# 2005 City of Santa Paula Potable Water System Master Plan Amendment

**City of Santa Paula**

**Project Engineer** Randy Toedter, PE

Brian Yanez

June, 2012

970 Ventura Street Santa Paula, CA 93060

# PURPOSE OF THE AMENDMENT

The purpose of this Master Plan Amendment is to amend the exiting 2005 Potable Water System Master Plan to reflect updated East Area 1 and East Area 2 water system improvements. Because the approved City of Santa Paula Potable Water Master Plan no longer accurately reflects East Area 1 and 2 developments, this amendment was prepared to bring the Master Plan up-to-date. This amendment specifically addresses the East Area 1 and 2 improvements and how each development's potable water system will be integrated with the existing City infrastructure.

This amendment contains text and graphics that have been revised from the approved 2005 Potable Water Master Plan.

# GENERAL DESCRIPTION

The East Area 1 development is a 501-acre site that is located North of Highway 126, East of Santa Paula Creek and West of Orcutt Creek. The development is a mixture of residential, commercial, retail, open space and public facilities and includes a maximum buildout of 1,500 residential units, 150,000 square feet of light industrial uses, 285,000 square feet of commercial uses, 36.3 acres of civic/institutional uses, and various other land uses. The project will be built out in phases over a 10-year period with full build out to be completed in 2020.

East Area 2 covers approximately 90 acres and is located directly to the south of East Area 1. East Area 2 will supplement the East Area 1 development to serve 340,000 SF of commercial buildings under the Santa Paula East Gateway Specific Plan as well other commercial and industrial uses.

The amendment looks at each development's integration with the City's existing system, and does not include the analysis of East Area 1 and 2's internal facilities. The developer has engaged the services of another engineering consultant to verify that internal distribution system and storage requirements meet City meets requirements put forth in the approved 2005 Master Plan. This information will be provided during the review of the Tentative Tract Maps and system design.

# EAST AREA 1 AND EAST AREA 2 SYSTEM SUPPLY CONNECTIONS

## EXISTING CONDITION

### East Area 1

Currently, water supplies for the agricultural water uses of East Area 1 are derived from three or more on-site wells. These wells draw from the Santa Paula and Fillmore Groundwater Basins. The property owners have a combined on-site groundwater allocation of 1,283 AFY from the Santa Paula Basin and have historically withdrawn 329 AFY from the Fillmore Groundwater Basin. Therefore, combined groundwater sources available on-site for the East Area 1 development is approximately 1,612 AFY.

### East Area 2

Water supply to the East Area 2 area is supplied by the existing City of Santa Paula Water System. Currently, water usage in the existing developed East Area 2 site is estimated to be 63AF/yr. Some existing lines in the Ferris Lane area are currently 2" or smaller and known to be deficient. These lines would be upgraded to 6" or 8" pipes per the approved Master Plan. In the Hallock Drive Area, the existing lines are 10" AC with no deficiencies noted. Three farmers irrigation wells exist along the southern property line and will be accommodated in the ultimate East Area 2 build out so that the three wells can remain active.

## PROPOSED CONDITION

Due to unknown timing of system wide upgrades to the City system, the City staff felt it prudent that the East Area 1 development contains a self-sufficient potable water system which required the sizing of tanks to meet the storage needs for the entire development. East Area 2 development will be served from the existing City water main in Hallock Drive and connected to the new tanks and distribution system of East Area 1. East Area 2 is currently a part of the City's 200-zone. The decision on which pressure zone will ultimately serve East Area 2 has not been determined. Storage tanks installed with the East Area 1 development will provide additional storage for the 200-zone system. The East Area 1 development will connect to the existing City system at two (2) locations: Hallock Drive and Telegraph Road intersection in the South and Santa Paula Street in the West. The Hallock Drive and Telegraph Road intersection will serve as the main point of connection (POC) for the project. A schematic of East Area 1 and East Area 2's integration into the existing City system can be found on ***Figure A.***

The East Area 1 project was designed as a single zone water system capable of supplying all of East Area 1 and 2's Maximum Daily Demand (MDD) with a new above-ground storage tank. Calculations of the East Area 1 and East Area 2 MDD were based off of demand factors in Table 3-10 of the approved Master Plan and can be found in *Table I* and *Table 2,* respectively. A 3.0 MG tank has been sized to serve the East Area 1 development on its own, new 300-zone, in addition to the East Area 2 development located within the City's existing 200-zone.

