Environmental Utilities Department**

**October 2013**

# WATER SUPPLY ASSESSMENT FOR THE FIDDYMENT RANCH SPECIFIC PLAN AMENDMENT PHASE 3 PROJECT

## INTRODUCTION

## PURPOSE

Senate Bill 610 (Water Code, § 10910 et seq.) requires that, for certain defined "projects," a City or County must request any "public water system" that would serve the project to prepare an assessment of the availability of water supplies for the project and other planned development. (See also Cal.Code Regs., tit. 14, div. 6, ch. 3 ["CEQA Guidelines"], § 15155.) Where a City or County provides its own water service, the City or County must prepare its own water assessment. Such a water supply assessment (WSA) is performed in conjunction with the land-use approval process, and is included in the environmental document for the proposed project at issue. The WSA must include an evaluation of sufficiency of the water supplies available to the water supplier to meet existing and anticipated future demands, including the demand associated with the project, over a twenty-year horizon that includes normal, single-dry and multiple-dry years.

The WSA must identify existing water supply entitlements, water rights, or water service contracts held by the water supplier or relevant to the identified water supply received in prior years by the public water system. (See Water Code §10910, subd. (d).)

If the public supply for the proposed project includes groundwater supplies, the WSA must describe all groundwater basins from which the proposed project will be supplied. For each basin that has not been adjudicated, the assessment should indicate whether the California Department of Water Resources has identified the basin as over drafted or has projected that the basin will become overdrafted if present management conditions continue. In addition, the report should provide a detailed description of the efforts being undertaken in the basin to eliminate the long-term over draft condition. (Water Code, §10910, subd. (f).)

If the WSA concludes that additional water supplies are necessary, the public water supplier must submit plans for acquiring additional water supplies including the measures that would be taken to

acquire and develop those supplies. The future water supply projects and programs discussion may be based upon proposed methods of financing, estimated costs, information related to federal, state and local permits and the estimated timeframes within which the public water system expects to be able to acquire the additional supplies. (Wat Code, §10911, subd. (a).)

## PROJECT BACKGROUND

The West Roseville Specific Plan (WRSP) area is located in the northwest corner of the City (Figure 1). The WRSP was approved by the Roseville City Council on February 4, 2004 to guide development of ±3,162 acres located west of Fiddyment Road in the City of Roseville. The WRSP area was originally comprised of two distinct large landholdings: the Westpark Property, which included ±1,483 acres in the southwest portion of the WRSP area, and the Fiddyment Ranch Property, consisting of ±1,678 acres in the northeast portion of the WRSP area. The WRSP is planned primarily as a residential community with an overall mix and intensity of uses similar to that found in adjacent portions of the City. The WRSP provides recreation, open space, employment and educational opportunities.

The current WRSP land use plan provides for construction of 4,207 dwelling units within Fiddyment Ranch. In 2009, the applicant proposed to amend the WRSP to accommodate an additional 1,905 dwelling units and 7.3 acres of commercial land uses in the Fiddyment Ranch portion of the plan area. This would provide a total of 6,112 dwelling units within Fiddyment Ranch.

Specifically, the 2009 project proposed changes to the land use designations and development densities within Fiddyment Ranch to provide for up to 580 additional Low Density Residential units, up to 609 additional Medium Density Residential units, up to 716 additional High Density Residential units, and between 63,598 and 127,195 square feet of commercial space (assuming a Floor-Area-Ratio between 20 and 40 percent). The increase in total unit numbers and the additional higher density residential units were proposed in response to anticipated future housing demand for higher density and more affordable products. The 2009 application was ultimately delayed due to economic reasons and a new application submitted in 2013 as described below.

## PROJECT DESCRIPTION

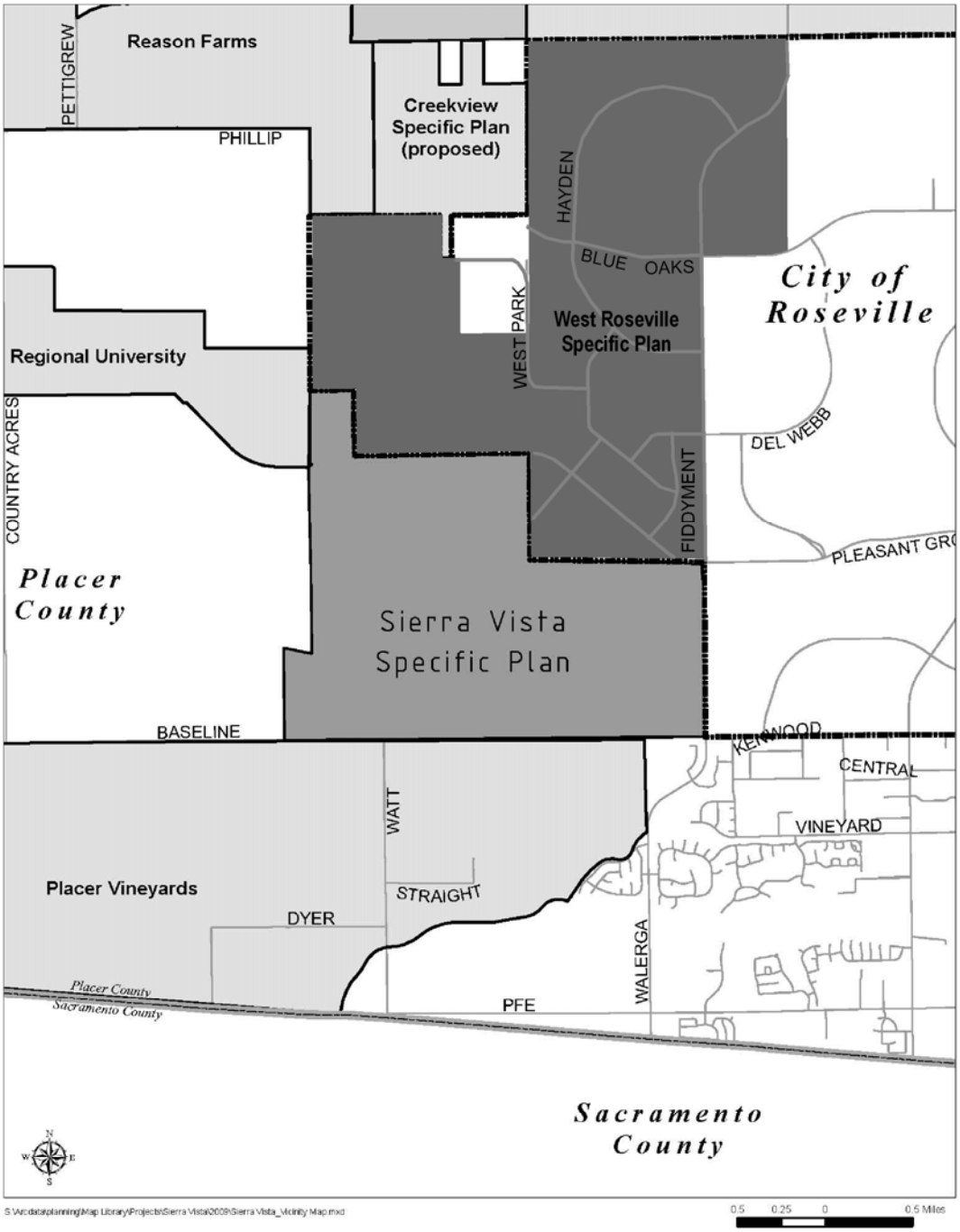
In January, 2013, the applicant re-submitted the Fiddyment Ranch SPA#3 (SPA 000049) entitlement application which proposes an increase in dwelling units nearly identical to that identified with SPA 000040, described above; the primary exception being HDR Parcels F-21, 22, 23, & 24. The density of these HDR Parcels will remain at the currently approved (and master planned) 20 units/ac, unlike the 2009 proposal which had proposed to increase the density of these parcels. This revision to the SPA #3 application results in a reduction of 244 High Density residential dwelling units in the total number of units requested to be added to the plan (total number of units proposed to be added is reduced from

1,905 dwelling units requested in SPA 000040 to 1661 dwelling units currently requested). The SPA 000049 application would provide a total of 5,868 dwelling units within the Fiddyment Ranch portion of the West Roseville Specific Plan.

## PROJECT AREA CHARACTERISTICS

The undeveloped areas in the WRSP contain non-native annual grasslands. The topography of the area is relatively flat, with areas of rolling terrain. The WRSP area supports Pleasant Grove Creek, Curry Creek, and Kaseberg Creek. Fiddyment Ranch Phase 1 is located south of Pleasant Grove Creek, while Phases 2 and 3 are located north of the creek. Native oaks are present along the riparian stream corridors in the Fiddyment Ranch property. Wetland areas are dispersed throughout the WRSP area, with the greatest concentration located in the northwest corner of the Fiddyment Ranch property, which is designated Open Space.

FIGURE 1


Reason Farms
PETTIGREW
Creekview Specific Plan (proposed)
PHILLIP
HAYDEN
BLUE OAKS
City of Roseville
WEST PARK
West Roseville Specific Plan
Regional University
COUNTRY ACRES
DEL WEBB
FIDDYMENT
PLEASANT GR
Placer County
Sierra Vista Specific Plan
BASELINE
KENWOOD
CENTRAL
VINEYARD
WATT
Placer Vineyards
STRAIGHT
DYER
WALERGA
Placer County
Sacramento County
PFE
Sacramento County
N
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E
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0.5 0.25 0 0.5 Miles

## PROJECT BACKGROUND AND HISTORY

With its approval on February 4, 2004, the WRSP established the land use designations and zoning standards for the specific plan area. Prior to adoption of the WRSP, an EIR was prepared to analyze the potential environmental effects that would result from buildout according to the WRSP. The WRSP EIR, State Clearinghouse #2002082057, was certified by the City at the time of approval of the Specific Plan. If approved, the proposed Specific Plan Amendment and associated entitlements would constitute a substantial change in the project analyzed in the WRSP EIR. In accordance with CEQA Guidelines Section (§) 15162, the City has determined that a Subsequent EIR must be prepared to evaluate whether the proposed substantial change in the WRSP would result in any new significant impacts that would increase the severity of impacts beyond the level that was evaluated in the WRSP EIR.

The City is, therefore, preparing the WRSP Subsequent Environmental Impact Report (SEIR) that evaluates the environmental impacts of the proposed Fiddyment Ranch SPA 3 Project. Information from this WSA is used in the analysis of project impacts in the Public Utilities section of the SEIR. The SEIR includes extensive analysis of the potential environmental impacts of the water supply strategy for the project.

## PROPOSED PROJECT

The proposed project intensifies residential development with the Fiddyment Ranch portion of the WRSP. The revised land use plan would decrease the land designated for Low Density Residential by 91.1 acres and increase the land designated for Medium and High Density Residential to 55.8 and 18.9 acres respectively, primarily within Phases 2 and 3 of Fiddyment Ranch. The Community Commercial land uses will increase by 7.3 acres. Parcel F-51 is designed as Parks and is slated to accommodate a neighborhood park. This parcel will increase in size by 3 acres from 8.91 acres to 11.9. The Open Space designation will increase by 0.12 acres. Public/quasi-public land uses will increase by 1.9 acres as a result of Parcel F-71 increasing in size from 8.7 acres to 10.6 acres accommodate the elementary school, and lastly, the land dedicated as right of way will increase by 14.6 acres growing from 66.4 acres to 81.0 acres to accommodate two new east/west collector roadways.

Requested entitlements include: 1) a General Plan Amendment to revise the WRSP land use plan and text to reflect the proposed unit increase, and increase the City's residential unit allocation; 2) a Specific Plan Amendment to revise the land use plan and text to reflect the proposed unit increase; 3) a Rezone to modify the City's Zoning Map to reflect the proposed land use plan; 4) a Large Lot Tentative Map Modification to divide the property consistent with the new land use and circulation plan; and 5) a

Development Agreement Amendment to outline developer and City obligations and to account for the changes proposed by this project. These entitlements collectively make up the Fiddyment Ranch Specific Plan Amendment 3 Project. The existing land use plan and the proposed land use plan are shown in Figures 2 and 3 below.

