

Schumaker & Company



Final Report
Volume I of III

Stratified Management & Operations Audit
of
Pennsylvania-American Water Company
for the
Pennsylvania Public Utility Commission
Bureau of Audits

Docket No. D-06MGT029

August 2008



Table of Contents

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1
A. Objectives and Scope.....	2
B. Functional Evaluation Summary	3
C. Summary of Estimated Benefits.....	5
Priority.....	5
Benefits.....	6
D. Summary of Recommendations.....	7
Phase I – Diagnostic Review.....	8
Chapter II – Executive Management, External Relations, and Human Resources.....	8
Chapter III – Financial Management	9
Chapter IV – Support Services.....	9
Chapter V – Water Operations	12
Phase II – Pre-Identified Issues Review.....	13
Chapter VI – Corporate Governance.....	13
Chapter VII – Corporate Culture, Management Structure, & Staffing Levels.....	13
Chapter VIII – Affiliate Interests	14
Chapter IX – Diversity and EEO.....	14
Chapter X – Customer Service.....	15
Chapter XI – Operational Performance	16
Phase III – Focused Area Analysis.....	16
Chapter XII – Phase III Water Operations – Distribution Business Systems.....	16
Chapter XIII – Phase III Human Resources	17
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19
A. Executive Management.....	19
Background & Perspective	19
Findings & Conclusions.....	27
Recommendations	29

Table of Contents (continued)

B. External Relations and Corporate Communications.....	31
Background & Perspective.....	31
Findings & Conclusions.....	34
Recommendations	36
C. Human Resources	38
Background & Perspective.....	38
Findings & Conclusions.....	44
Recommendations	55
III. FINANCIAL MANAGEMENT	59
A. Background & Perspective.....	59
Financial Requirements Planning and Cash Management.....	62
Cash Management.....	62
Financial Requirements Planning.....	64
Managerial Reporting, Accounting, and Controls	67
Processes	67
Systems	69
Performance Metrics.....	70
Budget Management, Reporting, and Control	73
Internal Auditing.....	78
B. Findings & Conclusions	82
Financial Requirements Planning and Cash Management.....	82
Managerial Reporting, Accounting, and Controls	83
Budget Management, Reporting, and Control	84
Internal Auditing.....	86
C. Recommendations	87
Financial Requirements Planning and Cash Management.....	87
Managerial Reporting, Accounting, and Controls	88
Budget Management, Reporting, and Control	88
Internal Auditing.....	88

Table of Contents (continued)

IV. SUPPORT SERVICES.....	91
A. Information Technology and Systems.....	91
Background & Perspective	91
Mission, Focus, & Objectives.....	91
Organization & Staffing	92
Business Solutions.....	95
Infrastructure & Operations.....	101
Client Services & Support.....	105
Project Management Office.....	107
Global Strategy & Architecture.....	109
Planning & Performance.....	111
Expenditures	112
Backup/Recovery, Disaster Recovery, and Security/Protection	113
Backup/Recovery.....	113
Disaster Recovery.....	113
Security/Protection.....	114
Technology Audits	115
Governance Processes.....	116
Findings & Conclusions.....	118
Recommendations	127
B. Transportation and Fleet Management	133
Background & Perspective	133
Organization & Staffing	133
Fleet Operating Performance Statistics and Trends.....	137
ARI	138
Fleet Composition and Annual Expenditures.....	139
Major Processes and Systems	143
Vehicle Acquisition	143
Vehicle Maintenance and Repair.....	144
Fuel Supply.....	145
ARI Processes.....	146
ARI Systems.....	147
Internal Audit of the Fleet Management Function	148
Findings & Conclusions.....	148
Recommendations	150

Table of Contents (continued)

C. Facilities and Property Management.....	153
Background & Perspective.....	153
Organization & Staffing.....	153
Expenditures.....	155
Major Processes and Systems.....	156
Metrics.....	156
Findings & Conclusions.....	157
Recommendations.....	157
D. Procurement Services and Materials Management.....	159
Procurement Services.....	159
Background & Perspective.....	159
Organization & Staffing.....	159
Staffing Levels.....	167
Expenditures.....	168
Major Business Processes.....	169
Major Systems.....	171
Findings & Conclusions.....	172
Recommendations.....	174
Materials Management.....	175
Background & Perspective.....	175
Organization & Staffing.....	175
Expenditures.....	176
Major Business Processes.....	176
Findings & Conclusions.....	183
Recommendations.....	193
E. Risk Management.....	199
Background & Perspective.....	199
Organization & Staffing.....	199
Operating Expenses.....	205
Findings & Conclusions.....	210
Recommendations.....	212
F. Legal Services.....	213
Background & Perspective.....	213
Organization & Staffing.....	213
Expenditures.....	216
Major Processes and Systems.....	217
Findings & Conclusions.....	219
Recommendations.....	221

Table of Contents (continued)

V. WATER OPERATIONS	223
A. Production	226
Background & Perspective	226
Findings & Conclusions	228
Recommendations	236
B. Network Operations and Maintenance	237
Background & Perspective	237
Findings & Conclusions	238
Recommendations	246
C. Maintenance Services	249
Background & Perspective	249
Findings & Conclusions	249
Recommendations	252
D. Engineering Department	253
Background & Perspective	253
Findings & Conclusions	254
Recommendations	257

**Table of Contents
(continued)**

Volume II

VI. CORPORATE GOVERNANCE.....	255
A. Background & Perspective.....	255
B. Findings & Conclusions	258
C. Recommendations	267
VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS	269
A. Background & Perspective.....	269
Multiple Reorganizations	269
Performance Management	273
B. Findings & Conclusions	274
C. Recommendations	281
VIII. AFFILIATE INTERESTS	283
A. Background & Perspective.....	284
Affiliate Relationships	284
Organizations.....	284
Agreements	292
Affiliate Transactions	294
Services Provided To/From PAWC.....	294
Services Provided by Affiliates to PAWC	295
Services Provided by PAWC to Affiliates	296
Personnel Transfers From/To PAWC.....	296
Property Transfers From/To PAWC	297
Major Processes and Systems.....	298
Cost Accumulation & Assignment	298
Pennsylvania-American Water Company	298
AWWSC	298
Direct Charges/Cost Allocation	299
Systems	302
Invoicing and Payment Methodologies	302

Table of Contents (continued)

Restrictions	302
Dividends	302
Other Restrictions	303
B. Findings & Conclusions.....	304
From PAWC to Affiliates	305
From Affiliates to PAWC	306
C. Recommendations	312
IX. DIVERSITY/EEO.....	315
A. Background & Perspective.....	315
Organization & Staffing.....	318
Employer Diversity	318
Supplier Diversity	319
Major Processes & Systems.....	320
Employer Diversity	320
Supplier Diversity	321
Statistical Data	323
Employer Diversity	323
Diversity Composition	323
Equal Employment Opportunity Commission Complaints.....	326
Supplier Diversity	326
B. Findings & Conclusions.....	327
C. Recommendations	339
X. CUSTOMER SERVICE	343
A. Background & Perspective.....	343
Call Center Operations.....	344
Organization & Staffing	348
Call Center Technology.....	350
Call Routing and Management.....	350
Workforce Management.....	350
Customer Relations.....	352
Organization & Staffing	352
Service First Program	355
Customer Surveys	357

Table of Contents (continued)

Customer Accounting and Billing	357
Systems	358
Billing Cycle	359
Credit and Collections	361
Meter Management.....	367
Theft of Service Management.....	369
B. Findings & Conclusions	370
Informal Complaints.....	380
Mediation Complaints	380
Complaint Turnaround Time	381
Formal Complaints.....	381
Executive Complaints.....	382
C. Recommendations	386

XI. OPERATIONAL PERFORMANCE..... 391

A. Damage Prevention Programs and Practices	391
Background & Perspective	391
Findings & Conclusions.....	392
Recommendations	394
B. Chapter 101 Compliance	395
Background & Perspective	395
Findings & Conclusions.....	396
Recommendations	399
C. Unaccounted-For-Water	401
Background & Perspective	401
Findings & Conclusions.....	403
Recommendations	412
D. Capital Investment and Operating Expense Levels.....	413
Background & Perspective	413
Findings & Conclusions.....	415
Recommendations	420

**Table of Contents
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

- A. Background & Perspective..... 421
 - Prior Findings..... 421
 - Prior Recommendations..... 421
- B. Findings & Conclusions..... 422
 - Current Status..... 423
 - Planned Status 427
- C. Recommendations 434
- D. Overall Summary Conclusions..... 439
- E. Implementation Plan..... 441
 - Assumptions 441
 - Project Staffing..... 442
 - Project Plan..... 442
 - Project Schedule..... 443
 - Project Costs Estimates 445

XIII. PHASE III HUMAN RESOURCES 447

- A. Background & Perspective..... 447
- B. Project Team Deliverables..... 448
 - Human Capital Scorecard 448
 - Financial Measures 449
 - Customer Measures..... 449
 - Process Measures..... 451
 - Employee (Learning and Growth)..... 451
 - Workforce Planning and Replenishment 451
 - Aging Workforce..... 451
 - Changing Demographics..... 452
 - Growing Demand for Operators..... 452
 - Implications..... 452
 - PAWC’s Aging Workforce..... 453

Table of Contents
(continued)

Workforce Planning and Replenishment.....454
 Critical Knowledge Risk Management.....455
 Workforce of the Future.....455
 Retiree Retention.....456
Project Plan456
Strategic Alignment456
 External Focus.....457
 Growth.....458
C. Findings & Conclusions458
D. Recommendations459

XIV. APPENDIX A: DATA AND STATISTICS 461

A. Section 1 – PAWC464
 Total Net Plant in Service465
 Water Sales by Volume (millions of gallons)466
 Operating Revenue468
 Residential Revenue versus Water Sold469
 Commercial Revenue versus Water Sold.....470
 Industrial Revenue versus Water Sold471
 Wholesale Revenue versus Water Sold472
 Governmental Authority Revenue versus Water Sold.....473
 Fire Service Revenue versus Water Sold.....474
 Other (Utility & Non-Utility) Revenue.....475
 Total Average Number of Customers (year-end)476
 Total Employees (year-end)477
 Total Operation and Maintenance Expense478
 Production Expense479
 Purification Expense.....480
 Transmission and Distribution Expense480
 Customer Accounting Expense481
 Administrative and General Expense.....482
 Miles of Main in Service483
 Performance Ratios484
 Performance Ratios per Million Gallons485
 Performance Ratios per One Thousand Customers.....485
 Performance Ratios per Mile of Main.....486
 Performance Ratios - Average Number of Customers per Employee.....486
 Performance Ratios - Gross Utility Plant in Service per Average Number of
 Customers487

Table of Contents (continued)

B. Section 2 – Comparative.....	489
Total Net Plant in Service.....	490
Water Sales by Volume (millions of gallons)	491
Residential Water Sold.....	492
Commercial Water Sold.....	493
Industrial Water Sold	494
Wholesale Water Sold.....	495
Governmental Authority Water Sold	496
Fire Service Water Sold	497
Other Water Sold	498
Operating Revenue	499
Residential Revenue	500
Commercial Revenue.....	501
Industrial Revenue.....	502
Wholesale Revenue	503
Governmental Authority Revenue.....	504
Fire Service Revenue.....	505
Other Revenue.....	506
Total Average Number of Customers (year-end)	507
Residential Average Number of Customers.....	508
Commercial Average Number of Customers.....	509
Industrial Average Number of Customers	510
Wholesale Average Number of Customers	512
Governmental Authority Average Number of Customers	513
Fire Service Average Number of Customers	514
Other Average Number of Customers	516
Total Employees (year-end)	517
Total Operation and Maintenance Expense	518
Production Expense.....	519
Purification Expense.....	520
Transmission and Distribution Expense	521
Customer Accounting Expense.....	522
Administrative and General Expense.....	523
Miles of Main in Service.....	524

Table of Contents
(continued)

Performance Ratio Expense.....	525
Operation and Maintenance Expenses per Million Gallons.....	526
Production Expenses per Million Gallons	527
Purification Expenses per Million Gallons	527
Transmission & Distribution Expenses per Million Gallons	528
Customer Accounting Expenses per Million Gallons	528
Administrative & General Expenses per Million Gallons	529
Operation and Maintenance Expenses per Thousand Customers	530
Production Expenses per Thousand Customers.....	531
Purification Expenses per Thousand Customers.....	531
Transmission & Distribution Expenses per Thousand Customers.....	532
Customer Accounting Expenses per Thousand Customers.....	532
Administrative & General Expenses per Thousand Customers	533
Operation and Maintenance Expenses per Mile of Main	534
Production Expenses per Mile of Main.....	535
Purification Expenses per Mile of Main.....	535
Transmission & Distribution Expenses per Mile of Main.....	536
Customer Accounting Expenses per Mile of Main.....	536
Administrative & General Expenses per Mile of Main.....	537
XV. APPENDIX B: GLOSSARY	539

Table of Exhibits

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1	
Exhibit I-1	Functional Evaluation Summary Phase I – Diagnostic Review	4
Exhibit I-2	Functional Evaluation Summary Phase II – Pre-identified Issues Review	4
Exhibit I-3	Functional Evaluation Summary Phase III – Focused Area Analysis	5
Exhibit I-4	Summary of Priority Totals	6
Exhibit I-5	Summary of Benefits	6
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19	
Exhibit II-1	American Water Organization, as of December 31, 2007	20
Exhibit II-2	American Water Eastern Division Reorganization, as of December 31, 2007	22
Exhibit II-3	Pennsylvania-American Water Company Organization, as of December 31, 2007	23
Exhibit II-4	AWWSC Communications and External Affairs Organization, as of December 31, 2007	31
Exhibit II-5	Summary of Expenditures for AWWSC External-Relations Activities, 2003 to 2007	33
Exhibit II-6	AWWSC Human Resources Organization, as of December 31, 2007	38
Exhibit II-7	AWWSC Benefits Services Center, as of December 31, 2007	39
Exhibit II-8	Pennsylvania-American Water Company Human Resources, as of December 31, 2007	40
Exhibit II-9	HR-Process Improvement Objectives, September 11, 2007	42
Exhibit II-10	American Water Business Strategy, September 13, 2007	48
Exhibit II-11	Retirement Forecast Thru 2021, Normal and Early Retirement	50
Exhibit II-12	Pennsylvania-American Water Company Staffing Requisitions and Average Time to Fill 2003 to 2007 (through February 2007)	53
III. FINANCIAL MANAGEMENT	59	
Exhibit III-1	AWWSC Financial Functions, as December 31, 2007, Page 1 of 2	60
Exhibit III-1	AWWSC Financial Functions, as of December 31 2007, Page 2 of 2	61
Exhibit III-2	PAWC Mellon Lockbox Account Daily Balances, 2003 to 2007	62
Exhibit III-3	Example of SSC Cash Management Metrics, June 2006 through September 2007	63

**Table of Exhibits
(continued)**

Exhibit III-4	Cash Management Sample Excerpt from Reconciliation Summary for Month ended August 2007.....	64
Exhibit III-5	AWCC Long-term Debt and Commercial Paper Ratings, 2003 to 2007.....	66
Exhibit III-6	Systems Supporting American Water’s and PAWC’s Accounting and Finance Functions.....	70
Exhibit III-7	SSC Payroll, General Accounting, Rates, General Tax, & Accounts Payable Metrics, June 2006 through September 2007.....	71
Exhibit III-8	Training Provided to SSC Personnel 2006 and 2007, as of October 31, 2007.....	72
Exhibit III-9	Budget Process Flows from American Water to PAWC as of December 31 2007.....	73
Exhibit III-10	American Water Budget Process, as of December 31, 2007.....	74
Exhibit III-11	American Water Second-Quarter Budget Reforecast Timetable.....	76
Exhibit III-12	Internal Audits Completed by Year, 2003 to 2004.....	80
Exhibit III-13	Internal Audits Completed by Year, 2005 to 2006.....	81
Exhibit III-14	PAWC Key Financial Statistics (\$ Thousands) 2002 to June 30, 2007.....	85

IV. SUPPORT SERVICES 91

Exhibit IV-1	AWWSC Information Technology Services Organization, as of December 31, 2007.....	93
Exhibit IV-2	ITS Staffing Levels, 2004 to 2007.....	94
Exhibit IV-3	ITS Business Solutions Organization, as of December 31, 2007.....	95
Exhibit IV-4	ITS Business Solutions Organization Functional Applications, as of December 31, 2007.....	96
Exhibit IV-5	ITS Business Solutions Organization Technical Applications, as of December 31, 2007.....	97
Exhibit IV-6	KPIs for the ITS Director of Business Solutions, as of December 31, 2007....	98
Exhibit IV-7	Typical Testing Performed and Responsible Group as of December 31, 2007.....	100
Exhibit IV-8	ITS Infrastructure & Operations Organization as of December 31, 2007.....	101
Exhibit IV-9	KPIs for the ITS Director of Infrastructure & Operations, as of December 31, 2007.....	102
Exhibit IV-10	Major Infrastructure & Operations Initiatives, as of December 31, 2007.....	104
Exhibit IV-11	ITS Client Services & Support Organization, as of December 31, 2007.....	105
Exhibit IV-12	ITS Project Management Office Organization, as of December 31, 2007.....	107
Exhibit IV-13	ITS Global Strategy & Architecture, as of December 31, 2007.....	109
Exhibit IV-14	High-Priority List of Standards, as of December 31, 2007.....	110

**Table of Exhibits
(continued)**

Exhibit IV-15	PAWC Information Technology Costs, 2003 to 2007	112
Exhibit IV-16	Example Disaster-Recovery-Plan (DRP) Testing Cycle, as of December 31 2007.....	113
Exhibit IV-17	IT/IS-Related Audits, 2003 to 2007	115
Exhibit IV-18	Mix of ITS Resources Approved by ITSC, as of December 31, 2007	117
Exhibit IV-19	Actual versus Budget ITS Staffing Levels, 2004 to 2007	120
Exhibit IV-20	ITS Performance Metrics, 2005 to 2007 (through First Half of 2007 Only) ..	123
Exhibit IV-21	American Water Vehicle Replacement Criteria as of January 24, 2006.....	135
Exhibit IV-22	PAWC Annual Fleet Operating Performance Statistics 2005 to 2007	138
Exhibit IV-23	PAWC EOY Vehicle Fleet Composition and Trends by Vehicle Class, 2003 to 2007	139
Exhibit IV-24	PAWC Revised EOY Vehicle Count, 2003 to 2007	140
Exhibit IV-25	PAWC Fleet Utilization Statistics, as of August 31, 2007	141
Exhibit IV-26	Operations and Maintenance Budget Versus Actuals, 2002 to 2007.....	141
Exhibit IV-27	ARI Annual Billings to PAWC, 2003 to 2007.....	142
Exhibit IV-28	Total Vehicle Leasing Expense, 2003 to 2007	142
Exhibit IV-29	Accident Dollars Recovered Due to Subrogation by ARI, 2003 to 2007	146
Exhibit IV-30	Supply Chain Organization, as of December 31, 2007.....	160
Exhibit IV-31	AWWSC Supply Chain Staffing Levels, 2004 to 2007.....	168
Exhibit IV-32	PAWC Total Procurement Value, 2002 to 2007	169
Exhibit IV-33	PAWC Inventory Levels by Stock Type as Reported by PAWC, 2003 to 2007	184
Exhibit IV-34	PAWC Stock E Inventory Turns as Reported by PAWC, 2003 to 2007.....	185
Exhibit IV-35	PAWC Stock E Inventory Turns by Warehouse, as Reported by PAWC, 2004 to 2007.....	186
Exhibit IV-36	AWWSC Operational & Financial Risk Management Organizations, as of December 31, 2007.....	199
Exhibit IV-37	AWWSC Operational Risk Management Organizations Southeast Region – Pennsylvania Only, as of December 31, 2007.....	200
Exhibit IV-38	Operational Risk Management Staffing Levels for PAWC Activities, 2002 to 2007	202
Exhibit IV-39	Resolution of Claims Review and Approval Limits, as of December 31, 2007.....	204
Exhibit IV-40	Annual Insurance Premium Expense, Other Than Group, for PAWC and American Water, 2004 to 2007	205
Exhibit IV-41	Self-Funding Retentions, as of December 31, 2007.....	206
Exhibit IV-42	# PAWC Claims By Accident Year, 2002 to 2007	207
Exhibit IV-43	\$ PAWC Claims Incurred By Accident Year, 2002 to 2007	208

**Table of Exhibits
(continued)**

Exhibit IV-44	PAWC Loss Control Expenditures as % of Claimed Losses, 2002 to 2007.....	209
Exhibit IV-45	AWWSC Legal Organization, as of December 31, 2007	213
Exhibit IV-46	AWWSC Southeast Region Legal Organization Providing PAWC Legal Services, as of December 31, 2007.....	215
Exhibit IV-47	Southeast Region/PAWC Operating Costs, 2005 to 2007	216
Exhibit IV-48	PAWC Outside Legal Counsel Costs, 2003 to 2007	217

V. WATER OPERATIONS..... 223

Exhibit V-1	PAWC Water Districts, as of December 31, 2007	223
Exhibit V-2	Water District Statistics, as of December 31, 2007	224
Exhibit V-3	PAWC Water Operations Organization, as of December 31, 2007	225
Exhibit V-4	PAWC Production Department Organization, as of December 31, 2007.....	227
Exhibit V-5	Production Facility Tours, as of December 31, 2007	228
Exhibit V-6	Coatesville Wastewater Treatment Facility, as of December 31, 2007.....	229
Exhibit V-7	Coatesville Wastewater Treatment Facility, as of December 31, 2007.....	229
Exhibit V-8	Coatesville Water Treatment Plant, as of December 31, 2007.....	230
Exhibit V-9	Coatesville Retaining Dam on Reservoir, as of December 31, 2007.....	230
Exhibit V-10	Silver Springs Water Source Conodoquinet Creek, as of December 31, 2007.....	231
Exhibit V-11	Silver Springs Water Intake Showing Exterior Screen, as of December 31, 2007.....	231
Exhibit V-12	Silver Springs Water Intake and Pump Station, as of December 31, 2007.....	232
Exhibit V-13	Silver Springs Aldrich Purification Units, as of December 31, 2007.....	232
Exhibit V-14	Silver Springs Lagoons, as of December 31, 2007	233
Exhibit V-15	West Shore Plant, as of December 31, 2007.....	233
Exhibit V-16	Performance Charts on Coatesville Water District Office, as of December 31, 2007.....	234
Exhibit V-17	Partnership Annual Report for Pennsylvania-American Water Company – Butler 2006–2007, as of December 31, 2007	235
Exhibit V-18	PAWC Network Department Organization, as of December 31, 2007	237
Exhibit V-19	PAWC Leaks/Breaks by Water District by Year, 2002 to 2006	240
Exhibit V-20	PAWC Average Leaks/Breaks Frequency by Water District by Year, 2002 to 2006.....	241
Exhibit V-21	PAWC Capital/Maintenance Expectations Based on Leak/Break History, as of December 31, 2007	242

**Table of Exhibits
(continued)**

Exhibit V-22	PAWC Actual Capital Expenditures – Main Replacements, 2004 to 2007	243
Exhibit V-23	PAWC Maintenance Expenditures by Water District, 2003 to 2007	244
Exhibit V-24	PAWC Distribution of Capital and Maintenance Expenditures by District, 2003 - 2007.....	245
Exhibit V-25	PAWC Maintenance Services Organization, as of December 31, 2007.....	249
Exhibit V-26	Sample Condition-Based Maintenance Test, as of December 31, 2007.....	251
Exhibit V-27	PAWC Engineering Department Organization, as of December 31, 2007.....	253
Exhibit V-28	PAWC Inventory of Comprehensive Planning Studies and Other Studies, as of July 2007	255

**Table of Exhibits
(continued)**

Volume II

VI. CORPORATE GOVERNANCE..... 255

VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS269

Exhibit VII-1 PAWC Positions Subject to Reorganization, as of April 2004.....272

VIII. AFFILIATE INTERESTS 283

Exhibit VIII-1 American Water Works Company, Inc. Organization,
as of December 31, 2007.....286

Exhibit VIII-2 TWH, LLC Organization, as of December 31, 2007.....287

Exhibit VIII-3 American Water Enterprise, Inc. Organization, as of December 31, 2007.....288

Exhibit VIII-4 AWWSC Corporate Organization, as of December 31, 2007289

Exhibit VIII-5 Affiliate Agreements involving PAWC and Other American Water Entities,
as of December 31, 2007.....293

Exhibit VIII-6 Summary of Charges Involving Affiliated Services
Provided To/From PAWC, 2002 to 2007294

Exhibit VIII-7 Summary of Charges Involving Affiliated Services
Provided To/From PAWC by Affiliate/Type, 2002 to 2007295

Exhibit VIII-8 PAWC’s Share of AWWSC Expenses (\$ Thousands), 2002 to 2007.....295

Exhibit VIII-9 Percentage of Direct Charges versus Allocations for AWWSC Charges to
PAWC, 2005 to 2007296

Exhibit VIII-10 Personnel Transfers From/To PAWC and its Affiliates, 2003 to 2007297

Exhibit VIII-11 AWWSC Expense Categories, as of December 31, 2007301

Exhibit VIII-12 PAWC Dividend Payments to American Water, 2002 to 2007303

IX. DIVERSITY/EEO 315

Exhibit IX-1 Southeast Region HR Organization, as of December 31, 2007318

Exhibit IX-2 AWWSC Supply Chain Organization, as of December 31, 2007319

Exhibit IX-3 Diversity Composition of PAWC Employees, as of December 31, 2006.....323

Exhibit IX-4 Diversity Composition of PAWC Employees, as of December 31, 2007324

Exhibit IX-5 PAWC Consolidated AAP Data, 2004 to 2006
(as of August of Each Year)325

Exhibit IX-6 Number of PAWC Agreements with Women and Minority Vendors,
2005 to 2007326

**Table of Exhibits
(continued)**

Exhibit IX-7	Annual Spend Value and Percentage of Total Spend by PAWC with M/WBE Suppliers, 2002 to 2007	327
Exhibit IX-8	Location Validation Activities for AAP/EEO-1 Reporting by Area, as of December 31, 2007.....	330
Exhibit IX-9	Summary of American Water Progress against Diversity Plan, as of December 31, 2007, Page 1 of 3.....	332
Exhibit IX-9	Summary of American Water Progress against Diversity Plan, as of December 31, 2007, Page 2 of 3.....	333
Exhibit IX-9	Summary of American Water Progress Against Diversity Plan, as of December 31, 2007, Page 3 of 3.....	334
Exhibit IX-10	PAWC Women and Minority Utilization, as of December 31, 2006	336
X. CUSTOMER SERVICE		343
Exhibit X-1	American Water National Call Center, as of December 31, 2007.....	344
Exhibit X-2	Inside Alton Call Center, as of December 31, 2007.....	346
Exhibit X-3	Inside Pensacola Call Center, as of December 31, 2007	347
Exhibit X-4	Customer Service Center Organization, as of December 31, 2007	348
Exhibit X-5	AWWSC Eastern Division Organization, as of December 31, 2007	352
Exhibit X-6	AWWSC Southeast Region Customer Relations Organization, as of December 31, 2007.....	353
Exhibit X-7	PAWC Appointment Windows, as of December 31, 2007	356
Exhibit X-8	PAWC Met Appointments, 2005 to 2007	356
Exhibit X-9	Collection and Termination Practices, as of December 31, 2007	362
Exhibit X-10	PAWC Account Hold for Medical Condition, 2003 to 2008	362
Exhibit X-11	PAWC Customers Enrolled in Various Programs, as of December 31, 2007.....	363
Exhibit X-12	PAWC Accounts Receivable Aging Trends, 2002 to 2007	364
Exhibit X-13	PAWC Late Payment Revenues, 2002 to 2007	365
Exhibit X-14	PAWC Agency Collections, 2004 to 2007	365
Exhibit X-15	PAWC Allowance for Uncollectible Trends (\$ Thousands), 2004 to 2007.....	366
Exhibit X-16	Agreements Created/Broken, 2003 to 2007.....	366
Exhibit X-17	PAWC Full-time Meter Readers, 2004 to 2007	367
Exhibit X-18	Meter Age Histogram, as of December 31, 2007	368
Exhibit X-19	Meter Testing Rates, 2003 to 2007	369
Exhibit X-20	Theft of Service Statistics, as of December 31, 2007.....	370
Exhibit X-21	PAWC and American Water % of Calls Answered within 30 Seconds, 2002 to 2007	371
Exhibit X-22	PAWC Customers' Unanswered Calls (Alton and Pensacola)	

xx

2002 to 2007.....372

**Table of Exhibits
(continued)**

Exhibit X-23	American Water and PAWC Call Abandoned Rates, 2002 to 2007	373
Exhibit X-24	PAWC Average Handle Time (Seconds), 2002 to 2007	374
Exhibit X-25	American Water CSR Turnover Rates By Call Center,2003 to 2007.....	374
Exhibit X-26	CSR Staffing Level Changes for American Water as a Whole, 2005 to 2007.....	377
Exhibit X-27	Number of PAWC Informal and Mediation Complaints, 2006.....	379
Exhibit X-28	PAWC Informal Complaints, 2003 to 2007.....	380
Exhibit X-29	PAWC Mediation Complaints, 2003 to 2007.....	381
Exhibit X-30	PAWC Average Turnaround Time for Complaints (Days), 2003 to 2007	381
Exhibit X-31	PAWC Formal Complaints, 2003 to 2007.....	382
Exhibit X-32	PAWC Executive Complaints, 2004 to 2007	382
Exhibit X-33	PAWC Dispute Trends, 2002 to 2007	383
Exhibit X-34	PAWC Billing Errors, 2003 to 2007	384
Exhibit X-35	Additional Costs From Over Estimates, as of December 31, 2006	385
Exhibit X-36	PAWC Consecutive No Read Progress, as of December 31, 2007	388

XI. OPERATIONAL PERFORMANCE 391

Exhibit XI-1	PAWC Emergency Response Exercises, as of December 31, 2006	397
Exhibit XI-2	Table Top Exercises Completed in 2007, as of December 31, 2007.....	398
Exhibit XI-3	PAWC Unaccounted-for Water, 2003 to 2007	403
Exhibit XI-4	PAWC Unaccounted-for-Water by Water District, 2005 to 2007	404
Exhibit XI-5	PAWC Unaccounted-for Water Reported to PaPUC, as of December 31, 2006.....	407
Exhibit XI-6	Analysis of PAWC Reported Unaccounted-For Water, 2005 to 2007.....	408
Exhibit XI-7	PAWC Unaccounted For Real Losses Calculation, as of December 31, 2007.....	409
Exhibit XI-8	System Pressure Impact on Report UFW, 2005 to 2007	410
Exhibit XI-9	PAWC Wilkes-Barre District Metering Areas, as of December 31, 2007.....	411
Exhibit XI-10	PAWC Capital Investment Program Expenditures, 2003 to 2007	413
Exhibit XI-11	PAWC Miles of Main Replacement by Water District, 2003 to 2007	414
Exhibit XI-12	PAWC Total Number of Employees, 1998 to 2007	416
Exhibit XI-13	PAWC Distribution Overtime Hours 2005 to 2007	417
Exhibit XI-14	Production Overtime Hours, 2005 to 2007.....	418
Exhibit XI-15	PAWC Maintenance Trends Pittsburgh, 2003 to 2007.....	419
Exhibit XI-16	PAWC Valve Operations, 2003 to 2007	420
Exhibit XI-17	PAWC Production Overtime, 2005 to 2007	421

**Table of Exhibits
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Exhibit XII-1	Distribution Business Processes, as of March 31, 2008	428
Exhibit XII-2	Valve and Hydrant Asset Performance Distribution Business Processes, as of March 31, 2008.....	431
Exhibit XII-3	Workforce Management and Parts and Inventory Distribution Business Processes, as of March 31, 2008.....	432
Exhibit XII-4	Leak Tracking and Reporting Distribution Business Processes, as of March 31, 2008.....	433
Exhibit XII-5	Recommended Distribution Business Processes Road Map as of March 31, 2008.....	435
Exhibit XII-6	Project Resource Estimates	442
Exhibit XII-7	Project Plan and Schedule.....	444
Exhibit XII-8	Project Cost Estimate, Page 1 of 2	445
Exhibit XII-8	Project Cost Estimate, Page 2 of 2	446

XIII. PHASE III HUMAN RESOURCES..... 447

Exhibit XIII-1	PAWC Human Capital Scorecard, as of March 31, 2008.....	450
Exhibit XIII-2	Percentage of Employees Eligible for Early Retirement in the Next Five Years by Selected Locations, as of April 1, 2008.....	454
Exhibit XIII-3	Strategy Matrix, April 1, 2008.....	457

XIV. APPENDIX A: DATA AND STATISTICS 461

Exhibit XIV-1	Total Net Plant in Service	465
Exhibit XIV-2	Total Water Sold.....	466
Exhibit XIV-3	Operating Revenue.....	468
Exhibit XIV-4	Residential Revenue	469
Exhibit XIV-5	Commercial Revenue	470
Exhibit XIV-6	Industrial Revenue.....	471
Exhibit XIV-7	Wholesale Revenue	472
Exhibit XIV-8	Governmental Authority Revenue.....	473
Exhibit XIV-9	Fire Service Revenue.....	474
Exhibit XIV-10	Other (Utility & Non-Utility) Revenue	475

**Table of Exhibits
(continued)**

Exhibit XIV-11	Total Average Number of Customer (year-end).....	476
Exhibit XIV-12	Total Employees (year-end).....	477
Exhibit XIV-13	Total Operation and Maintenance Expense.....	478
Exhibit XIV-14	Production Expense.....	479
Exhibit XIV-15	Purification Expense.....	480
Exhibit XIV-16	Transmission and Distribution Expense.....	480
Exhibit XIV-17	Customer Accounting Expense.....	481
Exhibit XIV-18	Administrative and General Expense.....	482
Exhibit XIV-19	Miles of Main in Service.....	483
Exhibit XIV-20	Performance Ratios.....	484
Exhibit XIV-21	Performance Ratios per Million Gallons.....	485
Exhibit XIV-22	Performance Ratios per One Thousand Customers.....	485
Exhibit XIV-23	Performance Ratios per Mile of Main.....	486
Exhibit XIV-24	Performance Ratios – Average Number of Customers per Employee.....	486
Exhibit XIV-25	Performance Ratios – Gross Utility Plant in Service per Average Number of Customers.....	487
Exhibit XIV-26	Utility Plant in Service Less Depreciation.....	490
Exhibit XIV-27	Total Water Sold (millions of gallons).....	491
Exhibit XIV-28	Residential Water Sold (millions of gallons).....	492
Exhibit XIV-29	Commercial Water Sold (millions of gallons).....	493
Exhibit XIV-30	Industrial Water Sold (millions of gallons).....	494
Exhibit XIV-31	Wholesale Water Sold (millions of gallons).....	495
Exhibit XIV-32	Governmental Authority Water Sold (millions of gallons).....	496
Exhibit XIV-33	Fire Service Water Sold (millions of gallons).....	497
Exhibit XIV-34	Other Water Sold (millions of gallons).....	498
Exhibit XIV-35	Total Operating Revenue (\$'s).....	499
Exhibit XIV-36	Residential Revenue (\$'s).....	500
Exhibit XIV-37	Commercial Revenue (\$'s).....	501
Exhibit XIV-38	Industrial Revenue (\$'s).....	502
Exhibit XIV-39	Wholesale Revenue (\$'s).....	503
Exhibit XIV-40	Governmental Authority Revenue (\$'s).....	504
Exhibit XIV-41	Fire Service Revenue (\$'s).....	505
Exhibit XIV-42	Other Revenue (\$'s).....	506
Exhibit XIV-43	Total Average Number of Customers (year-end).....	507
Exhibit XIV-44	Residential Average Number of Customer.....	508
Exhibit XIV-45	Commercial Average Number of Customers.....	509
Exhibit XIV-46	Industrial Average Number of Customers.....	510
Exhibit XIV-47	Wholesale Average Number of Customers.....	512
Exhibit XIV-48	Governmental Authority Average Number of Customers.....	513
Exhibit XIV-49	Fire Service Average Number of Customers.....	514

**Table of Exhibits
(continued)**

Exhibit XIV-50	Other Average Number of Customers	516
Exhibit XIV-51	Total Number of Employees (year-end)	517
Exhibit XIV-52	Total Operation & Maintenance Expense	518
Exhibit XIV-53	Production Expense	519
Exhibit XIV-54	Purification Expense	520
Exhibit XIV-55	Transmission & Distribution Expense	521
Exhibit XIV-56	Customer Accounting Expense	522
Exhibit XIV-57	Administrative & General Expense	523
Exhibit XIV-58	Miles of Main in Service	524
Exhibit XIV-59	Performance Ratio Expense Background Data Total Average Number of Customers per Employee Gross Utility Plant in Service per Total Average Number of Customers	525
Exhibit XIV-60	Expenses per Million Gallons	526
Exhibit XIV-61	Production Expenses per Million Gallons	527
Exhibit XIV-62	Purification Expenses per Million Gallons	527
Exhibit XIV-63	Transmission & Distribution Expenses per Million Gallons	528
Exhibit XIV-64	Customer Accounting Expenses per Million Gallons	528
Exhibit XIV-65	Administrative & General Expenses per Million Gallons	529
Exhibit XIV-66	Expenses per Thousand Customers	530
Exhibit XIV-67	Production Expenses per Thousand Customers	531
Exhibit XIV-68	Purification Expenses per Thousand Customers	531
Exhibit XIV-69	Transmission & Distribution Expenses per Thousand Customers	532
Exhibit XIV-70	Customer Accounting Expenses per Thousand Customers	532
Exhibit XIV-71	Administrative & General Expenses per Thousand Customers	533
Exhibit XIV-72	Expenses per Mile of Main	534
Exhibit XIV-73	Production Expenses per Mile of Main	535
Exhibit XIV-74	Purification Expenses per Mile of Main	535
Exhibit XIV-75	Transmission & Distribution Expenses per Mile of Main	536
Exhibit XIV-76	Customer Accounting per Mile of Main	536
Exhibit XIV-77	Administrative & General Expenses per Mile of Main	537

XV. APPENDIX B: GLOSSARY 539

Table of Findings

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19
Finding II-1	In general the American Water/PAWC organization adequately supports current ratepayer and corporate objectives.....27
Finding II-2	Organizational planning and development at American Water/PAWC is largely informal and could be improved.....27
Finding II-3	Management communications and control are adequate.28
Finding II-4	Administrative procedures and controls are appropriate.28
Finding II-5	American Water and PAWC lack a formal, systematic strategic-planning process.29
Finding II-6	American Water’s external relations function has been recently strengthened and is well positioned to support corporate objectives and regional/state efforts; however, the role of the Southeast Regional Director should be better defined.34
Finding II-7	American Water has recently developed a number of strategic external-relations programs; however, these programs have not yet been rolled out, and there are no regional or state-specific operational plans.35
Finding II-8	AWWSC Human Resources has no direct accountability to PAWC.44
Finding II-9	PAWC does not have a service level agreement with AWWSC that specifies the level of HR support to be provided.....45
Finding II-10	Human Resources does not have standard metrics and does not make regular reports of its contribution.45
Finding II-11	Data integrity problems in the JD Edwards human resources information system makes for additional manual effort, creates opportunity for errors, and limits PAWC HR’s ability to measure its effectiveness.46
Finding II-12	American Water Works Service Company and regional/local HR have extremely limited training and development capacity to support of the strategic HR needs of PAWC.....46
Finding II-13	Pennsylvania training and development is focused on technical training and has not aligned to the broader strategic HR needs of PAWC.47
Finding II-14	PAWC’s Human Resources and executive management have recognized the loss of human capital and the potential for a large number of retirements in coming years but has not developed a plan to respond to these needs.....49
Finding II-15	PAWC does not have effective position control.51



**Table of Findings
(continued)**

Finding II-16 A lack of reliable information on employee capabilities (bench strength) hinders PAWC’s ability to respond effectively to current demands and plan for future growth.52

Finding II-17 PAWC has not met its goal to reduce time-to-hire by 10%.53

Finding II-18 PAWC uses a time and attendance system with limited functionality that was developed in-house53

Finding II-19 American Water/PAWC does not have a formal management development process.54

Finding II-20 PAWC does not have a learning management system.....55

III. FINANCIAL MANAGEMENT 59

Finding III-1 PAWC cash is managed in an efficient and cost-effective manner by corporate cash management functions.....82

Finding III-2 Long-term debt is obtained at favorable rates.83

Finding III-3 The consolidated managerial reporting, accounting, and control functions serving PAWC are efficient and closely monitored.83

Finding III-4 American Water’s general ledger system is not current and has not recently been updated to add needed functionality.....83

Finding III-5 The AWWSC’s Shared Services Center provides an extensive amount of employee training.84

Finding III-6 The function of reporting actual financial results compared to budgets is managed and controlled effectively.84

Finding III-7 Several key PAWC financial statistics have been deteriorating in recent years..85

Finding III-8 The Internal Audit Department is not sufficiently isolated from the Financial Management organization.86

Finding III-9 The number of internal audits conducted has declined significantly during the past five years.....86

IV. SUPPORT SERVICES 91

Finding IV-1 American Water’s long-range IT planning activities have been on hold since SOX compliance efforts began in 2006 following RWE’s December 2005 decision to divest of American Water.118

Finding IV-2 ITS has made little progress in recent years with regard to addressing the technology needs of American Water’s business units, including those impacting PAWC operations.....118

Finding IV-3 The PMO has developed project-management documentation that is extensive in scope; however, materials to help employees effectively apply these standards has not yet been included as part of such documentation.120

Table of Findings (continued)

Finding IV-4	The ITS organization is not placing adequate emphasis on certain staff's achievement and maintenance of project-management certifications.....	121
Finding IV-5	The ability of the Client Services & Support group to electronically deploy software upgrades to workstations is hindered by American Water's network, which results in additional costs to ITS customers, such as PAWC.....	121
Finding IV-6	ITS management is not appropriately focusing its employee-training and development efforts through the use of a skills inventory for individual employees.	121
Finding IV-7	The ITS organization does not have sufficient client-satisfaction information and data with which to evaluate its ability to serve AWWSC or PAWC departments.	122
Finding IV-8	The ITS organization has not developed service-level agreements with its client groups.	122
Finding IV-9	ITS' performance versus its targets show varying, and in some cases, poor results.	123
Finding IV-10	Although ITS backup/restoration and security/protection plans and activities are generally reasonable, its disaster recovery plan is inadequate and appropriate testing activities are not being performed, despite its recent Chapter 101 self-certification reports that PAWC has met all required elements.	124
Finding IV-11	The IT security function is not part of the ITS organization, which is atypical of industry practices.	126
Finding IV-12	The data center space has recently been expanded in large part as a result of American Water not effectively performing a consolidation of its servers.	126
Finding IV-13	The current American Water employee vehicle assignment policy does not include a provision for an annual review of the requirements of employees for vehicles and, therefore, it does not address changes in employee job titles and positions.....	148
Finding IV-14	A regularly scheduled physical inventory of vehicles leased from ARI is not performed.....	149
Finding IV-15	There is an exception report for multiple fuel transactions in one day but not for apparently excessive fuel usage over a period of time (i.e., weekly or monthly).....	149
Finding IV-16	Neither the ARI contract nor the resultant invoices have been audited by the AWWSC Internal Auditing group.....	149
Finding IV-17	Continued use of the two PAWC mechanics in the Pittsburgh District goes against the recommended policies of American Water and may not be cost-effective.149	
Finding IV-18	The improper reporting of taxable benefits relating to employer-provided vehicles that was identified in the internal audit conducted in November 2005 has yet to be addressed in a satisfactory manner.	150

Table of Findings (continued)

Finding IV-19	There are no standardized reports or data collected on the status of state inspections for vehicles in the PAWC fleet.....	150
Finding IV-20	There is no integrated Facilities and Property Management group at either American Water or at PAWC.....	157
Finding IV-21	There are no formal policies and procedures to guide the performance of the facilities and properties management function at PAWC or at American Water.	157
Finding IV-22	The current procurement module of the ERP system is 12 years old and lacks significant amounts of capability that would be expected from a state-of-the-art current application.	172
Finding IV-23	The use of preferred suppliers under national contracts is not mandated and likely is having a negative financial implications for the operating companies as a result of not maximizing the use of suppliers that have been subjected to a bidding and negotiation process.	173
Finding IV-24	The lack of PAWC-specific data that is collected in relation to the procurement function renders it difficult for the PAWC management to evaluate and assess the effectiveness of that function’s performance at PAWC.	174
Finding IV-25	Based on the numerous inventory procedures and systems deficiencies that were identified during the course of this audit, it appears that the inventory data and calculations that are produced by PAWC are inaccurate to some extent.	183
Finding IV-26	The inventory management computer systems that are currently in use are very out of date and the data that is collected is by no means sufficient to maintain proper control of inventory.	187
Finding IV-27	There is no centralization or leadership in the materials management function at American Water operating companies, including PAWC.	188
Finding IV-28	No standardized, comprehensive inventory-management policies and procedures exist for either American Water in general or for PAWC.	189
Finding IV-29	Insufficient inventory-skills training is provided to storeroom personnel.	189
Finding IV-30	There is currently no standardization of part numbers across the PAWC storerooms or American Water operating companies in general, although this situation is being reviewed at the current time.	189
Finding IV-31	There are no inventory grid systems in the PAWC storerooms, making the location of parts difficult and time consuming for those who are not familiar with the inventory layout at that particular storeroom.	190

**Table of Findings
(continued)**

Finding IV-32	There is no standardized, formal cycle-counting program in place.	190
Finding IV-33	PAWC does not have a mechanism to identify and report on material that is obsolete or held in excessive quantities.....	190
Finding IV-34	Maintenance items are not inventoried and therefore can only be reordered based on visual inspections.	191
Finding IV-35	The strategic parts inventory could be reduced for PAWC by consolidating them into a few strategic inventory locations.....	191
Finding IV-36	Inventory maintenance and control is inconsistent across the PAWC storerooms and the control of inventory was observed to cover the range from inadequate to sufficient.....	191
Finding IV-37	The vast majority of the storerooms that were visited by Schumaker & Company consultants did not have a computer terminal in the storeroom area; rather, data entry and lookup were the responsibility of an administrative person in the each of the service center front offices.....	192
Finding IV-38	Under the current procedures, rolling stock (that being the inventory that is carried on the field operations trucks) is tracked as part of the on-hand balance of parts.192	
Finding IV-39	A formal enterprise risk management program was established in 2003 when RWE acquired American Water, but this program must now evolve as American Water (and therefore PAWC) changes it focus to SEC/SOX compliance.....	210
Finding IV-40	When looking to outside legal organizations for help in addressing PAWC’s legal needs, the Southeast Region Legal organization does not rely on competitive bidding to develop a master list of pre-qualified legal firms.	219
Finding IV-41	The AWWSC Legal organization has not evaluated the use of standard legal management software across its various entities; therefore, the Southeast Region (and ultimately PAWC) may not be benefiting from processes associated with the use of a “best in class” system.....	220
V. WATER OPERATIONS		223
Finding V-1	PAWC production facilities are well operated.	228
Finding V-2	PAWC uses state-of-the-art, computerized supervisor control and data acquisition (SCADA) systems to continuously monitor critical pumping and treatment processes, as well as distribution system hydraulic conditions, at most of its treatment plants and associated remote facilities.....	236
Finding V-3	Best practices are not necessarily shared or implemented by the various water districts.238	

Table of Findings (continued)

