EISENHARDT GROUP

STRATEGIC PLAN FOR WATER AND WASTEWATER UTILITY PROGRAMS

CITY OF GRANTS PASS, OREGON

OCTOBER 2015

FINAL

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ACKNOWLEDGEMENTS

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Professional Profile information is included as Appendix 1.

Grants Pass City Staff Members and Elected Officials

EGI would like to acknowledge the following Grants Pass staff for their assistance in providing information, photos, and data, arranging interviews with key staff, and providing input on recommendations:

Aaron Cubic – City Manager

Jay Meredith – Finance/Fleet Director

Terry Haugen – Public Works Director

Jason Canady – Superintendent, Water Treatment Plant

Bob Hamblin – Superintendent, Collection and Distribution

Gary Brelinski, Jr. – Superintendent, Water Restoration Plant

EGI also acknowledges the PAVE Committee members and their contributions through review sessions held during the project development, analysis, and report preparation.

1.0 EXECUTIVE SUMMARY

Background

Scope of Work

The City of Grants Pass (City) issued a Request for Proposal on December 22, 2014 to conduct an assessment of City water treatment, wastewater treatment, and distribution and collection service functions to assess the degree to which the City operations are managed as efficiently as possible. In addition, the assessment was to evaluate the different strategic alternatives that may be available to the City to continue to effectively and effectively provide these utility services well into the future. The product of the assessment was envisioned to be a comprehensive strategic planning document to be used by the Grants Pass Public Works Department to track the established goals, objectives, and priorities for at least the next five years. The strategic plan was to include recommendations to guide key policy, facility, personnel, training, and resource allocation decisions for at least the next five years.

Analysis

Process

Eisenhardt Group, Inc. (EGI) employed several approaches to develop this assessment and recommendations for the water treatment, wastewater treatment, distribution, and collection service provision functions. These approaches included:

1. Document reviews
2. Site visits
3. Conduct of Strength – Weaknesses – Opportunities – Threats: (SWOT) analysis and interviews with management and staff

4. Conduct of an *Assessment Checklist* evaluation
5. Performance of benchmarking using American Water Works Association performance indicators
6. Conduct of an Effective Utility Management (EUM) survey
7. Evaluation of strategic alternatives

Conduct of SWOT Analysis

Background on SWOT Analyses

A SWOT analysis is a structured planning method used to evaluate the strengths, weaknesses, opportunities and threats involved in a project or in a business venture. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favorable and unfavorable to achieve that objective.

- Strengths: characteristics of the utility that are advantageous in accomplishing its mission.
- Weaknesses: characteristics that pose a risk to future operations.
- Opportunities: elements in the environment that the utility could exploit to its advantage.
- Threats: elements in the environment that could cause trouble for the utility.

Identification of SWOTs is important because they inform later steps in planning to achieve the objective.

In developing the SWOT analysis, the EGI team met with the management staff and the utility staff and conducted facility site visits to develop the SWOT input. The highlights of the SWOT included:

Strengths

The SWOT analysis identified a utility with significant strengths including:

- Good customer service provided by a knowledgeable and experienced staff that works as a team to achieve goals
- The compliance record of the utility is a source of employee pride
- Good management advocacy for resources to operate and maintain the utility
- The utility has access to ample water resources

Weaknesses

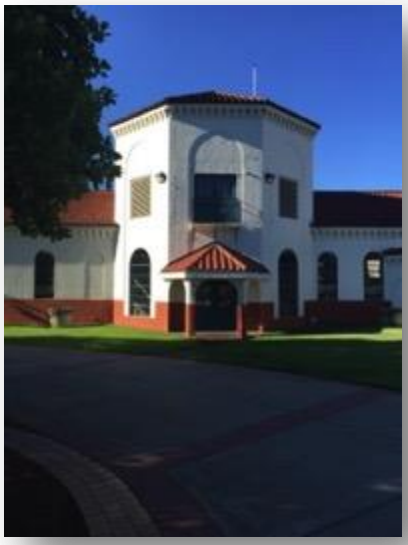
The primary weaknesses were identified as:

- Old and inadequate treatment plants, inadequate knowledge management and asset management systems, and inadequate staffing levels
- Limited system redundancy features
- The pending retirements of staff were generally felt to be a risk factor for continued operations
- The sensitivity of the community to rate increases and their low awareness of water and wastewater challenges (i.e., greater need to communicate) was mentioned numerous times
- The need for improvements in internal communications and coordination was cited

Opportunities

The primary opportunities were identified as follows:

- Improving succession planning, training, and development
- Improving asset management – implementing a process to replace assets that is fact driven
- Implementing a communications program to improve public outreach and awareness
- Improving resource recovery (solids handling, methane generation, power generation and wastewater reuse)
- Implementing new technology
- Upgrading pump stations and reservoirs



Threats

The primary threats were identified as follows:

- Aging infrastructure
- Emergency preparedness / Single source of supply
- Exceeding wastewater effluent permit limits in the summer months
- Privatization (sale of the utility)
- Inadequate staffing and space
- Public that is adverse to needed rate increases
- Perception that Council doesn't appreciate water/wastewater
- Plant security
- Any erosion of the relationship between management and staff
- Inadequacy of some information technology systems

Assessment Checklist

Background on the Assessment Checklist Evaluation

EGI uses an Assessment Checklist approach in the evaluation of utilities. The checklist, augmented with the experience of the EGI team, indicates that the City's performance for the overall water and wastewater utility is satisfactory for about half of the elements with three areas assessed as "Best in Class" or "Above Average" and seven elements that would benefit from added attention and improvement.

The areas where performance was at Best Practice or Above Average levels include:

1. **Regulatory Compliance** – The City has a very good record of compliance that is attributable to a professional staff that is dedicated, creative, and hard working. The physical condition of the treatment plants has been recognized as in need of replacement (water plant) and upgrades (wastewater plant). Despite this, staff consistently produces a high quality water product for both water and wastewater. There was one example of a violation (related to ammonia) and minor monitoring violations in recent years. The relationship of staff with regulators is good and corrective actions were promptly taken. Plant improvements for wastewater and a new water plant are planned to minimize future risks of violation.

2. **Cost Containment** – The utility staff (Management and Council) appear to be very cost sensitive in the operations of the utility. There is always a balance to be struck in saving money and deferring maintenance, though, and cost containment is not always the best strategy. An example of this is the deferral of coatings (paint) at the Water Treatment Plant, as the cost estimate was purportedly considered excessive. Failing to adequately maintain coatings may not represent structural weaknesses but it does represent an image issue that could be construed as a utility not paying attention to the small things and begging the question as to whether the "large" things are being handled adequately.

3. **Distribution and Collection Systems Performance and Maintenance** – Flushing and TV systems appear to be working well. There are systematic capital upgrades underway. Equipment appears adequate/good for the work required. Overall, the group has a very good performance history. This is an area where planning is based on individual experience; significant knowledge will depart with retirements and an effort should be made to transfer that knowledge and systematically capture the knowledge in written

operating and maintenance procedures (this is discussed later in this report). The overall water utility system (water & wastewater) experiences a complaint level that is typical for combined water/wastewater utilities.

The Assessment Checklist Evaluation identified seven areas where improvement in demonstrated performance is warranted. Those areas are described below.

1. **Improvement Area #1 – Asset Management** - Generally, the team observed a motivated professional workforce at both the water and wastewater plants and in collection and distribution. They are seemingly spread thin. Maintenance appeared to be done (notwithstanding some observed water plant coatings issues). Anecdotal information indicates the following levels of reactive or unplanned maintenance:

    i. Collections – 10%,
    ii. Distribution – 25–35%
    iii. Wastewater Treatment – 50%
    iv. Water Treatment – 15%

    Best in class utilities have levels of approximately 20% time spent on reactive maintenance and therefore have 80% or more of time spent on planned maintenance activities.

    The current maintenance management system was built in-house. It includes a basic equipment inventory and preventative maintenance listing. The system does document maintenance work when performed. However, incomplete documentation of unscheduled maintenance results not only in completeness issues, but in incomplete maintenance histories for specific pieces of equipment. Rigorous documentation of maintenance histories is a normal part of modern maintenance and asset management systems and program capabilities. Replacement/upgrade plans have not been established nor have costs been projected. Tracking of spare parts inventory for critical equipment/activities is needed (staff indicated that occasionally there are inadequate replacement parts on the shelf). A formalized modern program should be developed and implemented that will include housing all key equipment information, maintenance requirements, and assigning equipment criticality (to help prioritize maintenance activities).

2. **Improvement Area #2 – Systems Development and Implementation** - Some current systems are outdated and lack capabilities. Document management systems are largely paper-based records that need to be upgraded to current practices/standards (i.e., the

usage of computerized systems). Accessing historical information is cumbersome and appears to rely on "tribal knowledge" as much as records. This is a significant vulnerability as the workforce ages and retires, taking that knowledge with them.

The SCADA system in the WTP is nearly 15 years old and generally outside a typical replacement life cycle. The City upgraded the water distribution system SCADA system in 1999. The SCADA system monitors reservoir levels, pump operating status, and local pressures throughout the system. The central computer system is located at the water treatment plant (source: Grants Pass Water Distribution System Master Plan January 2001). We understand an update to the Distribution System Master Plan is being contemplated.

The WTP has a Windows-based SCADA and control system. The existing control system was installed as part of the SCADA improvements in 2002. Recent upgrades at the WTP include new processors and software (source: Draft City of Grants Pass Water and Wastewater SCADA Systems Master Plan, May 2015).

The SCADA system incorporates operator input, specified set points and programmed algorithms to make decisions for the operator or provide prompts to assist them in the performance of their duties. Examples include filter flow set points, backwash timing, and filter to waste timing. Flow pacing of chemical feeds is present and residuals are measured against desired goals.

The plant uses on-line water quality instrumentation and bench-top equipment to monitor and control plant performance. Raw and settled water turbidity is continuously monitored. Each filter (as well as the combined filter effluent) is equipped with an on-line turbidimeter to monitor filter performance and ensure regulatory compliance. All turbidimeter signals are integrated into the SCADA system.

Finished water pH is continuously monitored for corrosion control compliance. Raw water and settled water pH are measured periodically each day via grab samples analyzed in the plant's laboratory.

An on-line chlorine residual analyzer is used to monitor the plant effluent residual. Pre-basin and settled water chlorine residuals are measured periodically each day via grab samples.

The Draft City of Grants Pass Water and Wastewater SCADA Systems Master Plan (May 2015) provided an assessment of the existing Process Control Systems (PCS), identified functions required of the PCS systems and outlined upgrades and costs required to meet future needs. The report observed/recommended the following:

- The main facility has a staffed Operator Station where control and monitoring of all WTP and remote site processes is accomplished using Rockwell's RSView32 software. This software runs on Microsoft's Windows XP platform, *which is an obsolete operating system, and is not compatible with currently available Windows platforms.*
- The PC at this operator station is the only PC at the facility, commonly referred to in Industrial Automation as "Stand Alone" control. There is no ready backup for this station should the PC have a hardware or software failure. Backups are done

manually.
- Installation of individual particle counters on the filter effluent would better predict turbidity breakthrough and ensure continued compliance with regulations.

The report noted several SCADA issues for both the water and wastewater treatment plants including the need to:

- Implement uniform labeling
- Improve the organization of wiring in cabinets
- Replace old power supplies inside the Control System cabinets
- Implement RSView32 HMI Software Upgrades to gain increased serviceability of the computer that contains the software. The major factors that drive the need for increased serviceability as follows:
    - discontinued support and security vulnerabilities of the Microsoft XP operating system,
    - decreasing availability of computer hardware compatible with the KTX communication card, and
    - discontinued status of the current HMI software.
- Implement SLC and MicroLogix Controller Upgrades

The report further outlined the current and future needs of the City's SCADA software including:

- Process visualization and control tools
- Real-time data trending capability
- Historical data archiving and trending capability
- Security improvements
- Reporting
- Terminal Server Capabilities
- Virtual Environment Compatibility
- Asset Management System Connectivity

Among other findings, the Water Treatment Plant Facility Plan Update (January 2014) concluded that:

- The SCADA system at the plant will likely require additional software and firmware upgrades. During the planning horizon considered for this report, it is anticipated that replacement software and hardware will be needed to stay current with developing technology.
- The location of the filter effluent flow meters prevents the measurement of filter- to-waste flows which results in potential operations and water quality problems.
- The existing flow meters lack adequate lengths of upstream and downstream straight pipe, significantly reducing the accuracy of the meters. Therefore, replacement of the filter effluent flow meters is recommended along with piping changes to integrate filter-to-waste flow measurement.

It is EGI's view that, even though the water plant is scheduled to be abandoned, systems should be kept current with product life cycles. We further observe that daily start/stop operations (i.e. running the plant for limited hours each day) incurs a risk of process upsets. To mitigate this, Staff has developed a detailed standard operating procedure to manage

bringing the plant back on line and have historically successfully implemented that procedure. Nonetheless, such operational methods are not ideal for stable water treatment and uniform water quality. A new treatment plant should be assessed against a 24 hour operation (with the potential need for additional storage). The cost-tradeoffs should be assessed.

The breadth of opportunities are well summarized by Superintendent Jason Canady "We are at a point where so many upgrades/replacements are needed we can embrace new technologies that will more fully automate both plant processes enabling current/future staff to focus on other items besides how we currently operate our facilities."

The current communications system for the utility should be re-evaluated and upgraded (including emergency communications). Development of a formal communications / technology master plan is warranted including systems to better access geographical information in the field (including as-builts, etc.).

3. Improvement Area #3 – Computerized Maintenance Management System (CMMS) - The current maintenance management system relies heavily on the informal expertise of staff with limited written records retention or capabilities. Currently, staff track maintenance on key equipment, but lack the ability to track planned/unplanned maintenance. It is also not clear whether equipment "criticality" has been formally determined in the establishment of maintenance priorities. According to staff, maintenance is conducted according to manufacturers' warranties; this should be verified as without such documentation there is a significant risk of voiding new equipment warranties, as the record system will not satisfactorily exist to satisfy warranty requirements of the equipment manufacturers.

There is also a need for a work order generation system that will link to an Asset Management System and define and schedule maintenance, generating work orders based upon that data. Such information will be invaluable in building the case for continued investment in the water and wastewater systems. Tracking and reporting of deferred maintenance and replacement cost profiles could be generated and would improve maintenance planning and efficiency. The current system will also benefit from uniform development of "Standard Operating Procedures" (SOPs) so as to retain and document that proper maintenance procedures are used and followed. This is especially important given pending staff retirements in some utility areas and the need to capture their "tribal knowledge" in a documented manner for continued usage by the staff.

4. **Improvement Area #4 – Laboratory Information Management Systems** (LIMs) — The Water Treatment Plant uses an in-house built LIMs system that, from reports of operators, works fine, allowing basic trend analysis. The system purportedly assists operators in choosing chemical dosages based upon current conditions, considers river levels and limits plant flow rates based on limitations of water rights/permits, provides extensive analysis of past performance and predicts future water quality/quantity. It performs regulatory reporting in addition to internal process reporting. There are numerous small LIMs packages on the market, however, that represent better tools for operations assessment and planning including linking to the SCADA system, providing predefined analysis of current conditions and customizable dashboards of plant performance information and would be worth exploring. In the Wastewater Division, there is limited ability to store and retrieve information in formats that facilitate / allow trend analysis and / or process assessments for cost effectiveness. This capability should be implemented to improve efficiency.

5. **Improvement Area #5 – Current O&M Manuals and SOPs** - Some SOPs (Standard Operating Procedures) exist, but other areas are not documented. There is a need for systematic documentation (and systems upgrades/augmentation) to capture the "tribal knowledge" of individuals in all three divisions. Efforts are being made but individuals retain much knowledge. As staff retire, this loss of knowledge will be significant.

6. **Improvement Area #6 – Security** - The EGI team has observed several areas where security attention is required. These have been conveyed verbally to management and the PAVE Committee. A security review and implementation of actions to address the identified concerns is appropriate.

7. **Improvement Area #7 – Systems for Energy Efficiency and Optimal Chemical Usage** - Systems for optimizing chemical and energy use are limited. Trending capability to optimize cost effectiveness and identify tradeoffs is limited. Upgraded automation could help with coagulant and polymer dosage control at the water treatment plant. Process energy use analysis would be helpful, especially at the wastewater plant. There are opportunities to explore, including:

    a. Expansion of alternative energy generation (solar and biogas)
    b. Reuse of water for agricultural irrigation

    An energy plan (including efficiency and generation) should also be developed.

Benchmarking

AWWA Performance Indicators

In addition to the Assessment Checklist Evaluation, EGI conducted benchmarking of City water and wastewater operations based upon the American Water Works Association's (AWWA's) Utility Benchmarking Program. Their program is a system of well-defined performance indicators specific to the water and wastewater sector. These indicators were designed to help water and/or wastewater utilities improve their operational and managerial efficiency and effectiveness. The information is generated from an annual utility benchmarking survey. The Benchmarking: Performance Indicators for Water and Wastewater – 2013 Survey Data and Analyses Report was published in 2015.

While the benchmark/performance indicator information is a good comparative tool, AWWA also cautions "external comparisons are often not straightforward because numerous system-specific factors can influence the system performance." As such, the results should be viewed as a general comparison of performance and only as an indicator of potential areas of improvement. There are elements of the Grants Pass water and wastewater systems that are unusual (such potential items were listed above) and may challenge comparisons with other utilities.

Taken as a whole, and reinforcing the Assessment Checklist evaluation described above, the examined performance indicators present a picture of a utility that excels in numerous areas while presenting opportunities for improvement to better manage long-term costs (Table ES-1 below). Staff is admirably processing significant flows through the existing treatment facilities and producing high quality product water (notwithstanding the 2013 violation at the Wastewater Plant). Wastewater and water operating costs appear favorable to industry benchmarks. Nonetheless, water and wastewater service affordability performance indicators show both water and wastewater in the bottom quartile in comparison to other utilities in the AWWA database driven largely by the relatively low median household income in the service area. There may be unique attributes of Grants Pass that complicate direct comparisons; performance indicators should be used as "starting points" for exploring areas of improvement.

Table ES-1: Summary of Quantitative Performance Indicators

	Benchmark Description	Quartile Performance			
		Top	3rd	2nd	Bottom
1	Total O&M cost per account, water		X		
2	Million gallons delivered per day per employee, water		X		
3	Water main breaks per 100 miles of pipe	X			
4	Customer technical service complaints per thousand accounts, water			X	
5	Training (hours per employee), water	X – Water Treatment			X – Distribution
6	Service affordability, water				X
7	% Planned Maintenance (vs. reactive maintenance), water		X		
8	Regulatory compliance rate (# of standard and/or monitoring violations), water	X			
9	Water loss			X	
10	Total O&M per wastewater account, wastewater		X		
11	Million gallons treated per day per employee, wastewater	X			
12	Collection system integrity (failures per 100 miles of pipe), wastewater		X		
13	Training (hours per employee), wastewater	X – Wastewater Treatment			X – Collection
14	Service affordability, wastewater				X
15	% Planned Maintenance (vs. reactive maintenance), wastewater			X	
16	Regulatory compliance rate (# of standard and/or monitoring violations), wastewater	X (2014)			X (2013)
17	Customer technical service complaints per 1000 accounts, wastewater	X			

In addition, while AWWA does not provide comparative quantitative benchmark information on the following performance indicators, EGI has provided comments regarding:

- Safety record
- Annual grievances filed, water
- Annual grievances filed, wastewater

Normalizing the head count for Grants Pass Public Works to the BLS database (100 full-time workers) suggests the incident rates (as judged by claims) appear to be higher than found in the trade, transportation and utilities sector database (approximately 1 in 10 employees per year for Grants Pass vs. about 3 per 100 per year in the database). While claim dollar amounts are relatively low, a continued re-emphasis on safety in the utility appears warranted.

Based upon interviews with management staff, grievances are relatively rare in the utility. Water and Wastewater Treatment did not have any grievances from 2011–2014 but Distribution and Collection had one each in years 2011, 2013, and 2014.

Conduct of Survey

An on-line survey incorporating the "Effective Utility Management" (EUM) self-assessment and other questions was developed to allow water and wastewater utility staff to electronically respond confidentially.

As stated in the Effective Utility Management primer, the ten attributes of effectively managed water sector utilities *provide useful and concise reference points for utility managers seeking to improve organization-wide performance. The Attributes describe desired outcomes that are applicable to all water and wastewater utilities. They comprise a comprehensive framework related to operations, infrastructure, customer satisfaction, community welfare, natural resource stewardship, and financial performance* (Effective Utility Management: A Primer for Water and Wastewater Utilities, June 2008).

The ten attributes are (see main Report, Section 5 - Task 1 for full descriptions):

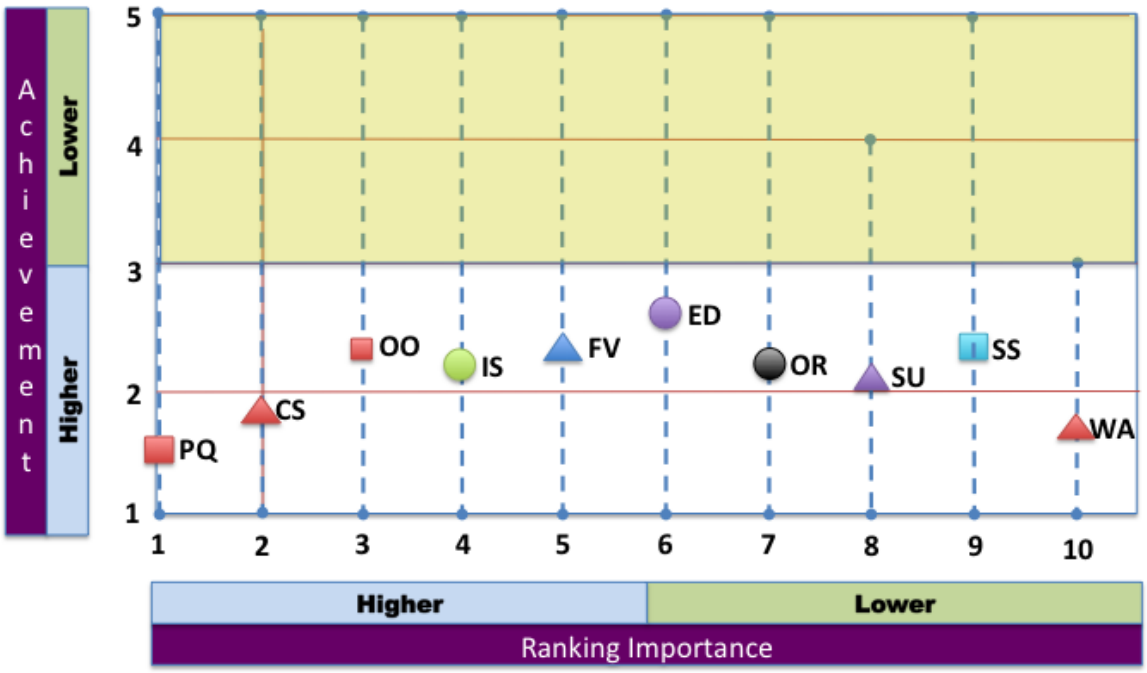
- Product Quality (PQ)
- Customer Satisfaction (CS)
- Employee and Leadership Development (ED)
- Operational Optimization (OO)

- Financial Viability (FV)
- Infrastructure Stability (IS)
- Operational Resiliency (OR)
- Community Sustainability (CS)
- Water Resource Adequacy (WA)
- Stakeholder Understanding and Support (SS)

The survey was administered from May 28 through June 13, 2015. A total of 23 employees responded comprising the superintendents of the three divisions and employees below them. It is important to note that these employee perceptions are based upon their experience and "vantage point" in the organization. The results were shared with each Division in small group "interviews" where the issues were discussed and each group was further asked to provide the "strengths, weaknesses, opportunities and threats" (SWOT) they perceive in their divisions and for the utility in general. Based upon these follow-up interviews, there are distinctions between the divisions.

The average response is plotted in Table ES-2. The dashed lines depict the range of responses (e.g., most attributes incurred a response ranging from 1 to 5; SU and WA showed a response range from 4 to 1 and 3 to 1, respectively, as shown by the dashed lines in the chart. Areas that

Table ES-2: Summary of EUM Self Assessment Results



would be of specific concern would appear in the upper left corner of the graphic where the importance ranking is "high" and the achievement ranking is "low". As can be seen there are no issues in this quadrant. Further, across all ten areas no single area rose above an achievement ranking of 3 meaning that employees generally perceive good performance across the ten

attributes as indicated by the higher achievement ratings (lower numbers). The "lowest" achievement attribute was "Employee and Leadership Development", for which the average response approached a "3", still comparatively good.

The second component of the survey consisted of multiple-choice questions. Thirty-eight questions were posed to the respondents and the responses are summarized as follows:

- The organization receives high remarks with regard to discipline, "spirit" and supervisory interest/confidence. There is an interesting contrast to interviews that indicated some morale issues in Collection and Distribution related to a perception that they are not appreciated. These concerns seem to largely be directed at the Director level and above.
- There are space constraints in the Collections and Distribution Division where older, smaller offices/work spaces are the norm.
- Communications could be improved within the Department. Uniform conveyance of information in routine staff briefings and, particularly, explanation of rationales for decisions would be helpful in improving communications. Team-building could also be helpful. Many employees feel there needs to be better ways for ideas to be heard.
- Several employees believe that improved vehicles are needed.
- Several employees view the department in a negative light.
- There are concerns with current Department training including both content and availability.

Staffing Summary

Current staff and supervisors are dedicated, hardworking, and delivering strong results, as documented in this Report. Current staffing levels are also identified as "lean" and an area for staffing actions. Having said that, current events and conditions create the need for immediate (2016) staffing actions as summarized below. Staffing and staffing actions are provided in further detail in the Report Recommendations and in Task I (Water & Wastewater Core Topics), Task III (Water Distributions), Task V (Wastewater Collection).

Identified and recommended 2016 staffing actions are the following:

1) **Wastewater Treatment** – add one maintenance position and one systems planner position in parallel with the addition of expanded facilities and system upgrades.
2) **Water Treatment –** provided adequate reservoir storage is available and useable year round, expand staffing (two position net increase) so as to staff for year round 24x7 operation of the water plant so as to avoid the identified start-up and shut down risks and potential water quality impacts. Make additional staffing decisions in concert with decisions for the new water plant design, construction, and operation.
3) **Collection & Distribution** – add a systems planner resource (possibly as a shared resource with wastewater treatment). Once the Master Plans now underway are

completed, assess if the Plans increase workloads or add new requirements. Additionally, establish an updated workplan for uni-directional flushing of the water distribution system. With the workload implications assessed, further assess the staffing needed to accomplish the Master Plans and the uni-directional flushing got the water distributions system.

Strategic Public-Private Partnership Evaluation

Background

The RFP workscope required the documentation and assessment of the pros and cons of the different partnership possibilities available to the City of Grants Pass for the following water and wastewater service areas and components:

- Design and construction of the new Water Treatment Plant (WTP)
- Wastewater Plant (WP) expansion projects
- Operation of the utilities and plants
- Ownership of the utility infrastructure and plants
- Customer service (meter reading, billing, and accounts receivable)
- Strategic alternatives for financing the new WTP and the WP expansion

The assessments and analysis provided are based on the experiences of the EGI team members in the design, construction, and operation of water and wastewater utility systems. In addition to the conventional methodology, this includes direct experience with additional options including design/build (DB); design/build/operate (DBO); contract operations; and sale of utility to the private sector. In addition to the experiences of the EGI team members, research and publications from the following organizations were utilized:

- Design, Build Institute: Choosing the Right Project Delivery Method
- KKR and Suez Environmental: P3 Opportunities and Approaches
- AMSA/AWWA: Evaluating Privatization I & II
- AMSA/AWWA: Public vs. Private: Comparing the Costs
- Public Works Finance: Cost / Performance Results for DBO and DB
- Telecon discussion with Donald Levine, Levine Consulting
- Telecon discussion Tom Brown, United Water

Distribution and Collection Division

The Distribution and Collection Division, based upon our assessments and documented performance, is performing well and not confronting significant facility / construction challenges at the current time.

As a result, the Strategic Plan recommends that the current structure be continued and that alternatives such as splitting the division and consolidating segments into the water or wastewater treatment divisions not be pursued at this time. The current arrangement provides good service, is cost-effective (as evidenced by benchmarking), and there would be no apparent improvement with restructuring or with privatization. Therefore, the public – private partnership discussion and assessments exclude these areas of the water and wastewater utilities.

Water and Wastewater Treatment

Unlike the Distribution and Collection Division, the treatment requirements and facility needs for continued regulatory compliance, reliability, and cost effective operations have created significant near term capital facility requirements for both the water and wastewater treatment utilities.

Current plans call for wastewater expansion and upgrade facilities costing $20 million (2014 dollars) and a new water plant estimated to cost (in 2013 dollars) $60 million. EGI concurs with the needs and the recommended timelines: 1) 2016 for wastewater, 2) initiation of water plant implementation immediately (as also recommended by MSA/MWH in their 2014 report) so that the new plant is on-line by 2019. These capital costs are over and above the "pay as you go" capital items that are annually funded, without debt borrowings, by the current utility rates. Given the recommended timing of the capital needs, it is envisioned that financing will occur using a $ 70 million bond issue and then a subsequent $ 10 million bond issue for the second phase of wastewater capital needs.

Utility rates must increase by 34% for water and 6.9% for wastewater to provide the needed revenues for repayment of $70 million of borrowings over the 25-year life of the bond. Wastewater rates will be increased again for the phase II capital program budgeted at $ 10 million and scheduled to occur 5+ years into the future. With an estimated 85% of the $70 million bond proceeds used for funding the new water plant, water rates will shoulder the majority of the overall increase. Based upon current rates, water and wastewater rates each generate approximately the same annual revenues of $6.5 million for water and $ 6.0 million for wastewater and serve 10,867 water accounts and 13,105 wastewater accounts.

Should the implementation of the new water plant be delayed, EGI recommends that immediate actions be launched for the development of new SCADA/PLC/MMS/Asset Mgt. master plans for water, wastewater, and distribution & collection that will be part of the new water plant and upgrades/replacements/new capabilities for systems at wastewater treatment collection / distribution, and water treatment.

Water and Wastewater Treatment Facilities

Unlike the Distribution and Collection Division, the facility needs for capacity, continued regulatory compliance, reliability, and cost-effective operations have created significant near-term capital facility requirements for both utilities.

The current water treatment plant will be replaced with a new facility using new processes (ballasted flocculation, high rate filters, and ozone treatment) and significant systems upgrades for computerized process control and reporting (SCADA), maintenance management (MMS), laboratory management (LIMS), and asset management. Current staff does not have experience with the design / construction / startup of a new water treatment facility and must, at the same time, continue the successful operation of the existing facility through an overlap period with the on-line operation of the new facility.

Significant resource and skill set augmentation are necessary for any and all procurement options. Acquisition of these resources, performance responsibility, and cost exposures vary greatly between the procurement alternatives.

The needs for wastewater treatment can be summarized as additional facilities of the same processes and equipment as currently being used. These facilities are needed to provide capacity expansion to insure treatment of increased flows and loadings, to replace or upgrade worn equipment, and to provide necessary seismic upgrades.

As a result, the construction requirements for the wastewater treatment facility can be accomplished in a modular phase without disruption of the existing treatment systems. With the exception of an updated SCADA and LIMS system installation and its usage, new types of systems are not required. New operational skills, process skills or the need to assimilate new systems are also constrained to the SCADA and LIMS systems.

Procurement Alternatives

A summarized overview of the procurement alternatives is provided below in Table ES-3. Significant differences in responsible party, control, risk assignment, guarantees, and financial responsibility exist between the alternatives.

Table ES-3: Procurement Alternatives

Structure Name	Key Features
1) Conventional Structure (Design/Bid/Build, or DBB)	City staff operates; consultant designs; construction bid (low bidder wins); project management contracted; startup assistance. Multiple entities, roles, and contracts
2) City Operates with Design/Build of Facilities (DB)	Single contract for design & construction (one contract with one party responsible to City); City staff operates.
3) Design/Build/Operate (DBO)	Competitive procurement using a single contract; entity responsible to the City for all phases and ongoing operation. Costs, regulatory compliance guaranteed. Annual cost adjustment per published indices. Incentive savings and termination provisions. City retains ownership, permits, rate setting, and control.
4) Concession	Long term agreement that transfers all components including rate setting to private sector; financing by private sector; can provide significant upfront cash to City. Assets remain owned by City. Typical term is 40+ years.
5) Sale of Utility to Private Sector	Transfers ownership, permits, water rights, operation, and regulatory compliance to private sector firm. City receives financial payment for assets transferred in the sale. Control now the responsibility of Oregon PUC not the City. Rates approved by Oregon PUC not the City. Service area expansions must be negotiated with private sector owner.

Concession option (4) and Sale of the Utilities (5) to the Private Sector do not align with City objectives and require private sector financing costs with capital finance charges more than double the City's cost for tax-exempt debt. As agreed with the PAVE Committee, these options were eliminated from further consideration as no benefits accrue to Grants Pass that are not provided by other alternatives and the financing costs are significantly higher and would create additional rate increases with no benefit to the ratepayer. The decision made was to therefore focus on Conventional, DB, and DBO alternatives.

Wastewater Treatment Facilities – There are several factors that support using a DB approach for the procurement of the new wastewater facilities. These include:

- Facility needs are upgrades and additional treatment based on using existing equipment, technology, and processes.
- Wastewater needs map well to DB with City staff operation and use of consultants. The DB approach provides significant benefits to the City and ratepayers.
- Usage of the DB alternative avoids adding the project/program management workload on City staff as would occur under the Conventional model.

- The exceptions to the above are the upgraded SCADA and MMS systems and capabilities. These can and should be pursued as a separate procurement and should be coordinated with the water facilities so the same systems software and hardware are used at both utilities.
- The demonstrated track record of the DB format and approach, as compared to the Conventional model, delivers project capital costs savings that are estimated in the range of 10–40%. For Grants Pass, this translates into a potential capital cost savings of $ 1.0 million to more than $4 million for the facilities upgrades planned for 2016–2019.

New Water Treatment Plant – There are several factors that support using a DBO approach for the procurement of the new water facilities. These include:

- Facility needs are for a new plant that is located at a new site and that uses different technology, processes, and systems than the existing treatment plant.
- Significant augmentation of existing City staff (numbers and expertise) would be required under a Conventional approach.
- Based upon the potential cost savings identified for the DB and DBO alternatives and the ability to align these alternatives with City goals and priorities, the recommendation development focused on the advantages provided by these alternatives as compared to the Conventional model.

Both the DB and the DBO alternatives have demonstrated significant cost savings (20–30%) as compared to the Conventional DBB approach with City staff augmented with consultants. DBO provides significant additional advantages and benefits for the City. Overall responsibility for design, construction, startup, and performance would be integrated into the responsibility of this single entity. As such, usage of the DBO approach avoids the exposure of multiple firms pointing to another firm as the responsible entity and thus leaving the City without an assured pathway for resolution other than legal proceedings. The DBO approach effectively eliminates, for the City, the multiple firm and City staff separate responsibilities associated with the DB approach. While the DB approach can and does provide some of the guarantees and performance commitments, it continues to have the “two party” responsibility for plant performance for startup and meeting of regulatory requirements. Because of this key difference, the DBO approach provides far superior guarantees and risk shifting away from the City or City staff. Table ES-4 summarizes the tradeoffs.

Table ES-4: Comparison of Risk Assignment and Guarantees

	Topic	Private Sector DBO	DB & Staff Operates
1)	Capital costs guaranteed	yes	possible
2)	Operating costs guaranteed (short & long term)	yes	no
3)	Guaranteed facility performance	yes	no
4)	Permitting risk assumed	yes	partial
5)	Construction schedule delays	no cost adj.	time & dollars ??
6)	Change order costs (not City initiated)	no - guaranteed	possible
7)	Guaranteed regularory compliance	yes	no
8)	Regulatory fine coverage	yes	no - City pays
9)	Performance bond for construction	yes	yes
10)	Performance bond for operations	yes	no
11)	Guarnteed staff employment	yes	yes
12)	Liability coverages	yes	no - City pays
13)	Ability to early terminate agreement	yes	NA
14)	Upfront reimbursement of RFP procurement costs	yes	no

Because the DBO alternative involves modifications to staffing (some City employees' transition to the private sector), the DBO alternative should require offers of employment to existing staff for a minimum time period (typically two years) with comparable compensation and benefits.

Recommendation of Measurable Goals and Strategies

Each recommendation is followed by the page reference at which further detail can be found.

Critical Recommendations

1. Use the Design / Build (DB) procurement alternative for the wastewater treatment facilities. *(Page 80)*
2. Use the Design / Build / Operate (DBO) procurement alternative for the new water treatment plant to gain the cited advantages for costs, staffing, guaranteed performance for design and construction, guaranteed regulatory compliance, and cost and financial guarantees. *(Page 80)*
3. Evaluate ways to optimize the size of a new water treatment plant. *(Page 94)*. There are several approaches that can be taken to optimize the size/phasing of the new water treatment plant. These include:
    a. Incentivize conservation – consider revising pricing tiers to drive peak reduction; consider conducting a cost of service study to ensure full cost recovery is occurring.

b. Repair of leaks / water loss – Closely examine and optimize the system to reduce unaccounted for water.
c. Evaluate cost / tradeoffs of more storage against the water treatment plant expansion.
d. Evaluate phasing of the expansion.
e. Evaluate recycled water use in agricultural area to reduce potable water demands.

4. Complete the update of the Emergency Preparedness Plan. *(Page 71)* The Emergency Preparedness Plan was developed in 2004 and is currently under review. As part of that revisit, several areas need attention:
    - Conduct contingency planning for emergency loss of water supply (e.g., contamination).
    - Regularly conduct emergency preparedness exercises.
    - Develop a contingency plan to mitigate the risk of taking down a basin for maintenance at the WTP (no backup).
    - Develop a business resumption or continuity plan to ensure key administrative and operational elements can continue during emergencies (e.g., loss of an administrative facility, billing/invoicing, information technology backup systems, etc.).
    - Examine criticality and need to upgrade pump stations and reservoirs.
    - Evaluate backup power needs.
    - Consider mutual aid agreements with regional (or beyond) utilities.
5. Evaluate and improve security systems at current plants. The details of these recommendations will be handled verbally. *(Page 115)*
6. Conduct an assessment of pump station reliability (including backup power needs) to ensure the desired level of supply reliability. Develop replacement or upgrade plans for the 13 pump stations should be developed. *(Page 126)*
7. Consider more frequent inspections of older tanks (more frequent than 5 years). *(Page 127)*

Necessary Recommendations

8. Invest in staff recruitment and retention. *(Page 75)* Due to pending retirements in the water and wastewater staff, there is a need to develop a succession plan. The plan / strategy should have multiple dimensions including:
    - Conduct of compensation surveys to ensure competitive salaries.
    - Hiring of replacements before key departures to allow job shadowing.
    - Ensuring full staffing complement of approved positions.
    - Revisiting cross training as appropriate.
    - Continuing internships at community colleges.
    - Developing paid operator or mechanic internships.
    - Supporting employee development / training through appropriate incentives. The City could benchmark such incentives used by other area utilities.

- Developing employee appreciation programs (especially in Distribution and Collection).
- Developing career path training for all utility staff positions (including supervisory training).
- Consider some 360 evaluations for senior management positions (Public Works Director and Superintendents).
- Ensure staff is engaged in industry associations (create learning environment).

9. Develop a communications plan for the utility. *(Page 72)* Given the challenges facing the water and wastewater service provision in the City, there is a need to build greater awareness and knowledge of water in the community. Significant rate increases are possible that will not be favorably received in the absence of a strong articulated business case for the required infrastructure (which exists). In addition, efforts to optimize the construction of the required facilities may require additional community efforts in conservation requiring consistent and helpful messaging. The use of asset management systems will, over the long term, assist in communicating the capital and operations and maintenance needs to community. The City should consider developing a better understanding of the community's willingness to pay through surveys/focus groups as part of any outreach effort to help measure the effectiveness of the City's information/messaging efforts. The new billing system that is being implemented presents an opportunity to use the bills to better message the needs of water and wastewater services. This can be done through a redesign of the bill combined with providing appropriate insert information.

10. Upgrade Knowledge Management Systems. *(Page 72)* Currently many of the records systems are on paper requiring significant dependence on senior managers' knowledge and recall. Systems are needed to document how/why decisions are made.
11. Re-emphasize safety training content and frequency. *(Page 73)* Claims rates appear high for a utility of Grants Pass' size. Safety is part of the current culture in the City but should be re-emphasized and institutionalized.

12. Develop a Technology Plan/Strategy. *(Page 72)* The current SCADA system in the WTP is 15 years old. The new WTP will have a modern system and this should be kept updated. Both the new WTP and the existing WRF would benefit from having modern Laboratory Information Management systems implemented on startup. There are numerous industry standard systems that have robust data management, analysis and reporting capability. The ability to provide field accessibility of updated as-built drawings was mentioned by numerous staff as an important efficiency measure/technology.
13. Implement a new Asset Management System (AMS). *(Page 73)* The current system was built in house and is not fully functional. There is a basic equipment inventory and preventative maintenance listing; Replacement / upgrade plans have not been established, nor have costs. Formalized modern programs will greatly improve long-range effectiveness. The increasing ambitiousness of future requirements will require an Asset Management System. There is also an incomplete listing of equipment on both the water and wastewater side of the utility making it difficult to track maintenance activities. This may contribute to the non-uniformity in the degree of reactive maintenance that occurs in the Divisions. For example, anecdotally, the Distribution and Collection, Wastewater Treatment and Water Treatment Divisions spend approximately 10%, 25–25%, 50% and 15% of their maintenance time in "reactive maintenance" activities (i.e., fixing things that break). Industry norms are close to 20%. A formal AMS would verify these anecdotal estimates. There is a need to standardize across the utility. It is also not clear that all warranty maintenance is being regularly conducted.
14. Implement a Computerized Maintenance Management System (CMMS). *(Page 50)* A CMMS that uses information from the AMS to issue work orders and track completion of required activities is needed.
15. Develop energy strategy/plan. *(Page 72)* The Plan should define the plans for use of digester gas, implementation of alternative energy projects (e.g., solar photovoltaic) and energy efficiency measures.
16. Examine automation opportunities in new facilities. *(Page 51)* Upgraded automation could help with dosage control at the new water treatment plant as well as polymer optimization at the Water Restoration Facility.
17. Engage operations and maintenance staff in operability assessments of new facilities. *(Page 72)*
18. Institute a formalized weekly staff meeting and planning session for the water and wastewater utility. *(Page 81)* The water utility session should involve the Water Treatment Division and the Distribution section of the Distribution and Collection Division. The wastewater utility session should involve Wastewater Treatment and the Collection section of the Distribution & Collection Division. Such an approach should yield significant benefits including improved awareness of overall utility activities

and priorities, better / more informed cooperation/communication, and an integrated operation and maintenance set of priorities and actions.

19. Assess the potential to move the Distribution and Collection Division staff to the new treatment plant site to improve communication and provide adequate workspace for those employees. *(Page 177)*
20. Re-implement a Uni-Directional Flushing (UDF) program to focus on older areas of the City. *(Page 122)* The water quality complaint logs should be used to help focus the UDF.
21. Continue to conduct comprehensive water loss assessments. *(Page 125)* While the volumes of lost water are not dramatically large, savings on losses could potentially help forestall some system expansion (especially if connected to more aggressive water conservation programs).
22. There are some higher pressure areas of the system (North Valley Line) that might be candidates for energy recovery technology (e.g., inline microturbines). *(Page 125)*
23. Implement a regular valve-exercising program. *(Page 126)*
24. Develop a replacement parts inventory that is based on need/frequency of repairs. *(Page 128)*
25. Evaluate need to expand pretreatment program (currently one person). *(Page 132)*
26. Fill unfilled wastewater plant positions. *(Page 132)*
27. Continue to track AMR/AMS opportunities. *(Page 140)*
28. Formalize documentation of judgments on late bills. *(Page 121)*
29. Once the new billing system is implemented, redesign bills to simplify and incorporate key water messaging to improve community's recognition of the value proposition of reliable water and wastewater services. *(Page 143)*

Desirable Recommendations

30. Evaluate bulk water program pricing. *(Page 95)*
31. Document Standard Operating Procedures (SOPs). *(Pages 12, 13, 50, 75, 78, 115, 116, 131, 133)*
    a. Like many utilities, significant knowledge is retained by experienced senior managers. When those managers retire or move, some knowledge is lost. Documenting procedures helps minimize that loss of knowledge. The City should systematically review all key SOPs and ensure they are documented.
    b. There is a need to update the list of items that residents must not put in the sewer.
    c. Staff identified a need to strengthen the grease rider.

32. Evaluate the feasibility/legality of adopting a lifeline rate system. *(Page 121)* Alternatively, conduct a cost of service study coupled with carefully constructed water tiers (pricing), which could help those on the bottom of the income ladder.
33. The "Customer Information System" (CIS) is largely paper at this point. *(Page 122)* Grants Pass should considering implementing a CIS (especially once a Maintenance Management System is in place) to improve efficiency. The current process used appears reasonable, but improving the level of automation of these activities could improve efficiency (and record keeping).
34. Conduct representative testing/calibration of new meters prior to installation to confirm acceptable limits. *(Page 122)*

Additional Topics Addressed in the Report

This Executive Summary has focused on the key areas specified for the Report. Additional topics are discussed later in the Report. Some of the additional topics were blended into this Executive Summary and will not be "new information" when the full Report is read. The following items are addressed in detail in the sections of the Report that follow:

Section 4 –	Task II	Potential uses of the current water plant and site after new water plant is built on a different site and operational (Note: this item not addressed in the Executive Summary)
Section 5 –	Task III	Water meter replacement, customer service for water distribution, water system flushing
Section 6 –	Task IV	No additional topics not summarized in the Executive Summary
Section 7 –	Task V	Sewer main cleaning, TV'ing, and maintenance
Section 8 –	Task VI	Meter reading and utility billing, customer payments

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2.0 INTRODUCTION

Background

The City of Grants Pass (City) issued a Request for Proposal on December 22, 2014 to conduct an assessment of City water treatment, wastewater treatment, and distribution and collection service functions to assess the degree to which the City operations are managed as efficiently as possible. In addition, the assessment was to evaluate the different strategic alternatives that may be available to the City to continue to effectively provide these utility services well into the future. The product of the assessment was envisioned to be a comprehensive strategic planning document to be used by the Grants Pass Public Works Department to track the established goals, objectives, and priorities for at least the next five years. The strategic plan was to include recommendations to guide key policy, facility, personnel, training, and resource allocation decisions for at least the next five years.

Kickoff Meeting Description

The kickoff meetings for the project were held on May 19–21, 2015. The meetings consisted of:

Day 1: The EGI team took tours of the key facilities including the water and wastewater plants, and the collection and distribution Division offices and maintenance yard. The EGI team discussed system operations/needs and future facility plans with the Division superintendents.