Ultimately, the 3.0MG tank serving East Area 1 and 2 has a 0.41 MG surplus when operating on the recommended 18-hr basis. East Area 1 and 2 storage requirements can be found in *Table III.*

In addition to the installation of the 3.0 MG tank, the development agreement for the East Area 1 development also requires a 2.0 MG tank be installed with the East Area 1 improvements. This tank will provide additional storage for the overall City system and for future developments outside of the East Area 1 vicinity. It will also provide increased water pressure within the existing City system.

Both proposed tanks are set at a bottom elevation of 535. Therefore, water levels in the tank will create a new 300 pressure zone within East Area 1 that is independent of the City's system. Although no pump station will be needed to transfer water from East Area 1 to existing developments to the West of Santa Paula Creek, a pump station will be required to pump water from the existing City system to the East Area 1 development in the case that the storage tanks on the east side of Santa Paula Creek are shut down for maintenance. *Figure B* displays a general schematic of the integration of these tanks into the existing City system.

Six wells will pump water from the East Area 1 project site. Two wells will be located near Haun Creek. The other four well will be located on the west side of the project, adjacent to Santa Paula Creek. Six standby wells will be constructed adjacent to each duty well. The two wells at the east end of the property will serve the East Area 1 development. The other four wells will serve as additional supply for the City's system. A schematic layout of the well field can be found in *Figure C.*

Water pumped from wells east of the Santa Paula Creek is of good quality. At this time water treatment is not expected (except for disinfection to meet or exceed State Drinking Water Standards). Water quality will be monitored. In the case where treatment is required, water will be treated at well head systems or a central treatment facility, likely located at the southeast corner of the project. From there, water will be pumped to the storage tank locations throughout the City. The pump station will be located near the 12$^{th}$ Street bridge in the southwest corner of the East Area 1, so wells along the Santa Paula Creek will not pump into the 300-zone but into the City's 200-zone.

The minimum combined capacity of the wells needed to supply the East Area 1 MDD (sized for an 18-hour basis) is 1700 GPM. After the development of East Area 2, well capacity must increase by 150 GPM to serve increased water demands, therefore increasing the minimum well capacity to 1850 GPM. Each well within the system will be designed to operate between 1000-1500 GPM, which greatly exceeds the required well capacity. The pump station capacity serving the 3.0 MG tank from the wells was analyzed assuming both wells have a minimum capacity of 1000 GPM (2000 GPM combined capacity). Estimates of East Area 1 and 2 combined pumping requirements can be found on *Table III*. It is recommended that during periods of peak demand, wells delivering water to the 3.0 MG tank be able to deliver 2,800 GPM.

# EAST AREA 1 AND 2 EFFECTS ON EXISTING CITY INFRASTRUCTURE

East Area 1 will function as its own self-sufficient water system, providing the required 2.59 MG of storage for the East Area 1 and 2 developments. The development of East Area 1 will provide extra storage for the City's 200-zone, allowing the City to increase availability of fire flows and pressures downstream of the tank. With the full build out of East Area 2 and the 2.0 MG tank, the system will hold a surplus if 2.41MG (assuming the recommended 18-hr basis), enabling increased flexibility in system operations.

## LEGEND

- STORAGE TANK
- WELL
- EAST AREA 1 IMPROVEMENTS BOUNDARY
- EAST AREA 1 WATER LINES
- EXISTING WATER MAINS
- CONNECTION TO CROSS TOWN TRANSMISSION LINE
- PUMP STATION


**FIGURE A: EAST AREA 1 AND 2 IMPROVEMENTS**

**CITY OF SANTA PAULA**
**POTABLE WATER MASTER PLAN**

SHEET 1 OF 1

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J:\LIM14521\Eng\Santa Paula Master Plans\Water Master Plan\4521-Water Master Plan Ammendment_Figure B.dwg Jun 07, 2012, 2:42pm elabudo

GROUND ELEVATION (FT)

