

SEP 11 2008



Chandler · Arizona
Where Values Make The Difference

MEMORANDUM**MUNICIPAL UTILITIES DEPARTMENT MEMO ER9-012**

DATE: SEPTEMBER 11, 2008

TO: MAYOR AND COUNCIL

THRU: W. MARK PENTZ, CITY MANAGER *WMP*
PAT MCDERMOTT, ASSISTANT CITY MANAGER *PM*
DAVE SIEGEL, MUNICIPAL UTILITIES DIRECTOR

FROM: GREGG CAPPS, WATER RESOURCE MANAGER *GCC*

SUBJECT: ADDENDUM TO ITEM 15 - CLARIFICATION OF PEAK HOUR DEMAND

The purpose of this memo is to clarify the criteria we use to design our water infrastructure. At the September 8, 2008 Study Session, it was indicated that we use peak hour water demand to design our water infrastructure. To expand upon that, we use existing peak hour and maximum day water production data to provide a ratio that reflects Chandler's water demand characteristics. We then use this ratio to provide the minimal standards we need for buildout capacity. During peak hour flows, pressure in the system is at its lowest. The ability to meet peak hour demand is critical in order to have adequate pressure to satisfy fire flow, residents and industry needs.

Infrastructure built to meet these peak demands are needed during the summer months. Chandler's water demands rise and fall during a 24-hour period with the highest peak occurring early in the morning around 7:00 am. The maximum peak hour flows occur during the months of June, July, and August. Water demands in the summer months approach the maximum day and corresponding peak hour demands on a regular basis.

Flow out of the storage reservoirs is at its maximum rate during the peak hour flow rate. The storage reservoirs, wells, and booster pumps must provide adequate outflow to meet this rate and be able to provide fire flow when required. Capital improvements were recommended in the Water System Master Plan to sustain water system performance during high demand periods.



Chandler · Arizona
Where Values Make The Difference

BR1
SEP 08 2008

15
SEP 11 2008

MEMORANDUM

MUNICIPAL UTILITIES DEPARTMENT MEMO ER9-011

DATE: SEPTEMBER 11, 2008

TO: MAYOR AND COUNCIL

THRU: W. MARK PENTZ, CITY MANAGER
DAVE SIEGEL, MUNICIPAL UTILITIES DIRECTOR

FROM: GREGG CAPPS, WATER RESOURCE MANAGER *DMC*

SUBJECT: ACCEPTANCE OF THE 2008 INTEGRATED WATER, WASTEWATER AND RECLAIMED WATER MASTER PLAN

RECOMMENDATION:

Staff recommends Council accept the 2008 Integrated Water, Wastewater, and Reclaimed Water Master Plan.

BACKGROUND AND DISCUSSION:

Master planning the City's water, wastewater, and reclaimed water systems on a regular basis is required so infrastructure can be constructed at the proper time and location. A reliable, well-planned utility system is essential to the City successfully serving its residential, commercial and industrial customers. The Master Plan update incorporated the City's planning direction that was identified in the General Plan Update. The General Plan was updated concurrently with the Master Plans. Funding for these capital improvement projects, as well as system development fees, are based on the Master Plan.

The Integrated Master Plan is based on a common land use plan with a rate of land development consistent with residential, commercial and industrial growth projections. It is projected the average annual water supply needs will be 84.4 million gallons per day (mgd) with peak summer demands reaching 122.3 mgd.

As outlined in the Executive Summary, key features of the Integrated Water, Wastewater and Reclaimed Water Master Plan include:

Water

- The Santan Vista (Joint Chandler/Gilbert) and Pecos Water Treatment Plants provide 84 mgd treatment capacity and dual surface water sources for system reliability;
- New pressure zone boundary stabilizes system pressure and operation of Zone 1 (West Chandler);
- New groundwater wells provide supply reliability with a treatment capacity of 74.2 mgd;
- Booster Pump Station upgrades improves system operation and saves energy;
- Total water treatment capacity will meet the annual average day demand during an emergency outage at either the Pecos or Santan Vista Water Treatment Plants. This amount of back-up supply meets the basic needs for the health, safety and welfare of each household.

Wastewater

- Completed West Chandler Wastewater Management Analysis with technically feasible options to collect and treat wastewater currently delivered to Lone Butte Water Reclamation Facility (WRF);
- Recommendation of a 10 mgd treatment expansion for West Chandler, future growth, and committed industrial wastewater flows;
- West Chandler Lift Station and Dual Force Mains to be completed by 2017;
- Force Mains interconnecting the Water Reclamation Facilities to transfer wastewater and reclaimed water increases redundancy;
- Five mgd expansion of Chandler's wastewater treatment capacity by 2017 if necessary.

Reclaimed Water

- Reconfigured delivery system saves costs and improves operation;
- Chandler's recharge facilities provide for 100% reclaimed water utilization;
- Recharge and reuse facilities at multi-use sites provide for better use of land resources.

These improvements will allow the City to follow its buildout strategy by using a coordinated approach to successfully complete the required infrastructure.

FINANCIAL IMPLICATIONS:

The Integrated Master Plan process identified a combined infrastructure improvement program totaling more than \$628 million. At buildout, the components are projected to cost \$213 million for water, \$373 million for wastewater, and \$42 million for reclaimed water. Funding and budgets for these infrastructure improvements will be addressed with the proposed 2009-2014 Capital Improvement Plan and in future Capital Improvement Plans.

PROPOSED MOTION:

Move to accept the 2008 Integrated Water, Wastewater, and Reclaimed Water Master Plans as recommended by staff.

Attachments: 2008 Integrated Water, Wastewater, and Reclaimed Water Master Plans Executive Summary and Presentation Slides with a hard copy maintained in the City Clerk's Office.



Chandler + Arizona
Where Values Make The Difference

DRAFT
Buildout & Beyond



**WATER, WASTEWATER, RECLAIMED WATER
MASTER PLAN UPDATE**

PROJECT NO. WA0710-101

Executive Summary

September 2008



carollo
Engineers...Working Wonders With Water™

in association with

**BROWN AND
CALDWELL**

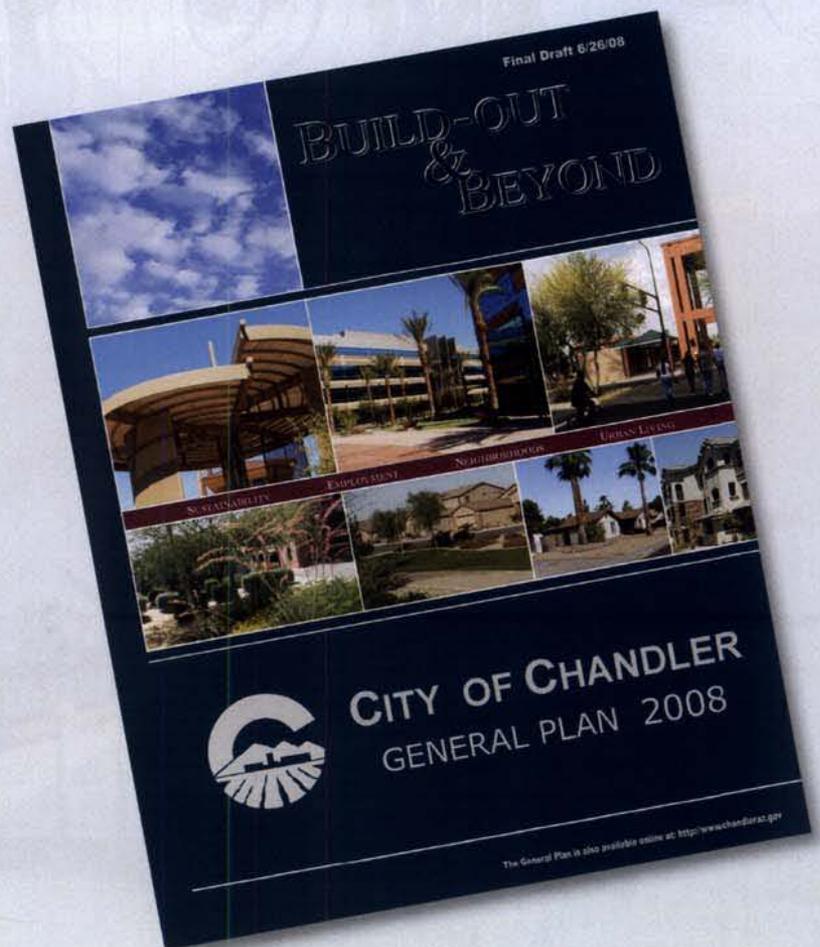
Buildout & Beyond

As the City of Chandler approaches residential buildout, its focus shifts from keeping pace with rapid growth to preparing for the future beyond buildout. The recently approved General Plan 2008 describes the City's vision for the future. At buildout and beyond, Chandler seeks to create a sustainable city through careful planning with a focus on economic development and revitalization.