Day 2: Morning meetings were held with senior City staff (Aaron Cubic, Jay Meredith, Terry Haugen) to:

- Review the scope of work,
- Conduct a SWOT analysis,
- Discuss management systems capability and strategic alternatives,
- Discuss the EGI Assessment Checklist approach and best practices,
- Initiate discussion of appropriate benchmarks,
- Frame the Effective Utility Management (EUM) survey and identify potential stakeholder participants,
- Provide an overview of alternative operating models and attributes, and identify PAVE Committee expectations.

Afternoon meetings were held with the Water Treatment, Wastewater Treatment, and Distribution

and Collection Division Superintendents. The project workscope was reviewed and input was received. The Superintendents participated in a SWOT analysis of the utility.

Day 3: The EGI team provided a morning status update with Finance Director Jay Meredith and developed the framework for the PAVE Committee presentation. The EGI team then worked to develop the presentation, meeting with the PAVE committee mid-afternoon. The presentation provided the PAVE committee with an overview of the scope, discussed the Assessment Checklist approach, conveyed preliminary observations and identified next steps.

Staff Interviews

EGI interviewed many City staff in person and by telephone in development of this report. The bulk of the City in-person interviews occurred on June 24 and 25 at City offices with follow-ups during subsequent visits to Grants Pass. Multiple telephone conference calls with City staff were also conducted over the course of the project. Project kickoff meetings were held on May 19 - 21, PAVE Committee workshops were held on June 25, July 22, Aug 11, and October 1, and a design charrette on water site usage was held on July 21.

List of Documents Reviewed

The following types of documents were reviewed:

- Annual Reports (last 3 years)
- Organization / staffing chart with positions, titles, number
- Annual report to regulatory agencies; violations
- Safety record (last 3–5 years)
- MMS Report and AMS report (last year) for plants, collection system & water transmission system
- List of operational highlights last 3 years
- Off-site resources & expertise provided to Grants Pass (list of firms / expertise / an approximate frequency)
- Capital Improvement Plans (CIPs)
- Annual Financial Plan and supporting documents
- Bond issue financial disclosure
- Information technology plans
- Description of current usage of SCADA and computerized control systems
- Integrated Resources Plan

- Awards, recognitions last three years
- Last three Consumer Confidence Reports
- Last two years of Board agendas
- Last year of Water Quality compliance reports
- Strategy documents related to source water quality challenges
- New water plant – design contract, pilot testing information and results, schedule
- User rates for each of last five years
- Biosolids hauling records
- Shift descriptions
- Last year of DMRs
- List of compliance issues over last five years
- Sewer maintenance records
- User rates for each of last five years
- Industrial pretreatment requirements with list of major dischargers
- Water Conservation Plan
- Emergency Operations Plan
- Risk Management and Loss Prevention Plan
- Community Rate comparisons for water & wastewater service
- Executive Summary section of Water Plant seismic assessment
- Examples of typical, individual employee record file for training for Water, Wastewater, and Collection and Distribution divisions
- Examples of safety training / SOP lesson plan
- Examples of Technical Training / SOP lesson plan
- Description of current billing system & process

EGI Team Members

Paul Eisenhardt

Mr. Eisenhardt is a nationally recognized expert in public-private partnerships for provision of utility services and outsourcing. He has negotiated over 50 contracts for provision of water and wastewater services of municipalities. Since 1996, he has managed privatization procurements for municipal clients that have exceeded $1.5 billion in contract value. In the competitive assessment and improvement area, he has worked with water and wastewater utilities nationwide. Topics have included strategic assessments, benchmarking, treatment plant operations and maintenance, water distribution and wastewater collection system management, utility management and administration, customer service, capital planning, and strategic planning. He has authored “Best Practices” research reports (WERF and AWWARF) for utility operations & management and for capital program management. He has a Bachelor’s of Science degree in Engineering from Brown University and an MBA from the Harvard Business School.

Ed Means

Mr. Means provides consulting services to water utilities in the areas of strategic management, water resources, and water quality. His experiences include 20 years with the Metropolitan Water District of Southern California, in positions of Supervising Chemist, Laboratory Manager, Director of Resources, Chief of Operations, Chief Operating Officer and Acting General Manager of a billion dollar water utility. In these capacities, he managed virtually all aspects of water service provision from water resources to operations of a complex transmission, distribution and treatment system and all administrative support functions. Since 1999, Mr. Means has helped build and sell to environmental engineering companies and has provided strategic consulting services to many of the large water utilities in the U.S. He has 35 years of experience and has published over 125 articles on water quality, water resources and planning in industry publications.

Brian Hemphill, PE

Mr. Hemphill has more than 35 years of experience as a consultant in the wastewater and water treatment industry. He has been involved in facilities planning, process design, detailed design, and management review and analysis. His expertise extends to all phases of wastewater and water management with particular emphasis on residuals management and processing evaluations and design. Brian's knowledge of water and wastewater treatment processes, design, operation and maintenance considerations provides an excellent basis for technical assessments, benchmarking, operational assessments, and for the technical assessment of alternatives for facility operations. He is a registered professional engineer in the State of Oregon.

Jim Bewley

Mr. Bewley has over 40 years of experience in wastewater treatment, recycled water, and water utilities. He has served in positions from operator chemist, superintendent, to Executive Director/Utility System Manager. He has direct experience with the planning, design and implementation of a 29 MGD wastewater facility and has worked extensively with multi-jurisdictional Boards and authorities. He provides operations, managerial and regulatory expertise for utility management and procurement assignments. He is a certified wastewater treatment operator (CA - Grade V).

Augmenting the EGI Team for Task II item to identify future uses of the current water plant site were consultants from the architectural firm of Ogden, Roemer, Wilkerson Architecture, Medford, OR (Ken Ogden and Dana Crawford) and from the landscape/design firm of Walker Macy, Portland, OR (Mike Zilis, and Nathan Kaplan).

Ken Ogden, AIA, Ogden Roemer Wilkerson Architecture

Ken emphasizes a collaborative approach with honest design. His wide-ranging experience and community-centered practice are evident in the strategic visions, master plans, and architectural designs performed for most jurisdictions in the Rogue Valley. His dedication to community extends to active involvement on several local boards such as Rotary, City of Medford Parks Foundation, the Illinois Valley Safe House Alliance, and serving as president for both the state and local AIA chapters.

Ken graduated from the Southern California Institute of Architecture and is licensed in Oregon, California, Washington, and Hawaii.

Dana Crawford, AIA, LEED AP, Ogden Roemer Wilkerson Architecture

Dana obtained her Bachelor of Architecture from the University of Oregon and brings 20 years of experience with a strong background in higher education, civic architecture, and public involvement. Along with her project management and programming skills, Dana is known for delivering client-specific and award-winning solutions through collaboration. Dana is registered in Oregon, a LEED accredited professional, and President-Elect of the Southern Oregon AIA chapter.

Michael W. Zilis, ASLA - Principal, Landscape Architect, Walker Macy

With decades of leadership in the planning and design of parks, waterfronts, transportation-related projects, community planning and urban redevelopment, Mike has a keen understanding of the physical requirements of development and land use approval processes. He provides vision and leadership for efficient and feasible implementation-oriented planning. Collaboration with other disciplines in site and program analysis and planning strategy is key to Mike's work.

Education includes Bachelor of Landscape Architecture, University of Oregon, Earth Sciences and Graphic Design, Northern Illinois University. He holds Professional Registrations for Landscape Architect for, State of Oregon, #222; Landscape Architect, State of Washington, #700; Landscape Architect, State of California, #5242; Landscape Architect, State of Utah,
7021882-5301.

Nathan Kappen, ASLA – Associate, Landscape Architect, Walker Macy

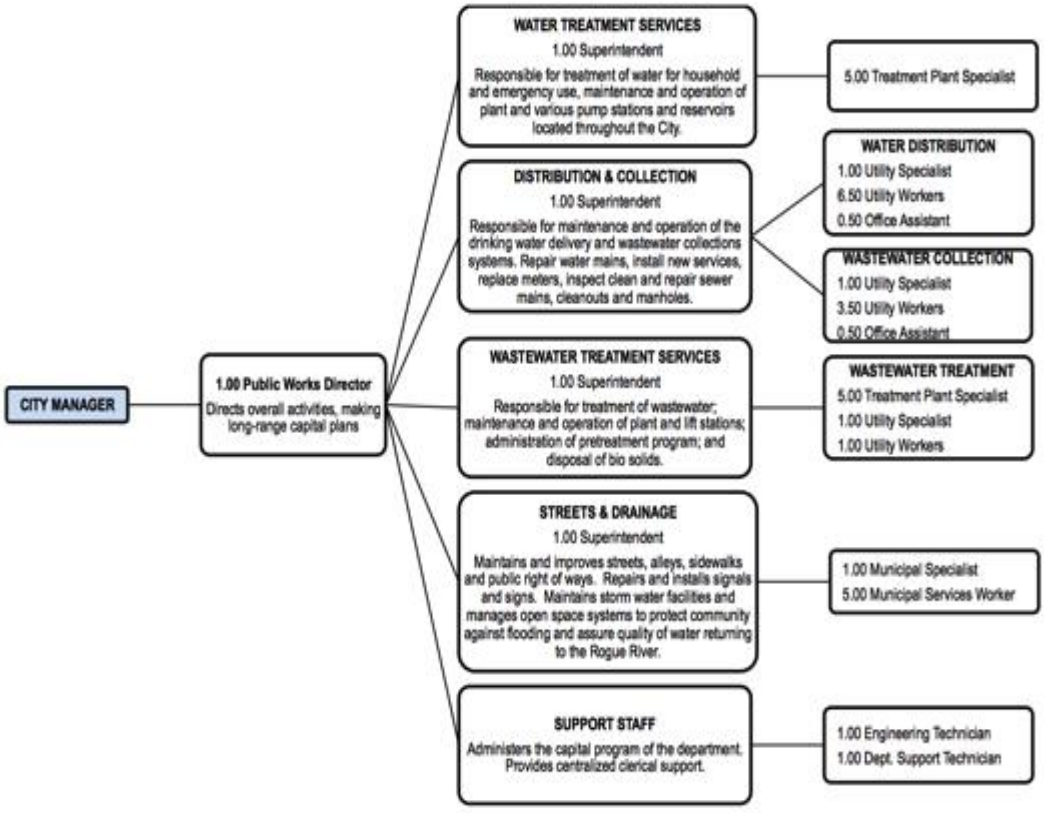
Nate is an enthusiastic and dedicated landscape architect and project manager and is emerging in the firm as a leader in design. His thoroughness and energy has brought fresh design thinking to a wide variety of projects, from public open spaces to private development work. Nate balances his design knowledge with substantial technical capabilities. Education includes Bachelor of Landscape Architecture, Washington State University. He holds Professional Registrations for Landscape Architect for State of Washington, #1374.

3.0 TASK I: WATER & WASTEWATER CORE TOPIC AREAS

Organizational Structure and Best Practices

The current structure of the Public Works function is depicted in Figure 3-1. Water and wastewater services are provided through three Divisions: Water Treatment Services, Distribution and Collection and Wastewater Treatment Services. The three divisions are each led by a Superintendent and contain 5, 13 and 7 staff, respectively. With support and management staff, the water and wastewater service functions comprise 31.4 FTEs providing service to 10,867 water accounts and 13,105 wastewater accounts.

Figure 3-1 Organization of the Public Works Department



Identification of Performance Issues

EGI used several approaches to develop this assessment and recommendations for the water and wastewater service provision functions:

1. Document review
2. Site visits
3. Conduct of Strength – Weaknesses – Opportunities – Threats (SWOT) analysis with management and staff
4. Conduct of an Assessment Checklist Evaluation
5. Conduct of an Effective Utility Management survey
6. Performance of Benchmarking using American Water Works Association benchmark statistics

This approach helped to define the findings and recommendations included in this report.

Performance Measures

Approach

EGI employs an assessment checklist that comprises the major functional areas of water and wastewater utilities. The Assessments were conducted by the four (4) member EGI team using document reviews, conference calls, surveys, interviews, and several days of on-site assessments of facilities, systems, and personnel. The EGI team members bring appropriate credentials and experiences as briefly summarized below and elaborated in the Professional Profiles of Appendix 1.

Description of 20 Assessment Checklist Elements

EGI staff assessed the Water, Wastewater, Collections and Distribution Divisions using the EGI Assessment Checklist of 26 elements representing the array of functions that a well-run utility must perform. The checklist was developed based upon the experience of the EGI team in other evaluations, industry best practices, detailed interviews with City staff, and field visits to the water and wastewater treatment plants. The ratings were developed by consensus of the EGI team and represent a summary of utility performance against industry practices. The rating scale is from 1–5 as follows:

5 = Best Practice

4 = Above Average

3 = Satisfactory

2 = Improvement

1 = Requires Upgrade

The Assessment Checklist elements are listed and summarized below:

1. **Planning** – Water, wastewater facility, resource and information technology planning is conducted with foresight and is current.

2. **Billing Systems** – The process of collecting billing information (meter reading) through provision of billing and collection of revenue is efficient and accurate.

3. **Regulatory compliance** – The utility complies with applicable state and federal regulations.

4. **Cost containment** – The utility relentlessly pursues cost efficiency in operations, and makes effective use of state-of-the-art methods.

5. **Water quality & effluent quality and operational performance parameters** – This element refers to the utility's performance in providing consistently high quality water and wastewater production.

6. **Asset Management Systems: Status & Accomplishments, Plans & Schedule** – This element refers to the degree of implementation and consistent use of modern asset management systems.

7. **O&M performance** – This element refers to the real or perceived operations and maintenance performance of the utility. Is the system operated and maintained in a proactive manner? Are the operators responsive to operational upsets or issues?

8. **Systems development and implementation** – This element refers to the level of incorporation of information systems and operating systems to ensure consistent, high-quality service.

9. **Usage of automation & SCADA System** – This element refers to the progressiveness of the operations to incorporate appropriate automation and monitoring systems to reduce operating costs (labor, chemical and energy) and improve system performance.

10. **Maintenance management system (MMS)** – This element refers to the adoption and consistent use of maintenance management systems to reduce unplanned outages, and optimize deployment of maintenance resources.

11. **Laboratory management/performance (usage of Laboratory Information Management Systems, LIMS) –** This element refers to the level of adoption of LIMS technology to manage laboratory work/sampling and record and report data. Development and adoption of quality assurance programs to ensure confidence in report information is included here.

12. **Current O&M manuals and SOPs** – This element refers to the presence of up-to-date documented procedures for major operational and maintenance functions and activities.

13. **Solids handling program** – This element refers to the consistent and rigorous management of solids from water and wastewater facilities. The minimization / optimization of solids volumes is included here as is consistent compliance with applicable regulations.

14. **Awards and recognitions** – This element refers to the real and perceived excellence of the utility as measured by the accolades, recognition and awards received.

15. **Staff alignment with strategic plan objectives and requirements** – This element refers to the real or perceived level of coordination and cooperation among the City staff and the utility.

16. **Employee programs: Training, certifications, safety, cross-training** – This element refers to the breadth and depth of the employee programs to ensure staff are well-trained and prepared to provide high quality water and wastewater services.

17. **Distribution system and collection system performance and maintenance** – This element reflects the level of reliable operations and maintenance of the distribution and collection systems.

18. **Security** – This element reflects staff sensitivity to and adequacy of security features for the physical facilities.

19. **Systems for energy efficiency and optimal chemical usage** – This

element refers to the deployment of systems to help optimize energy and chemical use.

20. **Human resources systems** – This element refers to availability and effectiveness of succession plans and effective recruitment to ensure adequate system staffing.

Assessment Checklist

The 20 element Assessment Checklist ratings are summarized in Table 3-1, including the EGI team's rating and specific observations shown in the Notes/Comments column. The highlights of the assessment are described further below and embedded in the report recommendations:

Table 3-1. Summary Results for Assessment Checklist Evaluation

Element Number	Description	Performance Rating Average	Notes / Comments
1	Planning	3	WTP, WWTP & C&D Master plans are current and of good quality. However resource usage, more aggressive conservation and IT / automation are major opportunities only partially addressed.
2	Billing systems	3	Limited review by EGI; Current legacy system works satisfactorily and economically meets historical needs but does not easily accommodate changes. Transition to an automated system is underway.
3	Regulatory compliance	5	Excellent record – both utilities; Ammonia limits were exceeded (Oct 2013) on one occasion and needs to be carefully watched. Just two NPDES permit excursion in last ten years.

Table 3-1 Continued. Summary Results for Assessment Checklist Evaluation

Element Number	Description	Performance Rating Average	Notes / Comments
4	Cost containment	4	Lean staffing, tight budgets, maintenance area a concern; Operating cost reductions may be

			attainable with improved knowledge management methods. Appear to be doing a good job but lacks tracking systems (target vs. actual power, chemical, maintenance).
5	Water quality & effluent quality and operational performance parameters	3+	Excellent; favorable raw water quality but occasionally "flashy" source water turbidity events; operations staff is professional and has routinely handled events. WRF is barely able to meet current ammonia limit, with one reported violation. Planned upgrades will remedy this problem. Aware of requirements but may be lacking tracking on process specific basis.
6	Asset Management Systems (AMS): Status & accomplishments, plans & schedule	1+	AMS is needed; Very basic equipment inventory and PM listing; Replacement / upgrade plans not established, nor costs. Formalized modern programs will greatly improve long-range effectiveness. The increasing ambitiousness of future requirements will require an AMS.
7	O&M performance	3	O&M Performance is excellent attributable to professional operations and maintenance staff (in spite of limited CMMS/Asset Management tools); maintenance concerns (deferred items, conditions, records). Need for funding and provision of management tools (CMMS, AMS, SCADA upgrades) for improved planning and tracking of maintenance.
8	Systems development and Implementation	2	Existing systems are outdated, lack capabilities; need for significant upgrades.

Table 3-1 Continued. Summary Results for Assessment Checklist Evaluation

Element Number	Description	Performance Rating Average	Notes / Comments
9	Usage of automation & SCADA System	2+	SCADA technology is out of date, new facilities offer opportunity for more automation (currently staff will not operate water plant unattended).

			Improvement opportunity. Wastewater runs unattended (rating = 3). Drinking water plant is shut down daily during winter months (rating = 2).
10	Computerized Maintenance management system (CMMS)	2-	Need for CMMS system and usage to replace current approaches, which are inadequate.
11	Laboratory management / performance (usage of LIMS)	2	Wastewater plant has limited ability to store and retrieve information in formats that facilitate / allow trend analysis and / or process assessments for cost effectiveness. Simple LIMS would improve records and reporting. Added LIMS capability at the water plant would link to the SCADA system so as to provide predefined analysis of current conditions and customizable dashboards of plant performance information.
12	Current O&M manuals and SOPs	2	Some SOPs exist. Other areas not documented. Need for systems upgrades and augmentation. Efforts are being made but much knowledge is retained by individuals.
13	Solids handling program	3	Landfill usage cushions impacts of need for redundancy. Programs are reliable and cost-effective, and align with community standards. New WTP design should include updates on solids dewatering; wastewater composting abandoned due to cost.
14	Awards & Recognitions	3	Water Treatment Superintendent is active in trade organizations but not clear beyond that.

Table 3-1 Continued. Summary Results for Assessment Checklist Evaluation

Element Number	Description	Performance Rating Average	Notes / Comments
15	Staff alignment with strategic plan objectives and requirements	3	Staff are capable and dedicated; Staff understands and advocates the need for systems and new facilities. Staff also seems to support procurement alternatives analysis.
16	Employee Programs: Training, Certifications, Safety, Cross-Training	3-	Staff individuals are good quality. Lean staffing restricts and inhibits these programs. Creates backup exposures. Improvement opportunity if funding provided. Preliminary indications suggest that formal cross-training could be improved. Certifications appear to be appropriate. More formalization of the training curriculum is needed so as to document short schools, workshops, etc.
17	Distribution system and collection system performance and maintenance	4	Few complaints; flushing & TV systems working; systematic capital upgrades underway. CMOM. Equipment is good. Over all very good performance history – planning is based on individual experience – needs criteria for adjustment/change.
18	Security	1	WRF is adequate. Significant vulnerabilities exist at WTP, warrant a review and actions to reduce / eliminate
19	Systems for energy efficiency and optimal chemical usage	2	Improvement area; limited systems, trend or cost effectiveness tradeoffs occurring. Upgraded automation could help with dosage control at WTP. Polymer optimization at WRF is uncertain. Process energy use analysis would be helpful, especially at WRF.

Table 3-1 Continued. Summary Results for Assessment Checklist Evaluation

Element Number	Description	Performance Rating Average	Notes / Comments
20	Human resources systems	3-	Adequate but some staff positions unfilled and staff retirements forthcoming create need for upgrades and planning; Succession planning is limited; Needs career path training - entry level to craft level to lead/supervisor to some superintendent level capability.
** Rating scale: 5 = Best Practice, 4 = Above Average, 3 = Satisfactory, 2 = Improvement, 1 = Requires Upgrade			

The results for this Assessment Checklist evaluation indicate that Grants Pass' performance for the overall water and wastewater utility is satisfactory for about half of the elements with three areas assessed as "Best in Class" or Above Average and seven elements that would benefit from added attention and improvement.

The areas in which performance was at Best Practice or Above Average levels include:

1. **Regulatory Compliance** – The City has a very good record of compliance that is attributable to a professional staff that is dedicated, creative, and hard working. The physical condition of the treatment plants have been recognized as in need of replacement (water plant) and upgrades (wastewater plant). Despite this, staff consistently produces a high quality water product for both water and wastewater. There was one example of a violation (related to ammonia) and minor monitoring violations in recent years. The relationship of staff with regulators is good and corrective actions were promptly taken. Plant improvements are planned to minimize future risks of violation.

2. **Cost Containment** – The utility staff (Management and Council) appear to be very cost sensitive in the operations of the utility. There is always a balance to be struck in saving money and deferring maintenance, though, and cost containment is not always the best strategy. An example of this is the deferral of coatings (paint) at the Water Treatment Plant, as the cost estimate was purportedly considered excessive. Failing to adequately maintain coatings may not represent structural weaknesses but it does represent an image issue that could be construed as a utility not paying attention to the small things and begging the question as to whether the "large" things are being handled adequately.

3. **Distribution System and Collection Systems Performance and Maintenance** – Flushing and TV systems appear to be working well. There are systematic capital upgrades underway. Equipment appears adequate/good for the work required. Overall the group has a very good performance history. This is an area where planning is based on individual experience; significant knowledge will depart with retirements and an effort should be made to transfer that knowledge (this is discussed later in this report). The overall water utility system (water & wastewater) experiences a complaint level that is typical for combined water/wastewater utilities. The complaint history was analyzed from paper records back to 2002 and is summarized below.

There were 223 recorded complaints during the 13-year period. Color complaints for the drinking water system represent the largest portion of the 13-year record analyzed (93 of the 223 total complaints). Given there were approximately 10,000 accounts during that period, the annual complaint rate for the overall drinking water and wastewater systems is about 1.7 complaints per year / 1,000 accounts. The median complaint rate for combined water/wastewater utilities is 1.0 complaint per thousand. The bottom quartile is 7.0 complaints per 1000 accounts (Source: AWWA Benchmarking Performance Indicators for Water and Wastewater: 2013 Survey Data and Analyses Report). As such, the analyzed results indicate a complaint level somewhat higher than the average for utilities. Table 3-2 summarizing the Water System Complaint Log is provided on the next page.

Table 3-2: Water System Complaint Log

Year	Taste	Odor	Color	Other	Annual Total
2002	3	4	22	4	33
2003	4	4	8	1	17
2004	2	2	4	0	8
2005	2	2	4	0	8
2006	4	7	19	0	30
2007	3	4	2	5	14
2008	3	8	3	4	18
2009	4	6	3	4	17
2010	1	3	3	4	11
2011	1	3	6	11	21
2012	5	6	13	3	27
2013	3	2	5	0	10
2014	5	2	1	1	9
13 yr Total	**40**	**53**	**93**	**37**	**223**

Similarly, the Assessment Checklist Evaluation identified seven areas in which improvement in demonstrated performance is warranted. These areas are described below.

1. **Improvement Area #1 – Asset Management (Checklist Element #6) —** Generally, the team observed a motivated professional workforce at both the water and wastewater plants and in collection and distribution. They are seemingly spread thin. Maintenance appeared to be done (notwithstanding the water plant coatings issue mention earlier). Anecdotal information indicates the following levels or reactive or unplanned maintenance:

i. Collections – 10%,
ii. Distribution – 24-35%
iii. W/W Treatment 50%
iv. Water Treatment - 15%

Best in class utilities have levels of approximately 20% time spent on reactive maintenance.

The current maintenance management system was built in-house. It includes a basic equipment inventory and preventative maintenance listing. There does not appear to be rigorous documentation of maintenance histories, a normal part of modern AMS programs. Replacement/upgrade plans have not been established nor have costs been projected. Tracking of spare parts inventory for critical equipment/activities is needed (staff indicated that occasionally there are inadequate replacement parts on the shelf). A formalized modern program should be considered housing all key equipment, maintenance requirements, and assigning equipment criticality (to help prioritize maintenance activities). This should drive a "fact-based" process to replace assets and help justify the needed replacements. There are relatively inexpensive web-based systems (e.g. Sedaru) that would greatly improve long-range effectiveness of maintenance resource usage. Construction of the new water treatment plant is an ideal time to transition to a new system that will include the wastewater plant and collection and distribution activities as well.

2. **Improvement Area #2 – Systems Development and Implementation (Checklist Element #8)** — Some current systems are outdated and lack capabilities. Document management systems are largely paper-based and need to be upgraded to current practices/standards. Accessing historical information is cumbersome and appears to rely on "tribal knowledge" as much as records. This is a vulnerability as the workforce ages and retires, taking that knowledge with them. The SCADA system is fifteen years old and generally outside a typical replacement life-cycle and uses outdated technology and systems that are no longer supported. The water plant system does not provide control / adjustment algorithms but rather is used to create data logging of parameters for usage by the operating staff to make process adjustments. Given the current water plant is scheduled to be abandoned there is no need for significant upgrades; however, systems should be kept current with product life cycles. The current communications system for the utility should be re-evaluated and upgraded (including emergency communications). Development of a formal communications / technology master plan is warranted including systems to better access geographical information in the field (including as-builts, etc.). The plan could consider methods to improve communications within and between the Divisions and management/other City Departments.

3. **Improvement Area #3 – Maintenance Management System (Checklist Element #1 –** The current maintenance management system relies heavily on the informal expertise of staff with limited written records retention or capabilities. There is a need for a work order generation system that will link to the Asset Management System and define and schedule maintenance, generating work orders based upon that data. Tracking and reporting of deferred maintenance and replacement cost profiles could be generated and would improve maintenance planning and efficiency. Implementation of a modern, fully capable computerized maintenance management system (CMMS) will provide these capabilities. The current system will also benefit from development of "Standard Operating Procedures" (SOPs) so as to retain and document that proper maintenance procedures are used and followed (the Water Treatment Division has documented SOPS for key operational actions including:

    - PLC Fault Clearing
    - Pump Station After Hours Emergency Call Out
    - Pump Station Intrusion
    - Treatment Plant After Hours Emergency Call Out
    - Bailey I/P Controllers
    - Differential Pressure Transmitters
    - CAL-004-1720 Formazin Calibration
    - CAL-007 – Solitax sc Raw Water Turbidimeter Calibration
    - Chemical Deliveries
    - LAB-001 – Weekly Mill Pond Sample
    - Filter-aid Mixing
    - Normal Plant Start-Up
    - OPS-007 – Pilot Filter Polymer Batch Mixing
    - OPS-008 – Manual Operation of Grundfos DME Chemical Feed Pump
    - OPS-012 – Every Other Hour Checks
    - OPS-015 – Once Per Shift Checks
    - OPS-016 – Transferring Sodium Hypochlorite
    - OPS-019 – Plant Freeze Protection
    - OPS-022 – Chemical Spill Response
    - OPS-023 – Simplified Jar Test Procedure
    - OTHER-010 Temperature Data Logger Instructions

    Documentation of SOPs across all divisions is especially important given pending staff retirements in some utility areas and the need to capture their "tribal knowledge" in a documented manner for continued usage by the staff. Without such documentation there is a significant risk of voiding new equipment warranties, as the record system will not satisfactorily exist to satisfy warranty requirements of the equipment manufacturers.

4. **Improvement Area #4 – Laboratory Information Management Systems (LIMs) (Checklist Element #11)** — The Water Treatment Plant uses an in-house built simple LIMs system that, from reports of operators, works fine, allowing basic trend analysis. There are numerous small LIMs packages on the market, however, that represent better tools for operations assessment and planning and would be worth exploring. In the Wastewater Division, there is limited ability to store and retrieve information in formats that facilitate / allow trend analysis and / or process assessments for cost effectiveness. This capability should be implemented to improve efficiency.

5. **Improvement Area #5 – Current O&M Manuals and SOPs (Checklist Element #12)** — Some SOPs exist. Other areas are not documented. There is a need for systematic documentation (and systems upgrades/augmentation) to capture the "tribal knowledge" of individuals in all three divisions. Efforts are being made but much knowledge is retained by individuals. As staff retire, this loss of knowledge will be significant.

6. **Improvement Area #6 – Security (Checklist Element #18)** — The EGI team has observed several areas where security attention is required. These have been conveyed verbally to management and the PAVE Committee. A security review and implementation of actions to address the identified concerns are appropriate.

7. **Improvement Area #7 – Systems for Energy Efficiency and Optimal Chemical Usage (Checklist Element #19)** — Systems for optimizing chemical and energy use are limited. Trending capability to optimize cost effectiveness and identify tradeoffs is limited. Upgraded automation could help with coagulant and polymer dosage control at the water treatment plant. Process energy use analysis would be helpful, especially at the WRF. There are opportunities to explore:

    a. Expansion of alternative energy generation (solar and biogas)
    b. Reuse of water for agricultural irrigation

    An energy plan (including efficiency and generation) should be developed.

Benchmarks

AWWA Benchmarks

In addition to the Assessment Checklist Evaluation, EGI conducted benchmarking of Grants Pass water and wastewater operations based upon the American Water Works Association's (AWWA's) Utility Benchmarking Program. Their program is a system of well-defined performance indicators specific to the water and wastewater sector. These indicators were designed to help utilities providing water and/or wastewater services improve their operational and managerial efficiency and effectiveness. The information is generated from an annual utility benchmarking survey. The Benchmarking: Performance Indicators for Water and Wastewater – 2013 Survey Data and Analyses Report was published in 2015. The details of the calculations are included in Appendix 2.

The purpose of the benchmarking is to provide objective performance measures for decision makers that are responsible for overseeing/managing water and wastewater utilities. For each of the benchmarks, survey information was collected from water and wastewater utilities as well as utilities that provide both "combined" services.

Per AWWA, "To make valid comparisons, performance indicator must be well defined and consistently used in context. If definitions are inconsistent or incomplete, the resulting performance data will not be comparable. Even when comparable date is collected, external comparisons are often not straightforward because numerous system-specific factors can influence the system performance. Important variables that may be outside of the utilities control include the following:

- Water sources
- Treatment requirements
- System age/materials
- Topography/environment
- Organizational vision and culture
- Historical and current strategic and operating plans
- Budget
- Customer base
- External service providers (electricity, gas, telecoms, etc.)
- Services from enterprise/corporate functions (finance, IT HR, etc.)
- Regulations
- Governance
- Political environment
- Economies of scale (as system size increases, efficiency may improve)
- Economies of scope (diversification of services may lead to efficiencies)
- Economies of density (as population density increases, unit costs may decrease)"

In collaboration with Grants Pass management, twenty performance indicators were selected for calculation and comparison (the work scope proposed 10 total). The performance indicators include:

1. O&M cost per account, water
2. Million gallons delivered per day per employee, water
3. Water main breaks per 100 miles of pipe, water
4. Customer technical service complaints per thousand accounts, water
5. Training (hours per employee), water
6. Service affordability (average residential monthly water bill x 12) / (Real median annual household income), water
7. % Planned Maintenance (vs. reactive maintenance), water
8. Regulatory compliance rate (# of standard and/or monitoring violations), water
9. Water loss, water
10. Total O&M per wastewater account, wastewater
11. Million gallons treated per day per employee, wastewater
12. Collection system integrity (failures per 100 miles of pipe), wastewater
13. Training (hours per employee), wastewater
14. Service affordability (average residential monthly wastewater bill x 12) / (Real median annual household income), wastewater
15. % Planned maintenance (vs. reactive maintenance), wastewater
16. Regulatory compliance rate (# of standard and/or monitoring violations), wastewater
17. Customer technical service complaints per thousand accounts, water

In addition, while AWWA does not provide comparative quantitative benchmark information on the following three performance indicators, EGI comments are provided:

18. Safety record
19. Annual grievances filed, water
20. Annual grievances filed, wastewater

These benchmark metrics provide a good cross-section of system performance for water and wastewater, capturing elements of efficiency and system operations.

The AWWA Benchmarks were generated across, in some cases, dozens of water and wastewater utilities that provided their information. An implicit assumption by AWWA and users of the performance indicators is that the reporting utilities have provided accurate information. The results are portrayed as quartile values. The top 25% of respondents indicated they were at or above the "top quartile" value shown. One half of the respondents were above (or below) the "median" value and 25% of the respondents were at or below the "bottom quartile" value. The "Grants Pass Value" is calculated using the AWWA methodology and information provided by the Grants Pass Public Works Department. The AWWA data are recent (solicited through October 2014) and, where financial metrics are involved, have not been adjusted for inflation. Recent inflation has been low in the Grants Pass area and is not expected to substantially alter the comparisons.

The results should be viewed as a general comparison of performance and only as an indicator of potential areas of improvement. There are elements of the Grants Pass water and wastewater systems (such potential items were listed above) that are unusual and may challenge comparisons with other utilities.

Summary Conclusions from the Twenty Selected AWWA Benchmark Metrics

As discussed, there are literally hundreds of potential benchmark performance indicators. The twenty depicted here are a good cross-section of utility performance. The results of the benchmarking are in alignment with the Assessment Evaluation Checklist Evaluation described in this report. There are multiple performance indicator areas where Grants Pass is "above average" as a water and wastewater utility. So as to track continued performance and improvements or deteriorations, Grants Pass should consider periodically measuring against these (or other) benchmarks in the future.

The calculations supporting each indicator are included as Appendix A of this report.

Performance Indicator #1 – Total O&M Cost Per Account, Water

This indicator provides a measure of employee efficiency as expressed by the total number of active accounts serviced by utility employees as FTEs per year. The metric is calculated as follows:

$$\text{Total O\&M Cost of Potable Water Services (\$/account)} = \frac{\text{Total O\&M Cost}}{\text{Number of active residential + non-residential accounts}}$$

2015 budget/cost data for the water operations were tabulated separately and compared against total water accounts (10,867). The results are depicted in Table 3-3 below. Grants Pass ranks in the second quartile in the benchmark for the utilities survey (29 water operations).

Table 3-3: Total O&M Cost per Water Account, Water

Grants Pass Value	Top Quartile	Median	Bottom Quartile
$308	$243	$361	$542

*Source: AWWA 2015 Benchmarking Study, P. 75

Performance Indicator #2 — Million Gallons per Day of Water Produced Per Employee

This indicator provides a measure of employee efficiency as expressed by the amount of potable water produced by utility employees (as full-time employees (FTEs)) per year. For a given reporting period, it is calculated as follows:

$$\text{MGD of Water Produced per Employee} = \frac{\text{Average daily production}}{\text{Total number of FTEs}}$$

Table 3-4: Million Gallons Water Delivered per Day per Employee

Grants Pass Value	Top Quartile	Median	Bottom Quartile	Assumptions
0.29	0.32	0.24	0.16	Employees* (2015)
				15.26

Source: AWWA 2015 Benchmarking Study, p. 79
Water employees derived from 2015 budget document

Grants Pass is favorably in the 3rd quartile for this metric.

Performance Indicator #3 – Water Distribution Breaks per 100 Miles of Pipe

This indicator quantifies the condition of a water distribution system, expressed as the annual number of pipeline breaks per 100 miles of distribution piping. A break means physical damage to a pipe, valve, hydrant, or other appurtenance that results in an abrupt loss of water. On the basis of the length of pipe in a system, this indictor is calculated as follows for given reporting period:

$$\text{Breaks per 100 miles of pipe} = \frac{\text{Total number of breaks x 100}}{\text{Total miles of distribution system piping}}$$

From January 2009 to August 2015 (approx. 6.5 years) there were 46 water main breaks for an average of 7 breaks per year for the 6.5 year timeframe (per Bob Hamblin).

Table 3-5: Breaks per 100 Miles of Pipe

Grants Pass Value	Top Quartile	Median	Bottom Quartile
3.6	4	13	

Source: AWWA 2015 Benchmarking Study, p. 80
Miles of pipe = 194 (per Bob Hamblin)

Grants Pass is in the top quartile for this metric.

Performance Indicator #4 – Customer Technical Service Complaints per 1000 Accounts, Water

These indicators provide the complaint frequency related to customer service or core utility services expressed as the number of complaints per 1,000 customer accounts per reporting period. It is calculated as follows:

$$\text{Customer service complaints per 1000 accounts} = \frac{\text{Total number of complaints x 1,000}}{\text{Number of residential accounts + Number of non-residential accounts}}$$

Table 3-6: Annual Customer Technical Service Complaints per 1000 Accounts

Grants Pass Value	Top Quartile	Median	Bottom Quartile
1.6	0.2	1	7

Grants Pass is in the 2nd quartile.

Performance Indicator #5 – Training Hours Per Employee, Water

This indicator provides a measure of the amount of training that employees receive expressed as the annual number of training hour per employee as FTEEs. This indicator does not address the effectiveness or efficiency of the training program. For a given reporting period, it is calculate as follows:

$$\text{Training (hr/employee)} = \frac{\text{Total training hours completed by all employees during the reporting period}}{\text{Total number of FTEs}}$$

Table 3-7: Training Hours per Employee (hr/FTE), Water

Grants Pass Value	Top Quartile	Median	Bottom Quartile
7 – Distribution 55 – Water	25	16	8

Source: AWWA 2014 Benchmarking Study, P. 26

See supporting Table 3-7a on the next page

Table 3-7a: Training Hours by Divisions

Division	Total Training Hours *	Years	# Employees	Hours per Employee per Year
Distribution *	291	5	8.8	7
Water Treatment **			6.46	55

* Per Bob Hamblin
** Per Jason Canady

Grants Pass is in the bottom quartile for Distribution and the top quartile for Treatment

Performance Indicator #6 – Service Affordability, Water

This indicator provides a measure of the affordability of water services as a percentage of local median household income (MHI). For a given reporting period, it is calculated as follows:

$$\text{Water Service Affordability (\% of MHI)} = \frac{\text{Average residential monthly water bill} \times 12^{*}}{\text{Real median annual household income}^{**}}$$

Table 3-8: Service Affordability, Water

Grants Pass Value	Top Quartile	Median	Bottom Quartile
1.23%	0.50%	0.64%	0.81%

Source: AWWA 2015 Benchmarking Study, p. 70
* Average annual residential water bill is $ 409 (per Jay Meredith)
** Median Household Income (2013) is $33,207
(http://www.citydata.com/income/income-Grants-Pass-Oregon.html)

Grants Pass is in the bottom quartile on this measure.

Performance Indicator #7 – Planned Maintenance Ratio, Water

This indicator quantifies a utility's efforts regarding planned (proactive) and corrective (reactive) maintenance. Time charged for maintenance work includes all time spent responding to the maintenance work order including travel, obtaining tools and parts, and completing the work.

Grants Pass does not maintain detailed records of planned vs. preventative maintenance. The implementation of a maintenance management system would track such data. Nonetheless, it is possible to use anecdotal information on planned maintenance from the informal interviews that were conducted with the utility staff. Based upon input from several staff in the interviews, the planned maintenance percentages for water treatment are approximately 85% and for water

distribution are 65–75%. These estimates place the water plant in the top quartile of performance and the water distribution in the 2nd quartile of performance. Based on on-site observations, the 85% percentage may be significantly higher than results or may have a reduced set of requirements for planned maintenance. These observations are reinforced by the limited number of maintenance staff and scheduling systems.

$$\text{Planned Maintenance Ratio (\% of total maintenance time)} = \frac{\text{Total time for planned maintenance}}{\text{Time for planned maintenance} + \text{Time for corrective maintenance}}$$

Table 3-9: Planned Maintenance Ratio

Grants Pass Value	Top Quartile	Median	Bottom Quartile
85% – water plant* 64-75% – distribution*	75%	52%	27%

Source: AWWA 2015 Benchmarking Study, p. 81

* This is an anecdotal estimate based upon staff interviews and needs to be verified

Performance Indicator #8 – Regulatory Compliance Rate (% Days in Compliance), Water

This indicator quantifies the percentage of time each year that a utility meets all health-related drinking water standards required by primacy regulation. It does not take into account additional parameters regulated by individual states, nor does it include violations of monitoring requirements. A utility measures it compliance relative only to those primary maximum contaminant levels (MCLs) and treatment techniques (TTs) that apply to its operation. The compliance performance indicator defines the percentage of the year that the utility was in compliance with all federally mandated, health-related drinking water quality parameters. For a given reporting period, this indicator is calculated as follows:

$$\text{Regulatory Compliance - Water} = \frac{\text{Number of days that the utility was in full compliance with all applicable regs}}{\text{365 days}}$$

Table 3-10: Regulatory Compliance – Water

Grants Pass Value	Top Quartile	Median	Bottom Quartile
100%*	100%	100%	100%

Source: AWWA 2015 Benchmarking Study, p. 74

Grants Pass staff has done an excellent job in maintaining compliance with drinking water regulations.

Performance Indicator #9 – Distribution System Real Water Loss

This indicator quantifies the percentage of water that fails to reach customers and cannot otherwise be accounted for through authorized consumption. Distribution system water loss is the difference between the volume of water produced for use by all customer classes and the volume of water that is actually consumed by authorized users. This indicator is calculated as follows:

$$\text{Real Water Loss (\%)} = \frac{\text{(Total volume of water lost due to leakage on transmission and distribution mains, leakage and overflows at utility storage tanks, and leakage on service connections up to the point of customer metering)}}{\text{(Average daily production x 365 days)}}$$

Table 3-11: Distribution System Real Water Loss

Grants Pass Value	Top Quartile	Median	Bottom Quartile
8.4%*	1.0%**	5.9%	9.5%

* Source: Water Management and Conservation Plan Update, 2014 p.25, 5 year average 2007–2011

** Source: AWWA 2014 Benchmarking Study, P.60 (this was not benchmarked in 2015 study)

Grants Pass water distribution system losses are in the 2nd quartile of the benchmarked utilities.

Performance Indicator #10 – Operating and Maintenance Cost per Account, Wastewater

The operations and maintenance costs for wastewater service can be compared between utilities once normalized by the number of accounts served. The metric is calculated as follows:

$$\text{O\&M Cost of Wastewater Services (\$/Account)} = \frac{\text{Total O\&M Cost}}{\text{(Number of residential accounts + Number of nonresidential accounts)}}$$

There are 13,105 wastewater accounts.

Table 3-12: O&M Cost per Account, Wastewater

Grants Pass Value	Top Quartile	Median	Bottom Quartile
$292	$238	$344	$476

Source: AWWA 2014 Benchmarking Study, P. 89

Grants Pass is favorably in the third quartile in this metric.

Performance Indicator #11 – Million Gallons of Wastewater Treated Per Employee

This indicator provides a measure of employee efficiency as expressed by the amount of wastewater processed by utility employees (as FTEs) per year. For a given reporting period, this indicator is calculated as follows:

$$\text{MGD Wastewater Processed per Employee} = \frac{\text{Average MGD wastewater processed}}{\text{Total number of FTEs}}$$

Table 3-13: MGD Wastewater Processed per Employee

Grants Pass Value	Top Quartile	Median	Bottom Quartile
0.32	0.26	0.18	0.13

Source: AWWA 2014 Benchmarking Study, P. 75

Grants Pass is in the top quartile in this metric.

Performance Indicator #12 – Collection System Integrity, Wastewater (Sewer System Overflows per 100 miles of pipe)

This indictor quantifies the condition of a wastewater collection system, expressed as the annual number of sewer system overflows per 100 miles of collection system piping. A collection system failure is a loss of capacity resulting from a flow restriction in gravity or pressurized wastewater systems. On the basis of the length of pipe in a system, this indicator is calculated as follows:

$$\text{Sewer Overflow (overflow events per 100 miles of pipe)} = \frac{\text{(Total number of sewer overflows x 100)}}{\text{Total miles of collection system piping}}$$

Table 3-14: Collection System Integrity, Wastewater (Sewer System Overflows per 100 miles of pipe)

Grants Pass Value	Top Quartile	Median	Bottom Quartile
1.6	1.2	2.5	6.9

Source: AWWA 2015 Benchmarking Study, p.93

Grants Pass is in the 3rd quartile for this metric based upon a survey of 62 combined water/wastewater operations.

Performance Indicator #13 – Training Hours Per Employee, Wastewater

This indicator provides a measure of the amount of training that employees receive expressed as the annual number of training hour per employee as FTEEs. This indicator does not address the effectiveness or efficiency of the training program. For a given reporting period, it is calculate as follows:

$$\text{Training (hr/employee)} = \frac{\text{Total training hours completed by all employees during the reporting period}}{\text{Total number of FTEs}}$$

Table 3-15: Training Hours per Employee (hr/FTE), Wastewater

Grants Pass Value	Top Quartile	Median	Bottom Quartile
7 – Collection 45 – WW Treatment	25	16	8

Source: AWWA 2014 Benchmarking Study, P. 26

* See supporting Table 3-15a below

Table 3-15a: Training Hours by Division

Division	Total Training Hours	Years	# employees	Hours per employee per year
Collection *	186.2	5	5.66	7
Wastewater **			10.46	45

* Per Bob Hamblin

* Per Gary Brelinski, Jr.

Grants Pass is in the bottom quartile for Collection and in the top quartile for Wastewater Treatment for this training hours metric.

Performance Indicator #14 – Service Affordability, Wastewater

This indicator provides a measure of the affordability of wastewater services as a percentage of local median household income (MHI). For a given reporting period, it is calculated as follows:

$$\text{Wastewater Service Affordability (\% of MHI)} = \frac{\text{Average residential monthly water bill x 12*}}{\text{Real median annual household income**}}$$

Table 3-16: Service Affordability, Wastewater

Grants Pass Value	Top Quartile	Median	Bottom Quartile
1.23%	0.54%	0.76%	1.05%

Source: AWWA 2015 Benchmarking Study, p. 70

* Average annual residential bill is $368 (per Jay Meredith)

** Median Household Income (2013) is $33,207
(http://www.city-data.com/income/income-Grants-Pass-Oregon.html)

Grants Pass is in the bottom quartile on this performance indicator.

Performance Indicator #15 – Planned Maintenance Ratio, Wastewater

This indicator quantifies a utility's efforts regarding planned (proactive) and corrective (reactive) maintenance. Time charged for maintenance work includes all time spent responding to the maintenance work order including travel, obtaining tools and parts, and completing the work.