**Figure 2**

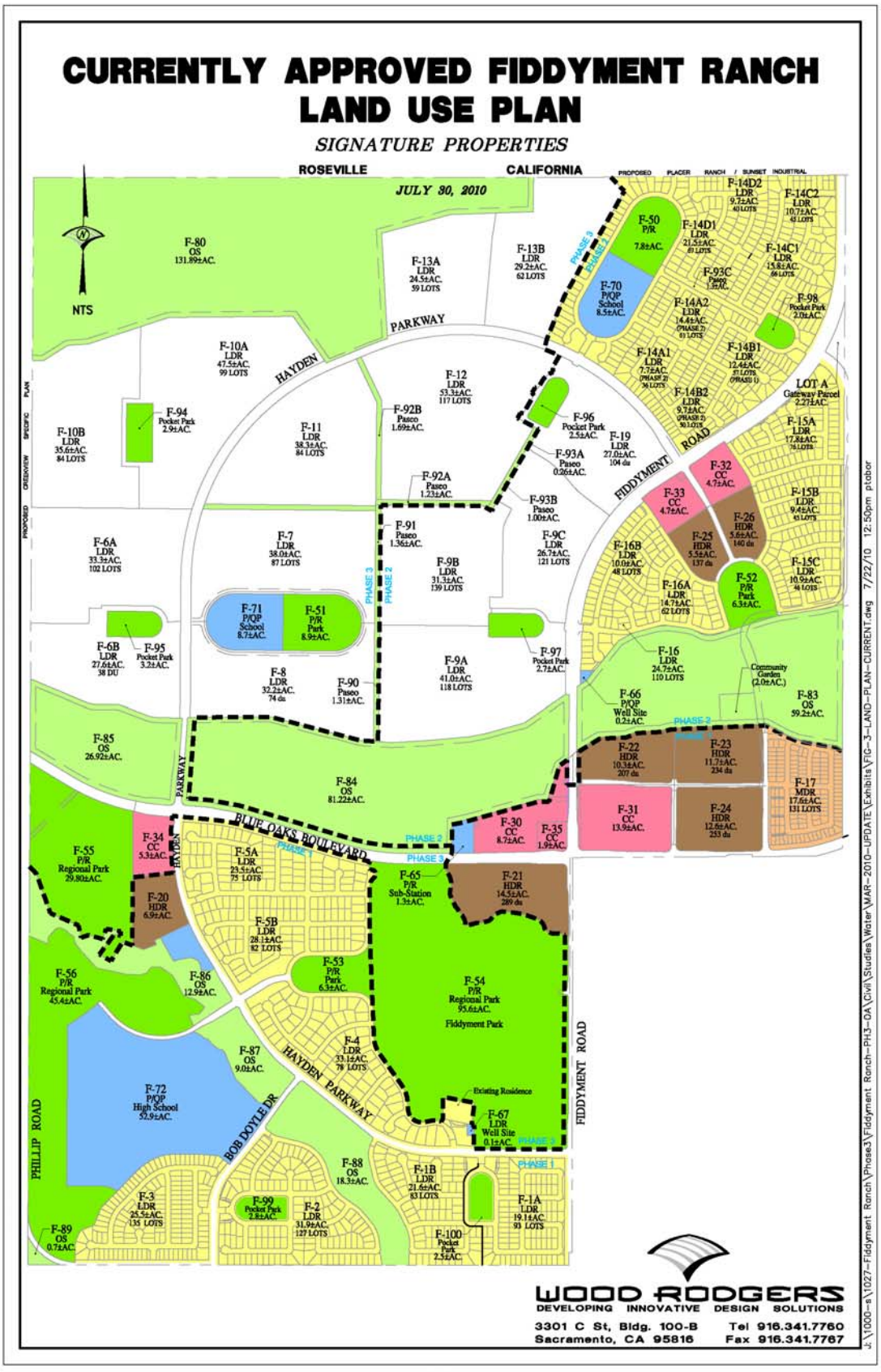
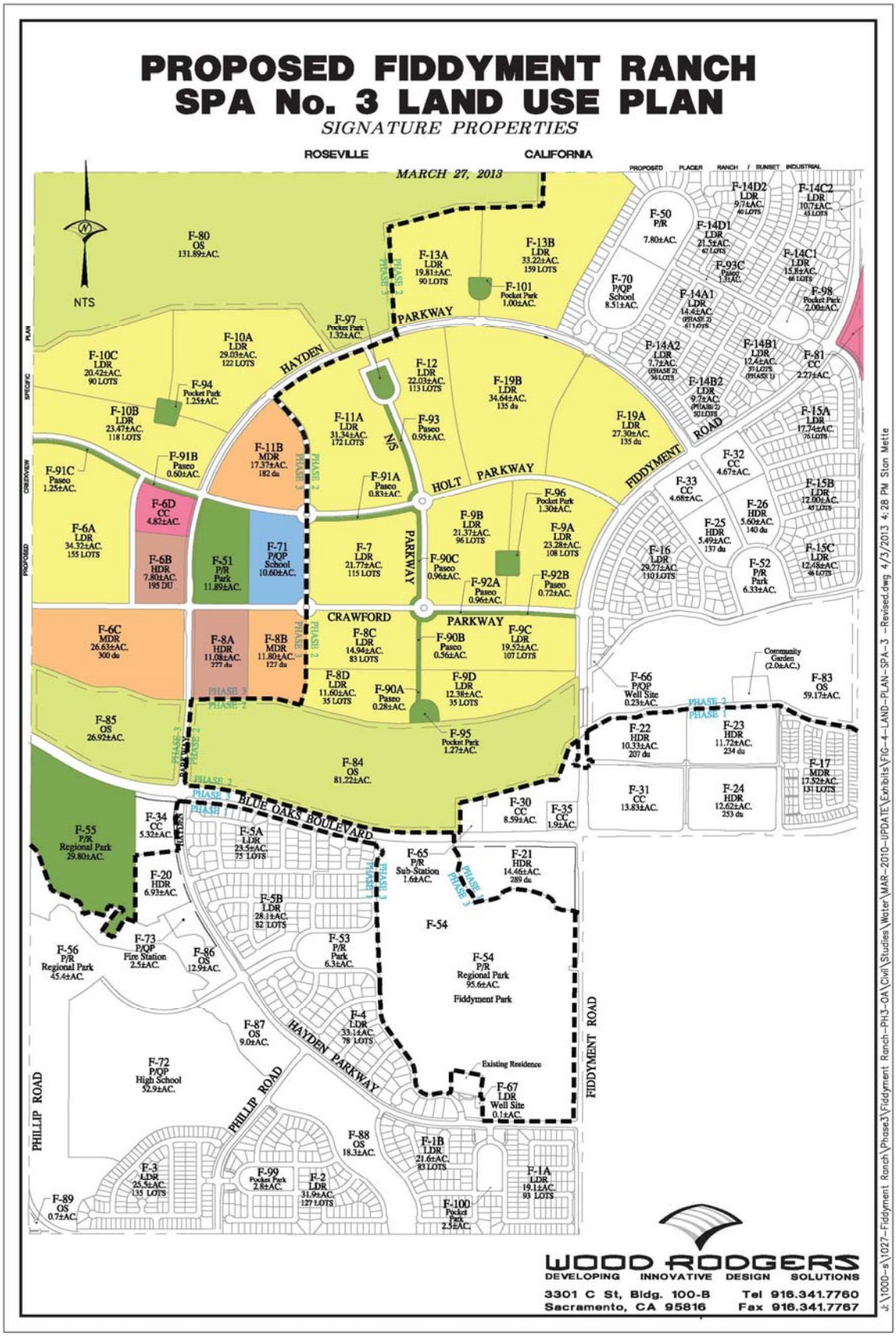

CURRENTLY APPROVED FIDDYMENT RANCH
LAND USE PLAN
SIGNATURE PROPERTIES
ROSEVILLE
CALIFORNIA
JULY 30, 2010
NTS
PROPOSED SPECIFIC PLAN
OREGON VIEW
PROPOSED PLACER RANCH / SUNSET INDUSTRIAL
PARKWAY
HAYDEN
FIDDYMENT ROAD
PHILLIP ROAD
BOB DOYLE DR
BLUE OAKS BOULEVARD
HAYDEN PARKWAY
Fiddyment Park
Existing Residence
Community Garden (2.0±AC.)
PHASE 1
PHASE 2
PHASE 3
F-80 OS 131.89±AC.
F-10A LDR 47.5±AC. 99 LOTS
F-10B LDR 35.6±AC. 84 LOTS
F-94 Pocket Park 2.9±AC.
F-11 LDR 38.3±AC. 84 LOTS
F-12 LDR 53.3±AC. 117 LOTS
F-13A LDR 24.5±AC. 59 LOTS
F-13B LDR 29.2±AC. 62 LOTS
F-92B Paseo 1.69±AC.
F-92A Paseo 1.23±AC.
F-91 Paseo 1.36±AC.
F-6A LDR 33.3±AC. 102 LOTS
F-7 LDR 38.0±AC. 87 LOTS
F-9B LDR 31.3±AC. 139 LOTS
F-9C LDR 26.7±AC. 121 LOTS
F-6B LDR 27.6±AC. 38 DU
F-95 Pocket Park 3.2±AC.
F-71 P/QP School 8.7±AC.
F-51 P/R Park 8.9±AC.
F-8 LDR 32.2±AC. 74 du
F-90 Paseo 1.31±AC.
F-9A LDR 41.0±AC. 118 LOTS
F-97 Pocket Park 2.7±AC.
F-85 OS 26.92±AC.
F-84 OS 81.22±AC.
F-55 P/R Regional Park 29.80±AC.
F-34 CC 5.3±AC.
F-20 HDR 6.9±AC.
F-5A LDR 29.5±AC. 75 LOTS
F-5B LDR 28.1±AC. 82 LOTS
F-53 P/R Park 6.3±AC.
F-56 P/R Regional Park 45.4±AC.
F-86 OS 12.9±AC.
F-87 OS 9.0±AC.
F-4 LDR 33.1±AC. 78 LOTS
F-72 P/QP High School 52.9±AC.
F-65 P/R Sub-Station 1.3±AC.
F-54 P/R Regional Park 55.6±AC.
F-67 LDR Well Site 0.1±AC.
F-30 CC 8.7±AC.
F-35 CC 1.9±AC.
F-21 HDR 14.5±AC. 289 du
F-88 OS 18.3±AC.
F-1B LDR 21.6±AC. 83 LOTS
F-1A LDR 19.1±AC. 93 LOTS
F-100 Pocket Park 2.5±AC.
F-99 Pocket Park 2.8±AC.
F-2 LDR 31.9±AC. 127 LOTS
F-3 LDR 25.5±AC. 135 LOTS
F-89 OS 0.7±AC.
F-50 P/R 7.8±AC.
F-70 P/QP School 8.5±AC.
F-14D2 LDR 9.7±AC. 40 LOTS
F-14C2 LDR 10.7±AC. 45 LOTS
F-14D1 LDR 21.5±AC. 89 LOTS
F-14C1 LDR 15.8±AC. 66 LOTS
F-93C Paseo 1.7±AC.
F-98 Pocket Park 2.0±AC.
F-14A2 LDR 14.4±AC. (PHASE 2) 61 LOTS
F-14A1 LDR 7.7±AC. (PHASE 2) 36 LOTS
F-14B1 LDR 12.4±AC. 51 LOTS (PHASE 1)
F-14B2 LDR 9.7±AC. (PHASE 2) 50 LOTS
F-96 Pocket Park 2.5±AC.
F-19 LDR 27.0±AC. 104 du
F-93A Paseo 0.26±AC.
F-93B Paseo 1.00±AC.
LOT A Gateway Parcel 2.27±AC.
F-15A LDR 17.8±AC. 76 LOTS
F-32 CC 4.7±AC.
F-33 CC 4.7±AC.
F-26 HDR 5.6±AC. 140 du
F-25 HDR 5.5±AC. 137 du
F-15B LDR 9.4±AC. 63 LOTS
F-16B LDR 10.0±AC. 48 LOTS
F-16A LDR 14.7±AC. 62 LOTS
F-52 P/R Park 6.3±AC.
F-15C LDR 10.9±AC. 44 LOTS
F-16 LDR 24.7±AC. 110 LOTS
F-66 P/QP Well Site 0.2±AC.
F-83 OS 59.2±AC.
F-22 HDR 10.3±AC. 207 du
F-23 HDR 11.7±AC. 234 du
F-17 MDR 17.6±AC. 131 LOTS
F-31 CC 13.9±AC.
F-24 HDR 12.6±AC. 253 du
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767
J:\1000-s\1027-Fiddyment Ranch\Phase3\Fiddyment Ranch-PH3-OA\Civil\Studies\Water\MAR-2010-UPDATE\Exhibits\FIG-3-LAND-PLAN-CURRENT.dwg 7/22/10 12:50pm ptobor

**Figure 3**


PROPOSED FIDDYMENT RANCH
SPA No. 3 LAND USE PLAN
SIGNATURE PROPERTIES
ROSEVILLE CALIFORNIA
MARCH 27, 2013
NTS
PROPOSED PLACER RANCH / SUNSET INDUSTRIAL
PROPOSED SPECIFIC PLAN AMENDMENT
OREGON HOUSE
PHILLIP ROAD
HAYDEN PARKWAY
FIDDYMENT ROAD
HOLT PARKWAY
CRAWFORD PARKWAY
BLUE OAKS BOULEVARD
N/S ROAD
F-80 OS 131.89±AC.
F-13A LDR 19.81±AC. 90 LOTS
F-13B LDR 33.22±AC. 159 LOTS
F-101 Pocket Park 1.00±AC.
F-97 Pocket Park 1.32±AC.
F-10A LDR 29.03±AC. 122 LOTS
F-10C LDR 20.42±AC. 90 LOTS
F-94 Pocket Park 1.25±AC.
F-10B LDR 23.47±AC. 118 LOTS
F-12 LDR 22.03±AC. 113 LOTS
F-19B LDR 34.64±AC. 135 du
F-11A LDR 31.34±AC. 172 LOTS
F-93 Paseo 0.95±AC.
F-19A LDR 27.30±AC. 135 du
F-11B MDR 17.37±AC. 182 du
F-91B Paseo 0.60±AC.
F-91C Paseo 1.25±AC.
F-91A Paseo 0.83±AC.
F-6D CC 4.82±AC.
F-6A LDR 34.32±AC. 155 LOTS
F-6B HDR 7.80±AC. 195 DU
F-51 P/R Park 11.89±AC.
F-71 P/QP School 10.60±AC.
F-7 LDR 21.77±AC. 115 LOTS
F-9B LDR 21.37±AC. 96 LOTS
F-96 Pocket Park 1.30±AC.
F-9A LDR 23.28±AC. 108 LOTS
F-90C Paseo 0.96±AC.
F-92A Paseo 0.56±AC.
F-92B Paseo 0.72±AC.
F-6C MDR 26.63±AC. 300 du
F-8A HDR 11.08±AC. 277 du
F-8B MDR 11.80±AC. 127 du
F-8C LDR 14.94±AC. 83 LOTS
F-90B Paseo 0.56±AC.
F-9C LDR 19.57±AC. 107 LOTS
F-8D LDR 11.60±AC. 35 LOTS
F-90A Paseo 0.28±AC.
F-9D LDR 12.38±AC. 35 LOTS
F-95 Pocket Park 1.27±AC.
F-85 OS 26.92±AC.
F-84 OS 81.22±AC.
F-55 P/R Regional Park 29.80±AC.
F-34 CC 5.32±AC.
F-5A LDR 23.5±AC. 75 LOTS
F-20 HDR 6.93±AC.
F-5B LDR 28.1±AC. 82 LOTS
F-65 P/R Sub-Station 1.6±AC.
F-21 HDR 14.46±AC. 289 du
F-54
F-54 P/R Regional Park 95.6±AC.
Fiddyment Park
F-53 P/R Park 6.3±AC.
F-56 P/R Regional Park 45.4±AC.
F-73 P/QP Fire Station 2.5±AC.
F-86 OS 12.9±AC.
F-87 OS 9.0±AC.
F-4 LDR 33.14±AC. 78 LOTS
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F-1B LDR 21.6±AC. 83 LOTS
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F-99 Pocket Park 2.8±AC.
F-2 LDR 31.9±AC. 127 LOTS
F-100 Pocket Park 2.5±AC.
F-89 OS 0.7±AC.
F-50 P/R 7.80±AC.
F-14D1 LDR 21.5±AC. 67 LOTS
F-14D2 LDR 9.7±AC. 40 LOTS
F-14C2 LDR 10.7±AC. 45 LOTS
F-70 P/QP School 8.51±AC.
F-14C1 LDR 15.8±AC. 66 LOTS
F-93C Paseo 1.31±AC.
F-98 Pocket Park 2.00±AC.
F-14A1 LDR 14.4±AC. (PHASE 2) 61 LOTS
F-14A2 LDR 7.7±AC. (PHASE 2) 36 LOTS
F-14B1 LDR 12.4±AC. 59 LOTS (PHASE 1)
F-14B2 LDR 9.7±AC. (PHASE 2) 30 LOTS
F-81 CC 2.27±AC.
F-15A LDR 17.74±AC. 76 LOTS
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F-25 HDR 5.49±AC. 137 du
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F-23 HDR 11.72±AC. 234 du
F-17 MDR 17.52±AC. 131 LOTS
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F-30 CC 8.59±AC.
F-35 CC 1.9±AC.
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Sacramento, CA 95816 Fax 916.341.7767
J:\1000-s\1027-Fiddyment Ranch\Phase3\Fiddyment Ranch-Ph3-0A\Civil\Studies\Water\MAR-2010-UPDATE\Exhibits\FIG-4-LAND-PLAN-SPA-3 -Revised.dwg 4/3/2013 4:28 PM Stan Mette

