Findings and Recommendations for a Water Utility Sector Management Strategy: Appendices

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March 30, 2007

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Appendix A: Statement of Intent

May 2, 2006

Effective Water Sector Utility Management

Statement of Intent

U.S. Environmental Protection Agency (EPA)
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)
Water Environment Federation (WEF)

Introduction: This Statement of Intent is entered into and between the U.S. Environmental Protection Agency (EPA) and the following organizations: 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), and the Water Environment Federation (WEF). These organizations are referred to herein as the Signatory Organizations.

Background: Recent events have highlighted the fundamental importance of sustaining our Nation's water and wastewater infrastructure. Effective utility management is key to achieving this goal. Effective management can help utilities enhance the stewardship of their infrastructure, improve performance in critical areas, and respond to other challenges. Addressing the Nation's water and wastewater infrastructure also calls for ongoing collaboration between government, industry, elected officials, and other stakeholders. The Signatory Organizations have a history of collaborating to promote effective utility management and desire to formalize these efforts.

Purpose: The purpose of this Statement is to formalize a collaborative effort among the signatory organizations in order to promote effective utility management. The Statement is intended to describe and facilitate cooperation, collaboration, coordination, and effective communication among the signatory organizations.

Objectives: The objectives of this Statement are to:

o Affirm the belief by the Signatory Organizations in the value of sound and effective utility management;

o Strengthen partnerships among the Signatory Organizations and water and wastewater utilities;

o Establish a framework for working together to advance understanding of the principles and practices of effective utility management, and to encourage and promote their wider application;

o Improve utility performance through the utility-specific application of effective management tools, performance measurement and other techniques and systems; and

o Enhance utility decision making through public awareness and customer confidence.

Outreach to Utilities: Outreach to utilities is expected to occur throughout this collaboration on the following topics:

o key attributes of effectively managed utilities;

o existing utility management resources;

o resource gaps, barriers, and opportunities to encourage more utilities to manage effectively; and

o potential measures of success for utilities to gauge progress.

Recognition: The Signatory Organizations intend to develop a joint strategy to identify, encourage, and recognize excellence in water and wastewater utility management.

Communication: The Signatory Organizations intend to communicate widely about this Statement with their constituencies and encourage them to focus increased attention on utility management systems and programs.

Note: All actions that EPA may take in furtherance of this statement are subject to the availability of appropriated funds and the parties to this agreement will not submit a claim to EPA for compensation solely on the basis of this agreement. In signing this statement, none of the organizations listed above, including EPA, are obligating funds nor making any commitment to provide funding to any organization or individuals in the future. Further, EPA cannot endorse the sale or purchase of products or services developed by the participating organizations. This Statement does not create any right or benefit, substantive or procedural, enforceable by law or in equity against the other Signatory organizations or EPA, their officers or employees, or any other person. This Statement does not apply to any person outside of the other Signatory Organizations and EPA.

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Executive Director
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Appendix B: Focus Group Participants

Las Vegas Focus Group

Name	Title	Organization
Costanzo, Nick	Assistant General Manager	El Paso Water Utilities
Friess, Philip	Departmental Engineer	County Sanitation Districts of Los Angeles
Gans, Jim	Senior Vice President of Operations	Las Vegas Convention and Visitor's Authority
Graham, Guy	Wastewater Services Manager	City of Gresham
Hardy, W. Brent	Citizen	
Janis, Wayne	Assistant Director	Phoenix Water Services
Johnson, Peggy Maze	Executive Director	Citizen Alert
Offret, Dan M.	Executive Assistant to the President	Pima Community College
Pantuso, Joseph	Environmental Affairs Specialist	Southern Nevada Homebuilders Association
Porter, Dennis	Utility Services Director	City of Henderson
Steirer, Marsi	Deputy Director	City of San Diego Water Department
Stratton, Mark	General Manager	Metro Water District
Williams, Myrna	President of the Board	Clark County Commissioner
Facilitators:		
Greenwood, Rob	Partner	Ross & Associates Environmental Consulting, Ltd.
Williams, Anna	Associate	Ross & Associates Environmental Consulting, Ltd.

Elmhurst Focus Group

Name	Title	Organization
Clavel, Robert	Engineer-Manager	Wheaton Sanitary District
Gardner, Mike	Water and Wastewater Systems Manager	Bowling Green Municipal Utilities
Garelli, Brett	Assistant Chief Engineer	Metropolitan Water Reclamation District of Greater Chicago
Larson, Roger	Deputy Watershed Management Bureau Director	Wisconsin Department of Natural Resources
Marshall, Raymond	Deputy Director	Narragansett Bay Commission
McCracken, Stephen	Director of Watershed Management	The Conservation Foundation
Poole, Allan	Director	Department of Public Utilities, City of Naperville
Schellpfeffer, Jon	Chief Engineer and Director	Madison Metropolitan Sewerage District
West, Mary	Environmental Services Coordinator	Missouri Public Utility Alliance
Facilitators:		
Greenwood, Rob	Partner	Ross & Associates Environmental Consulting, Ltd.
Williams, Anna	Associate	Ross & Associates Environmental Consulting, Ltd.
Observers:		
Horne, Jim		U.S. Environmental Protection Agency, Office of Water
O'Neill, Eileen	Chief Technical Officer	Water Environment Federation

Appendix C: Focus Group Agenda

[*Note: The agendas for the two focus groups were the same except for the date and location.*]

Effective Water Utility Management Focus Group

September 26, 2006 | 11:00 AM – 4:00 PM

Mead Conference Room – Las Vegas Valley Water District

1001 S. Valley View Blvd., Las Vegas, NV 89153

Please arrive no later than 10:45 AM

11:00 AM—Welcome and Introduction

11:15 AM—Background and Working Lunch

- *What are the key challenges water sector utility managers face?*

12:00 PM—Defining "Effective Utility Management"

- *What do you think of when you hear the term effective utility management?*
- *What accomplishments or actions signal to you that a water sector utility is effectively managed?*

1:30 PM—Barriers to and Incentives for Effective Utility Management

- *What do you view as the primary factors that motivate utilities to invest in improving their management efforts?*
- *What holds utilities back from undertaking improvement to their management efforts?*
- *What are the ways the water sector can overcome these barriers to improving management?*

2:30 PM—Measuring Utility Performance

- *What has your experience been with performance measurement at your utility?*
- *Are you using, or are you aware of other utilities using, what you consider practical and useful measures of utility performance?*
- *If there are measures you would like to be using, but don't, what has held you back from developing these measures?*

3:15 PM—Synthesis and Wrap Up

4:00 PM—Adjourn

Appendix D: Example Utility Measures

1. Product Quality: Example Measures

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.