1000
900
800
700
600
500
400
300
200
100
0
SEA LEVEL

900 ZONE
600 ZONE
400 ZONE
EAST AREA 1, 300 ZONE
200 ZONE

CASE TANK
HWL=960
0.50 MG
LWL=936

MESA #1 TANK
HWL=827
0.23 MG
LWL=803

MESA #2 TANK
HWL=827
0.23 MG
LWL=803

PECK TANK
HWL=658
0.50 MG
LWL=634

TEAGUE TANK
HWL=658
0.21 MG
LWL=634

FUCHSIA TANK
HWL=658
0.50 MG
LWL=634

CHERRY HILL TANK
HWL=657
0.47 MG
LWL=636

CANYON BPS

PRV

EAST AREA 1 TANKS

HWL=560
2.0 MG
LWL=535

HWL=560
3.0 MG
LWL=535

ANDERSON TANK
HWL=488
0.62 MG
LWL=446

4.0 MG TANK

LIMONERA TANK
HWL=476
0.48 MG
LWL=440

MAIN RESERVOIR
HWL=488
4.40 MG
LWL=458

ANDERSON BPS

TERRICINA 600 BPS

GLADE DR. BPS

VIEW DR. BPS

TERRACINA 400 BPS

PARK STREET BPS

STECKEL TREATMENT FACILITY

WELLS LOCATED IN EAST AREA 1 DEVELOPMENT

LEGEND

- W — WELL AND PUMP
- P — PUMP
- EAST AREA 1 ZONE

SCALE

VERTICAL GRADIENT SCALE
1 UNIT = 100'
100'
50'
0'

HORIZONTAL TANK VOLUME SCALE
1 UNIT = 1.5 MG
0 1
0 .5 1 1.5
MG MG MG MG

# FIGURE B

**GRADIENT SCHEMATIC WITH EAST AREA 1 AND 2 IMPROVEMENTS**

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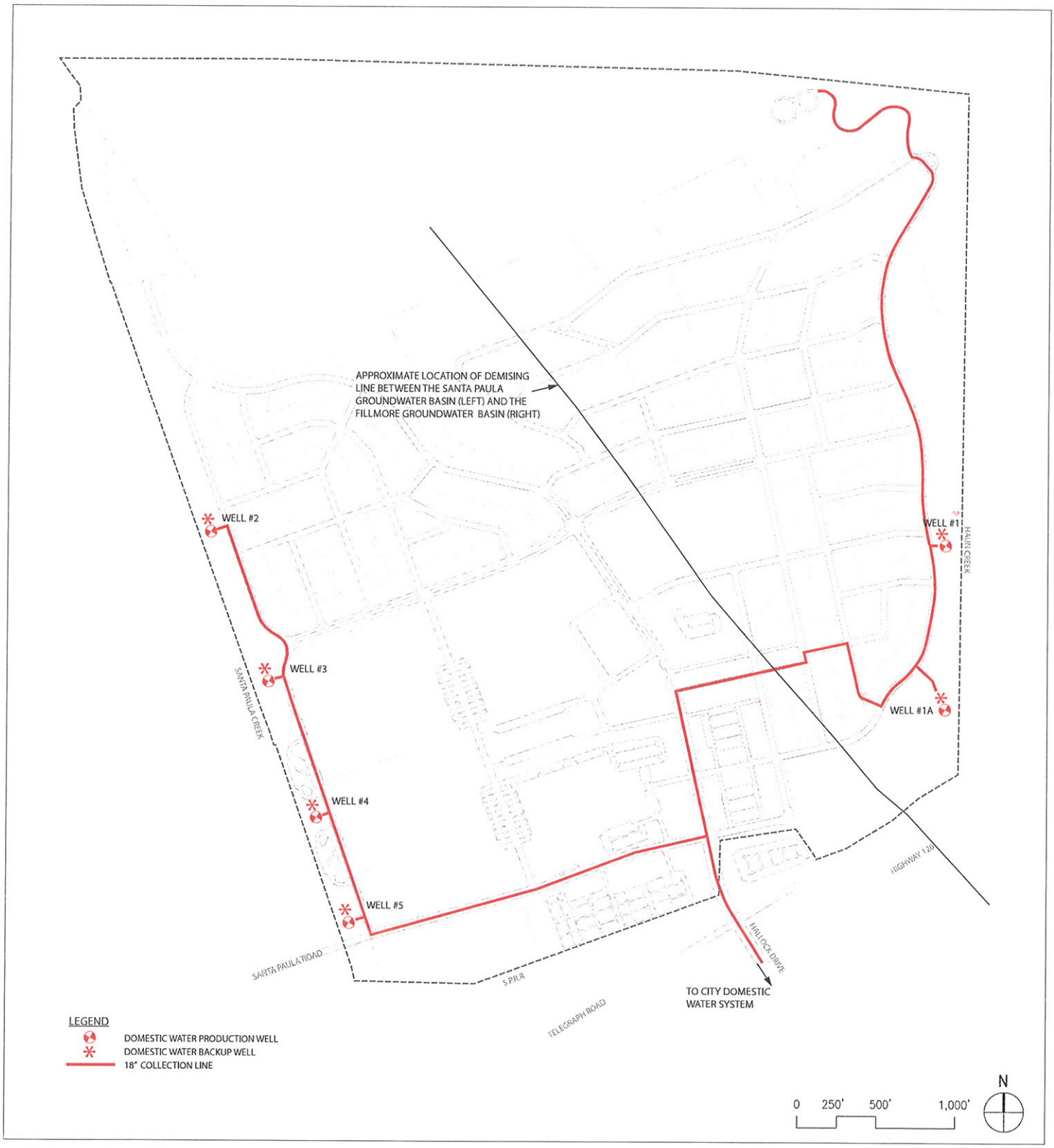
Figure C: Water Well Field Schematic




