Funding Projects and Programs in a Time of Scarce Resources

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Innovative Solutions to Funding of Capital Improvement Projects

Michael Gritzuk, P.E., Consultant
Pima County Regional Wastewater Reclamation Department
## History of Design-Bid-Build Projects in Arizona = History of Litigation

<table>
<thead>
<tr>
<th>Project</th>
<th>Budget Overrun</th>
<th>Schedule Overrun</th>
<th>Litigation Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ina Road WRF Sub-Regional WRF Expansion</td>
<td>35.2%</td>
<td>38 months</td>
<td>Recently settled</td>
</tr>
<tr>
<td>Green Valley WRF Expansion</td>
<td>34.8%</td>
<td>15 months</td>
<td>Recently settled</td>
</tr>
<tr>
<td>City of Phoenix 91st Ave. WTF Expansion</td>
<td>121%</td>
<td>30 months</td>
<td>Recently settled</td>
</tr>
</tbody>
</table>
Breaking the Cycle of Cost Over-Runs and Litigation

Pima County Regional Optimization Master Plan (ROMP)

- **Regulatory Requirements**
- **Infrastructure Rehabilitation/Replacement**

**Major planning effort to meet future infrastructure needs and comply with regulatory requirements**

**Regional Optimization Master Plan**

- Expand Ina Road WRF to 50 MGD
- Construct new 32 MGD Water Reclamation Facility
- Plant Interconnect
ROMP Budget

ROMP planning level estimated cost (2006 dollars): $536 million

ROMP budget (including construction cost inflation): $720 million

ROMP Philosophy
- Romp project budgets are not to be exceeded
- Aggressive professional negotiations
- Value engineering to stay within budget
- Recognition of current marketplace pricing
- Avoidance of project scope creep

Budget has been reduced to $660 million (and more reductions to come)
Project Delivery Alternatives
Evaluated for All ROMP Projects

Design-Bid-Build (DBB)

Construction-Manager-at-Risk (CM@R)

Design-Build (DB)

Design-Build-Operate (DBO)

Design-Build-Finance-Operate (DBFO)
Delivery Methods Selected

**Construction-Manager-at-Risk (CM@R)**

**Ina Road WRF Upgrade and Expansion**

**Plant Interconnect**

**Benefits**

- Early involvement of contractor in complex projects
- Transfer of construction risk to contractor
- Ongoing negotiation of contract price
  - Reduces change orders
- Project successes
  - Plant Interconnect completed on time, $6.8 million under budget of $41.2 million
  - Ina Road Upgrade currently under budget of $323 million
Delivery Methods Selected

**Design-Build-Operate (DBO)**

**Water Reclamation Campus WRF**

**Benefits**

- All costs associated with designing, permitting, constructing and commissioning are transferred to the DBO Company without any additional cost to the County.

- DBO company contractually agreed to a fixed price for its services including compliance with all County and regulatory requirements.

- DBO company is responsible for correcting and paying for any failures to comply with its contractual responsibilities without any increase in contract cost.
Delivery Methods Selected

**Design-Build-Operate (DBO)**

**Water Reclamation Campus WRF**

- Contract $75.9 million (31%) under ROMP design-build budget of $240 million
- O&M budget of $8+ million at Roger Road WRF will be reduced to $6 million
  - Roger Road WRF staff level of 56 will be reduced to 15 at new facility
- RWRD staff transition to DBO staff strictly voluntary
  - Staff guaranteed equal or better salary, benefits, longevity
  - Remaining RWRD staff: no layoffs; reduction by attrition, reassignment to other RWRD facilities

**Benefits**
<table>
<thead>
<tr>
<th>Location</th>
<th>System Type</th>
<th>Plant Size (MGD)</th>
<th>Estimated Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pima County, AZ</td>
<td>DBO WW</td>
<td>32</td>
<td>$75.9 million (31%)</td>
</tr>
<tr>
<td>Phoenix, AZ</td>
<td>DBO Water</td>
<td>80</td>
<td>$27 million (7%)</td>
</tr>
<tr>
<td>Seattle, WA</td>
<td>DBO Water (Tolt)</td>
<td>120</td>
<td>$70 million (40%)</td>
</tr>
<tr>
<td>Seattle, WA</td>
<td>DBO Water (Cedar)</td>
<td>180</td>
<td>$50 million (30%)</td>
</tr>
<tr>
<td>Tampa Bay, FL</td>
<td>DBO Water</td>
<td>66</td>
<td>$85 million (21%)</td>
</tr>
</tbody>
</table>
Decommission of Roger Road WRF:
Invitation to Private Sector for Innovative Solutions

Request for Expressions of Interest (in progress)

Roger Road WRF Equipment Salvage
Ina Road Powerhouse Equipment Salvage
Ina Road Pure Oxygen Generation Facility & Other
Decommission of Roger Road WRF: Invitation to Private Sector for Innovative Solutions

Request for Expressions of Interest (in progress)
Economic Development at Existing Roger Road WRF

INTERESTED PARTIES
- Parks & Natural Resources – Sports Park
- Residential / Commercial Development
- Education Center (Audubon Society)
- Water and Energy Sustainability Technology Center
National Perspective – Legislative Approaches to Project Funding

- Amendment to Clean Water Act
- Continuation and enhancement of State Revolving Fund Appropriation
- Advocate for Water Protection and Reinvestment Trust Fund
- Advocate for National Infrastructure Bank
Proposed Arid West Watersheds Wastewater Grant Program

- Authorizes grants for construction of wastewater conveyance and treatment facilities in arid west watersheds
- Authorizes up to $500,000,000 for direct grants and grants through State Revolving Funds
Innovative Program Management in a Time of Scarce Resources

Jackson Jenkins, Director
Pima County Regional Wastewater Reclamation Department
Typical industry practice is strictly defined job duties.