Finding V-4	Although PAWC has built a good SCADA system for operating the plants and distribution network, its implementation of technology for managing the day-to-day monitoring and reporting on various aspects of the business processes within network needs significant improvement.....	238
Finding V-5	The number of reported leaks/breaks by water district indicates that certain water districts are up to 10 times worse than others.....	239
Finding V-6	Maintenance and capital budgets do not appear to consistently take an analysis of leak/break historical data into consideration shown in <i>Exhibit V-24</i>	243
Finding V-7	PAWC has implemented a good proactive production equipment maintenance program.	249
Finding V-8	Although PAWC has implemented a good proactive production equipment maintenance program, it has failed to implement a computerized maintenance management program at the production facilities.....	252
Finding V-9	The Engineering Department generally conducts formal, comprehensive planning studies on a periodic basis for each water district.....	254
Finding V-10	With the most recent budgeting process (2008 Budget Year), the Engineering Department has implemented a more analytical main replacement decision-making methodology.	256

Table of Findings (continued)

Volume II

VI. CORPORATE GOVERNANCE XIII

Finding VI-1	The review, selection, and compensation of American Water’s Board are appropriate.....	258
Finding VI-2	American Water has adopted a substantive Code of Ethics document; however, the Code does not explicitly apply to all contractors and vendors who do business with American Water.	260
Finding VI-3	Board compensation appears to be appropriate; however, American Water has not recently reviewed Board compensation and has delayed the recruitment of new independent directors.	261
Finding VI-4	The American Water Board maintains adequate oversight and is taking further steps to increase its role in ensuring proper controls.	262
Finding VI-5	American Water is taking steps to strengthen oversight through the Audit and Corporate Governance Committees.	263
Finding VI-6	The Board exercises appropriate control over the external auditors; however, a process has not been established to ensure that cost comparisons for external audit services are performed on a periodic basis.....	264
Finding VI-7	The Internal Audit Department has adequate interaction with the American Water Board Audit Committee, but its reporting relationship to the American Water Board Audit Committee and American Water management is unclear.	265
Finding VI-8	American Water is taking substantive steps to comply with SOX/NYSE requirements for internal controls.	265

VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS..... 269

Finding VII-1	PAWC’s culture under RWE could best be defined as <i>insular</i>	274
Finding VII-2	PAWC, like American Water, operates various systems with substantial differences in how each entity is run with respect to certain fundamental business processes.	274
Finding VII-3	Divestiture from RWE presents a significant opportunity to refocus American Water and to strengthen PAWC by leveraging best practices across the enterprise.....	275
Finding VII-4	PAWC has not surveyed its employees since 2003 and has no current data on employee attitudes, management practices, and other key elements of corporate culture.276	

**Table of Findings
(continued)**

Finding VII-5 PAWC does not have a management development process.276
Finding VII-6 Human Resources does not have the capacity to support the change management requirements of PAWC.278
Finding VII-7 PAWC does not have any enterprise-wide improvement initiatives that fully engage employees at all levels.279
Finding VII-8 PAWC has limited management succession planning and workforce management capability, thereby making it difficult to assess the adequacy of staffing levels.279
Finding VII-9 American Water’s ethics policies and practices have been substantially communicated to all employees.279
Finding VII-10 Ethics allegations are properly recorded and promptly investigated.281

VIII. AFFILIATE INTERESTS 283

Finding VIII-1 Cost allocation documentation was disjointed and poorly organized, which required Schumaker & Company auditors to meet with multiple individuals and to review multiple documents in order to understand how affiliate relationships and cost allocations are handled at American Water.304
Finding VIII-2 The cost-allocation methodologies impacting PAWC are generally reasonable, although the use of number of customers for allocating AWWSC costs among regulated utilities is essentially a simplification mechanism that is not based on cost causative factors.305
Finding VIII-3 Although American Water engaged an independent consultant in 2006 and 2007 to perform cost-to-market comparisons for AWWSC charges to three of its regulated utilities, it does not perform these comparisons on a regular basis.307
Finding VIII-4 The AWWSC/PAWC affiliate agreement is not up to date and a new version has not been provided to the PaPUC for review and approval.309
Finding VIII-5 Ongoing training updates to AWWSC employees on timekeeping procedures, which could potentially impact affiliate charges, is not being provided.310
Finding VIII-6 Affiliate charges from RWE/Thames have been appropriately handled.310
Finding VIII-7 Most activities undertaken for monitoring and ensuring the appropriate implementation of cost-allocation processes are reasonable; however, internal audits of affiliate transactions and the systems that are used for creating affiliate charges are not regularly performed.311

**Table of Findings
 (continued)**

IX. DIVERSITY/EEO..... 315

Finding IX-1	The American Water/PAWC diversity program is primarily policy and affirmative-action-compliance oriented.	327
Finding IX-2	Employee location data used for EEO-1 reporting from American Water’s JD Edwards human resources information system (HRIS) are often incorrect, thereby causing the company to conduct a manual verification process.	329
Finding IX-3	PAWC and American Water do not have standard processes and use inconsistent methods for preparing affirmative action utilization and EEO-1 reports, which leads to reporting errors.....	329
Finding IX-4	No senior executive or officer of American Water reviews and approves the EEO-1 report prior to submittal to the federal government.....	331
Finding IX-5	American Water has developed a comprehensive diversity plan but has failed to effectively implement it.	331
Finding IX-6	PAWC has a fully compliant affirmative action plan, but could be more aggressive in setting affirmative action hiring goals and attracting women and minority job candidates.....	335
Finding IX-7	The supplier diversity program is informally conducted.	337
Finding IX-8	Over the 2003 to 2007 time period, PAWC has neither consistently submitted or fully complied with the filing guideline requirements for diversity reports submitted to the PaPUC.....	338

X. CUSTOMER SERVICE..... 343

Finding X-1	American Water call centers have failed to meet industry standard service levels.	370
Finding X-2	Customer service representatives are taking longer to complete calls and follow-up work.373	
Finding X-3	The Pensacola CSC CSR turnover rate exceeds industry standards.	374
Finding X-4	American Water has made no effort and has no plans to implement initiatives aimed at reducing employee turnover.	375
Finding X-5	More than one in four newly hired CSRs leave prior to completing all initial training and close monitoring.	376
Finding X-6	After several years of a decreasing number of CSRs, American Water now plans to hire additional CSRs.	377
Finding X-7	Despite the company’s unfavorable service levels, PAWC customers appear to be generally satisfied with the contact they have with the company.	377

**Table of Findings
(continued)**

Finding X-8 The Help Queue has proven effective in improving consistency of answers to customers and allowing supervisors to focus more of their time on CSR coaching and development.378

Finding X-9 Neither American Water nor PAWC have a customer accessible website to provide basic customer self assistance.378

Finding X-10 Neither American Water nor PAWC supports electronic billing at this time.378

Finding X-11 American Water has very limited customer self-serve options available on its IVR system.378

Finding X-12 The trends in various types of complaints (informal, mediation, executive, and formal) are generally increasing.379

Finding X-13 The number of disputes has increased significantly since 2004.383

Finding X-14 There is a significant amount of over estimating in the billing process.384

Finding X-15 A business case has been developed for an upgrade to the Advantex software used in FRCC operations.385

XI. OPERATIONAL PERFORMANCE..... 391

Finding XI-1 PAWC is unable to provide a complete and extensive third-party line-hit damage history for the last five years because of lack of good business processes.....392

Finding XI-2 PAWC’s recently developed third party line hit standardized reporting form has inherent deficiencies and is not integrated with other key business processes or systems to effectively manage this function.....393

Finding XI-3 The latest Chapter 101 self-certifications indicate that PAWC has met all required elements.396

Finding XI-4 PAWC maintains a physical security plan for each of its operating plant facilities.396

Finding XI-5 Business-continuity planning is less complete than our experience with other utilities.396

Finding XI-6 Emergency-preparedness planning has been tested via tabletop exercises.....397

Finding XI-7 The systems used for maintaining the operations and maintenance plans for each facility are labor intensive, subject to potential inaccuracies, and not as clearly defined as we have seen elsewhere in the utility industry.398

Finding XI-8 Unaccounted-for-water on a system-wide basis has improved as reported to the PaPUC since 2004; however, individual districts are experiencing high levels of unaccounted-for-water.403

Table of Findings (continued)

Finding XI-9	PAWC has developed a fairly extensive spreadsheet for reporting and monitoring non-revenue water and unaccounted-for water.	405
Finding XI-10	The linked Excel spreadsheets are a good prototype for building an improved NRW and UFW reporting and monitoring program, but the database platform would be a better technology upon which to build the tool.	405
Finding XI-11	PAWC has implemented an allowance for unavoidable real losses using an AWWA methodology (still under development) in reporting its unaccounted-for-water numbers to the PaPUC on an annual basis.	406
Finding XI-12	PAWC was unable to provide an engineering justification for the 100 psi pressure used in its calculation at this time.	409
Finding XI-13	PAWC is in the process of metering water usage within various parts of a water district as another indicator of possible leakage.	410
Finding XI-14	The collection of complete operating statistical data on production and network operations is complicated by a lack of standard data-collection and reporting systems.	415
Finding XI-15	Production field force staffing levels appear to be inadequate as overtime hours are increasing.	415
Finding XI-16	Valve operations and maintenance programs are not completely implemented across the PAWC distribution network.	419

**Table of Findings
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Finding XII-1	There is no common leak tracking system used throughout PAWC.	423
Finding XII-2	None of the current Access databases are scalable for a state-wide or enterprise-wide application.	424
Finding XII-3	Distribution operations personnel are very knowledgeable of their current leak tracking database.	424
Finding XII-4	PAWC’s current plans are to develop the leak tracking database as a part of CMMS; however, several key requirements may have been overlooked.	424
Finding XII-5	The main replacement prioritization process that PAWC implemented in 2008 is a reasonable algorithm for prioritization and is similar to methods used in the natural gas industry; however, it has not been developed to the point of having automatic interfaces to PAWC performance reporting systems.	425
Finding XII-6	The CMMS being implemented is a commercial product that allows significant user customization.	426
Finding XII-7	Valve operation tracking and reporting and hydrant flushing tracking and reporting are being appropriately integrated into CMMS.	431
Finding XII-8	Based on Schumaker & Company’s review, it is not clear that CMMS will provide the work management capabilities needed for managing PAWC’s distribution workforce.	431
Finding XII-9	The parts and inventory portion of CMMS is not being fully implemented at this time.	432
Finding XII-10	Incorporating the leak tracking and reporting system into CMMS may not be the best approach.	433
Finding XII-11	It may be more appropriate to integrate the leak tracking and reporting application with an enterprise GIS instead of CMMS.	434
Finding XII-12	There are currently no plans to integrate the NRW tracking and reporting with the leak tracking and reporting databases nor are there plans to integrate pavement tracking and reporting, permit tracking and reporting, or hit facilities tracking and reporting with a leak tracking and reporting system.	434

Table of Findings (continued)

XIII. PHASE III HUMAN RESOURCES	447
Finding XIII-1 The models and plans developed as part of this Phase III project provide clear direction for HR’s efforts to assist PAWC management in meeting its strategic priorities. Substantial work remains to implement these projects.....	458
Finding XIII-2 PAWC HR does not have all the resources necessary to implement the projects defined in the Phase III effort.....	458
XIV. APPENDIX A: DATA AND STATISTICS.....	461
XV. APPENDIX B: GLOSSARY	539

Table of Recommendations

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19
Recommendation II-1	Develop a systematic organizational-planning and development process. (Refer to Finding II-2.)29
Recommendation II-2	Develop a formal and integrated strategic-planning process. (Refer to Finding II-5.).....30
Recommendation II-3	Develop a regional/state operational external-communications plan. (Refer to Finding II-6 and Finding II-7.)36
Recommendation II-4	Strengthen HR accountability to the PAWC President. (Refer to Finding II-8.).....55
Recommendation II-5	Assess PAWC’s HR needs and staff accordingly. (Refer to Finding II-8 and Finding II-10.)55
Recommendation II-6	Develop an HR service level agreement with AWWSC. (Refer to Finding II-9.).....56
Recommendation II-7	Develop a Pennsylvania-specific HR scorecard. (Refer to Finding II-10.)56
Recommendation II-8	Align HR services to the strategic priorities of PAWC. (Refer to Finding II-8 and Finding II-12.)56
Recommendation II-9	Consider outsourcing technical training. (Refer to Finding II-13.).....56
Recommendation II-10	Implement a learning management system. (Refer to Finding II-20).....57
Recommendation II-11	Conduct comprehensive workforce planning for all levels of the organization and provide necessary resources for implementation. (Refer to Finding II-12 and Exhibit II-12.).....57
Recommendation II-12	Complete the Organizational Capability Review for all levels of PAWC management. (Refer to Finding II-16.)57
Recommendation II-13	Implement a leadership-development program and provide sufficient resources to sustain. (Refer to Finding II-19 .).....58
Recommendation II-14	Implement position control. (Refer to Finding II-15).....58
Recommendation II-15	Evaluate the costs and benefits associated with a more sophisticated time and attendance system. (Refer to Finding II-18.).....58

Table of Recommendations (continued)

Recommendation II-16	Analyze recruitment and selection process, implement process improvements, measure performance, and provide additional resources if necessary. (Refer to Finding II-16 and Finding II-17.) .58
III. FINANCIAL MANAGEMENT59	
Recommendation III-1	Research and develop plans for upgrading or replacing the current ERP system. (Refer to Finding III-4.).....88
Recommendation III-2	Investigate why key PAWC financial statistics have been deteriorating, develop and implement a plan for improving PAWC's financial health as appropriate. (Refer to Finding III-7.)88
Recommendation III-3	Assess the need for internal audits of American-Water-regulated utility operations and develop and implement plans to meet the internal audit requirements. (Refer to Finding III-9.)88
IV. SUPPORT SERVICES..... 91	
Recommendation IV-1	Expedite efforts to develop a long-range IT plan, and subsequently perform yearly review and update activities. (Refer to Finding IV-1 and Finding IV-2.)..... 127
Recommendation IV-2	Update ITS documentation as part of an ongoing program to include all aspects of a well-managed technology organization, including (but not limited to) operational, governance, and project management/QA functions. (Refer to Finding IV-2 and Finding IV-3.) 128
Recommendation IV-3	Address organizational issues involving vacancy of director positions, the appropriateness of staffing size of the various ITS groups, and the reporting location of the information systems' security function within American Water's organization structure. (Refer to Finding IV-2 and Finding IV-11.) 128
Recommendation IV-4	Expand American Water's commitment to project-management principles by requiring all ITS employees who are actively involved in project work to achieve PMP certification and by closely monitoring related activities to ensure that timely progress is made. (Refer to Finding IV-4.) 129
Recommendation IV-5	Enhance the American Water network to enable electronic deployment of software updates to PAWC employees. (Refer to Finding IV-5.) 129
Recommendation IV-6	Improve training and development efforts for ITS employees. (Refer to Finding IV-6) 129

Table of Recommendations (continued)

Recommendation IV-7	Develop a plan to regularly conduct ITS client-satisfaction surveys and implement the first survey in a timely manner. (Refer to Finding IV-7.)130
Recommendation IV-8	Establish ITS service-level agreements with major client groups. (Refer to Finding IV-8.)130
Recommendation IV-9	Implement a relevant ITS scorecard. (Refer to Finding IV-9.).....130
Recommendation IV-10	Update the ITS disaster recovery plan and begin routinely reviewing and testing disaster-recovery plans and documenting results. (Refer to Finding IV-10.)131
Recommendation IV-11	Perform a server consolidation study and implement study recommendations. (Refer to Finding IV-12.)132
Recommendation IV-12	Initiate a formal procedure requiring an annual review of the requirements for each employee to have an assigned vehicle based on his or her current job assignment. (Refer to Finding IV-2.).....150
Recommendation IV-13	Develop a formal procedure that details a requirement for the performance of a regularly scheduled annual physical inventory of the vehicles that are leased from ARI. (Refer to Finding IV-14.)...150
Recommendation IV-14	Develop an exception report that would clearly identify excessive fuel usage by specific vehicles or employees on a weekly or monthly basis. (Refer to Finding IV-15.)151
Recommendation IV-15	Perform an internal audit of the ARI contract and the resultant invoices using the AWWSC Internal Auditing group. (Refer to Finding IV-16.)151
Recommendation IV-16	Perform a cost/benefit analysis to determine whether the (continued) use of the two PAWC mechanics in the Pittsburgh District is cost effective. (Refer to Finding IV-17.).....151
Recommendation IV-17	Perform a reassessment of the PAWC policy relating to the use of employer-provided vehicles that are used for personal purposes in order to be in compliance with IRS regulations. (Refer to Finding IV-18.)151
Recommendation IV-18	Develop a computerized tracking system that is capable of monitoring the completion of the annual state-vehicle inspections for the individual vehicles in compliance with the established schedule. (Refer to Finding IV-19.)152
Recommendation IV-19	Establish a single point of responsibility for the facilities and properties management function at PAWC. (Refer to Finding IV-2.)157
Recommendation IV-20	Develop a set of formal policies and procedures to guide the performance of the facilities and properties management function at PAWC and American Water. (Refer to Finding IV-14.).....158

Table of Recommendations (continued)

Recommendation IV-21	Initiate a software identification, selection, and evaluation process for a new integrated procurement/materials management application. (Refer to Finding IV-22)	174
Recommendation IV-22	Evaluate in detail the impacts of not mandating the use of national contracts with preferred vendors by the state-operating companies, especially in terms of the financial impacts, and determine whether mandating this practice would be beneficial to the operating companies. (Refer to Finding 0-2.)	174
Recommendation IV-23	Initiate a study to determine how best to present the operational and performance data on a state company basis and to evaluate the potential benefits of such reporting changes. (Refer to Finding IV-24.)	175
Recommendation IV-24	Perform an internal audit of the inventory data that is produced and used by PAWC to determine the accuracy thereof. (Refer to Finding IV-25.)	193
Recommendation IV-25	Initiate an ERP materials management module evaluation and selection process with the intention of identifying a fully integrated ERP application that would serve the needs of the PAWC materials management function. (Refer to Finding IV-26.)	193
Recommendation IV-26	Establish a central point of management and responsibility for the materials management function at both AWWSC and PAWC. (Refer to Finding 0-6.)	194
Recommendation IV-27	Develop a comprehensive and detailed materials management procedures manual that is specific to PAWC. (Refer to Finding IV-14.)	194
Recommendation IV-28	Establish a formalized training program at PAWC for the personnel who have been designated as being responsible for the materials management function at the various storerooms. (Refer to Finding IV-29.)	195
Recommendation IV-29	Adopt and expeditiously implement at PAWC the standardized part-number format that is being developed by the Part Number Standardization Committee. (Refer to Finding IV-30.)	195
Recommendation IV-30	Design and implement a standardized inventory-grid location system at all PAWC storerooms. (Refer to Finding IV-31.)	195
Recommendation IV-31	Develop and implement a standardized procedure for performing cycle counting that is to be used at all storerooms. (Refer to Finding IV-32.)	196
Recommendation IV-32	Develop an inventory management plan that addresses how to identify and handle obsolete and excess material. (Refer to Finding IV-33.)	196

Table of Recommendations (continued)

Recommendation IV-33	Incorporate maintenance items into the current materials management application to gain better inventory control over these items. (Refer to Finding IV-34.)196
Recommendation IV-34	Establish a system of a few centralized storerooms that are to be used for strategic parts storage. (Refer to Finding IV-35.)197
Recommendation IV-35	Implement a program at PAWC to standardize the inventory maintenance and control procedures across the PAWC storerooms. (Refer to Finding 0-15.).....197
Recommendation IV-36	Install computer terminals in secure locations at all of the PAWC storerooms. (Refer to Finding IV-37.).....197
Recommendation IV-37	Develop and implement a procedural modification that stipulates that material is decremented from the inventory at the time of issue from the storeroom, not at the time that it is used in the field. (Refer to Finding IV-38.)198
Recommendation IV-38	Develop a formal implementation plan for changing the focus of the ERM process to include SEC/SOX compliance. (Refer to Finding IV-2.)212
Recommendation IV-39	Establish a formal mechanism for developing a pre-qualified list of external legal firms by periodically reviewing proposals from potential candidates. (Refer to Finding IV-2.)221
Recommendation IV-40	Perform a formal cost/benefit analysis regarding standardization of legal management software throughout the American Water system. (Refer to Finding IV-14.)221

V. WATER OPERATIONS 223

Recommendation V-1	Aggressively pursue the identification and implementation of technology-based best practices among the water districts. (Refer to Finding V-4 and Finding V-3.).....246
Recommendation V-2	Develop a business process for addressing aggressive identification of the most beneficial main segments for replacement based on an expectation of potential leak impact. (Refer to Finding V-4, Finding V-5, and Finding V-6.).....247
Recommendation V-3	Implement a computerized maintenance management system in conjunction with the proactive production equipment maintenance program. (Refer to Finding V-8.).....252
Recommendation V-4	Continue to develop a risk-assessment-based approach for identifying main replacement projects. (Refer to Finding V-9.)257
Recommendation V-5	Continue to periodically perform CPS studies. (Refer to Finding V-9.).....257

Table of Recommendations (continued)

Volume II

VI. CORPORATE GOVERNANCE	255	
Recommendation VI-1	Require contractors, vendors, and others doing business with American Water to conduct themselves ethically when dealing with American Water entities. (Refer to Finding VI-2.).....	267
Recommendation VI-2	Expand the American Water Board in anticipation of going public and review Board compensation as soon as possible. (Refer to Finding VI-3.)	267
Recommendation VI-3	Implement a process to periodically perform cost comparisons for external audit services. (Refer to Finding VI-6.).....	268
Recommendation VI-4	Modify the Internal Audit Department reporting structure so that it no longer administratively reports to the American Water CFO. (Refer to Finding VI-7 and Finding III-8.).....	268
VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS	269	
Recommendation VII-1	Expedite efforts to define and support a high-performing organizational culture. (Refer to Finding VII-1, Finding VII-2, and Finding VII-3.)	281
Recommendation VII-2	Implement an employee survey process with appropriate feedback and action-planning components. (Refer to Finding VII-4.).....	282
Recommendation VII-3	Implement a formal management development process. (Refer to Finding VII-5.).....	282
Recommendation VII-4	Fill open Organization Development positions in American Water and assess the need for additional change management resources for PAWC. (Refer to Finding VII-5, Finding VII-6, and Finding VII-7.)	282
Recommendation VII-5	Implement workforce management processes at PAWC. (Refer to Finding VII-8.).....	282
VIII. AFFILIATE INTERESTS.....	283	
Recommendation VIII-1	Develop formal, comprehensive documentation for affiliate relationships and cost allocations, and assign the responsibility for affiliate transactions to the appropriate manager. (Refer to Finding VIII-1.).....	312

**Table of Recommendations
(continued)**

Recommendation VIII-2 Perform a detailed analysis to verify that the use of the number of customers for allocating AWWSC costs among regulated utilities is reasonable and reasonably approximates the use of cost-causative factors; subsequently make modifications, as appropriate. (Refer to Finding VIII-2.).....312

Recommendation VIII-3 Regularly evaluate the cost of services provided to PAWC by its affiliates so as to verify that PAWC ratepayers are not being harmed by charging these services at cost rather than market. (Refer to Finding VIII-3.).....313

Recommendation VIII-4 Update the AWWSC/PAWC affiliate agreement, as necessary, and submit it to the PaPUC for review and approval. (Refer to Finding VIII-4.).....313

Recommendation VIII-5 Provide ongoing training updates to AWWSC employees on proper use of billing numbers for charging affiliates when reporting time. (Refer to Finding VIII-5.).....313

Recommendation VIII-6 Regularly conduct internal audits of affiliate transactions and associated cost allocations. (Refer to Finding VIII-7.).....314

IX. DIVERSITY/EEO 315

Recommendation IX-1 Update the diversity action plan, provide resources, and implement the plan in a timely manner and give consideration to a Pennsylvania-specific initiative. (Refer to Finding IX-1 and Finding IX-5.).....339

Recommendation IX-2 Complete efforts to assure data integrity in the JD Edwards human resources information system. (Refer to Finding IX-2.).....339

Recommendation IX-3 Develop and implement a standard data-verification process for EEO-1 reporting. (Refer to Finding IX-3.)340

Recommendation IX-4 Require the AWWSC Human Resources Vice President to review and approve EEO-1 reports prior to submission. (Refer to Finding IX-4.)340

Recommendation IX-5 Define, document, and implement more aggressive hiring plans for women and minorities. (Refer to Finding IX-6.)340

Recommendation IX-6 Formalize the supplier diversity program and explore the use of spend targets in the Supply Chain performance objectives. (Refer to Finding IX-7.)341

Recommendation IX-7 Submit comprehensive diversity reports to the PaPUC annually. (Refer to Finding IX-8.)341

Table of Recommendations (continued)

X. CUSTOMER SERVICE.....		343
Recommendation X-1	Invest in new customer interfacing technology, including IVR, electronic billing, and web self-service capabilities. (Refer to Finding X-1, Finding X-2, Finding X-6, Finding X-7, Finding X-9, Finding X-10, and Finding X-11).....	386
Recommendation X-2	Analyze employee turnover at the Pensacola Call Center and develop strategies to reduce turnover. (Refer Finding X-3 and Finding X-4).....	386
Recommendation X-3	Strengthen recruitment, selection, and training practices to improve the quality of new CSR hires. (Refer to Finding X-1, Finding X-2, Finding X-3, Finding X-4, Finding X-5, Finding X-6, Finding X-7, and Finding X-8).....	386
Recommendation X-4	Develop a Pennsylvania-specific customer service scorecard and regularly report associated metrics to the PAWC President. (Refer to Finding X-1, Finding X-2, and Finding X-7).....	387
Recommendation X-5	Perform an analysis of the increase in complaint trends that PAWC is currently experiencing. (Refer to Finding X-12).....	387
Recommendation X-6	Perform an analysis of the growth in PAWC disputes. (Refer to Finding X-13).....	387
Recommendation X-7	Initiate actions to lower the number of over estimates in meter reading. (Refer to Finding X-14).....	387
Recommendation X-8	Complete the upgrade project for Advantex. (Refer to Finding X-15).....	388
 XI. OPERATIONAL PERFORMANCE.....		 391
Recommendation XI-1	Develop a comprehensive damage prevention program. (Refer to Finding XI-1 and Finding XI-2.).....	394
Recommendation XI-2	Improve business-continuity planning. (Refer to Finding XI-4). ..	399
Recommendation XI-3	Perform a review and incorporate better technologies for preparing, distributing, and updating the emergency and the operations and maintenance manuals including the intranet site. (Refer to Finding XI-7.).....	400
Recommendation XI-4	Continue to strengthen the unaccounted-for-water program. (Refer to Finding XI-8).....	412
Recommendation XI-5	Incorporate the methodologies in the currently evolving UFW spreadsheets into a more appropriate technology, specifically a backend database with a client server or web interface. (Refer to Finding XI-10.).....	412

**Table of Recommendations
(continued)**

Recommendation XI-6	Refine the reporting of unaccounted-for water to the PaPUC. (Refer to Finding XI-11 and Finding XI-12.)412
Recommendation XI-7	Investigate the reasons for the increase in overtime that has occurred in the Production Department. (Refer to Finding XI-15)420
Recommendation XI-8	Implement standard systems for monitoring and reporting key statistical information in network operations. (Refer to Finding XI-1, Finding XI-14, and Finding XI-16.)421

**Table of Recommendations
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Recommendation XII-1	Structure the design of business applications for the distribution operations function as shown in Exhibit XII-5. (Refer to Finding XII-1, Finding XII-2, Finding XII-3, Finding XII-4, and Finding XII-10)	434
Recommendation XII-2	Develop the leak tracking and reporting database as a part of a larger, long-term effort to integrate with other supporting performance reporting business processes such as NRW, permits, pavement tracking, and hit facilities. (Refer to Finding XII-10 and Finding XII-12).....	436
Recommendation XII-3	Adopt the multi-organizational reporting structure (upon which CMMS is being implemented) across both the workforce management business process and supporting performance business processes. (Refer to Finding XII-6).....	436
Recommendation XII-4	Engage AWWSC ITS to assist in the development of the supporting performance reporting process systems identified in Exhibit XII-5. (Refer to Finding XII-6).....	436
Recommendation XII-5	Address the deficiencies in the current plans regarding the incorporation of leak tracking and reporting into the design of CMMS. (Refer to Finding XII-4).....	437
Recommendation XII-6	Consider integration of leak tracking and reporting with the eventual GIS system versus integration with CMMS. (Refer to Finding XII-5, Finding XII-10, and Finding XII-11).....	437
Recommendation XII-7	Ensure that the leak history is migrated into the eventual leak tracking and reporting database from all existing databases with good data. (Refer to Finding XII-4)	437
Recommendation XII-8	Electronically connect leak and other records to the main prioritization model. (Refer to Finding XII-4)	438

**Table of Recommendations
(continued)**

Recommendation XII-9	Allocate infrastructure improvement budgets on a state-wide basis not just district by district. (Refer to Finding XII-5)438
Recommendation XII-10	Consider the eventual implementation of the parts and inventory component of CMMS. (Refer to Finding XII-9)438
Recommendation XII-11	Recognize that a more robust distribution workforce management application may eventually be required to support future business processes. (Refer to Finding XII-8).....439
XIII. PHASE III HUMAN RESOURCES..... 447	
Recommendation XIII-1	Provide resources and perform timely implementation of the six deliverables developed as part of this Phase III project. (Refer to Finding XIII-1 and Finding XIII-2).....459
XIV. APPENDIX A: DATA AND STATISTICS 461	
XV. APPENDIX B: GLOSSARY..... 539	

I. Introduction and Report Summary

This chapter represents a summary introduction and results of the stratified management and operations audit of Pennsylvania-American Water Company (PAWC) completed by Schumaker & Company in 2008 for the Pennsylvania Public Utility Commission (PaPUC). It includes a synopsis of the objectives and scope of our work, a functional evaluation summary, and several exhibits, for amplification purposes, that encapsulate the recommendations and estimated benefits associated with these improvement opportunities.

These management and operational reviews, which are required of certain companies pursuant to 66 Pa. C.S. § 516 (a) and (c), come under the PaPUC's general administrative power and authority to supervise and regulate all public utilities in the Commonwealth, 66 Pa. C.S. § 501(b). More specifically, the PaPUC can investigate and examine the condition and management of any public utility, as stated in 66 PA C.S. §331(a). More specifically, the objectives of this management audit include the determination of what improvements, if any, can be accomplished in the utility's management and operations pursuant to Public Utility Code 66 Pa. C.S. §522(b). Specifically, it is intended that the management audit encourage economies, efficiencies, or improvements that benefit PAWC and its ratepayers and identify which, if any, cost saving measures can be instituted. The ultimate purpose is to explore economically practical opportunities for giving ratepayers lower rates and/or better service.

The remaining report chapters contain a discussion of our findings, conclusions, and recommendations for each discrete area of review within the scope of the audit. They include:

- ◆ Chapter II – Executive Management, External Relations, & Human Resources
- ◆ Chapter III – Financial Management
- ◆ Chapter IV – Support Services
- ◆ Chapter V – Water Operations
- ◆ Chapter VI – Corporate Governance
- ◆ Chapter VII – Corporate Culture, Management Structure, & Staffing Levels
- ◆ Chapter VIII – Affiliated Interests
- ◆ Chapter X – Customer Service
- ◆ Chapter XI – Operational Performance
- ◆ Chapter XII – Phase III Water Operations – Distribution Business Systems
- ◆ Chapter XIII – Phase III Human Resources
- ◆ Appendix A – Data & Statistics
- ◆ Appendix B – Glossary

These chapters provide the detailed facts and analyses that support, and provide context for, the recommendations we have made. Following the report body are two appendices – one (*Appendix A*) provides supporting financial and operating data and statistics, while the other (*Appendix B*) provides a glossary of terms.



The findings and recommendations contained in this audit report are the findings and recommendations of the consultant only and are not necessarily agreed to by PAWC or the PaPUC.

A. Objectives and Scope

The objectives of the stratified management and operations audit were established by the PaPUC in its request for proposal (RFP). The objectives of this audit were threefold:

- ◆ To provide the PaPUC, PAWC management, and the public with an assessment of the economy, efficiency, and effectiveness of PAWC's operations, management methods, organization, practices, and procedures.
- ◆ To identify opportunities for improvement and develop recommendations for improvement or further action.
- ◆ To provide an information base for future regulatory and other inquiries into PAWC's management and operations.

In essence, the PaPUC sought to determine what improvements, if any, could be accomplished in the management and operations of PAWC. Restated, the purpose was to explore and identify practical opportunities for PAWC to achieve improvements for efficient and effective operations, quality services, and cost savings, thus providing PAWC ratepayers the lowest possible rates consistent with above-average service delivery. Our assessment included PAWC's human, physical, and capital resources, its management decisions, compliance with regulatory requirements, and ability to effectively manage outside constraints and events. Given such breadth of scope, the audit encompassed virtually all of PAWC's management and operating functions as well as those American Water Works Company, Inc. (American Water) affiliates supporting PAWC management and operations. Each review was in sufficient detail to facilitate identifying defensible recommendations for cost savings and service quality improvements that were supported by benefit analyses to the extent they were quantifiable. This report provides details of our findings, conclusions, and recommendations for each specified area within the scope of the audit.

The stratified approach and work elements included three phases: 1) an assessment of the condition of major functional areas, 2) a more detailed examination of a number of pre-identified issues, and 3) a focused analysis of issues identified during the diagnostic review. The first stage of the audit consisted of a broad overview of major functional areas and it is referred to as *Phase I – Diagnostic Review*. The second stage of the audit encompassed a detailed review and analysis of six pre-identified issues as set forth in the RFP. This stage is referred to as *Phase II – Pre-Identified Issues Review*. The third stage of the audit consisted of a focused analysis of two (2) issues identified during *Phase I* activities. This stage is referred to as *Phase III – Focused Area Analysis*. Each of these phases concluded with the development of a report that presented our overall findings, conclusions, and recommendations. The actual field work for *Phase I* and *Phase II* began on July 13, 2007 and continued through December 31, 2007. The actual field work for *Phase III* began on February 4, 2008 and continued through April 30, 2008.

During conduct of the review, our consultants allocated considerable time to interviewing PAWC, American Water/American Water Works Service Company (AWWSC), and PaPUC personnel, reviewing reports and documentation, analyzing work flow processes, and assessing any changes being planned by PAWC management. The consultant team focused on identifying areas for improvement, rather than areas where operations performed well. Although some recommendations were associated with areas that had been identified prior to the review as improvement opportunities, we endeavored to formulate more detailed action steps in our recommendations.

This review was performed in accordance with generally accepted auditing standards (GAAS), as contained in the United States General Accounting Office's "Standards for Audit of Government Organizations, Programs, Activities, and Functions," related to issues of management economy, efficiency, and effectiveness as applicable to public utilities ("Yellow Book"), and in accordance with the standards as defined in the RFP and set forth in the National Association of Regulatory Utility Commissioners' "Consultant Standards and Ethics for Performance of Management Analysis."

B. Functional Evaluation Summary

Because the bulk of a management audit is focused on opportunities for improvement, it may give the reader the impression that the utility is seriously deficient. This is not necessarily so, because many of the findings may be of a relatively minor nature. Therefore, it is necessary to put each functional area or issue in perspective to provide the PaPUC, PAWC, and the public with an objective evaluation. The RFP established a set of evaluative criteria for summarizing the results of this audit. The rating is an evaluation of each area's or issue's operating or performance level relative to its optimum as of the time of the audit. The evaluation takes into account PAWC's resources, requirements, constraints, and operating environment. In some areas comparative data is useful and can be used. For the most part, however, each rating is utility specific; i.e., the rating of PAWC cannot be directly compared with that of another utility. Schumaker & Company's overall assessment of each work plan area is presented in the *Functional Evaluation Summary* shown in *Exhibit I-1*, *Exhibit I-2*, and *Exhibit I-3*, with the specific criteria used as follows:

- ◆ *Optimum* – The area is functioning more than adequately and no recommendations were made.
- ◆ *Minor improvement necessary* – The area is generally functioning adequately, but minor improvements are recommended.
- ◆ *Moderate improvement necessary* – The area is generally functioning adequately, but some substantial opportunities for improvement were recommended.
- ◆ *Significant improvement necessary* – The areas is not functioning adequately and many recommendations, requiring considerable effort, need to be implemented to achieve adequate performance.
- ◆ *Major improvement necessary* – The area is not functioning effectively or efficiently and many recommendations need to be implemented to achieve adequate performance. Implementation of these recommendations will have a major effect on cost levels and performance for PAWC.



**Exhibit I-1
Functional Evaluation Summary
Phase I – Diagnostic Review**

Chapter	Function	Evaluative Ratings				
		Optimum	Minor Improvement Necessary	Moderate Improvement Necessary	Significant Improvement Necessary	Major Improvement Necessary
II	Executive Management, External Relations, & Human Resources					
	Executive Management			X		
	External Relations			X		
	Human Resources				X	
III	Financial Management		X			
IV	Support Services					
	Information Technology					X
	Transportation Management		X			
	Facilities Management			X		
	Procurement Services		X			
	Materials Management					X
	Risk Management		X			
	Legal Services		X			
V	Water Operations			X		

**Exhibit I-2
Functional Evaluation Summary
Phase II – Pre-identified Issues Review**

Chapter	Function	Evaluative Ratings				
		Optimum	Minor Improvement Necessary	Moderate Improvement Necessary	Significant Improvement Necessary	Major Improvement Necessary
VI	Corporate Governance		X			
VII	Corporate Culture, Management Structure, & Staffing Levels			X		
VIII	Affiliate Interests			X		
IX	Diversity and EEO				X	
X	Customer Service					X
XI	Operational Performance			X		

**Exhibit I-3
Functional Evaluation Summary
Phase III – Focused Area Analysis**

Chapter	Function	Evaluative Ratings				
		Optimum	Minor Improvement Necessary	Moderate Improvement Necessary	Significant Improvement Necessary	Major Improvement Necessary
XII	Water Operations - Distribution Business Systems				X	
XIII	Human Resources				X	

C. Summary of Estimated Benefits

The audit produced 114 recommendations, which are contained in this report. A summary of the number of priority items, and estimated benefits, is grouped by phase. Following is a brief explanation of these categories of information.

Priority

To assist PAWC management in developing implementation plans, each recommendation has been assigned a priority of “high,” “medium,” or “low” according to the following criteria:

- ◆ *High* – Designated recommendations are high priority because of their importance and urgency. These represent significant benefit potential, major improvements to service, or substantial improvements to methods or procedures.
- ◆ *Medium* – Designated recommendations are of medium priority. In some instances, the implementation of these recommendations is expected to provide moderate improvements in profitability of operations, or management methods and performance. In other instances, implementation may provide significant longer-term benefits which are less predictable.
- ◆ *Low* – Designated recommendations reflect a lower priority. In many instances, they should be studied further or implemented sometime during the next few years. Potential benefits are perceived to be either modest or difficult to measure.

Exhibit I-4 summarizes the priority totals for each phase of the audit.

**Exhibit I-4
Summary of Priority Totals**

	High	Medium	Low
Phase I	26	35	3
Phase II	18	18	2
Phase III	8	3	1
Total	52	56	6

Benefits

The audit identified quantifiable cost savings that range from approximately \$400,000 in one-time savings and \$898,000 to \$1,142,600 in annual savings. Some of these savings could be considered an actual reduction in costs, where the majority of those savings would occur through better deployment and/or use of existing resources. Nonetheless, all of these opportunities should be pursued by PAWC. An overall summary of the one-time and annual costs savings is shown in *Exhibit I-5*.

**Exhibit I-5
Summary of Benefits**

	One-time Savings	Annual Savings*
Electronic deployment of software updates	N/A	\$100,000 to \$200,000
Server consolidation and increased archiving of data	N/A	\$223,000 to \$267,600
Reduction in inventory levels	\$400,000	\$100,000
Billing overestimates	N/A	\$300,000 to \$400,000
Damage prevention program	N/A	\$100,000
Reduction in Production Department overtime	N/A	\$75,000
Total	\$400,000	\$898,000 to \$1,142,600

* Includes cost savings and/or cost avoidance amounts

In many recommendations, it is not possible or practical at this time to measure “quantitative” benefits. The benefits associated with these recommendations fall primarily into four categories:

- ◆ Reduction in actual costs of operations within a PAWC or American Water area
- ◆ Increase in a revenue source within a PAWC area
- ◆ Change in work flow processes used in the provision of services to PAWC customers on a more effective or efficient basis
- ◆ Change in other processes resulting in good business practices being implemented

Particularly in instances where a new management practice or procedure is recommended (where one either did not exist or was not fully implemented), it may be difficult to estimate the actual benefit to be derived. It is believed, however, that the overall benefit will be improved effectiveness and efficiency of the specified PAWC or American Water area. Additionally, qualitative benefits may occur that cannot be easily quantified. They could include improved effectiveness and efficiency in operations, increased customer satisfaction, additional cost savings, increased revenues, etc. It should also be noted that, because it is not possible in all instances to estimate expected benefits prior to implementation, any implementation plan should include a reliable measurement tool to track benefits after implementation.

Quantifiable benefits (increased revenues or additional cost savings) have been provided where they could be estimated. This quantification is subject to some judgment and would require additional effort beyond the scope of this review to refine the estimates. The actual benefits from these recommendations are, therefore, subject to a degree of uncertainty. For other recommendations the benefits to be derived are of a more qualitative nature or, simply stated, the expectations of prudent management. Those areas where major quantifiable benefits have been identified in the report are described on the following pages.

As PAWC will have varying ways to implement recommendations, Schumaker & Company did not estimate the impact of implementing audit recommendations on PAWC’s expense. However, the short-term impact could be considerable. Additionally, implementation of recommendations often requires a phase-in period before benefits can be achieved.

D. Summary of Recommendations

The actual recommendation statements contained in the audit report are shown by phase and work plan area on the following pages. We have also indicated the recommendation number, page number in the report, priority, estimated time-frame to initiate implementation efforts, and estimated benefits following implementation. The details of each recommendation can be found in the individual chapters where the subject matter is evaluated.