Grants Pass does not maintain detailed records of planned vs. preventative maintenance. The implementation of a maintenance management system would track such data. Nonetheless, it is possible to use anecdotal information on planned maintenance from the informal interviews that were conducted with the utility staff. Based upon input from several staff in the interviews, the planned maintenance percentages are approximately 60%.

$$\text{Planned Maintenance Ratio (\% of total maintenance time)} = \frac{\text{Total time for planned maintenance}}{\text{Time for planned maintenance + Time for corrective maintenance}}$$

Table 3-17: Planned Maintenance Ratio, Wastewater

Grants Pass Value	Top Quartile	Median	Bottom Quartile
50%* wastewater plant 90%* collection	75%	52%	27%

Source: AWWA 2015 Benchmarking Study, p. 95

* This is an anecdotal estimate based upon staff interviews and should be verified through future maintenance management system implementation

Performance Indicator #16 – Regulatory Compliance Rate, Wastewater

Regulatory Compliance for Wastewater is expressed as the percentage of days during which the utility meets or exceeds all of the effluent quality standards in effect at a facility. Utilities base their calculations on requirements in operating / discharge permits. For a given reporting period, this indicator is calculated as follows:

$$\text{Number of days that the utility was in Regulatory Compliance Wastewater (\% days in compliance)} = \frac{\text{Full compliance with all applicable regs}}{\text{365 days}}$$

Table 3-18: Regulatory Compliance – Wastewater

Year	Grants Pass Value	Top Quartile	Median	Bottom Quartile
2013	92%*	100%	100%	100%
2014	100%	100%	100%	100%

Source: AWWA 2015 Benchmarking Study, p. 89

* One monthly average ammonia violation in Oct 2013

The treatment plant experienced a single violation (ammonia) in 2013. The plant has an otherwise good record of compliance.

Performance Indicator #17 – Customer Technical Service Complaints per 1000 Accounts, Wastewater

These indicators provide the complaint frequency related to customer service or core utility services expressed as the number of complaints per 1,000 customer accounts per reporting period. It is calculated as follows:

$$\text{Customer service complaints per 1000 accounts} = \frac{\text{Total number of complaints x 1,000}}{\text{Number of residential accounts + Number of non-residential accounts}}$$

Grants Pass does not maintain a complaint log covering all sewer related complaints (such as odor or rodent incidents). Anecdotally, since 2010 to date the division has averaged a total of 40 sewer calls per year. Sewer calls are documented when customers call about backups within their homes. The division crews check out the complaint and determine if the problem is with the customers plumbing or the public sewer system. In most cases the problem is related to the private sewer lateral and not the sewer mainline. During the same period of time an average of 3 calls per year were related to public sewer main problems.

Table 3-19: Annual Wastewater Customer Technical Service Complaints per 1000 Accounts

Grants Pass Value	Top Quartile	Median	Bottom Quartile
0.23	1.0	10.6	20.3

Source: AWWA 2015 Benchmarking Study, p. 49

Grants Pass is in the top quartile.

In addition to the benchmarks published by AWWA, the EGI Team assessed safety and grievance rates for the water and wastewater groups.

Performance Indicator #18 – Safety Record

The level of claims reported for the water/wastewater utility for the 3-year period from April 2012–April 2015 was $88,643 for an average of approximately $29,550 per year. Three, two, and three claims in a workforce of 31.38 Full Time Equivalents (FTEs) were submitted during the three, one-year periods. According to the Bureau of Labor Statistics*, the incidence rates (# of recordable cases) of nonfatal occupational injuries and illnesses in the trade, transportation and utilities sector were 3.9, 3.9 and 3.8 per 100 workers from 2011–2013.

Normalizing the head count for Grants Pass Public Works to the BLS database (100 full-time workers) suggests the incident rates (as judged by claims) appear to be higher than found in the trade, transportation and utilities sector database (approximately 10 in 100 employees per year for Grants Pass vs. about 3 per 100 per year in the database). While claim dollar amounts are relatively low, a continued re-emphasis on safety in the utility appears warranted.

Most of the safety training is tailgate type without a set lesson plan. One exception is a forklift training class that is taught by a trained City employee, using a significant course layout and prepared PowerPoint program. This exception is a working model for one topic for the safety program. Similar training programs should be developed to address the full spectrum of safety topics.

*Source: Bureau of Labor Statistics: http://www.bls.gov/news.release/osh.t07.htm

Performance Indicator #19/20 – Grievance Rate, Water

Based upon interviews with management staff, grievances are relatively rare in the utility. Water and Wastewater Treatment did not have any grievances from 2011-2014 but Distribution and Collection had one in 2011, one in 2013, and one in 2014.

- 2014 D&C – 1: Issue — interpretation and application of labor agreement language related to Standby, Callback and Pyramiding. Union filed an arbitration and the City prevailed.
- 2013 D&C – 1: Issue — imposed discipline in a workplace behavior incident between an employee in D&C and an employee in a separate division. City agreed to modify the discipline.
- 2011 D&C – 1: Issue — imposed discipline in a conduct unbecoming incident was too severe. City upheld and imposed discipline as proposed. Union filed an arbitration and the City prevailed.

Summary Conclusions from the 17 Selected AWWA Benchmark Metrics

Taken as a whole, the examined performance indicators present a picture of a utility that excels in numerous areas while presenting opportunities for improvement to better manage long-term costs (Table 3-20 below).

Staff is admirably processing significant flows through the existing treatment facilities and producing high quality product water (notwithstanding the 2013 violation at the WRF). Total operating costs for water services rank in the 2nd quartile as shown in Table 3-3. However, the relatively low household income for Grants Pass places the water utility in the bottom quartile for Service Affordability (Table 3-8).

For industry benchmarks. The costs and rate increases associated with the new water plant ($60 million cost) will unfortunately place further pressures on Affordability and push Grants Pass lower on the Affordability criterion for water service.

Wastewater operating costs appear favorable to industry benchmarks. Nonetheless, like water, the wastewater service affordability performance indicators, because of low household average income, places wastewater in the bottom quartile in comparison to other utilities in the AWWA database.

There may be unique attributes of Grants Pass that complicate direct comparisons; performance indicators should be used as “starting points” for exploring areas of improvement. Recommendations for areas of improvement based upon the totality of study analyses are addressed elsewhere in this report.

Table 3-20: Summary of Quantitative Performance Indicators

	Benchmark Description	Quartile Performance			
		Top	3rd	2nd	Bottom
1	Total O&M cost per account, water		X		
2	Million gallons delivered per day per employee, water		X		
3	Water main breaks per 100 miles of pipe	X			
4	Customer technical service complaints per thousand accounts, water			X	
5	Training (hours per employee), water	X - WT			
6	Service affordability, water				X
7	% Planned Maintenance (vs. reactive maintenance), water		X		
8	Regulatory compliance rate (# of standard and/or monitoring violations), water	X			
9	Water loss			X	
10	Total O&M per wastewater account, wastewater		X		
11	Million gallons treated per day per employee, wastewater	X			
12	Collection system integrity (failures per 100 miles of pipe), wastewater		X		
13	Training (hours per employee), wastewater	X			
14	Service affordability, wastewater				X
15	% Planned Maintenance (vs. reactive maintenance), wastewater			X	
16	Regulatory compliance rate (# of standard and/or monitoring violations), wastewater	X (2014)			X (2013)
17	Customer technical service complaints per 1000 accounts, wastewater	X			

Conduct of SWOT Analysis

A SWOT analysis is a structured planning method used to evaluate the strengths, weaknesses, opportunities and threats involved in a project or in a business venture. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favorable and unfavorable to achieve that objective.

- Strengths: characteristics of the utility that give it an advantage over others.
- Weaknesses: characteristics that utility could exploit to its advantage.
- Opportunities: elements that the utility could exploit to its advantage.
- Threats: elements in the environment that could cause trouble for the utility.

Identification of SWOTs is important because they inform later steps in planning to achieve the objective.

The EGI team met with the management staff and with the utility staff to develop the SWOT input. The summary results of the SWOT (representing management and staff perspectives) are as follows.

Strengths

The primary strengths were identified as follows:

1. The facilities are in decent shape
2. Team work
3. Able to get resources and equipment / Adequate staff to do work
4. Knowledgeable and experienced staff
5. Competent / Professional staff that takes pride in their work
6. Good customer service
7. Good rapport with public
8. Mostly supportive community
9. Dependability
10. Adaptable
11. Achieve goals
12. Management listens and supports
13. Good water resources
14. Quality product
15. Elevations for gravity sewers and water reservoirs
16. Persistence
17. Variety of work
18. Fair wages/ benefits
19. Job aptitude
20. Diversity of employee skills

21. Ability to make major repairs in-house in a timely fashion
22. Embrace technology and tools to do more with less
23. Sewer water rights
24. Greater than 82 cfs w/current demand of about 25 cfs
25. Good training
26. We provide a good value and service to community
27. Openness among co-workers
28. Ability to adapt to overcome adversity
29. Conservative approach
30. Accurate record keeping
31. Not much debt outstanding
32. Low water and wastewater bills are low; populace may not agree
33. Exemplary compliance record
34. Good relationships with state regulators

Weaknesses

The primary weaknesses were identified as follows:

1. Old treatment plants
2. Knowledge management systems – institutional knowledge; need systems for how decisions are made.
3. One person for pretreatment is not enough
4. SCADA is a big weakness
5. Community support for future Wastewater plant land needs – parks are more important
6. Plant capacity
7. Size of staff – we are very busy
8. Old equipment W/W
9. The ability to focus on one main objective
10. Skill knowledge
11. Leadership change
12. Community access and awareness
13. Double standards
14. Government is slow to work
15. Don't have enough replacement parts on the shelf
16. Communication
17. Distribution / Collection / Treatment disconnected
18. Distribution / treatment systems that are reliant on pumping
19. Major improvements tied to rate changes
20. Employees overly set in their ways

21. Aging infrastructure will cost a lot in the future
22. Limited number of employees = no knowledge overlap
23. Aging workforce – brain drain
24. Increasing federal / state rules
25. Inflation
26. Expenses
27. Criminal access to building
28. Some areas have morale issues attributed to “treatment of personnel and enforcement of issues”
29. Communication
30. Upper management support (directors)
31. Inter department interference
32. No room for records that we must maintain
33. Fiber line from city hall is very slow for our computers
34. Communications with city hall and other departments
35. Lack of technology in trucks
36. Lack of excavator
37. Vine street piping 10“ cast
38. Flushing program – Unidirectional program needed
39. Valve exercising
40. Old tools
41. Public safety (lack of) discourages people from moving here
42. Aging infrastructure
43. Not doing a lot of replacement on the water side
44. Asset management program is needed
45. Technology – SCADA plan is in development
46. Not a lot of industry
47. Community's ability to pay
48. Sustainability is not important if it costs
49. Thermal load is September / October when you don't have a lot of demand
50. Safety training requires a lot of time but is critical
51. No redundancy
52. Interconnections not available

Opportunities

The primary opportunities were identified as follows:

1. Internship program for operator or mechanic – Paid position
2. Staff electrician needed

3. Succession planning
4. Beneficial reuse of wastewater plant effluent – agricultural irrigation water
5. Solids handling
6. Methane regeneration
7. Power generation
8. Advancement
9. Training
10. Environment
11. New technology
12. Public outreach and awareness
13. Upgrade pump stations and reservoirs
14. Asset management – Process to replace assets that is fact driven
15. Manufacture bottled water or other water based products
16. Future plant expansion will improve water quality
17. Streets do patch paving
18. Communications program
19. Include storm water fee in the wastewater rate

Threats

The primary threats were identified as follows:

1. Exceeding effluent limits in the summer (wastewater)
2. Privatization of utilities
3. Overall permit regulations
4. Staffing – mechanic backup
5. Blower Failures
6. Slug load of toxics
7. Perception that Council doesn't appreciate water/wastewater
8. Lean staff
9. Cross training is a threat – lose focus
10. Not prepared for the big earthquake
11. Lack of back up supply redundancy
12. Clear-well ceiling issues
13. Aging infrastructure
14. Contaminants from upstream (water)
15. Single source of supply
16. Fragile building (WTP)
17. Public that is adverse to needed rate increases

18. County philosophy limits effective expansion
19. Inadequate space
20. Delays in building new plant
21. Plant security
22. Build a strong confident relationship between management and staff
23. Evaluate our bulk water program
24. Public perception
25. Global warming
26. Computer virus
27. Poor GIS system
28. Inaccurate mapping
29. Need to focus on as-builts
30. Loss of public confidence
31. Some labor issues
32. Future regulations
33. Emergency preparedness

SWOT Analysis Measurable Goals and Strategies

Critical Recommendations

1. Evaluate ways to optimize the size of a new water treatment plant. There are several approaches that can be taken to optimize the size/phasing of the new water treatment plant. These include:
    a. Incentivize conservation – consider revising pricing tiers to drive peak reduction; consider conducting a cost of service study to ensure full cost recovery is occurring.
    b. Repair of leaks / water loss – Closely examine and optimize the system to reduce unaccounted for water.
    c. Evaluate cost / tradeoffs of more storage against the water treatment plant expansion.
    d. Evaluate phasing of the expansion.
    e. Evaluate recycled water use in agricultural area to reduce potable water demands.
2. Emergency preparedness. Complete the update of the Emergency Preparedness Plan. The Emergency Preparedness Plan was developed in 2004 and is currently under review. As part of that revisit, several areas need attention:
    a. Conduct contingency planning for emergency loss of water supply (e.g., contamination).
    b. Regularly conduct emergency preparedness exercises.

c. Develop a contingency plan to mitigate the risk of taking down a basin for maintenance at the WTP (no backup).
d. Develop a business resumption or continuity plan to ensure key administrative and operational elements can continue during emergencies (e.g., loss of an administrative facility, billing/invoicing, information technology backup systems, etc.).
e. Examine criticality and need to upgrade pump stations and reservoirs.
f. Evaluate backup power needs.
g. Consider mutual aid agreements with regional (or beyond) utilities.

3. Evaluate and improve security systems at current plants. The details of these recommendations will be handled verbally.

Necessary Recommendations

4. Develop a communications plan for the utility. Given the challenges facing the water and wastewater service provision in the City, there is a need to build greater awareness and knowledge of water in the community. Significant rate increases are possible that will not be favorably received in the absence of a strong articulated business case for the required infrastructure (which exists). In addition, efforts to optimize the construction of the required facilities may require additional community efforts in conservation requiring consistent and helpful messaging. The use of asset management systems will, over the long term, assist in communicating the capital and operations and maintenance needs to community. The City should consider developing a better understanding of the community's willingness to pay through surveys/focus groups as part of any outreach effort to help measure the effectiveness of the City's information/messaging efforts. The new billing system that is being implemented presents an opportunity to use the bills to better message the needs of water and wastewater services. This can be done through a redesign of the bill combined with providing appropriate insert information.

5. Upgrade Knowledge Management Systems. Currently paper systems, tribal knowledge; need systems for how decisions are made; documentation.

6. Re-emphasize safety training content and frequency. Claims rates appear high for a utility of Grants Pass' size. Safety is part of the current culture in the City but should be re-emphasized and institutionalized.

7. Develop a Technology Plan/Strategy. The current SCADA system in the WTP is 15 years old. The new WTP will have a modern system and this should be kept updated. Both the new WTP and the existing WRF would benefit from having modern Laboratory Information Management systems implemented on startup. There are numerous industry standard systems that have robust data management, analysis and reporting capability. The ability to provide field accessibility of updated as-built drawings was mentioned by numerous staff as an important efficiency measure/technology.

8. Implement a new Asset Management System. The current system was built in house and is not fully functional. There is a basic equipment inventory and preventative maintenance listing; Replacement / upgrade plans have not been established, nor have costs. Formalized modern programs will greatly improve long-range effectiveness. The increasing ambitiousness of future requirements will require an Asset Management System. There is also an incomplete listing of equipment on both the water and wastewater side of the utility making it difficult to track maintenance activities. This has, in part, caused non-uniformity in the degree of reactive maintenance that occurs in the Divisions. For example, anecdotally, the Distribution and Collection, Wastewater Treatment and Water Treatment Divisions spend approximately 10%, 25–25%, 50% and 15% of their maintenance time in "reactive maintenance" activities (i.e., fixing things that break). Industry norms are close to 20%. A formal AMS would verify these anecdotal estimates. There is a need to standardize across the utility. It is also not clear that all warranty maintenance is being regularly conducted.

9. Implement a Maintenance Management System (MMS). A MMS that uses information from the AMS to issue work orders and track completion of required activities is needed.

10. Develop energy strategy/plan. The Plan should define the plans for use of digester gas, implementation of alternative energy projects (e.g., solar photovoltaic) and energy efficiency measures.

11. Examine automation opportunities in new facilities. Upgraded automation could help with dosage control at the new water treatment plant as well as polymer optimization at the Water Restoration Facility.

12. Operability assessments. – Engage operations and maintenance staff in operability assessments of new facilities.

Desirable

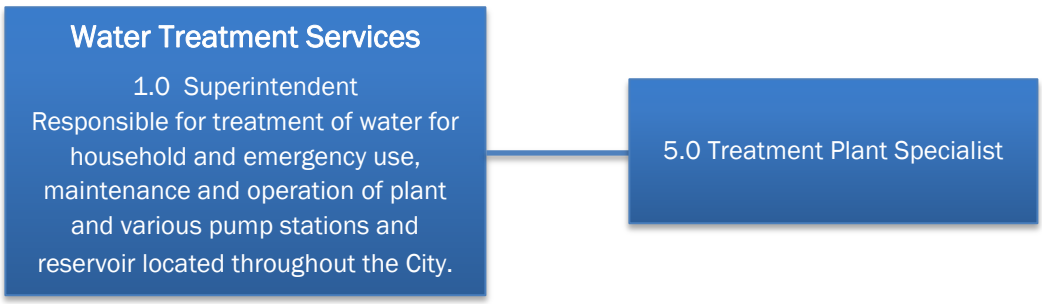
13. Evaluate bulk water program pricing

Analysis of Current Staffing: Water Treatment

Table of Organization

The table of organization for the Water Treatment Services Division is shown below.

Figure 3-2 Table of Organization for the Water Treatment Services Division



The Water Treatment Services Division consists of 6 FTEs augmented with contractors and consulting staff as required. The Superintendent provides supervision of the 5 treatment plant specialists (operators).

Discussion of Breadth of Operational Responsibilities

From the FY15 Adopted Operating and Capital Budget Document: *This activity is responsible* for the operations and maintenance of the City's Water Filtration Plant and thirteen remote pumping stations including their radio telemetry systems. Water is pumped from the Rogue River and treated at the Water Filtration Plant. After treatment, water is pumped through the distribution system into a network of reservoirs located at various elevations throughout our community. This activity also supplies water to the North Valley Industrial Park and the area surrounding the Merlin Landfill through a pump station and reservoir dedicated for that purpose.

The group operates very leanly to keep the 80+-year-old Water Treatment Plant operated and maintained. The plant has reached the end of its effective life and is due for replacement. The operating and maintenance burden of the old plant is likely greater than a new facility would require. The plant is operated 10+ hours per day October

to May and 24 hours per day June to September. The October to May operations require the daily startup and shutdown of the treatment plant and imparts some start/start risks that are addressed with a set of SOP's for plant startup and shutdown that require detailed operator involvement to assure success. Generally speaking, it is better to operate water treatment plants at consistent flows around the clock and let water storage reservoirs pick up any demand imbalance.

Analysis of Staffing Conditions (levels and responsibilities)

The operators are cross-trained and provide maintenance services in the plant (augmented by contractors and consultants). This "multi-skilled" nature of the workforce is advantageous from a cost management standpoint. The benchmarking exercise described earlier has indicated that the "O&M cost per employee" at the plant is in the second quartile compared to other plants in the AWWA database.

The water utility make use of contract and part-time labor to fill skill gaps or staffing shortfalls (e.g. 24 hour summer operations). Contract employees are used to fill in skills not present on staff: electricians, vibration/alignment services, laboratory services, etc. Standard operating procedures, operator protocols and the SCADA system help ensure smooth operations

Some examples of off-site resources & expertise include:

1. Engineering Services
2. Maintenance/Construction Services
3. Electrical/SCADA
4. Landscaping/Janitorial
5. Miscellaneous Services (e.g. printing)

Generalized Staffing Recommendations

1. Invest in staff recruitment and retention. Due to pending retirements in the water and wastewater staff, there is a need to develop a succession plan. The plan/ strategy should have multiple dimensions including:
    a. Conduct of compensation surveys to ensure competitive salaries.
    b. Hiring of replacements before key departures to allow job shadowing.
    c. Ensuring full staffing complement of approved positions.
    d. Revisiting cross-training as appropriate.
    e. Continuing internships at community colleges.
    f. Developing paid operator or mechanic internships.
    g. Supporting employee development / training through appropriate incentives. The City could benchmark such incentives used by other area utilities.
    h. Developing employee appreciation programs (especially in Distribution and Collection).

i. Developing a career path training program for all utility staff positions (including supervisory training).
j. Consider some 360 evaluations for senior management positions (Public Works Director and Superintendents).
k. Ensure staff are engaged in industry associations (create learning environment).

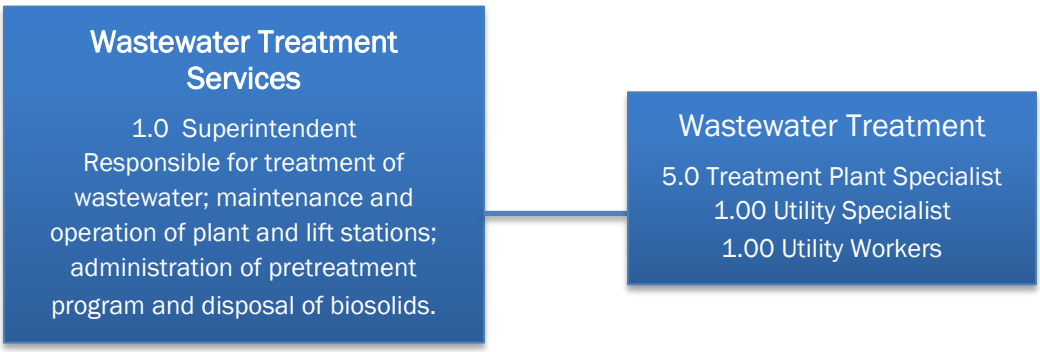
2. Document Standard Operating Procedures (SOPs)
    a. Like many utilities, significant knowledge is retained by experienced senior managers. When those managers retire or move, some operations and maintenance knowledge is lost. Documenting procedures helps minimize that loss of knowledge. The City should systematically review all key SOPs and ensure they are documented.
    b. There is a need to update the list of items that residents must not put in the sewer.
    l. Staff identified a need to strengthen the grease rider.
3. Further evaluate the risk / cost tradeoff associated with the daily plant shutdown mode of the winter months. Additional staff costs for manning the winter months are estimated at three staff for the nine month period which adds costs of approximately $ 120,000 / year and eliminates the process risk and water quality exposures associated with the daily shutdown and startup cycle.

Analysis of Current Staffing: Wastewater Treatment

Table of Organization

The table of organization for the Wastewater Treatment Services Division is shown below.

Figure 3-3 Table of Organization for the Wastewater Treatment Services Division



Discussion of Breadth of Operational Responsibilities

The following is taken from the FY15 Adopted Operating and Capital Budget Document: *"This activity provides for the processing and safe disposal of collected wastewater as required meeting State and Federal standards, ensuring no harmful effects on the community or the environment. These services are delivered through six programs: support services, operations, maintenance, solids disposal, lift stations, and pretreatment. In addition, this activity provides contract services to the Merlin Landfill for operation and maintenance services."*

Analysis of Staffing Conditions (levels and responsibilities)

The five treatment plant specialist positions are comprised of three operators and two mechanics. There is one pretreatment specialist, and one utility worker. Two of the three authorized operator positions are currently filled. The operators rotate weekly, one week responsible for the laboratory and the next week "outside" responsible for the plant activities. The Superintendent was recently promoted from an operator position upon the retirement of the prior Superintendent. As with the Water Treatment Plant the staffing is very lean compared to plants of similar size and complexity.

The plant is staffed from 7:00 am through 4:30 pm. On-call staff respond to off-hour alarm conditions at the plant and influent pump station.

The wastewater utility makes use of contract labor and part-time labor to fill skill gaps or staffing

shortfalls. Contract employees are used to fill in skills not present on staff: electricians, vibration/alignment services, laboratory services, etc.

Some examples of off-site resources & expertise include:

1. Engineering & Laboratory Services
2. Maintenance/Construction Services
3. Electrical/SCADA
4. Landscaping/Janitorial
5. Miscellaneous Services (e.g. printing)

Laboratory testing schedule and data are kept on a spreadsheet system developed by the operators. Maintenance records are kept on an in-house record system.

Generalized Staffing Recommendations

1. Invest in staff recruitment and retention. Due to pending retirements in both the water and wastewater staff, there is a need to develop a utility wide succession plan. The plan/ strategy should have multiple dimensions including:
   - Conduct of compensation surveys to ensure competitive salaries.
   - Hiring of replacements before key departures to allow job shadowing.
   - Ensuring full staffing complement of approved positions.
   - Revisiting cross-training as appropriate.
   - Continuing internships at community colleges.
   - Developing paid operator or mechanic internships.
   - Supporting employee development / training through appropriate incentives. The City could benchmark such incentives used by other area utilities.
   - Developing employee appreciation programs (especially in Distribution and Collection).
   - Developing a career path training program for all utility staff positions (including supervisory training).
   - Consider some 360 evaluations for senior management positions (Public Works Director and Superintendents).
   - Ensure staff are engaged in industry associations (create learning environment).
2. Document Standard Operating Procedures (SOPs)
   - Like many utilities, significant knowledge is retained by experienced senior managers. When those managers retire or move, some operations and maintenance knowledge is lost. Documenting procedures helps minimize that loss of knowledge. The City should systematically review all key SOPs and ensure they are documented.

3. Implement Maintenance Management System
    a. Asset inventory.
    b. Scheduled major maintenance activities
    c. Preventive maintenance schedule
    d. Identification of critical assets
    e. Maintenance history including labor time
4. Formalize Training Program
    a. Identify core skills for each position (link to SOPs)
    b. Develop lesson plans for each core skill (incorporate SOPs into lesson plan)
    c. Train the trainers
    d. Maintain individual training records (separate from "personal files')
    e. Include safety training lesson plans and individual training records
5. Additional Staff
    a. Pursue the addition of a second maintenance staff position and a computer systems position in parallel with the planned capital expenditures in 2016
    b. Explore with the Distribution / Collection Division the feasibility of sharing the computer system specialist resource

Analysis of Staffing for Distribution & Collections Division

Analysis and generalized staffing recommendations are provided in Task III (Water Distribution) and Task V (Wastewater Collection). In overview, the current staff provides very strong performance and results. The addition of a systems planner position (perhaps shared with wastewater treatment) is recommended. Additional staffing may be necessary if the currently underway Master Plans lead to significant new and / or additional workload requirements.

Compliance with Regulations

In years 2013 and 2014 the wastewater treatment plant experienced a single violation (ammonia) in 2013. The plant has an otherwise excellent record of compliance. However, continued high flow volumes experienced during major rainfall events present treatment capacity issues until such time as the capital plans are implemented and operational. New requirements expected in NPDES permitting are likely to result in the need for the planned improvements to the treatment process and need to be followed closely so as to avoid regulatory violations and fines.

Strategic Public-Private Partnership Evaluation, Financing Costs for Alternatives, Comparisons, and Recommendations

Background

The RFP workscope required the documentation and assessment of the pros and cons of the different partnership possibilities available to the City of Grants Pass for the following water and wastewater service areas and components:

- Design and construction of the new Water Treatment Plant (WTP)
- Wastewater Plant (WP) expansion projects
- Operation of the utilities and plants
- Ownership of the utility infrastructure and plants
- Customer service (meter reading, billing, and accounts receivable)
- Strategic alternatives for financing the new WTP and the WP expansion

The assessments and analysis provided are based on the experiences of the EGI team members in the design, construction, and operation of water and wastewater utility systems. In addition to the conventional methodology, this includes direct experience with additional options including design/build (DB); design/build/operate (DBO); contract operations; and sale of utility to the private sector. In addition to the experiences of the EGI team members, research and publications from the following organizations were utilized:

- *Design, Build Institute*: Choosing the Right Project Delivery Method
- *KKR and Suez Environmental*: P3 Opportunities and Approaches
- *AMSA/AWWA*: Evaluating Privatization I & II
- *AMSA/AWWA*: Public vs Private: Comparing the Costs
- *Public Works Finance*: Cost / Performance Results for DBO and DB
- *Telecon discussion with Donald Levine, Levine Consulting*
- *Telecon discussion with Thomas Brown, President of United Water Suez*

Overview of Facility and Operational Needs

Distribution and Collection Division

The distribution and collection systems are staffed, operated, and managed as a separate division from either the Wastewater Treatment or Water Treatment Divisions. The Distribution and Collection Division, based upon our assessments and documented performance, is performing well and not confronting significant facility / construction challenges that vary significantly from those currently being successfully addressed.

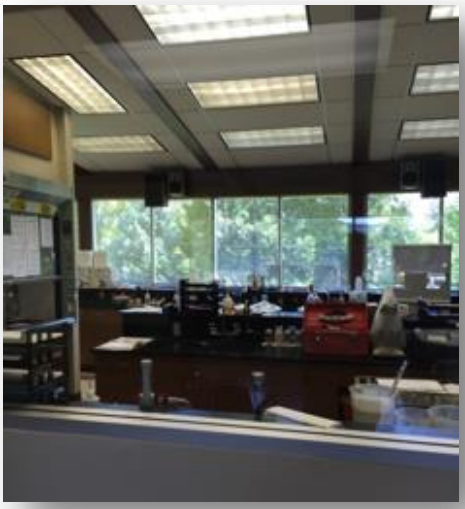
As a result, the Strategic Plan recommends that the current structure be continued and that alternatives such as splitting the division and consolidating segments into the water or wastewater treatment divisions not be pursued at this time. The current arrangement provides good service, is cost-effective (as evidenced by benchmarking), and there would be no apparent improvement with restructuring or with privatization. Therefore, the public–private partnership discussion and assessments exclude these areas of the overall water and wastewater utilities.

Should a partnership with the private sector be utilized for either water or wastewater treatment facilities, the leading firms also provide distribution and collection system management and operation services. As such, the City could add these functions at a later date or retain them as City staffed operations.

It is recommended that the Distribution and Collection Division initiate a weekly staff meeting and planning session for each overall water or wastewater utility. The water utility session should involve the Water Treatment Division and the Distribution section of the Distribution & Collection Division. The wastewater utility session should involve Wastewater Treatment and the Collection section of the Distribution & Collection Division. Such an approach should yield significant benefits including improved awareness of overall utility activities and priorities, better/more informed cooperation, and an integrated operation and maintenance set of priorities and actions.

Water and Wastewater Treatment Divisions

Unlike the Distribution and Collection Division, the treatment requirements and facility needs for continued regulatory compliance, reliability, and cost effective operations have created significant near term capital facility requirements for both the water and wastewater treatment utilities. Capital needs for the Master Planning underway for collection, distribution, and storm water systems are not reflected in this analysis. Appendix 5 identifies significant "free cash flow'" from current rates that may be a partial source of funding for these collection, distribution and storm water capital items – once identified and scheduled.



Financial Needs and Costs of Alternative Financing Options

Current plans (as summarized in Appendix 5) call for wastewater expansion and upgrade facilities costing (in 2014 $'s) $20 million and a new water plant estimated to cost (in 2013 dollars) $60 million. These capital costs are over and above the "pay as you go" capital items that are annually funded, without debt borrowings, by the current utility rates. Appendix 5 also summarizes these cash flows.

Inputs from Municipal Capital Markets Group (Bruce Allred and Jim Wrigley) provide the following overview of costs for financing options for the indicated $72 million:

a) 25 year public sector, tax exempt bonds – interest rate of 4.4%
b) 25 year private sector, taxable bonds – interest rate of 7–8%
c) Private sector equity financing – return on equity of 12–14%

Based upon the costs of financing, significant financial cost savings accrue to the utility and its ratepayers if public sector, tax-exempt bonds are utilized for the financing. Such borrowing can be structured as an "enterprise fund" borrowing whereby the utility rates and revenues are the security for the bond payments and the City's general fund obligations and borrowing capacity are not involved.

The next section discussion of Partnership Alternatives incorporates these cost of financing inputs. The Municipal Capital Markets Group analysis is provided as Appendix 6. This analysis calculates that overall utility rates must increase from today's rates by 34% for the water utility bond ($ 60 million) and by increases of 6.9% to fund the wastewater Phase I bond ($ 10 million) and by 9.6% to fund the wastewater Phase II bond ($ 10 million) that follows 3-5 years later.

As shown in the MCM Group analysis (Appendix 6), it is possible to structure the financing so that the increase may be spread over a 3–4 year time period rather than occurring all in one year. For example, the rate increases necessary for the water $ 60 million bond financing could be structured so with three consecutive rate increases of 10% each. Such an approach provides a cumulative rates increase above current rates as displayed below

2017 – 110 %
2018 – 121 %
2019 – 134 %

However, the total set of rate increases must all be authorized before the bonds can be successfully issued.

Water and Wastewater Treatment Facilities

Unlike the Distribution and Collection Division, the facility needs for capacity, continued regulatory compliance, reliability, and cost-effective operations have created significant near-term capital facility requirements for both utilities.

Water Treatment Plant

As recognized and authorized, the current water treatment plant will be replaced with a new facility using new processes (ballasted flocculation, high rate filters, and ozone treatment) and significant systems upgrades for computerized process control and reporting (SCADA), maintenance management (MMS), laboratory management (LIMS), and asset management (AMS). Further challenges are created by the fact that the current staff does not have experience with the design / construction / startup of a new water treatment facility and must,

at the same time, continue the successful operation of the existing facility through an overlap period with the on-line operation of the new facility.

Significant resource and skill set augmentation are necessary, as discussed and summarized in Table 3-21 on the following page, for any and all procurement options. Acquisition of these resources, performance responsibility, and cost exposures vary greatly between the procurement alternatives. Table 3-21 illustrates how the DBO alternative limits or avoids significant tasks and work assignments for City positions as these tasks are transferred to the DBO service provided firm as part of their contract requirements. Such risk shifting and skills shifting by the procurement alternatives are discussed further in subsequent sections of the report for this topic and in the PAVE Committee PowerPoints (Appendix 7).

Wastewater Plant

The needs for wastewater treatment can be summarized as additional facilities of the same processes and equipment as currently being used. These facilities are needed to provide capacity expansion to insure treatment of increased flows and loadings, to replace or upgrade worn equipment, and to provide necessary seismic upgrades.

As a result, the construction requirements for the wastewater treatment facility can be accomplished in a modular phase without disruption of the existing treatment systems. With the exception of an updated SCADA and LIMS system installation and its usage, new types of systems are not required. New operational skills, process skills or the need to assimilate new systems are also constrained to the SCADA and LIMS systems.

Table 3-21: Tasks to Bring New Water Plant On-Line

	Tasks to Bring New Water Plant On-Line	DBO avoids / limits this
Design	Develop RFQ/scope to engage a designer/provide input	
	Development and review preliminary scope or design - provide review/input	
	Procure construction manager (designer oversight)	X
	Provide detailed review of construction drawings and specifications	X
	· Site plan workshop	
	· Process workshop	
	· Control systems workshop	
	· Electrical workshop	
	· O&M workshop	X
	· Start-up and Commissioning workshop	X
	Designer may provide additional services (environmental work, permitting, RofW, hearings, project funding submissions)	
	Input into preparation of Bid package (design and bidders info packet)	
Build	Solicit and review bids	
	Pre-qualification?	
	Select Contractor(s)	
	Select construction manager to provide construction expertise to project team during all pre construction phases, doc control, tracking, evaluation of payments, schedule control, commissioning	
	Setup and involvement in dispute resolution process	X
	Designer maintains limited oversight of work	X
	Provide inspection	
	Pre startup testing	X
Operate	Commissioning of equipment and facilities	
	Computerized Maintenance Management System (CMMS)	X
	Cataloging of assets into Asset Management System	X
	Laboratory Information Systems (LIMS)	X
	Reporting metrics for facility operations and performance	X
	Staff training for new equipment and facility operations and maintenance	X
	Startup planning and preparation	X
	Continued operation of existing facilities to meet regulatory requirements	X
	Skills training and skills augmentation for existing staff	X
	Development and usage of standard operating procedures (SOPs)	X
	Establishment of a useable set of reference documents to include O&M manuals, SOPs, maintenance work plan procedures and practices, safety & training	X
	Warranty protection requirements for new equipment and facilities	X
	Potential consolidation of plant operations and maintenance staff and shops to the main plant location upon completion of construction	
	Initiation of formalized cross training sessions for ops., maint., and lab	X
	Expanded involvement of ops. and maint. staff, to include formalized sessions, in facility planning, layouts, equipment specifics and specifications, maintenance requirements and accessibility for maintenance	X
	Cataloguing of the skill sets necessary for new facilities as compared to those currently operated	X
	Updated position descriptions and responsibilities for new facilities	X
	SCADA system training (operations and maintenance), startup, and operational integration	X
	Startup testing	X
	Water quality analysis	X
	Decommissioning of old plant	

Potential Project Delivery Alternatives and Suitability for Grants Pass

Potential Organizational Structures

A summarized overview of the procurement alternatives is provided below in Table 3-22. As summarized in Table 3-23 and Table 3-24 significant differences in responsible party, control, risk assignment, guarantees, and financial responsibility exist between the alternatives.

Table 3-22: Procurement Alternatives

Structure Name	Key Features
1) **Conventional Structure (Design/Bid/Build, or DBB)**	City staff operates; consultant designs; construction bid (low bidder wins); project management contracted; startup assistance. Multiple entities, roles, and contracts
2) **City Operates with Design/Build of Facilities (DB)**	Single contract for design & construction (one contract with one party responsible to City); City staff operates.
3) **Design/Build/Operate (DBO)**	Competitive procurement using a single contract; entity responsible to the City for all phases and ongoing operation. Costs, regulatory compliance guaranteed. Annual cost adjustment per published indices. Incentive savings and termination provisions. City retains ownership, permits, rate setting, and control.
4) **Concession**	Long term agreement that transfers all components including rate setting to private sector; financing by private sector; can provide significant upfront cash to City. Assets remain owned by City. Typical term is 40+ years.
5) **Sale of Utility to Private Sector**	Transfers ownership, permits, water rights, operation, regulatory compliance to private sector firm. City receives financial payment for assets transferred in the sale. Control now the responsibility of Oregon PUC not the City. Rates approved by Oregon PUC not the City. Service area expansions must be negotiated with private sector owner.

The procurement options listed above have consolidated variations of the Conventional Structure into the one category. As such, the modified version of the Conventional approach that brings the contractor on board during design to work with the design consultants is consolidated into this category. Often referred to as Construction Manager / General Contractor (CM/GC) this variation has the CM/GC designated firm then sub out most of the work using a competitive bid (lowest cost selection) approach.

As identified in Table 3-22, risk assignment and financial responsibility varies greatly between these structures. Impacted items include responsibility for:

- Costs for capital and / or operation & maintenance
- Regulatory compliance
- Staffing and staff performance
- Rate setting
- Facility performance and regulatory compliance
- Ownership
- Financial responsibility for change orders

Table 3-23 below provides a summarized comparison of the typical risk assignment and guarantees provided the City by each of the procurement alternatives.

Table 3-23: Typical Risk Assignment and Guarantees Provided to City and Ratepayers (Green type indicates advantage/benefit)

Topic	Conventional	DB & Staff Operates	DBO	Concession	Privately Owned
1) Capital costs guaranteed	No	No	Yes	Yes	Yes–initial
2) Operating costs guaranteed	No	No	Yes	Yes	No
3) Guaranteed facility performance	No	No	Yes	Yes	Yes
4) Permitting risk assumed	No	No	Yes	Yes	Initial
5) Construction delays	City pays	Time & $'s likely	No cost to City	No $ adj.	No $ adj. initially
6) Change order costs (not City initiated)	City pays	City pays	No cost to City	No cost to City	No cost – initially
7) Guaranteed regulatory compliance	No	No	Yes	Yes	Yes, but …
8) Regulatory fine coverage	No – City pays	No – City pays	Yes	Yes	Yes, but …
9) Performance bond – construction	Yes	Yes	Yes	Yes	unclear
10) Performance bond – operations	No	No	Yes	Yes	Yes, but …
11) Guaranteed staff employment	No	No	Yes	Yes	Yes
12) Liability coverages	City pays	City pays	Yes	Yes	Yes
13) Ability to early terminate agreement	NA	Yes	Yes	Perhaps	NA
14) Reimbursement of procurement $'s	No	No	Yes	Yes	Yes
15) Option of upfront $'s to City	No	No	Yes	Yes	Perhaps
16) Facility financing responsibility	City	City	City	Private	Private
17) Tax exempt borrowing capability	Yes	Yes	Yes	Yes/No	No

The summary shown below in Table 3-24 was used to evaluate Risk Transfer, Guarantees Provided, Benefits, and Control. The Summary shows the inherent differences between the alternatives.

Table 3-24: Service Delivery Alternatives and Evaluation Factors

Grants Pass

Service Delivery Alternatives & Evaluation Factors

	Procurement Method						
	Conv	D/B	Conv&CO	DBO	D/B/F/O	Concession	IOU
Evaluation Factors							
Policy Setting	Full	Some	Some	Some	Some	Some	Very Ltd.
Control	Full	Some	Some	Some	Some	Ltd.	Very Ltd.
Service Levels	City	City	City	City	City	Shared	Ltd.
Guarantees							
* Costs	No	Ltd.	Ltd.	Yes	Yes	Yes	Ltd.
* Schedule	No	Ltd.	Ltd.	Yes	Yes	Yes	Ltd.
* Regulatory	No	Ltd.	Ltd.	Yes	Yes	Yes	Yes
Risk Assumption by Company	Ltd.	Ltd.	Ltd.	Yes	Yes	Yes	Yes
Financing	City	City	City	City	City/Priv.	City/Priv.	Private
$'s to City	No	No	No	Modest	Modest	Yes	Yes
Site Selection	City	City	City	City	City	City	Partial
Feasibility Studies	City	Private	City	Private	Private	Private	Private
Permitting	City	City	City	Ltd.	Ltd.	Private	Private
Technology Selection	City	Ltd.	City	Both	Both	Ltd.	Very Ltd.
Design	Separate	One	Separate				
Construction	Entities	Entity	Entities	One	One	One	One
Start-up		Separate		Entity	Entity	Entity	Entity
Demonstrates Performance	Multi.	Multi.	Multi.	One	One	One	One
Maintenance	City	City	CO	CO	CO	Priv.	Priv.
Repair & Replacement	City	City	Shared	Shared	Shared	Priv.	Priv.
Operations & Systems	City	City	Shared	CO	CO	Priv.	Priv.
Regulatory Stds.	City	City	Shared	CO	CO	Priv.	Priv.
Demonstrated Feasibility	Yes	Yes	Yes	Yes	Yes	Yes	Limited

MAIN ISSUES FOR DELIVERY METHOD SELECTION

Outside Influences	Internal Issues
Procurement Statutes	Control Desired
Local Ordinances	Labor Policies
Regulatory Acceptance	Schedule
Industry Experience and Expertise	Cost Considerations
Market Availability	Treatment Experience
Guarantees Required	Staff Capabilities
Facility Needs & Implications	Financial Capability
Cost of Financing	Systems Capability

Equally important, as developed and then confirmed in working sessions with the PAVE Committee, are the following items:

1. Procurement Objectives
2. Summarized List of Conclusions for Guiding Selection of Procurement Alternative
3. Development of Wastewater and Water Procurement Alternatives
4. Financing Costs for Alternatives (usage of public vs private financing)
5. Demonstrated Cost Savings of DB and DBO

The results for these items are summarized below.

1) Procurement Objectives

Share Risks

- Breadth and depth of resources
- Minimize capital costs and have predictable life-cycle cost
- Minimize rate payer impacts (short and long term)

Address Additional Community Priorities

- Sustainability and energy efficiency
- Be a good neighbor
- Utilities are a resource for economic development
- Fair treatment of employees

The Concession option and the Sale of the Utilities to the Private Sector do not align with City objectives and require private sector financing costs with capital finance charges more than double the City's cost for tax-exempt debt. As agreed with the PAVE Committee, these options were eliminated from further consideration as no benefits accrue to Grants Pass that are not provided by other alternatives and the financing costs are significantly higher and would create additional rate increases with no benefit to the ratepayer. The decision made was to therefore focus on Conventional, DB, and DBO alternatives.

2) Summarized List of Conditions for Guiding Selection of Procurement Alternative

- Wastewater treatment and water treatment facilities needed by Grants Pass need not follow the same procurement pathways. The needs, technology impacts, new skill requirements are different, as well as the need to operate two plants (water) at the same time.
- Significant new skills and workload additions are required for City staff to have the skill capabilities and the additional workforce to be successful with the staffing needs for new water treatment plant design, construction, startup, operations and the

simultaneous operation of the existing plant and its decommissioning. Table 3-21 provides such a listing.

- Existing City staff is dedicated and the City is fortunate to have them.
- The wastewater facility needs align well with DB with City staff operation. As currently done, usage of consultants to augment City staff with manpower and expertise can be utilized to bring the expanded facility, using the current treatment processes, on-line.
- Usage of the Conventional approach for the wastewater plant facility needs requires significant additional access to consultants and expertise as compared to the usage of the DB approach. In the DB approach, the DB firm provides much of the needed staff and expertise augmentation and thus eliminates the exposure of resource availability, adequacy, and potential coordination and schedule issues.
- The new water treatment plant is a candidate for DB or DBO. To be a successful DB candidate, City staff capabilities must be augmented with very significant consultant resources and expertise so as to address items listed in Table 3-21. The DBO procurement option provides these resources as part of the DBO and are a contract / performance requirement for the DBO. As such, the DBO alternative has the capability to provide a significant advantage in assuring staffing and expertise for the project as well as guaranteed costs and performance.

3) Development of Procurement Alternative Recommendations

A) Wastewater Treatment Facilities

- Facility needs are upgrades and additional treatment based on using existing equipment, technology, and processes.
- Wastewater needs map well to DB with City staff operation and use of consultants. The DB approach provides significant benefits to the City and ratepayers as summarized in Tables 3-22, 3-23, 3-24.
- Use of the DB alternative avoids adding the project / program management workload on City staff as would occur under the Conventional model.
- The exceptions to the above are the upgraded SCADA, MMS and LIMS systems and capabilities. These can and should be pursued as a separate procurement and should be coordinated with the water facilities so the same systems software and hardware are used at both utilities.

- As elaborated in item #4 (below), the demonstrated track record of the DB format and approach, as compared to the Conventional model, delivers project capital costs savings that are estimated in the range of 10–30%. For Grants Pass, this translates into a potential capital cost savings of $2.0 million to more than $ 6 million for the $20 million of planned wastewater treatment facility upgrades.

Recommendation: Use the Design / Build (DB) alternative for the wastewater treatment facilities.