Example Measures

Drinking Water Utility Measures

1) Pressure adequacy: Percent of customers with less than XX psi of pressure at the meter during normal operations.

2) Drinking water supply outages: Percent of retail customers experiencing water outages for one or more events totaling more than X hours/year.

3) Drinking water system reliability: Number of customer hours out of service per year divided by the total number of customer hours in that year.

4) Drinking water system reliability: Number of main breaks per mile of pipe per year.

5) Water quality complaints: Percent of customers that complain about water quality.

6) Turbidity: Monthly turbidity average (NTU) of filtered water.

7) Fire hydrant condition: Number of inoperable or leaking hydrants per 1,000 hydrants.

8) Fire hydrant flow: Percent of hydrants where flow available achieves required flow.

9) Drinking water compliance rate: Number of days in full compliance (times 100) divided by 365 days.[1]

Wastewater Utility Measures

10) Sewer overflows: Number of sewer overflows per 1,000 miles of pipe per year. Note: Utilities may wish to break this down into wet-weather and dry-weather overflows. Some overflows are allowable—the absolute number of overflows should be considered in this context.

11) Number of environmental violations: Number of documented regulatory violations (common utility measure). Note: This could include measures of the number of significant non-compliance violations (SNC) under the Clean Water Act and/or other violations.

12) Problem responsiveness: Percent of sewer system problems (backups, voids, lid off, ponding) responded to within a target period of time. Note: Problem responsiveness in this context also relates to operational optimization. It could also relate to customer service;

[1] QualServe benchmark

however, in these instances, maintaining "product quality" involves identifying and addressing problems *before* the customer is aware that problems exist.

13) Wastewater treatment effectiveness rate (compliance with effluent quality standards): Total number of standard non-compliance days (sum of all non-compliance days relative to all operating/discharge permits issues to the utility for an individual facility).[2]

14) Compliance monitoring measures (day-to-day operational): e.g., number of days permit parameters are maintained consistent with NPDES permit limit per year.

2. Customer Satisfaction: Example Measures

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.

Considerations regarding measurement of customer satisfaction are as follows.

- Regardless of how done, it is important to measure customer satisfaction consistently (e.g., once every six months or once a year) to understand changes over time.
- People who call into utilities represent a small fraction of the total customer base; therefore, it is important to measure customer satisfaction beyond incoming calls. There are more and less intensive ways to gauge broad customer satisfaction, e.g., using the invoice process to gather information, holding focus groups, conducting statistically-significant telephone surveys, etc.

Example Measures

Basic Measures

1) Number of customer complaints: e.g., number of customer complaint calls in daily reports. The number of customer calls (in general, not specific to customer complaint calls) is sometimes used as a customer satisfaction measure; but it alone is not necessarily associated with customer *satisfaction*. Calls may be placed for routine purposes such as turning on meters/service, or because customers lost their bills. For this reason, this example measure specifies the number of customer complaint calls. Other categories of incoming calls could also be used to track those that are related specifically to customer satisfaction.[3]

2) Customer service complaint rate: Percent of customer service complaints divided by number of active customer accounts.[4]

3) Customer service cost per account: Total customer service costs divided by number of active accounts.[5]

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[2] QualServe benchmark
[3] Common measure, also a QualServe benchmark
[4] QualServe benchmark
[5] QualServe benchmark

Responsiveness Measures

4) Responsiveness/rapidity of response: Percent of calls received and answered within a target timeframe.

5) Responsiveness: Number of customer calls dropped or abandoned.

6) Responsiveness/first call resolution: Number of customer calls resolved in one contact divided by total number of calls received. Note: this measure tracks the identity of the caller to ensure that the same customer is not calling back with the same problem.

7) Customer work order response time: Percent of customer work order requests completed within established service standards.

Comprehensive Customer Satisfaction Measures

8) Overall customer satisfaction: Percent of customers rating overall job as “good” or “excellent” (through a customer service survey).

3. Employee and Leadership Development: Example Measures

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.

Note: Safety measures are under the “Operational Resiliency” Attribute.

Example Measures

Human Resources Management

1) Turnover: Annual percentage of total and voluntary turnover.

2) Overtime: Total number of O&M overtime hours worked divided by total number of O&M hours.

3) Workforce succession planning: Does the utility have a current long-term workforce succession plan that accounts for projected retirements and other vacancies in each skill and management area (Yes/No)?

4) Professional development: Percent of employees that have employee development plans.

5) Professional development: Percent of employees eligible for certification that have attained it.

6) Professional development: Does the utility have a leadership development program that includes leadership training and other leadership-building opportunities (Yes/No)?

7) Employee satisfaction survey: Does the utility conduct an employee satisfaction survey (Yes/No)? **OR** Union grievances: Number of union grievances filed.

Productivity

8) Labor productivity: Staff per 1,000 water/sewer/water and sewer population served.

4. Operational Optimization: Example Measures

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.

Example Measures

1) Cost per million gallons produced / treated: O&M expenses (e.g., chemical, power, and/or total cost) per million gallons produced and delivered.

2) Distribution system water loss: Percent of produced water that fails to reach customers and cannot otherwise be accounted for through authorized usage.[6] This is equivalent to: Non revenue water: Difference between water supplied and water sold (i.e. volume of water "lost") expressed as a percentage of net water supplied.[7]

3) Sewer system effectiveness: Percent of customers experiencing backups in any year caused by the utility's sewer system.

4) Finished water efficiency rate (for surface water plants): Finished water as a percent of raw water.

5) Efficiency ratio: O&M expenditures relative to revenue.

6) Planned maintenance ratio: Planned maintenance ratio in percent (hours): hours of planned maintenance (times 100) divided by hours of planned and corrective maintenance.[8]

7) Direct energy use: Total amount of energy used (including renewable energy) per 1,000 customers.[9]

8) Material waste: Percentage of materials used that are wastes (processed or unprocessed) from sources external to the utility.[10]

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[6] QualServe benchmark
[7] The International Benchmarking Network for Water and Sanitation Utilities (IBNET) indicator definition
[8] QualServe benchmark
[9] Adapted from GRI 2002, Water U.K. 2005, and Australian VicWater 2003 measures as reprinted in Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 112 (draft)
[10] Adapted from GRI 2002

5. Financial Viability: Example Measures

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.