Phase I – Diagnostic Review

Chapter II – Executive Management, External Relations, and Human Resources

	Description	Page	Implementation		
			Priority	Initiation Time Frame	Benefits
II-1	Develop a systematic organizational-planning and development process.	29	Medium	6-12 months	Medium
II-2	Develop a formal and integrated strategic-planning process.	30	High	6-12 months	High
II-3	Develop a regional/state operational external-communications plan.	36	Medium	0-6 months	Medium
II-4	Strengthen HR accountability to the PAWC President.	54	High	0-6 months	High
II-5	Assess PAWC's HR needs and staff accordingly.	54	High	0-6 months	High
II-6	Develop an HR service level agreement with AWWSC.	55	High	0-6 months	High
II-7	Develop a Pennsylvania-specific HR scorecard.	55	High	0-6 months	High
II-8	Align HR services to the strategic priorities of PAWC.	55	High	0-6 months	High
II-9	Consider outsourcing technical training.	55	Medium	6-12 months	Medium
II-10	Implement a learning management system.	56	Medium	6-12 months	Medium
II-11	Conduct comprehensive workforce planning for all levels of the organization and provide necessary resources for implementation.	56	High	0-6 months	High
II-12	Complete the Organizational Capability Review for all levels of PAWC management.	56	Medium	6-12 months	High
II-13	Implement a leadership-development program and provide sufficient resources to sustain.	57	Medium	6-12 months	High
II-14	Implement position control.	57	High	0-6 months	High
II-15	Evaluate the costs and benefits associated with a more sophisticated time and attendance system.	57	Medium	6-12 months	Medium
II-16	Analyze recruitment and selection process, implement process improvements, measure performance, and provide additional resources if necessary.	57	Low	6-12 months	Medium

Chapter III – Financial Management

			Implementation		
	Description	Page	Priority	Initiation Time Frame	Benefits
III-1	Research and develop plans for upgrading or replacing the current ERP system.	88	Medium	0-6 months	Medium
III-2	Investigate why key PAWC financial statistics have been deteriorating, develop and implement a plan for improving PAWC's financial health as appropriate.	88	High	0-6 months	High
III-3	Assess the need for internal audits of American-Water-regulated utility operations and develop and implement plans to meet the internal audit requirements.	88	Medium	0-6 months	Medium

Chapter IV – Support Services

				Implementation	
	Description	Page	Priority	Initiation Time Frame	Benefits
IV-1	Expedite efforts to develop a long-range IT plan, and subsequently perform yearly review and update activities.	127	High	0-6 Months	High
IV-2	Update ITS documentation as part of an ongoing program to include all aspects of a well-managed technology organization, including (but not limited to) operational, governance, and project management/QA functions.	128	Medium	6-12 Months	Medium
IV-3	Address organizational issues involving vacancy of director positions, the appropriateness of staffing size of the various ITS groups, and the reporting location of the information systems' security function within American Water's organization structure.	128	High	0-6 Months	High
IV-4	Expand American Water's commitment to project-management principles by requiring all ITS employees who are actively involved in project work to achieve PMP certification and by closely monitoring related activities to ensure that timely progress is made.	129	High	0-6 Months	Medium
IV-5	Enhance the American Water network to enable electronic deployment of software updates to PAWC employees.	129	High	0-6 Months	\$100,000 to \$400,000 annually
IV-6	Improve training and development efforts for ITS employees.	129	Medium	0-6 Months	High

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
IV-7	Develop a plan to regularly conduct ITS client-satisfaction surveys and implement the first survey in a timely manner.	130	Medium	6-12 Months	Medium
IV-8	Establish ITS service-level agreements with major client groups.	130	Medium	0-6 Months	Medium
IV-9	Implement a relevant ITS scorecard.	130	High	0-6 Months	Medium
IV-10	Update the ITS disaster recovery plan and begin routinely reviewing and testing disaster-recovery plans and documenting results.	131	High	0-6 Months	High
IV-11	Perform a server consolidation study and implement study recommendations.	132	High	0-6 Months	\$223,000 to \$267,600 annually
IV-12	Initiate a formal procedure requiring an annual review of the requirements for each employee to have an assigned vehicle based on his or her current job assignment.	150	Medium	0-6 Months	Medium
IV-13	Develop a formal procedure that details a requirement for the performance of a regularly scheduled annual physical inventory of the vehicles that are leased from ARI.	150	Medium	0-6 Months	Low
IV-14	Develop an exception report that would clearly identify excessive fuel usage by specific vehicles or employees on a weekly or monthly basis.	150	Medium	0-6 Months	Low
IV-15	Perform an internal audit of the ARI contract and the resultant invoices using the AWWSC Internal Auditing group.	151	Medium	6-12 Months	Medium
IV-16	Perform a cost/benefit analysis to determine whether the continued use of the two PAWC mechanics in the Pittsburgh District is cost effective.	151	Low	6-12 Months	Medium
IV-17	Perform a reassessment of the PAWC policy relating to the use of employer-provided vehicles that are used for personal purposes in order to be in compliance with IRS regulations.	151	Medium	0-6 Months	Medium
IV-18	Develop a computerized tracking system that is capable of monitoring the completion of the annual state-vehicle inspections for the individual vehicles in compliance with the established schedule.	151	Medium	0-6 Months	Low
IV-19	Establish a single point of responsibility for the facilities and properties management function at PAWC.	156	High	0-6 Months	Medium
IV-20	Develop a set of formal policies and procedures to guide the performance of the facilities and properties management function at PAWC and American Water	157	High	6-12 Months	Medium

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
IV-21	Initiate a software identification, selection, and evaluation process for a new integrated procurement/materials management application.	173	High	0-6 Months	\$400,000 one-time \$100,000 annually
IV-22	Evaluate in detail the impacts of not mandating the use of national contracts with preferred vendors by the state-operating companies, especially in terms of the financial impacts, and determine whether mandating this practice would be beneficial to the operating companies.	173	Medium	6-12 Months	Medium
IV-23	Initiate a study to determine how best to present the operational and performance data on a state company basis and to evaluate the potential benefits of such reporting changes.	174	Medium	6-12 Months	Medium
IV-24	Perform an internal audit of the inventory data that is produced and used by PAWC to determine the accuracy thereof.	192	High	0-6 Months	High
IV-25	Initiate an ERP materials management module evaluation and selection process with the intention of identifying a fully integrated ERP application that would serve the needs of the PAWC materials management function.	192	High	0-6 Months	High
IV-26	Establish a central point of management and responsibility for the materials management function at both AWWSC and PAWC.	193	High	0-6 Months	High
IV-27	Develop a comprehensive and detailed materials management procedures manual that is specific to PAWC.	193	Medium	0-6 Months	Medium
IV-28	Establish a formalized training program at PAWC for the personnel who have been designated as being responsible for the materials management function at the various storerooms.	194	Medium	0-6 Months	Medium
IV-29	Adopt and expeditiously implement at PAWC the standardized part-number format that is being developed by the Part Number Standardization Committee.	194	Medium	0-6 Months	Medium
IV-30	Design and implement a standardized inventory-grid location system at all PAWC storerooms.	194	Medium	6-12 Months	Low
IV-31	Develop and implement a standardized procedure for performing cycle counting that is to be used at all storerooms.	195	Medium	0-6 Months	Medium
IV-32	Develop an inventory management plan that addresses how to identify and handle obsolete and excess material.	195	Medium	6-12 Months	Low

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
IV-33	Incorporate maintenance items into the current materials management application to gain better inventory control over these items.	195	Medium	6-12 Months	Medium
IV-34	Establish a system of a few centralized storerooms that are to be used for strategic parts storage.	196	Medium	6-12 Months	Low
IV-35	Implement a program at PAWC to standardize the inventory maintenance and control procedures across the PAWC storerooms.	196	Medium	6-12 Months	Medium
IV-36	Install computer terminals in secure locations at all of the PAWC storerooms.	196	Medium	6-12 Months	Medium
IV-37	Develop and implement a procedural modification that stipulates that material is decremented from the inventory at the time of issue from the storeroom, not at the time that it is used in the field.	197	Medium	6-12 Months	Medium
IV-38	Develop a formal implementation plan for changing the focus of the ERM process to include SEC/SOX compliance.	210	Medium	0-6 Months	Low
IV-39	Establish a formal mechanism for developing a pre-qualified list of external legal firms by periodically reviewing proposals from potential candidates.	219	Low	6-12 Months	Low
IV-40	Perform a formal cost/benefit analysis regarding standardization of legal management software throughout the American Water system.	219	Medium	6-12 Months	Medium

Chapter V – Water Operations

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
V-1	Aggressively pursue the identification and implementation of technology-based best practices among the water districts.	243	High	12+ months	High
V-2	Develop a business process for addressing aggressive identification of the most beneficial main segments for replacement based on an expectation of potential leak impact.	244	High	12+ months	High
V-3	Implement a computerized maintenance management system in conjunction with the proactive production equipment maintenance program.	249	High	12+ months	High
V-4	Continue to develop a risk-assessment-based approach for identifying main replacement projects.	254	High	12+ months	High
V-5	Continue to periodically perform CPS studies.	254	Medium	12+ months	Low

Phase II – Pre-Identified Issues Review

Chapter VI – Corporate Governance

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
VI-1	Require contractors, vendors, and others doing business with American Water to conduct themselves ethically when dealing with American Water entities.	267	Low	0-6 Months	Medium
VI-2	Expand the American Water Board in anticipation of going public and review Board compensation as soon as possible.	267	Medium	6-12 Months	High
VI-3	Implement a process to periodically perform cost comparisons for external audit services.	268	Medium	0-6 Months	Medium
VI-4	Modify the Internal Audit Department reporting structure so that it no longer administratively reports to the American Water CFO.	268	Medium	0-6 Months	Medium

Chapter VII – Corporate Culture, Management Structure, & Staffing Levels

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
VII-1	Expedite efforts to define and support a high-performing organizational culture.	281	Medium	6-12 Months	High
VII-2	Implement an employee survey process with appropriate feedback and action-planning components.	282	High	0-6 Months	High
VII-3	Implement a formal management development process.	282	Medium	6-12 Months	High
VII-4	Fill open Organization Development positions in American Water and assess the need for additional change management resources for PAWC.	282	High	0-6 Months	High
VII-5	Implement workforce management processes at PAWC.	282	High	0-6 Months	High

Chapter VIII – Affiliate Interests

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
VIII-1	Develop formal, comprehensive documentation for affiliate relationships and cost allocations, and assign the responsibility for affiliate transactions to the appropriate manager.	312	High	0-6 Months	Medium
VIII-2	Perform a detailed analysis to verify that the use of the number of customers for allocating AWWSC costs among regulated utilities reasonably approximates the use of cost-causative factors; subsequently make modifications, as appropriate.	312	Medium	6-12 Months	Medium
VIII-3	Regularly evaluate the cost of services provided to PAWC by its affiliates so as to verify that PAWC ratepayers are not being harmed by charging these services at cost rather than market.	313	Medium	6-12 Months	Medium
VIII-4	Update the AWWSC/PAWC affiliate agreement, as necessary, and submit it to the PaPUC for review and approval.	313	Medium	12+ Months	Medium
VIII-5	Provide ongoing training updates to AWWSC employees on proper use of billing numbers for charging affiliates when reporting time.	314	Low	12+ Months	Low
VIII-6	Regularly conduct internal audits of affiliate transactions and associated cost allocations.	314	High	0-6 Months	Medium

Chapter IX – Diversity and EEO

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
IX-1	Update the diversity action plan, provide resources, and implement the plan in a timely manner and give consideration to a Pennsylvania-specific initiative.	339	High	0-6 Months	High
IX-2	Complete efforts to assure data integrity in the JD Edwards human resources information system.	339	High	0-6 Months	Medium
IX-3	Develop and implement a standard data-verification process for EEO-1 reporting.	340	High	0-6 Months	High
IX-4	Require the AWWSC Human Resources Vice President to review and approve EEO-1 reports prior to submission.	340	High	0-6 Months	Medium
IX-5	Define, document, and implement more aggressive hiring plans for women and minorities.	340	High	0-6 Months	Medium

Implementation

	Description	Page	Priority	Initiation Time Frame	Benefits
IX -6	Formalize the supplier diversity program and explore the use of spend targets in the Supply Chain performance objectives.	341	Medium	6-12 Months	Medium
IX-7	Submit comprehensive diversity reports to the PaPUC annually.	341	High	6-12 Months	Low

Chapter X – Customer Service

				Implementation	
	Description	Page	Priority	Initiation Time Frame	Benefits
X-1	Invest in new customer interfacing technology, including IVR, electronic billing, and web self-service capabilities.	386	Medium	6-12 Months	Medium
X-2	Analyze employee turnover at the Pensacola Call Center and develop strategies to reduce turnover.	386	High	0-6 Months	High
X-3	Strengthen recruitment, selection, and training practices to improve the quality of new CSR hires.	386	Medium	0-6 Months	Medium
X-4	Develop a Pennsylvania-specific customer service scorecard and regularly report associated metrics to the PAWC President.	387	High	0-6 Months	High
X-5	Perform an analysis of the increase in complaint trends that PAWC is currently experiencing.	387	Medium	0-6 Months	Medium
X-6	Perform an analysis of the growth in PAWC disputes.	387	Medium	0-6 Months	Medium
X-7	Initiate actions to lower the number of over estimates in meter reading.	387	High	6-12 Months	\$300,000 to \$400,000 annually
X-8	Complete the upgrade project for Advantex.	388	High	12+	High

Chapter XI – Operational Performance

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
XI-1	Develop a comprehensive damage prevention program.	392	Medium	12+ months	\$100,000 annually
XI-2	Improve business-continuity planning.	397	Medium	12+ months	Medium
XI-3	Perform a review and incorporate better technologies for preparing, distributing, and updating the emergency and the operations and maintenance manuals including the intranet site.	398	Medium	12+ months	Low
XI-4	Continue to strengthen the unaccounted-for-water program.	410	High	12+ months	High
XI-5	Incorporate the methodologies in the currently evolving UFW spreadsheets into a more appropriate technology, specifically a backend database with a client server or web interface.	410	High	12+ months	High
XI-6	Refine the reporting of unaccounted-for water to the PaPUC.	410	Medium	6-12 months	Low
XI-7	Investigate the reasons for the increase in overtime that has occurred in the Production Department.	418	Medium	6-12 months	\$75,000 annually
XI-8	Implement standard systems for monitoring and reporting key statistical information in network operations.	419	High	12+ months	High

Phase III – Focused Area Analysis

Chapter XII – Phase III Water Operations – Distribution Business Systems

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
XII-1	Structure the design of business applications for the distribution operations function as shown in Exhibit XII-5.	434	High	12+ Months	High
XII-2	Develop the leak tracking and reporting database as a part of a larger, long-term effort to integrate with other supporting performance reporting business processes such as NRW, permits, pavement tracking, and hit facilities.	436	High	6-12 Months	High

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
XII-3	Adopt the multi-organizational reporting structure (upon which CMMS is being implemented) across both the workforce management business process and supporting performance business processes.	436	High	0-6 Months	High
XII-4	Engage AWWSC ITS to assist in the development of the supporting performance reporting process systems identified in Exhibit XII-5.	436	High	0-6 Months	High
XII-5	Address the deficiencies in the current plans regarding the incorporation of leak tracking and reporting into the design of CMMS.	437	High	0-6 Months	High
XII-6	Consider integration of leak tracking and reporting with the eventual GIS system versus integration with CMMS.	437	Medium	6-12 Months	Medium
XII-7	Ensure that the leak history is migrated into the eventual leak tracking and reporting database from all existing databases with good data.	437	High	0-6 Months	High
XII-8	Electronically connect leak and other records to the main prioritization model.	438	Medium	12+ Months	Medium
XII-9	Allocate infrastructure improvement budgets on a state-wide basis not just district by district.	438	High	12+ Months	High
XII-10	Consider the eventual implementation of the parts and inventory component of CMMS.	438	Medium	12+ Months	Medium
XII-11	Recognize that a more robust distribution workforce management application may eventually be required to support future business processes.	439	Low	12+ Months	Low

Chapter XIII – Phase III Human Resources

	Description	Page	Priority	Implementation	
				Initiation Time Frame	Benefits
XIII-1	Provide resources and perform timely implementation of the six deliverables developed as part of this Phase III project.	459	High	0-6 Months	High

II. Executive Management, External Relations, and Human Resources

This chapter will review executive management functions of Pennsylvania-American Water Company (PAWC), which include organizational structure and planning, management communications and control, administrative procedures and control, strategic planning and external relations, and human resources.

A. Executive Management

Background & Perspective

Organization Structure and Planning

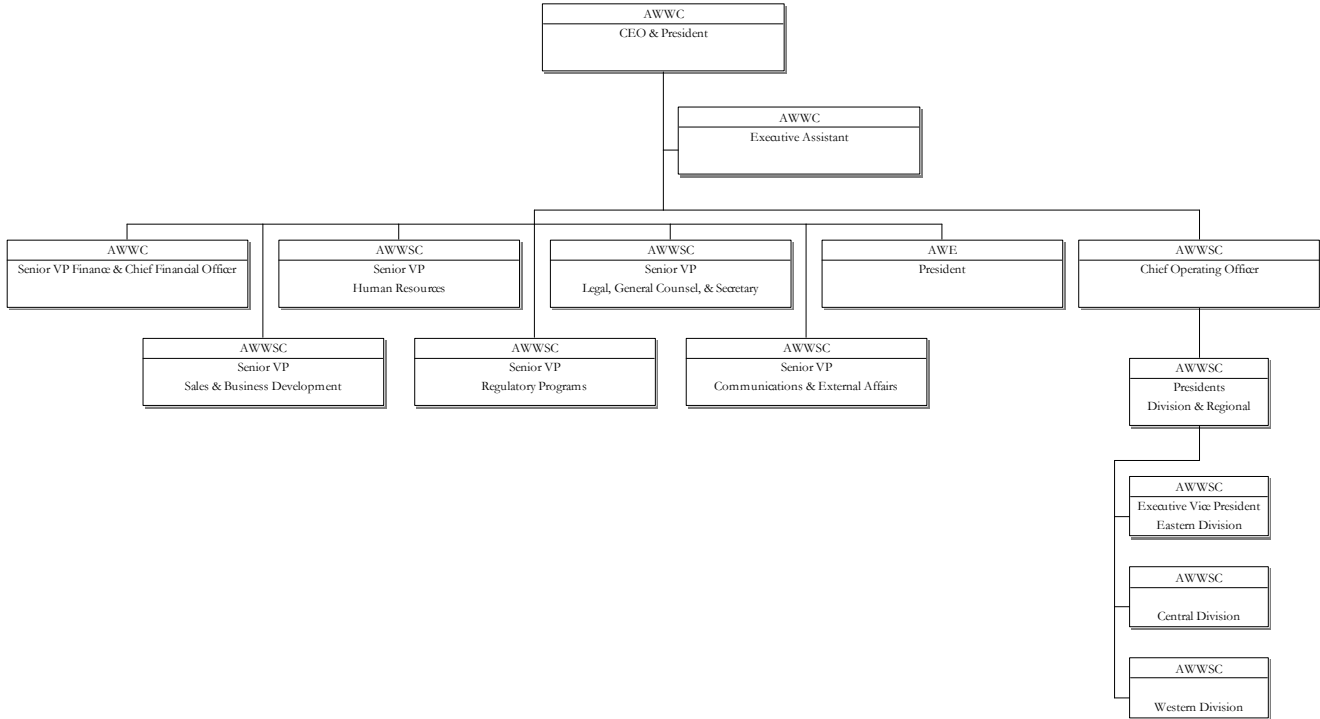
PAWC is a wholly owned subsidiary company of American Water Works Company, Inc. (American Water). PAWC is a regulated public utility that is organized and existing under the laws of the Commonwealth of Pennsylvania. It serves over 640,000 customers throughout 35 counties in Pennsylvania. PAWC owns and operates distribution systems for the purpose of furnishing potable water for residential, commercial, industrial, and government users in its service territory. PAWC also owns, operates, and maintains collection, pumping, and treatment systems for furnishing wastewater service to residential, commercial, industrial, and government users in its service territory.¹

American Water is a corporation that is located in New Jersey but organized and existing under the laws of the State of Delaware. American Water owns 18 regulated operating subsidiaries (including PAWC) in 18 states. American Water is currently wholly owned by RWE Aktiengesellschaft (RWE), a foreign corporation that is organized and existing under the laws of the Federal Republic of Germany.² As of 2007, RWE was planning on divesting all or part of its ownership in American Water through a public common-stock offering (to be listed on the New York Stock Exchange), although the timing of that offering has not been determined.³



The American Water organization as of December 31, 2007 is shown in *Exhibit II-1*.⁴

**Exhibit II-1
American Water Organization
as of December 31, 2007**



Acronyms at top of each box represent the employee's company affiliation. Although most employees are AWWSC employees, some are actually American Water Works Company (AWWC) employees or American Water Enterprises (AWE) employees.
Source: Information Response 257, Page 4. Information response 779

Reporting to the Chief Executive Officer (CEO) and President are Senior Vice Presidents (SVPs) for Finance (also Chief Financial Officer), Sales and Business Development, Regulatory Programs, Human Resources, Communications & External Affairs, and Legal, General Counsel & Secretary. Also reporting to the CEO is the Chief Operating Officer (COO), who is responsible for division and regional companies that are headed by regional and company presidents (including PAWC in the Eastern Division), as well as Vice Presidents (VPs) for Customer Services, Operational Services, and Process Performance. The AWE President also reports to the CEO.⁵

The last major organizational restructuring (completed) took place in November 2003, after RWE acquired American Water. That reorganization resulted in the consolidation of seven regions into four, with PAWC as one of six regulated subsidiaries that became part of the Southeast Region. Functional groups (e.g., service delivery, finance, human resources, and external affairs) were placed under regional leadership, with staff deployed into states as needed.⁶ The organization review that resulted in these

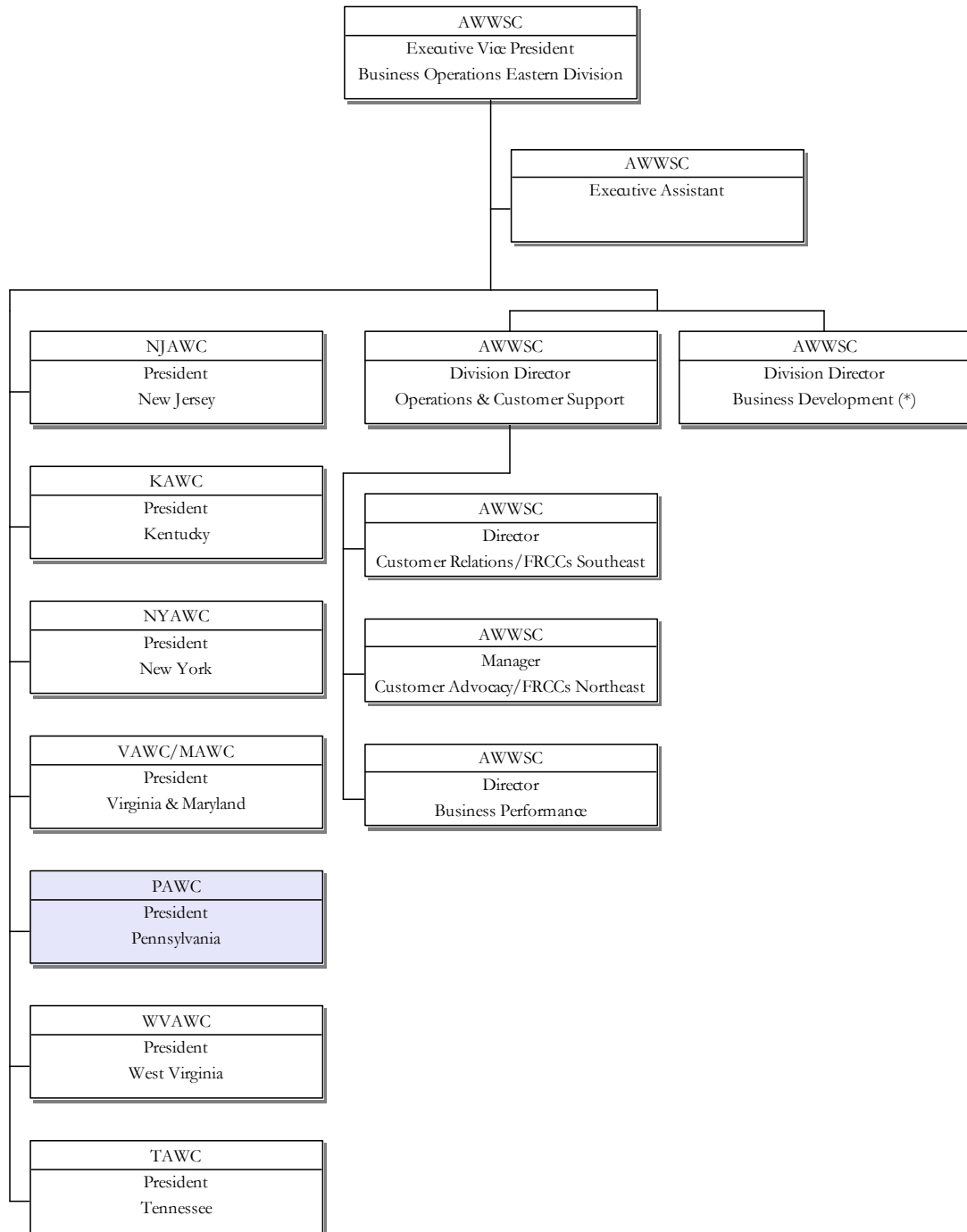
changes was part of an overall Vision and Strategy process that was carried out to develop a business model for enhancing customer service, accelerating business growth, and increasing efficiencies.⁷

Most employees at the corporate level are employees of the American Water Works Service Company (AWWSC), with the President/Chief Executive Officer and Senior Vice President/Chief Financial Officer (and their executive assistants) being the only employees of the parent company.⁸

In 2007 American Water began moving away from a regional structure to align key support functions on a national basis. The aim of this migration is to achieve economies of scale and best practices while focusing operational and state-specific functions on a state level. In late 2007 the Northeast and Southeast regions were combined into an Eastern Division (includes Pennsylvania-American Water Company), with the Central and Western regions combining in 2008 into a Western Division (also with state presidents). *Exhibit II-2* shows the first phase of this reorganization (Central and Western regions will realign after the Eastern Division is formed).⁹



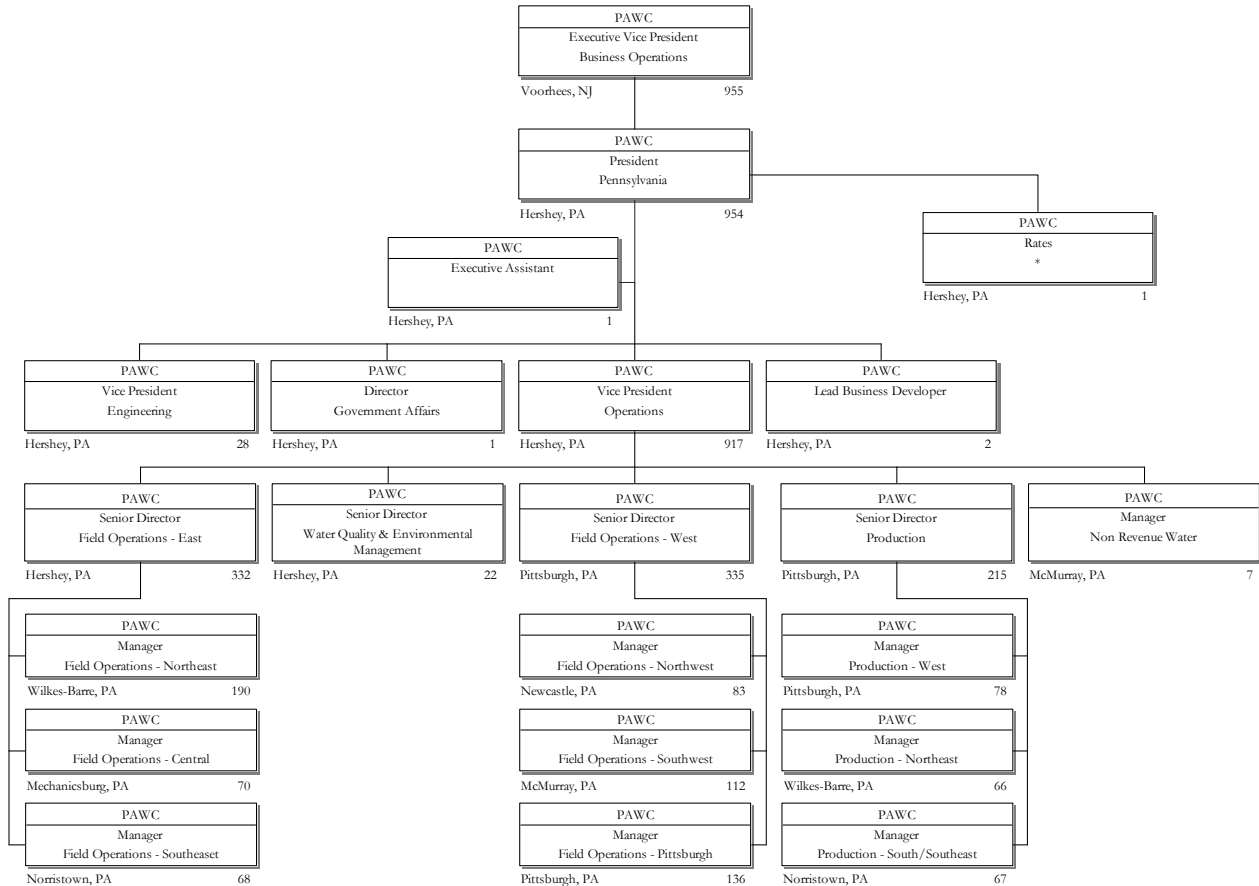
**Exhibit II-2
American Water Eastern Division Reorganization
as of December 31, 2007**



Source: Information Response 1, Page 4 and 257 Addendum. Information Response 779(2)

Exhibit II-3 shows the Pennsylvania state organization, with production, operations, engineering, and other state-specific functions reporting directly to the state president. Meanwhile, support functions (e.g., law, finance, human resources) are provided from the corporate level to all divisions/states.¹⁰

Exhibit II-3
Pennsylvania-American Water Company Organization
as of December 31, 2007



* Dual reporting to Finance and dotted line reporting to the PAWC President
Excludes 27 PAWC employees reporting to AWWSC management
Source: Information Response 257 and 779

The above organizational changes in Exhibit II-2 and Exhibit II-3 have come about through informal management discussions, not a formal process where minutes were kept of meetings. The process was driven by the CEO, based in large part on what he heard from employees, customers, and other stakeholders. No organizational measurement or assessment tools have been used. The PAWC President had no input to higher-level organization changes, but she is tasked with making necessary changes to the PAWC organization.¹¹

No written department nor division descriptions, which include goals and objectives for each department, exist.¹² In early 2008 PAWC began a process of developing goals and objectives.¹³

Management and Administrative Communications and Controls

PAWC uses a number of avenues to communicate with its employees, including:

- ◆ *Splash* – a regional employee newsletter on current events as well as important activities and employee accomplishments. *Splash* is distributed to all employees via hard copy and is available on the intranet.
- ◆ *Talking Splash Points* – a bi-weekly e-mail communiqué to all employees on company activities and initiatives. The purpose is to develop two-way dialogue between employees and management.
- ◆ *Change Partner Network (CPN)* – a group of employees representing all levels at American Water that facilitates discussion with others (through meetings) on various issues and questions. Network members participate in meetings via conference calls (bi-monthly) (including representation by PAWC) and then have follow-up meetings with their colleagues.
- ◆ *In The News* – a daily communiqué that is sent to management and supervisors highlighting news articles that pertain to PAWC and other pertinent utility-industry news.
- ◆ *News You Need To Know* – a daily e-mail broadcast of recent news, announcements, policy revisions, and other current items of interest. Employees can gain additional information on any topic through PAWC’s intranet.
- ◆ *Internal Announcements* – American Water-wide e-mail communications from senior management about important PAWC announcements.

Also, individual managers and supervisors conduct “tool box” talks with their direct reports.¹⁴

PAWC uses a number of management reports, including:¹⁵

- ◆ *Environmental Management and Compliance* – a monthly regional summary report to management on important environmental events and key statistics.
- ◆ *Network Reports* – PAWC superintendents provide key operating information to management (monthly).
- ◆ *External Affairs* – two monthly reports on activities in each state and summaries of issues that have the potential to negatively impact PAWC’s business.
- ◆ *Business Development Reports* – include pipeline report (transactions under development) and Critical Tasks memo (to closing of advanced transactions under agreement/offer outstanding/offer pending in ninety days).
- ◆ *Finance Reporting* and *Business Performance Reporting* (monthly) packages.

- ◆ *Capital Investment Management (CIM) Program Progress Report* (monthly) that tracks capital expenditures.
- ◆ *Reforecast Reports* (quarterly) on the Strategic Capital Expenditure Plan.

American Water creates and updates its policies via a process called the Policies, Strategies, and Practices process. A policy panel was established in August 2006 to guide and support this process. Key Governance templates were developed for American Water to define policies, practices, and strategies. American Water defines policies as pertaining to essential mandates that are basically non-negotiable, with few, if any, exceptions. Strategies describe what American Water strives to be or do and provide direction or guidance to management decisions that take into account appropriate service levels, costs and operating efficiencies, and business risks. Practices provide the details and steps for how the business should operate.¹⁶ Practices include guidelines, standards, procedures, processes/workflows, and tools (models, checklists, references, etc.). All policies are approved by the American Water Board, the AWWSC Board, and/or the Business Center Functional Executives (CFO, COO, etc.). Strategies and Practices are approved by Functional Managers (Business Centers and Regions). The intranet is used as the primary means of distributing policies, strategies, and practices throughout the organization. This effort is coordinated by the Policy Panel, which is made up of 17 managers representing all areas of the American Water system.¹⁷

Strategic Planning

American Water's corporate strategy, as described in its recent S-1 filing with the Securities & Exchange Commission (SEC), is to consistently provide customers with safe, high-quality drinking water as well as reliable water and wastewater services. American Water intends to implement this goal by:¹⁸

- ◆ Prudently investing in regulated water and wastewater infrastructure projects
- ◆ Earning an appropriate rate of return on investments from state public utility commissions
- ◆ Growing regulated businesses through acquisitions
- ◆ Pursuing public and private partnerships, including operations and maintenance (O&M), military contracts and services, and other non-regulated businesses that are complementary to its regulated businesses

The strategic-planning process for PAWC is initiated and directed by American Water, its parent company.¹⁹ Overall, American Water develops a strategy that then feeds down into business-unit strategies. These strategies, in turn, are used to develop business plans.²⁰ At the American Water level, a process calendar is developed that includes process deliverables and timeframes for process completion. PAWC supports this effort by identifying key assumptions and assigning responsibilities for task completion. These initiatives are then reflected in supporting plans that are developed at the Southeast Regional level. Quarterly financial planning and analysis meetings are held to update expectations (e.g., deadlines and approaches), key assumptions (e.g., capital expenditures), and future planning activities (e.g., tasks, owners, and due dates) for the business plans.²¹



For 2007, American Water targets were established in the areas of:²²

- ◆ *Finance* – meeting business-plan financial commitments, processing rate cases effectively, and securing regulatory approval for transfer of ownership (public offering).
- ◆ *Customer* – enhancing customer satisfaction, delivering reliable and high-quality service, further developing business growth, and enhancing brand equity through an integrated and coordinated company-wide communications approach.
- ◆ *Process* – enhancing operational performance by achieving Sarbanes-Oxley (SOX) compliance (enhanced internal controls and responsibility) and delivering on the capital program; executing a company-wide diversity plan.
- ◆ *Employee* – enhancing employee strength and capabilities as well as employee engagement and satisfaction.

Broad goals in all four of the above areas are assigned to senior level managers in the organization and these goals are then cascaded down through the organization (employee specific via a balanced scorecard).²³

There have been no strategic-planning studies performed in the past five years.²⁴

Regional business performance is tracked via monthly business-performance reporting packages (discussed by senior management through meetings and conference calls).²⁵

Corporate goals and targets have been defined for American Water, the regional levels, and PAWC in the areas of finance, customer service, process (operating performance and diversity), and employee (skills, capability, and employee satisfaction).²⁶ There are no associated business plans that directly tie in to these high-level goals and targets.²⁷

In February 2006, American Water conducted a partial internal benchmarking study that included the Customer Service Center (CSC), Information Technologies (IT), Shared Services Center (SSC) and Finance, Water Quality, Human Resources (HR), and Supply Chain organizations. This study focused on costs, and not service levels, although it identified some key performance indicators (KPIs) for each functional area as well as a discussion of supporting indicators (drill down) and qualitative drivers. Not all functions (e.g., operations) were included in this study. Subsequently (later in 2006), an outside group was engaged to perform a more comprehensive benchmarking study that would include the use of cost data to develop productivity and effectiveness data. This effort is on hiatus until after the initial public offering is completed. American Water has indicated it intends to complete this more comprehensive study.²⁸

The Southeast Region (PAWC contributes) has a number of key performance indicators (KPIs) that are monitored on a weekly and monthly basis.²⁹ Areas include financial (budget variance reports),³⁰ customer-opinion surveys and actions taken in response to each survey,³¹ inventory action plans and turns data,³² and numerous performance indicators for network, production, and field-service

personnel.³³ These performance measures are used by supervisors to manage specific areas of their responsibility and are not tied back to any corporate-wide strategic plan.³⁴

There are no major corporate initiatives underway except for the state-focused organization realignment (discussed earlier) and the Sarbanes-Oxley (SOX) compliance initiative (discussed in *Chapter X – Corporate Governance*).³⁵

Findings & Conclusions

Finding II-1 In general the American Water/PAWC organization adequately supports current ratepayer and corporate objectives.

American Water, PAWC, and regional and supporting organizations are undergoing significant organizational changes. The basis for these changes, while largely informally developed, is sound and practical. A corporate focus on centralizing core services, focusing more control at the state level, and promoting efficiencies, commonalities, and best practices throughout the American Water system is appropriate (especially given the numerous and dispersed companies in the American Water system).

A review of the existing organization³⁶ (American Water executive team, Southeast Region, and PAWC) down through the Manager/Director level shows that spans of control are appropriate, and Schumaker & Company did not identify any excess layering of management. Like functions are grouped together (within American Water, regional, and PAWC organizational units) and appropriate matrix relationships exist between like functions at different levels of the organization (e.g., financial functions up and down the organization).

Specific instances where Schumaker & Company recommends organizational changes are included in *Chapter IV – Support Services* and *Chapter IX – Diversity & EEO*.

Finding II-2 Organizational planning and development at American Water/PAWC is largely informal and could be improved.

There are no documented processes, criteria, or procedures for evaluating the efficiency and effectiveness of the organization. Organizational changes are not part of a strategic-planning process and, at the regional/company level, are justified through the budgeting process (as part of the process of reviewing additions, changes, and deletions impacting labor costs), as discussed further in *Chapter III – Financial Management*. There is no documentation on the rationale or process for past changes to guide future reviews (e.g., the conditions that prompted an organizational change). There are no requirements to periodically review the organization, nor are there any criteria that would define triggers to evaluating the organization or specific organizational units.³⁷

Finding II-3 Management communications and control are adequate.

American Water uses a number of written and intranet vehicles to communicate with its employees on a weekly (e.g., News You Need to Know), bi-weekly (e.g., Splash Points), and monthly (Splash) basis. Topics go beyond news of general interest and include ownership-transition updates; posting of new policies, organizational changes, and key managerial positions; information and training on SOX initiatives; customer satisfaction, diversity, information technologies, Code of Ethics, and the Ethics Hotline; and news on other important process initiatives (e.g., Supply Chain), among other items.³⁸ Splash, PAWC's monthly newsletter, is a professionally prepared publication that covers a wide range of topics, including personal messages from the Chief Executive Officer, and is well laid out (short, to-the-point articles with appealing pictures).³⁹

The Change Partner Network is a good means of promulgating information via face-to-face meetings between management and employees. The purpose of this American Water program is to employ a cross-section of employees to share information and create an ongoing dialogue about American Water's news, business changes, and operations. Although each meeting (held monthly and integrated into the weekly Splash Points/Tailhook meetings) has a designated speaker and topics, the interaction is two-way with the participants. The intent of such interaction is the identification of topics of interest and concern to employees (hot topics) and the provision of feedback on what is or is not working. Employees can participate via conference calls, and liaisons are identified to assist with follow-up questions and action items and to arrange for subject-matter experts to participate as needed, among other duties. Listed topics include important and changing customer, employee, and operations topics such as training, SOX compliance, customer service and call centers, and best operating practices, among others. The Southeast Region (which includes PAWC) has approximately 60 members of CPN, representing a broad range of employees across the Southeast and PAWC organizations. PAWC-specific issues are addressed mainly through Splash Points/Tailhook meetings.⁴⁰

Finding II-4 Administrative procedures and controls are appropriate.

Around the beginning of 2006, American Water and the subsidiary companies embarked on a review of policies and procedures. This process involves the Senior Management Team identifying and documenting the need for a new policy or a revision to existing policies, with sponsoring senior managers, affected functional areas, and other stakeholders developing and reviewing drafts of policies and implementation plans. A Policy Panel coordinates this effort and approves the policy for forwarding to the appropriate approval authority (American Water Board, AWWSC Board, or Business Service Executive). The appropriate functional area manager is then responsible for communicating and implementing the policy or procedure and for monitoring and reporting on its effectiveness or any problems.⁴¹ Guidelines in the form of templates and training presentations have been established to guide the form, substance, and consistency of all policies and practices. Policy implementation plans and Intranet posting checklists track development and implementation of each approved policy.⁴² Procedures are publicized to employees via weekly "What's New," more important procedures are further highlighted in other employee publications (e.g., Splash Points), and the library of all procedures

is maintained and made available on PAWC's intranet.⁴³ The status of policy review and implementation is addressed through the Policy Panel.⁴⁴

Functional managers are responsible for policy and procedure maintenance and the Policy Panel is charged with coordinating this effort. Policies are required to be reviewed every three years or when required by any significant operational or organizational changes. All updated policies are listed on the American Water intranet with the effective date of their last revision.⁴⁵

Finding II-5 American Water and PAWC lack a formal, systematic strategic-planning process.

Although American Water has laid out strategic goals and targets in various documents (e.g., S-1 filings, employee communications, and business plan), there is no strategic plan laying out the strategic direction of the company that is tied to overall goals and performance indicators.⁴⁶ Likewise, there are no directly supporting subsidiary plans that further break down goals and performance indicators.

Although the 2007–2011 business plan and supporting regional business plans contain some elements of non-financial aspects, these documents are largely financial-planning tools. PAWC does have a number of performance indicators (key performance indicators) and plans to improve non-financial areas (e.g., Human Resources), but these are not directly tied to corporate strategies.⁴⁷ As mentioned earlier, American Water has initiated an effort to develop performance indicators (including benchmarks); however, this effort has not been completed and needs to be incorporated into future strategic planning efforts.

Recommendations

Recommendation II-1 Develop a systematic organizational-planning and development process. (Refer to Finding II-2.)

Periodically (at least every five years), American Water should examine the organization to ensure that it is still meeting all corporate goals and objectives (customer service, efficiencies, etc.). This process can be incorporated into the annual strategic-planning process. Set out criteria for review such as spans of control, grouping of like functions, management layering, impact of management development and training, performance criteria, level of support required from other organizational units, and lines of reporting and communication (this is not meant to be an inclusive list). If these reviews come through management meetings/discussions and committee work, results should be documented. Also, the company must define conditions or situations that should trigger an organization review (e.g., major change of a business process, application of a new technology, difficulty responding to a major or systemic problem or issue). It must also assign responsibility for maintaining updated organization charts.



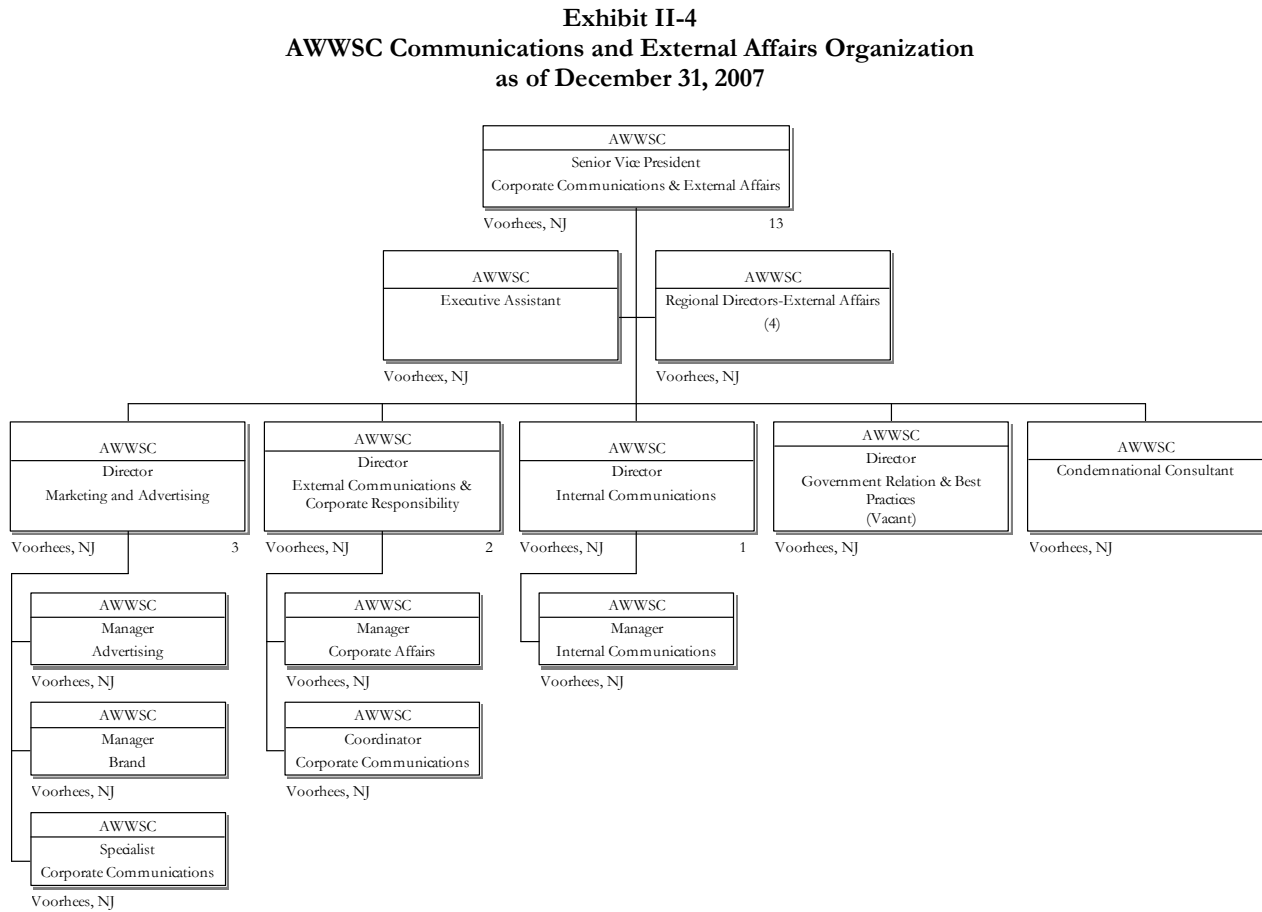
Recommendation II-2 Develop a formal and integrated strategic-planning process. (Refer to Finding II-5.)

American Water should develop a written strategic plan that embodies American Water's four main goals as described in its S-1 filing and other documents. The company must tie each strategic goal to sub-tending supporting goals and set performance targets to measure these goals. It will require subsidiary companies to develop supporting plans that directly tie back to the Corporate Strategic Plan. American Water should also establish calendars and processes (similar to business-planning process) and establish a coordinating group (e.g., Strategic Planning group) or expand the duties of the current Planning and Controls group to coordinate and assist in the process.

B. External Relations and Corporate Communications

Background & Perspective

The American Water External Affairs organization, which is part of AWWSC, is shown in *Exhibit II-4*.⁴⁸



Source: Information Response 444

The Corporate Communications and External Affairs group is lead by a Senior Vice President who reports directly to the American Water Chief Executive Officer and President⁴⁹ and is responsible for developing and implementing an integrated strategic-communications program for American Water and its subsidiary companies. This duty includes corporate communication, media relations, community relations, internal communications, and corporate social responsibility. The Senior Vice President Corporate Communications and External Affairs is also responsible for leading the government-affairs function, including direct or oversight responsibility for developing and maintaining relationships with government bodies, commissions, agencies, and legislatures at all levels. This obligation includes

participating in developing and supporting rate case strategy, developing and delivering to government officials relevant information, materials, and presentations, and developing external relationships to shape the legislative and regulatory environment.⁵⁰

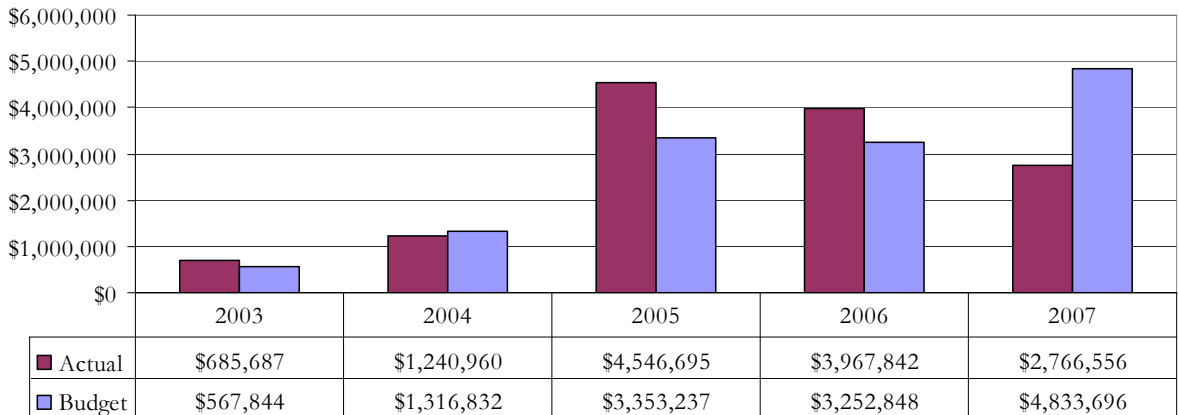
Reporting to the Senior Vice President are Directors for Internal Communications, Marketing and Advertising, and External Communication and Corporate Responsibility. The Director of Internal Communications is responsible for creating and maintaining a comprehensive, integrated, and proactive internal communication program, which ensures that employees are informed about American Water's strategy, business goals, and key initiatives. The Director of Communications and Corporate Responsibility is responsible for leading and managing American Water's external-affairs strategy including media relations, government relations, community relations, grassroots strategies, and key relationship development and management. The Director of Advertising and Marketing is responsible for marketing, advertising, and all communications activities to support key business-development activities as well as overseeing the American Water rebranding efforts (marketing and advertising programs to change, for the better, the way important publics feel about American Water when they hear or think about its name).⁵¹ A Director of Government Relations and Best Practices (this position has recently been created and is currently vacant) will be responsible for government-affairs-related activities on the federal and state levels. This responsibility includes direct contact with federal lawmakers and regulators concerning water and wastewater issues (including directing the efforts of contract lobbyists in Washington). It also entails working with the states to develop and implement local and state government-affairs programs including outreach programs. This position will have a dotted-line reporting relationship with the state presidents.⁵² In addition, four Regional Directors of External Affairs support the American Water effort and provide a more specific regional and state focus on this function.⁵³

American Water has recently rolled out several key communications strategies and programs as follows:

- ◆ *Rate Case Communications Strategy* – a methodology for outlining and implementing communications to regulatory bodies and key publics in support of rate-case filings.⁵⁴
- ◆ *Capital Investment Communications Strategy* – means of communicating to states, local communities, and other key constituencies the need and value of capital-investment projects.⁵⁵
- ◆ *Bill Insert Strategy* – projected number of inserts by state and associated costs.⁵⁶
- ◆ *Issues Management Protocol* – a means of identifying and managing issues affecting American Water and of establishing roles and responsibilities throughout the organization.⁵⁷
- ◆ *Collateral Overview Strategy* – a means of developing packages of communications material to be used throughout American Water.⁵⁸

Expenditures for AWWSC external-relations activities for the past five years (2003 to 2007) are shown in *Exhibit II-5*.⁵⁹

Exhibit II-5
Summary of Expenditures for AWWSC External-Relations Activities
2003 to 2007



2007 actual expenditures reflect only nine months of data.
Source: Information Response 445. Figures include payroll and overhead.

The budget increased significantly from 2004 to 2005 mainly because of increases in expenditures for payroll costs and advertising. The budget increase from 2006 to 2007 reflects marketing costs from Business Development, which was transferred under External Relations.⁶⁰ AWWSC External Relations staffing levels have increased significantly, from minimal levels up to its 2007 strength of 14, including Regional Directors.