The 2008 Water, Wastewater, Reclaimed Water Master Plan Update aligns with and builds upon the General Plan 2008 themes of economic development and revitalization.

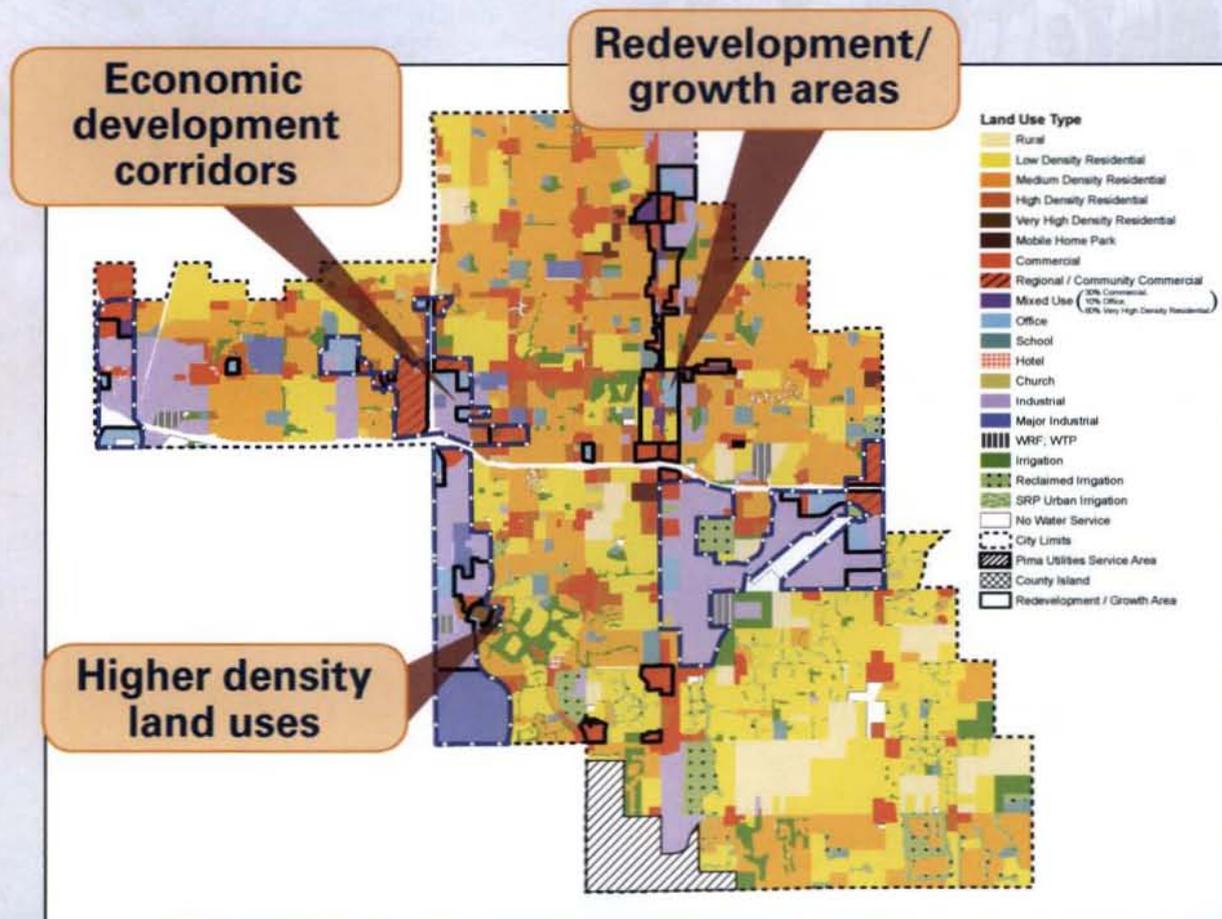
Land Use Drives Master Planning

The goals and objectives of the General Plan 2008 were incorporated into the Master Plan through the land use plan.



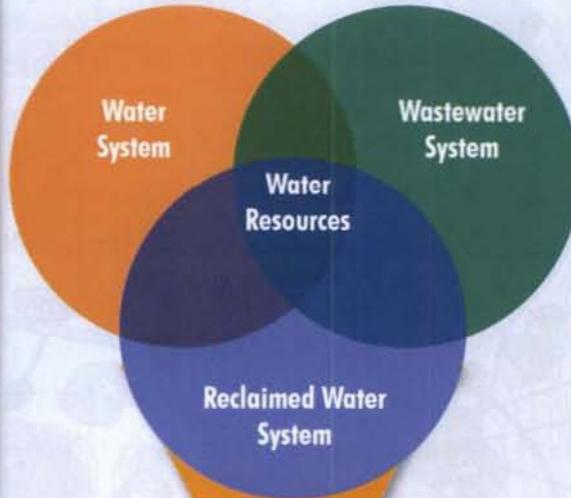
The Land Use Plan is an expression of the General Plan's vision

- Land Use Plan expresses the General Plan's vision of future economic development and community revitalization through higher density land uses, redevelopment/growth areas, and economic development corridors.
- Land use is the basis for water and wastewater projections.
- Water demand and wastewater flow projections are fundamental to assessing existing infrastructure and planning for future expansions and improvements.

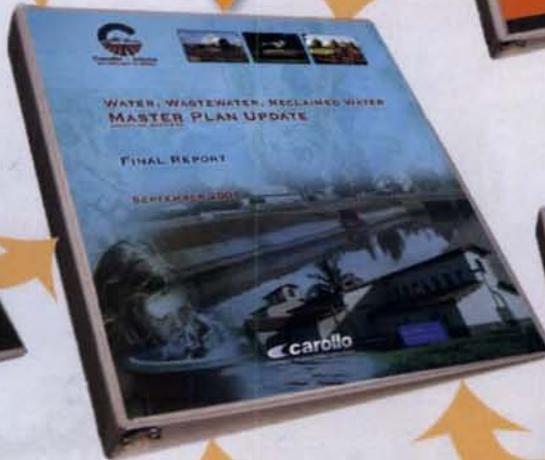
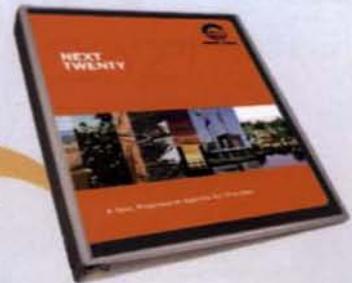
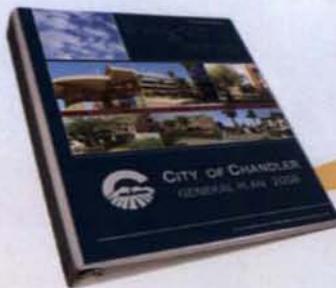


2008 Master Plan

"Integration" is the process of planning and designing infrastructure in a coordinated manner to maximize the use of available water resources.



The Master Plan consists of strategies to develop, manage, and use Chandler's surface water, groundwater, and reclaimed water resources. The Master Plan has been developed utilizing an integrated approach.