B) Water Treatment Facilities – New Plant

- Facility needs are for a new plant that is located at a new site and that uses different technology, processes, and systems than the existing treatment plant. Pilot testing work utilizes usage of these technologies and are operated by the water treatment staff and consultants. .
- Significant augmentation of existing City staff (numbers and expertise) will be required under a Conventional approach.
- Based upon the potential cost savings identified for the DB and DBO alternatives and the ability to align these alternatives with City goals and priorities, the recommendation development focused on the advantages provided by these alternatives as compared to the Conventional model.

  PowerPoint slides that were used to summarize the DB vs DBO comparison to city staff and members of the PAVE committee are provided in Appendix 7 of the report. Both alternatives have demonstrated significant cost savings (10–30%) as compared to the Conventional DBB with City staff augmented with consultants. These documented cost savings are elaborated in the subsection #4 of this section.

  As such, attention was then focused on the comparison of risk assignment and guarantees provided by the two alternatives (DB and DBO). Table 3-25 summarizes the comparison and shows significant advantages and benefits for the City in the usage of the DBO alternative. Many of these advantages are inherent in the single contract, one entity (firm) approach of the DBO. Overall responsibility for design, construction, startup, and performance are integrated into the responsibility of this single entity. As such, usage of the DBO approach avoids the exposure of multiple firms pointing to another firm as the responsible entity and thus leaving the City without an assured pathway for resolution other than legal proceedings. The DBO approach effectively eliminates, for the City, the exposure and issues of the multiple firm and City staff structure with the separation of responsibilities associated with the DB approach.

As discussed, the DBO performance, risk assignment, and guarantees are stipulated as contract provisions with contract provisions requiring financial capability to pay and the posting of bonds. While the DB approach can and does provide some of the guarantees and performance commitments, it continues to have the "two party" responsibility for plant performance for startup and meeting of regulatory requirements. Because of this key difference, the DBO approach provides far superior guarantees and risk shifting away from the City or City staff.

Table 3-25: Comparison of Risk Assignment and Guarantees for DB and DBO

	Topic	Private Sector DBO	DB & Staff Operates
1)	Capital costs guaranteed	yes	possible
2)	Operating costs guaranteed (short & long term)	yes	no
3)	Guaranteed facility performance	yes	no
4)	Permitting risk assumed	yes	partial
5)	Construction schedule delays	no cost adj.	time & dollars??
6)	Change order costs (not City initiated)	no guaranteed	City pays
7)	Guaranteed regulatory compliance	yes	no
8)	Regulatory fine coverage	yes	no - City pays
9)	Performance bond construction	yes	yes
10)	Performance bond operations	yes	no
11)	Guaranteed staff employment	yes	yes
12)	Liability coverages	yes	no - City pays
13)	Ability to early terminate agreement	yes	NA
14)	Upfront reimbursement of procurement costs	yes	no

Because the DBO alternative involves modifications to staffing (City employees' transition to the private sector), and modifications for how City control over the utility is gained and exercised, the following additional topics were addressed for the DBO alternative:

1. Existing City staff: DBO's, if properly constructed in the RFP and the service contract, require offers of employment to existing staff for a minimum time period (typically two years). Compensation and benefits are required to be comparable, with continuation of current vacation eligibility, etc. Depending on City union agreements, bumping rights into other comparable City positions may be an option for the City staff. Employment by the private sector also cannot be denied for pre-existing medical conditions except for the ability to pass a drug test. Provision of training programs for the new facilities for the transitioning City staff can also be specified and required.
2. Cost savings from operations and new technology: Both of these items are standard provisions in DBO agreements with a pre-established sharing formula (typically 50/50 or 60/40 between City and private sector operator).

3. Long term operational costs are pre-established and adjusted for changes in a common index such as the Consumer Price Index (CPI-U) or the Producer Price Index (PPI). Significant changes in finished water volumes required and produced also result in compensation adjustments using pre-established formulas. The adjustments are not linear with water volume so that a 10% increase in water production may result in only a 2–4%, or less, increase in costs. These items are part of the competitive procurement and life cycle cost analysis during proposal evaluations and incorporated into the contract service agreement.

   Recommendation: Use the Design/Build/Operate (DBO) alternative for the new water treatment plant. As compared to the DB alternative or the Conventional alternative, the DBO alternative provides the cited advantages for costs, staffing, guaranteed performance for design and construction, guaranteed regulatory compliance, and cost and financial guarantees.

#4) Demonstrated Cost Savings of DB and DBO Alternatives

Tables 3-26 and 3-27 summarize the demonstrated cost savings delivered by the DB and DBO alternatives. While both alternatives deliver cost savings as compared to the Conventional approach, the DBO alternative provides life cycle cost savings that include capital and operating cost savings while the DB alternative addresses only the capital component. Typically, operating costs over a 20-year time period are approximately equal to the capital costs.

Table 3-26: Examples of Design / Build Cost Performance

1) DB examples address only capital costs not life cycle costs. Operating costs over 20 years typically equal or exceed capital costs. DBO addresses the life cycle costs.

2) Studies by acknowledged experts show significant capital cost savings for DB as compared to the Conventional DBB approach.

– City of Phoenix, AZ Study "Alternative Delivery Methods Investigation for Lake Pleasant Water"	Avg. savings 29%
– William Reinhardt, editor Public Works Finance, article on Alternative Project Delivery Methods	Avg. savings exceed 20%
– Longmont, CO Water Treatment Plant Earns DB Award, news release, Black & Veatch	Savings of 6.5%
– Study of 144 water & wastewater projects found 38% finished under budget for DB versus 20% for Conventional DBB; Gordon Culp, Smith Culp Consulting	

Table 3-27: Examples of DBO Cost Performance

1) Appendix 8 provides 31 examples of DBO for water and wastewater
2) Typical cost savings in the 10–30% range for capital and operating costs (life cycle costs not just capital)
3) Costs include full contract term responsibility and coverage of capital repair and replacement

5) Usage of Oregon Statute 279C for DB and DBO Alternatives

Unlike the DBB approach where the lowest cost construction bid must be accepted (few and difficult exceptions), the usage of either DB or DBO procurements provide the ability to make selections based upon an established set of evaluation / selection criteria based on qualifications that can include items such as experience of the firm, experience of the key staff, demonstrated performance, cost, and guarantee provisions provided.

To do so, ORS 279C is used to create a "local contract review board" that creates the exemption from the sole selection criteria being lowest cost. Per the Oregon statute, the Grants Pass City Council can be the "local contract review board" for such purposes.

The ability to use ORS 279C was reviewed with Rick Sapir, Partner at Hawkins, Delafield & Wood legal counsel. Mr. Sapir was outside legal counsel for the Wilsonville DBO procurement and recently provided contract assistance to Vancouver, WA in conjunction with the contract operations procurement and RFP developed by Eisenhardt Group for the City of Vancouver that was issued as a public procurement document in late 2014.

Availability of DB and DBO Firms for the Grants Pass Wastewater and Water Facilities

As requested in the RFP, the listings below are provided so as to demonstrate availability of firms with demonstrated experience for the Grants Pass workscope for DB (wastewater) and DBO (water). Typically, the DB organization will be headed by a design engineering firm or a major general contractor with relevant wastewater expertise and experiences. Typically, the DBO organization is headed by a contract operations firm with engineering and construction firms employed by the lead organization. Again, all firms making up the DBO team will have significant water utility experience.

As such, the following organizations are likely candidates for the Grants Pass workscope assignments:

Design / Build (DB) – alphabetical listing

1. CDM Smith
2. CH2M
3. Carollo Engineers
4. HDR
5. Kennedy Jenks
6. MWH Americas

Note: Additional firms and contact information are available through the *Design, Build Institute of America* organization

Design / Build / Operate (DBO) firms – alphabetical listing

1. American Water
2. CH2M
3. Southwest Water
4. Severn Trent
5. United Water Suez
7. Veolia Water

Note: Additional firms and contact information are available through the *National Council Public Private Partnerships* organization and through listings in *Public Works Finance*, William Reinhardt, editor/publisher

Potential Actions to Reduce Plant Size and Capital Expenditures

The new water treatment plant is currently anticipated to have a capacity of 30 MGD. According to the 2014 Water Management and Conservation Plan Update, the historical Maximum Day Demand (MDD) has been between 9.3 and 14.2 mgd (MDD is typically used to size the capacity of supply sources, treatment facilities, transmission piping, pumping facilities and finished water storage facilities). MDD usually occurs in the July to August months in the Pacific Northwest and is associated with increased outdoor water use on the hottest days of the year. Average Daily Demand (ADD) is between 5.0 and 5.8 mgd.

Phasing of the new water plant using an ultimate build-out to 30 MGD would shift significant costs into the future and help insure that current capital costs align with current usage and needs for the next 10-15 years. Designed and built in such a modular manner, subsequent expansion beyond 15 MGD can be scheduled for the future so as to avoid current construction costs for unused capacity. Construction of additional finished water storage reservoirs may also delay the date for when capacity expansion beyond 15 MGD is required.

More aggressive efforts to manage water demands could also help reduce the ultimate size of the expansion and should be explored. The 2014 Water Management and Conservation Plan Update also included "5 year benchmarks for the City's continuation, evaluation, development and/or implementation of programs to perform annual water audits, maintain a fully metered system and the current meter testing and maintenance program; continue its leak detection program, maintain an annual budget for water main replacement, water meter replacement, and leak repair; maintain a rate structure based upon the amount of water metered at the service connection; provide education on water conservation via newsletters included with billing statements; maintain/expand the water conservation demonstration garden and feature it in mailings to highlight available low-water landscaping options; provide shower kits and faucet aerator kits; operation of the remaining bulk water dispensing station and temporary metered fire hydrant dispensing practices; and evaluate the feasibility and appropriateness of identifying, developing and implementing other programs including irrigation distribution system improvements, additional website content, supplier-financed incentive programs, and a 0.25 FTE staff person dedicated to the business, industry and government program".

Additional potential areas of demand reduction that should be considered include:

- Reduce water loss – Water loss is discussed later in the report but was estimated at 8.8% (2014 Water Management and Conservation Plan Update). If this can be reduced, some level of plant expansion may be able to be forestalled. The cost/benefit of this would need to be determined as some leak repair is costly given the amount of water saved.
- Greater incentivizes for consumer conservation – Aggressive consumer incentives (like turf removal) can significantly reduce outdoor landscape irrigation (a key demand driver for the plant expansion). Recently, in Southern California, a $450 million dollar turf removal program resulted in the removal of 150 million square feet of turf saving 80,000 acre-feet of water yearly (~71 MGD of average demand). Outdoor landscaping irrigation represents the primary contributor to summertime peak usage. Reduction of turf irrigation could affect the timing of plant expansion phases. Implementing such changes may not be popular in the community however.
- Examining the use of revised pricing tiers to drive peak reduction, conducting a cost of service study to ensure full cost recovery is occurring, and examine the use of water budget based rate structures can help reduce demands.
- Evaluate cost / tradeoffs of more storage to meet MDD versus the water treatment plant capacity expansion.

- Reevaluate phasing of the expansion.
- Evaluate recycled water use in agricultural area to reduce potable water demands. (The cost of transmission pipelines may be prohibitive).

Internal Survey

Background

The RFP workscope required the conduct of an "internal survey" to include collection of input from internal stakeholders about operating conditions for use in making operating and strategic plan recommendations. Surveys were to include City staff that work in various Water and Wastewater operating divisions and any City Council or PAVE Committee members that wanted to participate in this process. Accordingly, a survey was developed incorporating the "Effective Utility Management" concepts developed by:

- Association of Metropolitan Water Agencies (AMWA)
- American Public Works Association (APWA)
- American Water Works Association (AWWA)
- National Association of Clean Water Agencies (NACWA)
- National Association of Water Companies (NAWC)
- United States Environmental Protection Agency (EPA)
- Water Environment Federation (WEF)

As stated in the Effective Utility Management primer, the ten attributes of effectively managed water sector utilities *provide useful and concise reference points for utility managers seeking to improve organization-wide performance. The Attributes describe desired outcomes that are applicable to all water and wastewater utilities. They comprise a comprehensive framework related to operations, infrastructure, customer satisfaction, community welfare, natural resource stewardship, and financial performance (*Effective Utility Management: A Primer for Water and Wastewater Utilities, June 2008).

According to the "*Effective Utility Management: A Primer for Water and Wastewater Utilities*" (June 2008), the ten attributes are:

Product Quality (PQ)

Produces potable water, treated effluent, and process residuals in full compliance with regulatory and reliability requirements and consistent with customer, public health, and ecological needs.

Customer Satisfaction (CS)

Provides reliable, responsive, and affordable

services in line with explicit, customer- accepted service levels. Receives timely customer feedback to maintain responsiveness to customer needs and emergencies.

Employee and Leadership Development (ED)

Employee and Leadership Development Recruits and retains a workforce that is competent, motivated, adaptive, and safe-working. Establishes a participatory, collaborative organization dedicated to continual learning and improvement. Ensures employee institutional knowledge is retained and improved upon over time. Provides a focus on and emphasizes opportunities for professional and leadership development and strives to create an integrated and well-coordinated senior leadership team.

Operational Optimization (OO)

Ensures ongoing, timely, cost-effective, reliable, and sustainable performance improvements in all facets of its operations. Minimizes resource use, loss, and impacts from day-to-day operations. Maintains awareness of information and operational technology developments to anticipate and support timely adoption of improvements.

Financial Viability (FV)

Understands the full life cycle cost of the utility and establishes and maintains an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Establishes predictable rates – consistent with community expectations and acceptability – adequate to recover costs, provide for reserves, maintain support from bond rating agencies, and plan and invest for future needs.

Infrastructure Stability (IS)

Understands the condition of and costs associated with critical infrastructure assets. Maintains and enhances the condition of all assets over the long-term at the lowest possible life-cycle cost and acceptable risk consistent with customer, community, and regulator-supported service levels, and consistent with anticipated growth and system reliability goals. Assures asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences.

Operational Resiliency (OR)

Ensures utility leadership and staff work together to anticipate and avoid problems. Proactively identifies, assesses, establishes tolerance levels for, and effectively manages a full range of business risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related) in a proactive way consistent with industry trends and system reliability goals.

Community Sustainability (CS)

Is explicitly cognizant of and attentive to the impacts its decisions have on current and long-term future community and watershed health and welfare. Manages operations, infrastructure, and investments to protect, restore, and enhance the natural environment; efficiently uses water and energy resources; promotes economic vitality; and engenders overall community

improvement. Explicitly considers a variety of pollution prevention, watershed, and source water protection approaches as part of an overall strategy to maintain and enhance ecological and community sustainability.

Water Resource Adequacy (WA)

Ensures water availability consistent with current and future customer needs through long-term resource supply and demand analysis, conservation, and public education. Explicitly considers its role in water availability and manages operations to provide for long-term aquifer and surface water sustainability and replenishment.

Stakeholder Understanding and Support (SS)

Stakeholder Understanding and Support Engenders understanding and support from oversight bodies, community and watershed interests, and regulatory bodies for service levels, rate structures, operating budgets, capital improvement programs, and risk management decisions. Actively involves stakeholders in the decisions that will affect them.

Conduct of Survey

An on-line survey was developed to allow participants to respond electronically. The survey was administered from May 28 through June 13, 2015. A total of 23 employees responded comprising the Superintendents of the three Divisions and employees below them. The Public Works Director also responded so as to provide a senior management perspective; it was decided not to include his survey so as to have the survey results focus on the Superintendents and their staffs. A written copy of his responses was provided to him directly. The survey was comprised of two components:

1. A ranking of the EUM attributes by most to least important attribute for Grants Pass and to rank the achievement level for each attribute from highest to lowest achievement, and
2. A series of multiple choice questions related to department culture and management

It is important to note that these employee perceptions are based upon their experience and "vantage point" in the organization. Survey results were not broken down by Division. However, the results were shared with each Division in small group "interviews" where the issues were discussed and each group was further asked to provide the "strengths, weaknesses, opportunities and threats (SWOT) they perceive in their Divisions and for the utility in general. (These SWOT analysis / post interview follow-up sessions with the employees were not requested in the original scope of work or budgeted but were added by EGI so as to gain elaboration of identified issues and opportunities). Based upon these follow-up interviews, there are distinctions between the Divisions. The interview notes are included as Appendix 3 and the identified issues are considered in the strategic recommendations contained elsewhere in this report.

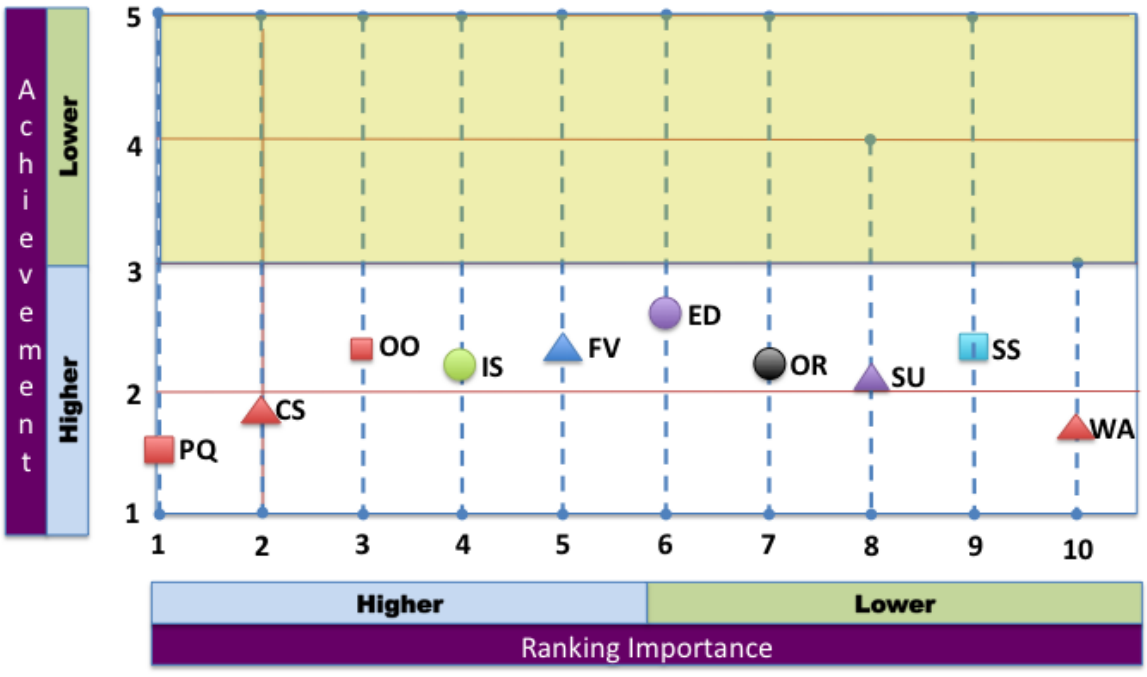
Results

The detailed results are included as Appendix 4. The summary results are depicted below. A total of 23 employees responded across the three Divisions: Water, Wastewater and Collection & Distribution.

EUM Table 1: Summary of Respondents

Respondent Divisions	Responses
Water	6
Wastewater	7
Collection & Distribution	10
Total	**23**

EUM Table 2: Summary of EUM Self Assessment Results



The averages response are plotted. The dashed lines depict the range of responses (e.g., most attributes incurred a response ranging from 1 to 5; SU and WA showed a response range from 4 to 1 and 3 to 1, respectively, as shown by the dashed lines in the chart. Areas that would be of specific concern appear in the upper left corner of the graphic where the importance ranking is "high" and the achievement ranking is "low". *As can be seen there are no issues in this quadrant.*

Further, across all ten areas no single area rose above an achievement ranking of 3 meaning that employees generally perceive good performance across the ten attributes as indicated by the higher achievement ratings (lower numbers). Produce Quality (PQ), Customer Satisfaction (CS) and Water Resource Adequacy (WA) received high marks. Operations Optimization (OO), Infrastructure Stability (IS), Financial Viability (FV), Operational Resilience (OR), and Community Sustainability (SS) received somewhat lower marks but still comparatively high. The "lowest" achievement attribute was "Employee and Leadership Development" where the average response approached a "3", still comparatively good.

The second component of the survey consisted of multiple-choice questions. Thirty-eight questions were posed to the respondents. The results are summarized below. An average response of 1 represents uniform disagreement (except question 26 where the responses should be thought of in an inverted fashion) and an average response of 4.0 represents uniform agreement with the statement.

EUM Table 3: Responses to Questions 1–5

#	Question	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Mean
1	I believe the Public Works Dept provides an excellent service to the community	0	0	2	21	3.91
2	My work conditions are acceptable	3	3	3	14	3.22
3	The vehicles we use are acceptable for their use	5	1	2	15	3.17
4	The technology we employ in general is effective	2	3	5	13	3.26
5	I have adequate supplies/ equipment necessary to do my job	4	1	5	13	3.17

These five questions generally elicited supportive responses. However, as displayed in the above table, there are several employees that believe that improved vehicles are needed.

EUM Table 4: Responses to Questions 6–11

#	Question	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Mean
6	I have adequate employee space to do my job	5	4	6	8	2.74
7	I am satisfied with my work schedule	1	0	7	15	3.57
8	I am proud to be a member of the Public Works Dept	1	1	5	16	3.57
9	In general, I am satisfied with my career	2	1	6	14	3.39
10	Morale is high in the division in which I work	5	3	5	10	2.87
11	The Dept has a clear sense of its mission	3	3	4	13	3.17

Question 6 indicates there are space constraints that employees believe are important and create issues. Group interviews of the three Divisions indicate this is emanating from the Collections & Distribution Division where older, smaller offices/work spaces are the norm. Question 10 also elicited substantial disagreement related to morale in the Collections & Distribution Division (as identified in the group follow-up interviews).

EUM Table 5: Responses to Questions 12–18

#	Question	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Mean
12	Whenever I have a concern at work I can always have my concerns resolved	3	2	9	9	3.04
15	The Public Works Dept is innovative when it comes to dealing with the community	1	4	7	10	3.18
16	I know what is expected of me at work	3	0	2	18	3.52
17	I have clear info about how to do my job	3	1	8	11	3.17
18	I feel comfortable with what I am asked to do in meeting my job requirements	1	2	4	16	3.52

Questions 12–18 generally elicited favorable responses. There are several employees that generally view the department in a negative light. In interviews with the Collection & Distribution

group it is clear that there is a perception by members of this group that they are not appreciated by the senior management team.

EUM Table 6: Responses to Questions 19–23

#	Question	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Mean
19	My supervisor and I maintain a clear understanding about what I am expected to do and how I am expected to carry it out	2	1	7	13	3.35
20	Management does a good job communicating their decisions to everyone in the Dept	4	3	9	7	2.83
22	In general, I believe there is good communication between the Dept and city hall	5	4	8	6	2.65
23	Management listens to my ideas about improving the Dept	4	2	4	11	3.05

Questions 20 and 22 (note there is no Question 21) indicate that communications could be improved within the Department. Uniform conveyance of information in routine staff briefings and, particularly, explanation of rationales for decisions would be helpful in improving communications. Team-building could also be helpful. These areas are considered in the recommendations.

EUM Table 7: Responses to Questions 24–27

#	Question	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Mean
24	My immediate supervisor listens to my ideas about improving the Dept	1	0	5	17	3.65
25	In general, the communication process in the Dept is excellent	3	5	5	10	2.96
26	I wish there was a better way for my ideas to be heard	6	8	4	5	2.35
27	I receive timely feedback that my work contributes to the overall success of the Dept	5	5	3	10	2.78

Questions 25–27 continue to echo the need for communications theme, and responses were underscored in the group interviews. Please note that question 26 scoring should be read in

the opposite direction as other questions. A lower score is better. Nonetheless, there are nine employees that believe there needs to be better ways for ideas to be "heard".

EUM Table 8: Responses to Questions 28–31

#	Question	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Mean
28	I receive necessary training to maintain/improve my skill and competency levels	5	3	4	11	2.91
29	My immediate supervisor is properly trained for the position he/she holds	0	0	4	19	3.83
30	Training opportunities are readily available in the Dept	5	1	6	11	3.00
31	Training opportunities are distributed fairly in the Dept	4	4	5	10	2.91

Questions 28 and 29 indicate that there are concerns with current Department training including both content and availability.

EUM Table 9: Responses to Questions 32–38

#	Question	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Mean
32	In the department discipline is applied fairly	5	1	6	11	3.00
33	My work is important	0	0	0	23	4.00
34	My work makes a positive contribution to the community	0	0	0	23	4.00
35	My supervisor takes personal interest in me	1	0	10	11	3.41
36	My supervisor supports my professional development	2	0	6	15	3.48
37	My supervisor is an effective leader	1	3	5	14	3.39
38	I have confidence in Management to lead the Dept	3	1	6	12	3.23

With regard to discipline, "spirit" and supervisory interest/confidence, the organization generally provides high marks. There is an interesting contrast to interviews that indicated some morale issues in Collection and Distribution related to a perception that they are not appreciated. These concerns seem to largely be directed at the Director level and above.

Recommendations

The results developed from the survey and SWOT analysis / interviews have been included in the overall report recommendations.

Equipment and Systems (High Level Review)

Both of the treatment facilities within the utility incorporate electronic monitoring devices and systems to monitor and/or control process operations. These devices are part of the overall SCADA (Supervisory Control and Data Acquisition) systems; they are the primary instruments and devices that provide input data to the process control systems (PCS). The overall SCADA systems are well documented in the recently completed draft report "SCADA Systems Master Plan" (Carollo Engineers, May 2015).

The master plan, outlines a program for upgrading the PCS for both treatment facilities. The plans include about $8 million in recommended upgrades to the two treatment facilities and associated remote systems (pump stations and reservoirs).

The field instruments at each facility represent typical levels of instrumentation for systems of similar size and complexity. The essential information needed to monitor key system and process conditions is being captured by the SCADA systems, and is available to system operators. This includes such important details as wetwell and reservoir levels; dissolved oxygen levels in aeration basins; major process flow rates; key filter operating parameters; etc.

Other than the recommendations of the SCADA Systems Master Plan, there is no apparent need to implement a systematic expansion of the extent or complexity of the monitoring systems, other than routine upgrades and modernization as subsystems are upgraded or replaced. The current system provides a reasonable balance between capturing useful and necessary data and the demands of installing, operating, and maintaining expensive and complex field instruments.
The staff survey completed as part of the master plan shows that nearly half of those responding (5 of 11) indicated that the existing processes are "not adequately automated from the HMI". This reveals an opportunity for control system upgrades as a part of future improvements.

The design phase for the new water treatment plant will be a logical point at which to consider modern system control functions that could optimize chemical dosages, etc. The current system, while relatively rudimentary, is appropriate for the existing treatment facilities in light of the modest treatment challenges imposed by the Rogue River source and the plant operators' experience.

A fully functional system might include the following:

- Information related to energy and chemical use - cost per MG treated.
- Real-time energy calculations associated with major equipment, peak rate shedding strategies, etc.
- For the wastewater treatment plant - real-time monitoring of TSS, ammonia, nitrate, and E. coli should be considered as a method of improving process optimization and control.

The LiquID Station (ZAPS Technologies) provides an example of such capabilities.

4.0 TASK II: WATER TREATMENT DIVISION

Uses for the Current Water Plant and Site

Introduction

As part of the strategic planning effort for the Water and Wastewater facilities for the City of Grants Pass, EGI team members completed a preliminary evaluation of potential uses for the existing Water Treatment Plant (WTP) site. The primary focus of this effort was a charrette held on July 21, 2015 to brainstorm and generate alternative ideas. EGI's team members reviewed the seismic study and toured the WTP and surrounding area in advance of the charrette to establish familiarity with the existing facility and its context.

A complete report on the charrette can be found in Appendix 9. This section provides a summary, as well as additional recommendations for future actions.

Charrette Summary

The charrette was held at the Parkway Public Safety Center. Attendees were Rick Riker and Roy Lindsey (City Councilors); Jason Canady (WTP Superintendent); Tom Schauer, Scott Lindberg, and Terry Haugen (City staff); Paul Eisenhardt, Brian Hemphill, Ken Ogden, Dana Crawford, and Nathan Kappen (EGI team members). The discussions included the characteristics of the site and buildings; opportunities and constraints unique to the facilities; potential uses; and pathways for development.

The key findings of the charrette process are summarized in the following pages of the Report:

Site and Facility Characteristics

- The filter building is aesthetically pleasing, and is iconic due to its location and architecture.
- The configuration of the site structures is not amenable to typical commercial or public uses. Significant rehabilitation work would be required.
- If the filter building is retained, a likely approach would involve keeping the existing façade only, and construction of structures behind and around the remaining façade.
- A recent structural and seismic evaluation identified extensive (and expensive) upgrades for all of the existing structures on the site.
- There are a number of approaches that would involve various degrees of reuse of existing structures, ranging from none (i.e., complete removal and replacement) to extensive.
- An extreme condition would involve selling the site as-is to a developer, although this option would need to retain rights of way to the existing water intake structure, which will remain in service, and to the large power lines that traverse the site.
- Conversion of large process tankage to useful facilities will be very challenging because of the peculiar configuration and need for structural upgrades.

Potential Uses

The charrette attendees developed 25 potential uses for the site (a full list is provided in the appendix). The suggestions were ranked by the group, and these were the most favored:

- Concert event venue
- Geographic hub
- Regional wine center/winery
- Water awareness center
- Brewpub
- Fish hatchery
- Splash park
- Interpretive center/museum

Process Issues and Next Steps

This evaluation and the charrette are the first steps in a development process for the site. The following provides guidance to subsequent steps in that process.

Vision

Creating and identifying a guiding vision for this project is a critical first step. Given the site's proximity to the river, downtown core and state highway, it is highly visible and has potential to

provide an outstanding amenity value. Despite the known and unknown challenges within the site, the building represents the City's history and is a part of the community. With a defined vision, the proper planning, involvement and approach, future uses as identified in the charrette and more can be achieved.

Action and Investment

Generating action and investment within the community is critical to a successful project. Creating an amenity that respects the historic building and context of the site will require coordinated public action from local, regional and state sources. The investments that are needed for public access, infrastructure, public space upgrades and development are generally developed through the following steps:

- Preliminary investigations
- Strategic due diligence
- Framework master plan
- Partner commitment

Increasing awareness of the site through advertisements, public announcements or access will generate interest and excitement. Public and pedestrian access to the site and river is one of the most important steps for improvement implementation.

Development Approach and Challenges

An effective approach to developing the site relies on several factors, with some obvious challenges:

- Aligning regulatory restrictions, partnerships, and regional demand sources to take full advantage of natural and historic features of the site while maximizing revenues and minimizing costs.
- Understanding the relationship between public investment in infrastructure, parks, public access and how this investment can help leverage significant private interest and investment.
- Identifying a location or strategy for adequate parking facilities to support potential development uses. This may represent a major challenge to certain potential uses given the small site area and utility right of way bisecting the site.
- Inadequate infrastructure, site preparation issues and building re-use options may significantly increase development costs and limit overall development for the site.

Recommended Site Development Program

Following is the EGI team recommendation for an effective program for the development of the site.

Committee

We recommend that a committee be formed to help direct the project and to provide input throughout the process. The committee could be comprised of:

1. Parks & Community Development Department: Parks, Planning, Engineering & Transportation
2. Public Works Department: Water Treatment
3. Citizens

Design Process

The design process should be organized to generate public excitement, reveal potential challenges and opportunities, create a concept master plan and to identify order of magnitude costs required for project development. The city should develop a request for proposal in search of a design team to assist the project throughout the process. The design team should have experience with projects of this complexity and public involvement. The team should include an Architects, Landscape Architects, Engineers, Planners, Real Estate Advisors and Cost Estimators.

The following steps should be taken:

1. Assessment

1.1. Kick off meeting with design team and committee. Identify goals, schedule, and challenges.

1.2. Assessment by design team:

- Assess physical and program opportunities and constraints including the existing architecture and site conditions.
- Review of planning documents related to community needs and aspirations
- Initial review of local real estate market and economics

1.3. Generate redevelopment program ideas based on assessment

1.4. Presentations:

- Committee meeting #1 – Design team presents assessment and findings. Discuss potential redevelopment program ideas.
- Public meeting #1 – Present the project to gain public involvement and input regarding the site and its possible reuse

1.5. Design team deliverables:

- Written summary of project goals, findings, opportunities and constraints.
- Assessment plans for site and architecture
- Programming concepts.
- Meeting notes

2. Alternatives

2.1. Design team develops 2-3 alternatives based on input received during the assessment phase

2.2. Test concepts including evaluation of economic viability and order of magnitude cost

2.3. Presentations by design team:

- Committee meeting #2 – Present alternatives and receives input
- Public meeting #2 – Share alternatives with public and receive feedback
- Planning Commission meeting #1 – Share project progress and discuss challenges/future opportunities
- City Council meeting #1 – Brief the Council regarding project possibilities and to obtain input

2.4. Design team deliverables:

- Written summary of alternatives and phases describing the process and input received.
- Illustrative site/architecture plan alternatives
- Rough order of magnitude cost estimate for each alternative
- General market assessment

3. Refinement

3.1. Based on input received, develop an alternative that embodies the input and is practical for redevelopment. Given the preliminary aspect of the study, the result may be two alternatives for further study depending on available resources and economic viability

3.2. Presentations by design team:

- Committee meeting #3 – Present refined alternative(s) to project committee
- Public meeting #3 – Share refined alternative(s) with public and request/receive input
- Planning Commission meeting #2 – Share refined alternative(s) and receive input
- City Council meeting #2 – Share refined alternative(s) and receive input

3.3. Develop a revised concept plan based on input received

3.4. Committee meeting #4 – Present concept plan to committee

3.5. Design team deliverables:

- Written Report summarizing refinement and public design process
- Illustrative site/architecture concept plan
- Rough order of magnitude cost estimate
- Outline summary of next steps for project development

Current Treatment Plant Operations

According to the "Water Treatment Plant Facility Plan Update" (January 2014) the Grants Pass WTP was originally built in 1931. It has undergone several upgrades and expansions to serve growing demands and more stringent water quality regulations. Capacity upgrades were completed in 1950, 1961, and 1983. Based on design capacity alone, the WTP capacity is currently limited by the raw water pump station capacity. The maximum overall hydraulic plant capacity is 20.2 mgd. The firm hydraulic capacity, with the largest river intake pump out of service, is approximately 15.1 mgd.

Because of the age of the plant and long term reliability issues and concerns, the City has decided to construct a replacement plant so as to assure the continued adequacy of supply and availability of high quality drinking water.

Treated water piped from the plant is pumped and stored by thirteen remote pumping stations and eight reservoirs. The distribution system is made up of five different elevation zones located throughout the city and over 160 miles of distribution lines varying in size from 2 to 36 inches in diameter. Liquid chlorine is added at strategic points in the distribution system to maintain the chlorine residual mandated by the OHA-DWP.

The plant is supplied with water from the Rogue River. There have been no treatment violations in the last 3 years. The Rogue River is flashy (has high turbidity episodes) in the winter, but very treatable at high turbidities. Primary concerns are increasing levels of algae that cause large diurnal swings in pH (often 1.5 units or more). The raw water is fairly pure; there are no real issues with metals, inorganics, synthetic organic chemicals or volatile organic chemicals (there is very low industrial use up stream). The biggest threats are from concentrated animal feeding operations and agricultural lands. Thus far, herbicide and pesticide findings are very low or non-detectable. Water rights are perfected up to the current plant capacity. In addition, the City has secured water rights permit extensions for the next 50 years.

The plant is operated by a small professional staff of six permanent operators that work 4/10 shift schedules in the winter months with daily plant shutdowns and then shift to a 24/7 schedule for the summer months when temporary operator staff is added for the summer months. The permanent plant staff are adept at maintaining and operating the plant. Due to challenges meeting CT compliance during the colder winter months, the plant flows are decreased. In addition, the plant is often shut down during low demand periods (which is generally undesirable for a water treatment plant and represents a risk factor each time the plant is restarted; SOPs exist for the restart to help ensure stable operations).

The City has a very good record of compliance that is attributable to a professional staff that is dedicated, creative, and hard working. Staff consistently produces a high quality water product out of the plant.

The City, with the assistance of consultants, is currently pilot testing high rate filtration and ballasted flocculation treatment processes. Initial testing has been highly successful. Plant staff

will continue to test filters at variable flow rates, altering polymer dosages, types and feeding ozone periodically to evaluate filtration performance under a wide range of conditions. The City is currently in the process of finding and acquiring land for the new treatment plant.

The utility staff (Management and Council) appears to be very cost sensitive in the operations of the utility. There is always a balance to be struck in saving money and deferring maintenance, though, and cost containment is not always the best strategy.

Some current systems are outdated and lack capabilities. Document management systems are largely paper-based and need to be upgraded to current practices/standards (i.e., the usage of computerized systems). Accessing historical information is cumbersome and appears to rely on "tribal knowledge" as much as records. This is a significant vulnerability as the workforce ages and retires, taking that knowledge with them.

The SCADA system in the WTP is nearly 15 years old and generally outside a typical replacement life cycle. The City upgraded the water distribution system SCADA system in 1999. The SCADA system monitors reservoir levels, pump operating status, and local pressures throughout the system. The central computer system is located at the water treatment plant (source: Grants Pass Water Distribution System Master Plan January 2001). We understand an update to the Distribution System Master Plan is being contemplated.

The WTP has a Windows-based SCADA and control system. The existing control system was installed as part of the SCADA improvements in 2002. Recent upgrades at the WTP include new processors and software (source: Draft City of Grants Pass Water and Wastewater SCADA Systems Master Plan, May 2015). The SCADA system incorporates operator input, specified set points and programmed algorithms to make decisions for the operator or provide prompts to assist them in the performance of their duties. Examples include filter flow setpoints, backwash timing, and filter to waste timing. Flow pacing of chemical feeds is present and residuals are measured against desired goals.

The plant uses on-line water quality instrumentation and bench-top equipment to monitor and control plant performance. Raw and settled water turbidity is continuously monitored. Each filter (as well as the combined filter effluent) is equipped with an on-line turbidimeter to monitor filter performance and ensure regulatory compliance. All turbidimeter signals are integrated into the SCADA system.

Finished water pH is continuously monitored for corrosion control compliance. Raw water and settled water pH are measured periodically each day via grab samples analyzed in the plant's laboratory. An on-line chlorine residual analyzer is used to monitor the plant effluent residual. Pre-basin and settled water chlorine residuals are measured periodically each day via grab samples.

The Draft City of Grants Pass Water and Wastewater SCADA Systems Master Plan (May 2015) provided an assessment of the existing Process Control Systems (PCS), identified functions

required of the PCS systems and outlined upgrades and costs required to meet future needs. The report observed/recommended the following:

- The main facility has a staffed Operator Station where control and monitoring of all WTP and remote site processes is accomplished using Rockwell's RSView32 software. This software runs on Microsoft's Windows XP platform, ***which is an obsolete operating system, and is not compatible with currently available Windows platforms.***
- The PC at this operator station is the only PC at the facility, commonly referred to in Industrial Automation as "Stand Alone" control. There is no ready backup for this station should the PC have a hardware or software failure. Backups are done manually.
- Installation of individual particle counters on the filter effluent would better predict turbidity breakthrough and ensure continued compliance with regulations.

The report noted several SCADA issues for both the water and wastewater treatment plants including the need to:

- Implement uniform labeling
- Improve the organization of wiring in cabinets
- Replace old power supplies inside the Control System cabinets
- Implement RSView 32 HMI Software Upgrades to gain increased serviceability of the computer that contains the software. The major factors that drive the need for increased serviceability as follows:
    - discontinued support and security vulnerabilities of the Microsoft XP operating system,
    - decreasing availability of computer hardware compatible with the KTX communication card, and
    - discontinued status of the current HMI software.
- Implement SLC and MicroLogix Controller Upgrades

The report further outlined the current and future needs of the City's SCADA software including:

- Process visualization and control tools
- Real-time data trending capability
- Historical data archiving and trending capability
- Security improvements
- Reporting
- Terminal Server Capabilities
- Virtual Environment Compatibility
- Asset Management System Connectivity

Among other findings, the Water Treatment Plant Facility Plan Update (January 2014) concluded that:

- The SCADA system at the plant will likely require additional software and firmware upgrades. During the planning horizon considered for this report, it is anticipated that replacement software and hardware will be needed to stay current with developing technology.
- The location of the filter effluent flow meters prevents the measurement of filter- to-waste flows that results in potential operations and water quality problems.

- The existing flow meters lack adequate lengths of upstream and downstream straight pipe, significantly reducing the accuracy of the meters. Therefore, replacement of the filter effluent flow meters is recommended along with piping changes to integrate filter-to-waste flow measurement.

It is EGI's view that, even though the water plant is scheduled to be abandoned, systems should be kept current with product life cycles. We further observe that daily start/stop operations (i.e. running the plant for limited hours each day) incurs a risk of process upsets. To mitigate this, staff has developed a detailed standard operating procedure to manage bringing the plant back on line and have historically successfully implemented that procedure. Nonetheless, such operational methods are not ideal for stable water treatment and uniform water quality. A new treatment plant should be assessed against a 24 hour operation (with the potential need for additional storage). The cost-tradeoffs should be assessed.

The breadth of opportunities are well summarized by Superintendent Jason Canady "We are at a point where so many upgrades/replacements are needed we can embrace new technologies that will more fully automate both plant processes enabling current/future staff to focus on other items besides how we currently operate our facilities.".

The current communications system for the utility should be re-evaluated and upgraded (including emergency communications). Development of a formal communications / technology master plan is warranted including systems to better access geographical information in the field (including as-builts, etc.).

The Water Treatment Plant uses an in-house built simple LIMs system that, from reports of operators, works fine, allowing basic trend analysis. There are numerous small LIMs packages on the market, however, that represent better tools for operations assessment and planning and would be worth exploring. In the Wastewater Division, there is limited ability to store and retrieve information in formats that facilitate / allow trend analysis and / or process assessments for cost effectiveness. This capability should be implemented to improve efficiency.

Some SOPs exist (especially in the Water Treatment Division). Other areas are not documented. There is a need for systematic documentation (and systems upgrades/augmentation) to capture the "tribal knowledge" of individuals in all three divisions. Efforts are being made but much knowledge is retained by individuals. As staff retire, this loss of operational and maintenance knowledge will be significant.

The EGI team has observed several areas where security attention is required. These have been conveyed verbally to management and the PAVE Committee. A security review and implementation of actions to address the identified concerns are appropriate.

Systems for optimizing chemical and energy use are limited. Trending capability to optimize cost effectiveness and identify tradeoffs is limited. Process energy use analysis would also be helpful.

Water Treatment Facility Preventive Maintenance

As summarized in the write-up for Task I, the EGI team observed a motivated professional workforce at the water and wastewater plants and in the collection and distribution division. However, staff is spread quite thin in all three divisions.

Focusing on the water plant, maintenance appeared to be done (notwithstanding the water plant coatings issue mentioned earlier in Task I) so that the aging plant, its equipment, and infrastructure remain functional and provide adequate, short-term reliability. However, the current water plant maintenance management system should be upgraded to provide better functionality and reporting capability. There is a need for a work order generation system that will link to the Asset Management System and define and schedule maintenance, generating work orders based upon that data. Tracking and reporting of deferred maintenance and replacement cost profiles could be generated and would improve maintenance planning and efficiency. The current system will also benefit from development of "Standard Operating Procedures" (SOPs) so as to retain and document that proper maintenance procedures are used and followed. This is especially important given pending staff retirements in some utility areas and the need to capture their "tribal knowledge" in a documented manner for continued usage by the staff. Without such documentation there is a significant risk of voiding new equipment warranties, as the record system will not satisfactorily exist to satisfy warranty requirements of the equipment manufacturers.

Performance Indicator #7 included in the Task I indicated that the water plant (based upon anecdotal inputs) achieves an 80+ % score for planned maintenance. This performance, if accurate, places the water plant planned maintenance percentage in the top quartile. Such a rating indicates a maintenance program that is achieving the desired goals and objectives in the cost effective conduct of maintenance so as to minimize the occurrence of unplanned, reactive maintenance. However, because of the significant limitations of the existing system and

approach, ready access to equipment histories, work order tracking, parts usage, and hours expended are not readily available. Such information will be essential for the cost effective maintenance of the new water plant equipment and facilities.

Recommendations

1) Looking ahead to both the continued maintenance of the existing water plant and the new water plant, there is the need for a comprehensive computerized maintenance management system and the need to develop a comprehensive library of Standard Operating Procedures (SOPs) for both maintenance and operations. The information and documentation captured by these systems are essential inputs for the overall Asset Management System (AMS) that also needs to be developed and implemented. Ideally, such systems should be put in place in parallel to the design, construction and startup of the new water plant. These systems are essential for the cost effective, efficient operation and maintenance of the new water plant. The systems selected for immediate implementation can be and should be suitable for the new plant facility. The same systems (software and hardware) should be used for both the water and wastewater plants.

2) Comprehensive training of staff on the capabilities and usage of these systems is required as staff currently does not have these experiences or demonstrated capabilities.

3) Concurrently, development of critical maintenance SOPs for the current water plant should be undertaken with emphasis on areas where maintenance knowledge, approaches, etc. currently resides with one staff member. With the new water plant a minimum of 3 years in the future, development of these items is well justified. Such actions will limit and/or eliminate the current exposure and single source of knowledge so that staff vacations, sickness, retirement, etc., do not leave the on-duty staff with no basis for how to proceed with the maintenance item.

Sections of the Improvement areas # 1, # 3 and # 5 and the Assessment Checklist items #7, 8, and 10 discussed in Task I are repeated in this section of the Report for emphasis and clarity.

1. Improvement Area #1 – Asset Management (Checklist Element #6) -
   The current asset management system was built in-house. It includes a basic equipment inventory and preventative maintenance listing. There does not appear to be rigorous documentation of maintenance histories, a normal part of modern AMS programs. Replacement/upgrade plans have not been established nor have costs been projected. Tracking of spare parts inventory for critical equipment/activities is needed (staff indicated that occasionally there are inadequate replacement parts on the shelf). A formalized modern program across all divisions should be considered housing all key equipment, maintenance requirements, and assigning equipment criticality (to help prioritize maintenance activities). This should drive a "fact-based" process to replace assets and help justify the needed replacements. There are relatively inexpensive web-based systems (e.g., Sedura) that would greatly improve long-range effectiveness of maintenance resource usage. Construction of the new water treatment plant is an ideal

time to transition to a new system that will include the wastewater plant and collection and distribution activities as well.

Improvement Area #3 – Maintenance Management System (Checklist Element #10) – The current maintenance management system relies heavily on the informal expertise of staff with limited written records retention or capabilities. Currently, staff track maintenance on key equipment, but lack the ability to track planned/unplanned maintenance. It is also not clear whether equipment "criticality" has been formally determined in the establishment of maintenance priorities. According to staff, maintenance is conducted according to manufacturers' warranties; this should be verified, as without such documentation there is a significant risk of voiding new equipment warranties, as the record system will not satisfactorily exist to satisfy warranty requirements of the equipment manufacturers.

There is a need for a work order generation system that will link to an Asset Management System and define and schedule maintenance, generating work orders based upon that data. Such information will be invaluable in building the case for continued investment in the water and wastewater systems. Tracking and reporting of deferred maintenance and replacement cost profiles could be generated and would improve maintenance planning and efficiency. The current system will also benefit from development of "Standard Operating Procedures" (SOPs) so as to retain and document that proper maintenance procedures are used and followed. This is especially important given pending staff retirements in some utility areas and the need to capture their "tribal knowledge" in a documented manner for continued usage by the staff. Without such documentation there is a significant risk of voiding new equipment warranties, as the record system will not satisfactorily exist to satisfy warranty requirements of the equipment manufacturers.