Example Measures

Basic Measures

1) Rates: Average monthly bill relative to similar utilities (common measure). Note: Some utilities may wish to compare against a national average; others may choose to measure against utilities in nearby areas. In addition, it is important to note that rates are a function of many factors and simple comparisons of different utilities' rates may be misleading.

2) Water use per customer: Meter sales per customer account.

3) Revenues to expenditures: Ratio of revenue to expenditure.

4) Return on assets: Net income divided by total assets.[11]

5) Return on equity: Annual return as a percentage of shareholder equity.

Liabilities and Debt

6) Debt ratio 1: Total liabilities divided by total assets.[12]

7) Debt ratio 2: Percent of debt greater than 180 days/total revenue.

Projections Versus Actual

8) Operating revenue versus plan: Operating revenue for the period/planned revenue for the period

9) Operating expenditures versus planned expenditures: Percent of O&M expenditures for current year versus planned O&M in the 10-year finance plan.

Cost Recovery

10) Full cost recovery: Economic water and wastewater real rates of return.

11) Rate adequacy: Rate revenue relative to long term infrastructure replacement cost.

[11] QualServe benchmark
[12] QualServe benchmark

6. Infrastructure Stability: Example Measures

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.

Example Measures

Asset Condition

1) Asset condition: Percent of assets for which a condition assessment has been conducted.

2) Sewer cleaning: Percent of sewers cleaned each year.

3) Sewer inspections: Linear feet of sewer lines televised each year divided by total linear feet of sewer lines.

4) Manholes inspected: Percent of manholes inspected per year.

5) Water distribution system integrity: Total annual number of leaks and pipeline breaks per 100 miles of distribution piping.[13]

6) Collection system integrity: Number of collection system failures per 100 miles of collection system piping per year.[14]

7) Planned maintenance ratio: Percent per hours and percent per cost.[15]

Asset Management Planning and Implementation

8) Comprehensive planning: Does the utility have a long-term comprehensive plan that addresses future asset needs (Yes/No)?

9) Asset renewal/replacement rate: Total actual expenditures (or total amount of funds reserved for renewal and replacement for each asset group) divided by the total present worth for renewal and replacement for each asset group.[16] Note: this is a system of measures that requires breaking down assets into classes (e.g., water treatment facilities, water distribution system, wastewater collection assets, wastewater treatment facilities, wastewater miscellaneous assets) and having data with which to support the calculations (e.g., total present worth of renewal and replacement needs for each asset class).

10) Capital reinvestment: Five-year running average of capital reinvestment relative to replacement value.

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[13] QualServe benchmark
[14] QualServe benchmark
[15] QualServe benchmark
[16] QualServe benchmark

11) Capital investment progress: Percent of capital investment projects started and completed on time and on budget (according to a capital improvement plan).

7. Operational Resiliency: Example Measures

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.

Example Measures

Risk Management

1) Risk identification: Has the utility identified organizational risks (Yes/No)?[17]

2) Risk management planning: Does the utility have a risk management plan in place, and is this plan fully integrated into the utility (e.g., is there a high level of awareness of the risk management policies and procedures amongst the staff?) (Yes/No)?[18]

Safety

3) Injury frequency rate: Total accident incident rate per year.

4) Vehicle accident rate: Number of vehicle accidents per one million miles.

5) Lost time: Lost time due to accidents per 1,000 field labor hours.

6) Safety training: Average hours of safety-related training per employee per year.[19]

7) Compliance with health regulations and standards: Number and type of non-compliance incidences with public health regulations and standards.[20]

8) Community notification: Does your utility provide timely notification to the public about spills, sewage discharges, and other water quality problems that make it unsafe for the public to swim, recreate or consume fish from local waters (Yes/No)?[21]

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[17] Adapted from Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 109 (draft)
[18] Adapted from Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 109 (draft)
[19] NAWC Water Utility Benchmark Survey
[20] GRI 2002, Water U.K. 2005, VicWater 2003, and related QualServe benchmark, as repeated in Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 113 (draft)
[21] Philadelphia Water Department, 2005, *The Smart Watershed Program Benchmarking Tool*

All-Hazards Preparedness

9) High security risk assets: Percent of assets determined to be a high security risk by vulnerability assessment.

10) All-hazards preparedness: State of revisions to protocols/procedures for incorporating continuity of operations into internal utility design and construction standards for new facilities/infrastructure and major maintenance projects.

11) Does the utility have a current All-Hazards Disaster Readiness Response plan?

12) Has the utility conducted a Hazard Identification and Vulnerability Analysis?

13) Is the utility trained according to NIMS and ICS requirements?

14) Have key customers and partners in emergency management been identified and are plans coordinated and reviewed?

15) Has the utility typed its equipment for Mutual Aid/requesting purposes?

8. Community Sustainability: Example Measures

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 use water and energy resources; promote economic vitality; and engender 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.

Example Measures

1) Community perception of utility: Does the utility seek out the views of customers, stakeholders, shareholders, and the community about its strengths, abilities, objectives, and/or strategies (Yes/No)?[22]

2) Community perception of utility: (Based on customer survey or other public information gathering effort.) Percentage of the community that believes that the utility's priorities reflect the community's priorities.

3) Watershed-based long-term infrastructure planning: Does the utility integrate alternative, watershed-based approaches to potentially reduce future infrastructure costs (e.g., centralized management of decentralized systems, smart growth strategies, source water protection programs, low-impact development, etc.) (Yes/No)?

4) Water affordability: Percent of households for whom water and sewerage service bills represent more than an affordable level of the average household income.