Jensen Design and Survey, 2011

## TABLE I

**EAST AREA ONE**

**SUMMARY OF ULTIMATE DOMESTIC WATER LAND USES AND DEMANDS**

| PROPOSED LAND USE | TOTAL UNITS | Area (Acres) | DEMAND RATES | Annual Demand (AF) | AVERAGE DAILY FLOW (GPM) | MAXIMUM DAY DEMAND (GPM) (1.5*ADD) | PEAK HOUR DEMAND (GPM) (2.7*MDD) |
|---|---|---|---|---|---|---|---|
| **Residential**[1] | **1500 units** | | | | | | |
| Single Family Attached | 266 units | | 163 gpd/person | 182.1 | 112.9 | 169.37 | 304.9 |
| Single Family Detached | 607 units | | 163 gpd/person | 387.9 | 240.5 | 360.72 | 649.3 |
| Multifamily | 627 units | | 163 gpd/person | 400.7 | 248.4 | 372.61 | 670.7 |
| **Light Industrial** | **150,000 sq. ft.** | | **2.49 gal/sq.ft/yr** | **1.1** | 0.7 | 1.07 | 1.9 |
| **Commercial** | **285,000 sq. ft.** | | **15.1gal/sq.ft/yr** | **13.2** | 8.2 | 12.28 | 22.1 |
| **Civic/Institutional** | | | | | | | |
| Elementary School | | 10.8 | 1.81 AFY/acre | 19.5 | 12.1 | 18.18 | 32.7 |
| High School | | 8.3 | 1.81 AFY/acre | 15.0 | 9.3 | 13.97 | 25.1 |
| Postsecondary Education | | 11.6 | 1.81 AFY/acre | 21.0 | 13.0 | 19.53 | 35.1 |
| Shared Facilities | | 5.6 | 1.81 AFY/acre | 10.1 | 6.3 | 9.43 | 17.0 |
| | | | | | | | |
| **Other Water Consumption** | | | | | | | |
| Shared Athletic Fields | | 23.2 | 2.22 AFY/acre | 51.5 | 31.9 | 47.90 | 86.2 |
| Parks/Greenways | | 65.8 | 2.22 AFY/acre | 146.1 | 90.6 | 135.84 | 244.5 |
| Agricultural Preserve (irrigated) | | 55.0 | 2.02 AFY/acre[2] | 111.1 | 68.9 | 103.32 | 186.0 |
| Open Space Preserve (not irrigated) | | 79.4 | No water use | 0.0 | 0.0 | 0.00 | 0.0 |
| | | | | | | | |
| **TOTAL** | | | | 1,359.4 | ***842.80*** | ***1264.20*** | ***2275.56*** |

[1] Demand is estimated at 3.75 residents per dwelling for Single Family Attached units and 3.50 residents per dwelling in bith Single Family Detached and Multifamimly Units.