In addition to AWWSC costs, expenditures specific to PAWC (direct expenses, excluding payroll and overhead costs) have averaged slightly over \$500,000 per year over the past five years, and these sums have been fairly consistent, although 2007 did see a jump to \$640,000. The great majority of these funds were devoted to community-relations activities such as donations to charitable organizations, sponsorship of local events and chamber of commerce activities (\$200,000 budgeted in 2007), and various printing and mailing services related to booklets, newsletters, flyers, print advertising, and the like (\$420,200 budgeted in 2007).⁶¹

PAWC must answer to a number of governmental and regulatory agencies including The Pennsylvania Public Utility Commission, the Office of Consumer Advocate, the Office of Small Business Advocate, the Department of Environmental Protection, the Department of State, the Ethics Commission, the Independent Regulatory Review Commission, the Pennsylvania Department of Transportation, the Department of Revenue, and the Pennsylvania Infrastructure Investment Authority.⁶²

There are a number of recent and active legislative proposals at the state level, covering a wide range of issues, that affect PAWC's operations. Included are bills involving investment funds for public water

and sewer projects (including several involving the Dam Project Fund), procedures to be followed on utility-industry restructuring, and other minor issues.⁶³

There are no public-opinion polls conducted for PAWC, except for an annual customer-satisfaction survey (on very broad customer satisfaction) and random inquiries of customers who have had recent contact with PAWC (again only in very broad terms of customer satisfaction).⁶⁴

Findings & Conclusions

Finding II-6 **American Water's external relations function has been recently strengthened and is well positioned to support corporate objectives and regional/state efforts; however, the role of the Southeast Regional Director should be better defined.**

Senior management of American Water and PAWC has recently strengthened the external relations function of the companies.⁶⁵ (Refer to *Finding II-7* for a discussion regarding program development.) Since 2006 the External Affairs and Corporate Communications function has been led by a senior officer who has high-level visibility in the organization. (Previously this function was led by a VP position.)⁶⁶ The Senior Vice President of Corporate Communications and External Relations has extensive experience in the communications field and, prior to joining American Water (approximately one year ago), was owner and president of her own communications consulting company.⁶⁷ Directors heading up Advertising and Marketing, External Communications, and Internal Communications are all well qualified (in terms of both education and experience) for their roles.⁶⁸ The Director of Government Relations and Best Practices is a newly created position and has not yet been filled.⁶⁹

The roles and responsibilities for these AWWSC positions are described in detail in job descriptions, which include primary roles, key accountabilities, an estimate on percentage of time spent on each one, key interfaces and relationships, and required education/experience/certifications.⁷⁰ These roles and responsibilities are applied across the American Water system.

Regional directors are identified to provide local presence and expertise. These directors report directly to the Senior Vice President of Corporate Communications and External Affairs (American Water) with a dotted-line reporting relationship to the state presidents. The Southeast Regional Director for External Affairs (responsible for Pennsylvania) has over 28 years of experience with American Water in a variety of customer service and operations roles (she was recently a manager of district operations) and has been in her current role for three years. She manages a staff of 12 employees and is responsible for providing strategic input, from the state and local levels, to American Water external and corporate communication efforts. She is also responsible for interfaces with all outside publics. These contacts and efforts have been on an ad-hoc basis (as issues and needs arise).⁷¹ For example, AWWSC External Relations has identified the importance of and need to proactively address major problems (e.g., major main breaks, service disruptions, environmental issues, etc.) and are developing corresponding programs

to manage these problems and other AWWSC programs; however, these programs need to be substantively rolled out to the regions and states.

Finding II-7 American Water has recently developed a number of strategic external-relations programs; however, these programs have not yet been rolled out, and there are no regional or state-specific operational plans.

American Water has recently developed a number of strategic programs to enhance the corporate communications and external affairs functions. The most significant of these involve rate case communications, capital investments, and issues management.

The Rate Case Communications Strategy is a lengthy (65-five-page) document that defines outreach activities' toward regulatory agencies, state and local governments, customers, and the community regarding the need and rationale for rates. These communication activities are broken out by those in support of a rate filing as well as ongoing, year-round activities. This strategy has well-defined goals (transparency of information to promote trust, education, and promotion of value, and to identify and address concerns as ongoing goals; substantive and comprehensive education of all interested publics on the need for rates and value of investments that are specific to rate cases) and broadly defined activities (termed strategies) to accomplish these goals. Audience/stakeholders (e.g., state regulatory authority) and key messages (e.g., demonstrate how and why water capital investment is important to the community) are also broadly defined. The plan goes on to specifically lay out tactics (action steps) to implement with the media, customers, local elected and appointed officials, and employees. This plan also requires regional external relations to develop supporting rate case strategies and timelines. Templates are also provided for letters to customers, press releases, frequently asked questions, and other items. Although this document is only in draft stage, as of early 2008, it provides a good basis for increasing external communications and relationships with regulatory agencies, state and local governments, and local communities and ratepayers.⁷²

The Capital Investment Communications Strategy is a supportive plan to the above Rate Case Strategy to further communicate the need and importance of water infrastructure projects. This strategy is structured similar to the Rate Case Strategy and further details communication vehicles for communicating, on an ongoing basis, with customers, community, and legislative leaders, regulatory agencies, and the media. This plan is also in draft stage.⁷³ Capital investment has been identified by American Water's senior management as a critical factor in American Water's future operation.⁷⁴

American Water has recognized the importance of identifying and even anticipating important issues and of addressing them in a positive and proactive manner. An Issues Management Protocol was recently developed (October 2007) that identifies issues by category (operational, environmental, and reputation), priorities of issues, broad strategies for identifying particular issues, profiling the issue (describing what the issue really is, its importance, who is affected, etc.), developing communication plan of action, assigning roles and responsibilities, assembling an Issues Management Team, and finally capturing key lessons learned.⁷⁵



A Collateral Overview Strategy has also been recently developed to serve as a living document to define standard communication packages that can be used throughout the American Water system. Examples include Investor Facts brochures, Community Facts brochures, state-specific brochures (e.g., what American Water does in those specific communities, partnerships, state contact points), and, notably, Regulator packages (information on consumer-education efforts, infrastructure updates, and other important issues).⁷⁶

All of the above documents provide a good basis for a substantive external relations strategy and effort, but they have only been recently developed and have not yet been rolled out for implementation. Of note is that these strategies (especially the Issues Management Protocol) rely on the activities of the regional and local external-relations personnel. Mention is even made in the Rate Case Strategy for supporting local operational plans. To date, these state-specific strategic/operational plans have not been developed, although there have been some recent efforts to develop outreach contact lists and communications time lines for upcoming rate case strategies. American Water has recently created a position of Director of Government Affairs, whose job description implies the responsibility to work with regional and state external-relations management and personnel to develop these supporting plans. This position has only recently been filled (December, 2007).⁷⁷

Recommendations

Recommendation II-3 Develop a regional/state operational external-communications plan. (Refer to Finding II-6 and Finding II-7.)

The Southeast Regional Director of External Relations, working with American Water's Corporate Communications and External Affairs Department, should develop a regional and state-specific (Pennsylvania) External Relations Plan. This plan should directly support and integrate with current and future American Water External Relations strategies and should contain, at a minimum, the following elements:

- ◆ A State Rate Case Strategy that reflects the American Water Rate Case Strategy yet features state-specific (Pennsylvania) details on contacts (e.g., specific regulatory, government, and community titles and names if possible), makeup of rate-case teams, calendars, communication vehicles, and reporting mechanisms. Action plans can be used to define and report progress on individual initiatives.
- ◆ An ongoing contact program, including development of a list or matrix of specific regulatory, government, community, and business contact points (titles of positions and names if possible) with specific company responsibilities to contact, a calendar for periodic contact, and a reporting mechanism for documenting topics, issues, feedback, follow-up action, etc. Government and community organizations should be proactively queried on perceptions, complaints, service levels, etc., and responses from this type of surveying should be analyzed for potential gaps in performance. Develop a database for capturing and analyzing these potential

issues. This type of key-stakeholder outreach program should identify and encourage American Water/PAWC senior managers to develop personal relationships with key external constituents and stakeholders who are important to American Water's/PAWC's business agenda. All of these relationships and contacts should be clearly and plainly documented.

- ◆ A Corporate Citizen Strategy to define how much and where monies should be directed toward event and activity sponsorships, grants, contributions, and community employee involvement. For example, efforts can be prioritized and divided among education (e.g., promoting science and engineering in local schools/technical colleges with the potential payback of developing an engineering pool of future employees), environment (e.g., programs on education, conservation, protecting endangered species, etc.), arts and culture, and community and neighborhood development. A Regional Contributions Committee can be formed from the region's senior managers to develop guidelines and recommend disbursements.

All regional and state external-affairs managers should have these new responsibilities detailed in their job descriptions and their organizational functions should be spelled out in charters. The new American Water Director of Government Affairs should provide strong corporate (American Water) support to developing stronger external relations at the state and local levels.

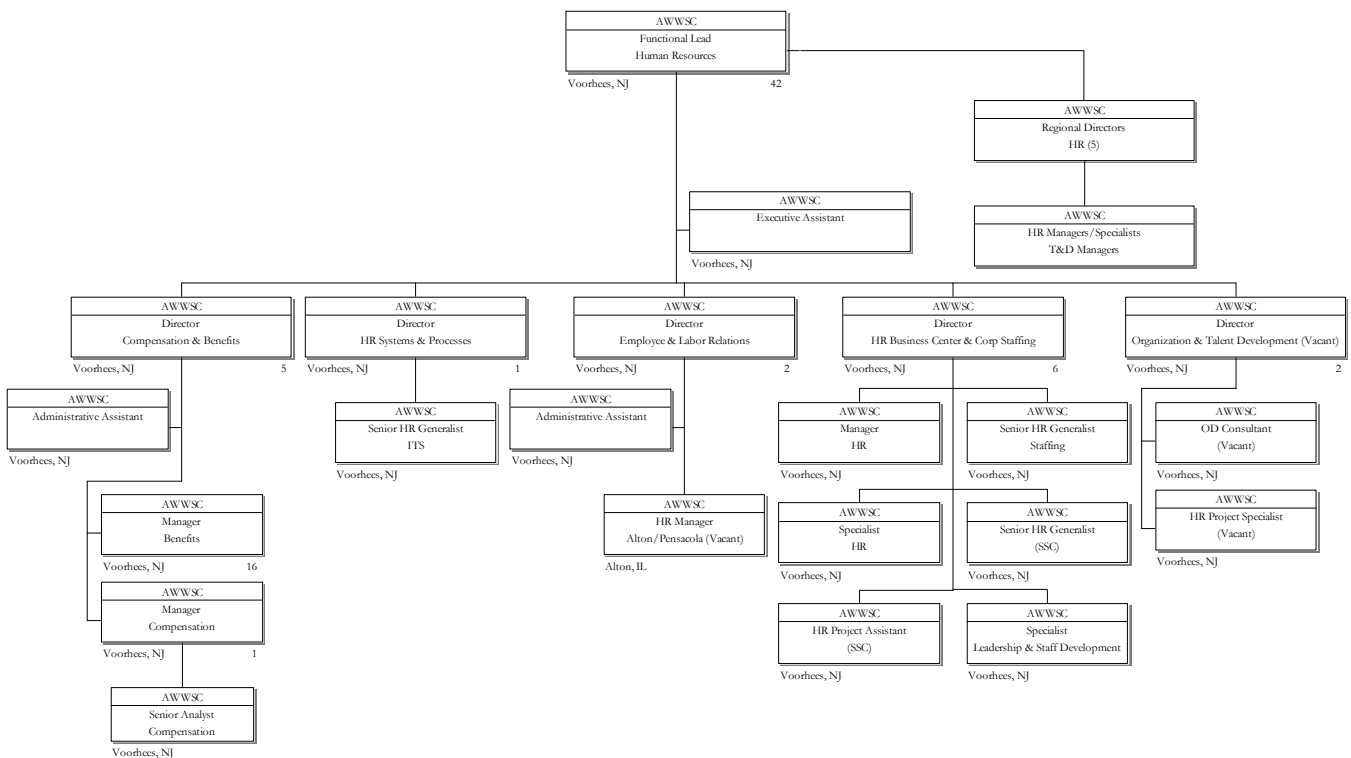
C. Human Resources

Background & Perspective

Organization & Staffing

Human resource (HR) services are delivered to American Water Works Company, Inc. (American Water) through a shared services model by the American Water Works Service Company (AWWSC) HR organization, which is organized as shown in *Exhibit II-6*. This approach assures consistency of policy and programs across all American Water business units while achieving some efficiencies over redundant local HR organizations.⁷⁸

Exhibit II-6
AWWSC Human Resources Organization
as of December 31, 2007

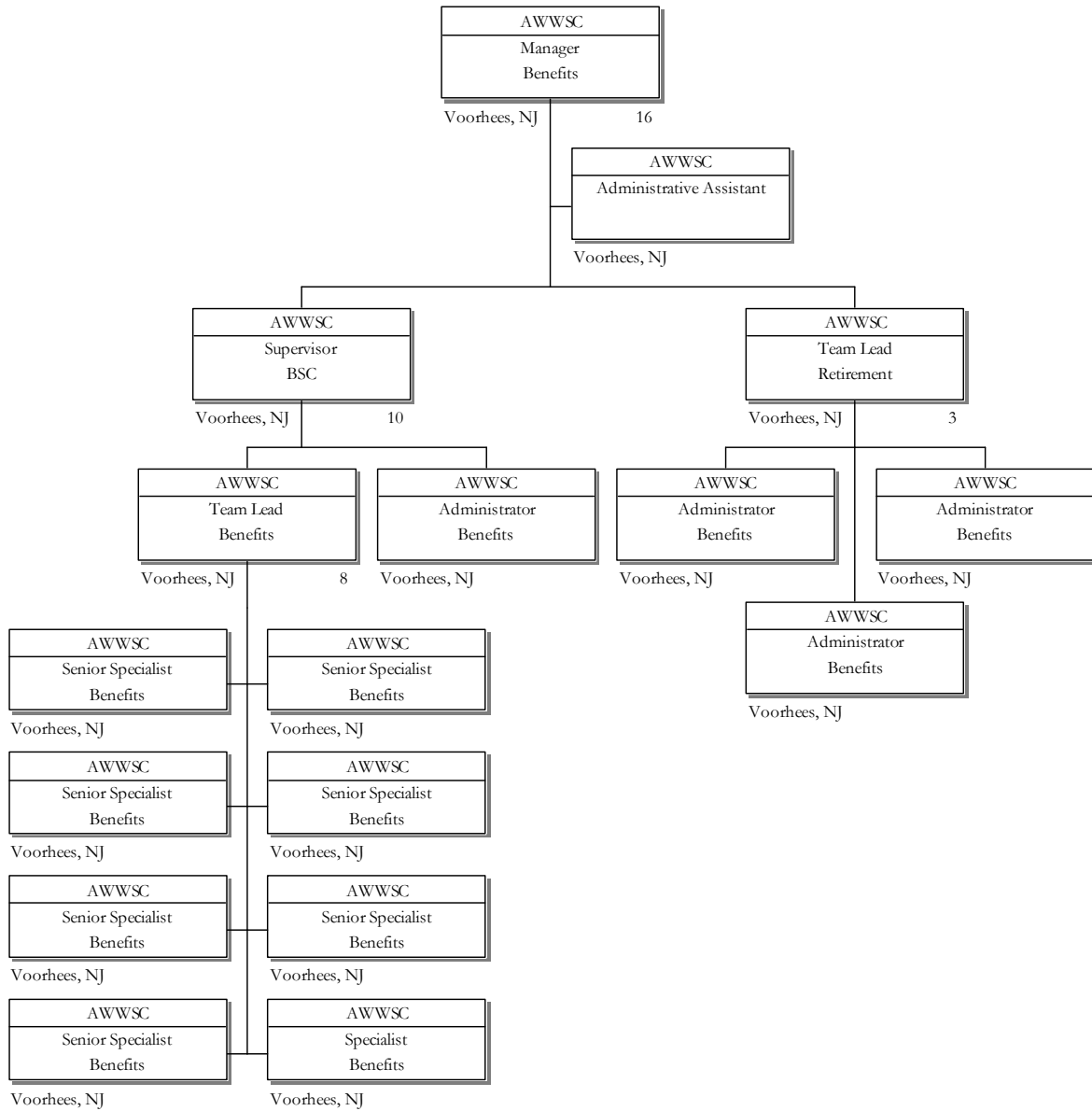


Source: Information Response 1, Interviews 21 and 22, and Company Comments

AWWSC has also set up a Benefits Services Center (BSC) organization to manage benefits across the American Water organization. Employees contact Benefits Specialists at a centralized call center to

receive information, make changes, and otherwise manage their benefits. This organization is described in *Exhibit II-7*.⁷⁹

**Exhibit II-7
AWWSC Benefits Services Center
as of December 31, 2007**

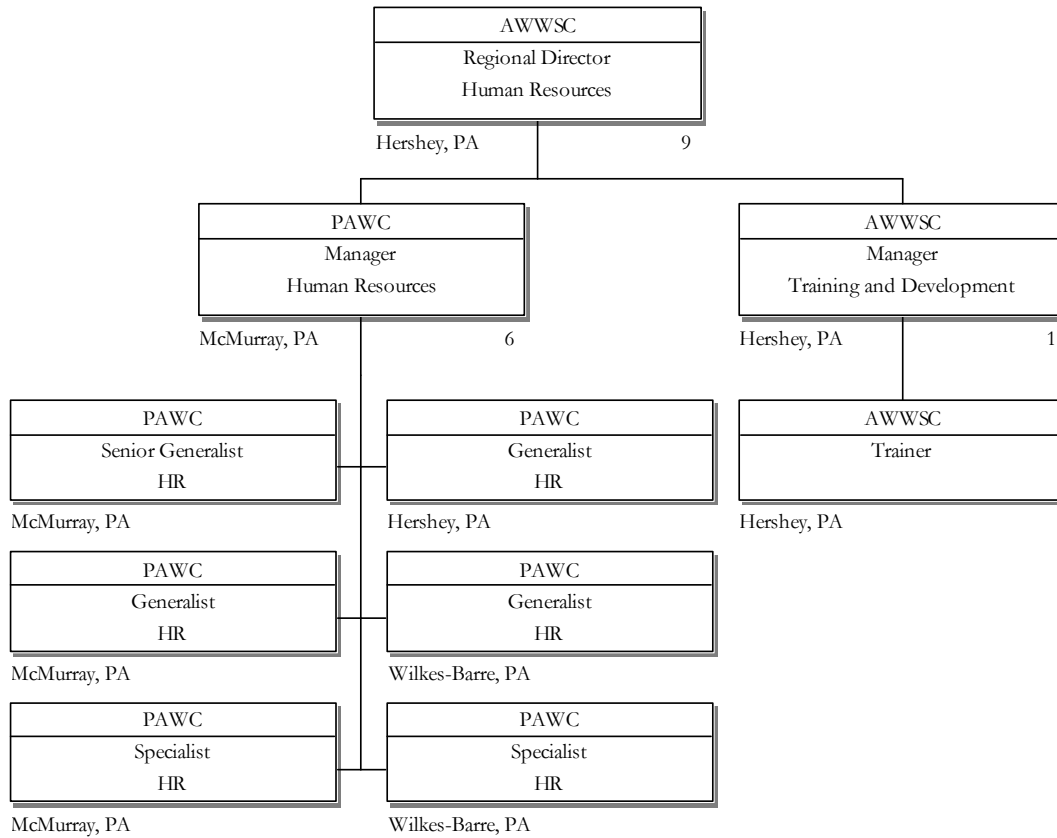


Source: Information Response 257 and Company Comments

AWWSC HR functions provided to Pennsylvania-American Water Company (PAWC) include employee and labor relations, compensation and benefits, HR systems and processes, and organization and talent development.

A small group of HR staff supports PAWC exclusively, as shown in *Exhibit II-8*.⁸⁰ An HR Manager and four HR Generalists serve PAWC’s day-to-day needs and are PAWC employees. These generalists are located in Hershey (1), McMurray (2), and Wilkes-Barre (1). The Manager and HR Generalists have responsibility for Pennsylvania employee and labor relations, staffing, wage/salary administration, legal compliance and policy implementation.⁸¹ There are also two HR Specialists (one in McMurray and one in Wilkes-Barre) who are primarily responsible for leave administration, including Family Medical Leave Act (FMLA) tracking, and who also assist with recruiting and wage/salary administration.⁸²

Exhibit II-8
Pennsylvania-American Water Company Human Resources
as of December 31, 2007



Source: Information Response 433 and Company Comments

HR Technology

JD Edwards World

American Water is using JD Edwards (JDE) as its primary Human Resources Information System (HRIS). The current version in use is JDE World Version 7.3.12. There are no plans to update to a newer release.⁸³ (The current version available is 9.1.⁸⁴) American Water does, however, have plans to

modify the existing software. These modifications are detailed in a business case that has been prepared to support the decision to make them.⁸⁵ *Exhibit II-9* details the objectives of the project.⁸⁶

Exhibit II-9
HR-Process Improvement Objectives
September 11, 2007

High-Level Business Objective 1: Improve JDE Functionality Within the Cum 12 Environment
HR-Related Objectives
Reduce time HR employees spend researching, processing, & reporting HR-related information
Reduce paper-based reporting for HR
Standardize codes to allow for easier, more consistent reporting
Reduce the need for ancillary databases for data analysis
Modify system to adequately prolong the useful life of JDE for HR
Improve the planning process through availability of HR-related data
Improve the timeliness and accuracy of communication to employees regarding changes to their record
Improve data integrity and reduce errors
Time-Entry-Related Objectives
Drive employees' responsibility and accountability for their time and attendance
Reduce time employees spend reporting time (both hours worked and not worked) – potentially through use of exception-based reporting for exempt employees only
Improve integration of Time & Attendance system with Financial system, including automatic tracking of vacation, illness, & holiday, etc. ... time; queries able to be run to access this information and create reports
To the extent possible, eliminate paper-based reporting for Time & Attendance
Eliminate duplicate time entry
High-Level Business Objective 2: Turn on Functionality Previously unused
Turn on Health and Safety module to assure capture of safety issues within the American Water core system
Turn on Workers' Compensation module to assure capture of work-related injury information within the American Water core system and reduce the likelihood of overpayments
Turn on Position Control module to facilitate role-based security and track the history of American Water positions
Turn on Applicant Tracking module to facilitate the importing of new hire data from Peopleclick
Turn on Job Requisition module to assure accuracy of budgeted headcount reporting
Turn on Wage & Salary module to facilitate salary planning and annual increase process
High-Level Business Objective 3: Improve Business Workflows
Implement workflow software to allow for some levels of automated approval routing

Source: Information Response 341

American Water has been using JD Edwards as its enterprise resource planning (ERP) for a number of years. The software, however, is not currently used to its full capability. Functions and screens are either not being used at all or are not being maintained. Turning on the functionality and populating and maintaining certain fields will increase the productivity of Human Resources and the employee

Service Center. In addition, it will streamline existing processes and protocols. The result of these improvements is increased customer and employee satisfaction.⁸⁷

The scope of this project is limited to improvements to the current version of JD Edwards. It includes turning on and populating currently unused modules, reviewing and cleaning up existing data, revising definitions of certain data elements, eliminating certain customization within JD Edwards to allow greater usage of the system's capability, and standardizing HR reporting.⁸⁸

Peopleclick

American Water uses Peopleclick RMS™ to manage the acquisition of employees. This software provides an efficient, cost-effective, and process-driven way to staff the organization. RMS provides employee-recruitment process management, from candidate identification and pre-screening to qualification and selection. Tied to powerful reporting and analytics tools, RMS provides enhanced visibility into diversity goals, recruitment performance, and strategic recruiting objectives.⁸⁹

Time and Attendance

American Water has four different time and attendance systems in use. It considers the system used in Pennsylvania as a model and seeks to broaden its use throughout American Water. This system was developed internally by PAWC.⁹⁰

ExecuTrack

Currently, American Water licenses ExecuTrack. The data for Executrack is used for the talent audit for ML (Management Level) 1 to 4 and some employees in levels 5 to 7, depending on their reporting relationship and potential for advancement. American Water, however, needs to go deeper into the organization to understand its bench strength in order to better plan and execute its business strategy. The first Organizational Capability initiative in 2006 encompassed approximately 300 employees, but American Water currently has the capability to include 400 individuals in ExecuTrack. As the company completes its divestiture, talent management will become increasingly critical. American Water will need to identify existing talent, assess and understand the strengths, and determine where it needs to invest in development.⁹¹

ExecuTrack will provide American Water with the ability to effectively track and report on information regarding employee knowledge, education/certifications, skills, and abilities. As a result, American Water should be able to more effectively manage and develop its talent.⁹² Schumaker & Company see this as a critical need for the company going forward.

Findings & Conclusions

Finding II-8 AWWSC Human Resources has no direct accountability to PAWC.

The PAWC Human Resources Manager and the AWWSC Regional Training and Development Manager serving PAWC report to a Southeast Region Director, who in turn reports to a Senior Vice President for Human Resources in Voorhees.⁹³ Human Resources functions performed by the HR staff assigned to Pennsylvania include employee and labor relations, staffing, wage/salary administration, legal compliance and policy implementation. There are four HR Generalists serving the entire state. These HR Generalists support all HR needs from offices in Hershey, McMurray, and Wilkes-Barre. A large percentage of their time is dedicated to staffing. There are also two HR Specialists (one in McMurray and one in Wilkes-Barre) who are primarily responsible for leave administration, including Family Medical Leave Act (FMLA) tracking, and who also assist with recruiting and wage/salary administration. The Pennsylvania HR Manager is the primary labor negotiator for PAWC collective-bargaining agreements, although the Regional HR Director has negotiated the most recent agreements in the larger bargaining units (Outside Districts, Pittsburgh and Wilkes-Barre/Scranton).⁹⁴

Although the PAWC HR Manager and her HR staff are PAWC employees, they report to the regional HR Director.⁹⁵ The Regional HR Director and the PAWC HR Manager are described as having *dotted-line* reporting relationship to PAWC's President and PAWC management.⁹⁶ However, in the case of the HR Manager, we would expect the opposite.

A regional Training and Development Manager and a Trainer also report to the regional HR Director. The Training and Development Manager is responsible for organization development, change management, and organizational effectiveness. She and the Trainer are focused on training as a component of organizational effectiveness. About 25% of the Training and Development Manager's time is spent on regional HR issues, while the remainder of her time is spent on Pennsylvania. Some time is also spent on American Water HR initiatives with a national focus.⁹⁷

We would agree that training and organizational development resources can be leveraged by the broader American Water organization. As such we would expect this to be a corporate position. Nonetheless, if 75% of the Training and Development Manager's time is spent on PAWC, we wonder if there may be a need for a full-time position in Pennsylvania.

As such, the purpose of the regional HR organization is not entirely clear to Schumaker & Company, although we suspect it makes sense for states where American Water has smaller operations with less regulatory scrutiny. From the perspective of PAWC, the regional HR organization puts important resources at arm's length.

This is not to say that it cannot work. Organizational development and the Regional Director spend a significant portion of their time on PAWC needs. Our concern is one of competing priorities and limited authority of the PAWC President to direct HR resources.

American Water's 2007 reorganization restored the state organization and the PAWC President position. This combined with the size of PAWC, its wide geographic scope, and the unique regulatory environment in which it operates, supports the need for a Human Resource organization that reports to the PAWC President and is aligned to the specific needs of this regulated entity.

Finding II-9 PAWC does not have a service level agreement with AWWSC that specifies the level of HR support to be provided.

Given the limited HR staff assigned to PAWC and the lack of a direct reporting relationship to PAWC management, Schumaker & Company looked for a service level agreement or similar document that would specify standards of performance by AWWSC. PAWC confirms that there is no service level agreement between PAWC and AWWSC.⁹⁸

A service level agreement is an important and, in recent years, commonly used document that defines a certain "level" of service that is to be provided by one organization to another. This agreement is expressed as a set of defined tasks and processes, each party's roles and responsibilities, and associated metrics of performance.

A paragraph in the 1989 AWWSC agreement with PAWC is all that defines the HR services provided by AWWSC. This paragraph reads:

G. Human Resources: Service Company shall assist in obtaining qualified personnel for Water Company; in establishing appropriate rates of pay for those employees; and in negotiating with bargaining units representing Water Company employees. It shall carry out training programs for the development of personnel and advise and assist Water Company regarding personnel. It shall also advise and assist Water Company in regard to group employee insurance, to pension and benefit plans, and in the drafting or revising of those plans when required. It will keep Water Company apprised of all employment laws and develop procedures and controls to assure compliance.⁹⁹

Most companies, in non-regulated industries, operating in a shared-services environment now have service level agreements in place that specify the resources dedicated to a specific unit. They also typically have clear metrics that define the quality and efficiency of the services provided. This type of agreement seems even more essential in a regulated affiliate relationship and, as we have indicated, does not exist for PAWC.

Finding II-10 Human Resources does not have standard metrics and does not make regular reports of its contribution.

Today's top-performing HR organizations measure and regularly report performance metrics. At minimum, these measurements include standard quality metrics related to cost, time, volume, errors, and customer satisfaction. More sophisticated measures are being implemented that relate directly to strategic outcomes and human capital contribution.

We found no such measures at PAWC. While some key indicators exist, such as time to fill on open staffing requisitions, turnover, grievance rates, etc., they are not tracked on a consistent basis nor regularly reported.¹⁰⁰ We reviewed the HR performance measures specified in the Southeast Region Target Agreement.¹⁰¹ Measures identified in this document range from specific and quantifiable, such as “Reduce time to hire by 10% compared to 2006,” to vague goals such as “Create work environment where each employee feels valued for their (*sic*) contributions regardless of individual differences.” Goals such as these are important, but we would expect the measures to be quantifiable.

Activity and HR programs do not, in and of themselves, provide any insight into HR’s effect on business results. We would expect a set of measures that reflect the full contribution of HR to PAWC’s success. These measures should be continuously tracked and periodically reported to executive leadership.

This finding was addressed further as part of our *Phase III* efforts.

Finding II-11 Data integrity problems in the JD Edwards human resources information system makes for additional manual effort, creates opportunity for errors, and limits PAWC HR’s ability to measure its effectiveness.

The lack of measures discussed above is driven in part by the lack of data. This was evident from our earliest interviews with Pennsylvania HR staff.¹⁰² The extent of the problem was better understood in subsequent interviews.¹⁰³ Schumaker & Company did not perform an audit of HR data, but we were told that there is important data that is not captured (such as position control¹⁰⁴), there is inconsistent use of codes (such as location codes¹⁰⁵) and that data from the system must be manually checked (such as the utilization data for the EEO1¹⁰⁶). The data integrity problems were evident to us in our review of the affirmative action utilization data.¹⁰⁷ We heard on more than one occasion, HR staff saying something to the effect of “you just can’t trust anything that comes out of J D Edwards.”¹⁰⁸ A recommendation addressing this finding is included in *Recommendation IX-2 of Chapter IX – Diversity & EEO*.

As part of its Sarbanes-Oxley controls, HR implemented a JDE verification report in 2007, which requires HR to manually verify all new HR changes made in JDE against the source document. This will improve data integrity going forward.¹⁰⁹ Unfortunately, it does not resolve existing data integrity problems and requires additional manual work.

Finding II-12 American Water Works Service Company and regional/local HR have extremely limited training and development capacity to support of the strategic HR needs of PAWC.

AWWSC has not filled (and is not currently seeking to fill¹¹⁰) the corporate Organization Development (OD) Director position. The only person maintaining any responsibility for this work has been reassigned from Corporate OD to be the HR Manager for Corporate Staffs. Consequently, little attention has been paid to supporting the training and organizational development needs of American

Water in general and Pennsylvania in particular. American Water is working on developing a common approach to management/supervisor development. This approach is expected to have common core modules and specific modules to meet local needs.¹¹¹ Although American Water expects to have an explicit strategy for management/supervisory/leadership development in 2008, no one is leading this effort¹¹² and we have not seen any evidence that resources have been dedicated to this project.

In addition, when a company undergoes significant change, such as American Water's divestiture and restructuring, we expect HR to provide a high level of change management support. American Water simply has no capacity to provide this support.

Finding II-13 Pennsylvania training and development is focused on technical training and has not aligned to the broader strategic HR needs of PAWC.

The Pennsylvania Training and Development staff conducted a needs assessment in 2006 that identified three key needs: high-performing teams, communication, and performance management. During a meeting to present these findings and discuss action planning, the regional senior management team determined that "back to basics" technical training was a top strategic priority, and the focus shifted to technical training needs. As a result, HR set up a technical-training task force (18 managers volunteered) and the staff developed the "Basic Water Business" course for new employees, identified job-related curriculum topics for key functions, and coordinated water quality webinars with another region.

The Regional Trainer has also served as an internal resource for the development of safety training as defined by the American Water Learning Council. Although this was a one-time project, the Regional Trainer played a key role in the development and administration of *Arc Flash* training (safety training to help protect employees from an electrical explosion due to a fault condition or short circuit). The Training and Development staff also designed meter-reader training credited with improving the accuracy of meter reading.¹¹³ This training serves as a prototype for training to be offered nationally by American Water.¹¹⁴

By all accounts, these are well-designed training programs that met a well-defined need. Our concern is the prioritization of limited resources on technical and safety training. Safety training generally must conform to state and federal standards and is therefore generic to an industry. As such, it is usually more cost effective to contract with an external vendor for such training. Although the Trainer for PAWC is planning to calculate a return on investment for the *Arc Flash* training,¹¹⁵ it is nearly impossible for this calculation to account for the lost opportunity costs associated with not addressing the strategic needs of the organization.

The training and development staff also designed meter-reader training credited with improving the accuracy of meter reading.¹¹⁶ This training serves as a prototype for training to be offered nationally by American Water.¹¹⁷ Unlike the training courses mentioned previously, this training is not entirely technical training and focuses on the impact of the meter reader role on billing, revenue and customer service that is unique to American Water.¹¹⁸

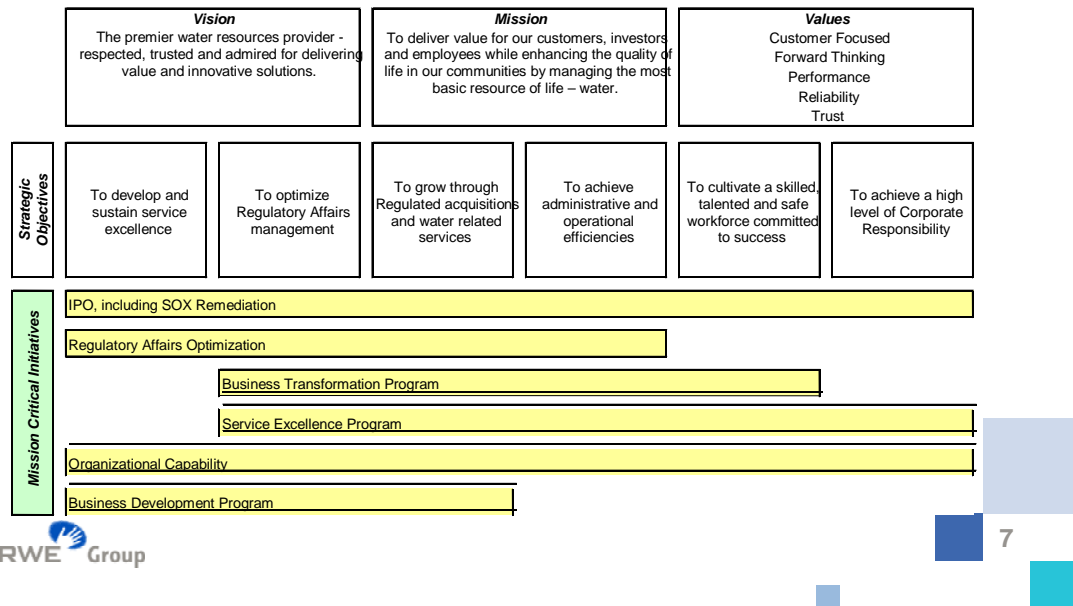
PAWC Training and Development is participating in a national Learning Council. This council was created as a strategic response to American Water’s defined strategic priorities, as illustrated in *Exhibit II-10*. Specifically, it was formed in response to requests from the field for general technical training as well as specialized training for licensure.¹¹⁹

Exhibit II-10
American Water Business Strategy
September 13, 2007



Strategy

American Water has identified its strategic objectives and will undertake several mission critical initiatives to implement its strategy through tactical plans



Source: Information Response 424

The Learning Council’s mission is to develop and maintain a prepared and productive workforce that aligns with American Water’s strategic goals.¹²⁰ The specific 2007 goals of the Learning Council are:

- Align and leverage current and emerging programs. Specific objectives include:¹²¹
 - Ensure inventory of current technical-training programs
 - Evaluate current curricula as to strategic relevance & quality
 - Use systematic instructional-design guidelines for new programs (International Association for Continuing Education & Training (IACET) standards)
 - Effectively share knowledge across the company

2. Provide implementation guidance for approved best operating practices. This goal includes change management, communications, and systematic instructional-design standards according to IACET.
3. Strengthen the Learning Council infrastructure. This goal includes stakeholder representation, member orientation, grant funding, and internal communication.
4. Develop and manage databases. These goals include the implementation of a Lotus Notes curriculum database and wider utilization of a compliance learning-management database.¹²²

We agree that this work is important and supports a strategic need for a skilled, talented, and safe workforce. Our concern is that this appears to be the primary focus of PAWC training and organization development activities.

We are also concerned that these initiatives address national needs and that PAWC resources play a substantial role in addressing these needs. If the need exists across the American Water enterprise, this again seems like a corporate role and that resources dedicated to PAWC should focus on the needs of the state organization.

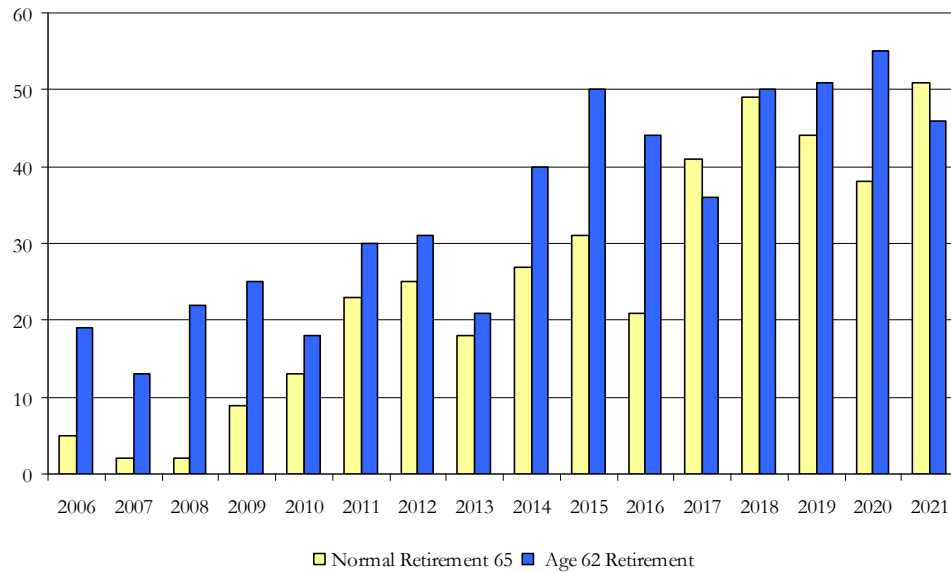
The President of PAWC has identified the need for culture change, a rededication to customer service, stronger connection to external stakeholders, and leadership development as strategic priorities.¹²³ However, these goals are not currently the priorities of the Training and Development staff and have not received much attention from AWWSC HR. In fact, the one person in AWWSC HR who maintains any organizational-development responsibilities agrees that PAWC Training and Development is heavily involved in technical training and is not focused on other strategic issues. In fact, he was the first to suggest that Pennsylvania Training and Development should formulate strategies based on PAWC strategic priorities.¹²⁴

This finding was addressed further as part of our *Phase III* efforts.

Finding II-14 PAWC's Human Resources and executive management have recognized the loss of human capital and the potential for a large number of retirements in coming years but has not developed a plan to respond to these needs.

PAWC's Human Resources has performed an analysis of employees who are eligible for retirement in the coming years. PAWC expects most eligible employees to retire at 62 years of age and calculates that 23% of its employees will retire by 2014¹²⁵ and 48% by 2021.¹²⁶ This estimate combined with regular attrition presents a *major* challenge to the company—one which the company has described as a “massive loss of institutional knowledge”¹²⁷ and was described by one HR Manager as “horrifying.”¹²⁸ *Exhibit II-11* provides a yearly analysis of employees who are eligible for retirement.¹²⁹

Exhibit II-11
Retirement Forecast Thru 2021
Normal and Early Retirement



Source: Information Response 440

It should be noted that “eligible to retire” does not necessarily mean “will retire.” The decision to retire reflects a complex and often uniquely individual set of variables. Retirement income and healthcare benefits are often weighed against work satisfaction, lifestyle goals, health condition, and other factors. PAWC simply has not gone further to analyze the retirement intentions of eligible employees.

In 2006, the Regional Human Resources Director prepared a document describing the problem and outlining possible responses.¹³⁰ This document further detailed the scope of the problem faced by the company:

- ◆ Inability to provide service to customers as required by regulators
- ◆ Lack of growth due to inability to support new customers
- ◆ Inability to comply with mandated maintenance and quality standards
- ◆ Work/life balance problems, leading to poor morale and retention issues
- ◆ Inability to perform capital work required to upgrade and maintain infrastructure
- ◆ Loss of reputation, as a reliable business and an employer
- ◆ Increased costs to attract and retain staff in a tight labor market

While the document lays out a number of possible strategies, it does not provide a specific recommendation nor does it include any implementation timetable. In addition, the document focuses on retention and workforce replenishment, suggesting that the workforce of the future will be much the same as the current workforce. Little consideration is given to changing needs of the organization and the potential for redesigned jobs.

The 2007 Target Agreement for the Southeast Region specifies: “Implement recommended actions from ‘Workforce Replenishment Document created in 2006’ as a Target Measure”.¹³¹ In fact, no implementation plan was created. A planned pilot project in western Pennsylvania was not implemented.¹³²

Finally, at the risk of pointing out the obvious, a goal is not a measure. We would expect to see specific retention, hiring, employee engagement, and training measures that demonstrate the effectiveness of the strategy.

This finding was addressed further as part of our *Phase III* efforts.

Finding II-15 PAWC does not have effective position control.

Position control is the accurate accounting of authorized positions and the number of individuals in a given classification. It is essential for workforce planning, budget control, and employment-law compliance. We would expect this control to be in place in the Human Resources Information System; however, the acting Vice President for Human Resources indicated that the function in the JD Edwards HRIS system does not work.¹³³

Requisition control is accomplished through Peopleclick, a staffing management software program. Use of this software allows the company to track all open positions, but it does not provide information on active employees nor can it tell the number of authorized positions versus actual number of positions filled. The company attempts to do a monthly reconciliation between Peopleclick and Hyperion (business-performance reporting system). The HR-Process improvement project does include implementation of the JDE Position Control Module¹³⁴ but the status of this project is unclear.

Workforce planning is done primarily through the budgeting process. Each manager requests a headcount based on historical requests and planned work.¹³⁵ But when Schumaker & Company asked for staffing data as part of the review of water operations, we were referred to the Affirmative Action utilization report.¹³⁶ We would expect the company to be able to produce a position-control report that is independent of the Affirmative Action plan (and we would expect the Affirmative Action data to be validated against the position-control data). In addition, we discuss in Chapter X (provide title of Chapter as well) the problems associated with this report.

Given all of this, we are not confident that the company has the ability to comprehensively analyze its workforce and its future needs. When Schumaker & Company requested a status update on the HR process improvement project and specifically the position control module in JDE, we were told that the project is now in the planning phase. No further details or timetable was provided.¹³⁷

Finding II-16 A lack of reliable information on employee capabilities (bench strength) hinders PAWC's ability to respond effectively to current demands and plan for future growth.

During Spring/Summer 2006, American Water conducted an Organizational Capability Review (OCR). The objectives of this effort were to:¹³⁸

- ◆ Identify internal talent to meet our current and future strategic business objectives
- ◆ Calibrate leadership capability and bench strength
- ◆ Identify and develop potential leadership talent for key roles
- ◆ Execute action plans to close succession and competency gaps

The process consisted of a series of group capability-review sessions held at both the regional and corporate levels to review the top four layers of leadership (based on reporting relationship – President of PAWC and next one or two levels – a total of about 300 people for all of American Water).¹³⁹ It also included a discussion of key business issues, the identification of potential succession candidates for key roles, and development actions to continue building a strong talent pipeline within the business. As part of the OCR, candidates were reviewed according to both their past performance and their assessed leadership potential. They were then identified for possible leadership positions in one of three timeframes: Ready Now (0–12 months); Ready in 1–2 Years; or Ready in 3–5 Years.¹⁴⁰

As a result of this process, the company reported, “Not surprisingly, given the 2004 reorganization, turnover, and subsequent high number of new hires to the organization, the bench strength in most functional areas is quite thin.”¹⁴¹

We found a specific example of the effects of this limited talent assessment in the business case for ExecuTrack software:

“As an additional benefit, ExecuTrack will assist us in addressing our business needs, specifically in the areas of talent identification, tracking, and performance management. For example, American Water had some successes as well as some unsuccessful bids that were tendered in 2005. We can directly attribute the loss of some potential work in the Southeast Region to our inability to effectively identify talent to be assigned to those projects. What separated us from the successful bidders was their ability to identify up front the individuals within their organizations they were proposing be assigned to the projects (based on specific skills/education/license requirements, and work experience). They were then able to include these individuals in the presentation/selling process. Due to our lack of information, we were not able to compete on this level. The impact on operating revenue (before taxes) for the five (5) years of the proposed contracts that were lost was in excess of \$3.6 million. Based on this example, going forward, it will be even more crucial for American Water to effectively assign resources to projects and potential business acquisitions and to be able to do it in a streamlined and efficient manner.”

American Water had planned to conduct the OCR assessment further down in the organization in 2007.¹⁴² It appears this aim was not accomplished. More specific to this audit, there is no OCR for PAWC and we believe that this review is critical given the PAWC's future direction.

Finding II-17 PAWC has not met its goal to reduce time-to-hire by 10%.

PAWC Human Resources set a measurable target for 2007 to reduce time-to-hire by 10% compared to 2006.¹⁴³ In 2006, the average time to fill a requisition was 63 days.¹⁴⁴ A 10% reduction would, therefore, put the 2007 target at 57 days but the company was only able to reduce the average number of days to 60. *Exhibit II-12* provides the number of requisitions and the average time to fill for the last two years.¹⁴⁵

Exhibit II-12
Pennsylvania-American Water Company Staffing Requisitions and Average Time to Fill
2003 to 2007 (through February 2007)

Year	Number of Staffing Requisitions	Average Time To Fill
2003	Not available	Not available
2004	Not available	Not available
2005	88 (Western PA only)	25 (Western PA only)
2006	173 (PA)	63 (PA)
2007	206 (PA)	60 (PA)

Source: Information Responses 272, 273, and 849

The data for 2007 suggests that PAWC is not meeting its goal. We also note that PAWC had trouble producing these figures and required corrections to their original submissions. Our concern is that workforce availability is critical to utility performance. This key HR performance indicator should be tracked and reported regularly. In addition, workforce replenishment has been identified by PAWC as a critical challenge. As such, we would expect to see an effort to improve performance in this area.

Finding II-18 PAWC uses a time and attendance system with limited functionality that was developed in-house

Currently, PAWC uses a combination of systems to track time and attendance. The company makes some use of the JDE time and attendance module but relies primarily on the homegrown system. The company also does a significant amount of manual tracking, which results in significant paperwork.¹⁴⁶ As we reported earlier, there is an HR Specialist for Pennsylvania who is primarily responsible for leave administration, including the manual tracking.¹⁴⁷

The time and attendance system can produce the following five reports:¹⁴⁸

1. Pay-periods-processed listing
2. HR-interface detail transaction listing
3. HR-interface error report
4. Payroll batch-file processing
5. HR-interface totals-transaction listing

We find this reporting capability to be of limited functionality. A more sophisticated time and attendance system would support leave administration and absence management and would provide reports useful to workforce planning.

In addition, this system is not a commercially supported one. Therefore, the risk of failure is greater and it will not have regular updates that are common with a modern system provided and supported by a third party.