The Multi-Skill Program breaks down job silos and creates a smaller, flexible and efficient workforce.
Multi-Skill Program: Workplace Benefits

**WORKFORCE**
- Provides a career-development program
- Increases level of job skills/certifications
- Creates structure for continuous learning/improvement
- Encourages a team culture
- Ends dead-end-job attitudes

**MANAGEMENT TEAM**
- Reduces layers of supervision
- Increases use of automation and control technology
- Increases communication and coordination
- Increases flexibility and job coverage
Multi-Skill Program:
Overview

• Combine Operator and Mechanic positions into a multi-skilled Operation & Maintenance Technician position
• Reduce the workforce by 22 positions over 2 years
  ▪ Workforce reduction achieved through attrition only – no layoffs
• Program began July 4, 2010
• Once fully implemented, cost savings are approximately $1 million per year
Multi-Skill Program: Implementation

• Multi-skill employee job track
  • Series of skill blocks, higher pay levels

Employee Advancement

<table>
<thead>
<tr>
<th>Operations</th>
<th>Maintenance</th>
<th>Process Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>O3</td>
<td>M3</td>
<td>PC3</td>
</tr>
<tr>
<td>O2</td>
<td>M2</td>
<td></td>
</tr>
<tr>
<td>O1</td>
<td>M1</td>
<td></td>
</tr>
</tbody>
</table>

TRAINEE
Innovative Commodity Solutions:
Ina Road WRF Expansion and Upgrade Project

2009 commodity contracts to lock in prices for major commodity purchases

Concrete commodity award
- Locked in price per cubic yard
- $66.75 vs. current price of $80-100
- Projected cost savings $1.2 million

Steel commodity award
- Locked in price per pound for rebar ($0.295 + fixed escalation cost)
- Now $0.31 vs. current price of $0.35-0.40
- Projected cost savings $600,000
Innovative Energy Solutions:
Buying Natural Gas on the Spot Market

• Natural gas traditionally bought through local gas company at commercial rate
• Can be bought on the spot market, then wheeled through agreement with local company
• Program began in August 2009

In FY 2009/10, saved $415,000
Innovative Energy Solutions:  
Power Co-generation at the Ina Road WRF

• RWRD began to use methane as a power source in 1977 to reduce costs
  - Co-generation power plant at Ina Road WRF
• Rare for water sector utilities to utilize methane gas for power generation
Innovative Solutions:
ROMP Biosolids/Biogas Master Plan

Goals

• 100% utilization of biogas
• Multiple outlets for beneficial utilization of biosolids
Biosolids/Biogas Master Plan:
Full Utilization of Biogas

- Methane will be 100% utilized
- RFEI under development
- Private sector invited to submit recommendations including:
  - Use of methane to heat sludge and convert it from Class B to A
  - Construction of another cogeneration plant for other uses or sale to the grid
  - Cleaning of methane sufficient for commercial sale
Biosolids/Biogas Master Plan: Biosolids Utilization

• RWRD currently has an efficient system for biosolids utilization (and limited transport charges)

• Further cost savings may include:
  - Increase in solids concentration
  - Production of concentrated fertilizer
Meeting Sustainability Goals in a Time of Scarce Resources

- Green building
- Renewable energy
- Alternative fuels
- Waste reduction
- Green purchasing
- Water conservation and management
- Social well-being, opportunity & equity

Pima County Sustainability Program

Goal: Develop renewable resources for a sustainable future

Integrate into all wastewater infrastructure planning

Photo by DesertWanderer, CC
Pima County Sustainable Action Plan:
Action Goals

• Transition to renewable energy sources to meet 15% of the energy needs of County facilities by 2025
• Maximize methane use to help power County wastewater operations
• Maximize county water resource assets, including groundwater rights, surface rights and effluent for natural resource protection
• Reduce water use in County facilities by 15% by 2025
Every phase of the Regional Optimization Master Plan incorporated investigation of sustainability projects including LEED Silver Certification, solar projects, water harvesting and energy recovery.
Implementing Sustainability Goals: Renewable Energy

- Two new 1-megawatt solar facilities to augment power at Ina Road and Roger Road WRFs
- Wind-driven aerators for Arivaca Junction WRF
Future Challenges: Regulatory Changes

Emerging contaminants, PCPs, and other regulatory issues

- Trace contaminants are ubiquitous in water
  - Pharmaceuticals, endocrine disruptors, perchlorate, phosphorus
- Ecological impacts demonstrated, human impacts unclear
- Public perception and trust are critical for water reuse
- Regulations move slowly, but are coming
Future Challenges: Infrastructure Reinvestment

- Miscellaneous Conveyance Rehabilitation and Repair
- Capacity Augmentation Program
- Utility Relocation Program
Future Challenges:
Supporting the True Cost of Reclaimed Water

Cost of Production
$1100 per Acre Foot

Cost to Users
$800 per Acre Foot
Questions