2014 Capital Improvement Program

March 27, 2014
Water Resources Department
Water CIP
Water CIP

• Life-Cycle Replacements/Reliability
  – Brown Road Water Treatment Plant, Pump Stations, Wells
  – Pipes

• Growth/Economic Development-Residential/Manufacturing
  – Signal Butte WTP: 24 mgd or 16 mgd
  – Wells
  – Pipes: Identified to support growth

• Contractual Obligations
  – Water Rights, Val Vista Water Treatment Plant and Transmission Main
Life-Cycle Replacements/Reliability
Water Infrastructure Replacement/Reliability CIP Investments (2009-2014)
Major Water Replacement/Reliability Projects Completed (2009-2014)

- Upgrade of three pump stations in City Zone
- Sixteen well upgrades (re-equipping and/or re-drill)
- Quarter section waterline replacements
- Waterline replacement projects joint with Transportation
- Brown Rd Water Treatment Plant (BRWTP) belt filter press
- Utility replacements on Main St with Light Rail project
- Reservoir aeration projects for water quality
- Generator installations for upper zone reliability
- Other pump station rehabilitation projects
Pasadena Pump Station Upgrade
BRWTP Belt Filter Press
Waterline Replacements
Well Rehab/Re-drill

- Pipeline replacements - 10 quarter sections
- Replacement of existing cast iron pipes (typical age > 60 years) in City Zone
- Pipe replacement joint with Transportation on major arterial streets
- Replacement of 44 miles of existing pipe
- Upgrades to existing pump stations, wells and reservoirs
- Upgrades to Brown Rd WTP
Impact of Pipe Breaks

Sinkholes

Street Flooding & Traffic Impact

Property Damage

Utilities Damage
Pipes Older Than 30 Years
Waterline Replacement Options

- 2,300 miles of waterline need to be replaced over 70 to 75 years
  - 60 miles of old cast iron pipe need replacement within next 10 years
  - 1,400 miles of asbestos cement pipe need replacement over next 40 years
- Option 1: Proposed 2014-2018 CIP for waterline replacement is $35M to $50M
- Option 2: A reduced 2014-2018 waterline replacement CIP program - $20M
- Additional $8M waterline replacement projects joint with Transportation
SE Mesa Growth – Residential and Manufacturing
MESA'S WATER TREATMENT PLANT CAPACITY AND DEMANDS

**VVWTP**
- Capacity = 90 MGD*
- Current Demand = 70 MGD
- Buildout Demand = 83 MGD

**BRWTP**
- Capacity = 72 MGD
- Current Demand = 66 MGD
- Buildout Demand = 72 MGD

**SBWTP**
- Capacity = 24 MGD**
- Current Demand = 14 MGD***
- Buildout Demand = 48 MGD

*City of Mesa Allocation

**Phase 1 Capacity Effective 2018
***Current Demand Met by Wells
Current Water Production Sources for SE Mesa

- **Existing Sources: Wells & Brown Road WTP (BRWTP)**
- **Wells**
  - Depletes future ground water resources
  - May cause subsidence
  - Impractical to meet total demand
  - Unpredictable - arsenic levels can rise over time
  - Unsustainable mode of operation
  - Practical limits of drilling new wells
  - Complicated operation to balance supply and demand
- **BRWTP**
  - Currently provides up to 10 mgd
  - Pressure mounding necessary to move water south
  - Available supply for SE Mesa will decline due to increased demand in BRWTP Service Area
Proposed Water Production Sources for SE Mesa (cont’d)

• Signal Butte WTP
  – Utilizes surface water
  – More reliable than wells
  – Simpler system operation
  – Provides redundancy for BRWTP
  – Conserves groundwater for drought
### Growth Projection in SE Mesa

Note: Numbers Shown are in Equivalent Dwelling Units (EDU)

<table>
<thead>
<tr>
<th>Year</th>
<th>Project</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Apple (Under Construction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7055</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DMB DU7 (Under Construction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1455</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total =</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8,510</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>PPNG DU4 (Pre-submittal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>484</td>
</tr>
<tr>
<td></td>
<td>Signal Butte &amp; Guadalupe by Blanford Medium Density Homes (Pre-Plat)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,029</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>381</td>
</tr>
<tr>
<td></td>
<td>Sunland Springs Unit 8 - 36 acres (Pre-Plat)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>PPNG DU2 - (Zoning)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,515</td>
</tr>
<tr>
<td></td>
<td>Total =</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,547</td>
</tr>
</tbody>
</table>

#### Growth in SE Mesa Beyond 2016 (Approx. 1200 DUs)

- **2013**
  - Apple (Under Construction)
  - DMB DU7 (Under Construction)
  - Total = 8,510

- **2014**
  - Apple (Under Construction)
  - DMB DU7 (Under Construction)
  - Total = 8,510

- **2015**
  - Apple (Under Construction)
  - DMB DU7 (Under Construction)
  - Total = 8,510

- **2016**
  - Apple (Under Construction)
  - DMB DU7 (Under Construction)
  - Total = 8,510

- **2017**
  - Apple (Under Construction)
  - DMB DU7 (Under Construction)
  - Total = 8,510

- **2018**
  - Apple (Under Construction)
  - DMB DU7 (Under Construction)
  - Total = 8,510