As shown on Figure 3, the Fiddyment Ranch SPA 3 Project's proposed land use plan includes low, medium, and high density residential uses; community commercial; parks and recreation areas, open space, and paseos; public/quasi-public uses, landscape corridors; and roadways. At buildout, the proposed project would provide 1,661 additional dwelling units and generate an additional population of approximately 4,335 persons, based on the City of Roseville's General Plan assumption of 2.61 persons per household. The project would also add between 63,598 and 127,195 square feet of commercial and employment uses. The currently approved and the proposed land use designations, applied zoning districts, acreages, and total dwelling units within Fiddyment Ranch are summarized in Table 1.

**TABLE 1**

**LAND USE PLAN SUMMARY**

| Land Use Category | Currently Approved Land Use (SPA 000035) | | Proposed SPA Land Use (SPA 000040) | |
|---|---|---|---|---|
| | Acres | Dwelling Units | Acres | Dwelling Units |
| Light Density Residential | 848.3 | 2,660 | 757.2 | 3,240 |
| Medium Density Residential | 17.1 | 131 | 72.9 | 740 |
| High Density Residential | 65.1 | 1,416 | 84.0 | 1,888 |
| Community Commercial | 38.5 | 0 | 46.1 | 0 |
| Elementary School | 17.2 | 0 | 19.1 | 0 |
| High School | 52.9 | 0 | 52.9 | 0 |
| Public/Quasi-public | 4.5 | 0 | 4.5 | 0 |
| Park | 220.6 | 1 | 216.5 | 1 |
| Paseo | 6.7 | 0 | 7.1 | 0 |
| Open Space | 340.2 | 0 | 340.1 | 0 |
| Right of Way | 66.4 | 0 | 81.0 | 0 |
| Total | 1,678 | 4,208 | 1,681 | 5,869 |

## DESCRIPTION OF THE CITY OF ROSEVILLE SERVICE AREA

The City of Roseville is located in Northern California's Central Valley, within comfortable driving distance of both the Sierra Nevada Mountains and the Pacific Coast, midway between the cities of Sacramento and Auburn. A mixture of residential, park and recreation, commercial and industrial land uses characterizes the service area.

The City of Roseville's climate is described as mild with abundant sunshine year-round averaging 285 sunny days per year. Total rainfall averages 17.5" with the majority of rainfall occurring between January and March. Summer months rarely experience precipitation. Peak water demands occur during the summer months.

The City's water service area is currently divided into six pressure zones. With the exception of Pressure Zone 4, where pressure is reduced through pressure reducing stations, all other pressure zones (Pressure Zones 1, 2, 3, 5, & SJWD) are either serviced by gravity, require boosting, or are served by adjacent water agencies that have sufficient pressure to serve these areas. The WRSP and proposed Fiddyment Ranch SPA 3 project are included in Pressure Zone 4.

**SCOPE OF WATER SUPPLY ASSESSMENT**

This WSA discusses historic water supplies, current water supplies, and additional sources of water that will be available to serve planned future growth. This information is presented consistent with the requirements of SB-610 (Water Code Sections 10910 – 10915.), and includes:

- Description of existing and projected water demand.
- Description of existing and projected water supply sources including:
    - Groundwater basins, surface water and other sources.
    - Opportunities for exchange or transfers of water on a short-term and long-term basis.
    - Plans to acquire additional water supplies.
- Assessment of the availability of existing and projected water supply sources during normal, single-dry, and multiple-dry years within a 20-year projection.

The WSA for the proposed Fiddyment Ranch SPA 3 Project contains information derived from several sources including:

- *Domestic Water Study, Fiddyment Ranch SPA No. 3,* Wood Rodgers, August 27, 2010
- *City of Roseville 2010 Urban Water Management Plan,* City of Roseville, 2011
- *Fiddyment Ranch SPA No. 3, Water Conservation Plan, Wood* Rodgers, Technical Memorandum, August 27, 2010, Revised July 11, 2013
- *Groundwater Impact Analysis for Proposed Reasons Farms Land Retirement Plan, MWH, June 2003*
- *PCWA's Integrated Water Resources Plan,* Brown and Caldwell, August 2006
- *Placer Groundwater Management Plan,* PCWA 1998

- *Recycled Water Study*, Fiddyment Ranch SPA No. 3, Wood Rodgers, August 6, 2010
- *Sierra Vista Specific Plan EIR Technical Memorandum: Effects of Changed Water Management Operations on Fisheries and Water Quality Impacts Previously Disclosed in the Water Form Agreement EIR, Robertson-Bryan Inc. and HDR, October 2009*
- *TM-1 – Unit Water Demand Factor Verification and Water Demand Evaluation and Update,* MWH, September 2006
- *TM 5a – Market Assessment for Recycled Water Distribution System,* RMC, Updated February 2008
- *Water Forum Agreement Final EIR,* November 1999
- *West Roseville Specific Plan FEIR,* February 2004
- *Western Placer County Groundwater Management Plan,* MWH ,August 2007

Water Code Sections 10910 - 10915 (inclusive) require land use lead agencies (cities and counties) to: 1) identify the responsible public water purveyor ("public water system") for a proposed development project, and 2) request from the responsible purveyor, a "Water Supply Assessment" (WSA). Where a city or county is its own water supplier, the city or county must prepare its own WSA. The purpose of the WSA is to demonstrate the sufficiency of the purveyors' water supplies to satisfy the water demands of the proposed development project, while still meeting the current and projected water demands of existing customers and planned future land uses over a 20-year time period. Water Code Sections 10910 – 10915 delineate the specific information that must be included in the WSA.

This WSA is structured in a way that indicates the requirement of the Water Code that is being addressed by stating the subsection number and title. Additional information is provided where it is useful in the understanding of the proposed Project, its water demands, and its water supplies.

***Section 10910(a) Determine if a proposed project is subject to California Environmental Quality Act (CEQA).***

The City of Roseville has made the determination that the proposed Fiddyment Ranch SPA 3 Project is subject to CEQA.

***Section 10910(b) Identify responsible public water system that will or may supply water to the proposed project.***

The City of Roseville has been identified as the responsible public water system for the Fiddyment Ranch SPA 3 Project.

***Section 10910(c)(1) Determine if the most recent Urban Water Management Plan (UWMP) includes projected water demand associated with the project.***

The 2010 UWMP dated August 2011, which was adopted by City of Roseville's Council Resolution 11-329, identifies current and projected water supply and demand through 2035 based on General Plan buildout. Water demands for the Fiddyment Ranch SPA 3 project were included within the 2010 UWMP but at demand levels based upon the applicants 2009 submittal (SPA 000040). The project as revised (SPA 000049) results in slightly decreased water demands when compared to the 2009 project submittal assumed within the 2010 UWMP. The project does slightly increase water demands above current land uses approved within the project areas as more fully explained below.

**Water Demand**

Water demand is the amount of water required to service customers on an average annual basis. The City measures this amount of water in acre feet per year (AFY). One acre foot of water is the volume of water that can cover an acre of land at a depth of one foot and equals 325,851 gallons. Total water demand for buildout of the City's existing General Plan and the Fiddyment Ranch SPA 3 Project was developed using the City's unit demand factors and applying those factors to the proposed land uses for the project area.

Water demands are segmented into potable demands and recycled water demands. Potable demands are that component of the total water demand that will be used for public health related activities such as drinking water, indoor use and irrigation in instances when recycled water is not available. Potable water demand needs are typically met by surface water supplies and supplemented by groundwater supplies for backup during emergency or surface water shortage conditions. Recycled water is tertiary treated wastewater and is a component of the overall water demand that can be used for irrigation. Net potable demands are calculated by subtracting estimated recycled water demands from the total water demand of the City.

The City's unit water demand factors are based upon actual customer water meter usage data. The current demand factors were developed in 2002 as part of the West Roseville Specific Plan process. The City conducted an additional study in 2006 to re-confirm the unit demand factors using a longer history of available water meter data from City customers. This study, *TM-1 – Unit Water Demand Factor Verification and Water Demand Evaluation and Update by MWH, September 2006* is provided in Attachment 1 of this WSA. The study re-confirmed the appropriateness of the unit demand factors developed in 2002. These factors are provided in Table 2.

## TABLE 2
## WATER DEMAND FACTORS

| Residential Land Use Categories | Unit Demand Factor (GPD/DU) |
|---|---|
| LDR1 (<3.5 DUs / Acre) | 728 |
| LDR2 (3.5 to 5 DUs / Acre) | 600 |
| LMDR1(>5.0 to 6.0 DUs / Acre) | 521 |
| LMDR2(6.0 to 8.0 DUs / Acre) | 430 |
| MDR (>8.0 to 12.0 DUs / Acre) | 323 |
| HDR1 (>12.0 to 16.0 DUs / Acre) | 288 |
| HDR2 (>16.0 DUs / Acre) | 177 |
| **Non Residential Land Use Categories** | **Unit Demand Factor (GPD/AC)** |
| Community Commercial / Retail | 2,598 |
| Business Professional | 2,598 |
| Light Industrial | 2,598 |
| Industrial | 2,562 |
| Railyard | 109 |
| Elementary School | 3,454 |
| High School | 4,069 |
| Pubic Quasi-Public | 1,780 |
| Parks | 2,988 |
| Open Space / Right of Way | 0 |

GPD/DU = Gallons per day per dwelling unit
GPD/AC – Gallons per day per acre

The additional water needed to serve the Fiddyment Ranch SPA 3 Project was calculated by comparing water demands estimated under the existing Fiddyment Ranch Land Use Plan to the water demands estimated for Fiddyment Ranch with the proposed land uses. The additional demand is then added to the buildout water demand of the City's existing General Plan to evaluate availability of water supplies to meet demands.

**General Plan Buildout Demands**

At buildout of the City's current General Plan, water demands are estimated to reach 63,033AFY. Buildout demands include the recently approved West Roseville Specific Plan, West Park Phase 4 project. As stated above, it also includes the currently planned land uses in the project area. Table 3 provides a summary of City General Plan buildout demands.

## TABLE 3

## GENERAL PLAN BUILDOUT WATER DEMANDS

| Project Land Use | Water Demand (AFY) |
|---|---|
| Low Density Residential | 26,319 |
| Medium Density Residential | 8,381 |
| High Density Residential | 3,656 |
| Commercial | 7,152 |
| Commercial Business Park | 2,494 |
| Industrial | 1,526 |
| Light Industrial | 3,588 |
| Public/Quasi Public | 1,231 |
| Parks and Paseo | 6,805 |
| Rail Road | 70 |
| Schools | 2,103 |
| Open Space | 0 |
| Urban Reserve | 4 |
| Sub-Total (w/o losses) | 63,329 |
| 2% for Losses | 1,267 |
| Sub-Total (w/losses) | 64,596 |
| Remove Corporate Centers Reserve | -313 |
| Water Conservation Reduction (SVSP) | -729 |
| Water Conservation Reduction (CSP) | -205 |
| Water Conservation Reduction (WSP) | -178 |
| Water Conservation Reduction (Pearl Creek Apts) | -5 |
| Water Conservation Reduction (WP Phase 4) | -133 |
| **Total Water Demand** | **63,033** |

SVSP = Sierra Vista Specific Plan
CSP = Creekview Specific Plan.
WSP = Westbrook Specific Plan
WP Phase 4 = WRSP Westpark Phase 4

**Fiddyment Ranch Specific Plan Amendment Phase 3 Project Water Demands**

Development of the Fiddyment Ranch SPA 3 Project area would include additional residential and commercial uses that would require water. The additional water demand for the Project, as summarized in Table 4 below, is estimated to be 202 AFY. This amount includes 575 AFY of additional water demands for residential and commercial uses and a reduction in park area water demand of 14 AFY. This amount also includes an additional 11 AFY for system losses (2% of total demand) and an overall water demand reduction within the project area of 370 AFY for water conservation measures being incorporated into the project.