AWWSC recognizes that using different systems in different places is a problem for the company and would like to move to a common platform. Unfortunately, this plan does not involve moving to a vendor supported system with sophisticated functionality. The company does not have a specific plan to modify or upgrade the Pennsylvania time and attendance system. Rather, they are looking to create a single time reporting system for all American Water that incorporates the best of the four systems currently in use. In February 2008, the company reports that the project, subject to approvals, is most likely to occur sometime in the 24 to 36 month timeframe.¹⁴⁹

We understand that time and attendance systems are expensive and can be difficult to implement. Clearly, American Water has chosen to save costs by using an existing system. We also note that American Water, time and attendance, as well as payroll, are owned by the Finance/Shared Services function, not the Human Resources function. Nonetheless, HR depends on the time and attendance system to support absence management and leave administration. In addition, it bears the cost of HR specialists whose primary role is leave administration and performs manual tracking of leaves that could be done by a modern time and attendance system. As such, we would expect HR to take a lead role in moving the company to a better system.

Finding II-19 American Water/PAWC does not have a formal management development process.

This finding repeats, to some degree, *Finding VII-4* in *Chapter VII - Corporate Culture, Management Structure, and Staffing Levels*, but we believe it is important to reiterate it here as it relates to other findings in this chapter. Given the growth goals of PAWC, the limited bench strength of management (*Finding II-16*), the threat of significant retirements and the corresponding loss of institutional knowledge (*Finding II-14*), and the technical training focus of PAWC Training and Organization Development Staff (*Finding II-13*), we see a significant unmet need to develop PAWC's leadership capabilities. Unfortunately, PAWC has no formal management or leadership-development process¹⁵⁰ nor does it have a plan to implement a

management/leadership-development program¹⁵¹ (although it does appear to recognize the need for one).¹⁵²

Finding II-20 PAWC does not have a learning management system.

PAWC HR does not have comprehensive data on employee training, training needs, certifications, licenses and other key data related to performance management and workforce planning.¹⁵³

Modern learning management systems provide a comprehensive database for learning records, competencies, certifications and related data. They provide sophisticated reporting training administration tools. These include course scheduling, employee self registration, manager access to employee records and training evaluation data. Increasingly, these systems also provide a platform for on-line learning. Some even integrate with performance management systems (work planning and evaluation).¹⁵⁴

Schumaker & Company believes that the high level of training needs and the limited training and development staff of PAWC argues strongly for such a system.

Recommendations

Recommendation II-4 Strengthen HR accountability to the PAWC President. (Refer to Finding II-8.)

The appointment of PAWC President signals the need for an organization that is fully responsive to the business needs and regulatory requirements of this organizational unit of American Water. Meeting the strategic objectives of Pennsylvania-American Water Company will require substantial HR support. We have made the point that HR leadership is aligned to regional and national priorities, perhaps giving less attention to Pennsylvania-specific needs.

At minimum, this would involve implementing a service level agreement (*Recommendation II-6*) and a HR scorecard (*Recommendation II-7*). In addition, the HR Director serving Pennsylvania should be evaluated, at least in part, by the PAWC President. Consideration should also be given to appointing a HR Director for Pennsylvania. PAWC is large enough to warrant an HR Director who is directly accountable to the PAWC President, with an indirect relationship to AWWSC HR and without regional responsibilities.

Recommendation II-5 Assess PAWC's HR needs and staff accordingly. (Refer to Finding II-8 and Finding II-10.)

Schumaker & Company is not able to determine whether there is sufficient HR staff to adequately serve the needs of the PAWC. Standard ratios cannot be applied. In the absence of a service level agreement,

we do not know the full-time equivalent (FTE) of the HR support PAWC receives from AWWSC; however, we have pointed to a number of factors that suggest HR is not fully meeting the needs of PAWC. We have identified unmet goals from the HR Target Agreement including such key goals as implementing workforce replenishment strategies, implementing the corporate diversity initiative, reducing time to hire, and increasing diversity hires. We have also identified the need for leadership development and the fact that Pennsylvania Training and Development staff have been largely focused on technical training.

As such, we recommend the PAWC clearly identify HR priorities and assess the capacity of the current HR organization to meet its needs. Where gaps exist, we believe additional resources should be provided to the function.

Recommendation II-6 Develop an HR service level agreement with AWWSC. (Refer to Finding II-9.)

AWWSC is a shared service provider to American Water affiliates (although the term is used only to describe financial services in this company). PAWC should have a specific agreement as is standard in shared services environments. The agreement should specify the services provided and the standards associated with the service. These standards should specify volume, time, and condition (quality) of service. Performance should be reported regularly and the agreement should be modified periodically.

Recommendation II-7 Develop a Pennsylvania-specific HR scorecard. (Refer to Finding II-10.)

It is an obvious follow-on to a service level agreement (SLA) that there be a standard set of metrics related to the standards in the SLA. We believe that the HR scorecard should include these metrics as part of a larger report on HR's contribution to PAWC. Consistent with the standard balanced-scorecard approach, we would expect to see measures that reflect the strategic, operational, financial, and customer (both PAWC management and employees) perspectives.

Recommendation II-8 Align HR services to the strategic priorities of PAWC. (Refer to Finding II-8 and Finding II-12.)

Human Resources in general and Training and Development in particular must align their efforts to the strategic objectives of PAWC. This aim requires a clear statement of the strategic priorities and a detailed plan from HR, with timelines and metrics, which spells out HR support.

Recommendation II-9 Consider outsourcing technical training. (Refer to Finding II-13.)

Designing and implementing technical training is not the highest and best use of the limited Training and Organizational Development staff. External vendors generally have standardized approaches and leverage higher volume to provided cost effective services. HR can provide strategic and administrative



support to the employee development (including technical training) but operations should own, manage and fund this need.

Recommendation II-10 Implement a learning management system. (Refer to Finding II-20)

Perhaps the most critical support that HR can provide related to employee development is a system to manage this function. Modern learning management systems streamline training administration and also provide a comprehensive data base of employee learning, competencies, licenses, certifications and related data. This data will not only support employee development, it will also support workforce planning, regulatory compliance and the staffing process. Such a system could also support a move to on-line learning where appropriate.

Recommendation II-11 Conduct comprehensive workforce planning for all levels of the organization and provide necessary resources for implementation. (Refer to Finding II-12 and Exhibit II-12.)

Given the long-term implications of retirement and normal attrition at PAWC, it is obvious that an action plan is needed. This plan should be more than a recruitment plan to replenish existing positions. PAWC needs to assess what competencies will be needed in the future. This is an opportunity to work with the union to redesign jobs for increased efficiency. In addition, the workforce plan should dovetail with the company's diversity initiative.

This plan should also address management succession planning at all levels. Again, the approach should be larger than a replenishment strategy but should also look to the leadership competencies that are necessary to fully engage the workforce, support a high-performing culture, and develop the leadership capacity of others.

While the loss of institutional knowledge is a challenge the company must face, the significant turnover in the coming years presents an enormous opportunity to change the corporate culture and develop a workforce that is fully capable of meeting the needs of PAWC and its customers.

The workforce planning process and associated strategies for addressing the future needs of the organization will require additional resources. The development of a comprehensive work plan should identify needed resources and form the basis for a business case for funding.

Recommendation II-12 Complete the Organizational Capability Review for all levels of PAWC management. (Refer to Finding II-16.)

Given the strategic priorities of PAWC, it is essential that HR complete an Organizational Capability Review for Pennsylvania and integrate into the performance management process. The process used for American Water's top 300 appears to be effective and should be applied to PAWC.

Recommendation II-13 Implement a leadership-development program and provide sufficient resources to sustain. (Refer to Finding II-19 .)

Given the strategic priority for leadership development, it seems obvious that this priority become the focus of the Training and Development group within Human Resources. This goal means finding other resources to meet the technical and safety-training needs of PAWC. Although we recognize the need for American Water to have a consistent philosophy and approach to leadership development across the enterprise, we are concerned that it will provide neither sufficient resources nor move with due haste. Whether Pennsylvania is a model for the rest of the organization or part of a company-wide initiative, we believe that PAWC will need additional training resources to implement an effective program.

Recommendation II-14 Implement position control. (Refer to Finding II-15)

As described in Finding 8, this essential control tool is critical for workforce planning. Schumaker & Company also made note that this endeavor is included in the HR-Process Improvement Project and reiterate the importance on implementing this aspect of the project.

Recommendation II-15 Evaluate the costs and benefits associated with a more sophisticated time and attendance system. (Refer to Finding II-18.)

Schumaker & Company has identified a number of risks associated with the current time and attendance system. American Water should conduct a risk assessment of the decision to continue with (and expand the use of) a homegrown system. Schumaker & Company believes a cost/benefit analysis of available systems would likely support a decision to replace the current system. While HR does not have sole responsibility for this system, we expect them to play a key role in defining the needs of a new system and to gain substantial efficiencies from its implementation.

Recommendation II-16 Analyze recruitment and selection process, implement process improvements, measure performance, and provide additional resources if necessary. (Refer to Finding II-16 and Finding II-17.)

The root cause of the current length of the time it takes to fill a position is not entirely clear. Given the anticipated turnover at PAWC, Schumaker & Company knows this function will continue to experience high demand. Schumaker & Company recommends a complete process analysis to determine whether there are ways to make the process more efficient. In addition, Schumaker & Company recommends a complete set of metrics be identified, tracked, and reported in order to monitor the staffing function's efficiency and effectiveness. Finally, Schumaker & Company would expect the workforce plan to predict hiring needs in the coming years and provide a firm basis for determining whether additional HR staff is required.

III. Financial Management

This chapter provides a review of the financial management services provided to Pennsylvania-American Water Company (PAWC).

A. Background & Perspective

Financial services support to PAWC is provided by American Water corporate department personnel (part of American Water Works Service Company or AWWSC) reporting to American Water's Senior Vice President (SVP)/Chief Financial Officer (CFO), who reports directly to the American Water Chief Executive Officer (CEO) & President. There are 469 staff (as of October 2007) reporting to the CFO in eight departments: 1) Regional Finance, 2) Internal Audit, 3) Investor Relations, 4) Information Technology Services (ITS), 5) Treasurer, 6) Controller, 7) Planning & Reporting, and 8) American Water Enterprises (AWE) Finance.¹⁵⁵ The Regional Finance departments are headed by Directors, while the other financial departments are headed by Vice Presidents, although all of the department heads have the same pay scale and grade. All of these departments, except for ITS and AWE, are reviewed in this chapter. The ITS Department is reviewed in *Chapter IV – Support Services*. The AWE Finance Department is not reviewed as part of this audit because AWE is a non-regulated entity and the AWE Finance Department does not provide services on behalf of PAWC.

The Regional Finance Directors are physically located within the five regional operations they support (Southeast Region, Northeast Region, Central Region, West Region, and AWE) in a matrix configuration. PAWC is in the Southeast Region, headquartered in Hershey, PA. The Regional Finance Directors support the Division Executive Vice Presidents (EVPs) for their respective division (Southeast Region is in the Eastern Division) and the State Presidents in their region, but they have a direct-line reporting responsibility to the CFO of American Water.¹⁵⁶ The Regional Finance Director for the Southeast Region is located in Hershey, along with four financial departments: Rates & Regulations; Performance, Planning, & Reporting; Controls & Compliance, and Project Finance. The other American Water financial departments are located either at American Water corporate headquarters in Voorhees, NJ, or at the Shared Services Center (SSC) in Cherry Hill, NJ.¹⁵⁷

Exhibit 0-1 presents AWWSC financial organizations that support PAWC operations, along with a brief description of the functions they perform and the size of the staffs performing them.¹⁵⁸



Exhibit III-1
AWWSC Financial Functions
as December 31, 2007
Page 1 of 2

Organizational Unit	Financial Functions	Staffing
SVP & CFO		
Regional Finance Director-Southeast Region		2 (includes 1 support staff)
Rates and Regulations	Support rate-making efforts for three states, including Pennsylvania. ¹⁵⁹ There are six other Rates staff members in West Virginia supporting the other three states in the Southeast	5 (for the 3 states) with 11 for total SE Region
Performance, Planning, & Reporting	Coordinate development of five-year plan and annual budget Monthly analysis and reporting of actual results compared to budget Develop quarterly reforecast of budget ¹⁶⁰ Financial support for Business Development initiatives (one position that reports to the Director)	6 in Hershey 2 positions in other locations, plus 3 vacant positions
Controls & Compliance	Helps develop, manage, and monitor key controls for the financial functions in the Southeast Region ¹⁶¹	1 (plus 3 vacant positions)
VP, Internal Audit		1
Internal Audit	Internal audits of PAWC and the other state operations and corporate functions ¹⁶²	6
VP, Investor Relations		1
Investor Relations	Planning, coordination, and communication required to be ready for American Water to go public ¹⁶³	1
VP, Shared Financial Services		1
Accounting	General ledger accounting and financial reporting for PA and the other states in the Southeast Region	10
Financial Services – Rates, Fixed Assets, and Cash Management	Back-office support for rate case filings for all state operations ¹⁶⁴ Controlling, managing, and reporting on fixed assets for all of the state operations ¹⁶⁵ Day-to-day cash management and reporting for all of the regulated state operations ¹⁶⁶	48
Financial Services – Accounts Payable, Employee Services (Payroll), and General Tax	Process all accounts payable, payroll, and general tax transactions for all regulated state water companies ¹⁶⁷	67
Support Services	Provides project management and systems liaison to Shared Services Center	8

Source: Interviews 65, 70, 74, 77, 124, 125, 126, 128, 129, 131, 132, 133, 134, 135, 136, 137, 138, 141, 142, and 157, plus Information Responses 1 and 532

**Exhibit III-1
AWWSC Financial Functions
as of December 31 2007
Page 2 of 2**

VP & Treasurer		1
Assistant Treasurer, Capital Markets, & Cash Management	Coordination and liaison with credit-rating agencies and bankers, and cash management accounting ¹⁶⁸	5
Risk Management	Covered in another chapter in this report	1
Financial Evaluation, Benefits	Management of pension benefit plans and trusts and capitalization analysis ¹⁶⁹	1
Treasury Planning & Reporting	Debt management, analysis, and reporting ¹⁷⁰	1
VP & Controller		1
Income Tax	Federal and state income tax analysis, accounting, and reporting ¹⁷¹	12 plus 4 vacant
Corporate Accounting	General ledger consolidation and corporate accounting ¹⁷²	8
Internal Controls	Development, management, and testing internal controls ¹⁷³	6
VP, Planning & Reporting		1
Financial Modeling & Evaluation	Financial planning, modeling, and capital investment evaluation ¹⁷⁴	3 plus 1 vacant
Business Performance Reporting	Financial and performance reporting for state, region	4 4
	Service Company financial planning and analysis.	
	Total	213 plus 11 vacant

Source: Interviews 65, 66, 70, 74, 77, 124, 125, 126, 128, 129, 131, 132, 133, 134, 135, 136, 137, 138, 141, 142, and 157, plus Information Responses 1 and 532

All of these staff, with the exception of the Regional Finance Director (Southeast Region) and Accounting (Southeast Region) perform financial functions for all regions. The number of financial staff for all the regional positions is roughly comparable. Staff in other regions (Northeast, Central, Western) support their region/division, as does other Regional General Accounting support.

This *Background & Perspective* section is further divided into four segments:

- ◆ Financial Requirements Planning and Cash Management
- ◆ Managerial Reporting, Accounting, and Controls
- ◆ Budget Management, Reporting, and Control
- ◆ Internal Auditing



Financial Requirements Planning and Cash Management

Financial requirements planning and cash-related services for PAWC are the responsibility of several different American Water corporate financial departments, all of which report to American Water’s SVP & CFO. Financial requirements and the monitoring of all funds are the responsibility of the Treasury Department, while cash accounting is managed and reconciled by the Cash Management group in the Shared Services Center.¹⁷⁵ This hierarchy is true for all of the state-regulated operations, including Pennsylvania. Actual customer billing and collection is the responsibility of the Customer Relations Department, which is reviewed in *Chapter X – Customer Service*.¹⁷⁶

Cash Management

Cash from customer payments enter the American Water system through PAWC’s lockbox accounts at Mellon Bank. Prior to 2008, Deutsch Bank also provided lockbox services (for state operations other than PAWC). Additional customer payments are collected through third-party collection sites at grocery stores and other similar retail establishments.¹⁷⁷ All available funds are swept from this account on a daily basis into a common American Water account. The average daily balance for PAWC’s Mellon Bank lockbox account for the past five years has been approximately \$900,000. The average daily balance for 2003 to 2007 is shown on *Exhibit III-2*.¹⁷⁸

Exhibit III-2
PAWC Mellon Lockbox Account
Daily Balances 2003 to 2007

Date	Average Daily Balance
2003	\$658,054
2004	\$873,748
2005	\$1,021,584
2006	\$958,824
2007	\$997,993
Total	\$902,040

Source: Information Response 38

Incoming cash in this cash account is reconciled by the Shared Services Cash Management group and is monitored by the Treasury Department. Reconciliation includes matching total cash received (according to Mellon Bank) to the total credited to customer accounts. Cash Management has a goal of reconciling these amounts within two days and is almost always able to do so within this timeframe. Effective January, 2008, Mellon Bank started providing check imaging for the PAWC lockbox. This imaging process allows American Water to research customer payment inquiries on a real-time basis through Mellon’s website rather than having to request copies of checks or payment stubs.¹⁷⁹ Cash Management’s metrics are measured and reported in the Shared Services Center results, along with the other financial Shared Services departments. As an example of the metrics used by American Water,

several of Cash Management’s metrics from June 2006 (not all of these specific performance metrics were tracked prior to June 2006)¹⁸⁰ through September 2007 are shown in *Exhibit III-3*.¹⁸¹

Exhibit III-3
Example of SSC Cash Management Metrics
June 2006 through September 2007

Cash Management Functions	2006									2007								
	Target	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
Cash Collections																		
Processed in one day (100%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Cash Disbursements																		
# of errors in payments - ACH & wire transfers	0	3	2	2	2	1	5	2	3	2	2	2	2	1	1	1	2	
Late payments to municipalities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
NSF check turn-over rate - 2 days	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
# of accurate ACH payments & wire transfers	n/a	1750	1789	1515	1156	865	1673	2032	1004	442	527	472	562	637	2197	2551	2037	
Reconciliations																		
# of accounts beyond policy	0	0	7	4	4	3	3	1	0	0	0	3	0	0	4	4	19	
Unrecorded items > 2 months	0	34	72	47	13	13	5	1	0	0	3	28	74	0	4	4	3	
Unreconciled items > 10% of account balance and > \$10,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
Accounts reconciled	160	136	136	136	136	157	157	159	160	160	160	185	151	175	170	173	153	

Source: Information Response 553

This exhibit is presented as an example of the kind of metrics that are kept in the Cash Management area. It indicates that over this 16-month period, performance was very consistent, targets were generally met, and performance improved in 2007 over 2006.

Additional analysis is performed on all accounts requiring reconciliation and is summarized in a Reconciliation (Recon) Summary, a monthly report that displays a count of successful reconciliations compared to all accounts that required reconciliation. Zero balance accounts do not require reconciliation. A sample taken from the August 2007 Recon Summary is shown in *Exhibit III-4*.¹⁸²

**Exhibit III-4
Cash Management
Sample Excerpt from Reconciliation Summary
for Month ended August 2007**

Function	Description	Count	Count %	Regional Counts				Explanation
				CE	NE	SE	WE	
All Functions	Total accounts	10,806	100.00%	3,047	1,989	2,903	2,867	
	Zero balance accounts	837	7.75%	184	251	208	194	
	Accounts requiring reconciliation	9,969	92.25%	2,863	1,738	2,695	2,673	
	Reconciliation completed	8,996		2,622	1,504	2,421	2,449	
	% completed	90.24%		91.58%	86.54%	89.83%	91.62%	
Cash	Total accounts	172	100.00%	36	67	43	26	“Expense less than \$1,000. Due to reconciling items > 60 days.
	Reconciliation completed	153	88.95%	36	52	39	26	
	Reconciliation not completed	19	11.05%	0	15	4	0	

Source: Information Response 531

This exhibit shows that, in reconciling accounts, the Southeast Region is slightly behind the total account reconciliation for all the regions (89.83% compared to 90.24%) but slightly ahead in reconciliation of cash accounts ($39/43 = 90.7\%$ compared to 88.95%).

Cash disbursements for PAWC are the responsibility of the Cash Management group in the Shared Services Center, the same group that is responsible for reconciling accounts and incoming cash. This work group performs the same cash management function for all the American Water regulated companies.¹⁸³ Cash disbursements for all regulated companies are made from one disbursement account in PNC Bank, which serves as the cash concentration and disbursement bank for all the other American Water regulated water utilities. The SSC Cash Management group manages this process and monitors all disbursement activities.

Financial Requirements Planning

The American Water subsidiary that serves as an internal bank for all the regulated operations is American Water Capital Corporation (AWCC). The AWCC acts as an internal bank, providing cash as needed to the regulated operating companies and receiving excess cash from operating companies as an investment. PAWC and the other regulated subsidiaries borrow from, and loan money to, the AWCC at the same rate. Borrowing and lending terms and rates for PAWC and the other regulated operating companies are controlled by the AWCC service agreement in place since June 15, 2000,¹⁸⁴ which governs

transactions between regulated companies, American Water Works Company (American Water's parent company), American Water Works Service Company, and AWCC.¹⁸⁵ The regulated water companies can go outside the American Water family to borrow funds when the rates are lower than what can be received by borrowing internally.¹⁸⁶ For example, PAWC has borrowed locally from the Commonwealth of Pennsylvania, which offers water facility loans through the Pennsylvania Infrastructure Investment Authority (PennVest loans). These low-interest loans are available to pay for design, engineering, and construction of publicly and privately owned drinking-water distribution systems. Terms depend on the useful life of the asset being financed. At June 30, 2007, approximately 4% of PAWC's long-term debt of \$887 million was PennVest loans.¹⁸⁷

The Treasury Department monitors the cash balances of all the state operations to ensure that adequate cash is available for all operations. The Treasury Department also monitors the daily cash position of the corporation as well as each of the operating companies. This corporate department receives real-time transaction and cash-balance reports from PNC bank. A treasury workstation system hosted by an application service provider (ASP) is used to assist in this function. Treasury workstations are used for the following cash and liquidity management functions:¹⁸⁸

- ◆ Long-term debt management
- ◆ Short-term debt management
- ◆ Inter-company debt management
- ◆ In-house bank management
- ◆ Consolidation account
- ◆ Banking reconciliation
- ◆ Limited general ledger posting
- ◆ Limited financial reporting
- ◆ Purchase price variance reporting

Additional functions offered through the treasury workstations that American Water is considering include:¹⁸⁹

- ◆ Enhanced general ledger posting
- ◆ Daily cash positioning
- ◆ Cash forecasting
- ◆ ACH/wire disbursements
- ◆ Enhanced account reconciliation
- ◆ Enhanced financial reporting
- ◆ Bank relationship management
- ◆ Fair market-value management

On a daily basis, the Treasury Department will determine the amount of funds (net of disbursements) available in bank accounts for overnight or temporary investment, which primarily is the AWCC concentration account. (For example, the PAWC Mellon Bank account only represents one- and two-day float amounts and associated funds are not available for possible overnight or temporary



investment.) Available funds will be invested by AWCC in money market accounts or in securities such as commercial paper, reverse repurchase agreements, treasury bills, and other short-term liquid investments.¹⁹⁰

The Treasury Department develops a long-term capitalization plan for each regulated water utility, including PAWC. Factors that are considered in developing this plan include:¹⁹¹

- ◆ Credit-rating impact
- ◆ Maturity profile
- ◆ Interest-rate risk
- ◆ Regulatory impact
- ◆ Tax implications
- ◆ Economic and market trends
- ◆ Accounting consequences

The debt/equity ratio for each utility is supposed to be based on the requirements of the applicable state regulator. The maximum debt level cannot be greater than 65% of total capitalization (as specified in the various bond indentures).¹⁹²

AWCC has credit lines totaling \$800 million with a number of banks. Additionally, there is an agreement to provide AWCC with a letter of credit up to \$150 million. The three main banks in this consortium are Credit Swiss, Citibank, and JPMorgan. Other banks in this group include Citizens, Morgan Stanley, and UBS.¹⁹³

American Water Works Company received an A- credit rating from Standard & Poor's in October 2006 and also in September 2007. Moody's assigned American Water a rating of Baa2 in October 2007.

American Water Capital Corporation has received ratings for the past five years for long-term debt and commercial paper. These ratings are shown in *Exhibit III-5*.¹⁹⁴

Exhibit III-5
AWCC Long-term Debt and Commercial Paper Ratings
2003 to 2007

	Standard & Poor's	Moody's
2003	A/NR	Baa1/P-2
2004	A/NR	Baa1/NR
2005	A-/NR	Baa1/NR
2006	A-/A-2	Baa1/P-2
2007	A-/A-2	Baa2/P-2

NR=Not rated
Source: Information Response 534

In its analysis of American Water Capital Corporation and American Water Works Company, Moody's stated that the one-notch downgrade of AWCC's senior unsecured debt had three causes: 1) the loss of implied support from RWE following the proposed American Water initial public offering (IPO); 2) historically weak consolidated credit metrics; and 3) the increase in financial and operating risk going forward as a stand-alone publicly traded company. The existence of a "support agreement" between the American Water parent company and AWCC, effectively backstopping AWCC's timely payment of principal and interest, as needed, was the reason given for the assignment of the Baa2 rating to senior unsecured debt of AWCC.¹⁹⁵

Managerial Reporting, Accounting, and Controls

Processes

The financial processes included under the broader functions of managerial reporting, accounting, and controls are carried out by corporate accounting departments located at the American Water corporate headquarters in Voorhees, NJ and the Financial Shared Services Center in Cherry Hill, NJ. Fixed assets, general ledger, accounts payable, payroll, and general tax work for PAWC are the responsibility of work groups under the VP, Shared Services, a group which is located in the Shared Services Center. Income tax and the responsibility for internal controls fall under the control of the AWWSC VP & Controller at the American Water corporate offices. Matrixed in with the operating management personnel at PAWC's headquarters in Hershey, PA is the Regional Finance Director and her staff. As a group they hold the responsibility for managing the periodic reporting and interpreting of actual financial results and providing a liaison between corporate financial offices and PAWC operations.¹⁹⁶

The accounting functions for PAWC and all of the other American Water operating entities are consolidated at the corporate level, with corporate representatives included in the local operations to provide the necessary financial support at the state level. Cash receipts and disbursements were discussed in the *Cash Management* section of this chapter. Basically, customer billing and collections, including accounts receivable, are consolidated at the corporate level (Customer Relations) along with cash accounting (Cash Management in the Shared Services Center) and cash control (Treasury), with transaction and balance information provided to the state level.¹⁹⁷

Likewise, the general ledger, accounts payable, fixed asset, payroll processing and reporting and general tax functions are performed by Shared Services for all of the regulated water companies, including PAWC. Transactions are processed at the Shared Services Center, and information on the details of the financial operations is provided through the liaison financial personnel to the PAWC management in Pennsylvania.¹⁹⁸

All PAWC invoices are received at the Shared Services Center in New Jersey. The accounts payable personnel use Real View Imaging (RVI) to scan invoices into the accounts payable module of the JD Edwards general ledger system. Accounts payable specialists are assigned by state responsibility and



invoices are segregated according to state. These specialists will code sales tax, vendor identification (ID), workbasket number, and representative individual, prior to scanning the invoice into RVI.¹⁹⁹

Supervisors access the invoices through JD Edwards and verify the accuracy and validity of the purchase. They then approve the invoice for payment. Terms of payment will have been established by another department (Purchasing). Invoices are filed onsite for 30 days so that they will be available to clear up any outstanding issues. They are then destroyed by an outside contractor.²⁰⁰

The Shared Services General Tax Department is responsible for managing and accounting for all state and local taxes applicable to PAWC operations, with the exception of income taxes. These applicable taxes include the following:²⁰¹

- ◆ Sales and use
- ◆ Gross receipts
- ◆ Franchise
- ◆ Property tax

By centralizing the general tax function, American Water believes that it has achieved a higher degree of professionalism. There have been some issues with this function in the past concerning late filing of tax returns. This function had been part of Shared Services, was then transferred to the operating companies or the regions, and is now back in Shared Services.²⁰²

To keep current on all state taxes and on rules and regulations governing the American Water property in approximately 1,000 counties throughout the United States, the General Tax work group subscribes to tax-updater information from Research Institute of America (RIA). This subscription allows the group to stay current on all state and local taxes. Documentation is maintained to verify that employees in this area have read the latest information available.²⁰³

The General Tax work group uses a transaction tax-management systems application by Sabrix, Inc. (Sabrix) to evaluate accounts payable transactions to determine local tax applicability. Approximately 1,100 product codes have been assigned to all possible types of transactions. The Sabrix vendor maintains the system, which is updated monthly to ensure that the tax data is current.²⁰⁴ Purchase orders (unpaid) and standard invoices, customer refunds, electronic disbursement requests (EDRs)²⁰⁵, and P-cards (all paid) are uploaded into the system daily to be matched against the taxability matrix in Sabrix. Data on the tax calculated is transferred to the JD Edwards general ledger system daily, where a tax accrual is made. Tax payments to state and local authorities are made monthly.²⁰⁶

Fixed assets for PAWC and all the regulated operating companies are managed and accounted for by a Shared Services work group that uses the PowerPlant system. This system, which was just implemented in 2007, interfaces directly with their general ledger system, JD Edwards.²⁰⁷ This system is commonly used by the utility industry and provides the necessary functionality to allow utilities to effectively manage their fixed assets. PowerPlant provides project management capability, consisting of work-order management, construction work in progress (CWIP) accounting, and facilitation of the capital-

budget development and asset unitization. Asset management features include management services such as cost accounting and pricing, CPR maintenance, depreciation studies, property tax management, and leased asset management as well as accrual and subledger accounting and calculations. The addition of the PowerTax module (in process of implementation at 2007 year-end) provides book-to-tax calculation and transactions, tax depreciation calculation, deferred tax calculation and facilitation, and tax provisions, including general-ledger mapping and calculation of effective tax rates.²⁰⁸ American Water management believes that PowerPlant will be a very valuable asset to assist their fixed-asset accounting. American Water is now working on developing custom reports from PowerPlant. With the acquisition of many companies with different types of fixed-asset records, management believes that some historical information of acquired companies is not maintained, because the detailed records were not available at the time of acquisition, but that presumption cannot be quantified. The fixed-asset recordkeeping habits of acquisitions continue to be a challenge for American Water.²⁰⁹

Payroll (Employee Services) accounting for all the American-Water-regulated operations, including PAWC, is performed by another work group in the Shared Services Center. The payroll module of the JD Edwards financial enterprise resource planning (ERP) system is used in this accounting.²¹⁰ Time entry for all regulated employees is conducted through a front-end system and interfaced into J.D. Edwards.²¹¹ Time reports are filed and kept for seven years. Non-union employees are paid on a bi-weekly basis. Union employees are paid on a weekly and bi-weekly basis. American Water's payroll includes approximately 7,000 employees across the country with 80 different union contracts.²¹² Every month, between 18,000 and 24,000 payments (checks or pay stubs) are distributed.²¹³ The Cash Management work group prints pay stubs and checks, and mails them to employees' work locations.²¹⁴ Approximately 70% of all American Water employees receive their pay through direct deposit.

Systems

American Water management since early in 2006 has been considering an upgrade to its accounting/payroll systems to gain some functionality. This upgrade need was being addressed with Thames Water (they were looking at SAP) before the decision was made to divest American Water and go public with an IPO. At that time, all planning and work concerning the upgrade of their current ERP or the exploration of a migration to a different system stopped. JD Edwards is considered relatively stable by American Water management and the financial functions indicate that no problems have been encountered with the general ledger system as a result of the number of transactions or the size of the system; however, American Water management has concerns about the lack of some automation features (refer to *Finding III-4*).²¹⁵

Exhibit III-6 lists the systems used by American Water and PAWC to support accounting and finance functions.²¹⁶

Exhibit III-6
Systems Supporting American Water's and PAWC's
Accounting and Finance Functions

System Name	Description
JD Edwards	Financial ERP system in which American Water currently uses the following modules: 1) General Ledger, 2) Accounts Payable, 3) Accounts Receivable, 4) Purchase Orders, 5) Inventory, 6) Payroll, and 7) Human Resources. JD Edwards interacts with the applications listed below.
Horizon/Blue Cross	Medical provider who processes all information pertaining to employee medical expenses.
Merrill Lynch	External vendor who processes all information pertaining to employee 401k. Customized interfaces are used in transmitting information on a weekly basis.
Aetna	External vendor who processes all information pertaining to dental/disability. Customized interfaces are used in transmitting information on a monthly basis.
Operations Parameter Database (OPD)	Contains information such as system delivery, water sales, customer counts, and unbilled revenue.
329-MD Operating Report	The Operational Data Report was developed to allow the business units to manage their responsible areas more efficiently. It was also designed for management to include in the Managing Director's Report.
Hyperion	Used for financial consolidation and reporting.
Treasury Workstation	Cash management system that is used to track cash movements within the company. System is interfaced with PNC Bank.
EX- Fax/EX Print	Third-party software used to automate the process of faxing purchase orders. Also allows custom formatting for AP and payroll checks.
RVI Imaging	External document-imaging system that allows document storage and feeds images into AP voucher process.
ECIS Billing System	Customized interfaces pass information into the financial system for credit refunds, summarized sales, and cash transactions.
PowerPlant (PP)	System for capital budgeting, project accounting, fixed-asset accounting, property tax, tax depreciation, deferred tax, tax provision, and internal and external capital lifecycle reporting for all legal entities of American Water. Customized interfaces have been written for passing information between PowerPlant and JD Edwards.
Vertex	Payroll tax calculator that maintains and calculates all payroll taxes and rules by locality.
Sabrix	Integrated solution with JD Edwards purchasing, payables, and inventory-management modules to meet its use-tax requirements.

Source: Information Response 49

Performance Metrics

Key finance and accounting functions performed by Shared Services for PAWC and the other regulated water companies are measured on a monthly basis. An edited example of some of these metrics in the 2006 and 2007 performance measures are shown below in *Exhibit III-7*.

Exhibit III-7
SSC Payroll, General Accounting, Rates, General Tax, & Accounts Payable Metrics
June 2006 through September 2007

Accounting Functions	2006								2007								
	Target	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Payroll																	
Payroll corrections	0	75	38	52	108	119	107	132	52	104	60	50	35	49	106	67	23
Payroll taxes filed timely (%)	100	95	100	100	100	100	100	97	98.6	100	92.1	99.4	100	100	100	99	100
General Accounting																	
Correcting journal entries	0	193	241	255	231	129	186	122	122	41	31	34	13	21	15	18	15
Established deadlines met (%)	100	100	100	100	100	100	100	50	100	100	100	100	100	100	100	100	100
Fixed Assets																	
FA subsystem reconciles to G/L (%)	100	99.98	99.81	99.98	99.86	99.91	99.88	99.88	99.92	99.92	99.86	n/a	n/a	99.79	99.30	100	99.87
Correcting journal entries	0	24	22	45	19	10	9	5	5	3	3	13	44	32	18	70	112
Rates																	
Tariffs loaded and tested (%)	100	100	100	100	100	100	100	100	100	100	100	94	100	100	100	100	100
Rate case data request sub. (%)	100	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	n/a
General Tax																	
Property tax payments filed timely (%)	100	n/a	n/a	n/a	n/a	92	98	99	96	95	99	99.9	97.5	93	98	71	99
Tax returns filed timely (%)	100	85	33	87	n/a	83	98	99.2	91	92	96	95	99	96	97	97	99
Accounts Payable																	
Invoice receipt to imaging (days)	3	4	5	5	3	3	4	3	2	2.4	1.7	1	1	1.7	1.7	2.1	1.2
Approval of invoices to processing (days)	3	5	4	4	4	5	5	5	4	4	4	5.2	3.3	2.61	2.55	2.9	5.1

n/a = not available

Source: Information Response 553

Although *Exhibit III-7* is primarily provided as an example of the type of metrics reported by the Shared Financial Services departments, it does reflect that American Water mostly met its target metrics and was very consistent over this 16-month period.²¹⁷

Forty hours of training is required for all Shared Services Center (SSC) employees. Such training is provided or coordinated by the Support Services work group. *Exhibit III-8* shows a list of the training classes offered in 2006 and 2007 and the number of SSC personnel who completed these courses.²¹⁸

Exhibit III-8
Training Provided to SSC Personnel
2006 and 2007
as of October 31, 2007

#	Training Course Title	# Completing Course	
		2006	2007 YTD
1	Utility Finance & Accounting – Level 1	115	54
2	Utility Finance & Accounting – Level 2	82	45
3	Service Company Billing & Accounting Training	22	
4	Sales and Use Tax	18	
5	ECIS Report Training	14	
6	SOX Overview Training	62	
7	SSC SOX Education Series – Account Reconciliation		84
8	SSC SOX Education Series – Financial Reporting Commitments		58
9	SSC SOX Education Series – Financial Statement Close		78
10	SSC SOX Education Series – Fixed Assets		44
11	SSC SOX Education Series – General Tax		27
12	SSC SOX Education Series – HR & Payroll		53
13	SSC SOX Education Series – Purchase to Pay		68
14	SSC SOX Education Series – Revenue		40
15	SSC SOX Education Series – Information Technology (IT)		39
16	Timesheet Training in JDE		18
17	Performance Review Form Training	31	
18	Avaya Telephone Training	166	
19	Create a Presentation Using the American Water Template	5	
20	LTM Generation II	118	
21	UPS Worldship Training	24	
22	Genesys Webconferencing 101	10	
23	Cool Functions in Excel	17	8
24	Advanced Excel 2003	84	
25	Excel 2000 Basics	15	
26	World Writer Level 1 Training	26	
27	World Writer – Part A		60
28	World Writer – Part B		52
29	Code of Ethics and Respect Training	309	
30	New Hire Orientation	56	103
31	Safety, Security, & Business Continuity Training	208	
32	Business Continuity Plan Training	38	
33	Setting and Achieving Your Priorities		70
34	Providing Constructive Feedback and Coaching		22
35	Driving Performance		50
36	SmartPros Orientation		10
37	Introduction to Access 2003		27
38	People Management Cycle		57
	TOTALS	1,420	1,067

Source: Information Response 551

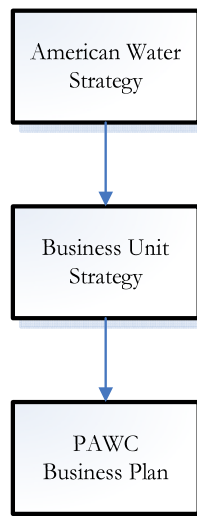
In 2006, 20 different classes were offered and 1,420 SSC attendees completed these courses. In 2007, 22 courses were offered and taught to 1,067 SSC attendees. Additionally, training is made available to all appropriate American Water personnel, including PAWC personnel, via Genesys conferencing/web training, On-Demand computer-based training, “train the trainer” training, and in-person training.²¹⁹

The first 16 courses listed on *Exhibit III-8* represent financial accounting and control courses that would be considered appropriate and desirable for SSC financial management personnel to attend. There were 921 SSC attendees for the financial accounting and control courses over a two-year period. That number represents 37% (921 SSC attendees/2487 total attendees) of all training provided for SSC attendees.²²⁰

Budget Management, Reporting, and Control

PAWC and all other American Water business units prepare annual business plans. At American Water, these business plans represent the impacts of ideas set out in strategic plans and converted into financial plans and budgets. The diagram in *Exhibit III-9* represents how the process flows from American Water down to the PAWC-level business unit.

Exhibit III-9
Budget Process Flows from American Water to PAWC
as of December 31 2007



Source: Interview 125

The business plan represents the translation of strategic intent into detailed implementation plans. As such, the business plan is designed to:

- ◆ Review business scope, capability, and environment
- ◆ Project business activities and identify actions required
- ◆ Assess enhancement anticipated and identify action required
- ◆ Set performance targets
- ◆ Facilitate understanding of financial performance
- ◆ Identify and develop financial and non-financial resources required

Annually, American Water will prepare a rolling five-year plan. The first year is the annual budget and is developed at the monthly detail level. The following four years are developed at the annual level, although including the same level of line-item detail.²²¹ *Exhibit III-10* presents the steps in the American Water budget-development process and the timeframes in which they are conducted.²²²

Exhibit III-10
American Water Budget Process
as of December 31, 2007

Step	Process Description	Time Frame
1	Profit targets by region and capital expenditures (CAPEX) targets by state	April
2	Develop corporate assumptions/plans – Agree profit and CAPEX targets, draft corporate assumptions, develop rate schedules, develop growth model, develop balance sheet model	May
3	Deliver business plan inputs – strategy, target confirmation, rates & regulations, economic assumptions, operations assumptions, HR assumptions, procurement assumptions, business development/growth, business efficiency initiatives, CAPEX, IT spend, tools, & models	May
4	Operations input to business plan	May
5	First draft AWWSC figures	May
6	RWE assumptions	June
7	First draft budget submission to corporate	August
8	Corporate finance, rates, and CAPEX review	August
9	Revised first-draft revision to regions	August
10	Regional revisions to business plan	August
11	Revised first-draft revisions to corporate	August
12	Final CAPEX plan	August
13	Second draft AWWSC figures to regions	September
14	CFO/COO review	September
15	Executive management team (EMT) review	September
16	Second draft submitted to corporate	September
17	EMT review of second draft	October
18	Delivery to parent corporation (RWE)	October
19	Feedback from parent corporation	November

Source: Interview 51 and Information Response 52

Templates are used by regional and corporate financial personnel to develop the income statement and balance sheet for the budget. This information is then uploaded to Hyperion Enterprise (Hyperion 9 will be used for future budgets). Hyperion reports are validated to ensure the input was completed accurately. Considerations in developing this material and sources for the various line items' underlying data are shown as follows:²²³

◆ **Income Statement**

- *Revenues* – The revenue template takes into consideration the number of connections, usage,

rates, system delivery, and non-revenue water/unaccounted water. The revenue is calculated for all classes (e.g., residential, industrial commercial, public authority, etc.)

- *Operating costs*
 - *Production costs* – These operating costs are developed using system-delivery expectations and future cost assumptions.
 - *Labor* – Headcount templates are used to determine labor costs, including overtime and capitalized labor, as well as employee taxes and benefits. Temporary employee needs are also determined. Other post-employment benefits (OPEB) and pension costs are supplied by the corporate organization.
 - *Service company* – The corporate component of AWWSC is provided by the corporate Financial Planning & Analysis (FP&A) organization. The regional component of AWWSC is developed based on input from functional department heads.
 - *Other Operating & Maintenance (O&M) expenses* – Department heads supply detailed input for expenses such as general office supplies and maintenance. Other expenses are determined based on input from the functional areas.
- *Depreciation/ amortization expense*
 - *Depreciation expense* is developed based on the strategic capital expenditure plan (SCEP) template, existing plant, and expected retirements.
 - *Amortization expense* is based on balances and amortization periods.
- *Interest expense* is developed based on input from the Treasury Department.
- *Taxes* – Tax rates are based on input from the corporate Financial Planning & Analysis/Tax departments.
- ◆ **Balance Sheet**
 - *Plant and equipment* – The SCEP template is used to determine capital expenditures.
 - *Accounts receivable* – This balance is determined based on the revenue plan and days outstanding.
 - *Accounts payable* – This balance is developed based on expenditure requirements and days payable outstanding (DPO).
 - *Debt placements, equity infusions, and cash* – These balances are budgeted-based business needs with Treasury input.
 - *Payroll accruals* – These accruals are developed using budgeted expense and expected requirements based on historical trends and current-year assumptions.
 - *Regulatory assets/liabilities* – These balances are determined from input provided by the Rates Group, Planning, and Tax departments based on historical regulatory treatment.



American Water has a formal quarterly budget reforecast process. The quarter 1 budget reforecast (Q1RF) is produced in March with February YTD data, the Q2RF is produced in June with May YTD data, and the Q3RF is produced in September with August YTD data. The budget reforecasts go through much the same development and review process as the original budget. *Exhibit III-11* presents the Q2RF timetable for 2007.²²⁴

**Exhibit III-11
American Water Second-Quarter Budget Reforecast Timetable**

Task	Owner	Due
Prepare and distribute guidelines and reporting template for Q2RF	Corporate Planning	06/01/07
Identify financing requirements for remainder of 2007 for Treasury to calculate interest	Business Units/Regions	06/04/07
Populate Q2RF with closed 2007 actuals and Q1RF for remaining periods (5 months actual + 7 months Q1RF)	Corporate Planning	06/12/07
Service Company Q2RF completed	Service Company	06/12/07
Calculate interest at business-unit level	Treasury	06/13/07
SCEPs finalized and provided to Regional Finance	Capital Program Management	06/13/07
Distribute management fees and business-change costs for Q2RF	Service Company	06/13/07
Provide interest to business units/regions	Corporate Planning	06/13/07
Pre-tax Q2RF loaded into Hyperion	Business Units/Regions	AM 6/20/2007
Tax provided pre-tax income and projection of permanent differences and significant temporary differences	Corporate Tax	PM 6/20/2007
Tax provides estimated tax requirement (ETR) for each entity	Corporate Tax	06/22/07
Taxes calculated and loaded into Hyperion	Business Units/Regions	06/25/07
Q2RF variance analysis due to Corporate Planning (profit & loss (P&L)): Q2RF YTD variances to Q1RF, total year budget (TYB) and last year's actual (LYA); B/S: 12/31/07 Q2RF to Q1RF & TYB)	Business Units/Regions	06/25/07
Q2RF tax review completed (written confirmation required)	Corporate Tax	06/26/07
Consolidation for Q2RF & intercompany reconciliation	Corporate Planning	06/26/07
Q2RF locked	Corporate Planning	06/26/07
Q2RF variance analysis due to Senior Management	Corporate Planning	06/29/07
Q2RF commentary due to RWE	Corporate Planning	07/12/07

Source: Information Response 52

Monthly reviews are held to discuss the PAWC financial results compared to annual budget, reforecasted budgets, and the prior year's data. The Southeast Region Financial Reporting Package (FRP) is developed under the auspices of the Regional Director Finance and is discussed in a monthly Financial Reporting Package meeting/call. Participants in this review include the American Water CFO, the VP & Controller, the VP Planning & Reporting, the VP Shared Financial Services, the Regional Director Finance, and the Shared Services Regional Accounting Director.²²⁵

Recipients of the Financial Reporting Package, in addition to the participants in the meeting, include the Executive VP Business Operations for the Eastern Division, members of the Corporate Financial Planning & Analysis group, and the PAWC State President. Included in this report and discussed at the monthly meeting are the month, quarter, and year-to-date income statement and balance sheet compared to the original budget, the latest reforecast, and the prior year's results.²²⁶ Variance explanations are included whenever the assigned variance thresholds have been exceeded. Variance thresholds differ by state operations.²²⁷ Variance thresholds are crossed when a regulated state operation's income-statement line item differs from budget estimates by more than 10% and from an established dollar amount by state. Pennsylvania's established dollar amount is \$250,000.

After the Financial Reporting Package has been developed and discussed, the monthly Business Performance Package (BPP) is prepared, again, under the control of the Regional Finance Director. The BPP adds operating data from service delivery and operating initiatives and is currently prepared at the regional level only. American Water expressed plan to move this function to the state level in 2008.²²⁸ The BPP is discussed in a monthly business-performance reporting meeting. Participants in this meeting usually include the American Water President & CEO, the SVP/ CFO, the Chief Operating Officer (COO), the Eastern Division Executive Vice President, and the Regional Director Finance. Recipients of the BPP, in addition to the participants of the meeting, include members of the corporate Financial Planning & Analysis group and the PAWC President. Included in this report, in addition to the financial information from the Financial Reporting Package, are quarterly operational data and some additional financial information, such as key performance indicators, status of key initiatives, and major projects; return on average common equity, financial ratios, financial trends and mitigating action plans, and reports of regulatory affairs and rate cases; business development, environmental compliance and service quality, labor issues and risk summary, legal corporate governance and policy compliance, and external affairs and other legal operating issues.²²⁹

The usual month-end financial-report development and meetings schedule is as follows:²³⁰

- ◆ *Day minus 1* (one business day prior to the end of the month) – Meeting takes place with state representatives and State Presidents and their staffs, basically operating people who are aware of what will be reported for the current month.
- ◆ *Day 5* (fifth business day of the next month) – Preliminary results are provided (in the evening) to the participants of the next day's debriefing conference call.
- ◆ *Day 6*: (fifth business day of the next month, which was Day 5 in 2007) debriefing call – Although the books are not yet closed at this time, this call discusses the pre-tax results (income statement, balance sheet, variance analysis, month-to-month trends, and questions to investigate). Adjustments can still be made that impact monthly financial results. This call includes the Shared Services Regional Finance Director; the Regional Director, Finance; the Manager – Performance, Planning, & Reporting; and their staffs, including state analysts.
- ◆ *Day 7* (seventh business day of the next month) (financial close) – Preparation of financial package begins using Hyperion 9.