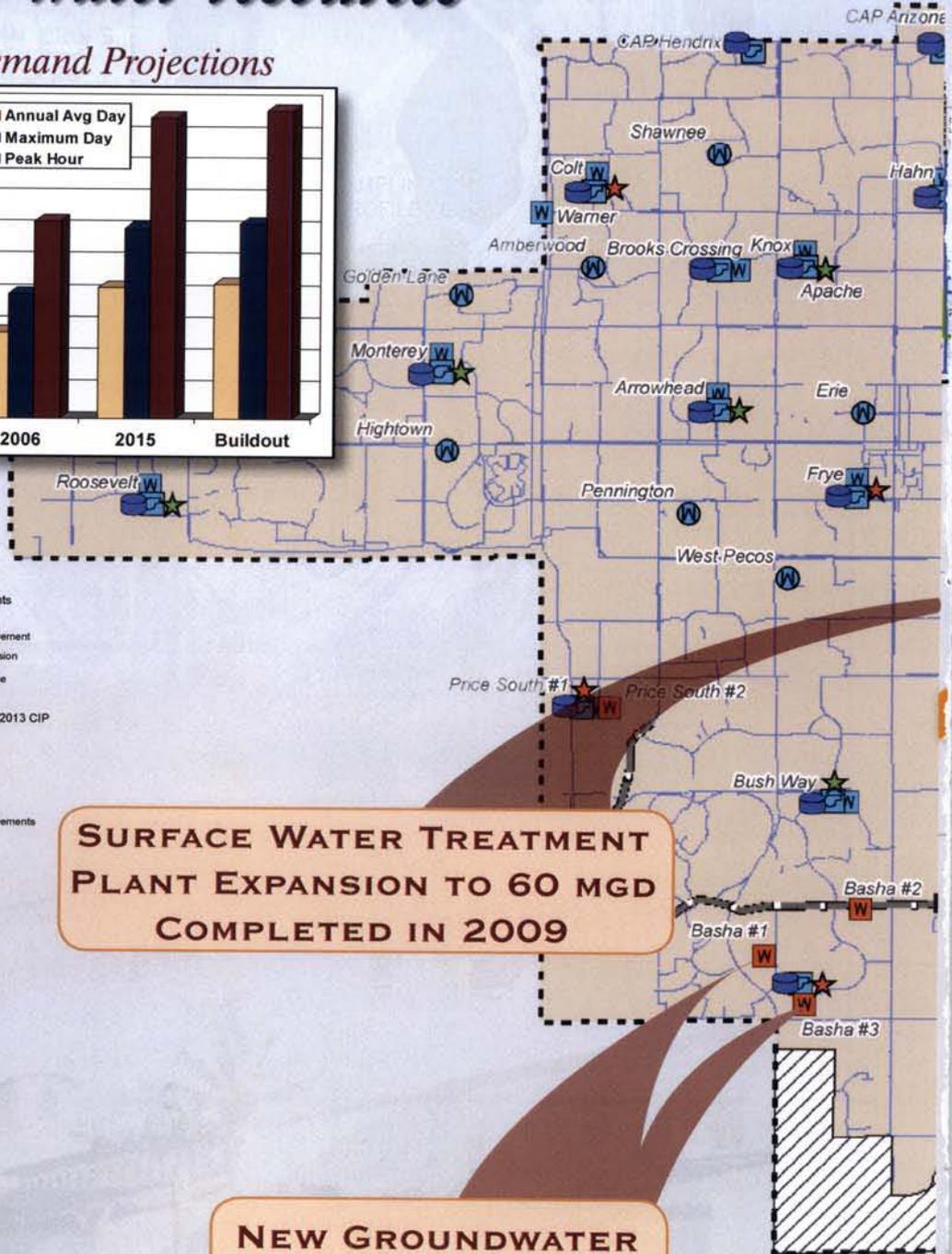
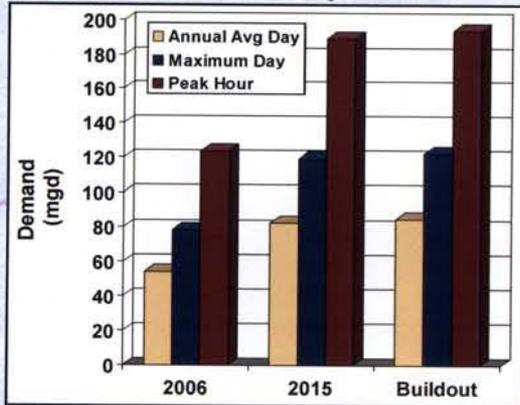
Chandler's Toolbox for FUTURE PLANNING

*The Master Plan
utilized
Chandler's
toolbox for
Planning
Maintaining
Expanding
Revitalizing
the City's
infrastructure.*



Water System Master Plan provides for flexible and efficient use of water resources

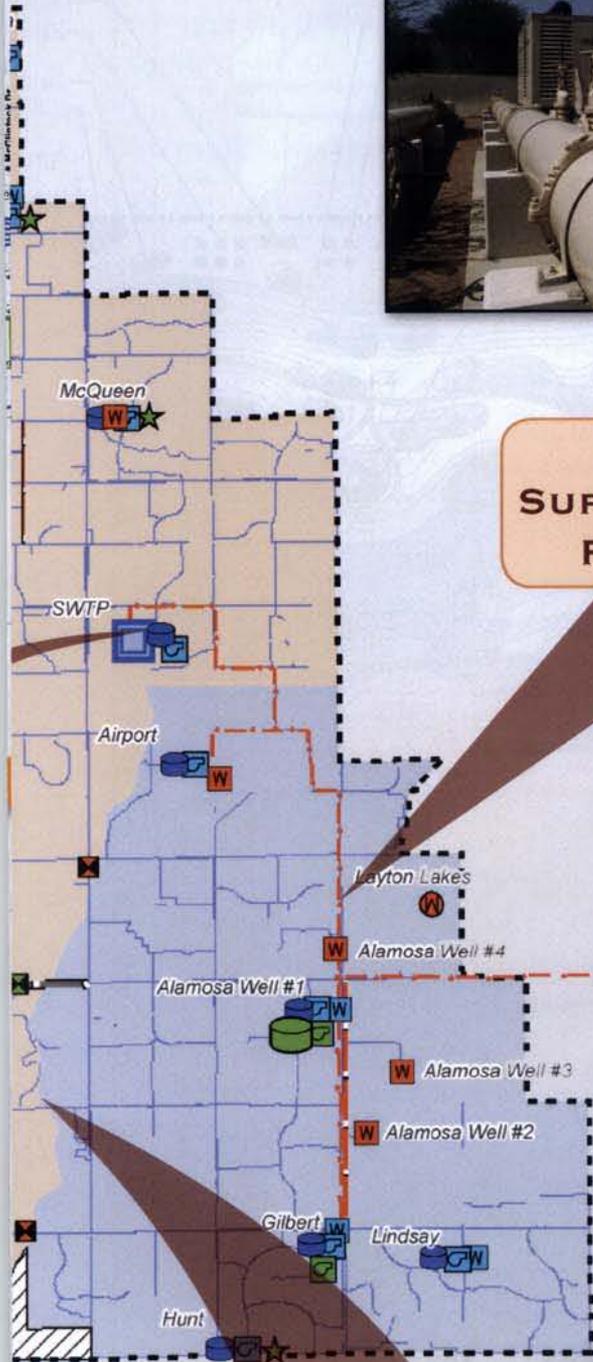
Water Demand Projections



- Proposed New CIP Improvements**
- Type
- ★ Booster Pump Station Improvement
 - ⊕ Booster Pump Station Expansion
 - ⊕ Additional Operational Storage
 - ⊕ PRV
- Water Facilities from FY 2008 - 2013 CIP**
- Type
- ⊕ WTP
 - ⊕ Direct Discharge Well
 - ⊕ Well Discharging to Storage
 - ★ Booster Pump Station Improvements
 - ⊕ PRV
- Transmission Mains**
- Diam
- 12"
 - 16"
 - 24" (Proposed to be Deleted)
 - Reservoir Supply System
- Existing Water Facilities**
- Type
- ⊕ WTP
 - ⊕ Reservoir
 - ⊕ Booster Pump Station
 - ⊕ Well Discharging to Storage
 - ⊕ Direct Discharge Well
- City Limits
- ▨ Pima Utilities Service Area
- Transmission Mains
- Future Pressure Zones**
- 1
 - 2