[2] Estimate of water demand for agricultural uses is based on use over the last five years required to irrigate336 acres of land under production (816.3 AFY/405 acres = 2012 AFY/acre)

**TABLE II**

| Development Area | WATER DEMAND (AF/ac/yr) [2] | AREA (AC)[1] | ANNUAL DEMAND (AF/yr) [4] | EXISTING USE | EXISTING DEMAND (AF/yr) | INCREASE IN ANNUAL DEMAND (AF/yr) |
|---|---|---|---|---|---|---|
| A | 2.0 | 32.3 | 65 | Undeveloped | 0 | 65 |
| B | 2.0 | 2.1 | 4 | Undeveloped | 0 | 4 |
| C | 2.0 | 8.1 | 16 | Light Industrial | 16 | 0 |
| D | 2.0 | 26.0 | 52 | Undeveloped | 0 | 52 |
| E | 2.0 | 6.0 | 12 | Residential/Light Industrial | 10 | 2 |
| F | 2.0 | 7.0 | 14 | Light Industrial | 14 | 0 |
| G | 2.0 | 2.6 | 5 | Light Industrial | 5 | 0 |
| H | 2.0 | 0.9 | 2 | Light Industrial | 2 | 0 |
| I | 2.0 | 5.2 | 10 | Industrial | 10 | 0 |
| J | 570.5 GPD/UNIT[2] | 8 UNITS | 5 | Residential | 5 | 0 |
| | | | | | TOTAL | 123 |

NOTES:

[1] Flows calculated based on gross acreage of Development Area

[2] Based on 15gal/SF/yr obtained from approved 2005 City of Santa Paula Water Master Plan.

| | | |
|---|---|---|
| TOTAL AVERAGE DAILY DEMAND (GPM)= | 76 | GPM |
| Maximum Daily Demand (GPM), MDD = 1.5*ADD= | 114.3 | GPM |
| Peak Hour Demand (GPM) = 2.7*MDD= | 308.6 | GPM |

# TABLE III

## EAST AREA 1

Minimum Tank Storage Capacity for East Area 1 and East Area 2 Developments

| | | Fire | | | | | Daily Reglatory Storage (Gal) | | | Total Storage Required (MG) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reservior | HWL | Flow (GPM) | Duration (Hrs) | Required Fire Storage (Gal) | MDD (GPM)* | 8-Hr Emergency Storage (Gal) | 24-Hr Basis | 18-Hr Basis | 9-Hr Basis | 24-Hr Basis | 18-Hr Basis | 9-Hr Basis | Reccomended Storage (MG) | Tank Capacity (MG) | Surplus Capacity (MG) | Basis of Reccomendation |
| 1 | 560 | 4500 | 4 | 1,080,000 | 1378.51 | 661,684 | 578,974 | 851,919 | 1,761,735 | 2.32 | 2.59 | 3.50 | 2.59 | 3.00 | 0.41 | 18-Hr Basis |

*Because 3.0MG tank will be sized for both East Area 1 and East Area 2, the $MDD_{,TOTAL}$= ($MDD_{,EA1}$ + $MDD_{,EA2)}$

Well Pump Station Capacity

| | | | | Required Flow for East Area 1 at MDD (GPM) | | | | | Deficit For: | | | Capacity For: | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pump Station | No. of Duty Pumps | Pump Capacity[1] | No. Of Standy Pumps | 24-Hr Basis | 18-Hr Basis | 12-Hr Basis | 9-Hr Basis | Reservior Basis | 24-Hr GPM | 18-Hr GPM | 9-Hr GPM | 24-Hr GPM | 18-Hr GPM | 9-Hr GPM |
| Well #1 | 1 | 1000 | 1 | | | | | | | | | | | |
| Well #1A | 1 | 1000 | 1 | | | | | | | | | | | |
| | 2 | 2000 | 2 | 1378.51 | 1838.01 | 2757.02 | 3676.02 | 18-Hr Basis | -621.49 | -161.99 | 1676.02 | yes | yes | no |