The Fiddyment Ranch SPA 3 Project includes significant water conservation measures that were not included in the currently approved WRSP but which will now be applied to all parcels within the proposed land use plan amendment area. These water conservation measures include:

- Turf reductions and low water using landscaping in residential front yards
- Smart irrigation controllers for irrigation uses
- Re-circulating hot water systems for residential units.
- Low water efficient water closets

The Domestic Water Study, Fiddyment Ranch SPA No. 3 by Wood Rodgers, dated August 27, 2010 and the Fiddyment Ranch SPA No. 3 Water Conservation Plan Technical Memorandum by Wood Rodgers, dated 27 August 2010 and as revised July 11, 2013 (included as Attachments 2 and 3) provide calculations showing the demands for the project and the estimated water saving expected from the conservation measures identified for inclusion in the Fiddyment Ranch SPA 3 Project.

It is important to note the Domestic Water Study was based upon the land use plan submitted with SPA 000040 (the 2009 project). The City has subsequently reviewed water demands for the project based on the proposed project, SPA 000049, and has updated the total water demand projections. A comparison of water demand for land uses currently approved within the plan area and water demands for the proposed project to show how overall water demands change is provided as Table 4 below.

**TABLE 4**

**FIDDYMENT RANCH WATER DEMANDS**

| Project Land Use | Existing Fiddyment Ranch Land Use Plan Water Demand (AFY) | Proposed Fiddyment Ranch SPA 3 Project Land Use Plan Water Demand (AFY) | Change in Demand (AFY) |
|---|---|---|---|
| Low Density Residential | 1,925 | 2,157 | 232 |
| Medium Density Residential | 63 | 283 | 220 |
| High Density Residential | 281 | 375 | 94 |
| Community Commercial | 113 | 134 | 21 |
| Elementary School | 67 | 74 | 7 |
| High School | 241 | 241 | - |
| Public/Quasi Public | 9 | 9 | - |
| Park | 738 | 724 | (14) |
| Paseo | 22 | 23 | 1 |
| Open Space | 0 | - | - |
| Right of Way | - | - | - |
| Sub-Total (w/o losses) | 3,459 | 4,020 | 561 |
| 2% for Losses | 69 | 80 | 11 |
| Sub-Total (w/losses) | **3,528** | **4,100** | **572** |
| Water Conservation Reduction | - | (370) | (370) |
| **Total** | **3,528** | **3,730** | **202** |

Development of the Fiddyment Ranch SPA 3 Project in combination with projected water demand for buildout of the City would be 63,235 AFY (63,033 AFY + 202 AFY).

***Section 10910(c)(2) If demands are included in most recent UWMP; incorporate information from the UWMP in the WSA.***

The 2010 UWMP dated August 2011, which was adopted by City of Roseville's Council Resolution 11-329, identifies current and projected water supply and demand through 2035 based on General Plan buildout. Water demands for the Fiddyment Ranch SPA 3 project were included within the 2010 UWMP but at demand levels based upon the applicants 2009 submittal (SPA 000040). The project as revised (SPA 000049) results in slightly decreased water demands when compared to the 2009 project submittal assumed within the 2010 UWMP. The project does slightly increase water demands above

current land uses approved within the project areas. Specific information on water demands is provided in response to Section 10910 (c)(1), above and response to Section 10910(c)(3) and 10910(c)(4), below.

***Section 10910(c)(3) If demands are NOT included in most recent UWMP, discuss existing system's water supplies available during normal, single dry, and multiple dry years during a 20-year projection to meet project demands, existing system and planned future uses.***

No response is required for this section because water demands for this project were assumed within the most recent UWMP.

***Section 10910(c)(4) Discuss projected water supplies available during normal, single dry, and multiple dry years during a 20-year projection versus projected water demand including existing system, and planned future uses.***

**Water Supply Sources**

The City of Roseville has three existing sources of water supply: 1) surface water, 2) recycled water for irrigation and cooling water, and 3) groundwater in drier and driest years or in times of emergency. Each is described below.

Surface Water

Folsom Lake has been the primary source of water for the City of Roseville since 1971. Through the Folsom Lake Municipal and Industrial (M&I) intake, Roseville receives untreated water from the U.S. Bureau of Reclamation (USBR) and the Placer County Water Agency (PCWA). Additionally, through this same delivery point, the City receives a normal/wet year water supply from San Juan Water District (SJWD). The untreated surface water is delivered to the City's Barton Road Water Treatment Plant. Roseville also maintains interties with PCWA, SJWD, the California American Water Company, and the Citrus Heights Water District. Interties are connections between existing distribution systems that can be used to deliver water between districts in the event of water treatment plant or conveyance system disruptions.

The City of Roseville has three surface water contract entitlements for American River water totaling 66,000 acre-feet per year (AFY): a 32,000 AFY contract with the USBR supplied from the Central Valley Project (CVP); a 30,000 AFY contract with PCWA supplied from the Middle Fork [American River] Project (MFP); and a 4,000 AFY contract with SJWD. The SJWD contract reallocates a portion of its PCWA contract water supply (also provided from the MFP) to the City's service area. Table 5, summarizes the City's water contracts.

## TABLE 5

## CITY OF ROSEVILLE SURFACE WATER CONTRACTS

| Contracted Water Supply Source | Contract Amount (AFY) |
|---|---|
| USBR (CVP supply) | 32,000 |
| PCWA (MFP supply) | 30,000 |
| SJWD (wet year only – MFP supply) | 4,000 |
| **Total Contracted Supplies** | **66,000** |
| Available Supplies: Normal/Wet Years | 58,900 |
| Available Supplies: Driest (Critically Dry) Years | 39,800 |

The City of Roseville is a signatory to the Water Forum Agreement (WFA), which provides a framework for future surface water and groundwater supplies in the region through the year 2030. Although water contract entitlements total 66,000 AFY, the City's diversions from the American River are limited by the Water Forum Agreement. The Water Forum Agreement categorized water years into three types: 1) Normal or Wet (normal/wet) Years, 2) Drier Years, and 3) Driest Years. These hydrologic year types are defined as follows:

- Normal/Wet Years: When the projected March through November Unimpaired Inflow to Folsom Reservoir is greater than 950,000 AF;
- Drier Years: When the projected March through November Unimpaired Inflow to Folsom Reservoir is between 950,000 AF and 400,000 AF; and,
- Driest Years: When the projected March through November Unimpaired Inflow to Folsom Reservoir is less than 400,000 AF.

In normal/wet years, the City has agreed to limit surface water diversions to 58,900 AFY. In driest years, also called critically dry years, the maximum diversion from the American River is limited to 39,800 AFY. It is important to note that during drier and driest years, the City also agreed to ensure that up to an additional 20,000 AFY of water be made available for release down the American River by PCWA through re-operation of its Middle Fork project. This 20,000 AFY of re-op water is not a part of the City's contracted supply of 66,000 AFY and is described in more detail below. Thus, in drier years, the City may divert an amount between 54,900 (58,900 – 4,000 SJWD supply) and 39,800 AFY from the American River based on unimpaired river flow into Folsom Lake with similar reoperation releases

from PCWA, and in driest years, the maximum diversion from the American River is limited to 39,800 AFY with the requirement for 20,000 AF of reoperation release into the American River as described below.

While the Water Forum Agreement limits the City of Roseville's diversion from Folsom Lake in driest years to no more than 39,800 AFY, the original goal was to limit diversion to 1995 baseline levels. City baseline diversions in 1995 were 19,800 AF. Because annual municipal and industrial (M&I) demands were projected to increase significantly between 1995 and 2030 it was agreed that it was not feasible to reduce City diversions to 1995 levels. The City agreed, therefore, to offset a portion of the demand in drier and driest years by facilitating additional releases of up to 20,000 AF (the difference between 39,800 AF and 1995 levels of 19,800 AF) of water into the American River. Increased releases would come either entirely from Middle Fork Project storage or from a combination of PCWA contract water and Middle Fork Project storage. The intent of Middle Fork Project re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels. By agreeing to release the same amount of environmental mitigation water down the American River as was diverted to supply new growth in the City, environmental impacts were held to 1995 levels. Those impacts were identified in the Water Forum Agreement EIR and mitigated by the Water Forum purveyor specific agreements described above.

Based on over 107 years of historical hydrology (and Water Forum Agreement restrictions), the 58,900 AFY contract surface water supply is assumed to be available to the City in about 83 percent of the years. In about 17 percent of the years, quantities ranging from 58,900 AFY to 39,800 AFY of surface water would be available per the Water Forum Agreement. Thus, in drier and driest years (i.e. during droughts), supplemental supplies potentially totaling up to 19,100 AFY (the difference between the normal/wet year supply and the driest year supply) are needed to make up for the dry-year and critically dry (driest)-year deficiencies. In addition, the City may be responsible for facilitating re-operational releases from PCWA in drier and driest years.

Recycled Water

The City of Roseville, along with the South Placer Municipal Utility District and Placer County are regional partners in the South Placer Wastewater Authority (SPWA). The SPWA was created in 2000 to oversee funding for regional wastewater and recycled water infrastructure. The City owns and operates two regional wastewater treatment facilities on behalf of the regional partners. These treatment facilities include the Dry Creek wastewater treatment plant (DCWWTP) and the Pleasant Grove wastewater treatment plant (PGWWTP). Both plants produce a Title 22 quality effluent that is available for recycled water applications. Recycled water for this project will be provided from the Pleasant Grove WWTP.

The City prepared the South Placer Regional Wastewater and Recycled Water Systems Evaluation (Systems Evaluation, June 2007) which delineates the 2005 regional wastewater service area boundary (2005 SAB) and provides baseline and projected characterizations of its regional wastewater and recycled water systems. The 2005 SAB includes areas within Roseville, Rocklin, Loomis, and portions of Granite Bay and unincorporated Placer County. Chapter 6, Recycled Water Systems Evaluation, of the Systems Evaluation report was conducted to assist in the ongoing expansion of a regional water recycling system. The goal of utilizing recycled water supplies is to promote responsible water supply management by beneficially reusing available tertiary treated recycled water for irrigation use to free up surface water and groundwater supplies for potable uses.

The regional recycled water system currently serves approximately 3,000 AFY of recycled water to parks, streetscapes, and golf course customers within and outside of the City limits. Of this amount, approximately 2,040 AFY are for irrigation and industrial customers within the City of Roseville. The City also supplies recycled water for cooling purposes to the Roseville Energy Park. System expansion is planned for more intensive use of recycled water in the western portion of the City as new development is built. Recycled water demands within the City are expected to increase by approximately 2,438 AFY for a total recycled water demand of 4,478 AFY at buildout of the City's existing General Plan. Recycled water is expected to be available in all hydrologic year types.

As documented in the *Recycled Water Study, Fiddyment Ranch SPA 3 by Wood Rodgers, dated August 6, 2010*, and included as Attachment 4, recycled water demands within the entire WRSP are currently estimated at 1,750 AFY under the existing land use plan. When considering the project, the recycled water demands are slightly increased to 1,766 AFY. Implementation of water conservation measures reduce recycled water demands by 85 AFY for a total recycled water demand at buildout of the WRSP of 1,681 AFY. This is an overall reduction in recycled water irrigation demands of 69 AFY within the WRSP (1,750 AFY – 1,681 AFY = 69 AFY). A copy of the Recycled Water Master Plan is included as Attachment 4 to this document. When considering buildout of the existing General Plan and the Fiddyment Ranch SPA No. 3 project, citywide use of 4,409 AFY of recycled water would offset total water demands. This includes 4,478 AFY within the existing City General Plan area and reduction of 69 AFY of recycled water demands as a result of the water conservation plan being implemented within the SPA 3 Project portion of the Fiddyment Ranch area. The use of recycled water as an assured water supply source reduces total surface water supply needs for the build out of the City and the Project to 58,826 AFY (63,235 AFY – 4,409 AFY RW supply).

Groundwater

Although the City has not relied on groundwater since 1991, groundwater is part of the City of Ros*e*vill*e*'s water supply strategy, to be used as a back-up supply during drier and driest years. The

City's Water Forum Agreement recognizes the extraction of up to 6,600 AFY of groundwater during the drier and driest WFA hydrologic year types. The City Council approved an aquifer storage and recovery (ASR) program at the March 21st 2012, City Council Meeting. Although not included as a primary source of supply to serve the Fiddyment Ranch SPA 3 project area, ASR will allow the City to store treated surface water (potable water) in the aquifer for use when needed. Under this program, surface water can be injected into the aquifer during wet times (wet years or during the rainy season), and then the City's groundwater wells can pump stored surface water during times of need or to reduce peak water demand periods, like those which occur during summer months. The City continues to work with the Regional Water Quality Control Board for the Central Valley Region and other state agencies in refining its ASR program. Prior to this testing program conducted for gaining approval for ASR, the last time the City relied on groundwater was during drought conditions experienced in 1991.

In August 2007, the Cities of Roseville and Lincoln, along with PCWA and California American Water Company (CAW), published the *Western Placer Groundwater Management Plan* (GMP). The GMP was prepared in an effort to maintain a safe, sustainable and high-quality groundwater resource to meet backup, emergency and peak demands within a zone of the North American Groundwater Sub-basin.

The City currently operates four groundwater well facilities which are capable of delivering approximately 12,000 AFY of water supply if run full time for the entire year. A more realistic production is 33 AF per day utilized for short term water supply. The wells are maintained primarily as a backup water supply and for improving water supply reliability. The City has plans to expand its groundwater well network. Twelve groundwater well sites are available in the City for construction of new wells. Future wells will be designed to include provisions for ASR. Once built, the City's sixteen groundwater facilities are estimated to allow for delivery of up to 112 AF per day or 41,000 AFY if run on a continuous basis.