[22] From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 106 (draft)

5) Organizational best practices index: Summary measure on implementation of management programs important to water and wastewater utilities, including strategic planning, long-term financial planning, risk management planning, performance measurement system, optimized asset management program, customer involvement program, and continuous improvement.[23]

6) Triple bottom line commitment: Does the utility include social, economic, and environmental goal areas as part of its strategic plan (Yes/No)?[24]

7) Triple bottom line progress assessment: Does the utility employ performance measures that cover economic, social, and environmental outcomes (Yes/No)?[25]

8) Total water use: Combination of following items: amount of water extracted by source per customer; water supplied by customer type per customer; wastewater collected per customer; recycled water per customer.[26]

9) Water conservation and efficiency: Does the utility have a water conservation program (e.g., covering leakage detection, demand management, urban design, appliance efficiency, etc.) in place (Yes/No)?[27]

10) Watershed management planning: Does the utility have watershed management programs in place (and do these include measurable objectives and targets) (Yes/No)?[28]

11) Investment in watershed management: Does the utility have a long-term capital budget that extends beyond the current budget year to provide dedicated funding for watershed management (e.g., protection and restoration) projects (Yes/No)?[29]

12) Green building/infrastructure: Has the utility promoted "green building" and related water conservation strategies, both for its own assets/buildings and in terms of promoting these throughout the larger community (e.g., working with local planning departments and developers on options for new construction) (Yes/No)?

9. Water Resource Adequacy: Example Measures

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.

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[23] QualServe benchmark
[24] From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 106 (draft)
[25] From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 106 (draft)
[26] GRI 2002, Water U.K. 2005, and Australian VicWater 2003, and adapted from Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 116 (draft)
[27] From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 107 (draft)
[28] From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 109 (draft)
[29] Adapted from Philadelphia Water Department, 2005, *The Smart Watershed Program Benchmarking Tool*

Example Measures

Short-term Supply Adequacy

1) Anticipated supply versus anticipated demand: Is anticipated supply sufficient for anticipated demand (Yes/No)?

2) Accuracy of demand projections: Actual water demand as a percent of projected water demand.

3) Reduced use from recycling: Amount of potable water demand reduced through recycling.

4) Water losses: Percent of unaccounted water of net water (production).

5) Drought management: Has the utility adopted a drought management plan (Yes/No)?

6) Per capita water consumption: Per capita water consumption per year.

Long-term Supply Adequacy

7) Long-term supply plan: Does the utility have a long-term water supply plan that accounts for anticipated (and unanticipated) population/demand changes (Yes/No)?

8) Long-term demand: Does the utility know the current and projected future population and water demand for current and future service areas (Yes/No)?

9) Long-term supply availability: Does the utility know the number of years for which existing supply sources are adequate (Yes/No)?

10) Long-term demand-management plan: Does the utility have a demand management/demand reduction plan (Yes/No)?

11) Long-term supply management: Does the utility predict and manage for long-term water supply? For example, does it predict supply adequacy based on predictions (e.g., using average past reservoir elevation data, year-to-date reservoir elevation data, and future normal, wet, dry, and very dry scenarios) (Yes/No)?

12) Supply policy/commitment: Does the utility have policies in place that require that, prior to committing to new service areas, it must have adequate dry year supply, or require additional supply be provided (Yes/No)? Alternatively, does the utility have a strong commitment to denying service commitments unless a reliable drought year supply, with reasonable drought use restrictions, is available to meet the commitment (Yes/No)?

10. Stakeholder Understanding and Support: Example Measures

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.

Example Measures

1) Stakeholder opinion: Based on feedback from likely stakeholder groups; e.g., governance board/council, residential customers, commercial/industrial clients, developers, city/county, regional partners, legislature, regulators, public/community/special interest.

2) Stakeholder opinion: Does the utility have a citizen advisory panel or other method to provide stakeholder input into the utility's decision making, priority setting, etc. (Yes/No)?

3) Government relations survey: Does the utility conduct a written survey to mayor and other key legislative officials (Yes/No)?

4) Community outreach and education: Number of public education presentations per year.

5) Community contribution: Number of volunteer hours in the community per employee (or per 100 employees, or per XX non-volunteer hours?) per year.

6) Stakeholder outreach and education: Does the utility consult regularly with stakeholders (Yes/No)?

7) Community contribution: Does the utility approach its business in a manner that provides tangible benefits to the community (e.g., by conducting neighborhood improvements) (Yes/No)?

8) Transparency to stakeholders: Is the information on the utility's strategies and performance complete (coverall all aspects of the utility), adequately disclosed, transparent, and readily available to customers, stakeholders, and (where applicable) shareholders (Yes/No)?[30]

9) Community outreach and education: Does the utility have a program to educate the community about the value of water, water services, and water conservation (Yes/No)?[31]

[30] From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 106 (draft)
[31] From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 107 (draft)

Appendix E: Example Resources

Part I: Example Resource Crosswalk

This example crosswalk shows the relationship between the resources identified by the Resources Subgroup and the Attributes of Effectively-Managed Water Sector utilities. For more information on authorship and availability of each resource, see the next section ("Example Resources").

In addition, six non-Attribute columns have been added to this example crosswalk: One column for each of the five Keys to Management Success (Continual Improvement Management Framework, Strategic Business Planning, Measurement, Leadership, and Organizational Approaches), and one column for case studies, which describe how a particular utility benefited from using a particular resource.

Please note that the Attribute and Key assignments for some resources are based on a general description of the resource and would need to be confirmed if a crosswalk like this were to be finalized and used.

#	Resource	Product Quality	Customer Satisfaction	Employee and Leadership Development	Operational Optimization	Financial Viability	Infrastructure Stability	Operational Resiliency	Community Sustainability	Water Resource Adequacy	Stakeholder Understanding and Support	Continual Improvement	Strategic Business Planning	Measurement	Leadership	Organizational Approaches	Case Study
1	American Management Association Seminars			X											X		
2	AMWA Annual Meeting	X	X	X	X	X	X	X	X	X	X						
3	Building the Water Utility Brand		X						X		X						
4	The Changing Workforce - Crisis and Opportunity			X												X	
5	Evaluating Privatization II					X											
6	Public vs. Private: Comparing the Costs					X											
7	The Changing Workforce - Seizing the Opportunity			X												X	
8	Public Works Management Practices Manual				X			X									
9	Performance Measurement in Public Works				X												
10	Public Works Performance Management				X												
							X			X			X				
							X			X			X				