3. Improvement Area # 4 - Laboratory Information Management System - The Water Treatment Plant uses an in-house built LIMs system that, from reports of operators, works fine, allowing basic trend analysis. The system purportedly assists operators in choosing chemical dosages based upon current conditions, considers river levels and limits plant flow rates based on limitations of our water rights/permits, provides extensive analysis of past performance and predicts future water quality/quantity. It performs all of our regulatory reporting in addition to just our internal process reporting. There are numerous small LIMs packages on the market, however, that represent better tools for operations assessment and planning including linking to the SCADA system, providing predefined analysis of current conditions and customizable dashboards of plant performance information and would be worth exploring. In the Wastewater Division, there is limited ability to store and retrieve information in formats that facilitate / allow trend analysis and / or process assessments for cost effectiveness. This capability should be implemented to improve efficiency.

4. Improvement Area #5 – Current O&M Manuals and SOPs (Checklist Element #12) – Some SOPs exist. Other areas are not documented. There is a need for systematic

documentation (and systems upgrades/augmentation) to capture the "tribal knowledge" of individuals in all three divisions. Efforts are being made but much knowledge is retained by individuals. As staff retire, this loss of knowledge will be significant.

Assessment Checklist Summary

Reinforcement of the need for the above Improvement Area recommendations is provided by these Assessment topics:

7	O&M performance	3	O&M Performance is excellent attributable to professional operations and maintenance staff (in spite of limited MMS/Asset Management tools); maintenance concerns (deferred items, conditions, records). Need for funding and provision of mgmt. tools (CMMS, AMS, SCADA upgrades). Maintenance is not adequately planned or tracked.

8	Systems development and Implementation	2	Existing systems are outdated, lack capabilities; need for significant upgrades.

10	Maintenance management system (MMS)	2-	Need for MMS system and usage to replace current approaches that are inadequate.

5.0 TASK III: WATER DISTRIBUTION DIVISION

Discussion of Breadth of Operational Responsibilities

From the FY15 Adopted Operating and Capital Budget Document: *Water Distribution is responsible for ensuring a consistently dependable supply of quality water for both domestic consumption and fire service protection. The services delivered in this activity are administered through the performance of distinct programs consisting of customer service, water quality, service installation and maintenance, system maintenance, main and hydrant installation, and general operations.*

The duties encompassed in these programs include; water sampling, water system flushing, meter replacement, water service installation and repair, fire hydrant repair and inspection, backflow prevention inspection, water main repair, and responding to customer concerns and requests. In addition, this activity provides support to both contractors involved in new construction and other City departments during their normal course of business.

Analysis of Water Meter Replacement Program, Analysis of Customer Leaks and Dead Meter Verifications

Current Process / Schedule

Currently, the staff has a two-pronged approach to replacing meters:

1. Customers complain or Billing staff observe an odd meter reading (e.g., month to month usage does not change or usage is unusually large or small) or

2. The meters exceed 15 years of age

While the goal is to replace all residential meters over 15 years of age, staffing limitations have resulted in that goal being approximately 17 years in practice. This summer, approximately 600 meters were changed out (using temporary help).

The service request process is fairly labor intensive. Finance develops such a request when they observe that consumption is higher than average (Distribution and Collection provides a dedicated "entry level" employee to Finance to coordinate this activity). This involvement helps the employee learn the system, the community and hone customer service skills. The employee picks up the service requests first thing each morning and proceeds to the residence/account to runs meter diagnostics. The employee repeats this process in the late morning, coordinating with Finance in the process. It is repeated again around lunch and later in the afternoon. The process appears effective but perhaps not efficient; much of the coordination on the service request with Finance could be done electronically.

The purchase of meters is through a low bid approach that seems to work well. The system is dominated with meters from Neptune, Badger and Sensus. Many of the meter manufactures are proving meters that have electronic capability to transfer data to a centralized database (whether the utility chooses to use that capability or not). Most of the larger meters have the capability to be read by radio or touch.

Discussion of Best Practices

The industry best practice is to move towards the use of smart meter technology and infrastructure that automates the collection of meter reading and performance in formation. This allows remote diagnostic information to be collected and automatically analyzed. Linked to a maintenance management/work order generation system, a service request/work order would be automatically generated and received electronically by staff on a mobile platform (laptop, iPad, mobile phone, etc.).

Discussion of Areas for Improvement

Grants Pass appears to have a reasonable target for meter replacement. Changing to automatic meter reading systems (discussed elsewhere in this document) does not appear to be cost-effective at this time however, should the City wish to become more aggressive with water conservation, smart meters and supporting infrastructure would be invaluable tools to help residents reduce water use.

The meter replacement approach in general appears typical. The largest inefficiency in the process appears to be the paper intensive nature of the work order system, a constraint that could be resolved through adoption of a modern maintenance management system.

Analysis of Notices and Disconnections for Nonpayment (Door Hangers)

Current Process

The current approach for managing delinquent accounts appears reasonable and humane. The delinquency trigger is outstanding bills above $55.01. Bills are generated 15 days after the first of the month meter reading. Twenty days after mailing, if the bill is not paid, a reminder letter is sent with notification that the customer's service will be terminated without prompt payment. Two weeks later, a door hangar is posted with notice of the amount due and a date certain for shut off of service. Bills are never "forgiven" but the City does accommodate payment plans to allow extra time to make payment. The system allows some degree of judgment on the part of the administrator (which is wise). The City does refer some customers to United Community Action Network (UCAN) to help with other bills to free up money to pay water bills. If a customer is shut off three times, there is a $150 deposit subsequently required; after a year of timely payments, the $150 is refunded.

Discussion of Best Practices

Practices vary wildly depending on the political/economic backdrop of the utility. There are no "lifeline" rate systems in place in Grants Pass as occur in some larger cities. For example, the City of Olympia offers a Lifeline Rate on utility services for customers who qualify as low-income and disabled, or low-income senior citizens (age 62 and over). This rate applies to residential customers only. Lifeline Rates are 50% of the standard utility rate for water, solid waste, sewer, and stormwater. Low income is defined as 50% below the median family income for the County. There are also combined household income limits. Because of relatively high unemployment in the Grants Pass area and median household incomes of approximately $33,207 (relatively low), ensuring water affordability for the community will remain and important consideration. This is especially evident when one examines the "affordability benchmarks" discussed earlier in this report.

Discussion of Areas for Improvement

Grants Pass should:

1. Evaluate the feasibility / legality of adopting a lifeline rate system.
2. Alternatively, conduct a cost of service study coupled with carefully constructed water tiers (pricing), which could help those on the bottom of the income ladder.

Analysis of Out of Cycle Meter Reading Requests and Meter Testing

Current Process

Out of Cycle Meter Reading requests are handled through the service request process described above. Additionally, Distribution and Collection Division may have direct customer contact that spurs a service request (e.g., a customer calling about seeing water in the meter box). Out of cycle requests typically occur a couple times a day.

Meter testing is limited to some sampling of failed meters (there is a test bench) although historical testing has not revealed systemic causes. In general failed meters are replaced. New meters are installed out of the box with no initial calibration.

Discussion of Best Practices

Best practice is for the Customer Service Representative to enter the information/complaint into a Customer Information System (CIS) linked to a Maintenance Management System that automatically generates the service request/work orders to affect a solution.

Discussion of Areas for Improvement

The "Customer Information System" is largely paper at this point. Grants Pass should considering implementing a CIS (especially once a Maintenance Management System is in place) to improve efficiency. The current process used appears reasonable, the level of automation of these activities could improve efficiency (and record keeping).

It is suggested that some sampling of new meters be testing/calibrated prior to installation to confirm acceptable limits.

Analysis of Frequency of Water Main Flushing Against Best Practices for Water Utilities

Current Process

The City historically conducted a unidirectional flushing (UDF) program but the program was discontinued about six years ago once the staff person responsible retired. The City does flush dead end blow-offs (hundreds about every six months (although the staff preference is quarterly); New developments are being asked to install looped systems.

UDF programs flush water from a clean source through a pipe and out, working in one direction and one segment at a time. By cutting off other flows, scouring velocities of 5 to 10 feet/second (ft/s) or more are achieved, compared to 1 to 3 ft/s with conventional flushing. UDF scours out sediment, biofilm, corrosion products, and tuberculation. UDF is more effective than conventional flushing and uses on average about 40 percent less water. Equally important, the sediment, corrosion products and biofilm are flushed out and not just moved to another pipe run that's often the case in conventional flushing.

Examining the customer complaint logs (Table 3-2), one can observe that taste, odor and colored water complaints comprise most of the annual consumer complaints received by the utility. Staff indicates that many of these complaints come from the older parts of the system where old and tuberculated water mains exist. The newer neighborhoods with concrete lines mains have generally lower levels of complaints although the overall rate of 1.6 complaints per 1000 accounts per year is about average for water utilities in the AWWA benchmarking database. A UDF program would likely help lower this rate. It would require a position dedicated to the effort. There is a current effort using consultants to conduct a pilot study in "Level 2A" part of system using Graphical Information System information to optimize unidirectional flushing.

Discussion of Best Practices[1]

Not all utilities conduct these programs. In arid areas there is great concern over the loss of water as well as the perception of water waste. Generally speaking programs are put in place to resolve a problem that has or is developing. The key to a successful UDF program is a good GIS and hydraulic model that is complete, accurate and integrated topologically for the UDF software to develop sequences that are functional. Without complete, accurate information, field crews executing the sequences will experience failures that range from inadequate system pressures and low flow conditions to incomplete flushing zones and nonsensical sequences that are actually isolations. In fact, if not done properly, UDF can worsen water quality.

Steps to launching a UDF program include:

1. **Consolidate the asset records.** Pull together the as-builts, GIS data and institutional knowledge. **Evaluate assets in the field.** Crews should assess asset condition, age and operability. Crews identify mapping discrepancies, establish elevations and sub-foot GPS coordinates for each valve and hydrant. The assets are mechanically tested. Operate the

[1] Source: *Unidirectional Flushing: An Asset Management Program with Long-Term Benefits*; Dave Lewis, WaterWorld, http://www.waterworld.com/articles/print/volume-29/issue-6/editorial-features/unidirectional-flushing--an-asset-management-program-with-long-t.html

valves and flow-test the hydrants. The pipes need to be verified with regard to connectivity, type, size, and condition. The water is sampled for key constituents of concern (e.g., turbidity, manganese, color, etc.) at key locations. **Update GIS and hydraulic models** to reflect actual field conditions.

2: Perform Criticality Analysis and Rehabilitate Assets – Based on industry experience, a large percentage of water valves are inoperable (40% or more). While UDF sequences can be designed around inoperable or inaccessible valves and fire hydrants, the majority needs to be usable. They are the control points for water flow in the pipe network. Unusable control points are omitted in flushing plans.

3: Create UDF Plan, Maps – The service area should be split into flushing zones and those zones subdivided into flushing sequences. Detailed maps are developed for each sequence, ensuring that the system is flushed with clean source water and that high flushing velocities are achieved. Before and after monitoring verifies the effectiveness.

4: Execute the UDF Plan – Communication is key to success in the implementation of a UDF plan. Use multiple methods to notify the public, with special emphasis on the areas that will be next in the flushing sequence. A website and a dedicated phone line with a live customer service representative, signs placed at the entrance to the flushing zones a few days prior to flushing are effective and the least expensive method of public notification, Door hangers placed a few days before the scheduled flushing are were effective in minimizing customer concerns and complaints.

5: Document Results and Capitalize on Asset Management Information – The benefit of a system-wide UDF program is immediately apparent in water quality and system service and monitoring data should be used to demonstrate and publicize the benefit.

Discussion of Areas for Improvement

A Uni-Directional Flushing program should be re-implemented to focus on older areas of the City. The water quality complaint logs should be used to help focus the UDF.

Review of Water Distribution System Maintenance Practices

There is a Master Plan in development for both the Distribution and Collection functions. The previous plan is over 10 years old and is in need of updating.

The current Division Superintendent is an experienced and system knowledgeable talent that has deep knowledge of the system and the maintenance history/issues. Much of the scheduling/maintenance efforts are developed and managed by this individual. Grants Pass

could benefit from implementing the revised Master Plans and injecting greater formality in the repair/replacement decisions.

The acquisition of a new site for the location of the new water treatment plant provides an opportunity to consider housing of the Collection and Distribution groups at the new site. Such siting would improve communication and coordination for the water staff (as well as provide better work space for both Collection and Distribution Division functions). The current organizational structure would not need to be changed. However, it is not uncommon for the treatment plant operator to also assume operational responsibility for the pump stations and storage reservoirs as an additional workscope under a DBO contract format. In any case, the prime focus of the DBO is and should be the design, construction, startup, and operation and maintenance of the new water treatment plant.

Leak Detection

Current Practice

Identification of leaks is primarily accomplished through receipt of complaints (e.g., residents or passing motorists). Abnormal flow conditions in closed loop areas also can flag a problem.
Staff also have detected significant leaks; unusual winter reservoir cycles detected by the Water Superintendent led to discovery of a substantial leak at the North Valley Reservoir.

Discussion of Best Practices

Grants Pass has observed water losses of about 8.4% (5 yr average, 2007–2011). The top quartile of water loss in industry surveys is 1.0%, the median 5.9%, and the bottom quartile 9.5%. Improvements are possible but will require investments.

Discussion of Areas for Improvement

Grants Pass should conduct a comprehensive water loss assessment. While the volumes of lost water are not dramatically large, savings on losses could potentially help forestall some system expansion (especially if connected to more aggressive water conservation programs).

It was also observed that there are some higher pressure areas of the system (North Valley Line) that might be candidates for energy recovery technology (e.g., inline microturbines). Elevated pressures are not presenting leak issues at this time as most of the area is new construction but, over time, this could become an issue.

Valve Exercising

Current Practice

Grants Pass has not experienced significant operational issues with frozen valves (there was one example of a recently delayed shut down due to such a valve). Staff estimate that, from operational standpoint, 90–95% of the valves operate properly. There are numerous valve boxes (estimated at 25%) that are full of dirt and require a vacuum truck to be dispatched prior to operating. Staff do have access to a "valve turner" to turn large valves without the physical labor of staff to do it.

Discussion of Best Practices

Many water systems employ valve exercising programs but many do not (do to the staffing cost). It is a Best Practice. An added advantage of the unidirectional flushing program described earlier is the periodic operation of key system valves and hydrants (the later of which there are about 1600).

Discussion of Areas for Improvement

There is a need for a regular valve exercising program.

Pump Station Maintenance

Current Practice

There are 13 pump stations in the system that are operated and maintained by the Water Treatment Division staff. There is currently backup power to provide approximately only 30% of supply in a major outage. While power outages are not expected to be long-lived, some reservoirs have minimal reserve storage (hours).

Discussion of Best Practices

Pump stations are critical and expensive components of water systems and, as a result, often receive significant maintenance attention. Replacement plans for ensuring continuity of operations are important.

Discussion of Areas for Improvement

Grants Pass should conduct an assessment of pump station reliability (including backup power needs) to ensure the desired level of supply reliability.

Replacement or upgrade plans for the 13 pump stations should be developed.

Storage Tank Cleaning / Inspection

Current Practice

The storage tanks are cleaned and inspected by divers approximately every five years. If needed, the reservoirs are drained and cleaned. Typically, accumulation of material is very light (consisting of perhaps 1" of harmless, likely post-precipitation floc from the treatment process). All tanks have been inspected/cleaned in the last five years. Frequency – have all been gone through in the last five years – every five years; recommend annually but wastes money.

- Just got through a round of cleaning
- Newer tanks (wire wrapped); pretty boaring; look at fittings, pylons, etc.
- Reservoir 4 is quite old – will need more looks (less than 1M)
- 8 reservoirs
- Sizes – 60,000 to 5 MG

Discussion of Best Practices

Many utilities will conduct annual inspections of tanks/reservoirs. Given the high quality of the source water and the effectiveness of the treatment process, the inspection/cleaning goal has been extended to 5 years at Grants Pass. This is reasonable from a water quality perspective.

Discussion of Areas for Improvement

Because the structural integrity of tanks is always important Grants Pass should consider having more frequent inspections of the older tanks (more frequent than 5 years).

Systematic Replacement Programs

Current Practice

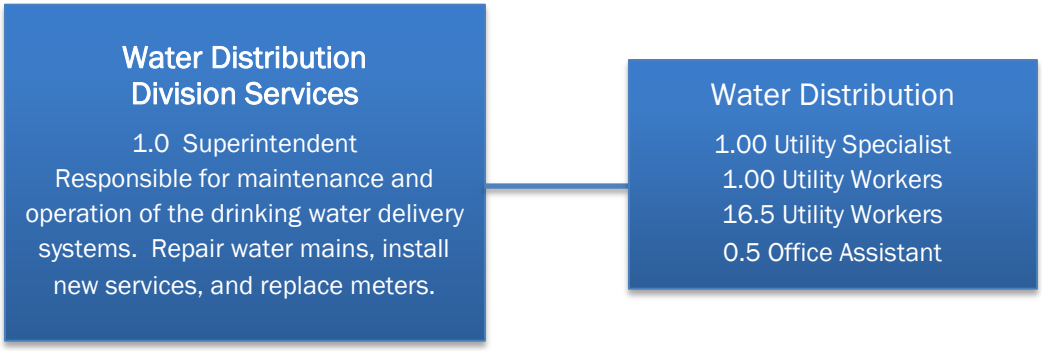
The systematic replacement programs have been described above for pipelines, valves, hydrants and meters.

Analysis of Current Staffing Levels, Responsibilities and Generalized Staffing Recommendations

Table of Organization

The table of organization for the Water Distribution Services Division is shown below.

Figure 5-1 Table of Organization for the Water Distribution Services Division



Water Distribution Staffing

The Division is leanly staffed given the scope and breadth of the system and responsibilities. The staff constraints are evidenced by the discontinuation of the Uni-directional Flushing Program some years ago upon retirement of the staff person responsible at the time. Routine valve exercising and other maintenance is somewhat informally prioritized (as discussed above). In addition, hours dedicated to training in this group are relatively low. The interviews of Division staff indicated that this group has some morale issues related to a perception that they are under-appreciated. The space constraints in the existing office area for the Distribution Services Division are evident and may be a contributing factor to these perceptions. In addition, the systems used by the staff in the Distribution Division are largely paper and should be generally upgraded to allow electronic access to key documents and as-builts (ideally from mobile devices). An electronic document management system should be implemented to house key files.

Discussions with management indicate there is value in revisiting the spare parts inventory to focus on high-frequency repair items.

Recommendations

1. Develop a replacement parts inventory that is based on need/frequency of repairs.
2. Implement weekly meetings of the Distribution section (of the Distribution Division) and the Treatment section (of the Treatment Division) to improve communications among these critically linked areas.
3. Consider relocating the Distribution and Collections staff to the new Water Treatment Plan to improve communications, work environment, and facilities.
4. Implement a unidirectional flushing program and workscope so that staffing and manpower needs to perform the program may be assessed and necessary staffing provided.
5. Work with the Wastewater Treatment Division to establish a systems planner position and capability to develop and implement the document management system.
6. Implement a document management system to house and allow electronic access to key documents. The ability for Distribution Division employees to access documents through mobile devices could improve efficiency.

6.0 TASK IV: WASTEWATER TREATMENT ADDITIONAL TOPICS

Wastewater Treatment Plant Expansion

As detailed in the wastewater plant master plan, the current facilities have inadequate capacity for satisfactory treatment (meet all regulatory requirements) when rainfall events create significant Infiltration & Inflow (I&I) events that significantly add to the volume of wastewater influent reaching the wastewater plant for treatment.

The expansions planned (two phases of $10 million each) will address the situation by providing increased processing capacity and by the replacement of older equipment that is beyond its recommended life for reliable usage. These capital items can and will be constructed so as to not require removal from service of existing facilities and will be done in a modular fashion. Doing so significantly reduces the operational burdens and complications of operating two facilities at once. Because the expansions provide more capacity of the same unit processes and technology, the staff will not need to learn new process technologies.

What will change is the ability to utilize systems technologies (SCADA and CMMS) for more reliable, cost effective operations and maintenance. The system expenditures provide an updated, modern computerized control system for treatment processes and energy usage (SCADA system) and a computerized maintenance management system (CMMS).

With these new systems and the expanded capacity in place, the wastewater plant will be well equipped and capable of meeting all regulations and discharge requirements to the Rogue River.

Staffing (numbers and skills) will be impacted by these capital improvements. Specifically, a preliminary assessment by EGI and the Plant Superintendent identify the need for at least one additional maintenance position and one additional pretreatment position. Skills and capabilities are also needed (training) so that usage of the SCADA and CMMS systems achieve their potential positives.

For the SCADA system these positives include improved, more cost effective and more reliable process management of the treatment processes, electric power and chemical usage reductions, and the ability to have the SCADA system make on-line process control adjustments.

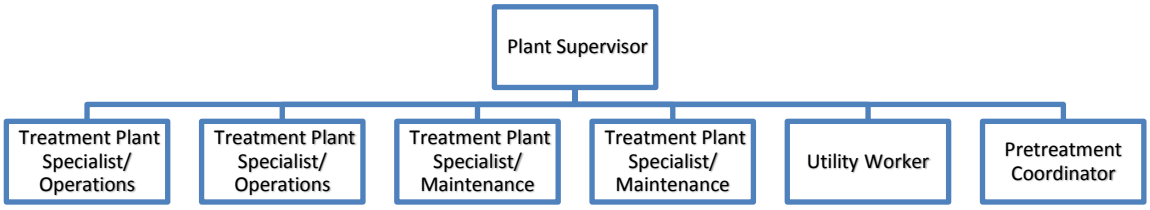
For the CMMS system these positives include integrated, computer system accessible maintenance records with comprehensive maintenance histories by piece of equipment, tracking of parts and labor hour expenditure by piece of equipment, and the ability to systematically identify the repair history for repair vs. replace decisions and long term capital planning.

The CMMS will also provide a listing of all maintenance requirements by piece of equipment. This capability is essential so as to insure that new capital equipment is properly maintained to manufacturer requirements and industry standards. This capability facilitates the most cost effective (clustering) of maintenance activities so as to address numerous items on a piece of equipment during one, planned maintenance session. The documentation of these activities, addressed by the CMMS system, is also essential so as to not void equipment warranties and maintenance specifications.

As future reductions in I&I flows are achieved through the upgrade and replacement of collection system lines, I&I impacts on the treatment plant will be reduced, which will lessen the need for process actions to preserve treatment plant performance and regulatory compliance.

Analysis of Current Staffing Levels and Responsibilities

The wastewater treatment plant has seven full time positions, organized as shown in the chart below. One of the operations positions is currently open.



Observations

The staffing level for the treatment plant was discussed in Section 5.0 of this report. It is recognized as lean when compared to facilities of similar capacity and complexity. It has served the city well, as evidenced by relatively minor transgressions of NPDES permit requirements for the treated effluent and biosolids management. The one notable permit violation for exceedance of the ammonia limit was not related to staffing; rather, a limitation in the nitrification capacity of the existing treatment systems that is addressed in the wastewater treatment plant Facilities Plan Update. The currently planned capital upgrades ($19 million) provide the necessary, additional treatment capacity as discussed earlier in this section of the Report.

Recommended Staffing and Responsibilities

The current organization structure and number of positions is satisfactory for the existing facility but additional staff is needed and recommended as facility expansion and new systems are undertaken

with the capital plan. Given the relatively lean staffing level, the most important consideration is continued coverage of responsibilities in the event of extended absences or other extraordinary conditions.

This condition is best addressed through these management measures:

- Cross-training between all staff to maximize opportunities for shifting responsibilities during. This might include cross-training with water treatment plant staff to the extent feasible within licensing requirements and staffing manpower needs (hours available). The current "lean staffing" numbers makes this action very difficult to accommodate.
- Capture of current procedures that currently exist as "institutional knowledge" for each specific staff member.
- Formalizing standard operating and maintenance procedures (SOPs).
- Continued expansion of monitoring systems and automated controls to minimize the need for human intervention in plant operations.

- Updating and upgrading of computerized maintenance management capabilities (CMMS) and process management (SCADA) with staff training for implementation of the capabilities and benefits.
- Increased emphasis on safety and safety training so as to further reduce exposure to lost time accidents and injury of staff.

To further reduce potential impacts and regulatory exposures, the City's industrial pretreatment program and requirements should be reviewed. Currently, the staffing for this program is one position. An additional position may well be justified and appropriate.

Meeting Permit Requirements

As discussed, wastewater plant equipment upgrades, capacity expansion, and implementation of new SCADA and CMMs systems will insure facility and equipment capabilities to meet wastewater discharge permits and eliminate the current exposure of ammonia discharge violations in the summer months. Should DEQ NPDES requirements for summer month discharges be further limited, some additional nitrogen removal equipment and facilities may be necessary at that time. Optimistically, the currently planned facilities may have the capability to meet such new standards and additional capital will not be necessary. Once the current capital improvements and upgrades are in place, summer operations will be able to test the limits that can be achieved.

Operational Implications of Completing the Wastewater Treatment Plant Expansion

Staffing Implications

As discussed in the earlier section of "Wastewater Treatment Expansion", the new facilities do not contain new processes or different equipment. As such, new operational skills and maintenance skills will not be required.

Additional staffing will be required for the added workload created by the expanded capacity and sets of equipment. Based upon a preliminary review by EGI with the wastewater superintendent, it appears that a minimum of one additional maintenance position and one additional pretreatment person will be necessary.

The new SCADA, MMS, LIMS and Asset Management systems (discussed in the next section) do provide significant capabilities but at the same time require new skills and procedures for the current staff. Training to equip staff with these skills and expertise should receive a high priority. Also, in the near term, a significant workload will be created to populate these systems with the required data for the effective usage and for the creation of SOPs. The data population workload and the SOP workload may well create the need for an additional position for a 12–18 month time period or the usage of a data entry firm under contract to the City.

Systems Implications

Implementation of updated SCADA, CMMS, LIMS, and Asset Management systems have been identified as strong positives and needs for the wastewater treatment division. Without such, both near term and long-term operations, cost effectiveness, and asset life of equipment remain or become "going forward" issues and exposures.

The systems selected for the SCADA, CMMS, LIMS and Asset Management should be coordinated with the Water Plant so as to select the same system (hardware and software) for use at both facilities. Doing so minimizes technical support requirements and creates familiarity in both staffs of the common capabilities and system operations.

Review Wastewater Treatment Facility Maintenance Practices

Similar to the water treatment plant, the EGI team observed a motivated and professional workforce. However, the staff is quite thin with only one, dedicated maintenance position that is augmented by two mechanics who perform maintenance throughout the plant operation. Similar to the water plant, the current wastewater plant maintenance management system relies heavily on the informal expertise of staff with limited written records retention or capabilities. There is a need for a work order generation system that will link to the Asset Management System and define and schedule maintenance, generating work orders based upon that data. Tracking and reporting of deferred maintenance and replacement cost profiles could be generated and would improve maintenance

planning and efficiency. The current system will also benefit from development of "Standard Operating Procedures" (SOPs) so as to retain and document that proper maintenance procedures are used and followed. This is especially important given pending staff retirements in some utility areas and the need to capture their "tribal knowledge" in a documented manner for continued usage by the staff. Without such documentation there is a significant risk of voiding new equipment warranties, as the record system will not satisfactorily exist to satisfy warranty requirements of the equipment manufacturers.

Additional concerns were identified in the assessment of planned vs. reactive maintenance. As reported in Performance Indicator #15 included in Task I, the wastewater plant (based on anecdotal inputs) achieves a 60% planned maintenance percentage with top quartile performance requiring a minimum of 72% and "Best Practices" establishing 80% minimum.

Equipment Inspection / Maintenance

As previously discussed in Task I, neither the water or wastewater treatment divisions maintain detailed records of planned vs. preventative maintenance. Interviews with wastewater staff were conducted so as to develop anecdotal information. The number quoted of 60% planned maintenance results from these discussions. The implementation of a Computerized Maintenance Management System (CMMS) will track such data.

Current practices appear to fall far short of best practices of 80% planned maintenance but within the "above the median" level for wastewater utilities in the AWWA survey.

Given the age of some of the current equipment (now scheduled for capital upgrades) and the current need for full capacity to reliably meet summer discharge requirements, improvement of the planned maintenance for key / critical pieces of equipment should be made a high priority. Additional maintenance staff will be necessary for such an effort.

Systematic replacement programs

Currently, as evidenced by the capital upgrade / expansion program for wastewater treatment and the lack of a formalized Asset Management System, current replacement programs appear to be predicated on anecdotal information and day to day operability / on-line capability of equipment. When failures occur, the assessment then focuses on the immediate needs and the least expensive way in which to accomplish. Under the best of efforts, this approach suffers from the potential to "Band-Aid" equipment and systems so as to either have them remain in service or quickly return to service. The approach sets the stage for the next failure of the equipment.

The situation is further complicated, per the wastewater treatment staff interviews, by approval difficulties and delays in obtaining approval for capital replacement items.

Best practices establish systematic replacement programs based upon the maintenance system (CMMS) inputs to the Asset Management System. In such practices, the repair frequency, cost for the repair, and estimated remaining useful life of the equipment are all formally tracked by each piece of equipment. Schedules for planned replacement are then developed with a minimum of a 5-year time horizon. These schedules are then updated annually and provide input to the annual planning process.

Recommendations

Improvements from the current situation can definitely be achieved. Additional maintenance staff can perform additional planned maintenance during the normal workweek. Improved record keeping by piece of equipment can also be obtained and input into the CMMS system. Additional staff will also provide resource to insure all preventive maintenance requirements and are loaded into the CMMS by piece of equipment. Maintenance SOPs should also be developed in a prioritized fashion starting with the most critical / most complicated maintenance requirements and procedures.

Implicit in the above is the recommendation to immediately proceed forward with the selection and implementation of a Computerized Maintenance Management System (CMMS). Comprehensive training of staff on the capabilities and usage of the system will be required.

The Assessment Checklist Summary reported in Task I for Maintenance Management and Equipment Replacement is repeated below for additional emphasis and elaboration of points summarized above.

7	O&M performance	3	O&M Performance is excellent attributable to professional operations and maintenance staff (in spite of limited MMS/Asset Management tools); maintenance concerns (deferred items, conditions, records). Need for funding and provision of mgmt. tools (CMMS, AMS, SCADA upgrades). Maintenance is not adequately planned or tracked.

8	Systems development and Implementation	2	Existing systems are outdated, old, lack capabilities; need for significant upgrades.

10	Maintenance management system (MMS)	2-	Need for MMS system and usage to replace current approaches that are inadequate.

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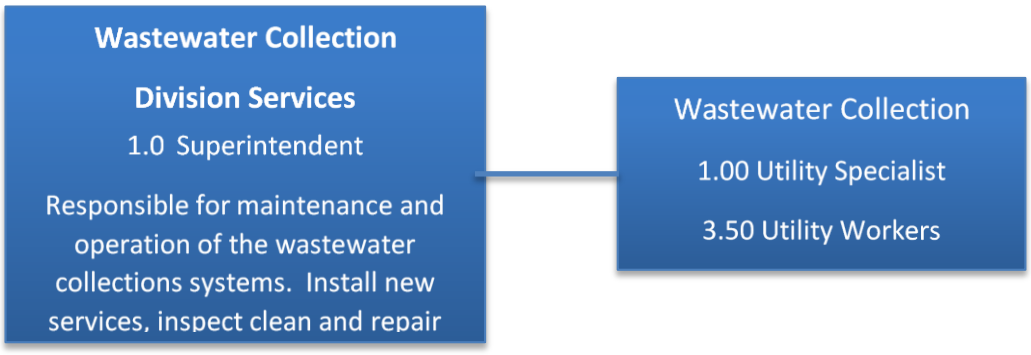
7.0 TASK V: WASTEWATER COLLECTION DIVISION

Discussion of Breadth of Operational Responsibilities

From the FY15 Adopted Operating and Capital Budget Document: *This activity is responsible for ensuring the safe, uninterrupted operation of sanitary sewer lines within the community and meeting state and federal standards. The services delivered are administered through distinct programs: customer service, inspection services, system maintenance, and general operations. The duties encompassed in these programs include sewer main repair and cleaning, manhole repair, clean-out repair, TV inspection of new and existing sewer lines, easement maintenance, and emergency service calls. The collection division provides support to both contractors involved in new construction and water distribution during their normal course of business.*

Figure 7-1 Table of Organization for the Wastewater Collection Division



Collection System Operations: Analyze Current Staffing Levels and Responsibilities and Make Generalized Staffing Recommendations

The current Division Superintendent is an experienced and system knowledgeable talent that has deep knowledge of the system and the maintenance history/issues. Much of the scheduling/maintenance efforts are developed and managed by this individual. Looking ahead, Grants Pass will benefit from implementing the revised Master Plans and injecting greater formality in the repair/replacement decisions.

The Division is leanly staffed given the scope and breadth of the system and responsibilities. With lean staffing and limited hours available, the hours dedicated to training in this group are relatively low. The space constraints in the existing office area for the Collection Services Division are evident. The systems used by the staff in the Collection Division are largely paper and should be generally upgraded to allow electronic access to key documents and as-builts (ideally from mobile devices). An electronic document management system should be implemented to house key files. Implementation of such a system will involve the addition of a systems planner position; this position is a candidate to be shared with the wastewater treatment division.

As the Master Plan currently underway is completed and decisions are made on the scope and timing for implementation of the Master Plan, the need for additional staffing and usage of contract labor to successfully implement the Plan should also be assessed against the workload, skills, and capacity of the existing workforce. Additional workscope will mean additional staffing or contract labor requirements.

Future plans should also consider relocating the Distribution and Collections staff to the new Water Treatment Plan to improve communications, work environment, and facilities.

Analysis of Frequency of Sewer Main Cleaning and CCTV Inspection Practices

Current Practice

The current practice is to flush and TV approximately 40,000 to 50,000 feet of gravity sewer line each six months in areas with known problems and the remaining lines on a four year rotational schedule. This scheduling is “mostly based” on personal judgment and the significant experiences of the Superintendent and Supervisor. Based on the performance history and EGI experiences at other locations, the current practices for the feet of line flushed, TV’ing, and overall schedule of 4 years are reasonable and cost effective.

Since 1986, the City has been compiling sewer condition and maintenance data into a central electronic database. The condition of the system and maintenance data have been linked to the City's geographic information system (GIS); however, the system reports do not include information on the cleaning of pressurized sewer mains that contain are release and vacuum release valves.

Best Practices

Industry best practices are based on a record system that identifies areas where sewer collection system problems have occurred or are most likely to occur. Maintenance activities and frequency of actions are then aligned with these documented assessments so as to focus maintenance activities on the highest probability problem areas.

Recommended Improvements

It is important to note that, according to maintenance staff, there have been no Sanitary Sewer Overflows reported in several years. The implementation of new programs should therefore focus on improvements in efficiency.

For example, the Division should develop and implement a comprehensive sewer system inspection, maintenance, and replacement database program. The program should consolidate as-builts, GIS data, maintenance history, blockages and unscheduled repairs, and personal institutional knowledge. The program should evaluate assets in the field by having crews assessing condition, age and past problems. Update GIS and hydraulic models to reflect actual field conditions. With this information, a maintenance schedule that focuses efforts on areas of highest concern and minimizes efforts where history shows longer times between maintenance are appropriate.

The database sewer collection system maintenance program will identify areas where specific problems occur and lead to development of preventive practices such as root foaming, and air relief valve maintenance.

Systematic Replacement Program

Current Practice

There are Master Plans in development for both the Distribution and Collection functions. The previous plans are more than 10 years old and in need of updating.

Best Practices

Best practices establish systematic replacement programs based upon the maintenance management system (CMMS) inputs to the Asset Management System. In such practices, the repair frequency, cost for the repair, and estimated remaining useful life of the equipment are all formally tracked by each piece of equipment. Schedules for planned replacement are then developed with a minimum of a 5-year time horizon. These schedules are then updated annually and provide input to the annual planning process. Life-cycle cost reductions on the range of 20% have been documented where comprehensive asset management systems have been implemented. Implementation of such practices in conjunction with the Master Plan should be undertaken.

8.0 TASK VI: UTILITY BILLING

Analysis of Alternatives to Manual Meter Reading and In House Utility Billing

Description of Current System

The current legacy Sungard/HTE mainframe-based system is being replaced. Preliminary activities are underway for the rollout and implementation of the new Utility billing system (Tyler/Munis) scheduled to commence January 2016 with a go live target date of 9 months later (September 2016).

Meter reading is currently done by a Portland-based contractor. Most of the meters are manual/mechanical in nature although some digital meters have been installed in commercial operations. There is an electronic download of billing data by customer and location from the meter-reading contractor. The rate paid to the meter-reading contractor is $81,000 annually for reading 10,867 water meters and 13,105 wastewater meters (wastewater volume is billed based on water consumption (winter average consumption for residential properties and actual monthly consumption for commercial, industrial, and public accounts). This amounts to $0.62 per meter (per Kimberley Gasperson).

Alternatives

Automatic meter reading, or AMR, is the technology of automatically collecting consumption, diagnostic, and status data from water meters and transferring that data to a central database for billing, troubleshooting, and analyzing. This technology mainly saves utility providers the expense of periodic trips to each physical location to read a meter. Another advantage is that billing can be based on near real-time consumption rather than on estimates based on past or predicted consumption. This timely information coupled with analysis can help both utility providers and customers better control the use and production of water. AMR technologies include handheld, mobile and network technologies based on telephony platforms (wired and wireless), radio frequency (RF), or power line transmission.

Advanced metering infrastructure (AMI) is an architecture for automated, two-way communication between a smart utility meter with an IP address and a utility company. The goal of an AMI is to provide utility companies with real-time data about water consumption and allow customers to make informed choices about usage based on the price at the time of use.

The vendors active in this market use several basic methods of collecting meter information. These include:

Radio Frequency Network

Radio frequency based AMR can take many forms. The more common ones are handheld, mobile, satellite and fixed network solutions. There are both two-way RF systems and one-way RF systems in use that use both licensed and unlicensed RF bands.

In a two-way or "wake up" system, a radio signal is normally sent to an AMR meter's unique serial number, instructing its transceiver to power-up and transmit its data. The meter transceiver and the reading transceiver both send and receive radio signals. In a one-way "bubble-up" or continuous broadcast type system, the meter transmits continuously and data is sent every few seconds. Data travels only from the meter transmitter to the reading receiver. There are also hybrid systems that combine one-way and two-way techniques, using one-way communication for reading and two-way communication for programming functions.

RF-based meter reading usually eliminates the need for the meter reader to enter the property or home, or to locate and open an underground meter pit. The utility saves money by increased speed of reading, has less liability from entering private property, and has fewer missed readings from being unable to access the meter.

Handheld

In handheld AMR, a meter reader carries a handheld computer with a built-in or attached receiver/transceiver (radio frequency or touch) to collect meter readings from an AMR capable meter. This is sometimes referred to as "walk-by" meter reading. Handheld computers may also be used to manually enter readings without the use of AMR technology as an alternate but this will not support exhaustive data, which can be accurately read using the meter reading electronically.

Mobile

Mobile or "drive-by" meter reading is where a reading device is installed in a vehicle. The meter reader drives the vehicle while the reading device automatically collects the meter readings. Often, for mobile meter reading, the reading equipment includes navigational and mapping features provided by GPS and mapping software. With mobile meter reading, the reader does not normally have to read the meters in any particular route order, but just drives the service area until all meters are read. Components often consist of a laptop or proprietary computer, software, RF receiver/transceiver, and external vehicle antennas.

Satellite

Satellite transmitters can be installed in the field next to existing meters. The satellite AMR devices communicate with the meter for readings, and then sends those readings over a fixed or mobile satellite network. This networks requires a clear view to the sky for the satellite transmitter/receiver, but eliminates the need to install fixed towers or send out field technicians, thereby being particularly suited for areas with low geographic meter density.

Cell Phone

There are also meters using AMR with RF technologies such as cellular phone data systems, ZigBee, Bluetooth, Wavenis and others.

Wi-Fi

WiSmart is a versatile platform that can be used by a variety of electrical home appliances in order to provide wireless TCP/IP communication using the 802.11 b/g protocol. The city of Corpus Christi became one of the first cities in the United States to implement city wide Wi-Fi, which had been free until May 31, 2007, mainly to facilitate AMR after a meter reader was attacked by a dog. Some meters are designed to transmit using Wi-Fi, even if a Wi-Fi network is not available, and they are read using a drive-by local Wi-Fi hand held receiver. Most of the automated utility meters installed in the Corpus Christi area are battery powered. Wi-Fi technology is unsuitable for long-term battery-powered operation.

Power Line Communication (PLC)

PLC is a method where electronic data is transmitted over power lines back to the substation, then relayed to a central computer in the utility's main office. This would be considered a type of fixed network system—the network being the distribution network which the utility has built and maintains to deliver electric power. Such systems are primarily used for electric meter reading. Some providers have interfaced gas and water meters to feed into a PLC type system.

Pros and Cons of Alternatives

Benefits of advanced metering – Advanced metering systems can provide benefits for utilities, retail providers and customers.

The benefits of smart metering for the utility can include:

- Improved meter reading accuracy
- Improved billing
- Potential cost savings
- Improved in-household leak detection
- Accurate profile classes and measurement classes, true costs applied
- Improved security and tamper detection for equipment
- Less financial burden correcting mistakes
- Transparency of “cost to read” metering
- In cases of shortages, utility will be able to manage/allocate supply
- Enables customer tracking of usage

The disadvantages of advanced metering include:

- Utility can control amount allocated to user (this is a pro and a perceived con)
- Utility can remotely shut off user
- Loss of privacy – details of use reveal information about user activities
- Greater potential for monitoring by other/unauthorized third parties

- Reduced reliability (more complicated meters, more potential for interference by third parties)
- Increased security risks from network or remote access

Potential Cost Savings from Use of Remote Water Meters

Given the relatively low cost of current meter reading services ($0.62/meter per Kimberley Gasperson), it is not clear that an AMR type meter service would be cost-competitive. Interviews with representative of Badger Meter at the American Water Works Association Annual Conference and Exposition in June 2015 at Anaheim, CA, indicated that an "all-in" meter reading solution (including meters, cell communication modules (Badger is the sole proprietor of this technology currently apparently), database and web-enabled customer access (but not billing)) would cost approximately $2.00 per month per account. Given the low meter cost of the current meter reading service, the investment does not appear to be cost-effective at this time. However, if there were a City interest in an aggressive water conservation program in the community tied to installation of smart meters, AND such meters could significantly reduce water consumption and peaking, downsizing of the treatment water treatment plant could be accomplished saving significant capital. A detailed analysis of this potential would be required prior to implementing this strategy. Clearly, smart meters would help detect in-house leaks, it is not clear to what degree correction of such leaks would drop water demands (and water peaks) and forestall some degree of plant expansion (i.e., save capital).

Evaluation of Customer Payment Alternatives

Description of Current System

The current mainframe-based system allows customers to access an online bill paying function but they cannot see the bill details. The bills are utilitarian (see example in Figure 8-1 below) and provide substantial opportunity to improve water and wastewater messaging. The City should take the opportunity with the new billing system to use the medium to convey important needs of the utility or achievements. Associating the bill/invoice with the value proposition (what is the customer getting for the payment) is critical to building support for the utility's programs and investments). Consider simplifying the first page of the bill associating the bottom line dollar amount with graphics or visuals associated with Utility activities, capital improvements, water or wastewater factoids, images of water related quality of life in the community, etc. Use the back of the page to contain details on billing and any legally required language.

Figure 8-1 Example Invoice for Current Billing System

Page 1

SERVICE ADDRESS [redacted]

ACCOUNT NUMBER	CYCLE	BILL DATE	CURRENT CHARGES DUE BY
[redacted]	05-52	6/25/15	7/15/15

Total Current Charges 117.00
PREVIOUS BALANCE .00
Total Amount Due 117.00

[redacted]

City of Grants Pass
101 Northwest "A" Street
Grants Pass, Oregon 97526
(541) 450-6035

00004392900003320600000117002

▼ TEAR HERE ▼

2803 LKADJ

SERVICE ADDRESS [redacted]

ACCOUNT NUMBER	CYCLE	BILL DATE	CURRENT CHARGES DUE BY
43929-33206	05-52	6/25/15	7/15/15

Rate Class : RESIDENTIAL
Last payment amount/date: 117.00 6/17/15

Last bill amount	117.00
Payments	117.00-
Adjustments	.00
Balance Forward	.00

	Service Period	Days	Meter Number	Current	Previous	Usage
W	5/15/15 6/18/15	34	9569	1914	1869	45
				USAGE FOR 6/14		22

Service		Consumption	Charge	Total
W	Water Base Charge		17.10	
W	Usage @ .90 per unt	10.00	9.00	
W	Usage @ 1.15 per unt	15.00	17.25	
W	Usage @ 1.36 per unt	20.00	27.20	
W	Elevation Charge0.0994	45.00	4.47	
	TOTAL WATER			75.02
CC	Backflow Charge	5/15/15 6/18/15	2.00	2.00
S	Sewer Base Charge		13.63	
S	Sewer Volume Charge	7.00	13.90	
	TOTAL SEWER			27.53
T	Street Utility Charg	5/15/15 6/18/15	3.48	3.48
J	Jail Svcs Utility	5/15/15 6/18/15	3.74	3.74
	5% Franchise Fee		5.23	5.23

Total Current Charges 117.00
PREVIOUS BALANCE .00
Total Amount Due 117.00

City of Grants Pass 101 Northwest "A" Street • Grants Pass, Oregon 97526 • (541) 450-6035

Best Practices

The current approach for managing delinquent accounts appears reasonable and humane. The delinquency trigger is outstanding bills above $55.01. Bills are generated 15 days after the first of the month meter reading. Twenty days after mailing, if the bill is not paid, a reminder letter is sent with notification that the customer's service will be terminated without prompt payment. Two weeks later, a door hangar is posted with notice of the amount due and a date certain for shut off of service. Bills are never "forgiven" but the City does accommodate payment plans to allow extra time to make payment. The system allows some degree of judgment on the part of the administrator (which is wise). There are no "lifeline" rate systems in place as some larger cities. For example, the City of Olympia offers a Lifeline Rate on utilities services for customers who qualify as low-income and disabled, or low-income senior citizens (age 62 and over). This rate applies to residential customers only. Lifeline Rates are 50% of the standard utility rate for Water, Solid Waste, Sewer, and

Stormwater. Low income is defined as 50% below the median family income for the County. There are also combined household income limits. Because of relatively high unemployment in the Grants Pass area and median household incomes of approximately $33,207 (relatively low) ensuring water affordability for the community will remain an important consideration. Alternatively, a cost of service study coupled with carefully constructed water tiers (pricing) could help those on the bottom of the income ladder. The City does refer some customers to United Community Action Network (UCAN) to help with other bills to free up money to pay water bills. If a customer is shut off three times, there is a $150 deposit subsequently required; after a year of timely payments, the $150 is refunded.