- ◆ *Day 9 or 10* (ninth or tenth business day of the next month) – Perform state eliminations for consolidations.
- ◆ *Day 12 or 13* (twelfth or thirteenth business day of the next month) – Conduct Monthly Financial Reporting Package meeting and conference calls.
- ◆ *Day 15 or 16* (fifteenth or sixteenth business day of the next month) – Conduct Business Performance Report meeting – includes financial information and operating data with input from Legal, External Affairs, and operations; prepare BPP in Hyperion.

Internal Auditing

PAWC does not have a separate internal audit function. Instead, the Internal Audit function for PAWC and all of American Water's operations is performed by the AWWSC Internal Audit Department.²³¹ This department is headed by the Vice President, Internal Audit (IA).²³² The Internal Audit VP's reporting line is to the Chair of the Audit Committee and CEO, with a dotted line to the CFO for administrative purposes (i.e., approve expense reports, tracking vacation, and processing other administrative paper work). The CFO also prepares the Internal Audit VP's personal performance review and the department budget review, with approval by the CEO and Chair of the Audit Committee. During this review, the Chair of the Audit Committee and CEO provide input, which is documented by the CFO for review with the Internal Audit VP. The Chair of the Audit Committee also reviews the Internal Audit VP's performance during a face-to-face meeting each year.²³³

The Internal Audit VP meets at least monthly with the CEO and at least quarterly with the Chair of the Audit Committee. Also, the Internal Audit VP meets monthly with the CFO for administrative purposes, as well as to have discussions regarding American Water's control strengths and weaknesses. Also, Internal Audit VP meets with all senior management (i.e. 23 individuals for the 2008 Internal Audit plan) to review control strengths and weaknesses, as well as gather input for annual planning and future audits.²³⁴

The current IA staff has seven members, including the VP, Internal Audit. There has been considerable turnover (approximately 60%) in this department since June, 2006, when the VP joined American Water. IA turnover since June, 2006 is higher than would be normal in an IA function that was not rotating personnel through this group as a training vehicle; however, IA management indicates that this turnover reflects the need to upgrade the quality of staff so as to bring additional value to the IA process. Current staff members have backgrounds in Information Technology (IT), IT/Accounting, Operations, and Engineering.²³⁵ Undergraduate college degrees include Accounting (4), Finance (1), Engineering (1), and Information Systems (1). Three staff members have earned Master of Business Administration (MBA) degrees. Professional certifications include Certified Public Accountants (CPAs) (2), Certified Fraud Examiners (CFEs) (2), Certified Information System Auditor (CISA) (1), Certified Internal Auditor (CIA) (2), and Certified Management Accountant (CMA) (1).²³⁶ The VP, Internal Audit intends to make this staff rotational in the future, with American Water personnel rotating through the

Internal Audit Department to other parts of the company in a two- to three-year cycle. The Internal Audit Department would serve as a management development program. A formal program for this aim does not currently exist.²³⁷ Over the past 12 months, training for the entire Internal Audit staff included the following classes or subject areas:

- ◆ Sarbanes-Oxley (SOX) Act
- ◆ Committee of Sponsoring Organizations (COSO) of the Treadway Commission control model
- ◆ Risk/control assessment
- ◆ Interpersonal/communication skills
- ◆ Regulatory accounting

Additional training was provided to selected individual auditors in IT controls, tax and risk assessment, and data query using WIN Idea software. Future training plans include report writing, statistical analysis, process improvement analysis techniques and tools, and project management.²³⁸

The Internal Audit Department has developed its audit process for compliance, operational, and information technology audits in accordance with the internal audit definition adopted by the Institute of Internal Auditors (IIA). This definition indicates that internal audits should “add value and improve an organization’s operations ... by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control and governance processes.”

Planning for internal audits conducted in 2007 was based on eight auditors in the Internal Audit Department, each with 161 workdays available for a total of 1,291 workdays for the entire audit staff. This total time was allocated to audits (60% or 775 workdays), SOX assistance (20% or 258 workdays), and management requests, investigations, or similar activities (20% or 258 workdays). To prioritize the areas to audit the following risk factors and applied weights were used:²³⁹

- ◆ Internal control system (35%)
- ◆ Findings of last audit (25%)
- ◆ Changes in organization/processes/staff (25%)
- ◆ Legal or other external influences (15%)

Back-up risk factors and applicable weight factors were:²⁴⁰

- ◆ Net profit of last fiscal year (25%)
- ◆ Revenues of last fiscal year (33%)
- ◆ Balance sheet total of last fiscal year (25%)
- ◆ Average number of employees in last fiscal year (17%)

Compliance audits are designed to assure that the company’s activities comply with relevant laws, regulations, and company policy. Operational audits evaluate whether business divisions, functions, and/or activities are operating economically, efficiently, and effectively. Information technology audits examine IT controls and evaluate information systems, practices, and operations.

The Internal Audit Department has performed an average of almost 12 audits per year over the past five years, with the numbers falling off in 2006 (6) and 2007 YTD (July) (2).²⁴¹ A list of internal audits performed in 2003 and 2004 are shown in *Exhibit III-12*.²⁴²

Exhibit III-12
Internal Audits Completed by Year
2003 to 2004

Count	Plan Year	Audit	Date Issued	Status
1	2003	Energy Management	08/28/03	Completed 2003
2	2003	Cash Management	10/07/03	Completed 2003
3	2003	Commercial Development Process	11/06/03	Completed 2003
4	2003	ORCOM Applications	10/02/03	Completed 2003
5	2003	American Water IS Policy Review	09/18/03	Completed 2003
6	2003	Ad Hoc - Integration Management	10/31/03	Completed 2003
7	2003	VTS Travel Audit	10/31/03	Completed 2003
8	2003	Debt Management	10/09/03	Completed 2003
9	2003	IS Business Continuity Planning	02/13/04	Completed 2004
10	2004	AWWSC Payroll	02/02/04	Completed 2004
11	2004	AWWSC - Pension	02/17/04	Completed 2004
12	2004	IS Data Center Review - Haddon Heights, NJ	03/05/04	Completed 2004
13	2004	Pennsylvania-American Water Company ((Capital Expenditures/Operations)/Financial Control and Reporting (FCR)/Information Systems)	03/19/04	Completed 2004
14	2004	AWWSC - Customer Service Center	03/16/04	Completed 2004
15	2004	IS Change Management	02/27/04	Completed 2004
16	2004	AWWSC - JD Edwards	03/26/04	Completed 2004
17	2004	Property Development	04/26/04	Completed 2004
18	2004	IS Data Center - Alton	04/29/04	Completed 2004
19	2004	AWWSC - Internal Controls	05/26/04	Completed 2004
20	2004	IS Data Center Review - Belleville Lab	04/15/04	Completed 2004
21	2004	American Water Release Management	06/18/04	Completed 2004
22	2004	Metering Processes	09/02/04	Completed 2004
23	2004	IS Data Centre Review - Voorhees	10/07/04	Completed 2004
24	2004	IS Data Centre Review - Hershey	10/18/04	Completed 2004
25	2004	IS Data Centre Review - Mt Laurel, NJ	10/11/04	Completed 2004
26	2004	IS Operations. Sys. Rev. - OS/400	10/18/04	Completed 2004
27	2004	One-Time Cost	11/23/04	Completed 2004
28	2004	American Water Capital Corporation	10/20/04	Completed 2004
29	2004	Ideas Into Action	10/11/04	Completed 2004

Source: Information Response 61

Those performed in 2005 and through July 2006 are shown in *Exhibit III-13*.²⁴³

**Exhibit III-13
Internal Audits Completed by Year
2005 to 2006**

Count	Plan Year	Audit	Date Issued	Status
30	2004	IS Network Security	01/14/05	Completed 2005
31	2004	Debt Management	02/04/05	Completed 2005
32	2004	IS Oper. Sys. Rev. - Unix	02/07/05	Completed 2005
33	2004	Business Development	03/22/05	Completed 2005
34	2004	IS Oper. Sys. Rev - Windows	07/25/05	Completed 2005
35	2005	End-to-End Billing Process	07/18/05	Completed 2005
36	2005	Commercial Development Process (Corporate Process)	08/11/05	Completed 2005
37	2005	AWWSC - Security	07/29/05	Completed 2005
38	2005	AWWSC - IS Infrastructure-Service/HelpDesk	08/10/05	Completed 2005
39	2005	End-to-End Payroll Process	09/21/05	Completed 2005
40	2005	AWWSC - Purchase Cards	10/04/05	Completed 2005
41	2005	STEP Program	10/07/05	Completed 2005
42	2005	AWWSC - IS Operating Environment Review - Notes & Intranet	11/04/05	Completed 2005
43	2005	AWWSC - Laboratories	11/22/05	Completed 2005
44	2005	Pennsylvania-American Water Company ((Capital Expenditures/Operations)/Financial Control and Reporting/Information Systems)	11/22/05	Completed 2005
45	2005	AWWSC - Disbursement Requests	11/16/05	Completed 2005
46	2005	American Water Capital Corporation - FCR	12/07/05	Completed 2005
47	2005	AWWSC - Cash Management (Receipts, Payments, & Recs)	12/07/05	Completed 2005
48	2005	AWWSC - Risk Management	12/14/05	Completed 2005
49	2005	AWWSC - AWSS Co Billing	01/19/06	Completed 2006
50	2005	AWWSC - Post Project Appraisal (Service First)	04/10/06	Completed 2006
51	2005	AWWSC - Financial Processes (includes governance)	06/29/06	Completed 2006
52	2006	Operations Performance of Call Center Generated Work	04/12/06	Completed 2006
53	2006	Meter Reading	05/10/06	Completed 2006
54	2006	Accounts Receivable/Reporting	06/07/06	Completed 2006
55	2006	IS - Service First Application	06/20/06	Completed 2006
56	2006	IS - SCADA Systems	07/11/06	Completed 2006
57	2006	Compensation and Benefits	07/19/06	Completed 2006
58	2007	AWWS - Purchase Cards	05/08/07	Completed 2007
59	2007	AWWSC - Disbursement Requests	06/14/07	Completed 2007

Source: Information Response 61

Only two of the audits completed during this five-year period targeted PAWC operations, but this tendency is not unexpected. That is because almost all financial functions concerning PAWC and the other regulated state operations are conducted in a consolidated manner by AWWSC corporate departments. The VP, Internal Audit indicated that this department should be able to increase the current audit workload to an average of approximately 20, a target that is similar to the number of audits conducted in the 2003 to 2005 period, prior to his arrival. He indicated that he would probably need additional staff to reach that number of annual audits.²⁴⁴

Both during an audit and at the exit interview for the audit, the audit findings, recommendations, and action plans are discussed with the management of the area being audited. Audit reports are distributed to the management of the audited area (including Operating or State Presidents of the area involved), to senior American Water management, to the Audit Committee chair, and to American Water's external auditors. Internal audit follows up with responsible parties on open action plans to verify resolution or obtain progress updates. The audit results can be escalated to senior management if appropriate corrective action has not been taken.²⁴⁵

Telephone calls from employees or persons outside of American Water who had complaints or who wished to report irregularities, ethical issues, or complaints used to come in on the American Water "Hot Line" to the Internal Audit Department. These calls now go to an outside firm. Reports of calls are e-mailed to the VP, Internal Audit and to an AWWSC attorney, who acts as a compliance officer and the administrator of ethics calls. Calls can be anonymous and are classified in 21 categories. There is an Ethics Committee (created at the beginning of 2007), consisting of the CFO (chair), General Council, COO, HR, and the VP, Internal Audit. This committee meets at least quarterly.

B. Findings & Conclusions

Financial Requirements Planning and Cash Management

Finding III-1 PAWC cash is managed in an efficient and cost-effective manner by corporate cash management functions.

The American Water Works Service Company manages cash for all of its regulated operations, including PAWC, in a consolidated manner. The Shared Services Cash Management group manages and reconciles incoming and outgoing cash, and the Treasury Department monitors cash balances and manages banking relationships. Together, these two corporate departments help ensure that all available cash is utilized and all entities have adequate cash for their daily needs. Incoming cash is collected in a Mellon Bank lockbox account. Daily, all available funds are swept from this account for a consolidated investment by American Water Capital Corporation to money market accounts or to commercial paper or other short-term liquid investments. The daily balance in this account after the fund sweep has taken place has varied from a low of less than \$19,000 to a high of \$2.3 million over a five-year period. The average daily balance in this account during this timeframe has been \$902,040. These funds were not available to be transferred, representing one- and two-day float, or the time it takes for the funds to clear the banks on which the checks are drawn.²⁴⁶

Cash disbursements for all regulated operations are made from a single disbursement account at PNC Bank. The Treasury Department uses a real-time connection to banking operations and a Treasury workstation system to monitor cash balances and movement effectively and efficiently.

Finding III-2 Long-term debt is obtained at favorable rates.

Because of the advantages of economies of scale in borrowing for all regulated water utilities, PAWC receives long-term funding through the American Water Capital Corporation. American Water policy states that if a lower-cost source is available, PAWC is free to use that alternative. PAWC has used low-cost water-facility loans through PennVest of the Commonwealth of Pennsylvania. These loans carry rates that are substantially lower than the other long-term debt PAWC carries. Interest rates on these PennVest loans vary from a low of 1.00% up to 4.19%, compared to notes payable to affiliates having interest rates from 4.92% (4.92% redeemed in 2006) to 6.87% and general mortgage bonds having interest rates ranging from 3.60% up to 9.71%.

Managerial Reporting, Accounting, and Controls**Finding III-3 The consolidated managerial reporting, accounting, and control functions serving PAWC are efficient and closely monitored.**

All managerial reporting, accounting, and control functions supporting PAWC operations are handled by financial departments of AWWSC. All of these functions for all of the American-Water-regulated companies are consolidated at AWWSC. This consolidation allows for economies of scale for transaction-type activities, such as billing, cash receipting, accounts payable, disbursements, and payroll. It also allows for a greater concentration of expertise, knowledge, and experience than might be possible in less-concentrated operations. Additionally, American Water has developed a number of performance measures that it uses to monitor these kinds of functions. Monthly reporting of performance measures affords the customer that is buying these services (PAWC) the ability to manage these functions and to ensure efficiency and effectiveness. Trends over the past 16 months indicate that performance against these metrics has been consistent and, for the most part, has met target or been close to targeted results. Unusual variances are explained in the monthly reporting process.²⁴⁷

Finding III-4 American Water's general ledger system is not current and has not recently been updated to add needed functionality.

American Water uses JD Edwards as its financial ERP system. This system has not been updated to the software's most current version. (American Water is using either JDE World Version 7.3.12, not 7.3.16, which Information Technology Services (ITS) indicates has additional functionality, or Version 9.1, which was recently released, although ITS indicates some enhancements have been incorporated). Several financial functions have noted during this audit that there was some functionality lacking in the version that is being used. Prior to the decision to divest from RWE and to pursue an IPO for American Water, plans were being made to explore alternative ERP options, including Systems Applications and Products (SAP). Additionally, the massive amount of work that has been expended on SOX compliance has drained resources that could have been used in planning for a system upgrade.



The company announced on November 2, 2007 that the responsibilities of a new role, Vice President of Finance and Accounting, is to include developing and implementing a strategy for a new financial system, which will be administered by the IT team.

Finding III-5 The AWWSC’s Shared Services Center provides an extensive amount of employee training.

AWWSC’s Shared Services Center requires that all employees receive 40 hours of training per year. A review of courses that were provided in 2006 and 2007 (through October 31, 2007) revealed a list of 38 different courses, running the gambit from technical financial classes such as “Utility Finance & Accounting” and Sarbanes Oxley control classes such as “SOX Education Series – Financial Statement Close” to more general classes involving “People Management” or “Driving Performance.” In the two years reviewed, almost 2,500 attendees had completed the courses offered by the Shared Services Center.

Budget Management, Reporting, and Control

Finding III-6 The function of reporting actual financial results compared to budgets is managed and controlled effectively.

Monthly financial and operations reports are developed to monitor actual performance compared to plans. Variances are discussed and explained in these reports and in meetings attended by key American Water and PAWC management and staff. Budgets are reforecast quarterly in a formal process. Actual results are compared to the original and latest reforecast budgets and to the prior year’s actual results on a monthly, quarterly, and annual basis. Performance measurements for consolidated activities conducted by the Shared Services Center are reported and reviewed on a monthly basis.

Finding III-7 Several key PAWC financial statistics have been deteriorating in recent years.

Key PAWC financial statistics for the past five years and through June 2007 are shown in *Exhibit III-14*.²⁴⁸

**Exhibit III-14
PAWC Key Financial Statistics
(\$ Thousands)
2002 to June 30, 2007**

Key Statistic	Year					6/30/07
	2002	2003	2004	2005	2006	YTD
Operating margin	42.7%	41.8%	39.9%	40.3%	38.8%	37.0%
O&M (a) efficiency ratio	41.2%	42.2%	44.1%	42.8%	45.1%	45.4%
EBITDA (b) margin	56.2%	56.6%	52.2%	54.8%	52.5%	51.5%
EBIT (c) margin	43.2%	43.0%	39.4%	40.9%	39.1%	37.0%
Net income to common margin	15.9%	17.1%	15.5%	16.7%	15.4%	14.2%
Current ratio	248.8%	125.0%	164.0%	76.6%	83.6%	77.6%
Operating revenues						
Operating revenues	353,523	355,507	384,402	399,796	402,750	201,756
Operating income						
Operating income	150,802	148,478	153,236	160,980	156,253	74,697
O&M expenses						
O&M expenses	145,553	150,094	169,450	170,940	181,476	91,680
Net income to common stock						
Net income to common stock	56,107	60,828	59,428	66,715	62,185	28,661
Depreciation and amortization						
Depreciation and amortization	45,848	48,165	49,192	55,412	54,236	29,137
General taxes						
General taxes	11,568	9,001	12,836	12,652	10,877	6,241
Other income (loss)						
Other income (loss)	2,303	4,663	(1,474)	2,734	1,139	10
Current assets						
Current assets	90,732	87,957	104,635	64,842	65,208	70,945
Current liabilities						
Current liabilities	36,475	70,357	63,793	84,610	78,023	91,410
Working capital						
Working capital	54,257	17,600	40,842	(19,768)	(12,815)	(20,465)

(a) O&M = Operations and maintenance

(b) EBITDA = Earnings before interest, taxes, depreciation, and amortization

(c) EBIT = Earnings before interest and taxes

Source: Information Response 56

These statistics indicate a gradual, but consistent, decline in PAWC's profitability and overall financial health for the past five and one-half years. The operating margin, which is a measure of a company's gross operating profitability, has decreased by 5.7 percentage points. Similar negative movements have occurred in PAWC's EBITDA margin (measuring the extent to which cash operating expenses use up revenue), EBIT margin (reflecting the cash available to pay off creditors), and the net income to common margin (an indication of how effective a company is at cost control).



During the same time period, PAWC's O&M efficiency ratio has increased by 4.2 percentage points. This rise reflects an increase in O&M expenses as a percentage of operating revenues, another negative measurement. PAWC's working capital (measuring the proportion of short-term liabilities that can be covered by current assets) has gone from a positive \$54 million to a negative \$20 million, indicating a decline in liquidity to accompany the decline in profitability and efficiency.

PAWC management believes that the information presented in *Exhibit III-14* reflects the company's decision to not seek rate relief prior to the most recent filing in April 2007. PAWC's prior general rate case filing was in April 2003.

Internal Auditing

Finding III-8 The Internal Audit Department is not sufficiently isolated from the Financial Management organization.

The Vice President, Internal Audit and the Internal Audit Department report, at least administratively, to American Water's SVP & CFO. Although the VP, Internal Audit also reports to the CEO and the Chair of the Audit Committee, the CFO prepares the performance review for this position. This performance review is then reviewed by the CEO and the Chair of the Audit Committee. The CFO also authorizes the VP, Internal Audit's personal leave and approves Internal Audit staffing levels, the speed of replacements, and internal auditor pay-grade levels which effectively impacts the department resource levels. The CFO does not direct the internal audit work effort nor does she approve audit projects, although she does have input into the audit planning process. This chain of command appears to place the Internal Audit function at least in part under the CFO, who is responsible for all the financial operations of American Water, including PAWC.

The Internal Audit function must be independent of the Financial Management organization. There should be neither the perception nor the actual situation whereby the Finance organization controls or exercises power over the same auditors who are auditing the financial activities. Even though there is adequate visibility with the Audit Committee, there is opportunity for inappropriate pressure to be placed on what should be an independent audit group is present.

Finding III-9 The number of internal audits conducted has declined significantly during the past five years.

The number of internal audits has declined considerably from 2003 to 2007. Audits completed in 2003 were nine, 25 in 2004, 17 in 2005, six in 2006, and two in 2007 YTD (July). It is difficult to compare the amount of work that went into internal audits in different time periods, because during this time, the audit process or philosophy might have changed, and certainly the resources, including the VP of Internal Audit, have changed. Nine auditors were in the Internal Audit Department in 2006 with a total of 1,475 available workdays, or 163 workdays per auditor. In 2007 the number of auditors was reduced

to eight with 1,291 total workdays or 161 workdays per auditor. The amount of time spent on audits was 60% of the total workdays available, with the other 40% being used to assist in the SOX efforts and to respond to ad hoc management requests, investigations, etc.²⁴⁹

An average number of workdays per year for employees for most companies is usually around 220. This allows eight weeks for vacation, holidays, sick, and otherwise non-productive time. American Water's Internal Audit Department averaged 162 workdays for 2006 and 2007, 58 workdays or almost 12 weeks less than this standard.

American Water's Internal Audit Department uses an assessment of risk factors and assigns weights to prioritize areas to be audited. However, the number of audits conducted has been negatively affected by several factors. The first factor, the need to assist the Internal Control group in assessing the company's control environment to ensure compliance with Sections 302 and 404 of the Sarbanes Oxley Act may be receding as the controls have been developed. There could be a continuing need for testing controls and assessing their effectiveness that could require Internal Audit hours, depending on how American Water addresses this on-going requirement. The second factor, the reduced number of workdays available per auditor to perform all work (average of 162 workdays in 2006 and 2007) should be addressed. The difference between the average workdays per year available for each auditor over the past two years (162) and a more normal average of 220 workdays is 58 workdays, or almost 12 weeks. It is difficult to understand how these days could have been spent in training, administration, or other activities not related to audits, SOX, or ad hoc requests or investigations. This is too great of a period of time to be used for training or other administrative functions, and most of it should be applied to performing additional internal audits.²⁵⁰ Regardless, if only eight audits were completed in 19 months, the degree of exposure to risk could be questioned.²⁵¹ Additionally, internal audits of cost accumulation, assignment, and allocation methodologies, factors, and systems are not regularly performed.²⁵² (Refer to *Chapter VIII – Affiliate Interest* for additional information about this topic.)

C. Recommendations

Financial Requirements Planning and Cash Management

None

Managerial Reporting, Accounting, and Controls

Recommendation III-1 Research and develop plans for upgrading or replacing the current ERP system. (Refer to Finding III-4.)

Plans to upgrade American Water's current JD Edwards ERP system were stopped when the decision was made to divest American Water from RWE and to go public with an IPO (although some enhancements have been incorporated). Even if American Water does not want to upgrade its current system until it has gone public, planning for the ERP changes needs to continue. Ideally, when the organizational changes have been finalized, the ERP plans will have been completed and the upgrading of American Water's current system or replacement with a different ERP could begin after the IPO has taken place.

Budget Management, Reporting, and Control

Recommendation III-2 Investigate why key PAWC financial statistics have been deteriorating, develop and implement a plan for improving PAWC's financial health as appropriate. (Refer to Finding III-7.)

Several key PAWC financial statistics indicate a gradual, but consistent, decline in PAWC's profitability and overall financial health for the past five and one-half years. Such statistics include operating margin, EBITDA margin, EBIT margin, and net income to common margin, O&M efficiency, and working capital, as previously discussed. AWWSC/PAWC needs to perform an in-depth investigation to analyze why this is happening and what could be done to improve PAWC's financial health. Included as part of this investigation should be the development of a formal plan to make necessary changes toward addressing required improvements.

Internal Auditing

Refer to *Chapter VI-Corporate Governance Recommendation VI-4*, which addresses *Finding III-8*.

Recommendation III-3 Assess the need for internal audits of American-Water-regulated utility operations and develop and implement plans to meet the internal audit requirements. (Refer to Finding III-9.)

The risks associated with all areas of American Water should be evaluated, including an emphasis on regulatory cost centers rather than primarily the consolidated financial statements (which are the responsibility of the external auditors). That way, a determination is made as to the frequency and type

of internal audits that could be conducted. An audit plan should be developed annually so that all areas with perceived risk can be reviewed in a reasonable period of time.

The Internal Audit staff should have more workdays than their average for the past two years (162) available to conduct internal audits. Additionally, as the SOX controls are developed and tested more internal auditor workdays should be devoted to conducting internal audits, rather than assisting in the SOX arena.



IV. Support Services

This chapter provides discussions regarding the following Pennsylvania-American Water Company (PAWC) support services

- ◆ Information technology (IT) and systems
- ◆ Transportation and fleet management
- ◆ Facilities and property management
- ◆ Procurement services and materials management (purchasing, vendor selection, contract administration, and inventory management)
- ◆ Risk management
- ◆ Legal services

A. Information Technology and Systems

This section provides a discussion of IT services provided by American Water Works Service Company (AWWSC) on behalf of PAWC. AWWSC is the non-regulated service company for American Water Works Company, Inc. (American Water).

Background & Perspective

Mission, Focus, & Objectives

All information technology services are provided to PAWC by the AWWSC Information Technology Services (ITS) organization. The mission statement of this organization is:²⁵³

To be a valued business partner dedicated to providing information technology support and delivery of innovative, flexible, scaleable, and secure solutions to meet business needs through standardized technology and processes in a cost-effective and efficient manner.

According to American Water management, much of the company's focus since RWE announced its divestiture of American Water has been Sarbanes-Oxley (SOX) compliance efforts. This emphasis has resulted from the anticipation of becoming a publicly-traded company.²⁵⁴ (Refer to *Chapter VI – Corporate Governance* for more discussion about these activities.) According to ITS management, ITS' SOX efforts to date include the following:²⁵⁵

- ◆ Purely ITS efforts to modify the organization's own processes, including governance and project-management processes, in which examples of the types of documentation developed or enhanced included:
 - Policies
 - Practices
 - Charters
 - Standards
 - Implementation plans
 - Swim lanes (or process flow diagrams that depict what or who is working on a particular subset of a process)
- ◆ Supporting business units (BUs) or special teams that provide committee authorization of technology changes in their SOX compliance efforts
- ◆ Access management/security remediation of issues

ITS management believed that its policies and procedures prior to its SOX efforts needed more formalization. Such documentation was reviewed by ITS leadership and functional experts, including a Policy Panel Review group.²⁵⁶

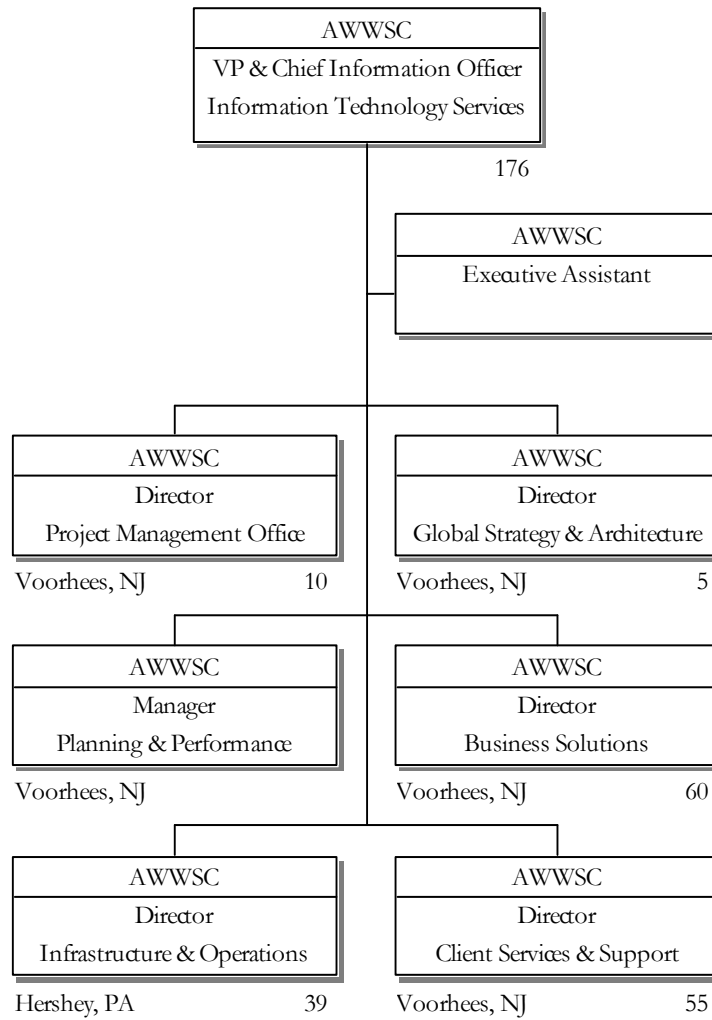
The 2007, ITS objectives included SOX certification/IT compliance, day-to-day support for business, development of a long-term IT strategy, improvements of services and performance, and execution of projects and enhancements approved and ranked by the IT Steering Committee.²⁵⁷

Organization & Staffing

The AWWSC ITS organization is led by a Vice President (VP) & Chief Information Officer (CIO) and is composed of six ITS groups that are primarily located in Voorhees (NJ) and Hershey (PA), plus site support and backup locations.²⁵⁸ These groups, illustrated in *Exhibit IV-1*, are:

- ◆ Business Solutions
- ◆ Infrastructure & Operations
- ◆ Client Services & Support
- ◆ Project Management Office
- ◆ Global Strategy & Architecture
- ◆ Planning & Performance

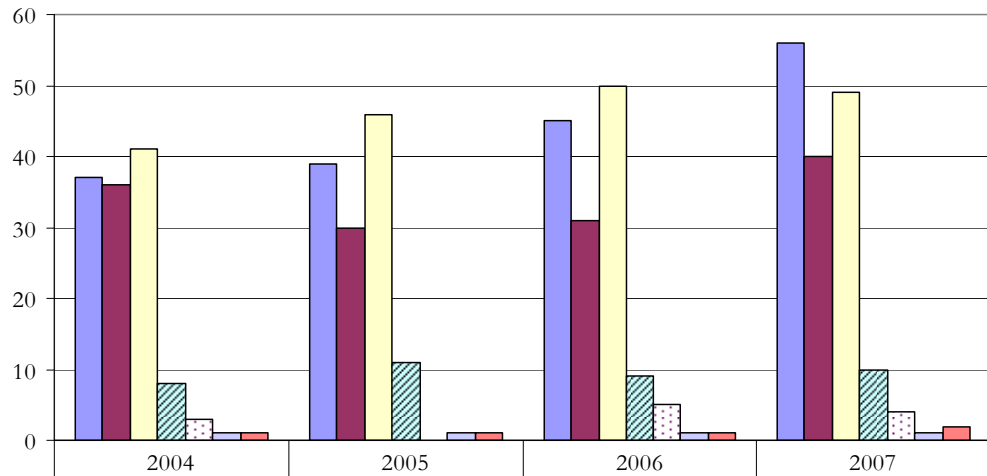
**Exhibit IV-1
 AWWSC Information Technology Services Organization
 as of December 31, 2007**



Source: Information Response 257

At the end of 2007, the ITS organization had 177 approved positions, of which 162 were filled.²⁵⁹ The staffing levels of the ITS organization over the last four years are shown in *Exhibit IV-2*. The majority of the ITS organization is a shared-services function that provides support to all American Water businesses.²⁶⁰ Those positions that are dedicated to providing PAWC support were set at five for 2004 to 2006, but they increased to six in 2007.

**Exhibit IV-2
ITS Staffing Levels
2004 to 2007**



Business Solutions	37	39	45	56
Infrastructure & Operations	36	30	31	40
Client Services & Support	41	46	50	49
Project Management Office	8	11	9	10
Global Strategy & Architecture	3	0	5	4
Planning & Performance	1	1	1	1
Administration	1	1	1	2
Total ITS Organization	127	128	142	162

Excludes vacant positions (see *Exhibit IV-19* for actual (above) versus budget comparisons)

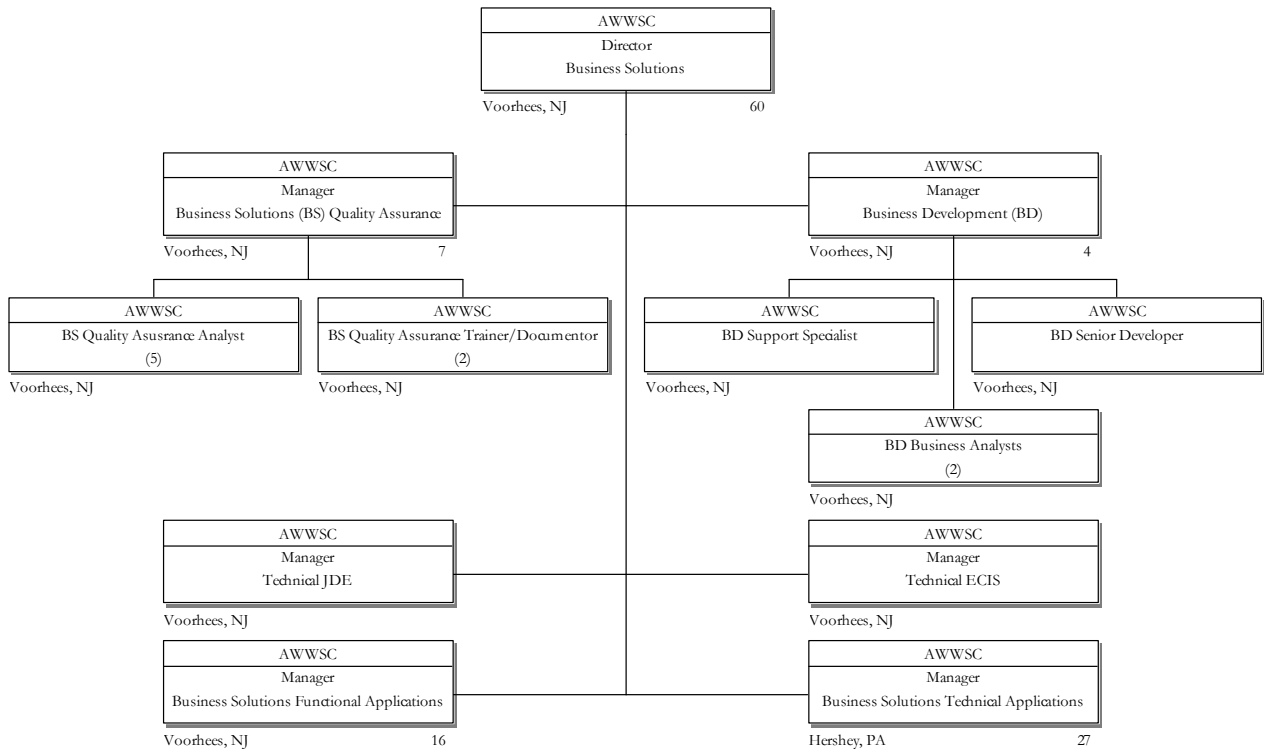
Prior to 2004, the ITS organization was not set up in the current structure and, as a result, information is not readily available.

Source: Information Responses 67 and 765 and Company Comments

Business Solutions

The Business Solutions group, which is illustrated in *Exhibit IV-3*, was formed in 2004 as part of restructuring efforts to work with business units (BUs) on application and data.²⁶¹

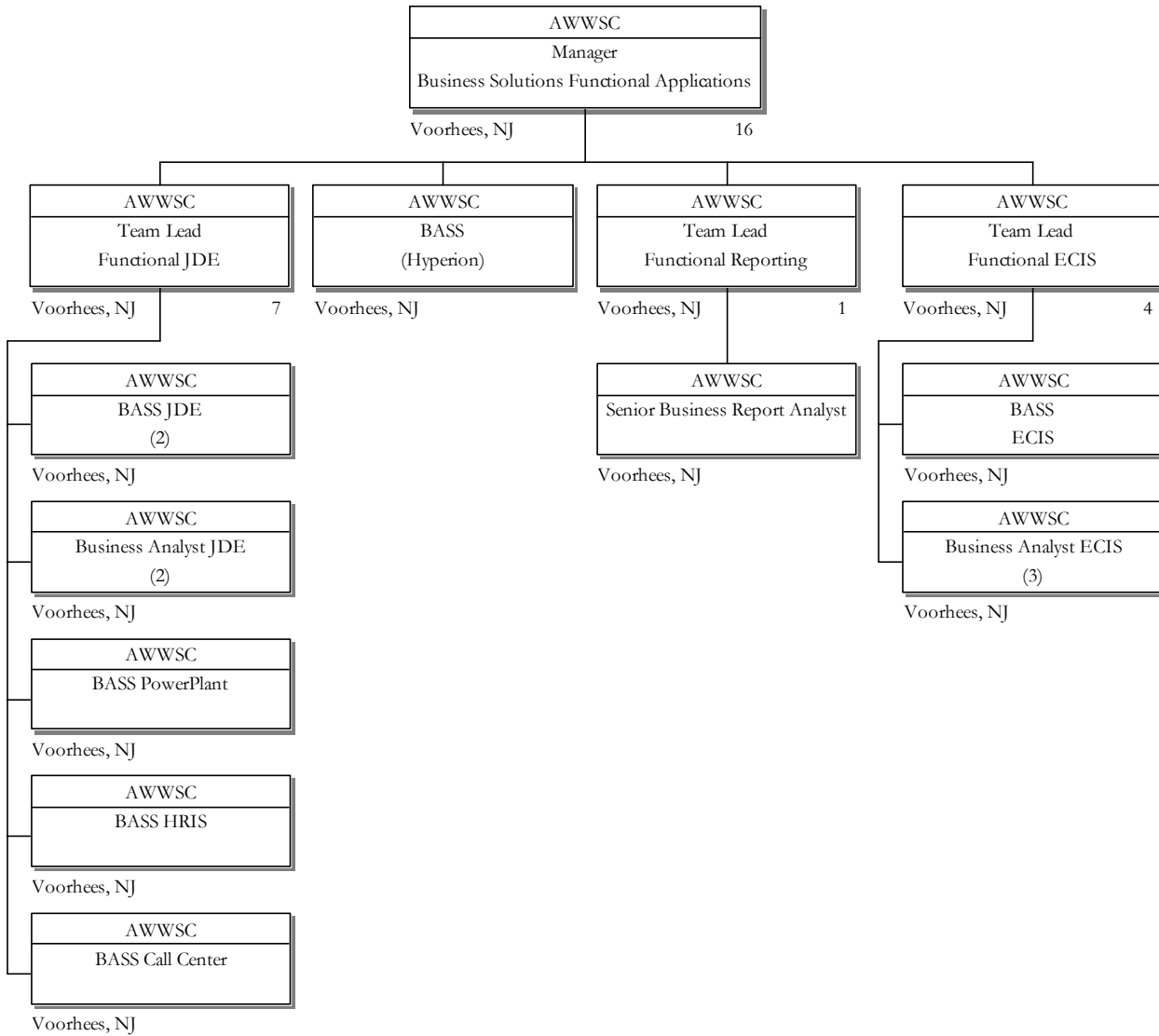
**Exhibit IV-3
 ITS Business Solutions Organization
 as of December 31, 2007**



Source: Information Response 257 and Company Comments

The Functional Application and Technical Application groups within Business Solutions are shown respectively in *Exhibit IV-4* and *Exhibit IV-5*.²⁶²

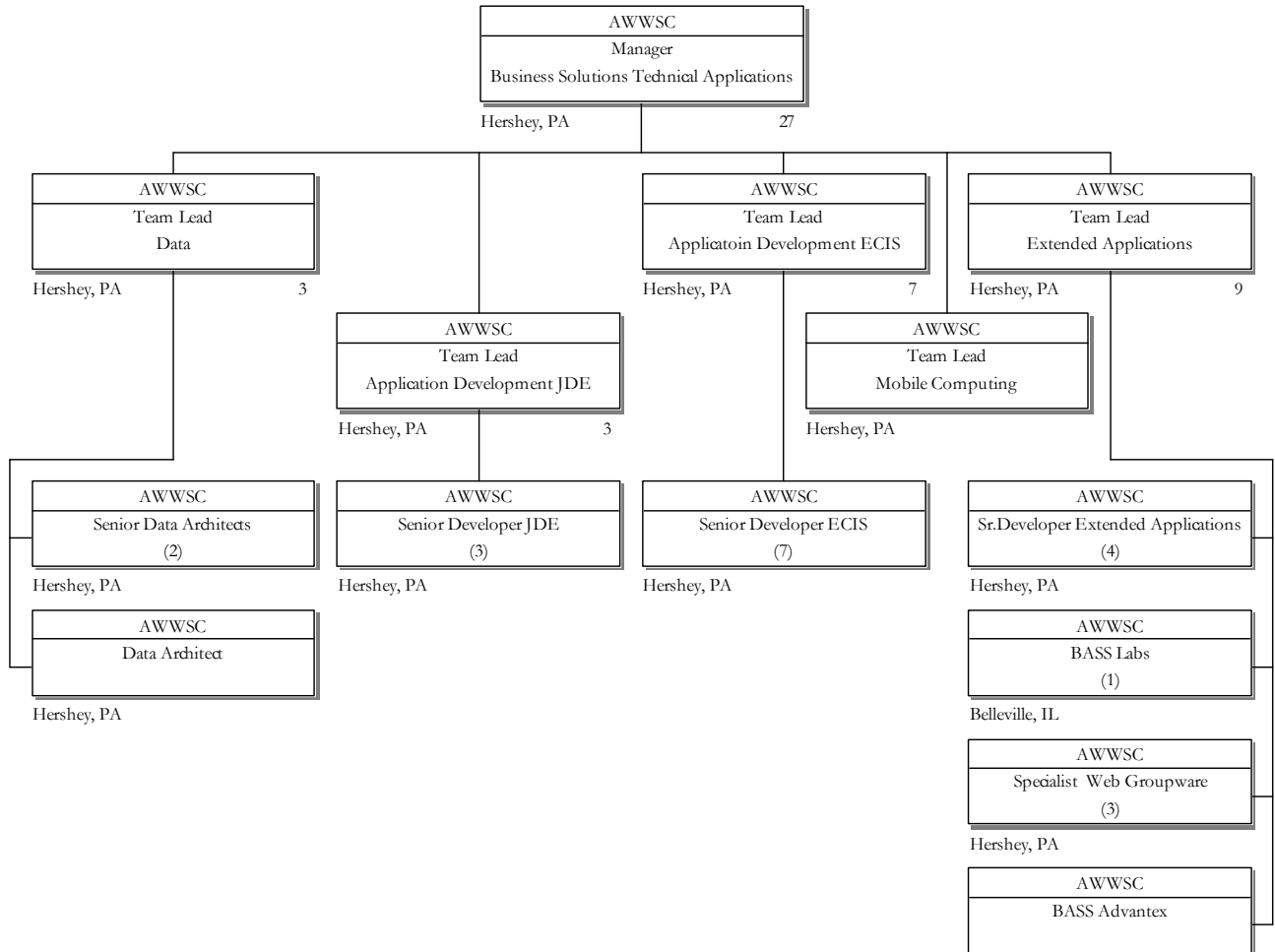
**Exhibit IV-4
ITS Business Solutions Organization
Functional Applications
as of December 31, 2007**



Business Application Support Specialist (BASS)

Source: Information Response 257 and Company Comments

**Exhibit IV-5
 ITS Business Solutions Organization
 Technical Applications
 as of December 31, 2007**



Business Application Support Specialist (BASS)

Source: Information Response 257 and Company Comments

An employee's typical pattern is to first gain experience in particular application(s), often smaller ones, to then become familiar with applications of a larger size, and finally to become involved in cross-training of various modules.²⁶³ Each employee is supposed to have a development plan that includes success measures associated with development objectives and activities.²⁶⁴ Most employees in the ITS organization have a technology background, but some come to the ITS organization from BUs, with the aim of becoming Business Analysts and Business Applications Support Specialists. When hiring employees, the Director looks for a mix of experienced and junior staff; however, this group leans more toward experienced staff, a hiring pattern the Director expects to continue.²⁶⁵

Exhibit IV-6 illustrates 2007 key performance indicators (KPIs) for the Director position, from which success measures for other Business Solutions employees are derived.²⁶⁶ The 2007 results, although not specifically illustrated in Exhibit IV-6, indicate that the targets for these metrics are being “met.”²⁶⁷

Exhibit IV-6
KPIs for the ITS Director of Business Solutions
as of December 31, 2007

KPI Description	KPI Formula	Weight	KPI Targets
Finance			
Manage operational spending within the budget established for respective area	Percentage of Q3 operating forecast underspending or overrun	15%	Exceeds: -3 % to 0% Meets: Over -3% to -5% Fail: Over 0% or over -5%
Customer			
Quality support of IT initiatives (projects, enhancements, break-fix, and maintenance, O&Ms, and tuck-ins)	Achieving average ranking of 90% or above	25%	Exceeds: > = 95% Meets: Between 85% and 95% Fail: 85% or less
Quality support of day-to-day operations	Achieving average ranking of 90% or above	5%	Exceeds: > = 95% Meets: Between 85% and 95% Fail: 85% or less
Processes			
SOX and external audit compliance	SOX and external audit compliance; no major weaknesses	25%	Exceeds: Certified, no weaknesses Meets: Certified, minor weaknesses Fail: Failed, major weaknesses
Enhance operational integrity and excellence	Continued improvement in mega processes	15%	Exceeds: Significant improvement Meets: Acceptable improvements Fail: Insufficient improvements
Employee			
Timely and effective staffing	Achieve targeted vacancy % level by year end	10%	Exceeds: < or = 3 % Meets: > 3% and < = 5% Fail: >5%
Development and training	Percentage of employees whose skill level increased as targeted in development plans	5%	Exceeds: > = 95% Meets: Between 85% and 95% Fail: 85% or less
		100%	

Source: Information Response 618 and 744

Some of the major systems supported include:²⁶⁸

- ◆ JD Edwards World (financial management of enterprise resource planning (ERP) modules, excluding budget management)
- ◆ Electronic Customer Information System (E-CIS) (customer services, including tracking of customer, account, premise, and service information)
- ◆ Hyperion (financial reporting and consolidation, initially used for budget management and eventually to be used for providing data on performance management)
- ◆ Sabrix (sales-and-use tax management)
- ◆ PowerPlant (fixed-assets management)

- ◆ Advantex (workforce automation)
- ◆ AdvantGard Integrated Cash Management System (ICMS) (only hardware and backend technologies of cash management system as Treasury support software)
- ◆ Meter shops/reading
- ◆ Others