#	Resource	Product Quality	Customer Satisfaction	Employee and Leadership Development	Operational Optimization	Financial Viability	Infrastructure Stability	Operational Resiliency	Community Sustainability	Water Resource Adequacy	Stakeholder Understanding and Support	Continual Improvement	Strategic Business Planning	Measurement	Leadership	Organizational Approaches	Case Study
11	Everything You Need to Know to be a Public Works Director			X	X			X			X				X		
12	Financing Stormwater Utilities					X				X							
13	Avoiding Rate Shock		X			X					X						
14	AWWA Manuals	X	X	X	X		X	X	X	X	X						
15	The Evolving Water Utility: Pathways to Higher Performance	X	X		X		X	X	X		X						
16	Thinking Outside the Bill			X		X			X								
17	Water Infrastructure at a Turning Point						X										
18	AWWA WaterWiser website	X			X				X		X			X			
19	Water and Wastewater Leadership Center	X	X	X		X											
20	Partnership for Safe Water	X	X		X												
21	AWWA/QualServe Program	X	X	X	X	X	X	X		XX	X	X		XX			
22	AWWA/WEF Joint Management Conference	X	X	X	X	X	X	X	X	X	X				X		
23	Workforce Planning for Successful Organization Change			X	X											X	
24	Triple Bottom Line Reporting				X	X			X								
25	Leadership, Motivation, and Change in the Competitive Utility Environment			X	X										X		X
26	Launching CMOM Using an EMS	X	X		X				X	X			X				X
27	Laying the Foundation	X	X		X				X	X							X
28	City of Fort Worth Six Sigma Page				X	X											
29	Charleston Commissioners of Public Works Conducting a Two-Front War	X		X	X				X			X					X
30	Managing the Water and Wastewater Utility			X	X	X	X								X		
31	East Bay Municipal Utility District Strategic Plan	X	X	X	X	X	X	X	X	X	X		X				
32	Asset Management: A Handbook for Small Water Systems		X		X		X										
33	Setting Small Drinking Water System Rates for a Sustainable Future					X	X										
34	Using Smart Growth Techniques as Stormwater Best Management Practices	X			X				X								
35	National Biosolids Partnership - EMS Program	X	X								X						
36	Achieving Environmental Excellence	X		X	X				X		X						
37	Reducing Cost and Optimizing Performance	X		X	X				X		X						
38	Capacity, Management, Operations, and Maintenance	X	X		X		X		X	X							
39	Getting to Yes: Negotiating Agreement Without Giving In			X	X		X								X		
40	Governmental Accounting, Auditing, and Financial Reporting 2005					X											

#	Resource	Product Quality	Customer Satisfaction	Employee and Leadership Development	Operational Optimization	Financial Viability	Infrastructure Stability	Operational Resiliency	Community Sustainability	Water Resource Adequacy	Stakeholder Understanding and Support	Continual Improvement	Strategic Business Planning	Measurement	Leadership	Organizational Approaches	Case Study
41	Generally Accepted Accounting Principles (GAAP)				X	X	X	X	X		X						
42	Primal Leadership: Learning to Lead with Emotional Intelligence			X											X		
43	Hunter Water Australia - Asset Management				X		X										
44	ICMA Center for Performance Measurement		X		X									X			
45	ISO 9000 Series	X	X														
46	ISO 14001	X	X		X				X	X							
47	Draft ISO 24510	X	X		X			X	X								
48	Draft ISO 24511	X	X		X		X	X	X								
49	Draft ISO 24512	X	X		X		X	X	X	X							
50	Alignment: Using the Balanced Scorecard to Create Corporate Synergies	X	X	X		X											
51	The Balanced Scorecard: Translating Strategy into Action	X	X	X		X						X	X	X			
52	The Strategy-Focused Organization	X	X	X		X											
53	Leading Change			X	X										X	X	
54	Watershed Impact Assessment Guidance for Municipal Managers				X		X		X								
55	International Infrastructure Management Manual				X		X										
56	NARUC Chart of Accounts				X	X	X	X	X		X						
57	NAWC Benchmarking Surveys	X	X	X	X	X	X	X	X	X	X						
58	Managing Public Infrastructure Assets to Minimize Cost and Maximize Performance				X		X										
59	Charleston CPW Water Distribution Operation	X	X		X				X	X							X
60	The Six Sigma Way Team Fieldbook																
61	Crucial Conversations: Tools for Talking when Stakes are High			X							X				X		
62	Peter F. Drucker Foundation for Nonprofit Management / Leader to Leader Institute			X	X										X		
63	The Triple Bottom Line				X	X			X								
64	The Fifth Discipline Fieldbook				X							X				X	
65	SA 8000			X													
66	UVA Senior Executive Institute			X	X										X		
67	WaterISAC Information Sharing and Analysis Center							X									
68	Water Services Association of Australia		X		X		X										
69	Asset Management for Water and Wastewater Utilities						X										
70	Water is Life, and Infrastructure Makes it Happen		X			X	X				X						

#	Resource	Product Quality	Customer Satisfaction	Employee and Leadership Development	Operational Optimization	Financial Viability	Infrastructure Stability	Operational Resiliency	Community Sustainability	Water Resource Adequacy	Stakeholder Understanding and Support	Continual Improvement	Strategic Business Planning	Measurement	Leadership	Organizational Approaches	Case Study
71	Continual Improvement in Utility Management	X	X		X			X	X								
72	Sustainable Infrastructure Management Program Learning Environment (SIMPLE)						X										
	TOTAL	**28**	**30**	**29**	**47**	**23**	**23**	**21**	**28**	**13**	**22**	**4**	**2**	**6**	**13**	**5**	**5**

Part II: Example Resources

Included in the draft list of example resource are the top five/most useful resources identified by Steering Committee Members and Collaborating Organization Representatives. This list would need further refinement for a final toolbox.

The final set of resources in a formal toolbox could be organized by Attribute (or other organizing construct), rather than alphabetically by author as they appear below. Please refer to the example crosswalk to see a conceptual exploration of the relationships between the Attributes and the example resources in the list below.