SURFACE WATER TREATMENT PLANT EXPANSION TO 60 MGD COMPLETED IN 2009

NEW GROUNDWATER WELLS



**NEW RESERVOIR
SUPPLY SYSTEM SERVES
PRESSURE ZONE 2**



**NEW PRESSURE ZONE
BOUNDARY IMPROVES
OPERATION**

**SANTAN VISTA WATER
TREATMENT PLANT
COMPLETED IN 2009**

KEY FEATURES

- ◆ Santan Vista and Pecos Water Treatment Plants provide 84 mgd treatment capacity and dual surface water sources for system reliability.
- ◆ New pressure zone boundary stabilizes system pressure and operation of Zone 1.
- ◆ New groundwater wells provide water supply reliability with a production capacity of 74.2 mgd.
- ◆ Well capacity maintenance.
- ◆ Booster Pump Station upgrades improve system operation and saves energy.
- ◆ Alamosa WPF operational storage.
- ◆ Total water treatment capacity will meet the annual average day demand during an emergency outage at either the Pecos or Santan Vista Water Treatment Plants. This amount of supply reliability will meet the basic needs for health, safety, and welfare of each household.
- ◆ Future Asset Management program.

Decision Making Process Resolves Wastewater Management Approach

The West Chandler Wastewater Management Study was a systematic approach to evaluating treatment alternatives for wastewater generated in West Chandler. The purpose of the study was to develop alternatives to the Lone Butte Wastewater Treatment Plant when the facility's lease agreement expires in 2017.

Decision Matrix



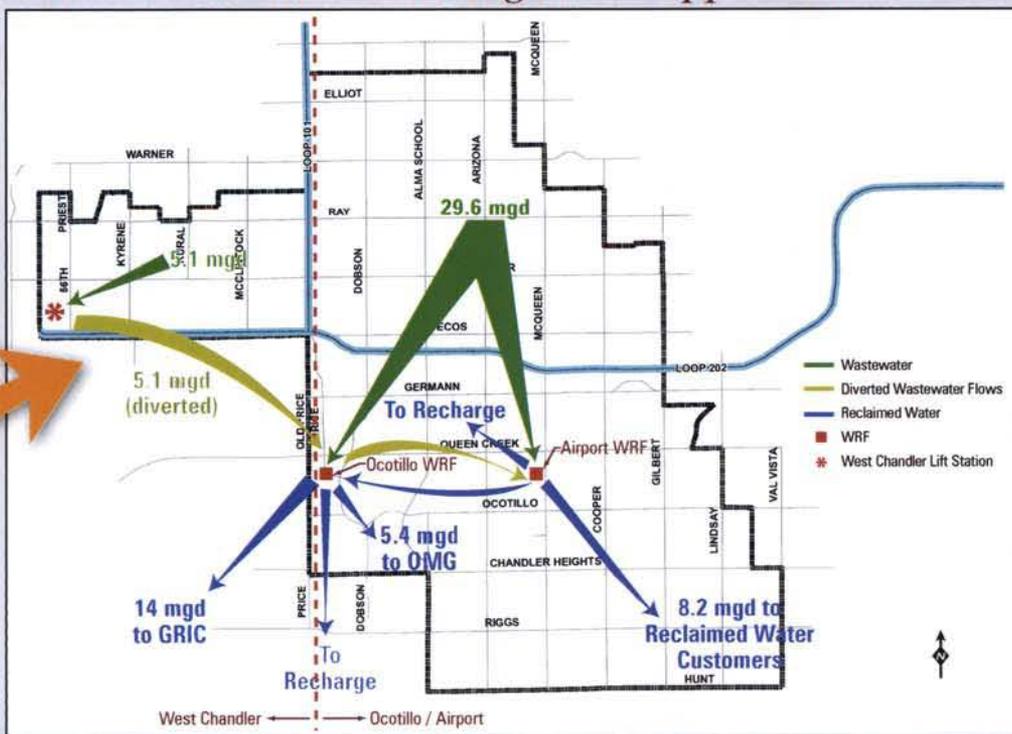
Wastewater management alternatives were evaluated based upon technical/institutional issues and estimated budgetary costs. The City used a weighting and ranking system to select the preferred wastewater management approach.

Evaluation Criteria	Weighting Factor	Ranking	Description
Estimated Project Cost	20		
Compatibility with Surrounding Community	20		
Long-Term Operations and Maintenance Costs	15		
Vulnerability to Catastrophic Failure (force mains, treatment facility, influent sewer, reclaimed water distribution)	10	6	Best alternative at satisfying the criterion
Reclaimed Water Management	10	5	Much better at satisfying the criterion than the other alternatives
Operational Flexibility to Receive or Divert Wastewater	10	4	Better at satisfying the criterion than the other alternatives
Right-of-Way/Easement/Permit Acquisition	5	3	Of equal satisfaction as the other alternatives
Disruption to Community During Construction	5		
Operational Control of Facilities	5	2	Less able to satisfy the criteria than the other alternatives
TOTAL	100	1	Much less able to satisfy the criteria than the other alternatives



Management of wastewater from West Chandler has a significant impact on the Wastewater and Reclaimed Water Master Plans.

Selected Wastewater Management Approach

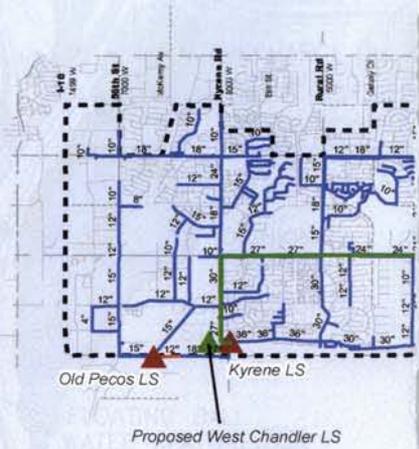
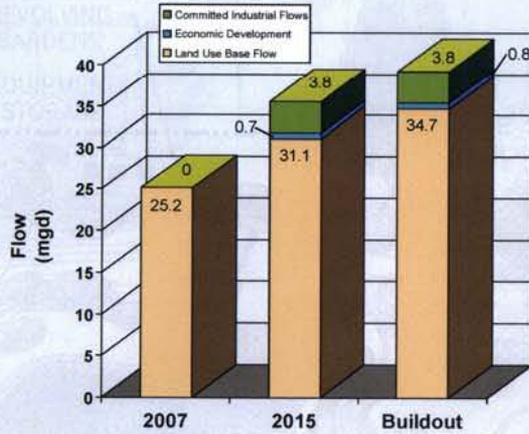


KEY RECOMMENDATIONS RELATED TO LONE BUTTE REPLACEMENT

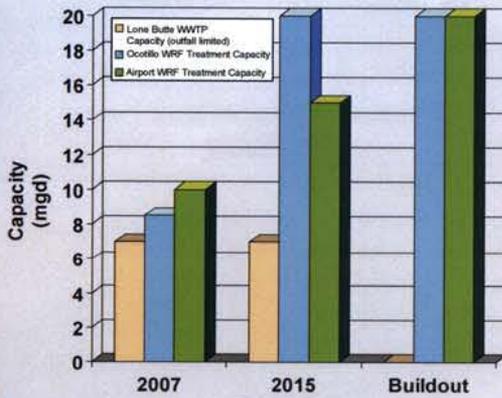
- The Lone Butte Wastewater Treatment Plant agreement will be allowed to expire in 2017.
- A new lift station and dual force mains will be constructed in West Chandler to convey wastewater to the Ocotillo Water Reclamation Facility.
- Ocotillo Water Reclamation Facility will be expanded to treat increased flows.
- The existing Ocotillo Water Reclamation Facility will be upgraded for future reliability and improved odor control.