Currently, American Water supports a hybrid of homegrown and packaged software applications; previously, most were homegrown applications. Although American Water is moving toward greater use of software packages, the ITS organization usually creates interfaces internally. That is because having a vendor do these interfaces is frequently expensive and creating them internally helps create ownership. Historically, ITS has driven application decisions, but the organization believes that BUs are becoming more knowledgeable about technology and applications.²⁶⁹

Currently, this group has major projects under way, including:²⁷⁰

- ◆ Billing and collections enhancements to E-CIS application
- ◆ Identity access management (IAM) security enhancements
- ◆ Advantex/Service First software upgrade
- ◆ Telephony redesign
- ◆ Internet redesign, including movement of ITS portal to SharePoint technology
- ◆ Divestiture logo redesign (removal) once initial public offering (IPO) completed

When needed, ITS uses external resources, typically on projects but occasionally on support functions. They usually come from one outside independent consulting firm (Accenture) or as independent consultants.²⁷¹

Besides applications development and support staff, the Business Solutions group also includes a quality assurance (QA) group. The QA Managers and QA analysts are involved with documentation and test plans, test scripts, assisting BUs, and defects tracking.²⁷² ITS developers execute unit tests.²⁷³ QA's role is to guide, assist, and support testers throughout the testing process; however, the QA analysts do not actually perform QA testing. A User Acceptance Testing (UAT) group from the business unit that requested the change is actively involved in most other types of testing activities, as shown in *Exhibit IV-7*, often as the primary group responsible for such testing.²⁷⁴ Many business units believe that ITS should be more actively involved in testing.²⁷⁵



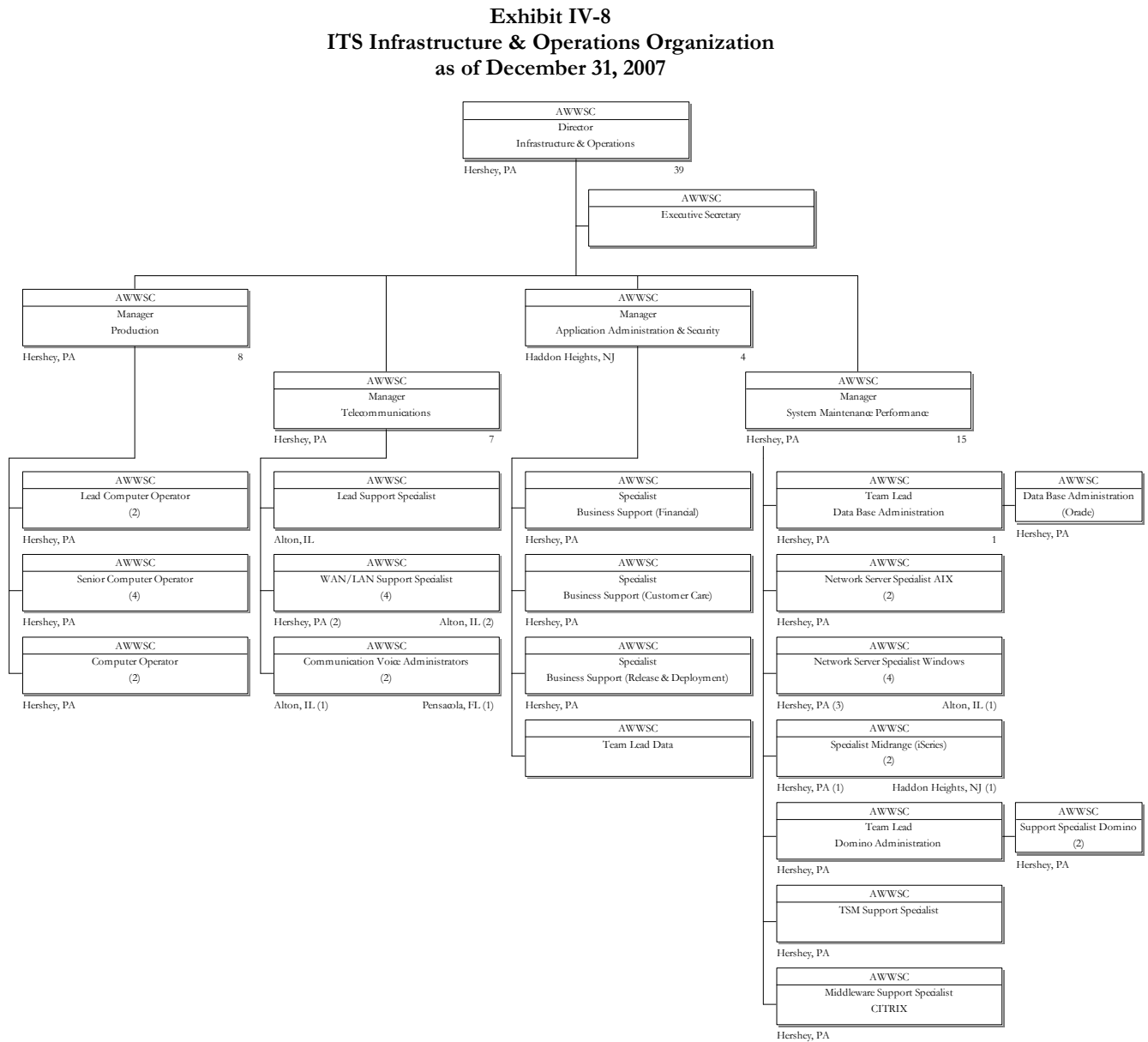
**Exhibit IV-7
Typical Testing Performed and Responsible Group
as of December 31, 2007**

	Type of Testing	Primary Group Responsible	Brief Description of Testing
1	Unit testing	ITS developers or a designated agent	Implemented against the smallest testable element (unit) of the system. It involves the testing of internal structures of the requested change, such as logic and data flow and/or the unit's function and observable behaviors. Unit testing is required for all changes.
2	Functional testing	Business unit	Executed by the User Acceptance Testing (UAT) group based on the test plan and test cases. Functional testing is to be performed for all projects. It is conducted to ensure that each function, transaction, and feature works correctly as per documented business requirements.
3	System integration testing	Business unit	Executed by the UAT group, if applicable, based on the test plan and test cases. Integration testing is to be performed for any modification where the change spans over multiple functional areas or business processes. It is conducted to ensure that the downstream impact of transactions is fully validated.
4	User acceptance testing	Business unit	Executed by the UAT group based on the test plan and test cases. User acceptance testing is to be performed for all modifications. It is the execution of predefined business scenarios or test scripts, which combine various business processes or test cases. User acceptance testing can span multiple systems, applications, and manual processes in accordance with the expected results.
5	Regression testing	Business unit	Executed by the UAT group, if applicable, based on the test plan and test cases. Regression testing is to be performed if the change could potentially and unintentionally affect functions, processes, or data that this change is related to but was not designed to alter. It looks at potentially impacted processes and scenarios that did not change but must be tested to prove no negative impacts exist.
6	Performance testing	ITS Infrastructure & Operations	Executed by ITS Infrastructure & Operations with assistance from the UAT group, if applicable, based on the test plan. Performance testing is to be executed when the change may have adverse effect on the network, system, or application as a result of the solution's or related systems' unknown behaviors. Its goal is to eliminate performance bottlenecks and to ensure that the solution is performing according to specified expectations based on KPIs that are essential for a meaningful performance test.
7	Load testing	Various ITS groups	If applicable, based on the test plan, load testing is executed by the ITS team in cooperation with, and on behalf of, the UAT group. It is to be performed when automated data loading is performed. This test is performed to ensure the accuracy and timeliness of data load into production environment to meet a KPI-measured quality and time window required for data migration. QA is accountable for coordination, scheduling, and management of the load test. ITS employees are accountable for execution of programs in a timely and scheduled fashion. The UAT group is accountable for data validation and reconciliation.
8	Stress testing	ITS Infrastructure & Operations	If applicable, stress testing is executed by ITS Infrastructure & Operations with assistance from the UAT group. It is to be executed when the change may have adverse effect on the network, system, or application as a result of volume of data, number of users, access method, configuration of landscape or interfaces, etc. Stress testing is performed to determine the stability and performance of a system under full or exceeded load of transactions and users. It involves testing beyond normal operational capacity, often to a breaking point, to observe the applications, systems, or network behavior.

Source: Interview 62 and Information Response 614

Infrastructure & Operations

The ITS Infrastructure & Operations group is illustrated in *Exhibit IV-8*.²⁷⁶



Source: Information Response 257 and Company Comments

Each Infrastructure & Operations employee is supposed to have a development plan that includes success measures associated with development objectives and activities.²⁷⁷ *Exhibit IV-9* illustrates the Director's KPIs, from which success measures for other Infrastructure & Operations employees are

derived.²⁷⁸ The 2007 results, although not illustrated in *Exhibit IV-9*, indicate that the targets for these metrics are being “met” or “exceeded.”²⁷⁹

Exhibit IV-9
KPIs for the ITS Director of Infrastructure & Operations
as of December 31, 2007

KPI Description	KPI Formula	Weight	KPI Targets
Finance			
Manage operational spending within the budget established for respective area	Percentage of Q3 operating forecast underspending or overrun	20%	Exceeds: -3 % to 0% Meets: Over -3% to -5% Fail: Over 0% .or over -5%
Manage capital spending within the budget established for respective area	Percentage of Q3 capital forecast underspending or overrun	10%	Exceeds: -5 % to 0% Meets: Over -5% to -10% Fail: Over 0% or over -10%
Customer			
Effective and timely support of IT initiatives (projects, enhancements, break-fix, and maintenance)	Percentage of work orders not meeting completion deadlines	10%	Exceeds: < or = 3% Meets: > 3% or <= 5% Fails: > 5%
Quality support of day-to-day operations and IT initiatives (projects, enhancements, break-fix, and maintenance)	Percentage of initiatives achieving average ranking of 90 or above	10%	Exceeds: >=95% Meets: Between 85% and 95% Fails: Under 85%
Processes			
SOX compliance	SOX compliance; no major weaknesses	25%	Exceeds: Certified, no weaknesses Meets: Certified, minor weaknesses Fail: Failed, major weaknesses
Enhance operational integrity and excellence	Continued improvement in mega processes	10%	Exceeds: Significant improvement Meets: Acceptable improvements Fail: Insufficient improvements
Employee			
Timely and effective staffing	Achieve targeted vacancy % level by year end	10%	Exceeds: < or = 3 % Meets: > 3% and. < = 5% Fail: > 5%
Development and training	Percentage of employees whose skill level increased as targeted in development plans	5%	Exceeds: > = 95% Meets: Between 85% and 95% Fail: 85% or less

Source: Information Responses 561 and 745

This group is composed of four subgroups:²⁸⁰

- ◆ Within the *Production* group, batch-production runs occur every night for customer service (AS/400) and financial (AS/400) systems. Most systems now run in a client/server environment, although JD Edwards (JDE) and Lotus Notes still run on AS/400 equipment.²⁸¹ Two data centers exist: one in Hershey (PA), the main facility, and the other in Haddon Heights (NJ), which is used for backup and disaster-recovery purposes.²⁸² The Hershey data center is staffed (three shifts) on a five days/week x 24 hours/day basis; however, data-center computers are available on weekends as well as weekdays because the data center then operates in a lights-out (no-staffing) manner.²⁸³ If necessary, ITS staff can be called into the data center using a formal on-call list.²⁸⁴ A Hershey data center expansion project is being completed in response to

capacity-planning efforts. Other projects include identity access management (IAM), voice over Internet protocol (VoIP), Cisco IP, etc. American Water has various platforms, including Microsoft Exchange and Lotus Notes for voicemail purposes, but is moving toward Microsoft Exchange as its standard platform. It also uses Cisco firewalls with content filtering at two points of presence (POPs) (Hershey and Haddon Heights). ITS has focused on disaster recovery/restoration as part of key SOX “404” applications. E-mail archiving and data retention is also being discussed.²⁸⁵ This group shares responsibility with the Operations Risk Management (ORM) for firewalls between supervisory control and data acquisition (SCADA) and BU servers, because ITS staff manages the network; however, the group does not support SCADA servers and applications.²⁸⁶ Refer to ***Error! Reference source not found.*** for further discussion about Chapter 101 compliance with regard to cyber-security and disaster recovery plans and to *Chapter V – Water Operations* with regard to physical-security, business-continuity, and emergency-response plans.

- ◆ The *Telecommunications* group is responsible for both data and voice communications, although American Water is just now centralizing voice systems. American Water has various platforms across its system, including Cisco, Avaya, Siemens, AT&T, and Lucent. For those areas where Avaya PBX telephone systems exist, American Water is moving its telephone systems to Cisco IP, as systems are fully depreciated and contracts expire.²⁸⁷
- ◆ The *Application Administration & Security Management* group has only recently been formed as part of American Water’s SOX compliance efforts, largely to ensure segregation of duties.²⁸⁸ Its focus is evolving. One area of responsibility includes access management. To gain access to American Water’s network and computer systems, a user access request (UAR) form (signed by a user’s supervisor) must be submitted for approval. The form is sent to the Operational Risk Management (ORM) Security group and then to the respective AWWSC BU for approval, if the requested access is determined to be a highly sensitive entitlement. Another area of responsibility within this group includes the processes for release and deployment from a pre-production environment to a production environment.²⁸⁹ One of the projects in progress is an identity access-management project that is scheduled to be completed by end of year (EOY) 2007.²⁹⁰
- ◆ The *Systems Maintenance & Performance* group is responsible for monitoring, maintenance, support, and administration of hardware, databases (not content), and Lotus Notes, including capacity planning. Various databases are used, including Oracle for Advantex (Service First), Hyperion, PowerPlant, Sabrix—although American Water also uses SQL, DB/400—and others.²⁹¹ Key projects under way in late 2007 include:²⁹²
 - Facility/infrastructure improvements
 - Upgrade central processing unit (CPU) of the production systems and development systems
 - Implement independent auxiliary storage pod (IASP) on production and development systems
 - Active directory (AD) security portion of the A/M project
 - Virtual machine (VM) pilot



Exhibit IV-10 illustrates other major Infrastructure & Operations initiatives that are either in progress or scheduled to be started.²⁹³

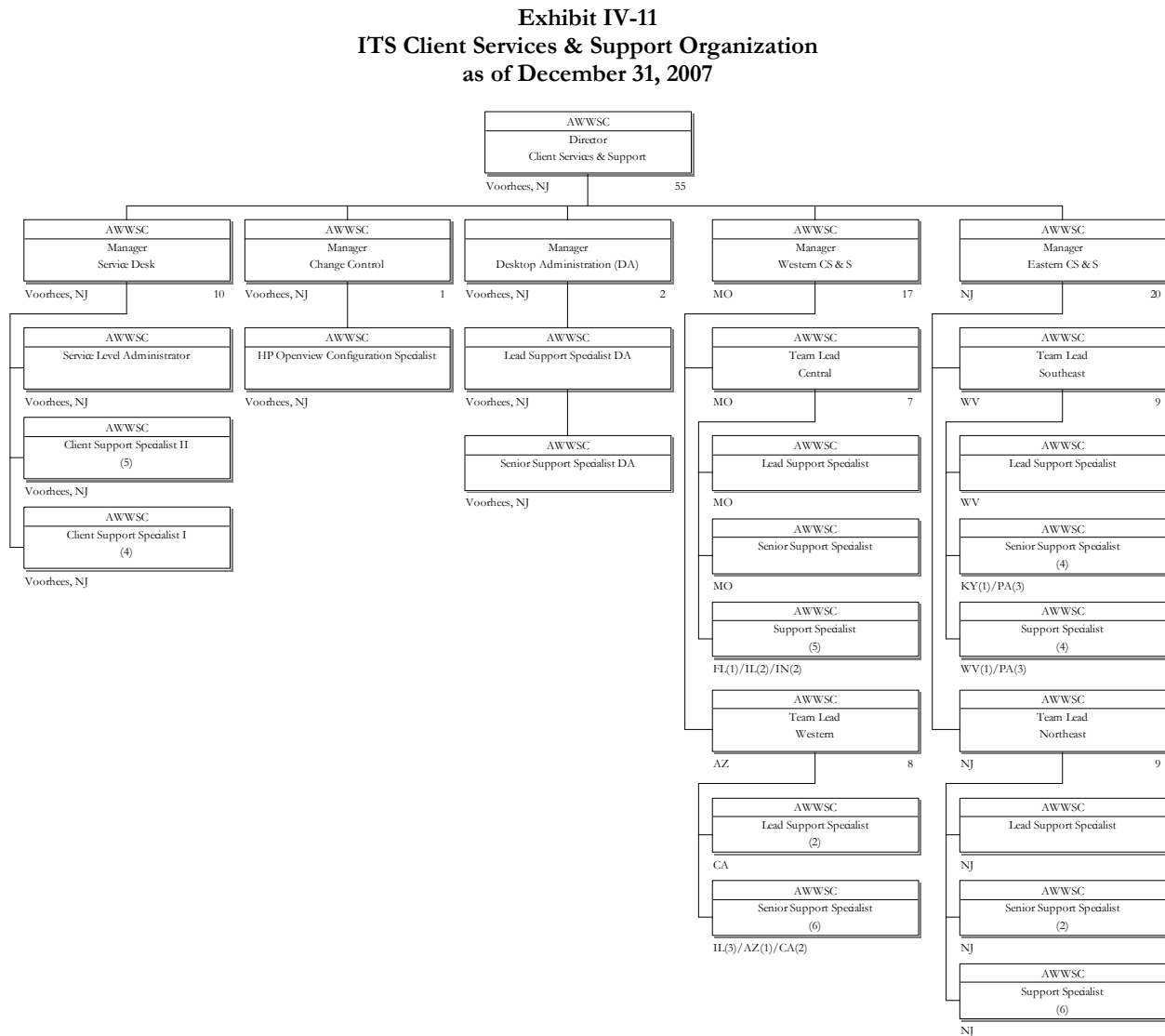
Exhibit IV-10
Major Infrastructure & Operations Initiatives
as of December 31, 2007

Due Date	Status	Impact	Title
End Before 6/31/08	In Progress	Medium	SQL Server Consolidation
End Before 8/31/08	In Progress	High	Oracle Server Consolidation
End Before 3/31/08	In Progress	High	SQL Server Secure Configuration Upgrade
End Before 3/31/08	In Progress	High	Oracle Server Secure Configuration Upgrade
End Before 3/31/08	In Progress	Medium	SQL Server Logging Automation
End Before 3/31/08	In Progress	Medium	Oracle Server Logging Automation
End Before 12/31/08	In Progress	Low	VM Ware Installation
End Before 3/31/08	In Progress	Medium	CITRIX Server Consolidation
End Before 12/31/08	In Progress	Medium	ES800 to DS8300 upgrade
End Before 12/31/08	Not Started	Medium	Physical Windows Server Consolidation

Source: Information Response 557

Client Services & Support

Exhibit IV-11 illustrates the ITS Client Services & Support (CS&S) organization.²⁹⁴



Source: Information Response 257 and Company Comments

This group's key functions include:²⁹⁵

- ◆ Site support (excludes Hershey data-center operations and support) for desktops/laptops, servers, and other network devices, including SCADA equipment but not software; fax equipment (located throughout American Water sites), which includes (but is not limited to) software deployment, troubleshooting, and monitoring at 81 PAWC sites for approximately 725 office personal computers (PCs), 143 tough books, and 60 SCADA PCs²⁹⁶

- ◆ IT change management (event and problem management), including moving of equipment and software into production
- ◆ Service (help) desk (7:00 a.m. to 7:00 p.m. Mondays through Fridays, with 7 days/week and 24 hours/day support via cellular telephone) for systems excluding SCADA; the help desk uses HP's OpenView Service Center software for tracking, monitoring, and reporting requests, in which Level 1 support is provided internally by help desk and Level 2 and 3 support by other ITS groups
- ◆ End-user training sessions
- ◆ Communications with user organization on support activities

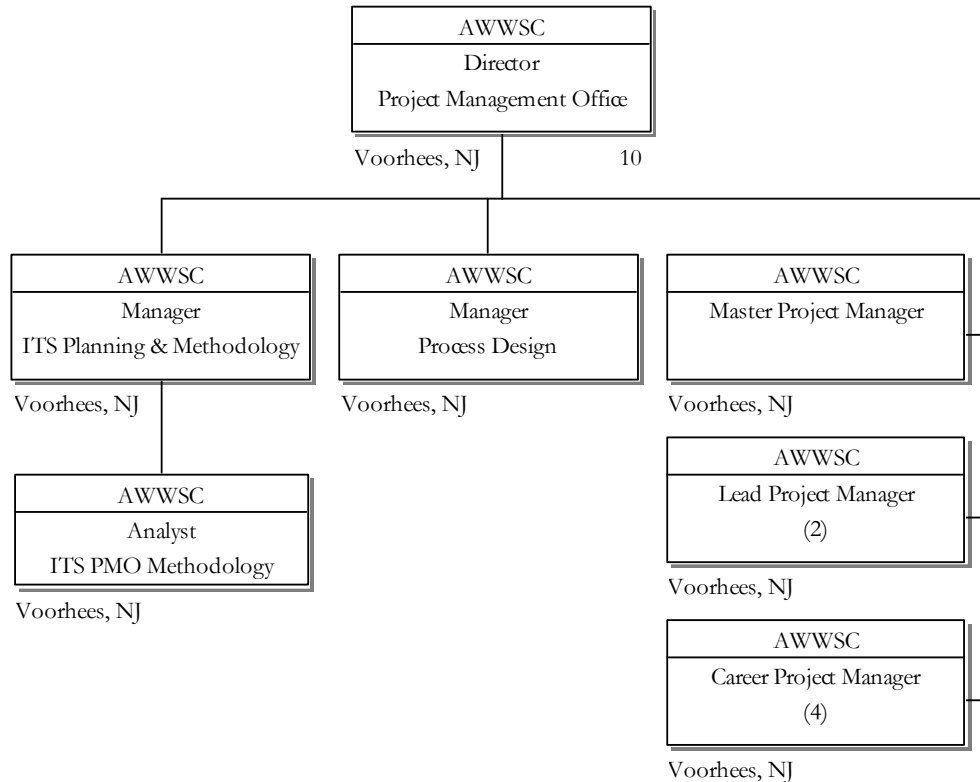
American Water has been attempting to standardize applications on desktop computers, and the Desktop Administration Manager estimated that the company has completed roughly 60% of this task at 2007 year-end. He is continually redeveloping the image; however, American Water has only one image with applications sitting on top of the core image. The desktop currently being imaged is based on Microsoft XP/Office 2003 and Lotus Notes. (Cost plus applications, such Microsoft Visio and Microsoft Project, are only installed when requested and approved by BU management.) American Water is evaluating when to go from Microsoft XP/Office 2003 to Microsoft Vista/Office 2007.²⁹⁷

Additionally, CS&S management indicates that its 2008 focus will be to expand from a break/fix orientation to a more proactive stance whereby additional services are provided to its customers. Among the activities that management hopes to consider adding to this group's responsibilities include use of additional software-deployment capabilities, inclusion of SCADA calls to the service desk, server and workstation virtualization, working as a partner with BUs for planning purposes, as well as others.²⁹⁸

Project Management Office

The ITS Project Management Office (PMO) organization is illustrated in *Exhibit IV-12*. At the time of Schumaker & Company’s field work, the Director’s position was filled by the Manager of ITS Planning & Methodology on an interim basis, as well as his own position.²⁹⁹

Exhibit IV-12
ITS Project Management Office Organization
as of December 31, 2007



Source: Information Response 257

This group is responsible for managing technology projects and portfolios of projects. It also facilitates the IT Steering Committee (ITSC) process. For every major project, a VP is assigned as a business sponsor. A business lead is also assigned, along with technical lead(s). All leads report to the project manager who is assigned to this project from the PMO organization. The project manager reports to a Project Steering Committee (PSC), which is formed to approve design, testing, production, etc. The PSC includes the business sponsor as well as VPs from the areas impacted. Many of the project managers have a technology background, although some also come with a business background. The ITS organization has three project-manager levels, including:³⁰⁰

- ◆ *Master* – has managed large projects from cradle to grave
- ◆ *Lead* – has managed small to medium projects, but not large projects

- ◆ *Career* – has managed small to medium projects; however, they are normally less complex projects than the Lead project-manager level

Other PMO groups include:³⁰¹

- ◆ *Planning & Methodology* – This group is responsible for ensuring that ITS' project-management methodology is followed on technology projects, monitoring committee activities, and mediating issues.
- ◆ *Process Design* – This group is responsible for effectively guiding and training BUs and the ITS organization through the design of business processes as technology projects are implemented. For example, the Process Design Manager mediates meetings to lead BUs in process design. That way, s/he can ensure that business requirements are met. Current projects include:
 - *Call center technology replacement project* – replacing Avaya solution, which is quite old; now looking at overall design as American Water is in the middle of evaluating options
 - *Upgrade of Service First project* – Advantex software package for scheduling and managing service orders was initially implemented approximately four years ago; upgrade under way aims to incorporate release and increase capacity

Each ITS project is governed by the following four phases:³⁰²

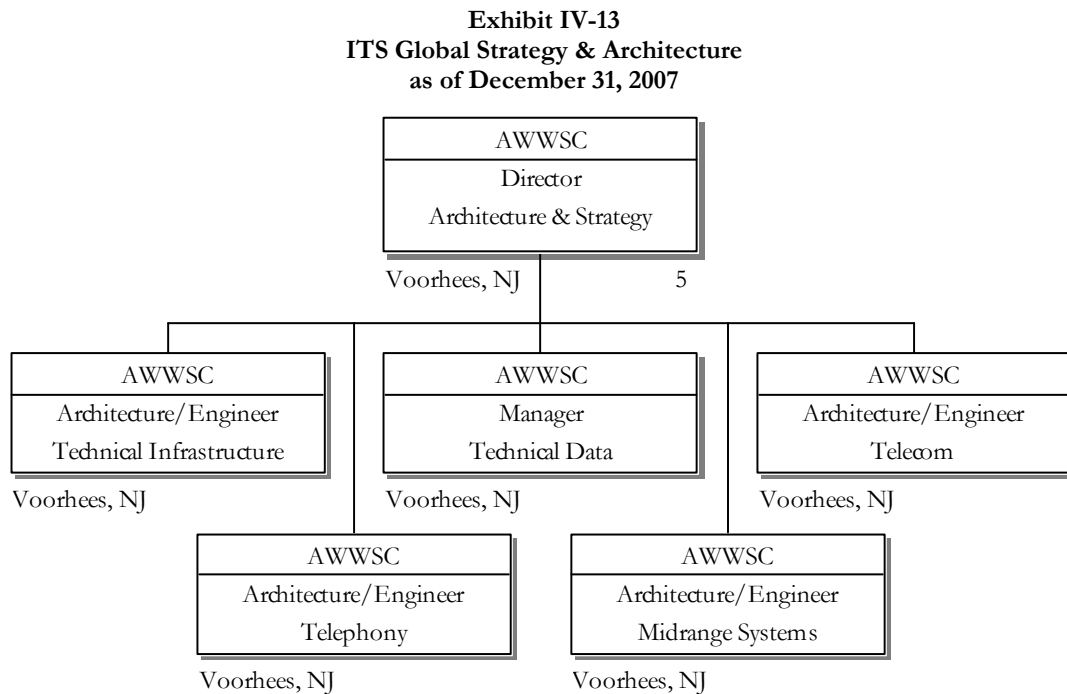
1. In the *Initiation Phase*, an idea for a project is developed into a full-blown business case.
2. During the *Planning Phase*, business and technical designs, along with the implementation approach and project plan, are documented.
3. The project team (Business and ITS) delivers the *Execute/Deliver Phase* via programming, configuration, and testing tasks, based on the requirements and specifications produced during the planning phase. The project manager oversees project delivery and reports to the business sponsor and project-steering team with regular status updates, scope change requests, project risks, and issues.
4. Projects are completed in the *Close Phase* where resources are released, accounting is closed, and lessons learned surveys are completed. All project knowledge, including any remaining open issues and risks, is transferred to ITS production support and the business sponsor.

American Water's project-management methodology, incorporating these four phases, is based on Deloitte's *PMO in a Box* methodology, which aligns closely with Project Management Institute's *Project Management Body of Knowledge* (PMBOK) and additional policies and procedures governed by SOX compliance. Supporting processes are used throughout the project lifecycle, including cost and financial management, resource allocation, project portfolio management, issue and risk management, management reporting, procurement management, benefits management, and scope change management.³⁰⁵

Each week, the PMO Director meets with the project managers to discuss each of the projects that are under way and the status of each.³⁰⁴

Global Strategy & Architecture

Exhibit IV-13 illustrates the ITS Global Strategy & Architecture organization, which was established in 2007.³⁰⁵



Source: Information Response 257

The Director of Global Strategy & Architecture position has been vacant since September 2007 and one of the five positions (Architect/Engineer Midrange Systems) has not yet been filled. Although the CIO expected to fill all vacant positions by end of calendar year 2007,³⁰⁶ as of the middle of January 2008, they were still vacant.³⁰⁷

This group's focus is to address pain points that have occurred because systems are not appropriately architected up front, including those architected correctly, not integrated in an appropriate manner, or not meeting ITS' strategic direction.³⁰⁸ To accomplish this aim, this group's existing objectives are to develop standards involving design and providing the last level of support for requests. In the autumn of 2007, the group was in the process of prioritizing standards and developing a high-priority list, as shown in *Exhibit IV-14*, which the Information Technical Review Board (ITRB) must approve.³⁰⁹ Although various ITS groups may be initially developing a standard, the Global Strategy & Architecture group is responsible for coordination of these standards.³¹⁰

**Exhibit IV-14
High-Priority List of Standards
as of December 31, 2007**

Group	Standard Name	Completion Date
Architecture	Data/Voice Wiring and Cabinet Standards	2007 (September)
	Network Router and Switch Hardware Standard	2007 (September)
	Telephone Models	2007 (October)
	Telephony and Voicemail Systems	2007 (November) (estimate)
	Wireless Standard	2008 (December) (estimate)
	Unified Communications Standard	2008 (December) (estimate)
	Call Center Telephony Standard	2008 (December) (estimate)
	Enterprise Directory Standard	2008 (December) (estimate)
	Wintel Server Standard	2008 (December) (estimate)
	Video Collaboration Standard	2008 (December) (estimate)
	Voice Network Standard	2008 (December) (estimate)
Business Solutions	Application Development Standards	2005 (December)
	Data Architecture Standards	2008 (December) (estimate)
	Web Development Standards	2008 (December) (estimate)
Project Management Office	Resource Management	2008 (December) (estimate)
	Project Prioritization	2008 (December) (estimate)
	Portfolio Management	2008 (December) (estimate)
	Dashboards/Metrics	2008 (December) (estimate)
Client Services & Support	Desktop Hardware	2008 (December) (estimate)
	Desktop Applications	2008 (December) (estimate)
	Desktop Imaging Standards	2008 (December) (estimate)
	Printers/Multifunctional Devices	2008 (December) (estimate)
	Mobil Devices	2008 (December) (estimate)
	Wireless/PDA Technologies	2008 (December) (estimate)
Infrastructure & Operations	Backup & Recovery	2008 (December) (estimate)
	Job Scheduler Access	2008 (December) (estimate)
	Job Submission, Execution, and Monitoring	2008 (December) (estimate)
	Tape Management	2008 (December) (estimate)

Source: Information Response 492

Of the 28 standards identified in *Exhibit IV-14*, only four had been completed at the end of Schumaker & Company's field work and most others were expected to be completed in 2008. A new group that finds itself without a leader for a long period of time will likely find it difficult to achieve its major objectives.

Planning & Performance

The Planning & Performance organization is composed of one person who is responsible for assisting the VP & CIO and IT's managers and directors with financial and service level management and reporting, including:³¹¹

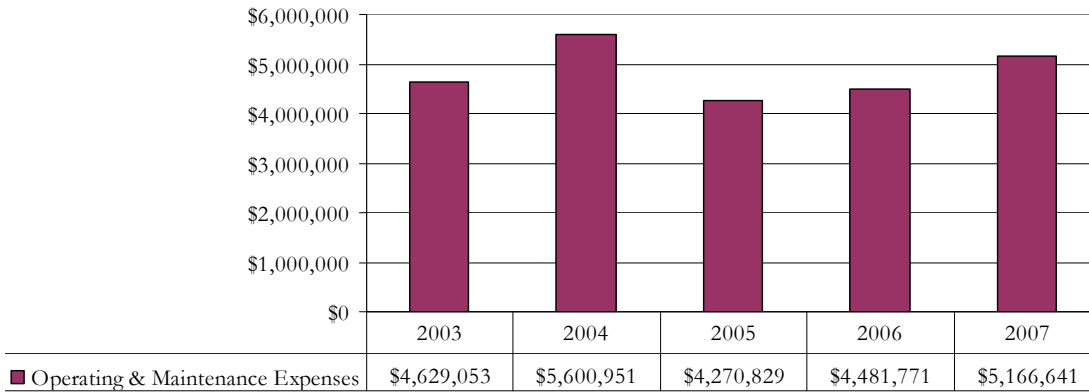
- ◆ Coordination of annual budget preparation for operations and maintenance (O&M) expenses and capital expenditures, monthly reforecasts of related financial data, and associated monthly variance analyses of actual data against budget and forecast levels
- ◆ Managing IT achieving monthly corporate financial deadlines, including
 - Submittal of variance report analyses and KPIs to AWWSC's planning organization
 - Participation in the "flash call" meeting with AWWSC's planning organization
 - Participation with the VP & CIO in the monthly business performance review meeting
- ◆ Coordination of monthly dashboard session reviews and creation of associated reports for reviews held monthly with IT's managers and directors
- ◆ Coordination of quarterly KPI reports of targets and results for IT organization where targets include:
 - Help desk first call resolution statistics
 - Actual versus budget financial data
 - Availability of data center
 - Availability of network
- ◆ Performing a sanity check of formulas used for IT allocation of costs by reviewing reports
- ◆ Helping IT's managers and directors promote quality in reporting by ensuring consistency (and removing consistency) in KPIs
- ◆ Performing special projects, as necessary

Expenditures

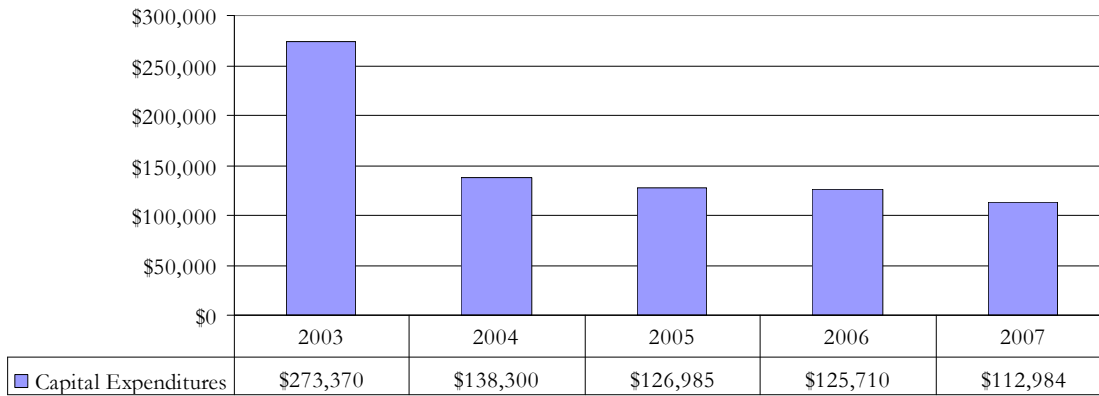
Exhibit IV-15 displays 2003 to 2007 information technology costs that have been charged to PAWC.³¹²

**Exhibit IV-15
PAWC Information Technology Costs
2003 to 2007**

Operating & Maintenance Expenses



Capital Expenditures



Source: Information Responses 68, 770, and 807

The ITS operating and capital budgets are developed for each AWWSC ITS organization, not at a state-specific level, which is typical of most service company functions. However, PAWC does have a technology-related capital budget managed by the AWWSC ITS organization. Prior to 2004, the ITS organization was not set up in the current structure and, as such, information is not readily available; therefore, AWWSC/PAWC was unable to provide equivalent 2003 capital expenditures. The ITS-related O&M expenses displayed are those amounts charged to PAWC on the AWWSC billing statements.³¹³ American Water ITS purchases some services specifically for PAWC, including telephony, telecommunications, copiers, and maintenance/support. Other services purchased by the ITS organization benefit all American Water customers, including PAWC.³¹⁴

Backup/Recovery, Disaster Recovery, and Security/Protection

Backup/Recovery

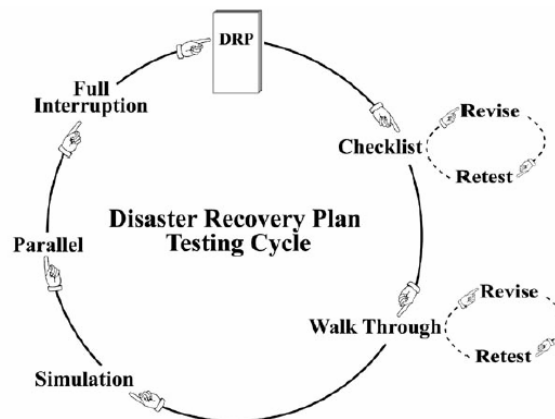
Tape copies of the key business systems' data and applications are produced on a daily, weekly, and monthly cycle based on American Water's established recovery-point objectives. Backup activities are monitored daily and are validated for success/failure. Remediation steps are taken for any backups that have not been successful. Automated tools are used to monitor jobs and to report exceptions to technicians. Computer operator(s) monitor the system console for errors and failed jobs are rerun.³¹⁵

All critical data is in the Hershey data center. Its data is backed up daily at secured offsite facilities, which include a location in New Jersey for AS/400 data and a nearby Pennsylvania location (approximately two miles away) for client/server data.³¹⁶

Disaster Recovery

The ITS organization has disaster-recovery-plan documentation that describes the use of regular testing cycles. Example testing methods were illustrated in the plan, as shown in *Exhibit IV-16*, which was compiled by ITS management and adapted from *The Disaster Recovery Journal DR Glossary and Testing Methods* (Wold & Shriver, 1994).³¹⁷

Exhibit IV-16
Example Disaster-Recovery-Plan (DRP) Testing Cycle
as of December 31 2007



Source: Information Response 637

The plan goes on to say that a test cycle should consist of a minimum of three phases, including a checklist, a walk through, and one of the advanced testing methods (simulation, parallel, and full interruption). Specifically, for the ITS organization, it indicates that the American Water testing frequency should include:³¹⁸

- ◆ Cluster data integrity (weekly)
- ◆ Walk through (quarterly)
- ◆ Random equipment failure (twice a year)
- ◆ Hershey data center failure (once a year)

According to ITS management, as part of its annual data-center failure test, all critical applications are to be restored according to a schedule, which is reviewed and approved by the appropriate business-function owner(s). Additionally, each business owner is to indicate if the test was a success.³¹⁹ See *Finding IV-10* for further discussion of American Water's disaster recovery plan and testing activities.

Security/Protection

Among the various security and protection actions that the ITS organization takes include the following:

- ◆ *Network* – Perimeter firewalls are installed between the Internet and American Water's network to establish a secure environment for the company's computer and network resources.³²⁰
- ◆ *Virus Protection* – All servers and personal computers use antivirus software and automated virus-scan policy management to safeguard the network and data. All computers are set up to receive regular virus updates from the antivirus system. Weekly reports are available to determine the status of engine and virus-definition files across American Water locations.³²¹
- ◆ *Logical Access* – All users access information systems through unique credentials, which include, but are not limited to, system account username and password pairs, strong authentication tokens, smart cards, or digital certificates. The monitoring of sensitive accounts, transactions, and data is also periodically done based on the sensitivity of the access or the risk level of the transactions.³²²
- ◆ *Physical Access* – Only authorized individuals are permitted physical access to centralized ITS resources. The data centers and associated rooms have doors that close automatically and securely. Mechanical locking mechanisms have storeroom function and remain locked at all times. Access to the data-center areas is controlled through an electronic access-control system (using an access badge), with entry and exit doors alarmed. Only personnel with defined business needs are authorized to enter these controlled access areas. Individuals who need to enter only occasionally are either escorted, issued temporary badges, or granted temporary access with their access badge. Individuals no longer requiring access have their access revoked upon notification.³²³
- ◆ *Fire/Water Protection of ITS Facilities* – Fire barriers within, above, and below the operations area plus fire alarms and overhead fire suppression systems are in place. Hand-operated extinguishers are also available and maintained per local fire and building codes. Rooms protected with an oxygen-displacing gas (Halon) as a fire-suppression system have doors that remain closed, and the protected areas comply with all local fire and building codes. (The Hershey data center is replacing its Halon system with FM200.) In addition, data centers and computer rooms are not located directly beneath sections of the facility that could become

water hazards, such as restrooms and kitchen areas.³²⁴

- ◆ *Backup Power Supply* – Potential points of utility failure have been eliminated and backup measures (i.e., installation of an uninterruptible power supply) have been implemented. In case of a power failure, emergency battery-powered lighting is installed and procedures are in place to periodically check their operation.³²⁵

Technology Audits

A total of 19 IT/IS-related audits have been performed in the last five years as shown in *Exhibit IV-17*.³²⁶ Although several were performed in 2003 through 2006, only two were performed in 2005 and 2006, and none occurred in 2007.³²⁷ Refer to *Chapter III – Financial Management* for a discussion of the decreasing number of audits performed by the AWWSC Internal Audit group.

Exhibit IV-17
IT/IS-Related Audits
2003 to 2007

Year	Description
2006	IS SCADA
2006	IS Service First Application
2005	IS AWWSC Operations Environment Review
2005	IS AWWSC Infrastructure Service Help Desk
2004	IS Operating Systems Review (Windows)
2004	IS Operating Systems Review (UNIX)
2004	IS Network Security
2004	IS Operating Systems Review (OS400)
2004	IS Data Center Review (Mt. Laurel)
2004	IS Data Center Review (Hershey)
2004	IS Data Center Review (Voorhees)
2004	IS Data Center Review (Belleville Lab)
2004	IS Data Center Review (Alton, Illinois)
2004	IS Change Management
2003	IS Data Center Review (Haddon Heights, NJ)
2003	IS PCI Data Center
2003	IS AWS PCI Standard Operating Procedures
2003	IS Business Continuity Planning
2003	IS AW Policy Review

Source: Information Response 615

Governance Processes

The governance processes include standards for planned and unplanned technology requests. According to ITS management, the documentation for these processes reflects a more restrictive environment, which ITS management believed was not working and, therefore, was recently changed. However, the documentation has not yet been adjusted to reflect these changes.³²⁸ Based on current practices, different levels of approval are required for approving all technology requests, depending on the type of request made.³²⁹

For *planned* technology requests, business units make their requests via the following process:³³⁰

- ◆ When interested in undertaking a technology project, a BU completes and submits a business opportunity form (BOF) (why, value, etc.) and a Technology Design Document – Level 1 (TDD L1) to the PMO for placement on the ITRB and ITSC agendas and distribution of the BOF to the ITSC. The ITRB reviews and provides feedback (suggested course corrections, standards requirements, technology roadmap requirements, etc.) regarding the TDD – L1 to ensure that the BOF presented to the ITSC represents a solution that is feasible and consistent with IT strategy before their consideration of the business value of the proposition. The ITSC is composed of the CFO, VPs, directors, and regional representatives, with the Director of Business Solutions as a non-voting member.
- ◆ The ITSC approves (or disapproves) the form (if a request is due to regulatory changes, then it is automatically done).
- ◆ If the ITSC approves the form, the PMO tracks business-case activities, which involves having the BU build a business case (also referred to as a Level 2 design), with ITS involved in estimating IT costs through the development of a Technology Design Document – Level 2 (TDD L2).
- ◆ The business case and TDD L2 are submitted to the ITRB, which is composed of ITS/Security directors who meet weekly to approve (or disapprove) the technical aspects of a project.
- ◆ Once the ITRB approves a business case, it goes back to the ITSC, which approves (or disapproves) the project. This approval process includes an endorsement of the capital budget, a project priority relative to other projects, and a scheduled start date. (If request involves enhancements, an ITSC subcommittee approves them.)
- ◆ ITS begins a project once the appropriate Regional Investment Management Committee (RIMC) (one for each of the four American Water regions and one for corporate, totaling five) releases the funds.
- ◆ The project is performed, in which a project manager, usually an ITS employee, heads the project team. (On large projects, both ITS and the BU generally have a project manager, with the ITS project manager acting as the overall project manager.) In 2007, ITS began having a Project Steering Committee (PSC), which is composed of high-level stakeholders, for all major

projects. The PSC meets monthly (or as needed) to provide oversight regarding the project’s business design, scope, testing, and finally making the recommendation to go live.

- ◆ Ultimately, however, the Change Approval Board (CAB), which meets weekly, is responsible for approving the requests that can actually go live. The CAB is composed of the Change Manager, ITS directors, and a Security director. Before moving systems to production, sign-offs using the production authorization form are required.

For *unplanned non-emergency* (break/fix) requests, requests are reported to the help desk and handled by the appropriate ITS group as part of its maintenance and support activities. Historically, ITS prioritized these requests; however, they now go into a queue, which ITS leads monitor on a daily basis, but are handled based on the process owner’s prioritization of these items.³³¹

For *unplanned emergency* requests (emergency is defined as a physical failure), requests are handled immediately but require a manager’s approval, with a post-mortem done by the CAB.³³²

The ITSC also approves the mix of how internal ITS resources should be split among break/fix, projects, enhancements, maintenance, and administration activities.³³³ The mix (approved as of December 31, 2007) is shown in *Exhibit IV-18*.³³⁴ Schumaker & Company did not identify any ITS mechanisms currently in place for ensuring that the approved mix is being followed.³³⁵

Exhibit IV-18
Mix of ITS Resources Approved by ITSC
as of December 31, 2007

IT Area	Projects	Enhancements	Break/Fix	Maintenance	Administration
Global Strategy & Architecture	60%	10%	5%	5%	20%
Core Business Systems	29%	21%	15%	15%	20%
Client Relations	10%	8%	45%	17%	20%
Infrastructure & Operations	12%	10%	25%	33%	20%
PMO	80%	0%	0%	0%	20%
Security	10%	20%	15%	35%	20%

Source: Information Response 490

Because ITS has limited resources, when the ITSC approves a project for ITS to complete, ITS may decide to augment its resources (if within budget).³³⁶

Findings & Conclusions

Finding IV-1 American Water's long-range IT planning activities have been on hold since SOX compliance efforts began in 2006 following RWE's December 2005 decision to divest of American Water.

At the time American Water was acquired by RWE in 2003, a major initiative was undertaken to integrate American Water processes and replace American Water applications with a single, common enterprise resources planning (ERP) solution. Also, work on legacy systems and applications were frozen. In December 2005, all IT initiatives were cancelled following RWE's decision to divest of American Water.³³⁷ Because all IT initiatives were cancelled, all long-range planning processes were put on hold when SOX compliance projects began in 2006. As a result, no long-range IT plan has existed since 2003 when American Water began its ERP initiative. In 2007 ITS started developing an infrastructure plan, but no applications plan is yet in progress.³³⁸ That is, no formal long-range plan exists. Only its five-year budget plan, similar to that of other American Water departments, and an 18-month project portfolio of both business-initiated and ITS infrastructure-related projects (developed based on business cases approved, ranked by the IT Steering Committee, and aligned based on rank and availability of the technology skills needed to execute the projects) exist.³³⁹

Despite not having a formal plan, in late 2007 ITS management verbally stated that its general expectations for the next five years are to refresh and standardize the IT infrastructure, to optimize ITS processes, and to implement new technologies to improve performance and enable business solutions needed by business units to meet their goals and objectives. ITS management also verbally stated that in 2008 it expects to replace existing outdated data network and other telecom technologies, to standardize its desktop environment, to upgrade existing core-system servers, and to deploy new telephony systems at sites where one is deemed needed and feasible. Also, other ITS activities include the delivery of projects as they are approved by the IT Steering Committee.³⁴⁰ For example, among those already investigated through strategy sessions is a review of client/server technologies that would reduce costs and improve and/or increase services to American Water customers³⁴¹ No formal strategic plan was in effect in late 2007.