Most useful resources identified to date (in alphabetical order)

1. AMA. **American Management Association (AMA) Seminars**.
   http://www.amanet.org/seminars/index.cfm
   Attributes: employee and leadership development

2. AWMA. **AMWA Annual Meeting**. http://www.amwa.net/ [Note: Speakers' PowerPoint presentations are posted on the Members Only area of the AMWA website]
   Attributes: product quality, customer satisfaction, employee and leadership development, operational optimization, financial viability, infrastructure stability, operational resiliency, community sustainability, water resource adequacy, stakeholder understanding and support

3. AMWA. 2006. **Building the Water Utility Brand**.
   http://www.amwa.net/features/competitiveness/
   Attributes: customer satisfaction, community sustainability, stakeholder understanding and support

4. AMWA and AMSA (NACWA). 2004. **The Changing Workforce…Crisis and Opportunity**.
   http://www.amwa.net/features/competitiveness/
   Attributes: employee and leadership development

5. AMWA and AMSA (NACWA). 2002. **Evaluating Privatization II**.
   http://www.amwa.net/features/competitiveness/
   Attributes: financial viability

6. AMWA and AMSA (NACWA). 2003. **Public vs. Private: Comparing the Costs**.
   http://www.amwa.net/features/competitiveness/
   Attributes: financial viability

7. AMWA and NACWA. 2006. **The Changing Workforce…Seizing the Opportunity**.
   http://www.amwa.net/features/competitiveness/
   Attributes: employee and leadership development

8. APWA 2004. **Public Works Management Practices Manual, 5th Edition**.
   http://www.apwa.net/bookstore/detail.asp?PC=PB.APWM
   Attributes: operational optimization, operational resiliency

9. APWA 1999. **Performance Measurement in Public Works**. http://www.apwa.net/bookstore/detail.asp?PC=PB.ANUT
   Attributes: operational optimization, operational resiliency, stakeholder understanding and support

10. APWA 1999. **Public Works Performance Management**. http://www.apwa.net/bookstore/detail.asp?PC=PB.APER
   Attributes: operational optimization, operational resiliency, stakeholder understanding and support

11. APWA 2004. **Everything You Need to Know to be a Public Works Director**. http://www.apwa.net/bookstore/detail.asp?PC=PB.A420
   Attributes: operational optimization, operational resiliency, stakeholder understanding and support

12. APWA 2003. **Financing Stormwater Utilities**. http://www.apwa.net/bookstore/detail.asp?PC=PB.AFSF
   Attributes: financial viability, water resource adequacy

13. AWWA. 2004. **Avoiding Rate Shock: Making the Case for Water Rates**. http://www.awwa.org/bookstore/product.cfm?id=20570
   Attributes: customer satisfaction, financial viability, stakeholder understanding and support

14. AWWA. **AWWA Manuals of Water Supply Practices, Standards, and Benchmarks**. www.awwa.org
   Attributes: product quality, customer satisfaction, operational optimization, infrastructure stability, operational resiliency, employee and leadership development, community sustainability, water resource adequacy, stakeholder understanding and support

15. AWWA. 2003. Nancy Zelig, editor. **The Evolving Water Utility: Pathways to Higher Performance**. http://www.awwa.org/bookstore/product.cfm?id=20519
   Attributes: product quality, customer satisfaction, operational optimization, operational resiliency, community sustainability, stakeholder understanding and support, infrastructure stability

16. AWWA. 2005. **Thinking Outside the Bill: A Utility Manager's Guide to Assisting Low-Income Water Customers**. http://www.awwa.org/bookstore/product.cfm?id=20594
   Attributes: customer satisfaction, financial viability, community sustainability

17. AWWA. 2006. **Water Infrastructure at a Turning Point: The Road to Sustainable Asset Management**. http://www.awwa.org/bookstore/product.cfm?id=20615
   Attributes: infrastructure stability

18. AWWA. **WaterWiser website**. www.waterwiser.org
   Attributes: operational optimization, community sustainability, stakeholder understanding and support

19. AWWA, AMWA, NACWA, and WEF. **Water and Wastewater Leadership Institute**. www.nacwa.org/meetings/leader
   Attributes: product quality, customer satisfaction, employee and leadership development, financial viability, stakeholder understanding and support

20. AWWA and EPA. **Partnership for Safe Water**. http://www.awwa.org/science/partnership/
    Attributes: product quality, customer satisfaction, operational optimization

21. AWWA and WEF. **AWWA/QualServe Self Assessment, Peer Review, and Benchmarking Program**. www.awwa.org/science/qualserve/
    Attributes: product quality, customer satisfaction, employee and leadership development, operational optimization, financial viability, infrastructure stability, operational resiliency, water resource adequacy, stakeholder understanding and support

22. AWWA and WEF. **AWWA/WEF Joint Management Conference**. http://www.awwa.org/conferences/jmc/
    Attributes: product quality, customer satisfaction, employee and leadership development, operational optimization, financial viability, infrastructure stability, operational resiliency, community sustainability, water resource adequacy, stakeholder understanding and support

23. AwwaRF. 2003. **Workforce Planning for Successful Organization Change** (AwwaRF Report 90965F). http://www.iwapublishing.com/template.cfm?name=isbn1843398710
    Attributes: employee and leadership development, operational optimization

24. AwwaRF, as prepared by Steven Kenway and Shiroma Maheepala. **Triple Bottom Line Reporting of Sustainable Water Utility Performance**. September 2006 [Draft]
    Attributes: operational optimization, financial viability, community sustainability

25. Bickerstaff, Rick. **Leadership, Motivation, and Change in the Competitive Utility Environment**. [case study]
    Attributes: employee and leadership development, operational optimization

26. Bickerstaff, Rick, and John Cook. **Launching CMOM using an EMS**. [case study]
    Attributes: product quality, customer satisfaction, operational optimization, community sustainability, water resource adequacy

27. Bickerstaff, Rick, Adrian Williams, and John Cook. 2003. **Laying the Foundation: An Environmental Management System is a Great First Step in Launching a CMOM Program**. From Water Environment and Technology. [case study]
    Attributes: product quality, customer satisfaction, operational optimization, community sustainability, water resource adequacy

28. City of Fort Wayne. **Six Sigma website**. http://www.cityoffortwayne.org/index.php?option=com_content&task=view&id=454&Itemid=591 [case study]
    Attributes: operational optimization, financial viability

29. Cook, John, and Myron Olstein. **Charleston Commissioners of Public Works Conducting a Two-Front War to Achieve Continual Improvement**. [case study]
    Attributes: product quality, employee and leadership development, operational optimization, community sustainability

30. Dolan, Roger. 2004. **Managing the Water and Wastewater Utility**. http://www.e-wef.org/timssnet/static/UM/P12103.htm
    Attributes: operational optimization, financial viability, infrastructure stability