Wastewater System Master Plan solidifies future conveyance and treatment

Projected Flows



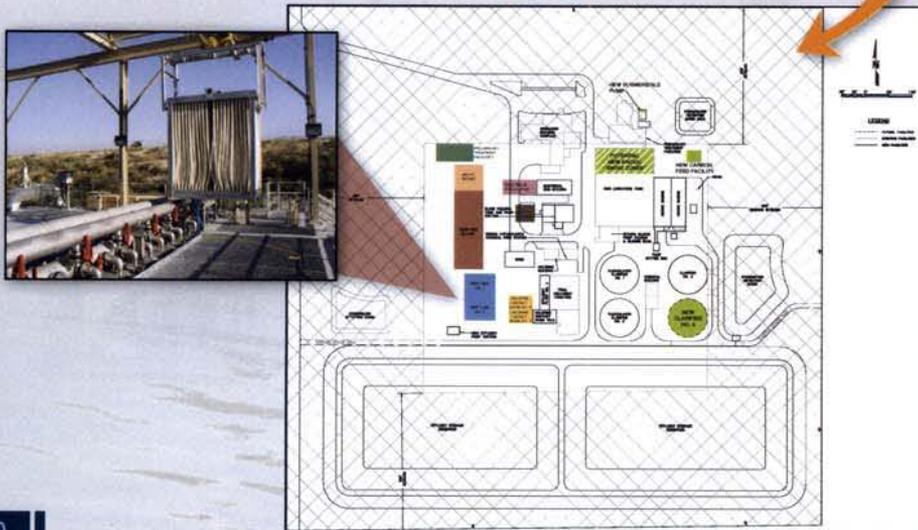
Plant Capacity

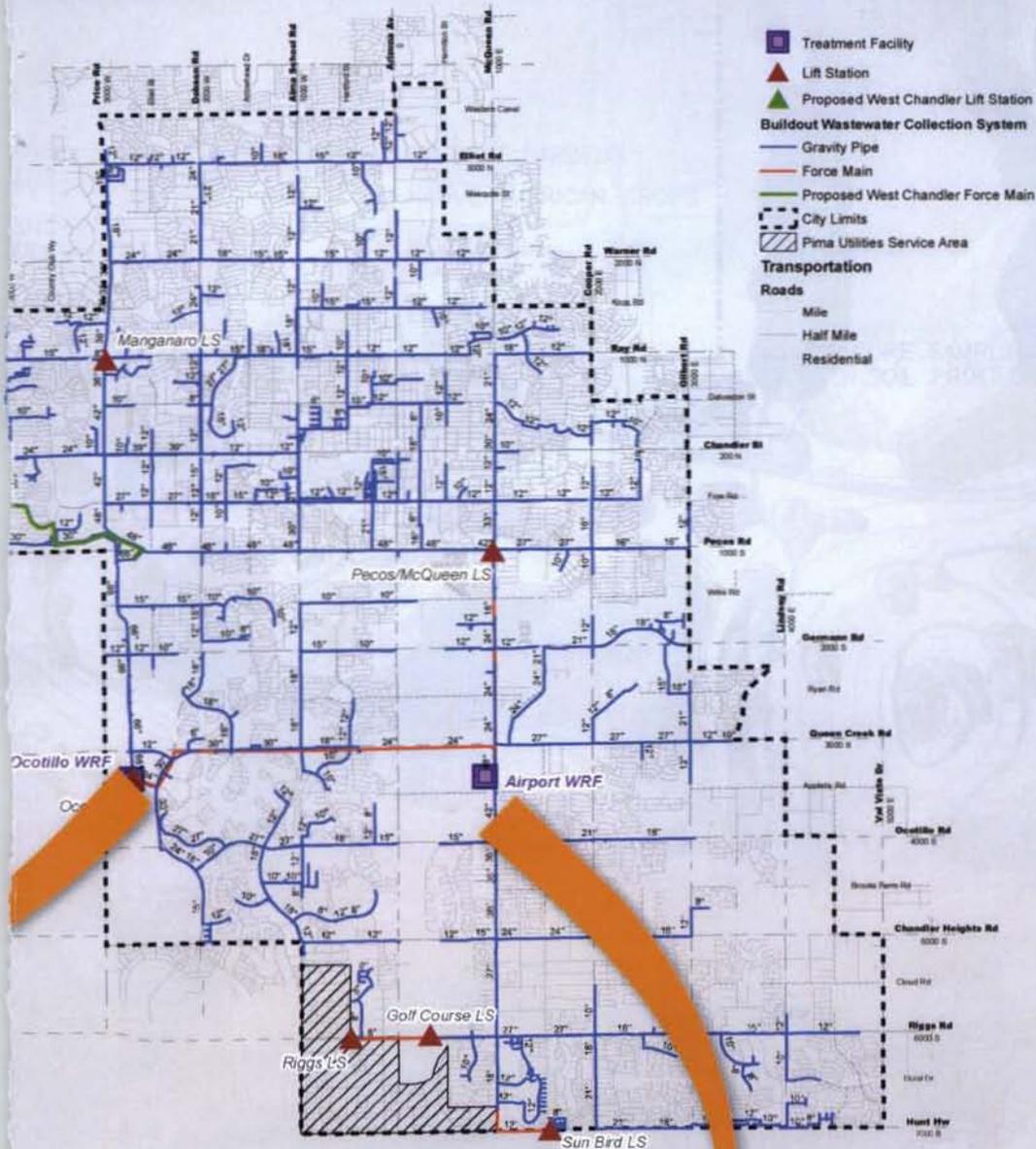
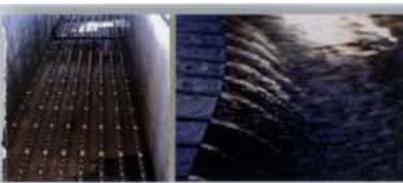


Ocotillo WRF



10 mgd Site Expansion





Airport WRF

KEY FEATURES

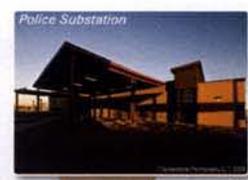
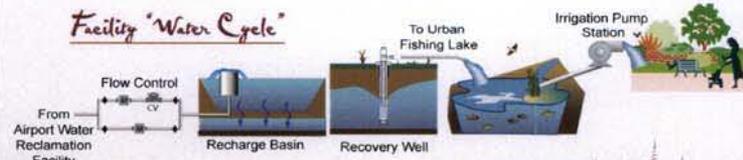
- ◆ Recommendation for 10 mgd treatment expansion at the Ocotillo Water Reclamation Facility (WRF) for West Chandler, future growth, and committed industrial wastewater flows.
- ◆ Ocotillo WRF Expansion Preliminary Design/ Feasibility Study.
- ◆ Ocotillo WRF Short Term Improvements.
- ◆ West Chandler Lift Station and Dual Force Main by 2017.
- ◆ 5 mgd expansion of WRF capacity for future growth by 2017.
- ◆ Commitment to ongoing asset management program for rehabilitation of facilities and sewer interceptors.
- ◆ Force mains interconnecting water reclamation facilities to transfer wastewater and reclaimed water increases redundancy and reliability.
- ◆ Rehabilitation of 66-inch sewer interceptor.