**Water Demands**

Water demand is the amount of water required to service a customer on an average annual basis. The City measures this amount of water in acre feet per year (AFY). Total water demand for the proposed project was developed using the City's unit demand factors and applying those factors to the proposed land uses for the plan area.

The City's unit demand factors are based upon actual customer usage data. The current demand factors were developed in 2002 as part of the West Roseville Specific Plan process. The City conducted an additional study in 2006 to re-confirm the unit demand factors using a longer history of available meter and water use data from City customers. This study, *TM-1 – Unit Water Demand Factor Verification and Water Demand Evaluation and Update by MWH, September 2006*, re-confirmed the appropriateness of the unit demand factors developed in 2002. These factors were provided previously in Table 2.

Water demands are classified as either potable demands or recycled water demands. Potable demands are that component of the total water demand that will be used for public health related activities such as drinking water, indoor use and irrigation when recycled water is not available. Potable water demand needs are typically met by surface water supplies and could be supplemented by groundwater supplies as needed. Recycled water is that component of the overall water demand that can be used for outside irrigation use. Potable demands are calculated by subtracting estimated recycled water demands from the total water demand.

**Existing and Buildout Water Demand**

The City's total water demand in 2010 was 30,342 AFY. Of this demand approximately 1,709 AFY was met through recycled water supplies. At buildout of the City's General Plan, water demands are estimated to reach approximately 63,033 AFY of which 4,478 AFY will be met through recycled water supplies.

**Fiddyment Ranch SPA 3 Project Water Demands**

Development of the Fiddyment Ranch SPA 3 Project area would include residential and commercial uses that would require water. The potable water demand for the project was determined utilizing unit water demand factors identified in Table 2 and applying those factors to proposed land uses in Fiddyment Ranch then subtracting recycled water supplies and estimated savings from planned water conservation measures. In calculating water supply, a two percent factor is added in to account for water system losses.

The Fiddyment Ranch SPA 3 Project has included significant water conservation measures into the project. These water conservation measures include:

- Turf reductions and low water using landscaping in residential front yards
- Smart irrigation controllers for irrigation uses
- Re-circulating hot water systems for residential units.
- Low flow efficient water closets

Fiddyment Ranch SPA No. 3, Water conservation Plan by Wood Rodgers dated August 27, 2010 and revised July 11, 2013 (included as Attachment 3) provides the calculations showing the estimated water saving expected from the conservation measures identified for inclusion in the Fiddyment Ranch SPA 3 Project.

The total additional water demand for the Project is estimated to be 202 AFY as described previously in Section 10910(c)(1). Development of the Fiddyment Ranch SPA 3 Project in combination with projected water demand for buildout of the City would be 63,235 AFY (63,033 AFY + 202 AFY). Total water demands for the City and the project at buildout are summarized in Tables 3 and 4, above.

**Water Supply vs. Water Demand**

The City of Roseville currently supplies surface water for municipal and industrial (M&I) uses. This requires firm surface water contract amounts to ensure that proper supplies are maintained for the residents and businesses relying on this supply of water. The estimates in the 2010 UWMP update show that in normal water years the City of Roseville has sufficient water to meet its customer's needs through 2035. Table 6 provides a comparison of projected water supply compared to projected water demand through buildout under the City's existing General Plan. In times of drought or water shortage, the urban demand is expected to decrease by a minimum of 10 percent as a result of increased conservation awareness and regulations. Water available from surface water supplies would be supplemented with use of recycled water and groundwater. It is expected that if supply were to be reduced due to shortage consistent with reductions identified in the Water Forum Agreement, existing supply is sufficient to meet City-wide demands.

## TABLE 6
## WATER SUPPLY AND DEMAND COMPARISON —NORMAL YEAR (AFY)

| Year | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | Build-out |
|---|---|---|---|---|---|---|---|
| Available Surface Water Supplies[1] | 58,900 | 58,900 | 58,900 | 58,900 | 58,900 | 58,900 | 58,900 |
| Recycled Water Supplies | 1,709 | 2,197 | 2,670 | 2,980 | 3,397 | 3,770 | 4,409 |
| **Total Water Supplies** | **60,609** | **61,097** | **61,570** | **61,880** | **62,297** | **62,670** | **63,309** |
| Water demand | 30,342 | 45,760 | 49,494 | 55,071 | 56,507 | 57,855 | 63,235 |
| Remaining Water Supplies | 30,267 | 15,337 | 12,076 | 6,809 | 5,790 | 4,815 | 74 |

1. Reference Table 5.

Normal / Wet Years

*Existing Conditions + Project*

In 2010, existing citywide water demands were 30,342 AFY. In both 2011 and 2012, potable water demands have decreased, presumably due to the economic down-turn. For purposes of this WSA, existing water demand from 2010 is conservatively used as the basis for existing demands.

Included within the existing 2010 demands are some units that have been constructed within the Fiddyment Ranch Area. As of 2010, 545 residential units had been constructed within the Fiddyment Ranch Area; this is 13% of the 4,208 units currently allocated within Fiddyment Ranch. It is estimated that these residential units would generate approximately 13% of the estimated demand in that area or 459 AFY(Reference Table 4 - 13% of 3,528 AFY = 459 AFY).

As indicated in Table 4, the Fiddyment Ranch area including the SPA 3 amendment will result in a total of 3,730 AFY of water demand once constructed. As indicated above, as of 2010 approximately 459 AFY of water demands within this area was already accounted for within the existing demands. Therefore, buildout of the Fiddyment Ranch SPA 3 project plus existing conditions would generate a total demand of 33,613 AFY (30,342 AFY + 3,730 AFY – 459 AFY).

Of this amount, 1,709 AFY is currently met through recycled water supplies. Therefore, the total potable water demand for the existing development in the City plus buildout of the Fiddyment Ranch SPA 3 project area is conservatively assumed to be 31,904 AFY (33,613 AFY total existing plus project water demand - 1,709 AFY met through recycled water supplies). The City has contractual supplies of 66,000 AFY (See Table 5) under normal year conditions, but is limited by the City's Water Forum Agreement to 58,900 AFY. Available supplies exceed existing plus project water demands by 26,996 AFY.

*Buildout Conditions + Project*

Assuming build-out conditions of the City and the Fiddyment Ranch SPA 3 project area, water demands would total 63,235. This is based upon a buildout demand of the General Plan of 63,033 AFY (see Table 3) plus the Fiddyment Ranch SPA 3 demand of 202 AFY (See Table 4). When considering total available water supplies at buildout, supplies exceed demand by 74 AFY. This is calculated by subtracting total water demands of 63,235 AFY from available supplies 63,309 AFY (see Table 6). Of the total demand, 4,409 AFY would be met with recycled water.

Drier and Driest Years

To meet water supply demands during drier and driest years the City may use other supplies like groundwater. Recycled water offsets the use of surface water supplies by reducing the City's reliance on American River supplies to meet irrigation demands that would otherwise use surface water supplies. Groundwater could be used to make up any water supply shortfall as further described herein.

In drier and driest years, the City will implement the water conservation strategies outlined in the Roseville Municipal Code (RMC). Section 14.09 of the RMC identifies "stages" of conservation designed to achieve a specific amount of reduction in water use to match available supplies for that year. Section 14.09 of the RMC outlines five drought stages with specific actions a water customer can implement to achieve a 10 to 50 percent water reduction.

Groundwater use has been identified as a method to augment available surface water supplies during drought Stages three through five. The use of groundwater will mitigate the impact of American River (surface water) supply shortfalls. Although the City has not used groundwater as a source since 1991 (except for testing associated with approval of the ASR program), the use of groundwater in future drier and driest years would be consistent with City practices and policies; and groundwater is already identified in the General Plan and GMP as a backup source of supply to be used in droughts or emergencies.

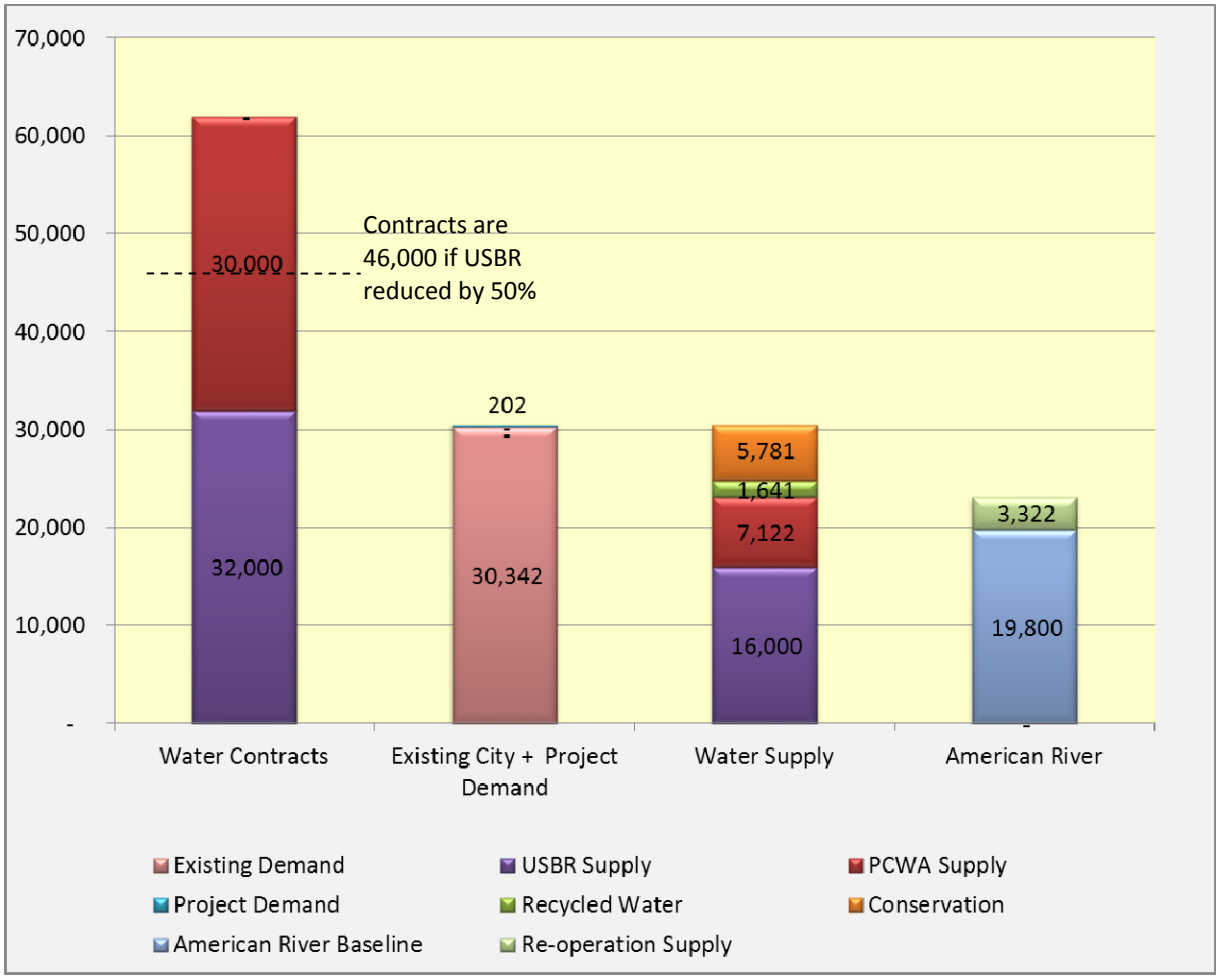
*Existing Conditions + Project*

For analysis of drier and driest years under existing conditions with the project, it is assumed the City's water supplies would be reduced to their lowest available level of 39,800 AFY per the City's Water Forum Agreement. Even at this maximum level of cut-back in supplies, driest year supplies (39,800 AFY) exceed water supply demands (30,544 AFY) by 9,256 AFY. It is important to note this analysis conservatively assumes no reduction in water supply demands as a result of implementing staged water conservation measures. It is expected that water demands will be reduced during drier and driest year conditions as a result of customer efforts to conserve water.

The City is required under its Water Forum Agreement to ensure environmental releases of water down the American River to the 1995 baseline level of 19,800 AFY. Even considering the required environmental release, the City has sufficient supplies to meet this element of the agreement. Figure 3 details how the City would meet existing plus project demands assuming a worse case reduction of 50% of the USBR portion of the City's water supply and only a 20% reduction in water demands through implementing staged water conservation. A fifty percent reduction would reduce USBR supplies from 32,000 AFY to 16,000 AFY and is considered worst case based on information from USBR staff and its existing M&I shortage policy. Conservation reductions total 5,781 AFY and

represent 20% of the required surface water supplies (demands less recycled water). Figure 3 also shows the volume of water required (noted as Re-operation Supply) for environmental releases to the American River.

**FIGURE 3**
**Existing City + Project Driest Year Supply (AFY)**




**NOTE:** The 4,000 AFY of San Juan Water District supply is not shown on this figure as it is only available in normal/wet years.

*Buildout Conditions + Project*

To understand the impacts of dry and driest year types on the City's water supply availability under buildout conditions, this WSA looks at 100 years of hydrologic record from the American River under two different water delivery pattern scenarios. The first scenario considers water supply cut backs under the City's Water Forum Agreement. The second scenario considers reasonably foreseeable

USBR water supply cutbacks as a result of the current Operations Criteria and Plan (OCAP) governing the joint operation of the Central Valley Project (CVP) by USBR and the State Water Project (SWP) by the California Department of Water Resources (DWR), as discussed below.