31. East Bay Municipal Utility District. 2006. **EBMUD Strategic Plan**. http://www.ebmud.com/about_ebmud/overview/strategic_plan/ebmud_strategic_plan.pdf
    Attributes: product quality, customer satisfaction, employee and leadership development, operational optimization, financial viability, infrastructure stability, operational resiliency, community sustainability, water resource adequacy, stakeholder understanding and support

32. EPA. **Asset Management: A Handbook for Small Water Systems 2003**. http://www.epa.gov/safewater/smallsys/pdfs/guide_smallsystems_asset_mgmnt.pdf
    Attributes: infrastructure stability, operational optimization, customer satisfaction

33. EPA. 2006. **Setting Small Drinking Water System Rates for a Sustainable Future**. http://www.epa.gov/safewater/smallsys/pdfs/guide_smallsystems_final_ratesetting_guide.pdf
    Attributes: financial viability, infrastructure stability

34. EPA. 2005. **Using Smart Growth Techniques as Stormwater Best Management Practices.** http://www.epa.gov/smartgrowth/pdf/sg_stormwater_BMP.pdf
    Attributes: operational optimization, product quality, community sustainability

35. EPA, NACWA, and WEF. **National Biosolids Partnership – EMS Program**. www.biosolids.org.
    Attributes: product quality, customer satisfaction, stakeholder understanding and support

36. EPA and the Global Environment and Technology Foundation. 2004. **Achieving Environmental Excellence: An Environmental Management Systems (EMS) Handbook for Wastewater Utilities**. www.peercenter.net
    Attributes: operational optimization, operational resiliency, community sustainability, employee and leadership development, product quality, stakeholder understanding and support

37. EPA and the Global Environment Technology Foundation. 2006. **Reducing Costs and Optimizing Performance: An Environmental Management Systems (EMS) Handbook for Wastewater Utilities**. www.peercenter.net
    Attributes: operational optimization, operational resiliency, community sustainability, employee and leadership development, product quality, stakeholder understanding and support

38. EPA Regions. **Capacity, Management, Operations, and Maintenance (CMOM)**. www.epa.gov.
    Attributes: product quality, operational optimization, community sustainability, water resource adequacy, customer satisfaction

39. Fisher, Roger, William L. Ury, and Bruce Patton (editor). **1991. Getting to Yes: Negotiating Agreement Without Giving In (2nd edition)**. http://www.amazon.com/Getting-Yes-Negotiating-Agreement-Without/dp/0140157352/sr=1-1/qid=1161127268/ref=pd_bbs_1/102-2170278-4848903?ie=UTF8&s=books
    Attributes: operational optimization

40. Gauthier, Stephen J. **Governmental Accounting, Auditing, and Financial Reporting 2005**. http://www.amazon.com/Governmental-Accounting-Auditing-Financial-Reporting/dp/0891252754
    Attributes: financial viability

41. **Generally Accepted Accounting Principles (GAAP)**.
    Attributes: financial viability, operational optimization, infrastructure stability, operational resiliency, community sustainability, stakeholder understanding and support

42. Goleman, Daniel, Richard E. Boyatzis, and Annie McKee. 2002. **Primal Leadership: Learning to Lead with Emotional Intelligence**. http://www.amazon.com/Primal-Leadership-Learning-Emotional-Intelligence/dp/1591391849
    Attributes: employee and leadership development

43. Hunter Water Australia. **Asset Management**. http://www.hwa.com.au/recentprojects.asp?id=345
    Attributes: operational optimization, infrastructure stability.

44. International City/County Management Association. **ICMA Center for Performance Measurement.** http://www1.icma.org/main/bc.asp?bcid=107&hsid=1&ssid1=50&ssid2=220&ssid3=297&t=0
    Attributes: customer satisfaction, operational optimization

45. International Organization for Standardization. **ISO 9000 Series: Quality Management**. www.iso.org.
    Attributes: product quality, customer satisfaction

46. International Organization for Standardization. **ISO 14001: Environmental Management**. www.iso.org
    Attributes: product quality, operational optimization, community sustainability, water resource adequacy, customer satisfaction

47. International Organization for Standardization. **Draft International Standard ISO/DIS 24510: Service activities related to drinking water and wastewater – Guidelines for the improvement and for the assessment of the service to users**. Final version expected in 2007. www.iso.org.
    Attributes: product quality, customer service, operational optimization, operational resiliency, community sustainability

48. International Organization for Standardization. **Draft International Standard ISO/DIS 24511: Service activities related to drinking water and wastewater – Guidelines for the management of wastewater utilities and for the assessment of wastewater services**. Final version expected in 2007. www.iso.org.
    Attributes: product quality, customer service, operational optimization, infrastructure stability, operational resiliency, community sustainability

49. International Organization for Standardization. **Draft International Standard ISO/DIS 24512: Service activities related to drinking water and wastewater – Guidelines for the management of drinking water utilities and for the assessment of drinking water services**. Final version expected in 2007. www.iso.org.
    Attributes: product quality, customer satisfaction, operational optimization, infrastructure resiliency, operational resiliency, community sustainability, water resource adequacy

50. Kaplan, Robert S. and David P. Norton. 2006. **Alignment: Using the Balanced Scorecard to Create Corporate Synergies**. http://www.amazon.com/Alignment-Balanced-Scorecard-Corporate-Synergies/dp/1591396905/sr=8-1/qid=1161814232/ref=sr_1_1/102-7413398-1706530?ie=UTF8&s=books
    Attributes: customer satisfaction, financial viability, employee and leadership development, product quality

51. Kaplan, Robert S. and David P. Norton. 1996. **The Balanced Scorecard: Translating Strategy into Action**. http://www.amazon.com/Balanced-Scorecard-Translating-Strategy-Action/dp/0875846513/sr=1-1/qid=1161814319/ref=sr_1_1/102-7413398-1706530?ie=UTF8&s=books
    Attributes: customer satisfaction, financial viability, employee and leadership development, product quality

52. Kaplan, Robert S. and David P. Norton. 2000. **The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment**. http://www.amazon.com/Strategy-Focused-Organization-Scorecard-Companies-Environment/dp/1578512506/sr=1-1/qid=1161814346/ref=sr_1_1/102-7413398-1706530?ie=UTF8&s=books
    Attributes: customer satisfaction, financial viability, employee and leadership development, product quality