Reclaimed Water System

Master Plan maximizes the utilization of a sustainable water resource

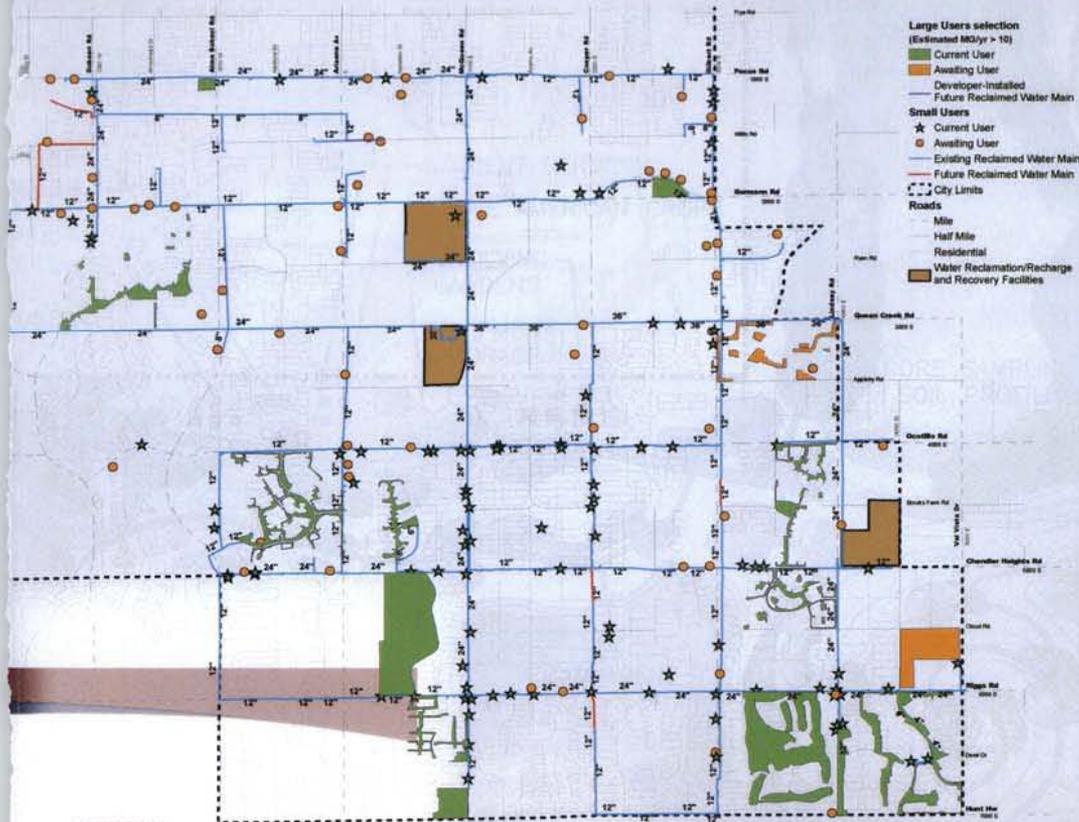


Chandler Heights Recharge Facility



Veterans Oasis Park





KEY FEATURES

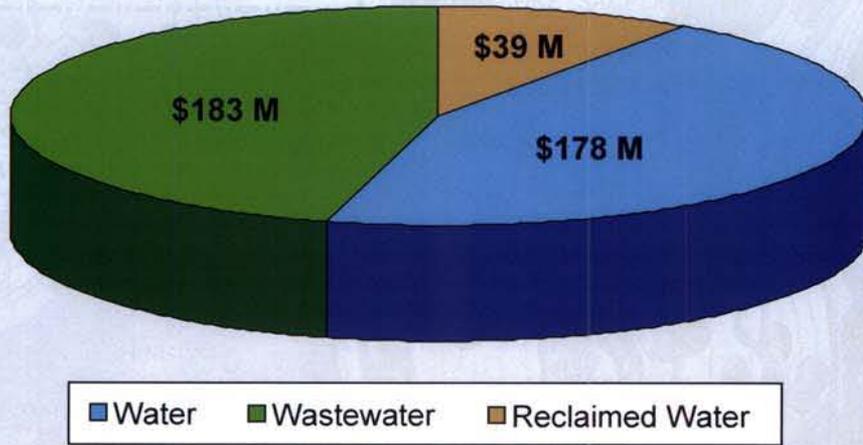
- Ocotillo WRF GRIC, and recharge pump station expansion.
- Aquifer storage and recovery well capacity expansion.
- Reconfigured delivery system saves costs and improves operation.
- Chandler's recharge facilities provide for 100% reclaimed water utilization.
- System operation is managed through scheduling of user deliveries.
- Locating recharge and reuse facilities at the City's multi-use sites provides for efficient use of land resources.



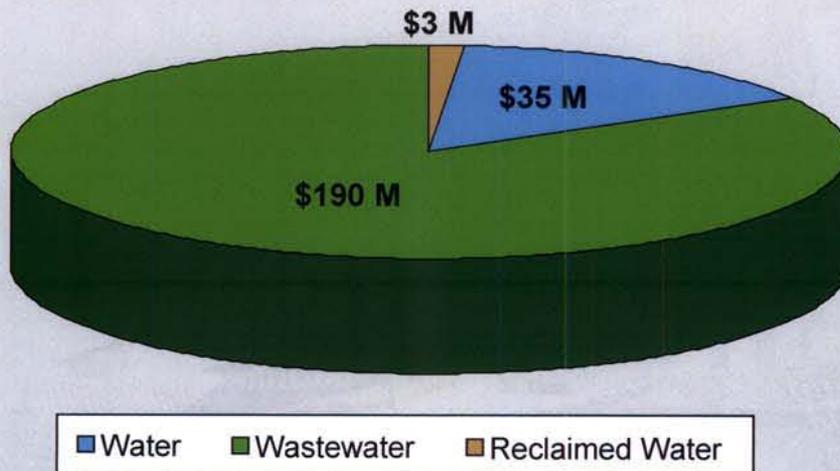
Tumbleweed Park Recharge and Recovery Facility

The Master Plan defines Chandler's buildout CIP

*Proposed 2008-2013 CIP Costs Totaling \$400 M
(escalated to time of construction)*



*Proposed 2013-Buildout CIP Costs Totaling \$228 M
(escalated to time of construction)*





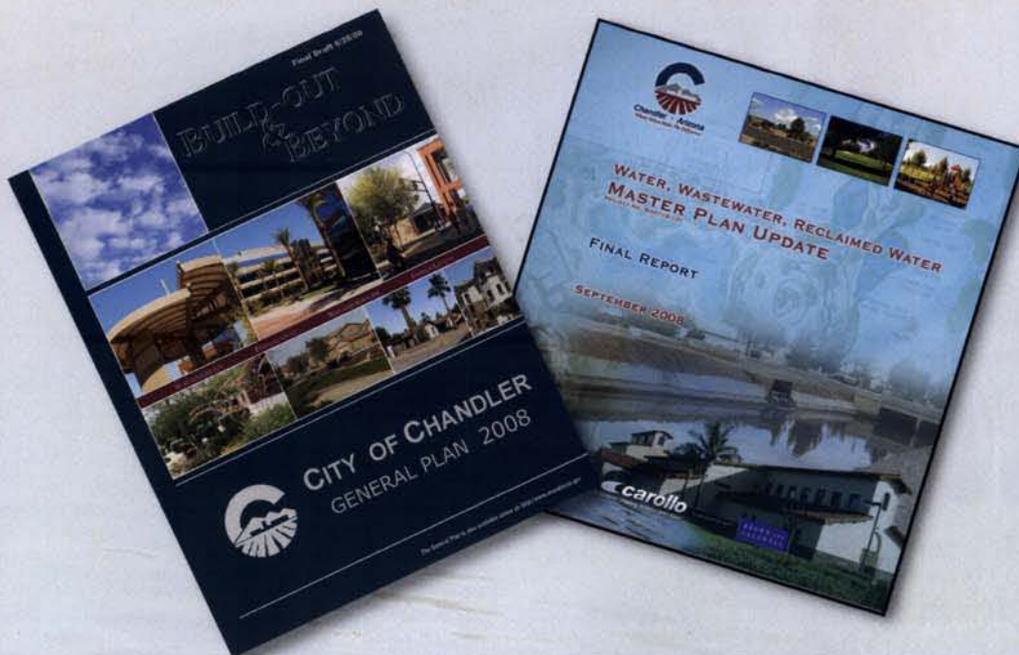
Buildout & Beyond...

MASTER PLAN UPDATE PROVIDES FOR A...

- Flexible*
- Reliable*
- Sustainable*

WATER, WASTEWATER, AND RECLAIMED WATER SYSTEM INCORPORATING...