Opportunities

1. Continue to track AMR/AMS opportunities
2. Once the new billing system is implemented, redesign bills to simplify and incorporate key water messaging to improve community's recognition of the value proposition of reliable water and wastewater services

9.0 APPENDICES

Appendix 1 – Professional Profiles

Eisenhardt Group provides management and financial consulting. The firm specializes in the assessment, development, and implementation of innovative approaches for procuring and receiving municipal services for water, wastewater, electric power, and solid waste. The firm has extensive experience in addressing the short-term and long-term needs of clients for provision of these critical services including the assessment of the cost of service, rate impacts and financing / procurement alternatives.

The hallmark of Eisenhardt Group consulting services is the recognition that the provision of municipal services has entered an era of rapid and dramatic change. Cities and counties are requesting and implementing new and expanded programs and services that reach out for expertise and risk sharing approaches that extend beyond tradition capabilities. Eisenhardt Group has recognized the need for developing new approaches and at the same time providing careful review and timely adjustment of the process. In doing so, Eisenhardt Group works with public agencies in five key areas:

1) Strategic consulting – identifying opportunities and challenges, and developing strategic visions for the identified area.
2) Specific opportunity assessment – building upon the strategic visions of the public agency, alternatives for implementing and accomplishing the vision are developed and evaluated using policy guidelines.
3) Assistance with the development of specific project procurements and governance structures
4) Management of RFQ/RFP processes – including contract and franchise negotiations.
5) Competitive assessments, cost of service assessments, benchmarking, rate studies, and financing alternatives.

Eisenhardt Group provides high-level policy and strategic analysis and alternatives identification for opportunity areas. When opportunity areas have been identified, Eisenhardt Group works with the leadership of the organization to develop preferred options and to identify the agency's next steps. The firm has accomplished:

- Over $1.5 billion of partnership programs
- First asset sale under E.O. 12803

- DBO contracts over $500 million
- Effective usage of incentive programs
- The most cost-effective procurements

Paul Eisenhardt, Principal

Mr. Eisenhardt's work focuses on strategic consulting to utilities, developing partnerships (public agency and private firm), and competitive assessments and technical improvement programs for provision of environmental services. He is a recognized leader in the development of competitive assessments and improvement programs for the management of municipal utilities. Recent strategy work includes utility consolidations, utility growth strategies, assessment of municipal concessions, utility restructuring, and water policy issues. Since 1996, he has managed outsourcing procurements (Contract Operations, DB and DBO) for municipal clients with a total contract value exceeding $1.5 billion and developed utility improvement programs with six utilities servicing over 2 million customers. His work experience encompasses the managerial, technical, and financial disciplines necessary to assess and implement effective utility systems and operations.

Detailed Experience

Strategic Assessment/Projects

Transfer of BuRec Project: Working for four urban water agencies, the project addressed the governance, technical and financial issues and feasibility of transferring the California Central Valley Project from federal to local control and ownership.

Water Utility Consolidation: Working for three water utilities, the project formulated the alternative approaches and resolved technical, operational and financial issues for the consolidation of the utilities into a regional water supply authority.

Concession Operator: Working for a public utility and a private utility, the projects assessed the strategic and operational fits of pursuing contract concession opportunities.

Water Utility Restructuring: Working for the World Bank and USAID, the project formulated the strategic alternatives for governance, structure, management and operational performance of irrigated water system (dams, pump stations, and application systems) for Romania.

Governance & Strategy Study: Working for the staff & board of DCWASA, the project is assisting the study of the strategic alternatives for the future organizational structure, governance, service delivery to include outsourcing & wholesale service provision, and the implications for the cost effectiveness of the water & wastewater utility.

Business Plan / Marketplace Assessment: The project developed a plan for revenue growth and economic viability for a landfill in the competitive marketplace.
SKF Wastewater District: Working for the staff and board, the project assessed the governance structure, organizational effectiveness, and technical issues (cost effectiveness, expansion

capabilities, ability to serve new customers) for this multi-member agency. Recommendations were provided for implementation by staff and the board.

Marin County Wastewater Assessment: Working for LAFCO, the project assessed the wastewater service provision of 11 agencies, opportunities for cost effectiveness and service improvements and implications of new collection system regulations. Cost effectiveness and service improvement recommendations were provided along with alternative governance structures and potential usage of JPA's by the 11 agencies.

Public-Private Partnership Services

Developed the evaluation techniques that typify the approaches used today by private sector service providers. These techniques were utilized to conduct over 75 plant evaluations and cost of service assessments of facilities ranging from 5 mgd to over 100 mgd. These evaluations addressed technical & regulatory requirements, operational performance, costs and budgets, risks, employees skills and training needs, systems needs (operational and management), and improvement opportunities. Situations included new plant startups, noncompliance improvement programs, assumption of existing municipal employees, development of performance incentives and performance monitoring criteria, and union negotiations.

Examples of Procurement Consulting

Novato Sanitary District: The project assessed the alternative structures for startup and operation of the District's new wastewater treatment facility. Alternatives assessed included District staffing, consultant augmentation of the District, and usage of contract operations. Subsequently, the project developed and implemented the contract operations alternative for a public-private partnership.

West Basin Municipal Water District: The project identified and qualified contract operation firms for the provision of contract O&M services for the West Basin water reclamation facilities. Project workscope included development of RFQ and RFP documents, development of evaluation / selection criteria, and evaluation of proposals received.

Jurupa Community Services District (JCSD): The project developed the contract operations proposal for JCSD provision of services for operation & maintenance of the Chino Basin Desalter facilities. Workscope included development of staffing plans and overall proposal submittals for scope of services, governance interfaces, and liability provisions.

Atwater, CA: Procurement management for the Design/Build and Contract Operations for alternative delivery and operation of a new 6 MGD tertiary wastewater treatment plant. Responsibilities include coordination and integration of EIR, permitting, design engineering, construction management, and startup on behalf of the City.

Renewable Energy (Hydro), Woonsocket, RI: As the City's procurement manager the project is reactivating the hydroelectric generation facility consistent with "run of the river" regulatory requirements and FERC license requirements. Project workscope include development of private sector proposal solicitations using a DBOO format, proposal evaluations, contract negotiations, and assistance during construction and startup.

Gresham, OR: Working for this community, the project assessed the wastewater utilities, current performance, identified improvement areas, and then identified and assessed alternative structures for the future management and operation of the utility and its 25 mgd regional treatment plant. The selected approach, a contract operations public-private partnership, provides significant new capabilities including a comprehensive asset management system and software and gained

significant performance guarantees, risk assumption, and performance incentives from the partnership.

Franklin, OH: Working for this community, the projects developed the successful wastewater asset sale to the private sector and the design, build, own, and operate development of a new water treatment plant. The workscope included the development of technical requirements and the evaluation of alternative technical approaches.

New Bedford, MA: Working for the community, the project developed the partnership arrangements (technical, managerial and financial) for wastewater services and then managed the RFQ/RFP process and proposal evaluations for a 20-year contract operations service agreement between the City and the private sector. The development of the technical specifications and performance requirements were part of the RFQ/RFO development, proposal assessments, and contract negotiations.

Woonsocket, RI: The project strategized alternatives for partnering with the private sector for wastewater services to achieve regulatory compliance and development of new facilities. After determining technical & regulatory requirements, the project managed the RFQ/RFP process, service agreement development, and contract negotiations for a DBO procurement. The City's existing privatization contract for sludge dewatering and incineration was also reviewed and improvement areas identified for implementation by the City.

Pawtucket, RI: The project assessed the strategic alternatives for upgrading the existing utility infrastructure and watershed management. New water treatment facilities are being provided using the Design, Build, Operate (DBO) partnership format with the private sector. Water quality standards and technologies required to address current, 2004 and 2010 treatment standards.

Green Bay, WI: The workscope involved the assessment (technical, operational, regulatory, and financial) of a private sector partnership with Wisconsin Electric for the treatment and disposal of biosolids.

Birmingham, AL: The workscope provided the overall strategic guidance and technical quality control for the development of the RFQ/RFP process for privatization of the water utility system.

Avalon, CA: The project determined the technical requirements and needs for a new wastewater treatment facility and utility system and then developed the process for partnering with the private sector for provision of the needed facilities and utility operations.

Washington Suburban (WSSC): The project assessed the strategic alternatives for provision of utility services (water & wastewater). Included were alternative procurement structures (contract operations, DB, DBO) and an initial assessment of the technical and managerial issues associated with the alternatives.

Richmond, CA: The project has assessed the current and future technical and operational needs for this wastewater utility. Based on these assessments, the project developed and evaluated alternative structures for satisfying the identified requirements. Approaches included partnering with the private sector, partnering with a near-by public utility, or continuing to provide services as an independent utility. A DBO partnership was selected and the project managed the procurement and implementation with the private sector.

Improvement Programs

Electric Power Procurement: Competitive procurement of electric power for municipal entities utilizing the open market capabilities of de-regulation and competitive private sector proposals solicited through formal RFP's. Procurements have resulted in long-term supply contracts with savings of 10–20%.

Austin, TX: The project benchmarked the water and wastewater utility and identified technical and management improvement areas and benefits.

San Diego, CA: Working with water utility, the project assessed improvement opportunities for the water distribution function—management, systems, employees and technology areas were included.

Cincinnati (OH) Water Works: Working with utility staff, the project profiled the implications (strategic and operational) of electric power deregulation for the utility. An action plan for future directions was developed to address technical, water quality, operational & financial areas.

Green Bay Metro Wastewater District: The project assessed the cost effectiveness of District operations, identified improvement areas, and worked with Executive Management to develop and implement a plan for reducing District staff by 25% while improving the effectiveness of District operations.

WERF Project/AWWA Book & Project

Toolkit of Effective Practices: Under a research grant from the Water Environment Research Foundation (WERF), the project catalogued efficient and effective practices at over 75 utilities for plant operations and maintenance. Focus areas are: organizational, operations and maintenance, process and technology, and energy management. An interactive website-based capability was developed to access the research findings. 1997–1999.

The Changing Water Utility: Published by AWWA, the book provides a comprehensive discussion of creative approaches for achieving utility efficiency and effectiveness. Mr. Eisenhardt authored five chapters of the book. 1999.

Best Practices for Capital Programs: This AWWARF funded research project is evaluated and catalogued best practices for the development and management of capital programs and implementation. 2005–2006.

Publications/Presentations

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Eisenhardt, Paul. "Risk Assessment and Contracting for Partnerships with the Private Sector", Water and Wastewater Summit Conference, Washington, DC, January 1999.

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Eisenhardt, P., Westerhoff, G., Chapters 6, 15, 16, 17 and 19 of "The Changing Water Utility", American Water Works Assn, January 1998.

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Eisenhardt, P., "3P's as an Economic Re-development Vehicle", US Conference of Mayors, Tulsa, OK, February 1997.

Eisenhardt, P., "Contract O & M Marketplace Approaches--1000 Contract Programs", Public Works Financing, January 1997.

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Eisenhardt, P., “Financial Considerations, Financing & Asset Sales of Public-Private Partnerships”, International Business Communications Conference, San Diego, July 1996, and Chicago, August 1996.

Eisenhardt, P., “Making Managed Competitions Fair”, Public Works Financing, June 1996.

Preconference Workshop “Nuts & Bolts of Drafting Effective Privatization Contracts”.

Eisenhardt, P., “Structuring an RFP for Private Involvement“, Center for Business Intelligence Conference, Washington, D.C. January 1996.

Eisenhardt, P., “Achieving Compromise“, Global Business Research Privatization Conference, New York City, NY December 1994.

Personal Data

Education

- BS Mechanical Engineering, Brown University
- MBA, Harvard University

Societies

- National Council Public-Private Partnerships
- American Water Works Association
- Water Environment Federation
- Association of California Water Agencies
- California Water Environment Association
- Design Build Institute America (DBIA)
- Harvard Business School Association (Seattle)
- Washington State Association of Water Agencies

Ed Means, Principal

Mr. Means brings over 30 years of experience with water utilities and utility management including over 18 years of experiences with the Metropolitan Water District of Southern California, including positions of Director of Water Quality, Director of Resources, Chief of Operations, Deputy General Manager/Chief Operating Officer and Acting General Manager. For the most recent 15 years he has consulted to water utilities. He has a deep understanding of western water resource and water quality issues. His particular areas of expertise include: water utility management, water operations, water resources planning, strategic planning, water rate development, drinking water regulatory development and compliance implementation, as well as water quality studies and investigations in source waters, treatment plants and distribution systems Between 1992 and 1997, he represented the National Water Resources Association (NWRA), and then the American Water Works Association (AWWA), on the Federal Advisory Committee negotiating the Disinfectants/Disinfection By-Products Rule. He has received several awards for his contributions to the drinking water industry, including the AWWA George Warren Fuller Award, the Association of Metropolitan Water Agencies (AMWA) President's Award, and the NWRA President's Award.

Detailed Experience

Strategic Assessment/Projects

Provided strategic planning services to:

- Central Arizona Project
- Marin Municipal Water District
- Rancho California Water District
- Municipal Water District of Orange County
- West Basin Municipal Water District
- City of Chandler Arizona
- City of San Diego
- City of Madison WS
- Columbus OH wastewater authority
- Water Environment Research Association
- American Water Works Association
- East Bay Municipal Utility District
- City of Seattle Public Utilities
- City of Calgary
- Palm Beach County Water Utilities Department
- Central Elmore Water & Sewer Authority

Desalination Project Experiences

Mr. Means has participated on desalination project teams on the following plants:

- Rosarito Beach, MX – San Diego County Water Authority and three other municipal partners
- Coquina Coast, FL – Coquina Coast Partners

- Dana Point, CA – Municipal Water District of Southern California
- Carlsbad, CA – Poseidon Resources
- Huntington Beach, CA – Poseidon Resources
- El Segundo, CA – West Basin Municipal Water District
- Camp Pendleton, CA – San Diego County Water Authority
- Metropolitan Water District of Southern California – International survey of desalination integration lessons learned

Additional Experiences

Regional Water Treatment Solutions for the Tri-Districts and City of Fort Collins. Facilitated multiple workshops to discuss of regional collaboration opportunities for three water districts in Colorado (2013).

City of San Diego Public Utilities Department. Trusted advisor to the Director of the utilities department on indirect potable reuse implementation (2013–14).

California Urban Water Agencies (CUWA). Principal in Charge for contract management of California Urban Water Agencies (2001–2005).

South Metro Water Authority regional collaboration facilitation. Facilitated multiple workshops engaging 9 utilities in Colorado to establish a regional water authority (2005).

Evaluation of water banking investment opportunity for Goldman Sachs (~2005).

Santa Clara Valley Water District Water Treatment Expert Panel Member.

Los Angeles Integrated Regional Water Management Plan / Los Angeles County CA. Mr. Means led two of 5 consultant teams examining opportunities to meld stormwater management, water supply development, habitat restoration, and recreational value creation in a bold vision for future LA County water management.

Water Research Foundation: Update of a Strategic Assessment of the Future of Water Utilities / Denver CO. Principal Investigator for AwwaRF 2604, "A Strategic Assessment of the Future of Water Utilities". Published book entitled "Watercourse: Charting Your Utility's Future".

Project Team member "Managerial Assessment of Water Quality and System Reliability". Water Research Foundation / American Water Works Association, 1997.

San Diego County Water Authority Drought Management Plan / San Diego CA.

Water Research Foundation, Principal Investigator: "Evaluating Effects of Climate Change on Water Utility Planning Criteria and Design Standards".

Water Research Foundation: Water Quality Implications of Large-Scale Application of Seawater Desalination / Denver CO. Project Manager for AwwaRF Tailored Collaboration Project Water Quality Implications of Large-Scale Application of Seawater Desalination¨.

Water Research Foundation: Water Quality Management: How to Structure it in a Utility / Denver CA. Principal Investigator for AwwaRF 2816, "Water Quality Management: How to Structure it in a Utility¨.

Water Research Foundation / California Energy Commission: Energy Research Needs Roadmap / Sacramento CA. Project Manager / Facilitator for AwwaRF / California Energy Commission workshop to develop an Energy Research Needs Roadmap to support an anticipated joint research funding program.

Metropolitan Water District of Southern California. Project Team member for scenario planning regarding future State Project water quality and implications for water treatment.

CH2M-Hill: Characterizing Salinity Contributions in Sewer Collection and Reclaimed Water Distribution Systems to Develop Salinity Management Strategies / Denver CA. Project Team member on Water Research Foundation Characterizing Salinity Contributions in Sewer Collection and Reclaimed Water Distribution Systems to Develop Salinity Management Strategies.

California Avocado Commission: Water Resources Consultant / CA. Represent the California Avocado Commission and Southern California growers in strategic agricultural water supply and water rate issues in Southern California.

Carollo Engineers: Delta Water Quality Study / Costa Mesa CA. Project Manager under subcontract to Carollo Engineers for the Delta Water Quality and Treatment study under a Water Research Foundation Tailored Collaboration with Contra Costa Water District.

City of San Diego: San Diego Water Reuse Study / San Diego CA. Project Manager for Science and Technology Assessment/American Assembly tasks associated with re-visit of the City of San Diego's North City Water Reclamation Plant indirect reuse project (2005)

Contra Costa Water District: Contra Costa Water District Regulatory Compliance Audit / Contra Costa CA. Conducted water quality regulation compliance audit for Contra Costa Water District in California.

Water Research Foundation: "Impacts of Climate Change on Infrastructure Planning and Design". Principal Investigator for this project on adaptation planning. The project won "best paper" for the AWWA water resources division in 2011.

Pawtucket, RI Utility Contract Services Contract Evaluation. Participated on a team with The Eisenhardt Group to evaluate bids for private utility contract operations.

Publications/Presentations

Selected Publications and Presentations Related to Strategic Planning and Water Resources

J. Lie and E. G. Means, Recycled Water - An Important Component of Metropolitan's Current and Future Water Supply. Presented at the Water Reuse Association of California Annual Symposium, San Diego, California, October 13–15, 1993.

J. Lie and E. G. Means, "Alternative Funding Programs for Water Reuse Projects – The Key to Southern California's Success." The Water Reuse Symposium, American Water Works Association, Dallas, Texas, February 27, March 2, 1994.

E. G. Means III, T. Brueck; A. Manning; L. Dixon; J. Miles; and R. Patrick. "The Coming Crisis: Water Institutions and Infrastructure". Manager to Manager Series, JAWWA 94:1 pp. 34–38, Feb. 2002.

R. Patrick, L. Dixon; T. Brueck, E. Means. "Alternative Service Delivery Models", Manager to Manager Series, JAWWA 94:4, pp. 44–48. April, 2002.

T. Hartley, M. Austin, J. Birkhoff, C. Chess, J. Conklin, M. F. McDaniel, E. Means, M. McGuire and C. J. Wiant. "Framework for Public Perception and Participation in Non-Potable and Potable Water Reuse Initiatives: Guidance on Establishing and Maintaining Public Confidence", WateReuse, WERF and AwwaRF, July 2002.

US Technical Review Team. 2002. A technical review of the Spanish National Hydrological Plan (Ebro River out of basin diversion). For the Environmental Minister of Spain. 100p.

S. Davis, M. Pearthree and E.G. Means III. "Tucson's Successful Re-Introduction of a Renewable Supply", Proceedings of the AWWA ACE in New Orleans, LA, June 16–20, 2002.

E. Means and J. Strayer. Applying the American Assembly Process to Water Reuse. California WateReuse 2005 Conference, February 27–March 1, 2005, San Diego, California.

E. Means, R. Patrick, L. Ospina, and N. West. "Scenario Planning: A Tool to Manage Future Water Utility Uncertainty". JAWWA, In Press, 2005.

J. Loveland, S. Diamond, B. Alspach and E. Means. "Pursuing Sustainable Local Supplies in Southern California: Issues in Treatment of Marginal Supplies", AWWA Sources Conference, Albuquerque, NM, February 2006.

N. Jazmadarian, J. Leserman, E. Means, M. Garrod, and D. Bostad, "Cost of "Free" Water", AWWA Sources Conference, Albuquerque, NM, February 2006.

N. Jazmadarian, E. Means, D. Dickerson, T. Bombardier, D. Friehauf, K Weinberg and J. Stephensen, San Diego County Water Authority's Facilitative Process to Develop a Drought Management Plan", AWWA Sources Conference, Albuquerque, NM, February 2006.

Steirer, M. A., Means, E. G. III, and L. S. Robin. "Supporting Public Outreach with a Stakeholder Group" National WateReuse Conference, Hollywood, CA, September 11–14, 2006.

Friehauf, D., Bombardier, T., Stephenson, J., Means, E., Jazmadarian, N. and J. Malinowski "San Diego County Water Authority Drought Management Plan", Geographical Society of America, "Managing Drought and Water Scarcity in Vulnerable Environments" conference, Longmont, CO, September 18–20, 2006.

Steirer, M. A. Means, E. G. III, and L. S. Robin. Stakeholders, Speakers, Supporters and More! Keys to Public Outreach Success", Proceedings of the AWWA-WEF Joint Management Conference, Portland, OR, Feb. 25–28, 2007.

Means, E. and N. Fleming. "Sustainable Water Development: Consensus by Crisis or Design?" AWWA Water Sources Conference and Exhibition, Reno, Nevada, February 2008.

Deeb, R., Hawley, E., and E. Means. "Building a National Utility Network to Address EC/PPCP Issues", AWWA Annual Conference and Exposition, Washington, D.C., June 14, 2011.

Alspach, B., Means, E.G. III, Burch, R., and C. Hill, "The Role of Desalination in a Diversified Water Resources Portfolio: Lessons Learned", Proceedings of the IWA World Water Congress, Montreal, CA, September 19–24, 2010.

Means, E.G., Laugier, M., Daw, J., and D. Owen, "Impacts of Climate Change on Infrastructure Planning and Design", JAWWA 102:6, pp. 1–14, June, 2010.

Yep, R., Wallis, M., Brown, J., Briggs, D., Means, E., and S. Cline. "Findings of a Regional Collaboration Study in the San Francisco Bay Area", Proceedings of the AWWA ACE, Chicago, IL, June 20–24, 2010.

Yep, R., and E. Means. "Bay Area Water Utilities Operations Collaborative: Model for Inter-Regional Utility Cooperation", Proceedings of the AWWA/WEF Utility Management Conference, San Francisco, CA, February 21–24, 2010.

Cline, S. and E. Means. "Industry Trends and Benefits of Regional Collaboration", Proceedings of the AWWA/WEF Utility Management Conference, San Francisco, CA, February 21–24, 2010.

Presentations

Participated in Sunday Seminar "Working With Your Customers: Strategies for Addressing Conflicts With the Public", AWWA Annual Conference and Exposition, Denver, Colorado, June 11, 2000.

Invited Panel Member on "Strategies for the Future", Environmental Financial Advisory Board's Cost-Effective Environmental Management Workgroup meeting, March 5, 2001, Washington, D.C.

Speaker on "The Growing Cost of Water Quality" Three Valleys Municipal Water Districts Spring 2003 Leadership Breakfast, May 16, 2003, Pomona, CA.

Distinguished Lecturer, University of Alberta Centre for Applied Business Research in Energy and the Environment, School of Business, on global water issues. October 2, 2003.

Participant in AwwaRF-sponsored "Workshop on climate change and water utilities", National Center for Atmospheric Research, Boulder CO, March 15 & 16, 2004.

Jazmadarian, N. and E. Means, "Cost of Free water", Proceedings of AWWA Sources Conference, Albuquerque, NM, February 5–8, 2006.

Loveland, J., Means, E., Diamond, S., and B. Alspach. "Pursuing Sustainable Local Supplies in Southern California: Issues in Treatment of Marginal Supplies", Proceedings of AWWA Sources Conference, Albuquerque, NM, February 5–8, 2006.

Moderator International Session: "Alternatives Water Resources", 2006 AWWA ACE, San Antonio, TX, June 14, 2006.

Speaker, "Communicating the Value of Water", Malcolm Pirnie breakfast workshop, Joint Management Conference, Portland, OR, February 27, 2007.

Keynote Addresses

Keynote Address, "Water Quality – 21sth Century Goals", North American Lake Management Society Annual Meeting, Reno, Nevada, December 2, 1999.

Keynote Address, "A Strategic Assessment of the Future of Water Utilities" at the 2001 Australian Water Association meeting in Canberra, Australia, April 2, 2001.

Keynote Address, "A Strategic Assessment of the Future of Water Utilities" at WWEMA annual meeting in La Quinta, CA, November 15, 2002.

Keynote Address, "The 21st Century Water Utility: Trends and Strategies"; New York Section AWWA Meeting, September 29–October 1, 2003, Verona, New York.

Keynote Address, Alaska Section AWWA Spring Meeting April 13, 2004, Anchorage, Alaska.

Keynote Address, "Water Resources in the 21st Century: Challenges and Opportunities". AWWA Sources Conference, Albuquerque, NM, February 5–9, 2006.

Keynote Address, "Future Trends", CA/NV Section AWWA Fall Conference, Long Beach, CA, October 3, 2006.

Keynote Address, "Water Trends". Water and Wastewater Equipment Manufacturers Association Annual Conference, San Diego, CA, November 10–11, 2006.

Keynote Address, "A Strategic Assessment of the Future of Water Utilities", Florida Section AWWA Conference, Orlando, FL April 15–17, 2007.

Keynote Address, "Future Trends: Strategic Implications for Our Customers", Basin Water Annual Corporate Meeting, Rancho Cucamonga, CA, March 26, 2007.

Keynote Address, "Future Trends: Strategic Implications for Our Customers", Aqua Aerobic Systems, Inc. Corporate Meeting. Rockford, IL, April 24, 2007.

Keynote Speaker on Future Trends, AWPCA Annual Conference, Mesa, AZ, April 30–May 3, 2007.

Books

"*Watercourse: Navigating Your Utilities Future*", published by Water Research Foundation, December 2001.

"*Excellence in Action: Water Utility Management in the 21st Century*". Contributing Author. Chapter 28, "How to Best Position Your Utility for the Future", AWWA 2001.

"*A Strategic Assessment of the Future of Water Utilities*", Water Research Foundation, 2006.

"*The Business of Water*", Contributing Author. Published by the American Water Works Association (AWWA), 2008.

"*Climate Change and Water*", Contributing Author, published by IWA/AWWA, 2009.

"*Water 2050: Attributes of Sustainable Water Supply Development*", Contributing Author, in press, published by Environmental & Water Resources Institute, 2010.

Personal Data

Education

- BS Social Ecology (UC Irvine)
- MA Social Ecology (UC Irvine)
- Cert. of Management (USC)

Societies

- American Water Works Association
- Urban Water Institute
- Association of California Water Agencies

Brian Hemphill, PE Principal

Mr. Hemphill has more than 35 years of experience as a consultant in the wastewater and water treatment industry. He has been involved in facilities planning, process design, detailed design, and management review and analysis. His expertise extends to all phases of wastewater and water management with particular emphasis on residuals management and processing evaluations and design. Brian's knowledge of water and wastewater treatment processes, design, operation and maintenance considerations provides an excellent basis for technical assessments, benchmarking, operational assessments, and for the technical assessment of alternatives for facility operations. He is a registered professional engineer in the State of Oregon.

Detailed Experience

Wastewater operations assessment, technical and regulatory compliance assessment, contract operation alternatives, and development of RFP for contract operations, City of Vancouver, WA, 2014.

Maintenance Management Plan, Columbia Boulevard Wastewater Treatment Plant, Portland, OR. Project manager for study of maintenance management program at Columbia Boulevard WTP and system-wide pump station system for City of Portland, OR.

Water Reclamation Facilities Plan, City of Bend, OR. Project manager for facilities plan for upgrade and expansion of the City's treatment facility to meet projected 11.9 mgd maximum month flow for year 2030.

Staffing Study, Durham Facility, OR. Project manager for staffing study, analyzing needs for expansion of operations and maintenance staff for expanded and upgraded 37.5-mgd Durham Facility for Unified Sewerage Agency of Washington County, OR.

Wastewater Facilities Plan Update, Unified Sewerage Agency, OR. Task manager for facilities plan update for Unified Sewerage Agency (now Clean Water Services) of Washington County, OR.

Comprehensive Solids System Upgrade, Westside WWTP, Vancouver, WA. Project Manager. Included predesign and final design of improvements and repairs to multiple hearth incinerator, new solids storage facility, and odor containment system.

Wastewater Facilities Plan Update, City of Lynnwood, WA. Task engineer for analysis and review of liquids and solids processes at 7.4 mgd plant that includes activated sludge, centrifuge dewatering, and fluidized bed sludge incineration.

Process Design, Edmonds, WA. Included primary clarification, activated sludge with deep aeration tanks, belt press sludge dewatering, and fluidized bed incineration.

Owner's Representative, Spokane County Regional Water Reclamation Facility Design Build, WA. Provided quality assurance for the design-build contract of a new 8.0 MGD, expandable to 24 MGD, regional water reclamation facility.

Solids Processing Systems Analysis, Meridian, ID. Developed and analyzed numerous alternatives for solids processing and management as part of overall plant facilities plan. Alternatives evaluated included continued Class B anaerobic digestion, Class A anaerobic digestion with multiple modes, composting, drying, and incineration.

Selected Publications/Presentations

"Innovative Materials Handling System at Biosolids Cake Storage Facility." Hemphill, Shanley, and Mikowski. 16th Annual Residuals and Biosolids Management Conference, Austin, TX.

"Sludge Incinerators – They Don't Bite." Paper presented at the Pacific Northwest Pollution Control Association Conference.

"Fluid Bed Technology for Sludge Destruction," *Water Engineering and Management.*

"A Wastewater Agency Looks to the Future: Biosolids Management Planning for Clackamas Water Environment Services". Hemphill, Moen, LaPierre, Killingbeck. Pacific Northwest Clean Water Association Conference.

Personal Data

Education

B.S. Civil Engineering – Oregon State University
M.S. Environmental Engineering – Oregon State University

Completed graduate level Hazardous Waste Management course, Oregon State University

Courses in contracts, project management, and negotiation

Certifications

Professional Engineer, WA and OR

Societies & Affiliations

Water Environment Federation, Residuals and Biosolids Committee Member, 2008–Present

Pacific Northwest Clean Water Association Residuals and Biosolids Committee Chair, 2009–Present

American Public Works Association

Employment History

HDR Engineering, 2007–2012; 1985–1994

Carollo Engineers, 1997–2007

Lambier Professional Group, 1994–1997

Neptune Microfloc, 1975–1984

Jim Bewley, Principal

Mr. Bewley has over 40 years of experience in the wastewater treatment and recycled water, and water utilities, has served in positions from operator, chemist, superintendent, and Executive Director / Utility System Manager. He has direct experience with the planning, design and implementation of a 29 MGD wastewater facility and has worked extensively with multi-jurisdictional Boards and authorities. His areas of expertise include treatment operations, construction, and utility management. He is a certified wastewater treatment operator (CA – Grade V).

Jim provides operations, managerial, and regulatory expertise for utility management and procurement assignments. A summary of these experiences and expertise are provided below.

Detailed Experience

Contract O&M procurement consulting for Novato Sanitary District, Novato, CA 2009

New Facility O&M Assessment and Preparation for Startup, Novato Sanitary District, Novato, CA 2008

Utility Management Assessment and Improvement Recommendations, SKF Utility District, Kingsburg, CA 2007

Southern Marin (LAFCO) Efficiency and Effectiveness Assessment and Strategic Improvement Options for eight (8) wastewater collection and treatment Districts, San Rafael, CA 2005

Design Build Operation Proposal Evaluation and program implementation systems and monitoring, City of Richmond (CA), 2001–2003

Apache Junction community Services District (AZ) v. M&E Operating Services, Bond default Litigation, Allen & Price, 2000

Project Subcommittee, Assessment of Technologies for Screening, Floatable Control and Screenings Handling, Water Environment Research Foundation, 1999

Value Engineering Team Member, DSRSD Stage 4 Expansion, Camp Dresser McKee, 1999

CalSPA v. City of Auburn (CA), Clean Water Act Third Party Citizens Suit, Decuir & Somach, 1998

City of Bremerton (WA) v. Metcalf & Eddy, O&M Contractor Responsibility for Odor Complaint Liability, Perkins Coie, 1997–1998

Master Plan Review, Dublin/San Ramon Services District, Dodson & Young

Publications/Presentations

Controlling Air Emissions from POTWs: A Guidance Document for Evaluating Technology, Witherspoon, Bewley, et al, Water Environment Federation, 1994

Air Regulations: A New Fact of Life for POTWs, Griffes, Bewley & Witherspoon, *CWPCA Bulletin*, Spring, 1991

CAA Title V Compliance Seminar, CH2M Hill, Diamond Bar, CA, June 1996

Clean Air Act Compliance Strategies, CH2M Hill, Richmond, VA, March 1994, Philadelphia, PA 1995

Association of Metropolitan Sewerage Agencies: Clean Air Act Control Technologies Development, December 1993

California Water Environment Federation: Operator Training, Industrial Source Control, Regulatory Issues

California Association of Sanitation Agencies: Construction Claims, Air Toxics Programs, Clean Air Act Implementation

Personal Data

Education

Certificate – Air Quality Management, UC Davis, 1996
B.A. Chemistry – San Francisco State University, 1970

Air Quality Management: 24 course units, UC Davis Extension, 1991–1996
Nature & Structure of Collective Bargaining, UC Berkeley Extension, 1985

Water Pollution Construction Claims, University of Baltimore, 1981

Certification

California State Water Resources Control Board – Grade V Operator (V-1058)

Cooperative Programs

Bay Area Regional Water Recycling Prog. Exec. Mgmt. Board, 1998–1999
California EPA, Regulatory Reform Task Force, 1994
Pooled Emissions Estimating Program, Jt. Powers Authority Chair, 1989–1991
Bay Area Air Toxics Group, Founding Chair, 1989
California Sanitation Risk Management authority (Insurance JPA), Organizing Committee and Founding Executive Board, 1987–1990

Societies & Affiliations

California Association of Sanitation Agencies
President 1989–1999
Director at Large 1995–1997

Chair – Air Subcommittee 1993–1995
TriTAC, 1985–present
Chair 1991–1993

California Water Environment Association

Association of Metropolitan Sewerage Agencies

Water Environment Federation

Employment History

Director of Operations – Oakwood Lake Water District (Manteca CA) 2012–Present
Authority Manager – San Ramon Valley Recycled Water Program, 2006–Present
Manager – South Bayside System Authority, 1982–2006
Superintendent – South Bayside System Authority, 1977–1982
Superintendent – City of San Carlos, 1974–1977
Chemist – City of Sunnyvale, 1972–1974
Operator – City of Richmond, 1971–1972

Appendix 2 – Performance Indicator Calculations

Performance Indicator #1 – Total O&M Cost Per Account, Water

Table X: O&M Cost per Account, Water

Grants Pass Value	Top Quartile	Median	Bottom Quartile	Assumptions	
308	243	361	542	O&M Cost for Water (2015)	Accounts 2015
				$ 3,349,858	10,867

Source: AWWA 2015 Benchmarking Study, p. 75

2015 Budget		
Water treatment	$	1,672,414
Water Distribution	$	1,310,484
Customer Services	$	366,960
General Program Operations	$	3,702,802
Total 2015 Water O&M	**$**	**3,349,858**

Subtracted as these are transfers to Capital

	Water Accts	W/W Accts	Total Accts
Number of accounts	10,867	13,105	23972
Prorate Ratio	0.45	0.55	1.00

DESCRIPTION

This program includes the operation, planning, engineering, production, and delivery of water to each customer connection. Water services are made available for industrial, commercial, domestic, and fire protection uses.

	ACTUAL FY'12 $	ACTUAL FY'13 $	BUDGET FY'14 $	MANAGER RECOMMEND FY'15 $	COMMITTEE APPROVED FY'15 $	COUNCIL ADOPTED FY'15 $	PROJECTED FY'16 $
Program Generated Resources	8,393,442	14,279,300	12,691,170	11,452,748	11,452,748	11,452,748	8,731,811
Total Resources	**8,393,442**	**14,279,300**	**12,691,170**	**11,452,748**	**11,452,748**	**11,452,748**	**8,731,811**
Requirements							
Water Treatment	1,432,233	1,529,966	1,636,499	1,695,164	1,695,164	1,695,164	1,702,488
Water Distribution	1,014,314	1,045,376	1,259,875	1,310,484	1,310,484	1,310,484	1,371,103
Customer Services	352,298	391,059	377,835	366,960	366,960	366,960	380,346
Debt Service	396,253	36,404	507,220	504,770	504,770	504,770	507,170
General Program Operations	2,280,210	3,306,098	2,750,479	3,702,802	3,702,802	3,702,802	2,867,353
Capital Construction	2,918,134	7,970,397	6,159,262	3,872,568	3,872,568	3,872,568	1,903,351
Total Requirements	**8,393,442**	**14,279,300**	**12,691,170**	**11,452,748**	**11,452,748**	**11,452,748**	**8,731,811**

Performance Indicator #2 - Million Gallons per Day of Water Produced Per Employee

Table X: Million Gallons Water Delivered per Day per Employee

Grants Pass	Top Quartile	Median	Bottom Quartile	Assumptions
0.29	0.32	0.24	0.16	Employees* (2015)
				15.26

Source: AWWA 2015 Benchmarking Study, p. 79

Current Water Demand, mgd
2015 Average Annual
4.5
Source: Water Master Plan 2015

Employees

Water treatment	6.46	**15.26**
Water Distribution	8.8	

Wastewater Treatment	10.46	**16.12**
Wastewater Collection	5.66	

Source: 2015 budget document

Public Works						
Water Treatment	*6.460*	*6.460*	*6.460*	*6.460*	*6.460*	*6.460*
Water Distribution	*8.800*	*8.800*	*8.800*	*8.800*	*8.800*	*8.800*
Wastewater Collection	*5.660*	*5.660*	*5.660*	*5.660*	*5.660*	*5.660*
Wastewater Treatment	*9.210*	*9.210*	*10.460*	*10.460*	*10.460*	*10.460*

Performance Indicator #3– Water Distribution Breaks per 100 Miles of Pipe

Table X: Water Distribution System Breaks per 100 miles of pipe

Grants Pass	Top Quartile	Median	Bottom Quartile
	4	13	24

Source: AWWA 2014 Benchmarking Study, P.80

Main Breaks		
Miles of transmission and distribution lines	**100 mile segments**	Total
194	1.94	

Breaks per year	Breaks/100mi
7	3.6

Per Bob Hamblin

* Water mains breaks: From January 2009 to August 2015 (~6.5 years), there were 46 water main breaks for an average of about 7 breaks per year for the 6½ year time frame (per Bob Hamblin)

Performance Indicator #4 – Customer Technical Service Complaints Per 1000 Accounts, Water

Table X: Annual Water Customer Service Complaints/1000 Accounts

Grants Pass Value	Top Quartile	Median	Bottom Quartile
1.6	0.2	1	7

Source: AWWA 2014 Benchmarking Study, P48

	Water Accts	W/W Accts	Total Accts
Number of accounts	10,700	10236	20936
Prorate Ratio	0.51	0.49	1.00

SUMMARY COMPLAINTS					
Year	Taste	Odor	Color	Other	Annual Total
2002	3	4	22	4	33
2003	4	4	8	1	17
2004	2	2	4	0	8
2005	2	2	4	0	8
2006	4	7	19	0	30
2007	3	4	2	5	14
2008	3	8	3	4	18
2009	4	6	3	4	17
2010	1	3	3	4	11
2011	1	3	6	11	21
2012	5	6	13	3	27
2013	3	2	5	0	10
2014	5	2	1	1	9
13 yr Total	40	53	93	37	223
Annual Average					17.15
1000 accounts					10.7

Performance Indicator #5 – Training Hours Per Employee, Water

Division	Total Training Hours*	Years	# employees	Hrs per Employee per Year
Distribution*	291	5	8.8	7
Treatment**			6.46	55
Collection*	186.2	5	5.66	7
Wastewater***			10.46	45

*Per Bob Hamblin
**Per Jason Canady
***Per Gary Brelinski Jr.

Performance Indicator #6 – Service Affordability, Water

Table X: Service Affordability, Water

Grants Pass	Top Quartile	Median	Bottom Quartile
1.23%	0.50%	0.64%	0.81%

Source: AWWA 2014 Benchmarking Study, P. 70

Per Jay Meredith July 20, 2015 email =
The average water bill (using a 12 month average) is calculated using 13 units as the consumption.

Average Monthly Bill = $34.10 Average Annual Water Bill = $409.20

Grants Pass Median Household $33,207 1.23%
Source: http://www.city-data.com/income/income-Grants-Pass-Oregon.html

Charge element			Water	Sewer
Water Base Charge			$ 17.10	
Consumption	10 units		$ 9.00	
	3 units		$ 3.45	
Sewer Base charge				$ 13.62
Sewer Volume Charge				$ 12.51
Transportation*		$ 3.48	$ 1.74	$ 1.74
Jail Services Utility*		$ 2.84	$ 1.42	$ 1.42
Fee in lieu of franchise*		$ 2.78	$ 1.39	$ 1.39
Total Monthly bill			$ 34.10	$ 30.68

*split between water and sewer

Performance Indicator #7 – Planned Maintenance Ratio, Water

Table X: % Planned Maintenance (% of Total Maintenance Time), Water

Grants Pass	Top Quartile	Median	Bottom Quartile
60%*	75%	52%	27%

Source: AWWA 2014 Benchmarking Study, P. 81
*Anecdotal information based upon staff interviews

Performance Indicator #8 – Regulatory Compliance Rate (% Days in Compliance), Water

Table X: Regulatory Compliance Rate (% days in compliance), water

Grants Pass	Top Quartile	Median	Bottom Quartile
100%	100%	100%	100%

Source: AWWA 2015 Benchmarking Study, P. 74

Performance Indicator #9 - Distribution System Real Water Loss

Table X: Distribution System Real Water Loss

Grants Pass Value	Top Quartile	Median	Bottom Quartile
8.4%*	1.0%	5.9%	9.5%

Source: AWWA 2014 Benchmarking Study, P.60 (this was not benc
the 2015 Study)

Source: Water Management and Conservation Plan Update, 2014 p
average 2007-2011

Real Water Loss = Total volume of water lost due to leakage on trar
and distribution mains, leakage and overflows at utility storage tanks
leakage on service connection up to the point of customer metering
daily production x 365 days

Water Management and Conservation Plan Update, 2014 p.25	
Year	Unaccounted For Water (%)
2007	9.6
2008	10.7
2009	8.1
2010	5
2011	8.8
Average	8.44

Performance Indicator #10 - Operating and Maintenance Cost per Account, Wastewater

Table X: O&M Cost per Water Account, Wastewater

Grants Pass Value	Top Quartile	Median	Bottom Quartile
$294	$238	$344	$476

Source: AWWA 2014 Benchmarking Study, P. 89

	Water Accts	W/W Accts	Total Accts
Number of accounts	10,867	13,105	23,972
Prorate Ratio	0.45	0.55	1.00

FY 2015 O&M Budget**	Wastewater
WW Collection	$777,652
WW Treatment	$2,278,209
General Program Operations	$24,050
Customer services	$408,653
Indirect Charges	$366,690
	$3,855,254

*excluded Debt Service and Capital Construction
2015 Council Adopted Budget**

Requirements	ACTUAL FY'12 $	ACTUAL FY'13 $	BUDGET FY'14 $	MANAGER RECOMMEND FY'15 $	COMMITTEE APPROVED FY'15 $	COUNCIL ADOPTED FY'15 $	PROJECTED FY'16 $
Wastewater Collection	610,532	664,654	724,766	777,652	777,652	777,652	803,139
Wastewater Treatment	1,658,256	1,653,176	2,004,990	2,278,209	2,278,209	2,278,209	2,312,899
Customer Services	255,016	264,006	410,326	408,653	408,653	408,653	426,275
Jo Gro	605,324	598,458	622,513	0	0	0	0
General Program Operations	9,764	12,000	24,050	24,050	24,050	24,050	24,050
Capital Construction	3,343,146	4,393,468	3,594,738	5,437,462	5,437,462	5,437,462	1,671,277
Indirect Charges	323,717	329,070	398,700	366,690	366,690	366,690	375,400
Debt Service	491,356	492,015	941,763	941,963	941,963	941,963	933,713
Transfers Out	900,046	962,852	1,034,000	1,782,392	1,782,392	1,782,392	1,159,362
Subtotal Expenditures	***8,197,157***	***9,369,699***	***9,755,846***	***12,017,071***	***12,017,071***	***12,017,071***	***7,706,115***
Contingency	0	0	1,363,572	1,264,973	1,264,973	1,264,973	1,354,135
Ending Balance	1,380,862	1,836,455	0	0	0	0	0
Total Requirements	**9,578,019**	**11,206,154**	**11,119,418**	**13,282,044**	**13,282,044**	**13,282,044**	**9,060,250**

Performance Indicator #11 – Million Gallons of Wastewater Treated Per Employee

Table X: Million Gallons Wastewater Processed per Day per Employe

Grants Pass Value	Top Quartile	Median	Bottom Quartile	Assumptions	
0.32	0.26	0.18	0.13	WW Employees 2015	W/W Processed*
				16.12	5.2

*2014 WRF Master Plan

Source: AWWA 2015 Benchmarking Study, p. 92

Performance Indicator #12 - Collection System Integrity, Wastewater (Sewer System Overflows per 100 miles of pipe)

Table X: Collection System Integrity, Wastewater (Overflow 100 miles of pipe)

Grants Pass Value	Top Quartile	Median	Bottom Quartile
1.6	1.2	2.5	6.9

Source: AWWA 2015 Benchmarking Study, p.93

Sanitary System Overflows (2013-14)				
1997	1998	1999	2000	4 yr average
2	6	0	2	2.5

Source: Collection System Master Plan

Feet of Collection	Miles of collection	100 Mile Increments
800,853	152	1.52

Table 4-2. Collection System Overflows (1997 to Present)

Date	Location	Cause
June 9, 1997	738 NW Amelia Drive	Broken Service Line
July 25, 1997	1044 NW 6th Street	Maintenance Accident
March 23, 1998	NE 9th Street	Sewer Obstruction During Storm Event
April 21, 1998	928 NE 12th Street	Sewer Obstruction During Storm Event
April 22, 1998	Treatment Plant Pump Station	Power Outage and Backup Generator Failure
June 29, 1998	NW Savage Street	Sewer Obstruction
August 29, 1998	2075 Highland Street	Support Pillar Dislodged Sewer Pipe at Creek Crossing
September 18, 1998	NW Savage Street	Unpermitted Discharge Water Line Flushing Water into Collection System
January 14, 2000	Manzanita Avenue	Storm Event
December 16, 2000	Bellaire Drive	Grease Problem

Performance Indicator #13 – Training Hours Per Employee, Wastewater

Table X: Training Hours Per Employee, Wastewater

Grants Pass	Top Quartile	Median	Bottom Quartile
7 - Distribution 7 - W/W Treatment	$25	$16	$8

Source: AWWA 2014 Benchmarking Study, P. 26

Division	Total Training Hours*	Years	# employees	Hrs per Employee per Year
Distribution*	291	5	8.8	7
Treatment**			6.46	55
Collection*	186.2	5	5.66	7
Wastewater***			10.46	45

* Per Bob Hamblin
** Per Jason Canady
*** Per Gary Brelinski Jr.