*Water Forum Agreement Delivery Pattern*

The City participated in the Water Forum, a regional stakeholder effort concerned with the protection of the Lower American River and reliable water supplies. The Water Forum resulted in the development of purveyor specific agreements that outline how suppliers will meet commitments agreed to as part of the Water Forum efforts. The goal of the Water Forum was to provide a safe and reliable water supply through the year 2030, while protecting resources associated with the Lower American River. Roseville's agreement contains a limitation of diversion from the American River in both wet and dry years. The City agreed to limit diversions from its American River supply contracts in wet years to no more than 54,900 AFY and in driest years no less than 39,800 AFY. Through its agreement with the San Juan Water District, the City increased its normal year water supplies an additional 4,000 AFY, for a total wet year supply of 58,900 AFY. Water supply contracts and Water Forum limitations are summarized in Table 5. Based on over 100 years of historical hydrology (and Water Forum Agreement restrictions), the 58,900 AFY contract surface water supply is assumed to be available to the City in about 83 percent of the years.

In about 17 percent of the years, quantities from 58,900 AFY to a minimum of 39,800 AFY of surface water would be available per the Water Forum Agreement. Thus, in drought years, supplemental supplies potentially totaling up to 19,100 AFY (the difference between the average/wet year supply and the dry year supply) are needed to make up for the dry-year and driest-year deficiencies. Figure 4, below, depicts the expected pattern of surface water supply deliveries to the City based upon historic hydrologic data under its Water Forum Agreement. The analysis completed for the Water Forum EIR projects full deliveries will occur approximately 83 percent of the time.

*USBR OCAP Delivery Pattern*

The OCAP describes the operations of the Central Valley Project and the State Water Project (reference Sierra Vista Specific Plan EIR Technical Memorandum: Effects of Changed Water Management Operations on Fisheries and Water Quality Impacts Previously Disclosed in the Water Form Agreement EIR, Robertson-Bryan Inc. and HDR, October 2009, and included as Attachment 4 to this document). The OCAP is pertinent to Roseville in that USBR water contracts with the City are delivered per CVP operation plans. The CVP is operated by the USBR while the SWP is operated by

the California DWR. Both the CVP and the SWP rely on the Sacramento River and the Delta as common conveyance facilities to meet various system demands including water contracts and environmental needs. The CVP system also includes Folsom Dam and Reservoir located on the American River. Reservoir releases and Delta exports must be coordinated so that both the CVP and SWP are able to retain their portion of the shared water and also jointly share in the obligations to protect beneficial uses. A Coordinated Operations Agreement (COA) between the CVP and SWP was developed and became effective in November 1986 as signed by USBR and the DWR.

The COA defines the rights and responsibilities of the CVP and SWP regarding water needs of the Sacramento River system and Delta and includes obligations for in-basin uses, accounting, and real-time coordination of water obligations of the two projects. A CVP/SWP apportionment of 75/25 is implemented to meet in-basin needs under balanced Delta conditions, and a 55/45 ratio is in effect for excess flow conditions. The COA contains considerable flexibility in the manner with which Delta conditions in the form of flow standards, water quality standards, and export restrictions are met. The operation of CVP/SWP is described in a document known as the Operations Criteria and Plan (OCAP). As updated in 2004, the OCAP provides a detailed description of the coordinated operations of the CVP and SWP based on historical data and serves as a starting point for planning project operations in the future. Under the federal Endangered Species Act (ESA), the United States Fish and Wildlife Service (USFWS) produced a formal Biological Opinion analyzing the impact of OCAP implementation on ESA-listed species (including the delta smelt). In effect, the ESA authorizes USFWS to require changes to the OCAP for the protection of the delta smelt and other federally listed species.

In 2005, USFWS issued a Biological Opinion for an updated OCAP, and concluded that CVP/SWP operations did not jeopardize delta smelt populations. However, the Biological Opinion was invalidated by a federal court following a lawsuit. USFWS was ultimately ordered to revise its Biological Opinion. The court also severely restricted CVP and SWP pumping in the Delta pending the USFWS's completion of the new Biological Opinion. Those restrictions took effect in December 2007.

In December 2008, USFWS released a new Biological Opinion concluding that CVP and SWP operations would jeopardize the continued existence of endangered delta smelt. USFWS further detailed a "reasonable and prudent alternative" to the proposed OCAP protocol that would, it claimed, protect the delta smelt and its habitat from the adverse effects of pumping operations. The "Reasonable and Prudent Alternative" (RPA) would restrict Delta pumping operations and would thus limit deliveries of water to CVP/SWP contractors south of the Delta.

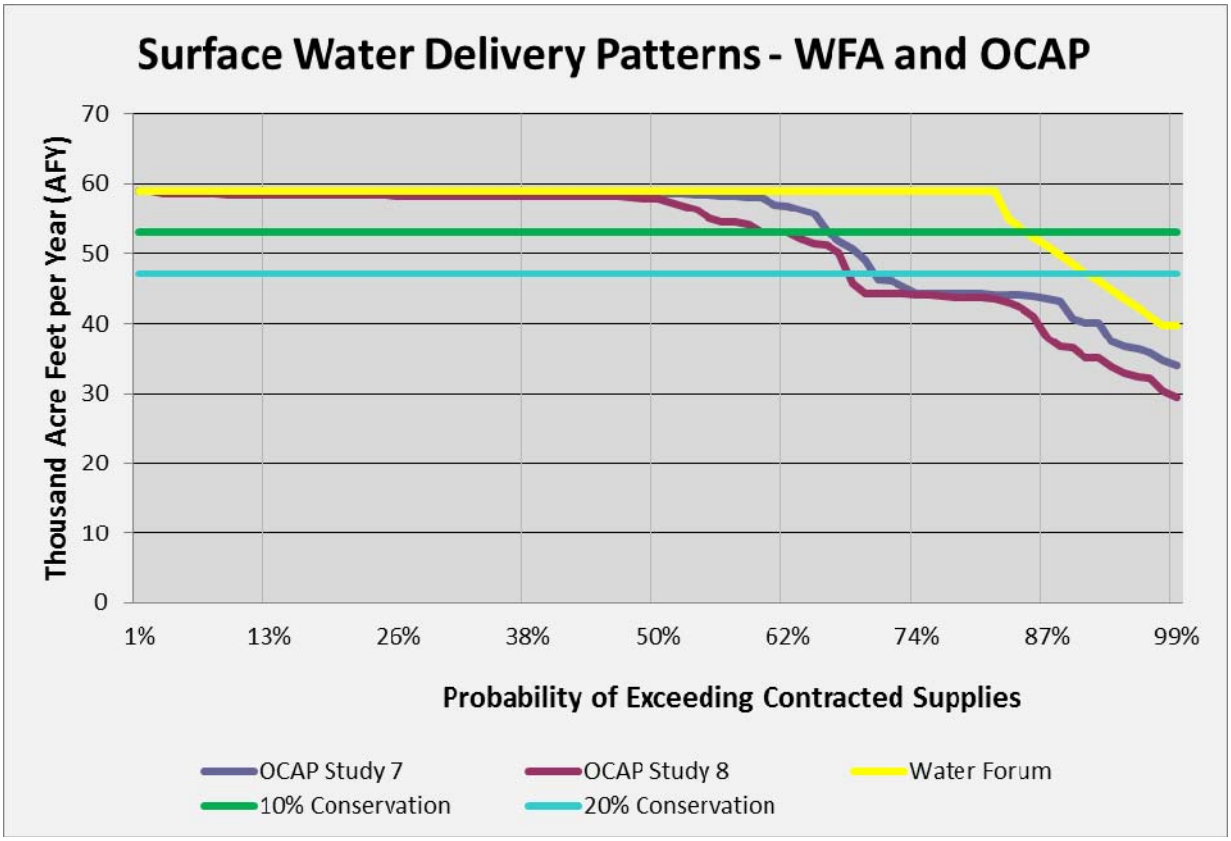
In October 2004, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) issued its own Biological Opinion for OCAP, and concluded that CVP/SWP operations were not likely to jeopardize the continued existence of the Sacramento River winter run Chinook salmon, spring run Chinook salmon, and Central Valley steelhead populations. In April, 2008, that Biological Opinion was also invalidated by the same court that heard the delta smelt suit as a result of a separate lawsuit. The court found that NMFS failed to analyze multiple factors and the 2004 Biological Opinion was remanded to NMFS and Reclamation for further consultation.

In 2009, NMFS also released a Biological Opinion on the revised OCAP and requested changes to protect ESA listed species including endangered Sacramento Rover winter-run Chinook salmon, threatened Central Valley spring-run Chinook salmon, threatened Central Valley steelhead and threatened Southern Distinct Population Segment (DPS) of North American green sturgeon. The Biological Opinions were invalidated by a federal court in December 2010. To date an updated OCAP has yet to be finalized.

To develop the new biological opinions, both USFWS (smelt) and NMFS (salmonids) utilized a series of model runs from CALSIMII know as Study 7 and Study 8. CALSIM II is a model of California's SWP and the Federal CVP, developed jointly by the DWR and USBR. Study 7 evaluated current conditions and Study 8 depicted future conditions as prepared by the Bureau of Reclamation.

For purposes of this WSA, Study 8 (future conditions, in which there is a reduced volume of water available under the City's contract with USBR in dry years to meet minimum environmental needs of the Delta) is used to evaluate possible impacts to Roseville deliveries from the to be finalized OCAP. Figure 4 depicts the changes in water supply deliveries to the City under OCAP, Study 7 (current conditions shown as the blue colored line) and Study 8 (shown as the magenta colored line) compared against Water Forum Agreement deliveries (shown as the yellow line). In addition, Figure 4 shows total water demand if the City were to conserve water equivalent to a 10% reduction in surface water supplies (green colored line) or a 20% reduction (aqua colored line).

**FIGURE 4**




Under the new OCAP (Study 8), full deliveries of PCWA and USBR contracted supplies are projected to occur about fifty percent of the time. When full deliveries are not available, shortages in surface water supplies can be mitigated through implementing water conservation and using supplemental groundwater supplies. In some of the years shortages in surface water can be fully mitigated through implementing water conservation levels between Stages 1 and 2 (between 10% and 20% conservation) outlined in the Roseville Municipal Code (RMC) Section 14.09. This is the area above the aqua 20% conservation line. Approximately 30 percent of the time surface water deliveries will fall below a level where mitigation must be accomplished with greater levels of water conservation or a combination of conservation and supplemental supply from groundwater. This is shown as the area below the aqua colored line. In the Water Forum analysis deliveries were projected to fall below the same level only seven (7) percent of the time.

Supplemental Supplies

In drier and driest years, regardless of delivery pattern, the City will need to make up the difference between available supplies from the American River and projected demands. This would be done through implementing conservation measures as identified in the RMC and supplementing available supplies with

groundwater. As explained earlier, the RMC identifies five drought stages with varying degrees of reduction (10% to 50%). The hydrologic record indicates that there were two (2) critically dry (driest) years and fourteen (14) drier years where City demands would need to be adjusted downward through conservation efforts to conform to available surface water supplies under the City's Water Forum Agreement.

Table 7 depicts the impacts of the Water Forum Agreement and shows estimated surface water shortfalls during historical drier and driest years assuming City build out surface water demand equivalent to 58,900 AFY (maximum diversion under the City's Water Forum Agreement). For example, in a normal year such as occurred in 1929, there would be no anticipated shortfalls in available surface water supplies to the City. In a critically dry (driest) years such as occurred in 1924 and 1977, the City would need to make up 19,100 AF of water supply. In drier years as the amount of surface water availability to the City increases from 39,800 AFY to 58,900 AFY, based upon the unimpaired inflow, the anticipated shortfall decreases from 19,100 to 0 AFY.