- Interconnected water reclamation facilities.*
- Expanded/upgraded Ocotillo Water Reclamation Facility.*
- Integration of the Santan Vista Water Treatment Plant and Reservoir Supply System.*
- 100% reclaimed water utilization.*
- Dual surface water source capabilities.*



ACKNOWLEDGEMENTS

The Carollo Engineers/Brown and Caldwell team wishes to extend its appreciation and gratitude to all of the City staff members who contributed their time and expertise to the success of this project:

- Planning and Development Department
- Public Works Department/Engineering Division
- Municipal Utilities Department



carollo
Engineers...Working Wonders With Water™

in association with

**BROWN AND
CALDWELL**

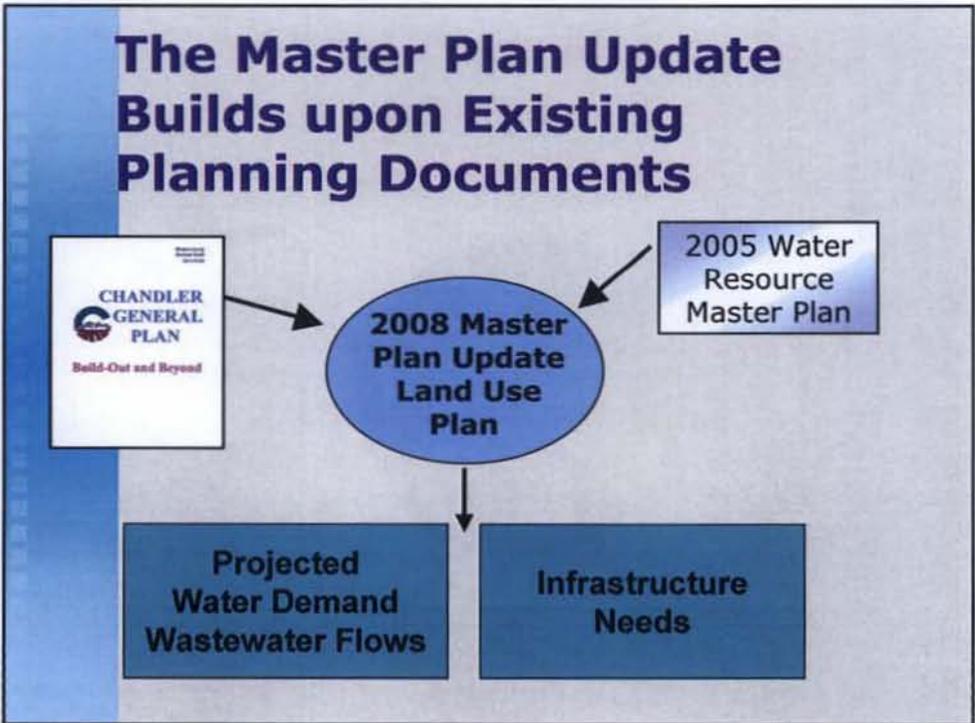


Chandler • Arizona
Where Great People Do Great Things

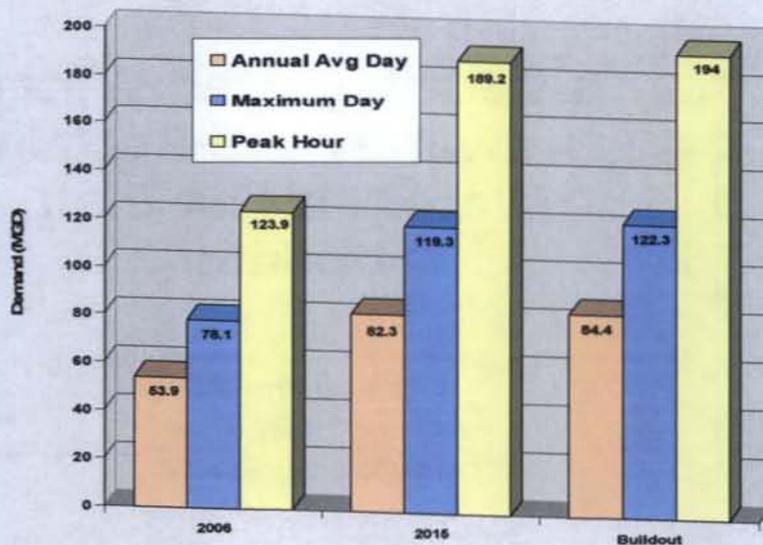
2008 Integrated Water, Wastewater, and Reclaimed Water Master Plan Update

MUNICIPAL UTILITIES DEPARTMENT

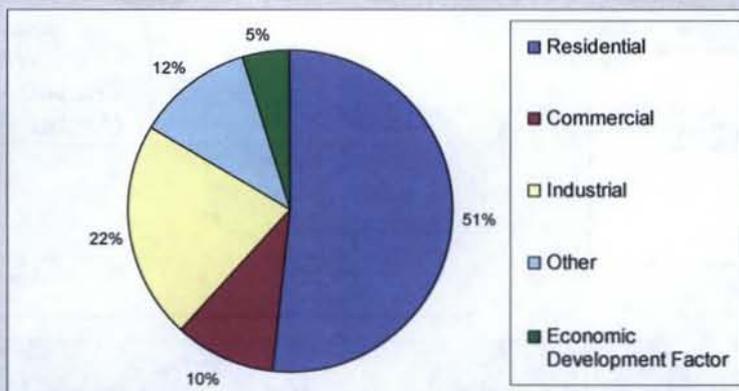
City of Chandler
Council Study Session
September 8, 2008



Water Demand Projections

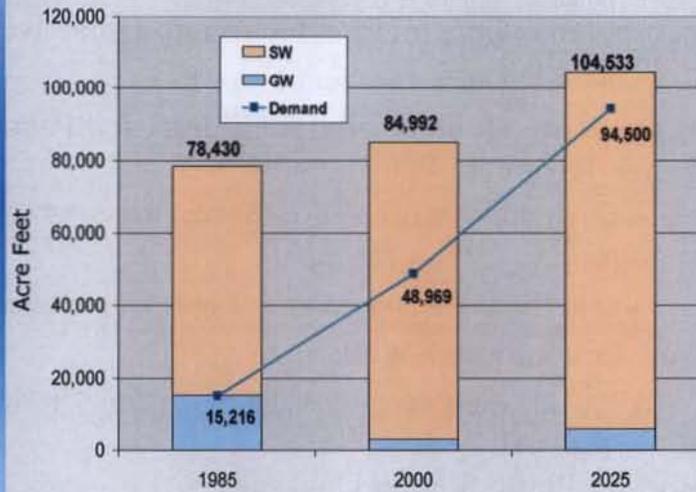


Water Usage At Build-Out

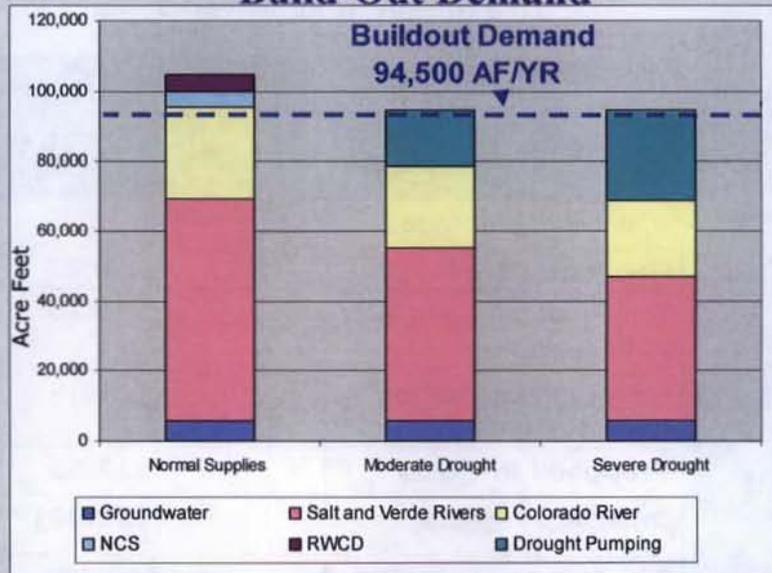


Note: Other water usage includes irrigation for parks, school use and un-metered. Common area irrigation is included as residential use.