53. Kotter, John P. 1996. **Leading Change**. http://www.amazon.com/Leading-Change-John-P-Kotter/dp/0875847471/sr=1-1/qid=1161814375/ref=sr_1_1/102-7413398-1706530?ie=UTF8&s=books
    Attributes: employee and leadership development, operational optimization

54. Low Impact Development Center. 2005. **Watershed Impact Assessment Guidance for Municipal Managers**. www.lowimpactdevelopment.org.
    Attributes: community sustainability, infrastructure stability, operational optimization

55. National Asset Management Steering Group (New Zealand). 2006. **International Infrastructure Management Manual**. http://www.nams.org.nz/International%20Infrastructure%20Management%20Manual
    Attributes: operational optimization, infrastructure stability

56. National Association of Regulatory Utility Commissioners (NARUC). **NARUC Chart of Accounts**. www.naruc.org
    Attributes: financial viability, operational optimization, infrastructure stability, operational resiliency, community sustainability, stakeholder understanding and support

57. National Association of Water Companies (NAWC). **NAWC Benchmarking Surveys**. www.nawc.org
    Attributes: product quality, customer satisfaction, operational optimization, financial viability, infrastructure stability, operational resiliency, employee motivation and commitment, water resource adequacy, community sustainability, stakeholder understanding and support

58. National Association of Clean Water Agencies (NACWA) in cooperation with AMWA, AWWA, and WEF. **Managing Public Infrastructure Assets to Minimize Cost and Maximize Performance.** http://www.nacwa.org/pubs/index.cfm#management
    Attributes: infrastructure stability, operational optimization

59. Oberoi, Kanwal, and Rick Bickerstaff. **Charleston CPW Water Distribution Operation: First Public Utility to Acquire ISO 14001 Certification**. [case study]
    Attributes: product quality, customer satisfaction, operational optimization, community sustainability, water resource adequacy

60. Pande, Peter S., Robert P. Neuman, and Roland R. Cavanagh. 2002. **The Six Sigma Way Team Fieldbook: An Implementation Guide for Process Improvement Teams**. http://doi.contentdirections.com/mr/mgh.jsp?doi=10.1036/0071373144
    Attributes: operational optimization, financial viability

61. Patterson, Kerry, Joseph Grenny, Ron McMillan, and Al Switzler. 2002. **Crucial Conversations: Tools for Talking when Stakes are High**. http://www.amazon.com/Crucial-Conversations-Tools-Talking-Stakes/dp/0071401946
    Attributes: employee and leadership development, stakeholder understanding and support

62. **Peter F. Drucker Foundation for Nonprofit Management / Leader to Leader Institute**. http://www.pfdf.org/about/index.html
    Attributes: employee and leadership development, operational optimization

63. Savitz, Andrew W and Karl Weber. 2006. **The Triple Bottom Line: How Today's Best-Run Companies are Achieving Economic, Social and Environmental Success – and How You Can Too**. http://www.amazon.com/Triple-Bottom-Line-Companies-Environmental/dp/0787979074/sr=8-1/qid=1161815464/ref=pd_bbs_sr_1/102-7413398-1706530?ie=UTF8&s=books
    Attributes: financial viability, community sustainability, operational optimization

64. Senge, Peter M., Art Kleiner, Charlotte Roberts, Rick Ross, and Bryan Smith. 1994. **The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization**. http://www.amazon.com/Fifth-Discipline-Fieldbook-Peter-Senge/dp/0385472560
    Attributes: operational optimization

65. Social Accountability International. **Social Accountability 8000 Standard**. http://www.sa-intl.org/index.cfm?fuseaction=Page.viewPage&pageId=473
    Attributes: employee and leadership development

66. **UVA Senior Executive Institute**. http://www.coopercenter.org/leadership/SEI/
    Attributes: operational optimization

67. **WaterISAC Information Sharing and Analysis Center**. http://www.waterisac.org/
    Attributes: operational resiliency

68. **Water Services Association of Australia (WSAA) – process benchmarking, asset management, civil maintenance, customer services**. http://www.wsaa.asn.au/
    Attributes: customer satisfaction, infrastructure stability, operational optimization

69. WEF. **Asset Management for Water and Wastewater Utilities: Manageable, Incremental Steps to Life-Cycle Asset Management**. www.wef.org/conferencesTraining/
    Attribute: infrastructure stability

70. WEF administered – broad alliance. **Water is Life, and Infrastructure Makes it Happen**. www.waterislife.net
    Attributes: customer satisfaction, financial viability, infrastructure stability, stakeholder understanding and support

71. WEF, NACWA, and EPA. **Continual Improvement in Utility Management: A Framework for Integration**. 2004. www.wef.org, www.nacwa.org, www.peercenter.net
    Attributes: product quality, operational optimization, customer satisfaction, operational resiliency, community sustainability

72. Water Environment Research Foundation (WERF). **Sustainable Infrastructure Management Program Learning Environment (SIMPLE)**. www.werf.us/products/tools.cfm. Free to WERF subscribers.
    Attributes: infrastructure stability

Appendix F: Steering Committee Members and Collaborating Organization Representatives

Steering Committee Members

David Brosman, El Paso Water Utilities Public Service Board

John Cook, Advanced Data Mining International, formerly of Charleston Water System†

Stephen Densberger, Pennichuck Water Service Co.

JC Goldman, Jr., United Water*

Dan Hartman, City of Golden Public Works*

Scott Haskins, Seattle Public Utilities*

Mary Lappin, Kansas City Water Services Department

Ed McCormick, East Bay Municipal Utility District†

Patricia Mulroy, Las Vegas Valley Water District

Howard Neukrug, Philadelphia Water

Dave Rager, Greater Cincinnati Water Works

Brian Ramaley, Newport News Waterworks

Joseph Superneau, Springfield Water and Sewer Commission†

Diane Taniguchi-Dennis, City of Albany Dept of Public Works†

Billy Turner, Columbus Water Works*

John Young, Jr., American Water*

Collaborating Organization Representatives

Julia Anastasio, American Public Works Association

Peter Cook, National Association of Water Companies

Jim Ginley, American Water Works Association*†

Chris Hornback, National Association of Clean Water Agencies*†

Jim Horne, US EPA, Office of Water*

Eileen O'Neill, Water Environment Federation†

Carolyn Peterson, Association of Metropolitan Water Agencies*

* Participated in the Measures Subgroup
† Participated in the Resources Subgroup

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