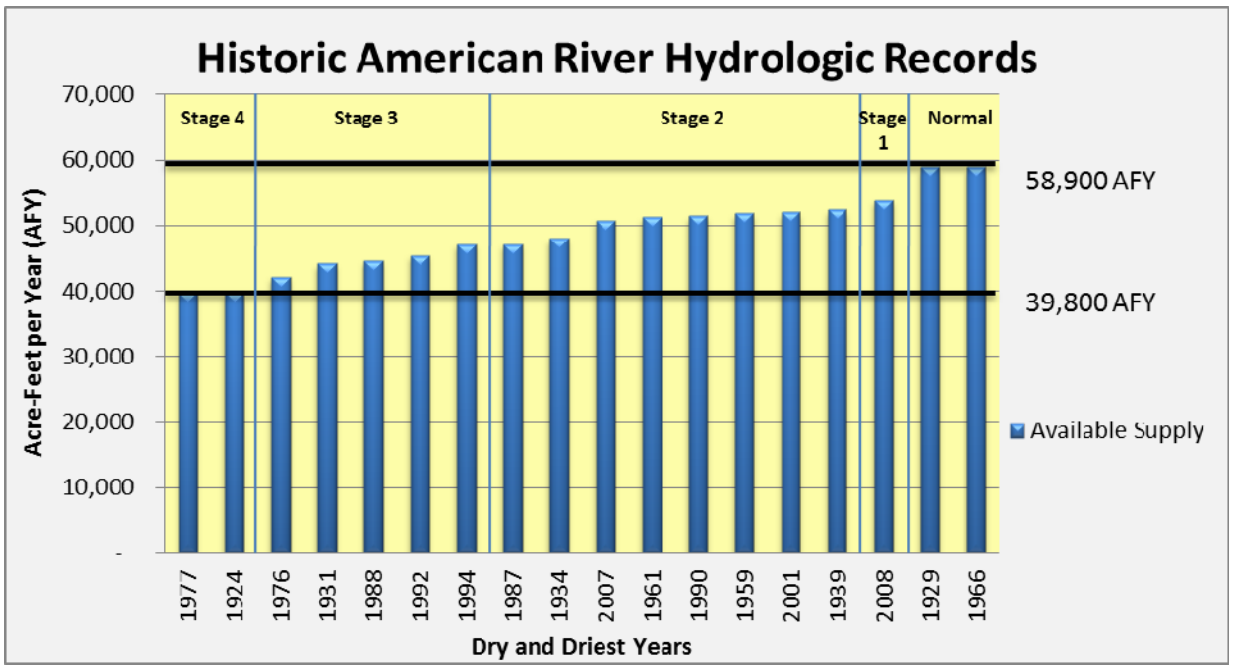
## TABLE 7

## WATER FORUM AGREEMENT IMPACTS ON HISTORIC AMERICAN RIVER HYDROLOGIC DRY AND DRIEST YEAR RECORDS

| Year | Year Type | Annual AF | Unimpaired Inflow AF | Available Water Supply AF | Normal Buildout Demand AF | Shortfall AF |
|---|---|---|---|---|---|---|
| **1977** | Driest | 520,190 | 289,740 | 39,800 | 58,900 | 19,100 |
| **1924** | Driest | 628,800 | 388,900 | 39,800 | 58,900 | 19,100 |
| **1976** | Drier | 598,260 | 484,060 | 42,719 | 58,900 | 16,181 |
| **1931** | Drier | 854,600 | 557,200 | 45,259 | 58,900 | 13,641 |
| **1988** | Drier | 892,974 | 576,736 | 45,938 | 58,900 | 12,962 |
| **1992** | Drier | 989,570 | 604,927 | 46,917 | 58,900 | 11,983 |
| **1994** | Drier | 956,228 | 665,328 | 49,014 | 58,900 | 9,886 |
| **1987** | Drier | 940,048 | 667,769 | 49,099 | 58,900 | 9,801 |
| **1934** | Drier | 1,084,000 | 699,700 | 50,208 | 58,900 | 8,692 |
| **2007** | Drier | 1,128,924 | 800,702 | 53,715 | 58,900 | 5,185 |
| **1961** | Drier | 1,021,670 | 817,440 | 54,297 | 58,900 | 4,603 |
| **1990** | Drier | 1,036,113 | 822,331 | 54,466 | 58,900 | 4,434 |
| **1959** | Drier | 1,209,420 | 836,380 | 54,954 | 58,900 | 3,946 |
| **2001** | Drier | 1,185,375 | 845,617 | 55,275 | 58,900 | 3,625 |
| **1939** | Drier | 1,006,140 | 858,220 | 55,713 | 58,900 | 3,187 |
| **2008** | Drier | 1,202,084 | 909,734 | 57,502 | 58,900 | 1,398 |
| **1929** | Normal | 1,255,100 | 952,600 | 58,900 | 58,900 | 0 |

Figure 5 graphically shows how, the estimated shortfall determined in Table 7 would be evaluated and placed into corresponding drought stages.

**FIGURE 5**



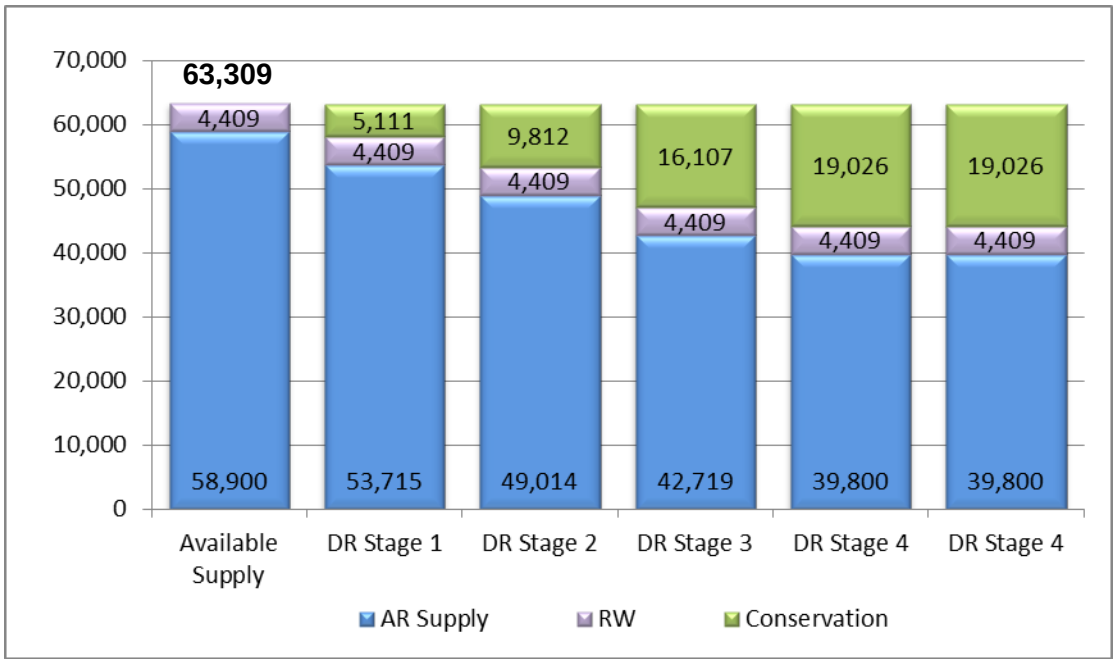

The buildout demand for the City of 63,033 plus the water demand for the proposed Fiddyment Ranch SPA 3 project (202 AFY) would be 63,235 AFY (63,033 AFY + 202 AFY). The net potable water demand is 58,826 AFY, which is calculated by subtracting anticipated recycled water usage at buildout with the Project (4,409AFY) from the buildout water demand (63,235 AFY – 4,409AFY = 58,826 AFY). This amount is then compared to available surface water supplies. In a normal water year, there is 58,900 AFY available from the American River. Therefore, water supplies would exceed water demand at buildout by 74 AFY under the General Plan plus the Fiddyment Ranch SPA 3 project.

In dry and driest years, the City would need to make up the difference between 39,800 AFY and 58,900 AFY (0 AFY to 19,100 AFY). This would be done through implementing conservation measures as identified in the RMC and supplementing available supplies with groundwater. As explained earlier, the RMC identifies five drought stages with varying degrees of reduction (10% to 50%). Table 7 and Figure 5 compares projected build out demands to available supplies based on 100 years of hydrologic record of the American River. The full history is contained in Attachment 5 to this WSA. The hydrologic record indicates that there were two (2) critically dry (driest) years and fourteen (14) drier years where City demands would need to be adjusted downward to conform to available surface water supplies. By way of

example and as shown on Figure 5, a critically dry year would necessitate the implementation of a Stage Four drought to reduce water demands to a level that is comparable with available supplies. Drought Stages One, Two, and Three would be required during the drier years depending on the level of surface water supply shortfall.

It is important to note that if the City is able to accomplish the recommended reductions in demand through more stringent (stages 3 – 5) conservation measures outlined in the RMC, groundwater would not be needed to supplement supplies. This is depicted in Figure 6 below.

**FIGURE 6**
**DRY AND DRIEST YEAR SUPPLY SCENARIOS**
**STAGED WATER CONSERVATION**

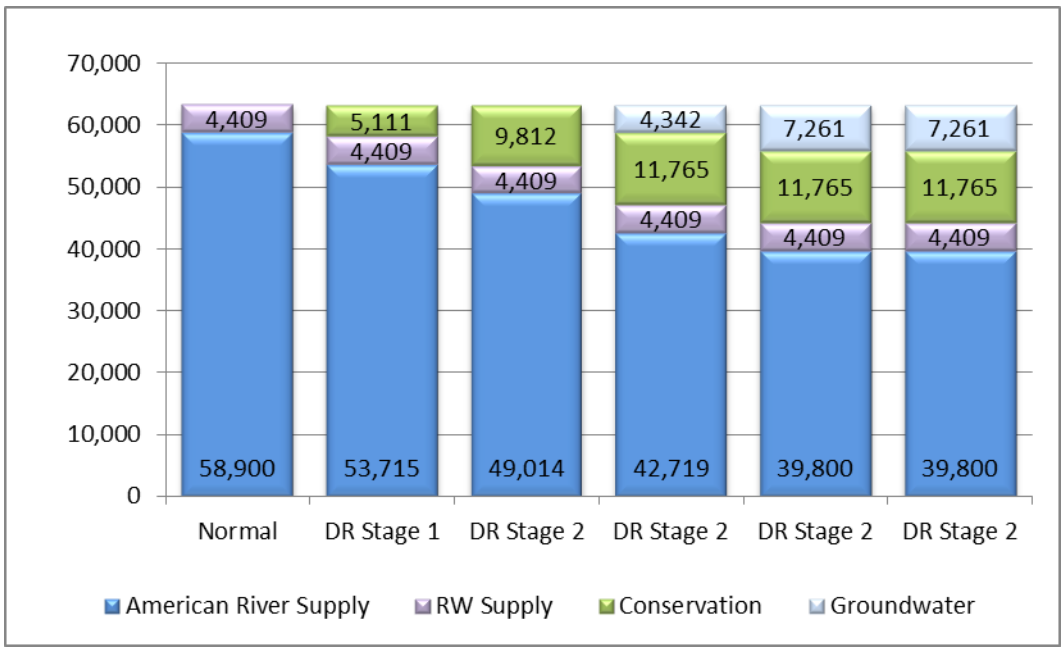



However, to ensure a highly reliable water supply for the City, this WSA assumes no more than a 20 percent reduction of surface water demands through conservation (20% of 58,900 AFY = 11,780 AFY). The 100 years of hydrologic data includes both the 1977 and 1924 droughts of record. This record provides a good picture of what could be anticipated as future unimpaired flows in the American River. The record indicates that there would be 15 years out of 100 that would require some level of conservation. Depending on water delivery patterns (Water Forum Agreement or OCAP), the number of years in which groundwater is required is different. Each is described below.

*Water Forum Agreement Scenario*

Of the 15 years out of 100 when supplemental supplies are required to meet demands and assuming up to a 20 percent reduction in surface water demand through conservation efforts, only 6 years would require groundwater pumping to make up for shortfalls in surface water supplies. The total amount of groundwater extracted over the life of the Project (based on the 100 year hydrologic record and the need to pump groundwater in only 6 of 100 years) would be 31,890AF. The annual amount varies depending on the year type, but ranges from a high of 7,261 AFY to a low of 0 AFY and is depicted in Figure 7 below.

**FIGURE 7**
**DRIER AND DRIEST YEAR SUPPLY SCENARIO**
**20% MAXIMUM WATER CONSERVATION**




In addition to groundwater to supplement surface water supplies during drought conditions, the City has identified groundwater as an emergency backup supply for the recycled water system to bolster reliability. It is assumed that 11 AFY of groundwater could be required during emergencies such as a plant outage to back-up the recycled water system. This is based upon 1.8 million gallons per day for a period of two days. Additionally, it was assumed that an emergency could occur once every five years. Thus, for the life of the project (which is assumed to be the hydrologic record of 100 years), up to 220 AF of groundwater could be required. This would result in a total extraction of groundwater over 100 years of 32,110 AF.

*OCAP Scenario*

It is estimated there would be 14 years out of 100 under the OCAP which would require groundwater pumping to make up for shortfalls in surface water supplies. The total amount of groundwater extracted over the life of the Project (based on the 100 year hydrologic record and the need to pump groundwater in only 14 of 100 years) would be 59,984 AF. The annual amount of groundwater required varies depending on the year type, but as with the Water Forum Agreement scenario, ranges from a high of 7,261 AFY to a low of 0 AFY (see Figure 5). An additional 220 AF of groundwater is expected to be extracted during the analysis period of the project (100 years) to supplement recycled water supplies for emergency conditions such as a plant outage. Thus for the life of the project (which is assumed to be the hydrologic record of 100 years) under the OCAP Scenario, total extraction of groundwater over 100 years would be 60,204 AF (59,984 AF + 220 AF).

***Section 10910(d)(1) Identify existing water supplies for the proposed project.***

Existing surface water, recycled water, and groundwater supplies for the City of Roseville are described under Section 10910(c)(4), above.

***Section 10910(d)(2)(A) Demonstrate existing water supply entitlements, water rights or water service contracts through written contracts or other proof.***

Documentation for water entitlement contracts is contained in Attachment 6. Included are:

- United States Bureau of Reclamation Long term water supply No. 14-06-200-3474A
- PWCA Water Supply Contract dated 1 September 2010
- United States Bureau of Reclamation Contract for Conveyance of Non-Project Water between the United States and City of Roseville No. 02-WC-20-2217

***Section 10910(d)(2)(B) Provide copy of capital outlay program for financing of a water supply that has been adopted by the public water system.***

Financing for water supply facilities are included in the City's Capital Improvement Projects (CIP). A list of CIPs for the next five years is provided in the City's annual budget document. Copies of the budget document are available at the City's Finance Department and can be read by members of the public upon request. Financing of these projects is through a combination of connection fees on new construction and general obligation bonds. A projected fund balance tied to the Capital Improvement Project schedule is also available at the City's Finance Department and can also be read by members of the public upon request.

***Section 10910(d)(2)(C)*** ***Identify any federal, state, and local permits required for construction of the facilities identified for delivering the water supply to the proposed project.***

The majority of the proposed water transmission facilities will be located in proposed City public rights-of-way and with City approved plans. A list of permit requirements for proposed facilities will be identified after the City's review of improvement plans. Possible permit requirements include grading permits, tree permits and other local, state or federal permits are identified in the environmental document for the WRSP.

***Section 10910(d)(2)(D)*** ***Identify any necessary regulatory approvals required to convey or deliver the water supply to the proposed project.***

Long-term water supply from the Central Valley Project (USBR supply) is the primary source of water for the City of Roseville. The City's 40-year long term contract with USBR expired in 2010. Subsequent to the expiration, the City entered into an interim supply contract with the USBR which is valid through February 28, 2015. Roseville has established a need for the contract amount of 32,000 AFY. The interim contract is required while the USBR completes long-term contract negotiations with its area water contractors along with preparing the appropriate environmental documentation. Completion of the environmental documentation will allow for signing of a new long-term contract between the City and USBR. The interim contract with USBR can be continued while the long-term contract is being finalized.