Water Supply for Future Growth



Projected Water Supply vs. Build-Out Demand



Water Master Plan Key Features

Incorporated General Plan Goals and Objectives

- ◆ Assessed impacts of future growth

Santan Vista (Joint Chandler/Gilbert) and Pecos Water Treatment Plants

- ◆ Dual surface water sources(84mgd treatment capacity)

New Pressure Zone Boundary

- ◆ Stabilizes system pressure and operation of zone 1

New Groundwater Wells

- ◆ Provide water supply reliability (74.2mgd treatment capacity)

Booster Pump Station Upgrades

- ◆ Improves system operation and saves energy

Proposed New Projects In addition to Approved 5 Year CIP

Proposed Capital Improvement	Project Cost Estimate (\$ millions) (FY 08-13)
Operational Storage	\$ 5.95
Pipe Assessment	\$ 0.27
Well Production Capacity Maintenance	\$ 3.15
Booster Pump Station Improvements	\$ 3.18
Proposed Projects	\$12.55
Deleted Projects	(\$13.03)
TOTAL Impact to CIP	(\$0.48)

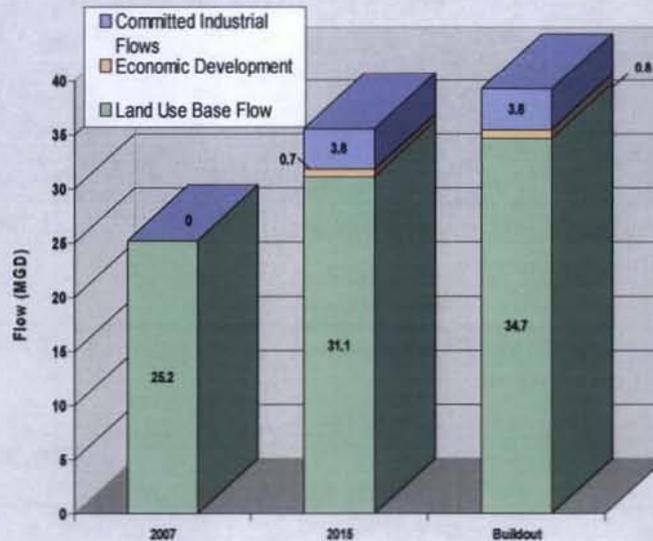
Proposed New Projects Beyond Approved 5 Year CIP

Proposed Capital Improvement	Project Cost Estimate (\$ millions) (Fy14-Buildout)
Well Production Capacity Maintenance	\$ 17.46
Booster Pump Station Improvements	\$ 17.67
Proposed Projects	\$35.13

Wastewater Master Plan Key Features

- **10 MGD Treatment Expansion by ~ 2014**
 - > Replaces Lone Butte WRF
 - > Treats wastewater from West Chandler, future growth and committed industrial flow
- **West Chandler Lift Station and Force Main by 2017**
 - > Delivers wastewater to Ocotillo and Airport WRF's
 - > Increases reclaimed water supply within Chandler
- **5 MGD Treatment Expansion ??**
 - > Provides treatment capacity for future growth
- **Ocotillo WRF Short Term Improvements**

Projected Wastewater Flows at Buildout



Lone Butte Replacement Options Evaluated

- 1) Ocotillo WRF 10 MGD Expansion
 - > Retire Lone Butte Lease
 - > Pump wastewater from West Chandler to Ocotillo WRF
- 2) Airport WRF 10 MGD Expansion
 - > Retire Lone Butte Lease
 - > Pump wastewater from West Chandler to Airport WRF
 - > Pump reclaimed water from Airport WRF to Ocotillo WRF
- 3) New 6MGD West Chandler WRF
 - > Retire Lone Butte Lease
 - > Pump reclaimed water from West Chandler to Ocotillo
 - > Expand Ocotillo WRF or Airport WRF 4 MGD
- 4) New 6MGD Water Reclamation Facility (WRF) at Lone Butte
 - > Expand Ocotillo WRF or Airport WRF 4 MGD
 - > Reclaimed water is needed to meet demand

Proposed New Wastewater CIP Projects

In addition to Approved 5 Year CIP

Proposed Capital Improvement	Project Cost Estimate (\$ millions) (FY 08-13)
10 mgd Wastewater Treatment Expansion	Funds in current 5 year CIP
Ocotillo WRF Short-Term Improvements	\$ 9.57
West Chandler Force Main routing Preliminary Design	\$ 0.24
TOTAL	\$ 9.81

Proposed New Wastewater CIP Projects

Beyond Approved 5 Year CIP

Proposed Capital Improvement	Project Cost Estimate (\$ millions) (Fy14-Buildout)
Rehabilitation of 66 inch Sewer Interceptor	\$ 18.12
West Chandler Lift Station	\$ 4.79
West Chandler Force Main (dual 24-inch DIP)	\$ 34.65
5 mgd Wastewater Treatment Expansion	\$ 122.00
TOTAL	\$179.56

Reclaimed Water Key Features

Reconfigured delivery system

- ◆ Saves costs and improves operation

Chandler's recharge and reuse provide 100 percent reclaimed water utilization

- ◆ Conserves drinking water and reduces water purchases

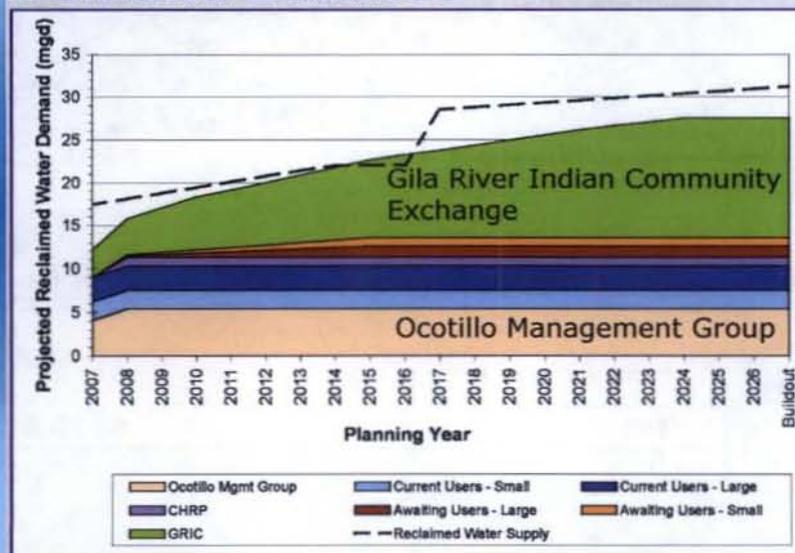
Recharge and reuse facilities at City's multi-use sites

- ◆ Provides for efficient use of land resources

Added pump capacity at Ocotillo WRF

- ◆ Needed for Gila River Indian Community Exchange agreement and Annual Storage and Recovery Wells

Reclaimed Water Supply/ Demand Balance



Proposed New CIP Projects

In addition to Approved 5 Year CIP

Proposed Capital Improvement	Project Cost Estimate FY (2008-2013)
GRIC Pump Station Expansions at OWRF	\$3.84
Recharge Pump Station Expansion at OWRF	\$1.72
Reclaimed Water Storage at Ocotillo WRF	\$9.66
TOTAL New Projects	\$ 15.22
Deleted Projects	(\$8.90)
TOTAL Impact to CIP	\$6.32

Proposed New CIP Projects

Beyond Approved 5 Year CIP

Proposed Capital Improvement	Project Cost Estimate FY (2014-Buildout)
GRIC Pump Station Expansions at OWRF	\$2.36
Reclaimed Water Pipeline and System In-Line Booster Pumps	\$1.04
TOTAL New Projects	\$ 3.40