Performance Indicator #14 – Service Affordability, Wastewater

Table X: Service Affordability, Wastewater

Grants Pass Value	Top Quartile	Median	Bottom Quartile
1.11%	0.54%	0.76%	1.05%

Source: AWWA 2014 Benchmarking Study, P. 70

Per Jay Meredith July 20, 2015

The average water bill (using a 12 month average) is calculated using 13 units as the consumption.

Average Monthly Bill = $30.68 Average Annual W/W Bill = $368

Grants Pass Median Household Income $33,207 1.1
Source: http://www.city-data.com/income/income-Grants-Pas
Oregon.html

			Water	Sewer
Water Base Charge			$17.10	
Consumption	10 units		$9.00	
	3 units		$3.45	
Sewer Base charge				$13.62
Sewer Volume Charge				$12.51
Transportation*		$3.48	$1.74	$1.74
Jail Services Utility*		$2.84	$1.42	$1.42
Fee in lieu of franchise*		$2.78	$1.39	$1.39
			$34.10	$30.68

*equally split between water and sewer

Performance Indicator #15 – Planned Maintenance Ratio, Wastewater

Table X: % Planned Maintenance (% of Total Maintenance Time), Wastewater

Grants Pass	Top Quartile	Median	Bottom Quartile
60%*	81%	65%	47%

Source: AWWA 2014 Benchmarking Study, P. 95

*Anecdotal information based upon staff interviews

Performance Indicator #16 – Regulatory Compliance Rate, Wastewater

Table X: Regulatory Compliance Rate (2011-15)

Year	Grants Pass Value	Top Quartile	Median	Bottom Quartile
2013	92%*	100%	100%	100%
2014	100%	100%	100%	100%

Source: AWWA 2015 Benchmarking Study, P. 89

*One ammonia violation in 5 yr period (Oct 30, 2013)

2013 Compliance months	2013 Months Out of Compliance	Percent Non-compliant		2013 % Non-compliant
12	1	0.083	1.00	0.917

Customer Technical Service Complaints per 1000 Accounts, Wastewater

Per Bob Hamblin, since 2010 to date the division has averaged a total of 40 sewer calls per year. Sewer calls are documented when customers call about backups within their homes. The division crews check out the complaint and determine if the problem is with the customers plumbing or the public sewer system. In most cases the problem is related to the private sewer lateral and not the sewer mainline. During the same period of time an average of 3 calls per year were related to public sewer main problems.

Accounts	Complaints per year	Complaints per 1000 accts
13,105	3	0.23

Appendix 3 – Division Interview Summary Notes

Wastewater Treatment

Strengths

- Plant in decent shape (for its age)
- Call-backs are down

Weaknesses

- People don't want to pay taxes
- Parks get lion's share of land vs. plant expansions
- One pretreatment person not a lot
- D & C aren't cross-trained – no certification pay now?
- City won't pay certs for across water – W/W
- Need to look at cross-training and incentivize certs/education etc.
- Fair wage / decent benefits
- ** Replacement parts inadequate; mix styles – not standardized on parts
- Leadership at top is tough -a lot of time as "interim" – awkward
- Community Access – people don't know about the system & what they own
- Double standards – different standard at City Hall vs. plant - $ and benefits
- Limited access to computers at plant
- Equipment concerns
- Flare at landfill not running properly – waiting for new budget
- Blowers
- People coming in don't have work ethic / knowledge
- Limited recruiting going on
- Consider paid interns
- Customers unhappy with rates/ levies
- W/W is much happier than D & C
- Morale issues
- Lower pay
- Lower skills
- 'Nobody knows buried stuff better than us' implies that tribal knowledge is dominant
- "As-builts" - not well documented
- Records management needs work – boxes of files organized – works but not "sweet"
- Has documented many procedures but details on e.g., distributors used could be improved
- 800 maintenance sheets on individual equipment maintenance and frequency
    - prints out weekly, monthly, biannually etc.
    - documents that it is done – logs hours spent
    - builds maintenance off of vendor specs – only new equipment in last 3 years; stuff before that is not
    - doesn't automatically generate task orders
    - don't do weeklies on a weekly basis because there isn't time
    - need to bring old equipment into the system
- Nothing prioritizes automatically; done by experience
- Need to engage staff in walk-throughs of new water plants

Opportunities

- Power generation – water falling- Energy Master plan- Methane recovery

- Beneficial reuse of w/w – lower mass loading
- Utility doesn't go to high school career day; fairs
- Advancement career wise
- Training – new processes; pilot studies
- Protect the environment
- New technology – also a threat and challenge
- Engage Ops/maintenance staff in operability assessments of new facilities

Threats

- Short-sited / near term priorities and actions by council
- Inadequate aeration basin – need to change
- If operations transitioned to private contractor, questions raised by employees:
    - What happens to PERS?
    - What happens w/ union?
- Concern over fly by night firm as contractor
- Phosphorus limits might be lowered
- Temp limits is a threat
- Inadequate
- Not much vandalism – some copper stealing and destructive
- Lack of mechanic backup when Kevin is out
- Blower failures
- More DEQ regulations; time & $ cost
- Privatization – maybe Council thinks they aren't doing good job
- 6% PERS Contribution by City; will it continue?
- Over – regulation – can't meet limits
- ½ of treatment crew gone in 5 – 6 years; significant challenges (knowledge retention, expertise, certifications)

Water Treatment

Weaknesses

- Communications – information
- Employees overly set in their ways
- Major capital tied to rate structures – no reserves
- Distribution/treatment is disconnected currently – split for 20 + years
- Billing
- Getting information out and coalescence is difficult
- Generating historical date reports is difficult
- System in place – being kicked off
- Link to consumer side is poor
- Smart meters not in place
- Communications – Superintendents need to bridge the gap
- Better ways for ideas to be heard – regular staff meetings
- D & C is an issue – they go their separate ways
- Timely performance evaluations (pretty good) some still late
- Separation – not happy with City, but happy with boss
- Limited training program
- Have position descriptions
- Doesn't define the skills / skills inventory and tailored training program
- W/W LIMS is a problem / Water Treatment system works well

- Ability to gain new expertizes and systems for new water plant

Opportunities

- Upgrade pump stations; a couple of reservoirs have a few issues
- Do have enough storage to run 24/7
- Tribal knowledge is departing and no knowledge capture system in place
- New plant technology needs Ops involvement and training
- Some complaints come to plant – disconnect between complaints in system and treatment
- Cross-training vs. difficult to manage- coordination is hard (Collection & distribution still cross–trains)
- Backup power needed for some pump stations

Distribution & Collection

- A lot installed in the 1980's
- Contract Divers – D & C handles
- Ensure end user engagement in vehicle purpose specification– some trucks oversized for need
- Policy on trucks being sold if the hours were low. Sometimes shorts vehicles
- D & C too little space w/ summer help especially
- With new plant – move D & C offices to plant location ?
- Directives – "or else" – mannerisms, not approachable
- Put in place 360 evaluations; solicit input?
- Training is an issue – not formalized; Terry has stepped in on training
- District should pay for cert reviews?
- Communication / interference from other depts. (transportation)
- Unions are a joke – not really good faith negotiations, very positional
- Grievance frequency is low (union isn't strong)
- Disconnect with Terry – He doesn't respect us, bad work environment
    - Needs to be appreciative
    - Need acknowledgement of good work/ communication
- Sometimes don't have exact tool but are innovative
- Technology- need access to as-builts in field – iPads
- Follow through on HR stuff- no follow through
- Need consistent policy on employee behavior
- Some personality differences between "street" dept. and D & C on coordination of paving
- Tribal knowledge is a big succession issue (e.g., guy that did flushing left)
- Safety rating – 8 on 10 scale – "good"
- Have to cross-train – has seen someone good in one area that must spend time in sewer – contract encourages advancement by getting certifications in both W and W/W

Appendix 4 – Data Reports for On-Line Survey

1. How long have you been working at Grants Pass

#	Answer		Response	%
1	Less than 1 year		1	4%
2	Between 1 and 5 years		4	17%
3	Between 5 and 10 years		6	26%
4	Between 10 and 20 years		9	39%
5	More than 20 years		3	13%
	Total		23	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.39
Variance	1.16
Standard Deviation	1.08
Total Responses	23

2. Which division are you currently working in (select one)?

#	Answer		Response	%
1	Management (City Manager, Public Works Director)		0	0%
2	Water Division		6	26%
3	Wastewater Division		7	30%
4	Collection & Distribution		10	43%
	Total		23	100%

Statistic	Value
Min Value	2
Max Value	4
Mean	3.17
Variance	0.70
Standard Deviation	0.83
Total Responses	23

Note: The Public Works Director did complete the Survey. However, his inputs are not reflected in the reported Survey results so that reported results exclude senior / top management inputs and focus on the staff reporting to the Public Works Director.

3. Product Quality (PQ)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	Complies with regulatory and reliability requirements. Is consistent with customer, public health, and ecological needs	17	5	0	0	1	23	1.39

Statistic	Complies with regulatory and reliability requirements. Is consistent with customer, public health, and ecological needs
Min Value	1
Max Value	5
Mean	1.39
Variance	0.79
Standard Deviation	0.89
Total Responses	23

4. Customer Satisfaction (CS)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	Provides reliable, responsive, and affordable services. Receives timely customer feedback. Responsive to customer needs and emergencies	9	12	1	0	1	23	1.78

Statistic	Provides reliable, responsive, and affordable services. Receives timely customer feedback. Responsive to customer needs and emergencies
Min Value	1
Max Value	5
Mean	1.78
Variance	0.81
Standard Deviation	0.90
Total Responses	23

5. Employee and Leadership Development (ED)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	Recruits and retains competent workforce. Is a collaborative organization dedicated to continual learning and improvement? Employee institutional knowledge is retained and improved. Opportunities are available for professional and leadership development. Integrated and well-coordinated senior leadership team.	4	9	4	3	3	23	2.65

Statistic	Recruits and retains competent workforce. Is a collaborative organization dedicated to continual learning and improvement? Employee institutional knowledge is retained and improved. Opportunities are available for professional and leadership development. Integrated and well-coordinated senior leadership team.
Min Value	1
Max Value	5
Mean	2.65
Variance	1.69
Standard Deviation	1.30
Total Responses	23

6. Operational Optimization (OO)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	Ongoing performance improvements. Minimizes resource use and loss from day-to-day operations. Awareness and timely adoption of operational and technological improvements	6	10	3	1	3	23	2.35

Statistic	Ongoing performance improvements. Minimizes resource use and loss from day-to-day operations. Awareness and timely adoption of operational and technological improvements
Min Value	1
Max Value	5
Mean	2.35
Variance	1.69
Standard Deviation	1.30
Total Responses	23

7. Financial Viability (FV)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	There is an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Rates are predictable and adequate.	3	12	4	0	1	20	2.20

Statistic	There is an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Rates are predictable and adequate.
Min Value	1
Max Value	5
Mean	2.20
Variance	0.80
Standard Deviation	0.89
Total Responses	20

8. Infrastructure Stability (IS)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	The utility effectively manages the condition of and costs associated with critical infrastructure assets. Maintains and enhances assets over the long-term at the lowest possible life-cycle cost and acceptable risk. Repair efforts are coordinated within the community to minimize disruptions	6	9	3	2	2	22	2.32

Statistic	The utility effectively manages the condition of and costs associated with critical infrastructure assets. Maintains and enhances assets over the long-term at the lowest possible life-cycle cost and acceptable risk. Repair efforts are coordinated within the community to minimize disruptions
Min Value	1
Max Value	5
Mean	2.32
Variance	1.56
Standard Deviation	1.25
Total Responses	22

9. Operational Resiliency (OR)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	Staff works together to anticipate and avoid problems. Proactively establishes tolerance levels and effectively manages risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related)	8	8	4	1	2	23	2.17

Statistic	Staff work together to anticipate and avoid problems. Proactively establishes tolerance levels and effectively manages risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related)
Min Value	1
Max Value	5
Mean	2.17
Variance	1.51
Standard Deviation	1.23
Total Responses	23

10. Community Sustainability (SU)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	Attentive to impacts on community and watershed health and welfare. Operations enhance natural environment. Efficiently use water and energy resources; promote economic vitality; engender overall community improvement. Maintain and enhance ecological and community sustainability including pollution prevention, watershed, and source water protection.	7	9	4	2	0	22	2.05

Statistic	Attentive to impacts on community and watershed health and welfare. Operations enhance natural environment. Efficiently use water and energy resources; promote economic vitality; engender overall community improvement. Maintain and enhance ecological and community sustainability including pollution prevention, watershed, and source water protection.
Min Value	1
Max Value	4
Mean	2.05
Variance	0.90
Standard Deviation	0.95
Total Responses	22

11. Water Resource Adequacy (WA)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	Ensures water availability through long term resource supply and demand analysis; conservation, and public education.	8	12	1	0	0	21	1.67

Statistic	Ensures water availability through long term resource supply and demand analysis; conservation, and public education.
Min Value	1
Max Value	3
Mean	1.67
Variance	0.33
Standard Deviation	0.58
Total Responses	21

12. Stakeholder Understanding and Support (SS)

#	Question	1. (Constantly achieve goals)	2. (Mostly achieve goals)	3. (Moderately achieve goals)	4. (Occasionally achieve goals)	5. (No system to achieve goals)	Total Responses	Mean
1	Engenders understanding and support from oversight bodies, community, and watershed interests, and regulatory bodies for service levels, rate structures, operating budgets, capital improvement programs, and risk management decisions. Actively involves stakeholders in the decisions that will affect them	3	13	1	3	1	21	2.33

Statistic	Engenders understanding and support from oversight bodies, community, and watershed interests, and regulatory bodies for service levels, rate structures, operating budgets, capital improvement programs, and risk management decisions. Actively involves stakeholders in the decisions that will affect them
Min Value	1
Max Value	5
Mean	2.33
Variance	1.13
Standard Deviation	1.06
Total Responses	21

13. Please rank the importance of each attribute to Grants Pass from most important (top) to least important (bottom) by selecting an attribute and clicking the up/down arrows:

#	Answer	1	2	3	4	5	6	7	8	9	10	Total Responses
1	Product Quality (PQ)	18	3	2	0	0	0	0	0	0	0	23
2	Customer Satisfaction (CS)	1	11	4	1	2	0	2	1	1	0	23
3	Employee and Leadership Development (ED)	0	0	7	1	3	2	2	2	2	4	23
4	Operational Optimization (OO)	1	1	4	7	4	5	0	0	1	0	23
5	Financial Viability (FV)	0	2	4	5	5	2	3	1	1	0	23
6	Infrastructure Stability (IS)	3	3	1	3	3	4	5	0	1	0	23
7	Operational Resiliency (OR)	0	1	0	3	3	2	7	7	0	0	23
8	Community Sustainability (SU)	0	1	0	1	0	5	2	7	7	0	23
9	Water Resource Adequacy (WA)	0	0	0	1	2	0	2	2	6	10	23
10	Stakeholder Understanding and Support (SS)	0	1	1	1	1	3	0	3	4	9	23
	Total	23	23	23	23	23	23	23	23	23	23	-

Statistic	Product Quality (PQ)	Customer Satisfaction (CS)	Employee and Leadership Development (ED)	Operational Optimization (OO)	Financial Viability (FV)	Infrastructure Stability (IS)	Operational Resiliency (OR)	Community Sustainability (SU)	Water Resource Adequacy (WA)	Stakeholder Understanding and Support (SS)
Min Value	1	1	3	1	2	1	2	2	4	2
Max Value	3	9	10	9	9	9	8	9	10	10
Mean	1.30	3.48	6.09	4.43	4.83	4.65	6.35	7.35	8.61	7.91
Variance	0.40	5.08	7.36	2.80	3.51	5.42	2.87	3.24	3.34	6.26
Standard Deviation	0.63	2.25	2.71	1.67	1.87	2.33	1.70	1.80	1.83	2.50
Total Responses	23	23	23	23	23	23	23	23	23	23

14. Please include comments here to support and clarify your ratings and rankings:

Text Response
Customer satisfaction is incredibly important, but financial stability, water quality and the ability to provide critical service under trying circumstances are also critical to the operation.
The water quality that we put into the river will always be the highest priority.
I find it difficult to rate these 10 items and feel that without looking at how I graded our level of achievement the rank of importance could be misinterpreted that we do not put enough time into my lowest ranked item. Although I have 'employee and leadership development' ranked last, I have still rated it as a 3. The only reason this is a 3 is because I have not personally seen training or education available for leadership development. On the other hand, we are diligent to ensure that the quality of our product exceeds regulatory benchmarks, and take pride in the quality and conveyance of our product. I ranked operational resiliency a little closer to the bottom because I feel that we at the water plant could better meet the system demands by becoming closer with our distribution department counterparts. In large, I feel that the City of Grants Pass strives to excel in each of these areas. In addition, I find it difficult to rate most of these as a 5 based on always being able to improve how we operate.
I feel the ratepayers may not understand the financial support we need to complete the mission.
I believe all of these are equally important. But I listed them in this order.
There should be an I DON'T KNOW choice.
PQ should be the most important. Without that you don't have Su, FV, CS and WA. I put ED third because if you can't work together than not much is going to get done in a timely and orderly fashion. FV was fourth because without it we would not be here and the customer is who pays are salary. Then I think most of the others should fall into place.
If you don't provide a great product your customers' satisfaction will suffer. Without knowledgeable stakeholders your organization will not receive the financial support you need to succeed. Without proper employee leadership and development you will not have employees striving for operational optimization. The wastewater infrastructure is a stable industry and that is the reason I choose this field when I was pushed out of the timber industry.
I feel as though the distribution and collections supervisor has no interest whatsoever in employee moral and career growth
This one is difficult to rate because you need all of these attributes to have a positive environment. They should be more in a pie chart of sorts. To me they all have a very important impact. So this exercise isn't very accurate.

Statistic	Value
Total Responses	10

15. Answer whether you disagree, somewhat disagree, somewhat agree, or agree with the following:

#	Question	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Total Responses	Mean
1	I believe the Public Works Department provides an excellent service to the community	0	0	2	21	23	3.91
2	My work conditions are acceptable	3	3	3	14	23	3.22
3	The vehicles we use are acceptable for their use	5	1	2	15	23	3.17
4	The technology we employ in general is effective	2	3	5	13	23	3.26
5	I have adequate supplies/equipment necessary to do my job	4	1	5	13	23	3.17
6	I have adequate employee space to do my job	5	4	6	8	23	2.74
7	I am satisfied with my work schedule	1	0	7	15	23	3.57
8	I am proud to be a member of the Public Works Department	1	1	5	16	23	3.57
9	In general, I am satisfied with my career	2	1	6	14	23	3.39
10	Morale is high in the division in which I work	5	3	5	10	23	2.87
11	The Department has a clear sense of its mission	3	3	4	13	23	3.17
12	Whenever I have a concern at work I can always have my concerns resolved	3	2	9	9	23	3.04
15	The Public Works Department is innovative when it comes to dealing with the community	1	4	7	10	22	3.18
16	I know what is expected of me at work	3	0	2	18	23	3.52
17	I have clear information about how to do my job	3	1	8	11	23	3.17

18	I feel comfortable with what I am asked to do in meeting my job requirements	1	2	4	16	23	3.52
19	My supervisor and I maintain a clear understanding about what I am expected to do and how I am expected to carry it out	2	1	7	13	23	3.35
20	Management does a good job communicating their decisions to everyone in the Department	4	3	9	7	23	2.83
22	In general, I believe there is good communication between the Department and city hall	5	4	8	6	23	2.65
23	Management listens to my ideas about improving the Department	4	2	4	11	21	3.05
24	My immediate supervisor listens to my ideas about improving the Department	1	0	5	17	23	3.65
25	In general, the communication process in the Department is excellent	3	5	5	10	23	2.96
26	I wish there was a better way for my ideas to be heard	6	8	4	5	23	2.35
27	I receive timely feedback that my work contributes to the overall success of the Department	5	5	3	10	23	2.78
28	I receive necessary training to maintain/improve my skill and competency levels	5	3	4	11	23	2.91
29	My immediate supervisor is properly trained for the position he/she holds	0	0	4	19	23	3.83

30	Training opportunities are readily available in the Department	5	1	6	11	23	3.00
31	Training opportunities are distributed fairly in the Department	4	4	5	10	23	2.91
32	In the department discipline is applied fairly	5	1	6	11	23	3.00
33	My work is important	0	0	0	23	23	4.00
34	My work makes a positive contribution to the community	0	0	0	23	23	4.00
35	My supervisor takes personal interest in me	1	0	10	11	22	3.41
36	My supervisor supports my professional development	2	0	6	15	23	3.48
37	My supervisor is an effective leader	1	3	5	14	23	3.39
38	I have confidence in Management to lead the Department	3	1	6	12	22	3.23

Appendix 5 – Capital Plans, Free Cash Flow and Finance Cost Illustration

Grants Pass Water & Wastewater Utilities

Capital Plans ($ Millions (2015 $'s)

Updated 9_18_15

Capital Needs Summary	0-5 yrs	5-10 yrs	10-15 yrs	15-20 yrs	Totals
Function					
Water Treatment Plant*	$60	$0	$0	$0	**$60**
Water Distribution Sys.**	2	5	5	5	**17**
Wastewater Treatment Plant	10	10	5	5	5	**35**
Wastewater Collection Sys.***	5	5	5	5	**20**
Capital Plan Needs	**$77**	**$15**	**$15**	$15	**$122**
Bond Funding Needs	$70	$10			**$80**
Use of Direct Funding from Existing Rates	$7	$15	$15	$15	**$52**
Potential Additional Items to be Funded from Utility Bill Fees:					
Storm Water Utility	4	4	5	6	**19**
Transportation	4	5	6	7	**22**
Total Bond Borrowings	**$70**	**$10**	**$0**	**$0**	**$80**

* Projection is "Base Case" and addresses next five years. Does not address on-going capital needs.

** Projection does not include additional needs from Master Plan analysis currently underway

*** Projection does not include additional needs from Master Plan analysis currently underway

Funding Availability from Existing Rate Structures (after bps. expenses & existing debt service & capital)					
Water****	$10.0	$10.0	$10.0	$10.0	$40.0
Wastewater*****	$1.0	$1.0	$1.0	$1.0	$4.0
$'s Available	$11.0	$11.0	$11.0	$11.0	$44.0

**** Water has $.3 million/yr available after all O&M costs; $.1 million/year funds on-going distribution system capital costs with $.2 million/year available to pay bond costs

***** Wastewater has $.2.2 million/yr available after all O&M costs; on-going treatment plant and collection system capital costs are each funded at $.1 million/year with $200,000/year available to pay bond costs

Tax Exempt Debt Costs for New Borrowings ($'s in millions)	All bonds 25 year term			
Annual Bond Costs	0-5 yrs	5-10 yrs	10-15 yrs	15-20 yrs
Water Bond ($60M) (new plant				
25 yr. bond @ 4.7%	$4.220	$4.220	$4.220	$4.220
Wastewater Bonds ($10M 0-5 yrs and				
$10M 5-10 yrs but) @ 4.4%	$0.615	$1.230	$1.230	$1.230
Annual Costs to be Funded from Rate Increases after Usage of Available Funds Listed Above				
Water Utility	$2.220	$2.220	$2.220	$2.220
Wastewater Utility	$0.415	$1.030	$1.030	$1.030

Note: Analaysis uses current operating budget ($12.5 million ($6.5 million water and $6.0 wastewater)

Rate Increase Impacts From Today's Rates for Water ($60 Million Bond in 0-5 years) and Wastewater ($10 million Bond in 0-5 years and $10 million bond in 5-10 years)

% Rate Increase each 5 years	0-5 yrs	5-10 yrs	10-15 yrs	15-20 yrs
Water	34%	0%	0%	0%
Wastewater	6.9%	9.6%	0%	0%
Cumulative % Rate Increase	0-5 yrs	5-10 yrs	10-15 yrs	15-20 yrs
Water	34%	34%	34%	34%
Wastewater	6.9%	16.5%	16.6%	16.5%

Note: 1) Current residential water customer pays about $.409/year before above increases

2) Current residential wastewater customer pays about $.368/year before above increases

Appendix 6 – Bond Funding, MCM Group Analysis

The financial analysis presented in the following pages of Appendix 6 were developed by Bruce Allred and Jim Wrigley of Municipal Capital Markets Group (MCM Group) using inputs provided by the City of Grants Pass. The rate impacts were similarly developed by MCM using the financial inputs from the City of Grants Pass for current rates and budgets.

Grants Pass, Oregon

Water & Waste Water Revenue Bonds, Series 2016 & Series 2017

Water Project Funding

(Current Rates + 100 or 125 bps, 25 Year Maturity)

	Multiple Issues Project Funding			Single Issue
	Series 2016 Cur Rate+100 bps	Series 2017 Cur Rate+125 bps	Combined	Series 2016 Cur Rate+100 bps
Principal	12,225,000	60,840,000	73,065,000	73,025,000
Other Sources	0	0	0	0
Total Sources	12,225,000	60,840,000	73,065,000	73,025,000
Deposit to Project Fund	12,000,000	60,000,000	72,000,000	72,000,000
Est. Costs of issuance [(a)]	225,000	840,000	1,065,000	1,025,000
Total Uses	12,225,000	60,840,000	73,065,000	73,025,000
Total Interest Expense	7,438,402	43,742,453	51,180,854	49,610,879
Bond Statistics				
Average Life	14.050	15.577		15.594
True Interest Cost (TIC)	4.39%	4.68%		4.42%
All Inclusive Cost (AIC)	4.46%	4.69%		4.44%
Dated Date	05/01/2016	06/01/2017	05/01/2016	05/01/2016
Final Maturity	06/01/2041	06/01/2042	06/01/2042	06/01/2041

(a) Estimated costs include underwriter, bond & other counsel, ratings fee, Oregon MDAC, other costs and rounding.

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Grants Pass, Oregon

Water & Waste Water Revenue Bonds, Series 2016 & Series 2017

Water & Waste Water Project Funding

Fiscal Year 6/30	Series 2016 1st Project Funding			Series 2017 2nd Project Funding			Total Debt Service
	Principal	Interest	Total D/S	Principal	Interest	Total D/S	
2016							0
2017	1,175,000	500,530	1,675,530				1,675,530
2018	305,000	445,108	750,108	0	2,614,594	2,614,594	3,364,701
2019	310,000	439,618	749,618	1,605,000	2,614,594	4,219,594	4,969,211
2020	315,000	433,139	748,139	1,635,000	2,581,691	4,216,691	4,964,830
2021	325,000	425,768	750,768	1,675,000	2,543,432	4,218,432	4,969,200
2022	330,000	417,285	747,285	1,720,000	2,500,050	4,220,050	4,967,335
2023	340,000	407,682	747,682	1,770,000	2,450,858	4,220,858	4,968,540
2024	355,000	396,632	751,632	1,820,000	2,394,926	4,214,926	4,966,558
2025	365,000	384,385	749,385	1,885,000	2,331,226	4,216,226	4,965,610
2026	380,000	371,281	751,281	1,955,000	2,261,481	4,216,481	4,967,762
2027	395,000	357,107	752,107	2,030,000	2,186,409	4,216,409	4,968,516
2028	410,000	341,742	751,742	2,110,000	2,105,615	4,215,615	4,967,356
2029	425,000	325,383	750,383	2,200,000	2,018,261	4,218,261	4,968,643
2030	440,000	307,958	747,958	2,295,000	1,924,981	4,219,981	4,967,938
2031	460,000	289,522	749,522	2,390,000	1,825,148	4,215,148	4,964,670
2032	480,000	269,926	749,926	2,500,000	1,719,032	4,219,032	4,968,958
2033	500,000	248,374	748,374	2,610,000	1,606,282	4,216,282	4,964,656
2034	525,000	225,924	750,924	2,735,000	1,482,568	4,217,568	4,968,492
2035	545,000	202,351	747,351	2,865,000	1,352,929	4,217,929	4,965,280
2036	570,000	177,881	747,881	3,000,000	1,217,128	4,217,128	4,965,009
2037	595,000	152,288	747,288	3,145,000	1,074,928	4,219,928	4,967,216
2038	625,000	124,620	749,620	3,290,000	925,855	4,215,855	4,965,475
2039	655,000	95,558	750,558	3,450,000	764,645	4,214,645	4,965,203
2040	685,000	65,100	750,100	3,620,000	595,595	4,215,595	4,965,695
2041	715,000	33,248	748,248	3,800,000	418,215	4,218,215	4,966,463
2042				4,735,000	232,015	4,967,015	4,967,015
Total	12,225,000	7,438,402	19,663,402	60,840,000	43,742,453	104,582,453	124,245,854

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Grants Pass, Oregon

Appendix 6

Appendix 6

Estimated Revenue Available for Debt Service

Fiscal Year 6/30	Series 2016 P&I	Series 2017 P&I	Total Debt Service	Revenue Avail From Base [c]	Other Revenue Source [a]	Total Revenue Avail	Coverage	Excess Revenue [b]
2016	0	0	0					
2017	1,675,530	0	1,675,530	1,687,500	406,912	2,094,412	1.250	418,882
2018	750,108	2,614,594	3,364,701	3,375,000	830,876	4,205,876	1.250	841,175
2019	749,618	4,219,594	4,969,211	5,000,000	1,211,514	6,211,514	1.250	1,242,303
2020	748,139	4,216,691	4,964,830	5,000,000	1,206,037	6,206,037	1.250	1,241,207
2021	750,768	4,218,432	4,969,200	5,000,000	1,211,499	6,211,499	1.250	1,242,300
2022	747,285	4,220,050	4,967,335	5,000,000	1,209,168	6,209,168	1.250	1,241,834
2023	747,682	4,220,858	4,968,540	5,000,000	1,210,674	6,210,674	1.250	1,242,135
2024	751,632	4,214,926	4,966,558	5,000,000	1,208,197	6,208,197	1.250	1,241,639
2025	749,385	4,216,226	4,965,610	5,000,000	1,207,013	6,207,013	1.250	1,241,403
2026	751,281	4,216,481	4,967,762	5,000,000	1,209,702	6,209,702	1.250	1,241,940
2027	752,107	4,216,409	4,968,516	5,000,000	1,210,644	6,210,644	1.250	1,242,129
2028	751,742	4,215,615	4,967,356	5,000,000	1,209,195	6,209,195	1.250	1,241,839
2029	750,383	4,218,261	4,968,643	5,000,000	1,210,804	6,210,804	1.250	1,242,161
2030	747,958	4,219,981	4,967,938	5,000,000	1,209,923	6,209,923	1.250	1,241,985
2031	749,522	4,215,148	4,964,670	5,000,000	1,205,837	6,205,837	1.250	1,241,167
2032	749,926	4,219,032	4,968,958	5,000,000	1,211,197	6,211,197	1.250	1,242,239
2033	748,374	4,216,282	4,964,656	5,000,000	1,205,819	6,205,819	1.250	1,241,164
2034	750,924	4,217,568	4,968,492	5,000,000	1,210,614	6,210,614	1.250	1,242,123
2035	747,351	4,217,929	4,965,280	5,000,000	1,206,600	6,206,600	1.250	1,241,320
2036	747,881	4,217,128	4,965,009	5,000,000	1,206,261	6,206,261	1.250	1,241,252
2037	747,288	4,219,928	4,967,216	5,000,000	1,209,019	6,209,019	1.250	1,241,804
2038	749,620	4,215,855	4,965,475	5,000,000	1,206,844	6,206,844	1.250	1,241,369
2039	750,558	4,214,645	4,965,203	5,000,000	1,206,503	6,206,503	1.250	1,241,301
2040	750,100	4,215,595	4,965,695	5,000,000	1,207,119	6,207,119	1.250	1,241,424
2041	748,248	4,218,215	4,966,463	5,000,000	1,208,078	6,208,078	1.250	1,241,616
2042	0	4,967,015	4,967,015	5,000,000	1,208,769	6,208,769	1.250	1,241,754
Total	19,663,402	104,582,453	124,245,854	125,062,500	30,244,818	155,307,318		31,061,464

(a) Enterprise revenue available from other existing sources. Funds released for other uses at fiscal year end. Other revenue is what is needed to reach coverage requirement.

(b) Represents total net revenues released at fiscal year end for other uses.

(c) Water and waste water est. combined revenue 1st year rate increase of 13.50%, 2nd year cumulative increase of 27.00% and 3rd year cumulative increase of 40.00%. Could use revenue 'Available for Potential Items' to reduce early year's rate increases.

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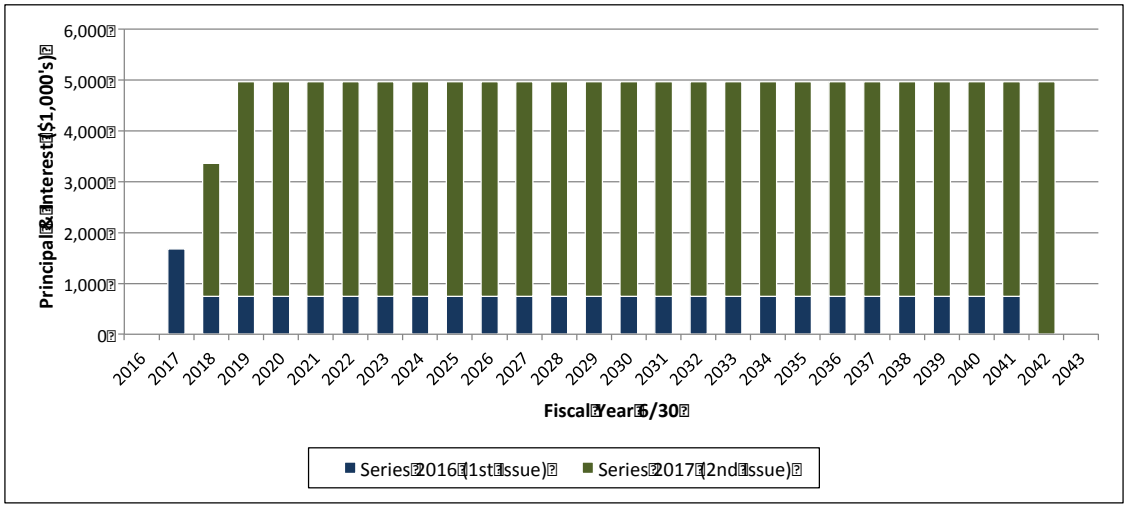
Grants Pass, Oregon

Water & Waste Water Revenue Bonds, Series 2016 & Series 2017

Summary of Debt Service



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Water & Waste Water Revenue Bonds, Series 2016 (Single Issue Only)

Water & Waste Water Project Funding

Fiscal Year 6/30	Water Revenue Bonds, Series 2016 Principal	Interest	Total D/S	Revenue Avail From Base [c]	Other Revenue Source [a]	Total Revenue Avail	Coverage	Excess Net Revenue [b]
2016	0	0	0					
2017	0	3,208,129	3,208,129	3,212,500	797,661	4,010,161	1.250	802,032
2018	1,150,000	2,961,350	4,111,350	4,125,000	1,014,188	5,139,188	1.250	1,027,838
2019	2,075,000	2,940,650	5,015,650	5,025,000	1,244,563	6,269,563	1.250	1,253,913
2020	2,115,000	2,897,283	5,012,283	5,025,000	1,240,353	6,265,353	1.250	1,253,071
2021	2,165,000	2,847,792	5,012,792	5,025,000	1,240,989	6,265,989	1.250	1,253,198
2022	2,225,000	2,791,285	5,016,285	5,025,000	1,245,356	6,270,356	1.250	1,254,071
2023	2,285,000	2,726,538	5,011,538	5,025,000	1,239,422	6,264,422	1.250	1,252,884
2024	2,360,000	2,652,275	5,012,275	5,025,000	1,240,344	6,265,344	1.250	1,253,069
2025	2,445,000	2,570,855	5,015,855	5,025,000	1,244,819	6,269,819	1.250	1,253,964
2026	2,530,000	2,483,080	5,013,080	5,025,000	1,241,349	6,266,349	1.250	1,253,270
2027	2,625,000	2,388,711	5,013,711	5,025,000	1,242,138	6,267,138	1.250	1,253,428
2028	2,725,000	2,286,598	5,011,598	5,025,000	1,239,498	6,264,498	1.250	1,252,900
2029	2,835,000	2,177,871	5,012,871	5,025,000	1,241,088	6,266,088	1.250	1,253,218
2030	2,955,000	2,061,636	5,016,636	5,025,000	1,245,794	6,270,794	1.250	1,254,159
2031	3,075,000	1,937,821	5,012,821	5,025,000	1,241,026	6,266,026	1.250	1,253,205
2032	3,205,000	1,806,826	5,011,826	5,025,000	1,239,783	6,264,783	1.250	1,252,957
2033	3,350,000	1,662,922	5,012,922	5,025,000	1,241,152	6,266,152	1.250	1,253,230
2034	3,500,000	1,512,507	5,012,507	5,025,000	1,240,633	6,265,633	1.250	1,253,127
2035	3,660,000	1,355,357	5,015,357	5,025,000	1,244,196	6,269,196	1.250	1,253,839
2036	3,825,000	1,191,023	5,016,023	5,025,000	1,245,028	6,270,028	1.250	1,254,006
2037	3,995,000	1,019,280	5,014,280	5,025,000	1,242,850	6,267,850	1.250	1,253,570
2038	4,180,000	833,513	5,013,513	5,025,000	1,241,891	6,266,891	1.250	1,253,378
2039	4,375,000	639,143	5,014,143	5,025,000	1,242,678	6,267,678	1.250	1,253,536
2040	4,580,000	435,705	5,015,705	5,025,000	1,244,631	6,269,631	1.250	1,253,926
2041	4,790,000	222,735	5,012,735	5,025,000	1,240,919	6,265,919	1.250	1,253,184
2042								
Total	73,025,000	49,610,879	122,635,879	122,912,500	30,382,348	153,294,848		30,658,970

(a) Enterprise revenue available from other existing sources. Funds released for other uses at fiscal year end. Other revenue is what is needed to reach coverage requirement.
(b) Represents total net revenues released at fiscal year end for other uses.
(c) Water and waste water est. combined revenue 1st year rate increase of 25.70%, 2nd year cumulative increase of 33.00% and 3rd year cumulative increase of 40.20%. Could use revenue 'Available for Potential Items' to reduce early year's rate increases.

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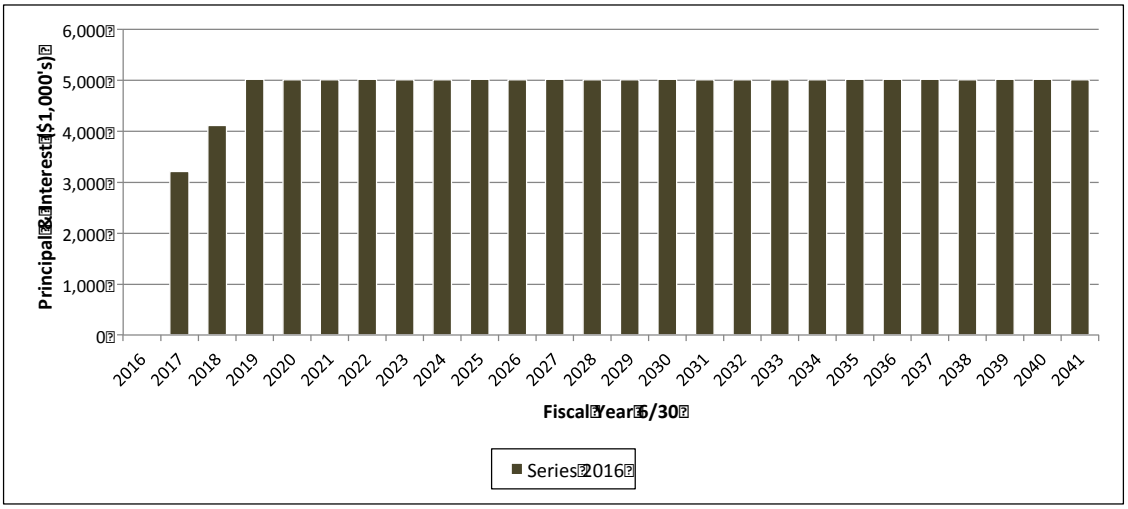
Water & Waste Water Revenue Bonds, Series 2016 (Single Issue Only)

Summary of Debt Service



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Grants Pass, Oregon

Water & Waste Water Revenue Bonds, Multiple & Single Issue Options

Estimated Revenue Available for New Debt Service

Multiple Issue Option (Series 2016 & Series 2017)

New Debt Service Payments	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
New Debt Service Revenues:																
Revenue Base	11,520,510	11,520,510	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000
Rate Increase (cumulative)			0.0%	13.5%	27.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
New Revenue Available for DS			0	1,687,500	3,375,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
New Debt Service																
Series 2016			0	1,675,530	750,108	749,618	748,139	750,768	747,285	747,682	751,632	749,385	751,281	752,107	751,742	750,383
Series 2017					2,614,594	4,219,594	4,216,691	4,218,432	4,220,050	4,220,858	4,214,926	4,216,226	4,216,481	4,216,409	4,215,615	4,218,261
Combined Debt Service			0	1,675,530	3,364,701	4,969,211	4,964,830	4,969,200	4,967,335	4,968,540	4,966,558	4,965,610	4,967,762	4,968,516	4,967,356	4,968,643
Revenue vs. DS Difference			0	11,970	10,299	30,789	35,171	30,801	32,666	31,461	33,443	34,390	32,239	31,485	32,644	31,357
Coverage Requirements																
New Revenue Available for DS			0	1,687,500	3,375,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Net Revenue from Funds (Needs)			0	406,912	830,876	1,211,514	1,206,037	1,211,499	1,209,168	1,210,674	1,208,197	1,207,013	1,209,702	1,210,644	1,209,195	1,210,804
Total Coverage Revenue Avail			0	2,094,412	4,205,876	6,211,514	6,206,037	6,211,499	6,209,168	6,210,674	6,208,197	6,207,013	6,209,702	6,210,644	6,209,195	6,210,804
Coverage Ratio				1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25

Single Issue Option (Series 2016 Only)

New Debt Service Payments	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
New Debt Service Revenues:																
Revenue Base	11,520,510	11,520,510	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000
Rate Increase (cumulative)			0.0%	25.7%	33.0%	40.2%	40.2%	40.2%	40.2%	40.2%	40.2%	40.2%	40.2%	40.2%	40.2%	40.2%
New Revenue Available for DS			0	3,212,500	4,125,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000
New Debt Service																
Series 2016 Only			0	3,208,129	4,111,350	5,015,650	5,012,283	5,012,792	5,016,285	5,011,538	5,012,275	5,015,855	5,013,080	5,013,711	5,011,598	5,012,871
Revenue vs. DS Difference			0	4,371	13,650	9,350	12,718	12,209	8,715	13,463	12,725	9,145	11,921	11,290	13,402	12,130
Coverage Requirements																
New Revenue Available for DS			0	3,212,500	4,125,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000	5,025,000
Net Revenue from Funds (Needs)			0	797,661	1,014,188	1,244,563	1,240,353	1,240,989	1,245,356	1,239,422	1,240,344	1,244,819	1,241,349	1,242,138	1,239,498	1,241,088
Total Coverage Revenue Avail			0	4,010,161	5,139,188	6,269,563	6,265,353	6,265,989	6,270,356	6,264,422	6,265,344	6,269,819	6,266,349	6,267,138	6,264,498	6,266,088
Coverage Ratio				1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25

Estimate of Net Revenue From Funds (Existing Projects Funding - CAFR Based)

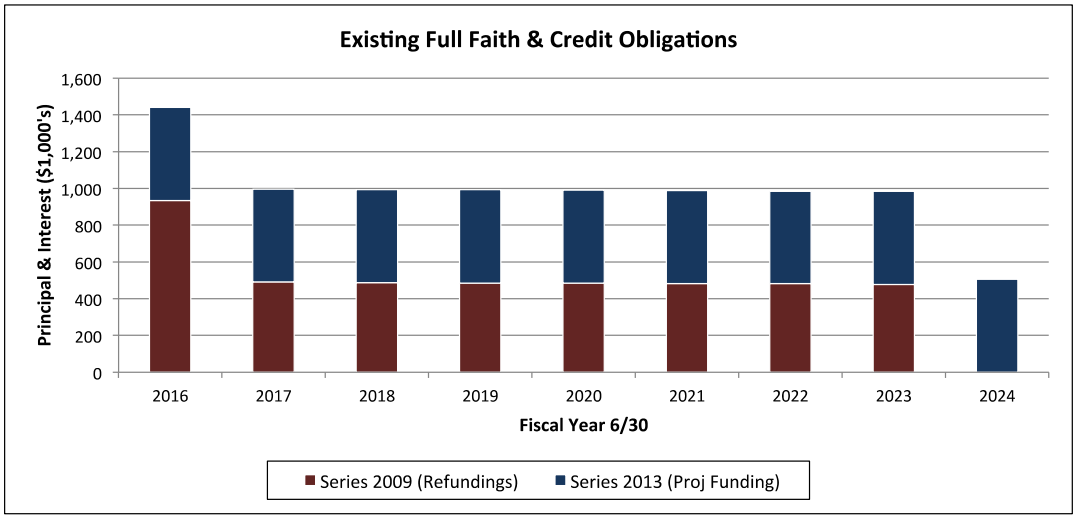
Fiscal Year	2014 (act)	2015	Estimated Fix 2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Combined Water/Sewer Funds:																
Revenues:																
Revenues	11,520,510	11,520,510	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000	12,500,000
Other Oper Revenues	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671	124,671
Total Revenues	11,645,181	11,645,181	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671	12,624,671
Expenses:																
Total Operating Exp	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705
Existing DS Pmts	1,448,983	1,446,733	1,440,883	995,483	992,583	992,023	991,363	988,500	984,100	982,700	504,900	0	0	0	0	0
Est. Capital Proj Funding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Expenses	8,824,688	8,822,438	8,816,588	8,371,188	8,368,288	8,367,728	8,367,068	8,364,205	8,359,805	8,358,405	7,880,605	7,375,705	7,375,705	7,375,705	7,375,705	7,375,705
Net Revenue From Funds	2,820,494	2,822,744	3,808,084	4,253,484	4,256,384	4,256,944	4,257,604	4,260,466	4,264,866	4,266,266	4,744,066	5,248,966	5,248,966	5,248,966	5,248,966	5,248,966