#### 5.83% Growth in SE Mesa Beyond 2016 (Approx. 1200 DUs)
Option 1 (24 mgd SBWTP) - Max Day Demand vs Production at SE Mesa
Option 2 (16 mgd SBWTP) - Max Day Demand vs Production at SE Mesa
Signal Butte WTP Options

• Capacity needs:
  – 16 mgd plant falls short of the supply needed
  – Cost savings minimal with 16 mgd (~$ 7M)
  – 16 mgd is not ideal size for redundancy
  – 24 mgd recommended for reliable water supply

• Preferred time for Bond Election
  – 2016 Bond Election would relieve the financial pressure slightly but would require two-year bond cycle (2014, 2016, 2018)
  – 2014 Bond Election is ideal

• 24 mgd WTP in 2014 Bond Election is recommended

24

• 24 mgd SBWTP ($123M)

• Additional infrastructure to support plant ($66M)
  – 3 mile long, 48” raw waterline to SBWTP
  – A network of new transmission mains
  – New wells for redundancy/reliability
  – Other improvements include upgrades to existing Signal Butte pump station and Gateway Airport utilities
Water CIP Recommendations

• 24 mgd SBWTP in 2014-2018 CIP
• Water infrastructure replacement and rehabilitation
  – $50M in 2014-2018 CIP
  • Includes $5M/year pipeline replacement in short-term
Wastewater CIP
Wastewater CIP

• Life-Cycle Replacements/Rehabilitation:
  – Northwest Water Reclamation Plant (NWWRP)
  – Southeast Water Reclamation Plant (SEWRP)
  – Greenfield Water Reclamation Plant (GWRP)
  – Sewer lines, Lift Stations, Odor Control Stations and Manholes

• Growth/Economic Development – Residential & Manufacturing
  – GWRP Expansion: 10 or 8 mgd
  – Conveyance lines to support growth

• Contractual Obligations
  – Sub-Regional Operating Group (SROG), 91st Ave. Wastewater Treatment Plant
  – SROG, Salt River Outfall (SRO) and Southern Avenue Interceptor (SAI)
Life-Cycle Replacements/Rehabilitation
Wastewater CIP – Replacement and Rehabilitation Investments (2009-2014)
Major Wastewater Replacement/Rehab Projects Completed (2009-2014)

• Southern AvenueInterceptor rehabilitation
• NWWRP headworks and clarifier rehabilitation
• Citywide sewer manhole rehabilitation
• Citywide sewer rehabilitation
• Southeast WRP disinfection improvements
• Rehabilitation of sewer crossing under US60
• Rehabilitation of existing lift stations and odor control stations

- NWWRP improvements
  - Primary odor control upgrade
  - Aeration improvements
  - Filter improvements
  - Improvements to Service Entrance Section (SES) and breakers
- SEWRP improvements
  - Process improvements
  - Filter improvements
  - Grit removal
- Greenfield WRP improvements
  - Primary odor control upgrade
  - Headworks and solids handling upgrades
- Equipment replacements at all plants
- Citywide manhole rehabilitation
- Citywide sewer rehabilitation
- Lift station and odor control station rehabilitation
Sewer Rehabilitation/Replacement Projects
Manhole Rehabilitation Projects
SEWRP Disinfection Project
SE Growth –
GWRP Expansion
MESA'S WASTEWATER TREATMENT FACILITIES

MAP GRAPHIC LEGEND
- EXISTING WWTP
- INTERCEPTOR LINE
- GREENFIELD WRP
- 91ST AVE WTP
- NORTH-WEST WRP
- SOUTHEAST WRP

Northwest Water Reclamation Plant

Northwest Mesa Interceptor

Central Mesa Interceptor

Greenfield RD Interceptor

Southern Ave Interceptor

Baseline Road Interceptor

91st Avenue WWTP (91st & Southern)

US 60

Salt River

202

McKellips Road

Brown Road

University Drive

Southern Avenue

Baseline Road

Elliot Road

Pecos Road

Queen Creek Road

Greenfield Road

Power Road

Ellsworth Road

Signal Butte RD

Author: C. Sagre
Created/Date: 3/16/2014
Path: \Public\Sagre\Maps & CML\PrintWastewater\Map - Mesa Wastewater.mxd
MESA'S WATER RECLAMATION PLANT CAPACITY AND FLOWS

**NWWRP**
- Capacity = 18 MGD
- Current Flow = 9 MGD
- Buildout Flow = 14 MGD

**SEWRP**
- Capacity = 8 MGD
- Current Flow = 5 MGD
- Buildout Flow = 8 MGD

**91ST AVENUE WWTP**
- Capacity = 24 MGD
- Current Flow = 17 MGD
- Buildout Flow = 24 MGD

**GWRP**

<table>
<thead>
<tr>
<th></th>
<th>Flow</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>4 MGD</td>
<td>4 MGD</td>
</tr>
<tr>
<td>Phase III (2018-2027)</td>
<td>8 MGD</td>
<td>14 MGD</td>
</tr>
<tr>
<td>Buildout</td>
<td>20 MGD</td>
<td>20 MGD</td>
</tr>
</tbody>
</table>

Author: G. Syre  Revised Date: 3/16/2014
Path: P:\GCS\Utilities\Maps\GCS HFM\Map - Wastewater Treatment Buildout Flows mw2
Wastewater CIP Recommendations

• 10 mgd GWRP – $104M
  – $9M in 2010 Bond
  – $95M in 2014-2018 CIP

• Wastewater infrastructure replacement and rehabilitation
  – $30M in 2014-2018 CIP