The State Department of Public Health and the Regional Water Quality Control Board must review and approve an Engineering Report documenting the proposed use of recycled water within the project area prior to recycled water use within the plan area.

***Section 10910(e)*** ***Identify other public water system or water contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system for the proposed project.***

The City's diversion point for its American River water supply is at Folsom Lake. Other water purveyors with water contracts or water supply entitlements that receive water at this division point includes, Sacramento County Water Agency (Zone 40 and City of Folsom) San Juan Water District, Sacramento Municipal Utility District, Placer County Water Agency, Folsom State Prison, El Dorado Irrigation District and East Bay Municipal Utility District.

The City of Roseville is a signatory to the Water Forum Agreement. The Water Forum is a Regional Plan developed by the Sacramento Area Water Forum and Foothill Forum Water Group with the objective for safe, reliable, and environmentally-sound water supplies from the American River watershed, the source of Roseville contract water. A number of stakeholders were involved in the planning process focusing on a Regional Water Agreement, which identified the resources needed to meet 2030 water demands. A copy of the Water Forum Agreement is available for review online at http://*www.watefforum.org/AGREE.HTM*.

***Section 10910(f)(1)*** ***Review any information contained in the UWMP relevant to the identified groundwater supply for the proposed project.***

The 2010 UWMP includes information pertaining to the local groundwater basin. As identified in the UWMP, the primary source of water supply for the City's service area is surface water from Folsom Lake. Although restrictions on groundwater use are not identified in the Water Forum Agreement for Roseville, groundwater was only projected to be used in times of drought and water shortage. Studies produced for the Water Forum estimated that groundwater will only be required in approximately 17 percent of the years. As documented in Section 10910 (c)(3) and (c)(4), above, the City now estimates that groundwater would be used in up to 6 of 100 years under the Water Forum Agreement Scenario or in up to 14 of 100 years under the OCAP Scenario.

***Section 10910(f)(2)*** ***Describe any groundwater basin from which the proposed project will be supplied. Include information as to whether the Department of Water Resources has identified the basin as over drafted or has projected that the basin will become over drafted.***

Placer, Sutter, and Sacramento counties are situated in the North American sub-basin located in the eastern central portion of the Sacramento Groundwater Basin. The North American sub-basin is defined by the Bear River on the north, the Feather River and Sacramento River on the west, the American

River on the south, and on the east by the Sierra Nevada Range. The sub-basin encompasses 351,000 acres (548 square miles). Drainage in the sub-basin is west -southwest at an average five percent grade.

The eastern boundary of the sub-basin is a north-south line extending from the Bear River south to Folsom Lake that passes about 2 miles east of Lincoln and is the approximate edge of the alluvial basin, where little or no groundwater flows into or out of the groundwater basin from the Sierra Nevada. The western portion of the sub-basin is a flat flood basin for the Bear, Feather, Sacramento, and American Rivers and several small east-side tributaries.

Various geologic formations comprise the water-bearing deposits that underlie the region. These formations include an upper aquifer system consisting of the Riverbank (formerly known as Victor) and Turlock Lake/Laguna (formerly known as Fair Oaks-Laguna Formations), and a lower aquifer system consisting primarily of the Mehrten Formation. These formations are typically composed of lenses of interbedded sand, silt, and clay interlaced with coarse-grained stream channel deposits. These deposits form a wedge thickening from east to west at a fairly constant rate to a maximum thickness of 2,000 feet near the Sacramento River.

Groundwater occurs in an unconfined to semi-confined state throughout the region. A confined aquifer state occurs in aquifers that have overlying stratum of low permeability. Groundwater under a confined state is described in terms of its piezometric surface elevation rather than a water surface elevation. The piezometric surface elevation is the elevation of water within a piezometer or well that is screened only in the confined or semi-confined aquifer. The groundwater surface elevation is the elevation of water in an unconfined aquifer. Semi-confinement can occur in local areas, and the degree of confinement typically increases with depth. Groundwater in the Riverbank and Turlock Lake/Laguna Formations is typically unconfined. The deeper Mehrten Formation, the major source of groundwater, exhibits semi-confined conditions.

The California Department of Water Resources (DWR) has not identified the basin as an over drafted basin. Groundwater levels in southwestern Placer County and northern Sacramento County have generally decreased between 1947 through 1997. Many wells experienced declines at a rate of about one and one-half feet per year with some of the largest decreases occurring in the area of McClellan AFB. After 1997 water levels seem to stabilize, indicating that the basin is in a state of equilibrium. Groundwater levels in Sutter and northern Placer Counties generally have remained stable, although some wells in southern Sutter County have experienced declines.

The groundwater basin has historically been pumped for agricultural and urban uses. The PCWA Integrated Water Resources Plan (IWRP) prepared by Brown and Caldwell dated August 2006 indicates a potential safe yield of 95,000 AFY for the basin. The safe yield is defined as the amount of

groundwater that can be continuously withdrawn from a basin without adverse impact and is commonly expressed as an annual average in acre-fee per year (AFY). The IWRP also estimated average annual agricultural and urban demands in Western Placer County have been about 97,000 AFY. Under these pumping conditions, the groundwater levels at the southern end of the basin have been stable since about 1982 and at the northern end of the basin, the levels have risen slightly. These stable groundwater levels indicate that groundwater pumping is currently in balance with the natural groundwater recharge rate.

Groundwater elevations are monitored by DWR for several decades. There are three groundwater wells in the DWR monitoring network in and immediately adjacent to the western edge of the City. One well is located adjacent to Pleasant Grove Creek just west of Fiddyment Road in the City's West Roseville Specific Plan Area. A second well is east of the WRSP along Kaseberg Creek southeast of the intersection of Fiddyment and Hayden Parkway. The third well is located on City-owned land north of the WRSP. Data for the first well indicate rising groundwater elevations since about 1977, which could be attributable to a decrease in agricultural pumping or recharge into a subsurface channel system. In 2002, the groundwater elevation ranged from 45 to 47 feet above mean sea level (msl). The second well, which has not been monitored since 1993, showed almost stable groundwater elevations between 1980 and 1993. Reported groundwater elevations in the well in 1993 were 17 to 20 feet msl. The westernmost well has been stable since about 1980, and decreased agricultural water use in the area suggests water table levels could rise. In 2002, groundwater elevations ranged from a low of 24 feet msl in November to a high of 17 feet msl in April. Bulletin 118 prepared by the California Department of Water Resources identifies eleven groundwater basins as being in a critical condition of overdraft. The North American sub-basin is not one of the eleven basins identified.

These stable groundwater conditions may be attributed to the conversion of agricultural lands to urban uses over the past several decades. With the land conversions, especially of former heavy pumping uses such as rice farming, pumping demands have decreased. It is expected that basin pumping demands will continue to decrease over time. According to the IWRP, urban development within the Placer Vineyards, Curry Creek and West of Lincoln study areas alone is estimated to reduce agricultural groundwater pumping demands by 20,000 AFY over time. If these pumping demands are not replaced by other equivalent pumping demands, it is expected to result in improvements to the condition of the basin. There are no existing legal constraints that limit groundwater pumping.

***Section 10910(f)(3) Describe the amount and location of groundwater pumped by the public water system for the past five (5) years.***

The City has extracted 392 AF of groundwater over the past five years (2008-2011). This extraction was made as part of the City's Aquifer Storage and Recovery (ASR) demonstration project. Use of

groundwater is part of the City of Roseville's current water supply planning, but it is only used for short-term back-up supply during dry years.

***Section 10910(f)(4) Describe the amount and location of groundwater projected to be pumped by the public water system from any basin from which the proposed project will be supplied.***

The use of groundwater is part of the City of Roseville's current water supply strategy, for short-term back-up supply during dry years and as an emergency backup to the recycled water system. Based upon the estimated water demand for the project, and as shown in Figure 7, a maximum of 7,261 AFY of groundwater maybe required during drier and driest hydrologic year types. Over the life of the project and as described in Section 101910(c)(2) above, under the OCAP Scenario, a total of 60,204 AF of groundwater would be required. This includes groundwater to supplement surface water supplies during drought conditions to meet City plus project buildout and 220 AF of groundwater as emergency backup supply for the recycled water system.

***Section 10910(f)(5) Analyze the sufficiency of the groundwater from the basin from which the proposed project will be supplied to meet the projected water demand associated with the proposed project.***

As indicated in Section 10910(f)(4) above, surface water will be used as the primary source of supply to service the project. During normal/wet hydrologic year types (86% of the years) groundwater is not required to meet water system demands. During 14% of the years (over a 100 year period and under the OCAP Scenario) up to 7,261 AFY or a lifetime draw of 60,204 AF of groundwater would be extracted from the basin to meet dry year water supply needs and supplemental recycled water demands.

The groundwater basin has historically been pumped by agricultural and urban uses. Over the past several decades, agricultural land has been converted to urban uses. With the land conversions, especially of formerly heavy pumping uses, such as rice farming, pumping demands have decreased. It is expected that basin pumping demands will continue to decrease over time. If these pumping demands are not replaced by other equivalent pumping demands, it is expected to result in improvements to the condition of the basin. There are no existing legal constraints that limit groundwater pumping and the PCWA August 2006, Integrated Water Resources Plan study indicates a potential safe yield of 95,000 AFY for the basin based on current groundwater level stability at these pumping levels.

Further, a review of potential basin impacts incorporates the results of a groundwater impact analysis prepared by MWH in June 2003 as part of the West Roseville Specific Plan (WRSP) project. This report, MWH Groundwater Impact Report, is included in Attachment 6. The MWH

report used the *North American River and Sacramento County Combined Integrated Groundwater and Surface Water Model* (IGSM) to simulate groundwater conditions. This model was originally developed for the *American River Water Resources Investigation* (ARWRI) and later updated by the American River Basin Cooperating Agencies for the *Regional Water Master Plan*.

The groundwater impacts described in the *MHW Groundwater* Impact *Report* were defined as the incremental changes between the groundwater conditions corresponding to a baseline condition that does not include development of the City's WRSP Area and groundwater conditions resulting after the WRSP Area has been developed. The following assumptions were made for the analysis of mitigating the dry-year groundwater use, which was assumed to be accomplished by fallowing land at the City owned Reason Farms property:

- 1,080 acres fallowed,
- 6,483 AFY of groundwater required to meet crop irrigation demand,
- 2,632 AFY of groundwater return by deep percolation of irrigation water,
- Net 3,151 AFY of groundwater recharge "banked" and available for other uses, based strictly on mass balance of water in system. (6,483 AFY – 2,632 AFY for percolation - 700 AFY for current cattle ranching operations).

To characterize the impacts to groundwater, this WSA analyzes the most conservative dry year scenario, the OCAP Scenario, in which there are more years when supplemental groundwater is required. As previously described, based upon historic American River hydrologic data, it is estimated that under the OCAP, there would be 14 years out of 100 when groundwater could be required to supplement reduced surface water supplies. In 86 out of 100 years, groundwater would not be required. The analysis calculates the volume of water that is "banked" or saved as a result of land retirement from Reason Farms and compares that to the volume of groundwater anticipated to be extracted over the same time period (100 years). This analysis is summarized below.

Using 3,151 AFY of banked groundwater available for beneficial use as a result of land retirement at Reason Farms and applying it over the period of the hydrologic record during which water supplies are not reduced (86 of 100 years), a 270,986 AF of groundwater would be saved (3,151 AFY x 86 years). Extracting the projected groundwater needs for the City and the Fiddyment Ranch SPA 3 project over this same time period under the more conservative OCAP scenario (60,204 AF) results in a net storage of groundwater of 210,782 AF (270,986 AF – 60,204 AF). This is an average annual groundwater savings of 2,108 AFY over 100 years. Under these conditions the groundwater basin is expected to increase as a result of eliminating rice farming at Reasons Farms. It is also expected that

implementation of the City's Aquifer Storage and Recovery program, where treated surface water is stored within the groundwater basin, will likely increase groundwater levels. Because the proposed project is expected to use less water than that identified as available from groundwater banking, adverse impacts to the groundwater basin are not anticipated. The numbers supporting this conclusion are shown in Table 8 below. Thus, the overdraft indicated by the difference between a sustainable yield of 95,000 AFY and the 97,000 AFY being pumped on average in recent years should be eliminated; and over time, particularly as more lands are converted from agricultural uses to urban uses, average annual withdrawals from the aquifer should be less than the average annual replenishment.

**TABLE 8**
**GROUNDWATER SUPPLY NEEDS AT BUILDOUT CONDITIONS**
**USBR OCAP DRY YEAR SCENARIO**

| GROUNDWATER USE | GROUNDWATER DEMAND (AFY) | GROUNDWATER OVER PROJECT LIFE (100 YEARS) | COMMENT |
|---|---|---|---|
| **Dry year supply to supplement surface water** | 7,2610 | 59,984 AF | Groundwater required in 14% of all years. Reference Impact 14.12.1-2 |
| **Recycled water emergency backup supply** | 11 | 220 AF | Assumes 1.8 mgd for a period of two days under emergency conditions when recycled water is not available. It is further assumed emergency conditions would occur once every five years for a total groundwater need of 220 AFY for the life of the project (100 years). |
| **Total Groundwater Needs** | **7,269 AFY** | **60,204 AF** | |
| **Banked Groundwater from Retirement of Reason Farms** | **3,151 AFY** | **270,986 AF** | Banking occurs in 86 of 100 years. |
| **Net Groundwater Banked** | | **210,782 AF** | |

The City of Roseville is currently utilizing multiple existing water sources including surface water, recycled water and groundwater to serve existing and future customers. Based upon the City's total projected water supplies for normal, single-dry, and multiple-dry years over a 20-year projection, as demonstrated by this WSA, the City will have sufficient water to meet projected water demands for the Westbrook Amendment in addition to meeting the existing service area's planned future demands. The City need not obtain new water sources either to serve the proposed project or to serve the City at build-out even during very dry years. This determination is based on the information provided in this WSA.