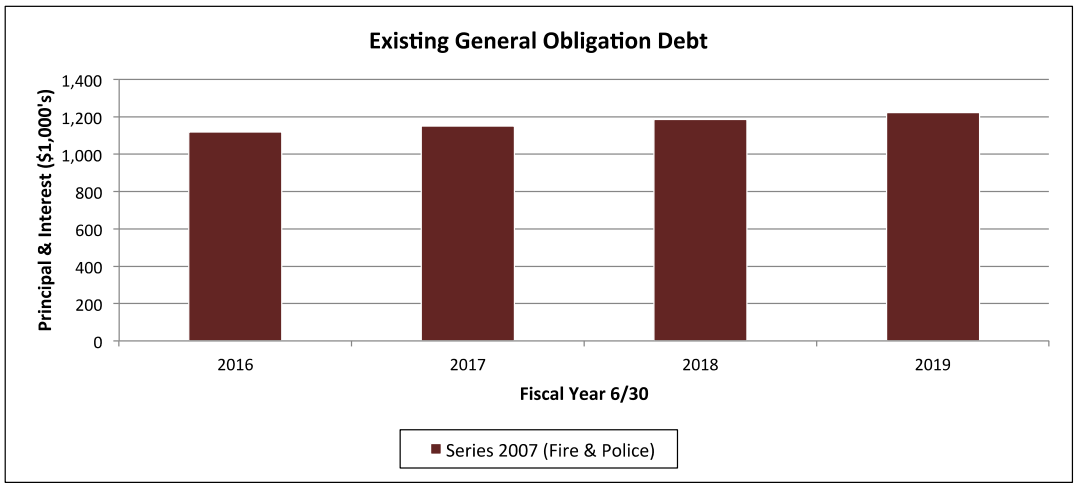
PROVIDED FOR DISCUSISON PURPOSES ONLY

MCM Group, Inc. 8/27/15 18:10

Grants Pass, Oregon
Water & Waste Water Revenue Bonds, Series 2016 & Series 2017

Summary of Existing Debt Service





PROVIDED FOR DISCUSSION PURPOSES ONLY

Chart of 2 issues in 1,000's

Date (Fiscal)	Existing Debt	Series 2016 (1st Issue)	Series 2017 (2nd Issue)
2016	0.0	0.0	0.0
2017	0.0	1,675.5	0.0
2018	0.0	750.1	2,614.6
2019	0.0	749.6	4,219.6
2020	0.0	748.1	4,216.7
2021	0.0	750.8	4,218.4
2022	0.0	747.3	4,220.0
2023	0.0	747.7	4,220.9
2024	0.0	751.6	4,214.9
2025	0.0	749.4	4,216.2
2026	0.0	751.3	4,216.5
2027	0.0	752.1	4,216.4
2028	0.0	751.7	4,215.6
2029	0.0	750.4	4,218.3
2030	0.0	748.0	4,220.0
2031	0.0	749.5	4,215.1
2032	0.0	749.9	4,219.0
2033	0.0	748.4	4,216.3
2034	0.0	750.9	4,217.6
2035	0.0	747.4	4,217.9
2036	0.0	747.9	4,217.1
2037	0.0	747.3	4,219.9
2038	0.0	749.6	4,215.9
2039	0.0	750.6	4,214.6
2040	0.0	750.1	4,215.6
2041	0.0	748.2	4,218.2
2042	0.0	0.0	4,967.0
2043	0.0	0.0	0.0

Chart of Series 2016 Rev Bond in 1,000's

Date (Fiscal)	Existing Debt	Series 2016
2016	#REF!	0.0
2017	#REF!	3,208.1
2018	#REF!	4,111.4
2019	#REF!	5,015.7
2020	#REF!	5,012.3
2021	#REF!	5,012.8
2022	#REF!	5,016.3
2023	#REF!	5,011.5
2024	#REF!	5,012.3
2025	#REF!	5,015.9
2026	#REF!	5,013.1
2027	#REF!	5,013.7
2028	#REF!	5,011.6
2029	#REF!	5,012.9
2030	#REF!	5,016.6
2031	#REF!	5,012.8
2032	#REF!	5,011.8
2033	#REF!	5,012.9
2034	#REF!	5,012.5
2035	#REF!	5,015.4
2036	#REF!	5,016.0
2037	#REF!	5,014.3
2038	#REF!	5,013.5
2039	#REF!	5,014.1
2040	#REF!	5,015.7
2041	#REF!	5,012.7

Charts of Existing Debt Service

Full Faith & Credit Debt

Date (Fiscal)	Series 2009 (Refundings)	Series 2013 (Proj Funding)
2016	933.7	507.2
2017	491.1	504.4
2018	486.1	506.5
2019	485.7	506.4
2020	484.7	506.7
2021	483.4	505.1
2022	481.2	502.9
2023	478.4	504.3
2024		504.9

Charts of Existing Debt Service

General Obligation Bonds

Date (Fiscal)	Series 2007 (Fire & Police)
2016	1,117.8
2017	1,151.3
2018	1,185.8
2019	1,222.0

Existing Debt

FF&C Series 2009 (water project refunding)

	date	principal	coupon	interest	P&I	Net D/S	
	6/1/10	695,000.00	2.00%	127,735.52	822,735.52	822,735.52	8,120,000.00
	6/1/11	1,080,000.00	3.00%	275,312.50	1,355,312.50	1,355,312.50	7,040,000.00
	6/1/12	1,095,000.00	2.23%	242,912.50	1,337,912.50	1,337,912.50	5,945,000.00
	6/1/13	725,000.00	3.00%	218,512.50	943,512.50	943,512.50	5,220,000.00
	6/1/14	745,000.00	4.00%	196,762.50	941,762.50	941,762.50	4,475,000.00
	6/1/15	775,000.00	3.00%	166,962.50	941,962.50	941,962.50	3,700,000.00
	6/1/16	790,000.00	3.50%	143,712.50	933,712.50	933,712.50	2,910,000.00
	6/1/17	375,000.00	4.00%	116,062.50	491,062.50	491,062.50	2,535,000.00
	6/1/18	385,000.00	4.00%	101,062.50	486,062.50	486,062.50	2,150,000.00
	6/1/19	400,000.00	4.00%	85,662.50	485,662.50	485,662.50	1,750,000.00
	6/1/20	415,000.00	3.92%	69,662.50	484,662.50	484,662.50	1,335,000.00
	6/1/21	430,000.00	4.00%	53,400.00	483,400.00	483,400.00	905,000.00
	6/1/22	445,000.00	4.00%	36,200.00	481,200.00	481,200.00	460,000.00
	6/1/23	460,000.00	4.00%	18,400.00	478,400.00	478,400.00	0
Total		8,815,000.00	0	1,852,360.52	10,667,360.52	10,667,360.52	0

Proposed Debt Service

1st of 2 issues - Series 2016 Rev Bond

	date	principal	coupon	interest	P&I	Net D/S	
	6/30/16	0	0	0	0	0.00	12,225,000.00
	6/30/17	1,175,000.00	1.44%	500,529.79	1,675,529.79	1,675,529.79	11,050,000.00
	6/30/18	305,000.00	1.80%	445,107.50	750,107.50	750,107.50	10,745,000.00
	6/30/19	310,000.00	2.09%	439,617.50	749,617.50	749,617.50	10,435,000.00
	6/30/20	315,000.00	2.34%	433,138.50	748,138.50	748,138.50	10,120,000.00
	6/30/21	325,000.00	2.61%	425,767.50	750,767.50	750,767.50	9,795,000.00
	6/30/22	330,000.00	2.91%	417,285.00	747,285.00	747,285.00	9,465,000.00
	6/30/23	340,000.00	3.25%	407,682.00	747,682.00	747,682.00	9,125,000.00
	6/30/24	355,000.00	3.45%	396,632.00	751,632.00	751,632.00	8,770,000.00
	6/30/25	365,000.00	3.59%	384,384.50	749,384.50	749,384.50	8,405,000.00
	6/30/26	380,000.00	3.73%	371,281.00	751,281.00	751,281.00	8,025,000.00
	6/30/27	395,000.00	3.89%	357,107.00	752,107.00	752,107.00	7,630,000.00
	6/30/28	410,000.00	3.99%	341,741.50	751,741.50	751,741.50	7,220,000.00
	6/30/29	425,000.00	4.10%	325,382.50	750,382.50	750,382.50	6,795,000.00
	6/30/30	440,000.00	4.19%	307,957.50	747,957.50	747,957.50	6,355,000.00
	6/30/31	460,000.00	4.26%	289,521.50	749,521.50	749,521.50	5,895,000.00
	6/30/32	480,000.00	4.49%	269,925.50	749,925.50	749,925.50	5,415,000.00
	6/30/33	500,000.00	4.49%	248,373.50	748,373.50	748,373.50	4,915,000.00
	6/30/34	525,000.00	4.49%	225,923.50	750,923.50	750,923.50	4,390,000.00
	6/30/35	545,000.00	4.49%	202,351.00	747,351.00	747,351.00	3,845,000.00
	6/30/36	570,000.00	4.49%	177,880.50	747,880.50	747,880.50	3,275,000.00
	6/30/37	595,000.00	4.65%	152,287.50	747,287.50	747,287.50	2,680,000.00
	6/30/38	625,000.00	4.65%	124,620.00	749,620.00	749,620.00	2,055,000.00
	6/30/39	655,000.00	4.65%	95,557.50	750,557.50	750,557.50	1,400,000.00
	6/30/40	685,000.00	4.65%	65,100.00	750,100.00	750,100.00	715,000.00
	6/30/41	715,000.00	4.65%	33,247.50	748,247.50	748,247.50	0.00
Total		12,225,000.00	0	7,438,401.79	19,663,401.79	19,663,401.79	0.00

Series 2018 Rev Bond 2nd of 2 issues

	date	principal	coupon	interest	P&I	Series 2016 DS	Net D/S	
	6/30/17	0	0	0	0	1,406,013.75	1,406,013.75	60,840,000.00
	6/30/18	0.00	0.00%	2,614,593.50	2,614,593.50	750,107.50	3,364,701.00	60,840,000.00
	6/30/19	1,605,000.00	2.05%	2,614,593.50	4,219,593.50	749,617.50	4,969,211.00	59,235,000.00
	6/30/20	1,635,000.00	2.34%	2,581,691.00	4,216,691.00	748,138.50	4,964,829.50	57,600,000.00
	6/30/21	1,675,000.00	2.59%	2,543,432.00	4,218,432.00	750,767.50	4,969,199.50	55,925,000.00
	6/30/22	1,720,000.00	2.86%	2,500,049.50	4,220,049.50	747,285.00	4,967,334.50	54,205,000.00
	6/30/23	1,770,000.00	3.16%	2,450,857.50	4,220,857.50	747,682.00	4,968,539.50	52,435,000.00
	6/30/24	1,820,000.00	3.50%	2,394,925.50	4,214,925.50	751,632.00	4,966,557.50	50,615,000.00
	6/30/25	1,885,000.00	3.70%	2,331,225.50	4,216,225.50	749,384.50	4,965,610.00	48,730,000.00
	6/30/26	1,955,000.00	3.84%	2,261,480.50	4,216,480.50	751,281.00	4,967,761.50	46,775,000.00
	6/30/27	2,030,000.00	3.98%	2,186,408.50	4,216,408.50	752,107.00	4,968,515.50	44,745,000.00
	6/30/28	2,110,000.00	4.14%	2,105,614.50	4,215,614.50	751,741.50	4,967,356.00	42,635,000.00
	6/30/29	2,200,000.00	4.24%	2,018,260.50	4,218,260.50	750,382.50	4,968,643.00	40,435,000.00
	6/30/30	2,295,000.00	4.35%	1,924,980.50	4,219,980.50	747,957.50	4,967,938.00	38,140,000.00
	6/30/31	2,390,000.00	4.44%	1,825,148.00	4,215,148.00	749,521.50	4,964,669.50	35,750,000.00
	6/30/32	2,500,000.00	4.51%	1,719,032.00	4,219,032.00	749,925.50	4,968,957.50	33,250,000.00
	6/30/33	2,610,000.00	4.74%	1,606,282.00	4,216,282.00	748,373.50	4,964,655.50	30,640,000.00
	6/30/34	2,735,000.00	4.74%	1,482,568.00	4,217,568.00	750,923.50	4,968,491.50	27,905,000.00
	6/30/35	2,865,000.00	4.74%	1,352,929.00	4,217,929.00	747,351.00	4,965,280.00	25,040,000.00
	6/30/36	3,000,000.00	4.74%	1,217,128.00	4,217,128.00	747,880.50	4,965,008.50	22,040,000.00
	6/30/37	3,145,000.00	4.74%	1,074,928.00	4,219,928.00	747,287.50	4,967,215.50	18,895,000.00
	6/30/38	3,290,000.00	4.90%	925,855.00	4,215,855.00	749,620.00	4,965,475.00	15,605,000.00
	6/30/39	3,450,000.00	4.90%	764,645.00	4,214,645.00	750,557.50	4,965,202.50	12,155,000.00
	6/30/40	3,620,000.00	4.90%	595,595.00	4,215,595.00	750,100.00	4,965,695.00	8,535,000.00
	6/30/41	3,800,000.00	4.90%	418,215.00	4,218,215.00	748,247.50	4,966,462.50	4,735,000.00
	6/30/42	4,735,000.00	4.90%	232,015.00	4,967,015.00	0.00	4,967,015.00	0
Total		60,840,000.00	0	43,742,452.50	104,582,452.50	19,393,885.75	123,976,338.25	0

Single Issue - Series 2016 Rev Bond

	date	principal	coupon	interest	P&I	Net DS	Bond Balance
	6/30/16	0	0	0	0	0.00	73,025,000.00
	6/30/17	0	0	3,208,129.17	3,208,129.17	3,208,129.17	73,025,000.00
	6/30/18	1,150,000.00	1.80%	2,961,350.00	4,111,350.00	4,111,350.00	71,875,000.00
	6/30/19	2,075,000.00	2.09%	2,940,650.00	5,015,650.00	5,015,650.00	69,800,000.00
	6/30/20	2,115,000.00	2.34%	2,897,282.50	5,012,282.50	5,012,282.50	67,685,000.00
	6/30/21	2,165,000.00	2.61%	2,847,791.50	5,012,791.50	5,012,791.50	65,520,000.00
	6/30/22	2,225,000.00	2.91%	2,791,285.00	5,016,285.00	5,016,285.00	63,295,000.00
	6/30/23	2,285,000.00	3.25%	2,726,537.50	5,011,537.50	5,011,537.50	61,010,000.00
	6/30/24	2,360,000.00	3.45%	2,652,275.00	5,012,275.00	5,012,275.00	58,650,000.00
	6/30/25	2,445,000.00	3.59%	2,570,855.00	5,015,855.00	5,015,855.00	56,205,000.00
	6/30/26	2,530,000.00	3.73%	2,483,079.50	5,013,079.50	5,013,079.50	53,675,000.00
	6/30/27	2,625,000.00	3.89%	2,388,710.50	5,013,710.50	5,013,710.50	51,050,000.00
	6/30/28	2,725,000.00	3.99%	2,286,598.00	5,011,598.00	5,011,598.00	48,325,000.00
	6/30/29	2,835,000.00	4.10%	2,177,870.50	$	5,012,870.50	45,490,000.00
	6/30/30	2,955,000.00	4.19%	2,061,635.50	5,016,635.50	5,016,635.50	42,535,000.00
	6/30/31	3,075,000.00	4.26%	1,937,821.00	5,012,821.00	5,012,821.00	39,460,000.00
	6/30/32	3,205,000.00	4.49%	1,806,826.00	5,011,826.00	5,011,826.00	36,255,000.00
	6/30/33	3,350,000.00	4.49%	1,662,921.50	5,012,921.50	5,012,921.50	32,905,000.00
	6/30/34	3,500,000.00	4.49%	1,512,506.50	5,012,506.50	5,012,506.50	29,405,000.00
	6/30/35	3,660,000.00	4.49%	1,355,356.50	5,015,356.50	5,015,356.50	25,745,000.00
	6/30/36	3,825,000.00	4.49%	1,191,022.50	5,016,022.50	5,016,022.50	21,920,000.00
	6/30/37	3,995,000.00	4.65%	1,019,280.00	5,014,280.00	5,014,280.00	17,925,000.00
	6/30/38	4,180,000.00	4.65%	833,512.50	5,013,512.50	5,013,512.50	13,745,000.00
	6/30/39	4,375,000.00	4.65%	639,142.50	5,014,142.50	5,014,142.50	9,370,000.00
	6/30/40	4,580,000.00	4.65%	435,705.00	5,015,705.00	5,015,705.00	4,790,000.00
	6/30/41	4,790,000.00	4.65%	222,735.00	5,012,735.00	5,012,735.00	0
Total		73,025,000.00	0	49,610,878.67	122,635,878.67	122,635,878.67	0

FF&C Series 2013 (water project)

	date	principal	coupon	interest	P&I	Net D/S	
	6/30/13	0	0	25,052.44	25,052.44	25,052.44	4,620,000.00
	6/30/14	370,000.00	2.00%	137,220.00	507,220.00	507,220.00	4,250,000.00
	6/30/15	375,000.00	2.00%	129,770.00	504,770.00	504,770.00	3,875,000.00
	6/30/16	385,000.00	2.00%	122,170.00	507,170.00	507,170.00	3,490,000.00
	6/30/17	390,000.00	2.00%	114,420.00	504,420.00	504,420.00	3,100,000.00
	6/30/18	400,000.00	2.00%	106,520.00	506,520.00	506,520.00	2,700,000.00
	6/30/19	410,000.00	3.01%	96,360.00	506,360.00	506,360.00	2,290,000.00
	6/30/20	425,000.00	4.00%	81,700.00	506,700.00	506,700.00	1,865,000.00
	6/30/21	440,000.00	3.68%	65,100.00	505,100.00	505,100.00	1,425,000.00
	6/30/22	455,000.00	4.00%	47,900.00	502,900.00	502,900.00	970,000.00
	6/30/23	475,000.00	4.00%	29,300.00	504,300.00	504,300.00	495,000.00
	6/30/24	495,000.00	4.00%	9,900.00	504,900.00	504,900.00	0
Total		4,620,000.00	0	965,412.44	5,585,412.44	5,585,412.44	0

GENERAL OBLIGATION BONDS, SERIES 2007 - POLICE & FIRE PROJECTS

	date	principal	coupon	interest	P&I	Net D/S	
	6/1/08	630,000.00	4.00%	390,445.00	1,020,445.00	1,020,445.00	9,190,000.00
	6/1/09	700,000.00	4.00%	387,000.00	1,087,000.00	1,087,000.00	8,490,000.00
	6/1/10	560,000.00	4.00%	359,000.00	919,000.00	919,000.00	7,930,000.00
	6/1/11	630,000.00	4.00%	336,600.00	966,600.00	966,600.00	7,300,000.00
	6/1/12	685,000.00	4.00%	311,400.00	996,400.00	996,400.00	6,615,000.00
	6/1/13	740,000.00	4.00%	284,000.00	1,024,000.00	1,024,000.00	5,875,000.00
	6/1/14	800,000.00	4.00%	254,400.00	1,054,400.00	1,054,400.00	5,075,000.00
	6/1/15	865,000.00	4.00%	222,400.00	1,087,400.00	1,087,400.00	4,210,000.00
	6/1/16	930,000.00	5.00%	187,800.00	1,117,800.00	1,117,800.00	3,280,000.00
	6/1/17	1,010,000.00	5.00%	141,300.00	1,151,300.00	1,151,300.00	2,270,000.00
	6/1/18	1,095,000.00	4.00%	90,800.00	1,185,800.00	1,185,800.00	1,175,000.00
	6/1/19	1,175,000.00	4.00%	47,000.00	1,222,000.00	1,222,000.00	0
Total		9,820,000.00	0	3,012,145.00	12,832,145.00	12,832,145.00	0

Appendix 7 – DB vs DBO Comparison (PAVE Committee Presentation)

City of Grants Pass

PAVE Committee

Water and Wastewater Strategic Plan

August 11, 2015

EISENHARDT GROUP

NOTE: To avoid confusion and conflict with revisions made subsequent to the August 11th PAVE Committee session, only the PowerPoint slides from Topic # 2 titled: "Task 1 – Strategic Plan – New Facilities" are included in this Appendix 7. Other materials presented and discussed on Aug. 11th are available from PAVE Committee meeting notes and records.

TOPIC # 2
Task I – Strategic Plan - New Facilities

a) Confirm July 22 Outcome

b) Reconfirm Strategy for Wastewater Plant Expansion

c) Complete Procurement Alts. for New Water Plant

- Key Tasks for design, construction, startup, ops
- Revisit EGI Assessment Checklist and AWWA Benchmark
- Further discuss candidate options for risks, benefits, control
- Comparison of Risk Assignment and Guarantees
- Examples of Partnerships and $ Savings

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TOPIC # 2
Confirm July 22 Outcomes

Procurement Objectives

Share Risks

- Breadth & depth of resources
- Minimize capital costs and have predictable life-cycle costs
- Minimize rate payer impacts (short & long term)

Address Additional Community Priorities

- Sustainability & energy efficiency
- Be a good neighbor
- Resource for economic development
- Fair treatment of employees

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TOPIC # 2
Confirm July 22 Outcomes

- Wastewater treatment and water treatment facilities need not follow the same procurement paths
  - Needs, technology impacts, new skill requirements are different
- SIGNIFICANT skills and staff augmentation required for City staff to be successful with new water plant design, construction, startup, operations and simultaneous operation of existing water plant and its decommissioning
- Existing City staff is dedicated and the City is fortunate to have them
- Wastewater facilities and needs map well to Design / Build with City staff operation and usage of consultants or Traditional Model
- New water plant is candidate for Design / Build with City staff operations and significant consultant augmentation or DBO procurement. Additional discussion of these alternatives at next session

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Topic # 2
Reconfirm Strategy for Wastewater Facilities

- Facility needs are upgrades and additional basins of existing equipment, technology, and processes
- Wastewater facilities and needs map well to Design / Build with City staff operation and usage of consultants or Traditional Model
  - DB approach provides potential benefits as listed in comparison chart
  - Traditional model places additional project / program management workload on City staff
- Exception to above is upgraded SCADA and MMS systems and capabilities envisioned. These can and should be pursued as a separate procurement

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TOPIC # 2
Water Plant Procurement Alternatives

1) Last session set aside Concession and IOU options

2) Last session acknowledged the need for significant augment for operating staff (numbers and expertise)

3) Benefits of Design/ Build single contract and DBO identified

4) Identified two candidate approaches that provide such:
   - Design / Build with City Ops. and significant consultant augmentation
   - Design / Build / Operate single contract

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TOPIC # 2
DB and DBO Overviews

Design / Build (DB) – one entity contract and City staff operates

1) Integrated process: overlapped design & constr. – typically fast tracked.
2) Two prime players: owner/operator and design-build entity.
3) One contract – owner to design-builder with single point of responsibility.
4) Entity can take on many forms including: Integrated design-build firm; Contractor led; Designer led; Joint venture; or Developer led.
5) The design-builder is responsible to design and construct the project to meet the performance standards set forth by the owner/operator in the contract
6) Significant operating staff requirements and participation in design, construction, startup
7) With respect to any prescriptive designs or specifications, the design-builder is responsible for discovering any inconsistency between the prescriptive requirements but the owner remains responsible for the cost to reconcile the inconsistent standards.

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TOPIC # 2
DB and DBO Overviews

Design / Build (DB) – Key Considerations

1) Cost efficiencies compared to Tradition DBB
   - fewer change orders, claims, litigation
   - earlier ability to have firm costs
   - change orders very limited (typically only owner requested require new $'s)
2) Delivers project more quickly than DBB or CMR
3) Owner should specify performance requirements not prescriptive specifications
4) DB team quals are essential procurement emphasis (costs a factor, but .....)
5) DB team, not owner / operator handles design details
6) City staff must make a "mental shift" to a different way of delivering a project
7) City responsible for operating staff training and performance
8) City staff and performance key to successful startup and demonstration of facility
9) Operating costs & systems are City responsibility

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TOPIC # 2
DB and DBO Overviews

Design, Build, Operate (DBO) – one contract with private sector

1) Guarantees for costs (capital & operating) , permits, schedule, regulatory compliance, systems performance, maintenance, warranty protections, proper staffing all possible
2) City staff transitions to become employees of DBO firm
3) City control and ownership of facilities retained by City
4) City responsible for authorizing and funding future capital expenditures as justified to City
5) Incentive saving programs can be included in contract
6) Corporate guarantee provided and bonding can be requested
7) Typically contract is long term (20 years)
8) Early termination for cause or for convenience

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TOPIC # 2
DB and DBO Overviews

Design, Build, Operate (DBO) – Key Considerations

1) Water Plant staff transitions to private sector
2) City retains ownership and control but control through contract T&C's which must be carefully and thoughtfully developed
3) City control and management through contract provisions not direct management of City staff (changed approach)
4) Operational costs adjusted annually by flows & inflation index
5) Proper maintenance, warranty protections, systems, and incentive savings included in contract workscope and guarantees
6) City responsible for authorizing and funding future upgrades as justified
7) Limited number of experienced, capable firms
8) Demonstrated performance history of successful projects and $ savings in both construction and operations (short & long term)
9) Process complies with Oregon Resolution 2131

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TOPIC # 2
List of Key Operations Staff Tasks - Handout

	Tasks to Bring New Water Plant On-Line	DBO avoids / limits
Design	Develop RFQ/scope to engage a designer/provide input	
	Development & review preliminary scope or design	
	Procure construction manager (designer oversight)	
	Provide detailed review of construction drawings and specs.	x
	· Site plan workshop	
	· Process workshop	
	· Control systems workshop	
	· Electrical workshop	
	· O&M workshop	x
	· Start-up and Commissioning workshop	x
	Additional Designer services (environmental work, permitting, RofW, hearings, project funding submissions)	
	Input into prep. of Bid package (design and bidders info)	

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TOPIC # 2
List of Key Operations Staff Tasks - Handout

	Tasks to Bring New Water Plant On-Line		
Build	Solicit and review bids		
	Pre-qualification?		
	Select Contractor(s)		
	Select construction manager to provide construction expertise to project team during all pre construction phases, doc control, tracking, evaluation of payments, schedule control, commissioning		
	Set up and involvement in dispute resolution process		x
	Designer maintains limited` oversight of work		x
	Provide inspection		
	Pre startup testing		x

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TOPIC # 2
List of Key Operations Tasks - Handout

	Tasks to Bring New Water Plant On-Line		
	Commissioning of equipment and facilities		
	Computerized Maintenance Management System (CMMS)		x
	Cataloging of assets into Asset Management System		x
O	Laboratory Information Systems (LIMS)		x
P	Reporting metrics for facility operations and performance		x
E	Staff training for new equipment and facility operations and maintenance		x
R	Startup planning and preparation		x
A	Continued operation of existing facilities to meet regulatory requirements		x
T	Skills training and skills augmentation for existing staff		x
E	Development and usage of standard operating procedures (SOPs)		x
	Establishment of a useable set of reference documents to include O&M manuals, SOPs, maintenance work plan procedures and practices, safety & training		x
	Warranty protection requirements for new equipment and facilities		x

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TOPIC # 2
List of Key Operations Staff Tasks – Handout

	Tasks to Bring New Water Plant On-Line		
	Potential consolidation of plant operations and maintenance staff and shops to the main plant location upon completion of construction		
O	Initiation of formalized cross training sessions for ops., maint., and lab		X
P	Expanded involvement of ops. and maint. staff, to include formalized sessions, in facility planning, layouts, equipment specifics and specifications, maintenance requirements and accessibility for maintenance		X
E	Cataloguing of the skill sets necessary for new facilities as compared to those currently operated		X
R	Updated position descriptions and responsibilities for new facilities		X
A	SCADA system training (operations and maintenance), startup, and operational integration		X
T	Startup testing		X
	Water quality analysis		X
	Decommissioning of old plant		

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TOPIC # 2
Assessment Checklist and AWWA Benchmarks

Assessment Checklist Items for Above Average or Best Practice

- Regulatory Compliance
- Cost Containment
- Distribution & Collection Sys. Performance & Maintenance

Assessment Checklist Items for Improvement and Upgrade

- Asset Management Systems
- Systems Development and Implementation
- Usage of Automation & SCADA Systems
- Maintenance Management System
- Laboratory Management (usage of LIMS)
- Security
- Systems for energy efficiency & chemical usage
- Human Resource Systems & Staff Training

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TOPIC # 2
Assessment Checklist and AWWA Benchmarks

AWWA Benchmark Description	Quartile Performance			
	Top	3rd	2nd	Bottom
#1 Customer Accounts Per Employee, Water	x			
#2 Customer Accounts per Employee, Wastewater (WW)		x		
#3 Million Gallons Delivered Per Day Per Employee, Water		x		
#4 Million Gallons Delivered Per Day Per Employee, WW			x	
#5 Operating and Maintenance Cost per Account, Water		x		
#6 Operating and Maintenance Cost per Account, WW	x			
#7 Water Distribution Sys. Breaks per 100 miles of Pipe		x		
#8 Col. Sys. Integrity, WW (failures per 100 miles of pipe)			x	
#9 Distribution System Real Water Loss	x			

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TOPIC # 2 - Evaluation of Procurement Alternatives, Risk Transfers, Benefits and Control

	Conv	D/B ✔	Conv&CO	DBO ✔	D/B/F/O	Concession	IOU
Evaluation Factors							
Policy Setting	City	Some	Some	Some	Some	Some	Very Ltd.
Control	City	Some	Some	Some	Some	Ltd.	Very Ltd.
Service Levels	City	City	City	City	City	Shared	Ltd.
Guarantees							
* Costs	No	Ltd.	Ltd.	Yes	Yes	Yes	Ltd.
* Schedule	No	Ltd.	Ltd.	Yes	Yes	Yes	Ltd.
* Regulatory	No	Ltd.	Ltd.	Yes	Yes	Yes	Yes
Risk Assumption by Company	Ltd.	Ltd.	Ltd.	Yes	Yes	Yes	Yes
Financing	City	City	City	City	City/Priv	City/Priv.	Private
Cost of Financing	5%	5%	5%	5%	5+%	8-12%	12+%
$'s to City	No	No	No	Modest	Modest	Yes	Yes
Site Selection	City	City	City	City	City	City	Partial
Feasibility Studies	City	Private	City	Private	Private	Private	Private
Permitting	City	City	City	Ltd.	Ltd.	Private	Private
Technology Selection	City	Ltd.	City	Both	Both	Ltd.	Very Ltd.
Design	Separate Entities	One Entity	Separate Entities	One Entity	One Entity	One Entity	One Entity
Construction							
Start-up		Separate					
Performance Responsibility	Multi.	Multi.	Multi.	One	One	One	One
Maintenance	City	City	CO	CO	CO	Priv.	Priv.
Repair & Replacement	City	City	Shared	Shared	Shared	Priv.	Priv.
Operations & Systems	City	City	Shared	CO	CO	Priv.	Priv.
Regulatory Stds.	City	City	Shared	CO	CO	Priv.	Priv.
Demonstrated Feasibility	Yes	Yes	Yes	Yes	Yes	Yes	Limited

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TOPIC # 2
Implications & Risk Factor Assignment

- **Cost and Performance Histories (handout)**
  - DB demonstrates 10 – 40 % capital cost reductions
  - DBO demonstrates 20 -30% life cycle cost reductions
- **Risk Assignment & Guarantees (handout)**
  - DB assigns some risks but not guarantees
  - DBO assignment significant risks and guarantees for performance, regulatory compliance, and costs
- **Policy Impacts and Control Impacts**
  - Modest for DB
  - Significant modifications for DBO

TOPIC # 2
Examples of DB Cost Performance

1) DB examples address only capital costs not life cycle costs. Operating costs over 20 years typically equal or exceed capital costs. DBO addresses the life cycle costs.

2) Studies by acknowledged experts show significant capital cost savings for DB as compared to the Traditional DBB approach.

- City of Phoenix, AZ Study "Alternative Delivery Methods Investigation for Lake Pleasant Water Treatment Plant" — avg. 29%
- William Reinhardt, editor *Public Works Finance*, article on Alternative Project Delivery Methods — avg. savings exceed 20%
- Longmont, CO Water Treatment Plant Earns DB Award, news release, Black & Veatch — 6.5%
- Study of 144 W & WW projects found 38% finished under budget for DB versus 20% for Traditional DBB, Gordon Culp, Smith Culp Consulting

TOPIC # 2
Examples of DBO Cost Performance - Handout

- Handout provides 31 examples of DBO for water & wastewater
- Typical cost savings in 20 - 30 % range for capital and operating costs (life cycle costs not just capital)
- Costs include full contract term responsibility and coverage of capital repair and replacement
- Information sources: *Public Works Finance and municipal entities*

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TOPIC # 2
Comparison of Risk Assignment and Guarantees-Handout

	Topic	Private Sector DBO	DB & Staff Operates
1)	Capital costs guaranteed	yes	possible
2)	Operating costs guaranteed (short & long term)	yes	no
3)	Guaranteed facility performance	yes	no
4)	Permitting risk assumed	yes	partial
5)	Construction schedule delays	no $ cost adj.	time & dollars ??
6)	Change order costs (not City initiated)	no - guaranteed costs	City pays
7)	Guaranteed regulatory compliance	yes	no
8)	Regulatory fine coverage for failure to meet stds.	yes	City pays
9)	Performance bond - construction	yes	yes
10)	Performance bond – operations	yes	no
11)	Guaranteed staff employment	yes	no
12)	Liability coverages	yes	City pays
13)	Ability to early terminate the agreement	yes	NA
14)	Upfront reimbursement of procurement costs	yes	no

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Appendix 8 – 31 Examples of DBO Cost Savings Performance

Examples of DBO Partnerships for Water & Wastewater

Municipality	Description (system type)	Plant Size (mgd)	Contract Term (years)	Procurment Type	Est.Cost Savings
Arvin, CA	Wastewater	2	35	DBO	$ 12 million (25%) *
Auburn, AL	Wastewater	7	25	DBO	$ 36 million (25 %) *
Cle Ullum, WA	Wastewater	2	20	DBO	$ 7 million (20%) *
Bessemer, AL	Water	24	20	DBO	$ 20 million (22%) *
Cranston, RI	Wastewater	23	25	DBO	$ 35 million (25 %) *
Delran, NJ	Water	30	20	DBO	not available
Evansville, IND	Water	60	10	DBO	$ 8.1 million
Gardner, MASS	Water	3	20	DBO	$ 5 million (20%) *
MCD, OH	Wastewater	5	20	DBOO	$ 18 million (23%) *
Franklin, OH	Water	5	20	DBO	$ 9 million (30%) *
Glens Falls, NY	Water	7	20	DBO	not available
Hingham, MASS	Water	8	20	DBO	not available
Honolulu, HW	Water Reclaim.	13	20	DBO	$ 21 million (22%) *
Key Largo, FL	Wastewater	3	20	DBO	$ 30 million (29%) *
Lynn, MASS	Wastewater CSO	28	20	DBO	$ 35 million (27%) *
Leominster, MASS	Water	4	20	DBO	$ 5 million (18%) *
Moncton, NB, Canada	Water	25	20	DBO	$ 12 Million (15%) *
Newport, RI	Wastewater	11	20	DBO	$ 25 million (30 %) *
North Brunswick, NJ	Water/WW	10/10	20/20	DBOO	$ 45 million *
Pawtucket, RI	Water	25	20	DBO	$ 30 million (32 %) *
Plymouth, MASS	Wastewater	3	20	DBO	$ 8 million (18%) *
Quincy, WA	Wastewater	6	20	DBO	$ 11 million (22 %) *
Richmond, CA	Wastewater	16	20	DBO	$ 42 Million (50 %) *
Tampa, FL	Desalinization	24	30	DBO	$ 60 million (20 %) *
Tampa Bay Water, FL	Water	66	15	DBO	$ 85 million (21 %) *
Seattle, WA - Tolt	Water	120	25	DBO	$ 70 million (40 %) *
Seattle, WA – Cedar	Water	100	20	DBO	$ 40 million (25%) *
Taunton, MASS	Wastewater	8	20	DBO	$ 45 million *
Washington Borough, NJ	Wastewater	2	15	DBO	$ 2.2 million (12 %) *
Wilmington. DEL	Wastewater	105	20	DBO	$ 60 million (27 %) *
Woonsocket, RI	Wastewater	18	20	DBO	$ 45 million (38 %) *

* Includes full-term capital repair and replacement risk by the private sector partner

DBO = Design, Build Operate; DBOO = Design, Build, Operate, Own

Source: Municipal entities and as reported in Public Works Finance

Appendix 9 – Charrette Report for Water Plant Site

CHARRETTE REPORT – ORW Architecture

CLIENT:	City of Grants Pass and Eisenhardt Group Inc.
PROJECT:	Grants Pass Water Treatment Plant – Design Charrette
LOCATION:	Grants Pass Public Safety Station
DATE:	August 6, 2015

Introduction

As part of the strategic planning effort for the Water and Wastewater facilities for the City of Grants Pass, Eisenhardt Group Inc. (EGI) team members conducted a charrette on July 21, 2015 to generate alternative ideas for future usage of the existing Water Treatment Plant (WTP) site. EGI's team members reviewed the seismic study and toured the WTP and surrounding area in advance of the charrette to establish familiarity with the existing facility and its context.

Charrette attendees were Rick Riker and Roy Lindsey (City Councilors); Jason Canady (WTP Superintendent); Tom Schauer, Scott Lindberg, and Terry Haugen (City staff); Paul Eisenhardt, Brian Hemphill, Ken Ogden, Dana Crawford, and Nathan Kappen (EGI team members).

Building Impressions

This report is based upon the results of the seismic study conducted by the City, a tour of the facility and site, general observations, and inputs from the Charrette session. During the tour and at the Charrette, the architects noted that the building is aesthetically pleasing but estimated that the more the building is preserved for reuse, the greater the costs of redevelopment due to the age and use-specific design of the original building and the magnitude of upgrades required to bring it into code compliance. Two examples are the ADA requirements for a re-purposed use of the facility and the large tankage excavations located inside the building that create additional issues and complexities with regard to seismic stability and use of the space. Group discussed multiple design approaches to maximize best features and minimize expenses. The group acknowledged that associating costs to potential developments should only be done after significant effort is dedicated to defining the scope, quality, and timing of each potential development.

Degrees of Reuse

Group discussed multiple development approaches ranging from maximal reuse to no reuse. All options must retain the existing water intake and access to it for maintenance:

- Complete building reuse with comprehensive upgrades for seismic and accessibility.
- Majority building reuse with moderate upgrades to accommodate occupancy change (e.g., retain building and tank infrastructure and maximize reuse of its unique features but with a change of use such as fish storage or hatchery).
- Partial demolition to retain building's best features (e.g., retain and reinforce building façade only, and build new structure behind and around remaining façade).
- Development of site only (e.g., infill storage tank to west to accommodate new development, minor modification/demolition of building to allow site development).
- Complete building and tank demolition, rebuild with new construction.
- Sell site (with building or demolish building) to offset debt obligation.

Overarching Development Issues

Group discussed broader issues that impact development options such as historic status, upgrades to the existing building, historic status, impact of current construction boom, and community concerns. Comments included:

- WTP is a local historic landmark with no known development prohibitions. Local status may lead to other benefits and limitations at state and national levels; verify effect of local status at broader level.
- WTP is an AWWA (American Water Works Association) historic structure. Verify AWWA process for modifications.
- Site is zoned R-2 but could be re-classified.
- From 2011 report, seismic upgrades of the WTP were estimated at $8–10M for partial code compliance.
- Construction costs have escalated significantly over the last two years. Many Rogue Valley subcontractors went out of business during the recession and the lack of workforce results in escalated prices. The local construction market may improve in the next few years as businesses rebuild, but recent escalation could increase the 2011 estimates by 30% or more, and full code compliance would result in significant additional cost increases.
- The site was designed for a very specific use; changing to a different use or occupancy would trigger upgrade investments.
- ADA (American Disabilities Act) requires accessibility changes for both the site (parking, walkways) and building (building entries, internal access to most spaces on each level).
- The community is cost conscious. There is potential for private benefactors but the Grants Pass general public is unlikely to support significant public spending.
- The site is valuable as a riverfront resource and one of the largest (5 acre) parcels with river adjacency in the area.
- Consider possible uses and value of combining the site with other nearby parcels prior to making development decisions.

- Public amenities and services benefit the greater good. Consider maintaining public ownership and use; it could be used in a particular way in the short term (e.g., recreational) and used in a different way in the long term.

Site Impressions

Directly adjacent to the Rogue River and at the intersection of Highway 199 and SE M Street, the site is in a prominent location. Barring the physical barriers from multi-lane roadways, there is potential for the site to become a gateway into the city's historic downtown core. The project site is central to the proposed trail network as outlined in the City's 'comprehensive park and recreation plan' and could become a hub for visitors. The existing skate park located to the north across M street begins to hint at the public, urban zone that could be created around the treatment plant site. Along with the many opportunities for re-use of this site, there are several constraints outlined below.

Site Opportunities & Constraints

Group discussed site characteristics and surrounding context. Observations included:

- New development would need to maintain the existing water intake, piping easement to the future site, and access for servicing the intake and piping.
- Electrical line easement would need to be maintained through the middle of the site or moved to the edge of the site for a significant investment (recent estimate by WTP was approximately $1M).
- Site offers fairly good traffic access; access from the east is challenged but may be improved.
- All utilities are available on site.
- Likely no environmental soil contamination.
- Site is connected to the City's proposed greenway trails.
- Pedestrian access is limited/constrained due to multilane roadways.
- The site offers good views of the mountain range to the Southeast.
- Good connection to freeway and ocean beaches
- Adjacent traffic is relatively noisy. Cabinet factory to the north generates significant noise and fumes.

Development Approaches

- Public Development
- Private Development
- Private/Public Development. A private developer who partners with a public agency to operate the site (e.g., an aquatic facility or recreational use) could result in lower insurance premiums for the public operator and lower cost per use to the general public.
- Design/Build operator (public ownership + private concessionaire)

Potential Reuses

Group generated ideas for alternative uses on the site. The group was encouraged to consider a broad range of ideas (recreational, residential, governmental, etc.), including far-fetched ideas that may serve as a springboard to more realistic uses. 25 ideas were shared and are listed below without prioritization.

1 Aquatic Facility (no competitive swimming in Rogue Valley) recreational slides, etc.
2 Community Center
3 Recreational Sports Facility, ball fields, tennis, etc.
4 Storage Units
5 Fish hatchery/tourist facility
6 Commercial site/retail shops
7 Multi-use (commercial below, housing or hotel above)
8 Resort development
9 Regional Wine Center/Winery
10 Interpretive Center/Museum
11 Concert event venue and/or outdoor performance space
12 Kayak rapids park
13 Splash spray park
14 Year-round facility (i.e., winter hockey/ice rink, summer splash park)
15 Senior daycare (lack of facilities in Rogue Valley)
16 Kid facilities (i.e., Boys/Girls Club, YMCA, daycare, etc.)
17 River gateway park with river experiences, e.g., guided river tours, zip line, etc.
18 State park
19 Sea World North
20 Geographic hub facility: centrally located "base camp" (resort, facility, or park) where multiple rivers, valleys, and recreational activities are accessed
21 Convention venue: ideally 500-1000 people
22 Water Awareness Center: environmental and educational displays, recreational river-based activities, xeriscaping, water use and re-use demonstration projects
23 Brewery/McMenamins
24 RV Parking or Park with access to downtown and activities
25 Drive-in movie theatre

Preferences Exercise

Each participant used three green dots to identify preferred uses and one red dot to identify a use they least preferred. Results were:

- 5 green dots: Convert event venue, Geographic hub
- 4 green dots: Regional Wine Center/Winery, Water Awareness Center
- 2–3 green dots: Brewery/McMenamins, fish hatchery, splash park, interpretive center/museum
- 4 red dots: Storage units
- 1 red dot: Regional wine center, senior and kid facilities, RV Parking, Drive-in theatre

The exercise fostered discussion on the unique aspects of the site, which uses generated enthusiasm, and which didn't. Comments included:

- Grants Pass is located at the nexus of several features (rivers, valleys, viticulture, etc.) and well positioned for a development that maximizes its central location, e.g., as an event venue or for the developing wine industry.
- The site has a unique adjacency to the water. Water is becoming a more valuable resource and while the site could be developed as a singular use, it could blend recreational and educational activities that teach about and demonstrate the value of water through water sports, low-water landscaping, wildlife habitat, new technologies for producing clean water, etc.
- Appreciation for maintaining the site as a public resource, via public access or a future public building.
- Group disliked uses that minimized access to and views of the river, or dedicated it to uses that could be located anywhere (e.g., storage units).
- Group acknowledged that cost is a driving factor and that undeveloped/conservative cost estimates can prematurely eliminate or elevate development possibilities. If redevelopment is desired for particular uses, more time should be dedicated to defining parameters before assigning costs.

Process Issues and Next Steps

The group identified potential subsequent steps and the timeline for developing the new WTP, decommissioning the existing WTP, and possible redevelopment. Items included:

- Verify implications of historic status locally, statewide, and nationally. Could include tax abatement or development limitations.
- Model the structural behavior of the building if pursuing moderate upgrades, e.g., how is the building structure affected if tanks are filled in below grade? Is soil stable below the existing structure?
- Contact McMenamins to query viability of potential development.
- Process timeline of next steps ranging from aggressive (quickest to implement) to conservative (slowest):

2015–2016	Strategic Planning (1–2 years)
2016–2017	RFP and Delivery Process for new WTP (.5 – 1 year)
2017–2020	Design and Construction of new WTP (1–3 years)
2019–2024	Decommission majority of existing WTP (1.5–4 years after completion of new WTP)

Vision

Creating and identifying a guiding vision for this project is a critical first step. The most recent design charrette has revealed future vision for this project is high. Despite the known and unknown challenges within the site, the building represents the City's history and is a part of the community. Potential re-use suggestions include a concert event venue, geographic hub, a regional wine center/winery, water awareness center, Brewery, fish hatchery, Splash Park and interpretive center/museum. With a defined vision, the

proper planning, involvement and approach, these future uses and more can be achieved.

Action & Investment

Generating action and investment within the community is critical to a successful project. Creating an amenity that respects the historic building and context of the site will require coordinated public action from local, regional and state sources. The investments that are needed for public access, infrastructure, public space upgrades and development are generally developed through the following steps:

- Preliminary investigations
- Strategic due diligence
- Framework master plan
- Partner commitment

Creating a greater awareness of the site through advertisements, public announcements or access will generate interest and excitement about the site. Public and pedestrian access to the site and river is one of the most important steps for improvement implementation. Once in place, the project site will offer connections to natural resources and to the future trail network as identified in the city's parks and open space master plan.

Development Approach

Given the sites proximity to the river, downtown core and state highway, it is highly visible and has potential to provide an outstanding amenity value.
A cost effective approach to developing the site relies on several factors:

- Aligning regulatory restrictions, partnerships, and regional demand sources to take full advantage of natural and historic features of the site while maximizing revenues and minimizing costs.
- Understanding the relationship between public investment in infrastructure, parks, public access and how this investment can help leverage significant private interest and investment.
- Identifying a location or strategy for adequate parking facilities to support potential development uses.

Development Challenges

Future development efforts on the site will encounter challenges associated with existing conditions and regulatory codes. These challenges will likely increase the costs of development (relative to development on a vacant urban parcel) and could restrict options for future use. The specific challenges could include:

- Inadequate infrastructure, site preparation issues and building re-use options, all of which may significantly increase development costs and limit overall development for the site.
- Potential reuses such as a water awareness center, concert venue or museum, were a few of the top preferences identified during the design charrette. Providing

adequate parking and vehicular circulation for these uses on site that meet current city codes may be challenging given the small site area and utility right of way bisecting the site.