The lack of a formal strategic plan prevents the ITSC from using such as plan as a guideline for deciding whether to approve (or disprove) projects and ranking-approved projects. It also means that ITS management's expectations are simply that as opposed to a plan for identifying what activities ITS should actually be doing.

Finding IV-2 ITS has made little progress in recent years with regard to addressing the technology needs of American Water's business units, including those impacting PAWC operations.

All IT initiatives were cancelled in 2005 and it appears that little progress has been made since then to address American Water's technology needs.³⁴² In late 2007, approximately 10 major IT projects were

under way, 30 business cases were started that might lead to major IT projects, and 13 major projects were backlogged.³⁴³ Additionally, examples of problems noted during this audit include:

- ◆ Dissatisfaction was expressed by various financial management groups due to lack of functionality in the current version of its financial enterprise resource planning (ERP) software, as discussed in *Chapter III – Financial Management*. This problem arose despite ITS' efforts to incorporate some enhancements.
- ◆ Software standardization across the American Water organization is lacking in selected instances. For example, although Schumaker & Company was told that American Water owns the inventory-management module of its ERP software, no Pennsylvania locations use the software. Instead, different inventory-management methodologies (manuals, spreadsheets, and Access databases) are in place in Pennsylvania, as discussed in the *Procurement Services and Materials Management* section of this chapter.
- ◆ Tools, such as 24x7 monitoring of failures, and analytical tools by the ITS help desk regarding types of issues so it can be more proactive in addressing customer needs are lacking.³⁴⁴

Although it was beyond the scope of this audit to determine specifically why little progress has been made, some of the potential factors brought to light include the following:³⁴⁵

- ◆ The lack of an IT strategic plan to guide the American Water organization in making project selection and prioritization decisions³⁴⁶
- ◆ The use of governance processes involving BOFs/business cases, project selection and prioritization, project initiation, project monitoring, and project closeout that is certainly cumbersome thanks to the many steps and groups involved and is, possibly, ineffectively implemented³⁴⁷
- ◆ The use of policies and procedures that focus primarily on SOX compliance rather than managing a well-run ITS organization³⁴⁸
- ◆ Relying too heavily on BUs to perform major testing activities (not just user-acceptance tests, which is generally done by BUs, but also functional tests, system integration tests, and regression-test activities as shown in *Exhibit IV-8*), which can cause delays because BUs must also be performing day-to-day operations at the same time³⁴⁹
- ◆ The vacancy of two key Director positions (PMO and Global Strategy & Architecture) for long periods of time³⁵⁰
- ◆ Inappropriate, and in some cases inadequate, ITS staffing levels³⁵¹

A recent ITS study was performed by Computer Sciences Corporation (CSC) on behalf of American Water. This study compared the staffing levels of ITS groups against industry averages. The study results indicated that the organization may want to review what staffing levels each ITS group should have. Preliminary indications are that these levels may be higher or lower than what ITS has budgeted in the past for each group.³⁵² That given, *Exhibit IV-19* illustrates that the number of positions

previously budgeted from 2005 to 2007 were not necessarily filled.³⁵³ According to ITS management, these vacancies were often attributable to hiring freezes.³⁵⁴

Exhibit IV-19
Actual versus Budget ITS Staffing Levels
2004 to 2007

	Actual			Budget			Difference		
	2005	2006	2007	2005	2006	2007	2005	2006	2007
Business Solutions	39	45	56	57	57	61	(18)	(12)	(5)
Infrastructure & Operations	30	31	40	39	37	40	(9)	(6)	0
Client Services & Support	46	50	49	58	56	56	(12)	(6)	(7)
Project Management Office	11	9	10	8	11	11	3	(2)	(1)
Global Strategy & Architecture	0	5	4	5	5	6	(5)	0	(2)
Planning & Performance	1	1	1	1	1	1	0	0	0
Administration	1	1	2	1	1	2	0	0	0
Total ITS Organization	128	142	162	169	168	177	(41)	(26)	(15)

Source: Information Responses 67 and 765

Certainly, an investigation of what staffing levels should be needs to be performed.

Finding IV-3 The PMO has developed project-management documentation that is extensive in scope; however, materials to help employees effectively apply these standards has not yet been included as part of such documentation.

The PMO has made an excellent start in developing project-management documentation, which includes the following.³⁵⁵

- ◆ PMO governance policy
- ◆ Project close practice
- ◆ Project initiation practice
- ◆ Project planning practice
- ◆ Project execute/deliver-analysis and design practice
- ◆ Project execute/deliver-build/configure/test practice
- ◆ Project execute/deliver-deploy practice
- ◆ PMO standards
- ◆ PMO guidebook

Most topics that Schumaker & Company would expect to see in project-management documentation for monitoring, measuring, and verifying steps that are designed to monitor progress against plan are generally included. Other materials often included in such documentation for programs, such as

checklists and templates to effectively apply these practices, were not noted in our review of the documentation.³⁵⁶

Finding IV-4 The ITS organization is not placing adequate emphasis on certain staff's achievement and maintenance of project-management certifications.

According to senior ITS management, all project managers (who are located in the PMO organization) are required to have Project Management Institute (PMI) certification as Project Management Professionals (PMPs).³⁵⁷ In our review of certifications, only four (Director, Senior Analyst, one Lead Project Manager, and one Career Project Manager) of the 11 PMO employees had achieved PMP certification, although one other employee (a Lead Project Manager) was working toward such certification.³⁵⁸ Conversely, QA staff (who are located in the Business Solutions organization) are not encouraged to have PMP certification, although quality assurance is a key component of good project-management principles.³⁵⁹ Schumaker & Company also believes that other ITS staff, such as technical staff who are involved in project activities, should be encouraged to get their PMP certification, regardless of where they reside within the ITS organization.

Encouraging employees to obtain project-management certifications helps both American Water and its employees by increasing those employees' skill sets to more effectively perform IT work.

Finding IV-5 The ability of the Client Services & Support group to electronically deploy software upgrades to workstations is hindered by American Water's network, which results in additional costs to ITS customers, such as PAWC.

The Client Services & Support group has the necessary software to electronically deploy software upgrades to workstations, but CS&S management indicates that it cannot use this software. That is because the network does not have the necessary bandwidth to do so efficiently. The result is that CS&S employees must physically go to workstations to deploy software or software upgrades after a workstation has been originally configured for use. In some cases, CS&S employees must drive to a location to deploy software upgrades. For PAWC, this travel could take as much as four hours one way. The Client Services & Support group has attempted to minimize this manual effort by first putting a universal image on all workstations at the time of acquisition and then making few software upgrades until the equipment is replaced.³⁶⁰

Finding IV-6 ITS management is not appropriately focusing its employee-training and development efforts through the use of a skills inventory for individual employees.

According to ITS management, ITS employees attend conferences and belong to professional organizations. In addition, employees are encouraged to participate in the following training and development (T&D) activities:³⁶¹



- ◆ NORDICS exchange group activities
- ◆ Gartner Group symposiums
- ◆ Vendor sessions (e.g., Cisco, AT&T, IBM, Microsoft)
- ◆ Common user groups (IBM, AS/400)
- ◆ Microsoft certifications
- ◆ Teleconferences
- ◆ ITS Information Day (focused on serving BUs better)
- ◆ Lunch & learn sessions
- ◆ White papers

Training and development (T&D) activities are performed based on the development needs that are identified mid-year and end of year at performing planning time. They are based on individual needs as opposed to group needs. It is up to individual managers to determine what is needed, because no tracking tools are available to them. Although American Water had already exhausted its Global Knowledge contract by the autumn of 2007, the CIO was looking to expand it. According to ITS management, as long as a manager has a training budget, s/he can use Global Knowledge.³⁶²

Nevertheless, individual managers have neither a formal skills inventory nor a T&D history available to them to make decisions regarding how, when, and where to send employees for T&D activities.³⁶³ Also, the recent CSC study of the ITS organization indicated that development plans are not in place for all ITS employees as required by ITS policy.³⁶⁴

Finding IV-7 The ITS organization does not have sufficient client-satisfaction information and data with which to evaluate its ability to serve AWWSC or PAWC departments.

The ITS organization does not routinely perform client-satisfaction surveys.³⁶⁵ Any information it has is obtained either through the use of a “lessons learned” activity, which is performed at the end of some (but not all) projects,³⁶⁶ or informally through discussions with BUs.³⁶⁷ Some individuals who were interviewed as part of this audit noted anecdotally that they had concerns about ITS’ ability to adequately provide service.

Finding IV-8 The ITS organization has not developed service-level agreements with its client groups.

Although ITS’ mission includes the organization being “a valued business partner,” no service-level agreements with client groups, either functionally oriented AWWSC groups or state entities (like PAWC), currently exist.³⁶⁸ The targets associated with ITS performance statistics, as shown in *Exhibit IV-20*, were the only documentation provided by ITS management when asked to provide service-level agreements (SLAs).³⁶⁹ Although written and signed, Schumaker & Company does not consider these documents to be service-level agreements. They are merely ITS targets.³⁷⁰ According to ITS management, the organization has not met with BUs to determine what business units expect from

the ITS organization.³⁷¹ Without having a good understanding of BU expectations, the ITS organization cannot truly have a client focus. It is therefore unable to appropriately provide the services that BUs (such as PAWC) require to meet the needs of their end customers.

Finding IV-9 ITS' performance versus its targets show varying, and in some cases, poor results.

Exhibit IV-20 illustrates ITS' performance metrics for the last three years, from 2005 through the first half of 2007.³⁷²

**Exhibit IV-20
ITS Performance Metrics
2005 to 2007 (through First Half of 2007 Only)**

Service Desk											
Metric	Target	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07
First Call Resolution Rate	60.00%	43.0%	54.0%	60.2%	60.7%	57.1%	51.6%	63.5%	73.0%	73.5%	76.0%
Telephone Answer Rate	70.00%	89.5%	80.0%	82.5%	77.6%	(a)	(a)	78.6%	82.9%	87.0%	89.0%
Telephone Abandon Rate	5.00%	1.9%	2.2%	2.8%	4.8%	(a)	(a)	5.7%	4.1%	3.0%	5.0%

(a) Upgraded the phone system and the switch reporting not available

ITS Infrastructure Availability											
Metric	Target	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07
Availability-Enterprise Servers	99.50%	99.6%	99.4%	99.5%	100.0%	99.8%	100.0%	100.0%	100.0%	100.0%	100.0%
Availability-Network Connectivity	99.95%	100.0%	99.9%	100.0%	100.0%	100.0%	99.9%	99.9%	100.0%	100.0%	100.0%

Governance & Alignment of Projects											
Metric	Target	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07
Governance of ITS Projects(a)	95.00%	75.0%	79.0%	74.0%	100.0%	100.0%	100.0%	80.0%	90.0%	79.0%	92.0%
Alignment of ITS Projects (b)	100.00%	100.0%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

1Q 05/2Q 05: Just implemented IT Governance tool to support the PMO process; 3Q 05: Spent the 3rd quarter completing the PMO processes and training; 4Q 06: Several projects need to improve their compliance with the PMO methodology; 1Q 07: 3 projects out of 14 did not comply with all PMO methodology, specifically PowerPlant, Hyperion, Daylight Saving projects.

3Q 06/4Q 06 Project list and priorities set by the ITS Steering Committee.

# of Work Order (WO) Legacy Requests											
Metric	Target	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07
Legacy Application WO Requests	Consistent Reduction Trend	2126	1970	1907	1814	2332	2220	2573	2421	2159	1589

Core Business Systems Turn-Around-Time (TAT) for Emergency/Critical Issues and UARs											
Metric	Target	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07
TAT-Priority 1 (Emergency)	95.00%				100.0%		66.7%	100.0%	100.0%		
TAT-Priority 2 (Critical)	95.00%	100.0%	100.0%	100.0%		100.0%				100.0%	100.0%
TAT-Average	90.00%	69.5%	82.4%	82.0%	76.6%	85.9%	87.2%	87.1%	91.2%	89.3%	90.6%

Highlighted areas indicate not making target
Data represents all American Water clients and none is classified as PA-specific.

Source: Information Responses 76 and 560

As shown by the highlighted items in *Exhibit IV-20*, many of these metrics have experienced time periods of poor performance. Those items where problems continue to occur in recent months include governance of ITS projects (% of ITS capital projects that follow the PMO methodology) and TAT average (average TAT for completing a user access request).

Additionally, approximately three years ago, ITS began formally doing KPIs for ITS managers, which are supposed to support business process improvements. (See *Exhibit IV-6* and *Exhibit IV-9* for examples.) These examples show that director KPIs are not aligned with the formal ITS metrics shown in *Exhibit IV-20*. We also noted that performance targets for the Client Services & Support organization include items focused on quality, budget variance, and two TAT metrics that are not included in *Exhibit IV-20*.³⁷³

The ITS organization has a limited number of performance targets that have not recently been examined for relevance to what is expected of a well-managed ITS organization,³⁷⁴ and may have been the same for the last three years, from 2005 to 2007. These targets are also often not aligned with the KPIs of the various directors. Unlike many technology organizations, ITS has not focused on developing a group of metrics (or scorecard) that concentrates on the appropriate issues and then keeping ITS management's attention on achieving these targets.

Finding IV-10 **Although ITS backup/restoration and security/protection plans and activities are generally reasonable, its disaster recovery plan is inadequate and appropriate testing activities are not being performed, despite its recent Chapter 101 self-certification reports that PAWC has met all required elements.**

Each year since 2005, PAWC has been required to provide self-certification forms to the Pennsylvania Public Utility Commission (PaPUC) regarding its emergency preparedness, as required by 52 Pa. Code §§ 101.1-101.7. Subsequently, concurrent with its PaPUC annual report filing, PAWC submits its self-certification filing, in which PAWC must indicate that the requirements were met for the entire prior year (e.g., submitted in early 2006, for 2005).³⁷⁵ The regulation requires a jurisdictional utility to develop and maintain written physical and cyber-security, emergency-response, and business-continuity plans, which include:³⁷⁶

1. A physical security plan must, at a minimum, include specific features of a mission-critical equipment or facility-protection program and company procedures to follow based upon changing threat conditions or situations.
2. A cyber-security plan must, at a minimum, include:
 - a. Critical functions requiring automated processing
 - b. Appropriate backup for application software and data; appropriate backup may include having a separate, distinct storage media for data or a different physical location for application software

- c. Alternative methods for meeting critical functional responsibilities in the absence of information technology capabilities
- d. A recognition of the critical time period for each information system before the utility could no longer continue to operate
3. A business-continuity plan must, at a minimum, include:
 - a. Guidance on the system restoration for emergencies, disasters, and mobilization
 - b. Establishment of a comprehensive process that addresses business recovery, business resumption, and contingency planning
4. An emergency-response plan must, at a minimum, include:
 - a. Identification and assessment of the problem
 - b. Mitigation of the problem in a coordinated, timely, and effective manner
 - c. Notification of the appropriate emergency services and emergency-preparedness support agencies and organizations

(Refer to *Chapter V – Water Operations* for discussion of PAWC’s physical-security plan, business-continuity plan, and emergency-response plan.)

For 2005, PAWC submitted self-certification forms indicating that it essentially met all such requirements, with some emergency-response plans to be reviewed and updated, as appropriate, in early 2006. Then, for 2006 and 2007, PAWC submitted self-certification reports indicating that it met all such requirements.³⁷⁷ However, as discussed below, disaster recovery plans are inadequate and testing activities are not being performed.

The following applications and data are replicated between the IBM 890 servers in the Hershey data center and the IBM 830 servers in the Haddon Heights data center:³⁷⁸

- ◆ JDE, including all JDE application modules and data
- ◆ E-CIS/Orcom, including all application and individual states’ data

However, this replication does not represent an adequate disaster recovery solution. If a disaster occurs, American Water has essentially a “spare” application set and respective data, but is not in a state to recover within the 12 hours included in its plan, as follows:³⁷⁹

- ◆ The IBM 890 integrated file system (IFS) share daily electronic funds transfer (EFT) data, which allows for customer billing and collections, was not being replicated between Hershey and Haddon Heights.
- ◆ The client configurations for JDE and E-CIS (as well as Hyperion) were only configured to access Hershey. Individual configuration changes for each client are required to point to

Haddon Heights in the event of a disaster, which would inhibit client processing until such configuration changes are made.

- ◆ In addition, restoration from tape has not taken place in production, but only in a development or test environment.

Additionally, American Water has not mimicked, or replicated applications in Haddon Heights or any other location, for the following key applications:³⁸⁰

- ◆ Service First (mobile work management system) for customer work order dispatch to the field
- ◆ Hyperion System 9 (financial reporting)
- ◆ PowerPlan Suite, including PowerPlant (capital asset management) and PowerTax
- ◆ Sabrix (sales and use tax)

Although American Water backs up the data each day for these applications, should there be a disaster in Hershey, Haddon Heights is not prepared to support these applications³⁸¹

Furthermore, the disaster recovery plan in place is insufficient and has never been tested, which was supported by our requests for a description of disaster-recovery tests performed by the ITS organization in recent years and for copies of any resultant documentation from the last test performed. No such evidence of tests actually being adequately performed could be provided.

Schumaker & Company also noted that the the two-mile separation in Pennsylvania from the Hershey data center to the backup site for client/server data is substantially less than the 10-mile minimum often considered a best practice for minimizing the likelihood both facilities would be impacted by the same event.³⁸²

Finding IV-11 The IT security function is not part of the ITS organization, which is atypical of industry practices.

The ITS organization does not have responsibility for the information systems' security function. That function is handled by a five-person IT-security staff reporting to the Director of Information Security. This director in turn reports to the Director of Operational Risk Management, as discussed in the *Risk Management* section of this chapter.³⁸³ Typically, technology organizations include the information systems' security function (not part of an operations function but reporting to the CIO), which allows appropriate coordination between the security and operations functions. In addition, the recent CSC study of the ITS organization indicates that the current split has not been working effectively.³⁸⁴

Finding IV-12 The data center space has recently been expanded in large part as a result of American Water not effectively performing a consolidation of its servers.

Capacity planning is not performed by the ITS Infrastructure & Operations group on an ongoing basis.³⁸⁵ Instead, annual capacity planning is performed by reviewing trends in data growth, including individual groups that are responsible for data.³⁸⁶ Each year, coinciding with the budgeting cycle, the ITS organization performs capacity planning based on historical growth and the impact of projects in the portfolio. Based on that assessment, the organization identifies upgrades and expansions that are needed to meet required capacity and performance. It then collaborates with the AWWSC Business Development Committee to perform capacity and integration planning.³⁸⁷

A Hershey data center expansion project was being completed in late 2007 in response to these capacity-planning efforts.³⁸⁸ This project included six components, including street power, power switch room, UPS, heating/venting/air conditioning (HVAC) units, fire protection, and refitting of space to house new computer and direct access storage device (DASD) systems. The costs associated with the expansion project were approximately \$942,500. To the extent that these costs are not merely upgrades, but truly expansion for computer/DASD systems, these costs should be considered lost savings.³⁸⁹ American Water management believes that refitting of the existing data center space to house equipment is an opportunity to prepare for the future growth plans and to facilitate any migration from legacy systems/platforms.³⁹⁰ However, expanding a data center in today's environment is contrary to what most IT organizations experience.³⁹¹ Most, in fact, have extra space, often due to aggressive server consolidation programs. To date, the ITS Infrastructure & Operations group has not formally undertaken such a program.

At the same time, other considerations, such as more aggressively archiving data rather than keeping all data online (also mentioned in the recent CSC study),³⁹² should be factored into the analysis.

Recommendations

Recommendation IV-1 Expedite efforts to develop a long-range IT plan, and subsequently perform yearly review and update activities. (Refer to Finding IV-1 and Finding IV-2.)

The ITS organization has been without a long-range IT since RWE acquired American Water in 2003 and the ITS organization began its ERP initiative (since cancelled). The organization must expedite efforts to have such a plan developed in 2008. Then, each subsequent year, ITS and BUs should review (and potentially update) the IT plan together to ensure that it meets not just ITS' needs, but also those of the BUs that it serves.

Recommendation IV-2 **Update ITS documentation as part of an ongoing program to include all aspects of a well-managed technology organization, including (but not limited to) operational, governance, and project management/QA functions. (Refer to Finding IV-2 and Finding IV-3.)**

Much of the documentation developed by ITS to date has been focused on achieving SOX compliance. This limited view is not appropriate. The ITS organization needs to identify all required processes within it, including (but not limited to) operational, governance, and project management/QA functions. Then, it should establish a program for routinely reviewing and updating these processes and for developing (or updating) the process documentation as well as standards for associated procedures and practices. All documentation should be reviewed at least annually.

As part of these efforts, the ITS organization should make sure that checklists and templates are included in such documentation.

Recommendation IV-3 **Address organizational issues involving vacancy of director positions, the appropriateness of staffing size of the various ITS groups, and the reporting location of the information systems' security function within American Water's organization structure. (Refer to Finding IV-2 and Finding IV-11.)**

At least three different types of ITS organizational issues were identified by Schumaker & Company in performing this audit. They include:

- ◆ The ITS organization must move quickly to fill the Director PMO and Director Global Strategy & Architecture positions. These groups cannot operate effectively without leadership to guide employees.
- ◆ A detailed analysis of the appropriate staffing size of the various ITS groups should be performed and reflected in ITS plans and budgets.
- ◆ The information systems' security function should be removed from the Operational Risk Management organization and moved into the ITS organization, although it should not be part of the Infrastructure & Operations organization.

The ITS organization must address each of these issues in the short-term so it can proceed with its plans as necessary.

Recommendation IV-4 **Expand American Water’s commitment to project-management principles by requiring all ITS employees who are actively involved in project work to achieve PMP certification and by closely monitoring related activities to ensure that timely progress is made. (Refer to Finding IV-4.)**

For an organization with the size and complexity of American Water’s ITS organization, few employees have project-management certifications. Certification not only helps to ensure that individuals have been trained in appropriate project-management practices, tools, and techniques, but it also helps to place appropriate emphasis by American Water management on the importance of best practices with regard to project management. Emphasis on project-management certification helps to ensure standardization of project-management implementation efforts. It also helps in determining which employees are truly interested in furthering their positions within the ITS organization by obtaining their PMP certification. Inclusion of project-management certification goals should be incorporated into the performance plans of appropriate employees. Those employees who are required to achieve PMP certification should include PMO staff, QA staff, and other ITS employees who are actively involved in project work, even if they do not hold project manager/QA titles. That is because they too need to understand project-management philosophies, concepts, techniques, and tools.

In addition to PMP certification, as part of its program to foster project-management principles, American Water should also ensure that skill-based mentoring and exposure to a variety of on-the-job development experiences is included in this program.

Recommendation IV-5 **Enhance the American Water network to enable electronic deployment of software updates to PAWC employees. (Refer to Finding IV-5.)**

Given that the CS&S group has the technology in place to electronically deploy software upgrades, this group should work closely with the Infrastructure & Operations group to develop the necessary steps to make deployment feasible. It should then implement these steps as quickly as possible. Every AWWSC manual deployment of software costs PAWC approximately \$100,000 more than doing deployments electronically. Achievable cost savings could approximate \$100,000 to \$400,000 in annual savings, depending on the number of times deployment occurs each year. If done annually, it could approximate \$100,000; if done semi-annually, it could approximate \$200,000; or if done quarterly, it could approximate \$400,000.

Recommendation IV-6 **Improve training and development efforts for ITS employees. (Refer to Finding IV-6)**

The ITS organizations should implement a skills inventory database for ITS employees that tracks professional development activities undertaken by ITS employees and associated management and technical skills held by these employees. This information could then be used by ITS management to

identify training and development activities necessary to improve the skills of ITS employees. The ITS management must ensure that all ITS employees have a development plan that incorporates professional development objectives.

Recommendation IV-7 Develop a plan to regularly conduct ITS client-satisfaction surveys and implement the first survey in a timely manner. (Refer to Finding IV-7.)

The use of regularly conducted client-satisfaction surveys can provide a technology organization with insightful information about the services it provides and how client groups perceive the organization. The use of such surveys is particularly helpful when looking at trends over time to determine whether service is improving or not.

It is the perfect time for the ITS organization to develop a plan to conduct client-satisfaction surveys. That is because a new CIO began work in the beginning of 2008. The use of such surveys would give the CIO a baseline from which to show progress as the CIO makes changes. The first survey should be done in a timely manner. Subsequent surveys should be routinely conducted. Many technology organizations conduct such surveys every one to two years.

Recommendation IV-8 Establish ITS service-level agreements with major client groups. (Refer to Finding IV-8.)

To truly become “a valued business partner,” the ITS organization must increase its client focus by interacting more frequently and effectively with its client groups. One of the ways the ITS organization can begin is by establishing service-level agreements with each of its major client groups, both functionally oriented groups and state entities. However, these agreements must not be developed and solely placed on a back shelf without further consideration. A mechanism must be developed that requires the ITS organization to at least quarterly (if not monthly) provide feedback to the client groups as to how the ITS organization is doing against the expectations included in the SLAs.

Recommendation IV-9 Implement a relevant ITS scorecard. (Refer to Finding IV-9.)

The existing ITS performance targets are outdated and do not reflect an organized approach to effectively improving the ITS organization’s performance. ITS management, in conjunction with BUs, should determine what key metrics are relevant and should then identify the particular targets against which results are measured. The KPIs for directors, as well as any success measures for individual ITS employees, should be aligned so that they support the key ITS performance targets included in an ITS scorecard. Similarly, these key ITS performance targets should support the IT strategic plan (described earlier in *Recommendation IV-1*).

Routinely (preferably monthly), scorecard results against targets, with explanations when targets are not achieved, should be published to all ITS employees and major business partners. In the future, when a

target is not achieved, a formal action plan should be developed and a responsible person assigned to improve results and subsequently achieve the target.

Recommendation IV-10 Update the ITS disaster recovery plan and begin routinely reviewing and testing disaster-recovery plans and documenting results. (Refer to Finding IV-10.)

The ITS organization should update its disaster recovery plan to address the shortcomings previously discussed. Among the actions that should be taken are:

- ◆ Begin replicating IFS between Hershey and Haddon Heights.
- ◆ Transition the tape management processes to a third-party for seven day a week collection at all sites and transfer to off-site storage and maintenance (at least 10 miles away) by the third party.
- ◆ Address the client configuration challenges for all American Water applications to be able to point to Haddon Heights instead of Hershey in the event that the need arises
- ◆ Establish recovery time objectives and recovery point objectives with line of business owners for all critical applications
- ◆ Adequately address all elements of the disaster recovery plan document and update it.
- ◆ Develop a plan (and routinely review it) to immediately do full disaster recovery testing for JDE and E-CIS applications.
- ◆ Develop a plan (and routinely review it) to put in place a disaster recovery solution (including replicated applications and data for the other business critical applications listed below:
 - Service First
 - Hyperion System 9
 - PowerPlan Suite
 - Sabrix

Furthermore, as the ITS organization has not reviewed and tested its plans and documented results, disaster recovery test activities should be routinely performed. The way a technology organization learns to quickly and efficiently restore its underlying technology, systems, and applications is by performing routine tests to bring up all core applications. As change occurs frequently within a technology environment, most well-run ITS organizations review checklists and perform walk throughs throughout each year. They also should replicate, at least annually, the situation where all core applications are operated from an alternative site than they normally are. Key representatives from major customer groups should be involved in approving that these applications are working as expected. The documentation of test results is important for the ITS organization to improve results the next time a test is attempted.

Besides improving its testing activities and documenting testing results, the ITS organization must regularly review its disaster-recovery plan and update it, as appropriate.

The disaster-recovery actions should be in alignment with American Water's business-continuity-plan (BCP) activities. (See *Chapter V – Water Operations* for a discussion of PAWC's BCP activities.)

Recommendation IV-11 Perform a server consolidation study and implement study recommendations. (Refer to Finding IV-12.)

Many ITS organizations have performed server-consolidation studies. That is because server consolidation is an approach to the efficient usage of computer-server resources so as to reduce the total number of servers an organization requires. Use of server consolidation typically occurs in response to server sprawl, a situation in which multiple under-utilized servers take up more space and consume more resources than can be justified by their workload. Therefore, many organizations are increasingly turning to server consolidation as a means of cutting unnecessary costs and of maximizing return on investment (ROI) in a data center. Of 518 respondents in a Gartner Group research study, 6% had conducted a server-consolidation project, 61% were currently conducting one, and 28% were planning to do so in the immediate future.³⁹³

Although consolidation can substantially increase the efficient use of server resources, it may also result in complex configurations of data, applications, and servers that can be confusing for the average user to contend with. To alleviate this problem, server virtualization may be used to mask the details of server resources from users while optimizing resource sharing. Another approach to server consolidation is the use of blade servers to maximize the efficient use of space.³⁹⁴

Given its recent increase in data-center space and the direction that many technology organizations are going to address server sprawl, the AWWSC ITS organization should undertake a server-consolidation study that factors in increased archiving of data. Based on the results, the ITS organization should implement any study recommendations in a timely manner. Ultimately it is not simply less space that could result in cost savings to American Water, but more significantly it is the use of fewer servers with increased archiving of data, plus associated support costs, that would provide the vast amount of potential savings. Based on a combination of these changes, the potential cost savings and/or cost avoidance to American Water could be approximately \$1 million to \$1.2 million annually. Based on PAWC receiving approximately 22.3%, PAWC's range would be approximately \$223,000 to \$267,600 in annual cost savings and/or cost avoidance.

B. Transportation and Fleet Management

This chapter provides a discussion of transportation and fleet management services provided by either American Water Works Service Company (AWWSC) or Pennsylvania-American Water Company (PAWC) in relation to the maintenance and operation of the vehicular fleet that is operated by PAWC.

Background & Perspective

Organization & Staffing

The majority of the fleet management function for both PAWC and all of the other American Water state-operating companies is provided by an external contractor, Automotive Resources International (ARI), which is headquartered in Mount Laurel, NJ. As such, the internal organization for fleet management at PAWC and AWWSC is very small, with only two full-time fleet management personnel at AWWSC and one AWWSC Southeast Region employee who handle the fleet management function on a part-time basis.³⁹⁵

The Fleet Manager at AWWSC reports to the Director of Supply Chain for AWWSC. The AWWSC Fleet Manager is located in Voorhees, NJ. He is responsible for fleet management policies, procedures, procurement, vendor selection, and approval of large maintenance expenses.³⁹⁶ The AWWSC Fleet Manager's primary responsibility is to ensure operating company compliance with the American Water Fleet Governance Document and with other relevant American Water policies and procedures for fleet management. These documents specify the guiding fleet maintenance standards such as how often to replace, maintenance, etc., company vehicles. The Fleet Governance Document is composed of several documents, including the following:³⁹⁷

- ◆ *Vehicle Utilization Policy* – governs the administration of the American Water vehicle-use plan
- ◆ *American Water Fleet Program/Program Governance* – primarily guides the interaction with the contracted fleet management company, ARI, including vehicle acquisition and maintenance guidelines
- ◆ *Bridgestone/Firestone Instructions* – sets forth the procedures for purchasing tires from the preferred tire vendor
- ◆ *Vehicle Replacement Policy* – intended to insure the vehicles that are operated are safe and reliable, while also attempting to optimize residual values, minimize maintenance costs, and minimize year-to-year fleet lease expense increases

PAWC also has two mechanics that are used to provide vehicle maintenance in the Pittsburgh District. These two mechanics at the Bethel Distribution Center (Bethel) perform preventive maintenance (PM) and minor repairs on the Distribution fleet of vehicles only. They do not provide service to any of the

automobiles that are out of Bethel. All of the other automobiles and light trucks at Bethel are serviced by external contractors. PAWC maintains a two-bay garage facility at Bethel. The reason given for retaining these two mechanics is that this is the way this service center has operated for years. It is the belief that it is better to perform the maintenance and repair work on an internal basis in this situation. That mindset stems from the specialized nature of the vehicles and the timeliness with which the work can be completed.³⁹⁸

One mechanic is on the day shift and primarily focuses on PM, minor repairs, and state inspections. The other mechanic works the evening shift. He performs PM and is also responsible for fueling the vehicles each evening. The PM functions include oil changes, brakes, tires, state inspections, and minor repairs. Heavy repairs, such as collision damage or transmission repair, are done externally. The information collected related to the maintenance work performed at Bethel is transmitted to ARI for inclusion in their database and maintenance-exception reports.³⁹⁹

The American Water Southeast Region (SER) Fleet Manager is located in Hershey, PA. He acts as the Fleet Manager for PAWC. This position is a part-time role that has been the responsibility of the AWWSC Southeast Region Manager of Operational Excellence since January 2006. Prior to 2006, a Manager of Fleet and Materials was responsible for these duties, but the position was eliminated when the designated employee was moved to another position. The current American Water SER Fleet Manager estimates that he spends about 50% of his time on fleet-management-related activities. While he does have some fleet-related responsibilities for other Southeast Region operating companies, these duties are very minor and require little time to be devoted to them. Therefore, the SER Fleet Manager devotes the large majority of his fleet-related time to PAWC. The American Water SER Fleet Manager receives transportation/fleet management assistance from three individuals: a PAWC network supervisor in the Pittsburgh District and the previously identified two full-time fleet management personnel within AWWSC.⁴⁰⁰

The assigned responsibilities of the American Water SER Fleet Manager include the following:⁴⁰¹

- ◆ *Ordering replacement vehicles for PAWC* – The American Water SER Fleet Manager follows the American Water standard Vehicle Replacement Policy as the basis for making replacement decisions. Data from the vehicle statistics database, which is maintained by ARI, are used in this decision-making. The American Water SER Fleet Manager tries to replace 15% to 20% of the vehicle fleet each year in accordance with the American Water policy guidelines. He focuses on replacing vehicles that are older (generally five years and up) and that have historically had high maintenance costs. In addition to operating considerations, the replacement policy attempts to optimize residual values, minimize maintenance costs, and minimize actual year-to-year fleet-lease expense increases.

Exhibit IV-21 presents the American Water Vehicle Replacement Criteria as contained in the American Water Fleet Program Governance document. It should be noted that these criteria are to be applied with the use of judgment, so replacement cycle times could be longer or shorter based on the condition and amount of usage of the individual vehicle.⁴⁰²

**Exhibit IV-21
American Water Vehicle Replacement Criteria
as of January 24, 2006**

Class	Mileage	Age		Miles (Hours) /Year
		Hours	(Months)	
Passenger Car	60,000		48	15,000
Sport Utility Vehicle	75,000		48	18,750
Mini/Compact Van	75,000		48	18,750
Full Size Van	75,000		48	18,750
Light Duty Truck (Pick Up)	75,000		60	15,000
Light Duty Utility Truck	75,000		60	15,000
Medium Duty Truck	84,000		96	10,500
Heavy Duty Truck	96,000		96	12,000
Light Duty Backhoe		2,500	60	500
Medium Duty Backhoe		2,500	60	500
Heavy Duty Backhoe		2,500	60	500
Forklift			120	
Skid Steer Loader			60	
Trailers			120	
Excavator			96	

Source: Information Response 84

Orders for new large vehicles (heavy trucks) are targeted to be entered into the ARI system by March/April of each year for delivery by year-end. That way, delivery of the vehicles and recognition of associated lease expenses in the proper budget year is ensured. Cars and light trucks are normally ordered primarily in July/August to ensure delivery by year end. All of the vehicles in PAWC are leased with the exception of some that were acquired in corporate acquisitions and are owned outright. The leasing is currently done exclusively through ARI with some older leases remaining from General Electric (GE) for the period previous to ARI taking over the fleet management responsibilities in 2003. At the end of the lease, the American Water SER Fleet Manager completes a Vehicle Termination Notice form. GE or ARI would normally handle the disposal of vehicles through an auction process, with the proceeds being returned to PAWC (minus a transaction fee). An alternative means of disposal that is used on occasion is that PAWC's truck-maintenance and up-fitting firm, the New Harrisburg Truck Body Company, can fill out a Customer Offer Sheet and place a bid on a specific large truck. The American Water SER Fleet Manager makes a decision after checking this offer against published Blue Book prices to see if it is reasonable and acceptable.⁴⁰³

- ◆ *Authorizing additional new vehicle acquisitions* – A request for an additional (as opposed to a replacement) vehicle is generated in the field and submitted to the PAWC Network Operations Manager for approval. This request and approval process is done primarily through the use of e-mail, rather than a formal document. After approval, the American Water SER Fleet Manager receives an e-mail from the PAWC Network Operations Manager. The American Water SER



Fleet Manager then works with the local supervisor who originated the request to develop a specification for the requested vehicle according to the specific needs of the requestor.

The AWWSC Fleet Manager is not involved in fleet-sizing decisions for the state-operating companies. Neither does he approve any increases that are made in the state-operating companies' fleet sizes. Such approval is strictly a locally made decision. The general rule of thumb is that employees who drive more than 14,000 business miles in a year will be eligible to receive a vehicle. However, this policy is not strictly enforced and there is no validation of the actual annual mileage for employees.⁴⁰⁴

Fleet requirements at the American Water state-operating companies are directly influenced by the number of employees and the work they perform. Additional employees, or a permanent staff reduction, can result in increases or decreases in the number of vehicles in the fleet.⁴⁰⁵

- ◆ *Budgeting* – The American Water SER Fleet Manager annually develops a five-year plan for the fleet management function, with a significant level of detail provided for the first year only. There are four major components of the fleet budget, those being:⁴⁰⁶
 - Vehicle leasing expense
 - Fuel costs, which are extrapolated from historical usage and a conservative prediction of future fuel prices
 - Maintenance and licensing costs, which are estimated through the use of historical data that is extrapolated based primarily on the size of the fleet
 - Capitalization of a portion of fleet expenses, which results in a credit to O&M expenses
- ◆ *Accident reporting* – ARI sends the American Water SER Fleet Manager an accident report and he is responsible for making sure that the proper people are informed of the incident. ARI handles insurance claims as well as the associated investigations. American Water has a very high deductible with its insurance carrier. If an accident is the fault of PAWC, the funds to pay for repair of a PAWC vehicle come out of the fleet maintenance budget. If the damage is to another vehicle, the claim is paid out of liability insurance. The PAWC Risk Management Group in Hershey handles driver training and safety.⁴⁰⁷
- ◆ *Review of monthly ARI bills* – The American Water SER Fleet Manager reviews the monthly bills from ARI to identify any errors that may be included. It is, however, the final responsibility of the AWWSC Fleet Manager to approve the invoices for payment. The American Water SER Fleet Manager is also responsible for monitoring those GE-leased vehicles that are being removed from the fleet to ensure that they are disposed of in a timely manner. Performance of this duty ensures that ARI is informed of such vehicles' status and stops billing the monthly service charge to PAWC. As of the end of 2007, the PAWC fleet no longer had any GE-leased cars and had only about 50 to 60 GE-leased large trucks that are on eight-year leases.

There is an existing American Water Fleet Policy Team, which is composed of the AWWSC Fleet Manager and other relevant AWWSC employees. This group is essentially an ad hoc team whose purpose is to make sure the fleet management policies applied at each of the American Water operating companies are consistent across all of the companies. This effort has been in progress since late 2006. There is no established timeframe for completion of the work.⁴⁰⁸

The Fleet Policy Team consists of the following individuals:⁴⁰⁹

- ◆ Director of Human Resources Systems and Processes
- ◆ A member of the Taxation group
- ◆ AWWSC Fleet Manager
- ◆ A member of the Payroll group
- ◆ Manager, Employee Services
- ◆ Manager, Internal Audit
- ◆ Manager, Internal Audit
- ◆ Director, Employee & Labor Relations
- ◆ Director, Business Performance
- ◆ Director, Network
- ◆ Manager, Business Performance
- ◆ Superintendent, Operations

Documentation produced as of September 2007 includes:⁴¹⁰

- ◆ Draft Revised Vehicle Utilization and Mileage Reimbursement Policy
- ◆ Draft Vehicle Utilization Practice
- ◆ Draft Company Vehicle Assignment Application
- ◆ Draft revised vehicle-mileage log and transportation personal-use form

The American Water Fleet Management Program Governance document was updated in August 2007 by the AWWSC Fleet Manager and the various regional fleet managers. As of December 2007, there was an ongoing project that targeted updating of the Vehicle Utilization Policy. The focus of this project is on improving the reporting of the personal use of company vehicles. To better track this information, ARI is developing a database of information based on the 525 form, which is used for reporting personal use of vehicles by employees. The overall intention is to strengthen the existing policy.⁴¹¹

Fleet Operating Performance Statistics and Trends

Exhibit IV-22 contains standard fleet operating performance statistics for PAWC for the period of 2005 through 2007.⁴¹²

Exhibit IV-22
PAWC Annual Fleet Operating Performance Statistics
2005 to 2007

	2005	2006	2007
Employees per Vehicle	1.4	1.4	1.4
Average PM Costs per Vehicle	\$75	\$100	\$105
Average Repair Costs per Vehicle	\$1,198	\$1,026	\$1,097
Average Total Operating Costs per Vehicle	\$8,422	\$8,829	\$8,911
Average Total Fuel Costs per Vehicle	\$2,548	\$2,723	\$2,977

Source: Information Response 814

ARI replaced GE Fleet Services as PAWC’s fleet management company in mid-2003. Therefore, detailed data and/or reports from GE Fleet Services are not available to enable PAWC to develop fleet performance statistics for the years prior to 2005.⁴¹³ Review and trend analysis of the data contained in *Exhibit IV-22* shows some line items that increase and some that decrease. Overall the trends appear to be reasonable when considered in light of inflationary times and the rising fuels costs of the reference period.⁴¹⁴

ARI

ARI handles the majority of the fleet management responsibilities for American Water and PAWC. ARI has been the American Water-contracted fleet management firm since 2003. GE was the previous provider of fleet management services for PAWC, but ARI became American Water’s company-wide fleet management contractor.⁴¹⁵

This vehicle leasing/fleet management contract was last bid in 2003. After a formal evaluation of the four bids that were received, ARI was selected as the preferred provider. The vehicle leasing/fleet management contract is scheduled to be rebid in 2008. It was stated that pricing will not be a major consideration; rather, performance will be the primary differentiating factor. ARI is responsible for establishing the contracts with services providers. All vehicles are leased from ARI, which acquires them based on the national purchase contracts with manufactures that are set up by the AWWSC Supply Chain group.⁴¹⁶

ARI is headquartered in Mount Laurel, NJ, which is near to Voorhees, NJ, the headquarters of American Water. ARI maintains a call center in Mount Laurel that is staffed by experienced mechanics. When a vehicle is taken to an ARI-approved repair shop, in accordance with the American Water Fleet Management Policy, the repair shop must call ARI for approval to make the repair. ARI can approve repairs that are less than \$1,000. If the repair is estimated to be between \$1,000 and \$5,000, ARI will call the American Water SER Fleet Manager for his approval. Such approval is based on the current status (age) of the vehicle and its repair history. The American Water SER Fleet Manager receives advice on these decisions from the call center mechanics at ARI. For repairs that are estimated as being over \$5,000, ARI will call the AWWSC Fleet Manager for approval.⁴¹⁷

In accordance with the Lease, Purchase/Disposal, and Fleet Management Services Agreement between ARI and AWWSC, ARI is paid a monthly fee that is calculated based on each service performed on a per-vehicle basis. Per the contract, the fleet management/service program fees that are to be charged by ARI to any American Water state-operating company that is using its services include the following:⁴¹⁸

- ◆ *Maintenance Management Program Fee:* \$4.25 per vehicle per month for passenger cars and trucks up to and including 15,000 pounds gross vehicle weight (GVW) without exterior up-fitting; or \$8.25 per vehicle per month for trucks over 15,000 pounds GVW and other equipment
- ◆ *Licensing Management Program Fee:* \$2.75 per vehicle per month
- ◆ *Title Maintenance Program Fee:* \$0.50 per vehicle per month
- ◆ *24-Hour Roadside Assistance Program Fee:* \$20.00 per occurrence
- ◆ *Fleet Insurance Management Program – Accident Reporting/Claims Analysis/Appraisals and Repairs Fee:* \$1.15 per vehicle per month; Subrogation Recovery Program Fee: 20% of recovery

The above listed fees are in addition to the actual costs incurred in the provision of the various programs. For example, vehicle-maintenance service charges would be passed on by ARI to PAWC based on the actual invoice from the automotive-repair service performing the work.⁴¹⁹

Fleet Composition and Annual Expenditures

Exhibit IV-23 which follows presents vehicle size by class for EOY 2003 through 2007. This data was provided by ARI and represents a “snapshot” of the vehicles having an active status at year-end.⁴²⁰

Exhibit IV-23
PAWC EOY Vehicle Fleet Composition
and Trends by Vehicle Class
2003 to 2007

	2003	2004	2005	2006	2007	Percentage Change from 2003 to 2007
Automobiles	71	61	61	59	68	-4.2%
Pickup Trucks	240	198	221	253	294	22.5%
Sport Utility Vehicles	20	20	37	39	31	55.0%
Dump Trucks	45	46	55	49	46	2.2%
Maint./Utility Trucks	148	145	157	147	146	-1.4%
Passenger Vans	9	9	8	7	7	-22.2%
Work Vans	178	140	142	139	130	-27.0%
Total	711	619	681	693	722	1.5%

Source: Information Response 808

PAWC stated that it believes the total number of vehicles, in all years except 2004, is overstated due to an accounting lag in getting vehicles that have been physically retired and removed from ARI’s database

after replacement vehicles have been delivered. Part of the reason given for this is that replacement vehicles are ordered with a delivery target of November/December. Therefore, if ARI is not notified in a timely manner that a replacement vehicle has arrived, or if the replacement vehicle is delivered close to year-end, both the replacement vehicle and the old vehicle could theoretically be listed as active in the ARI database.⁴²¹

In support of this contention of a lower vehicle count, PAWC provided the data included in *Exhibit IV-24*. This data presents the number of vehicles for which it claimed, or anticipated to claim, leased vehicle expense in rate filings for the years 2003 through 2007.⁴²²

Exhibit IV-24
PAWC Revised EOY Vehicle Count
2003 to 2007

Historic/Future Test Year	2003	2004	2005	2006	2007	Percentage Change from 2003 - 2007
Total Vehicles	673	610	612	647	665	-1.2%

Source: Information Response 808

PAWC explains that the reduction in total vehicles from 2003 to 2004 and 2005 is reflective of the staffing reductions that occurred as a result of the Thames Water reorganization initiative, as well as the transfer of PAWC employees to the Southeast Region Service Company. The increase in total vehicles from 2005 to 2006 and 2007 reflects staff additions, as well as the transfer of employees from the Southeast Region Service Company back to PAWC as American Water returned to state-focused operating companies.⁴²³

Exhibit IV-25 presents data on the average number of miles driven per month per vehicle by class of vehicle. The data used in the calculation represent actual data for the life of each respective vehicle.⁴²⁴

Exhibit IV-25
PAWC Fleet Utilization Statistics
as of August 31, 2007

Vehicle Class	Average Miles/Month
Cars	938
Pickup trucks	1,086
Vans	988
SUVs	1,123
Utility trucks	717
Dump trucks	750
Other, special	442

Source: Information Response 87

Exhibit IV-26 presents an analysis of the annual expenses incurred by PAWC for fleet operations and maintenance versus the amount that was budgeted for each year.⁴²⁵

Exhibit IV-26						
Operations and Maintenance Budget Versus Actuals						
2002 to 2007						
	2002	2003	2004	2005	2006	2007
Capitalized	(\$1,227,390)	(\$1,229,681)	(\$1,418,075)	(\$1,106,780)	(\$1,382,431)	(\$1,718,252)
Lease Expense	4,952,250	\$3,796,208	\$4,179,386	\$3,473,628	\$4,071,094	\$4,276,078
Fuel Expense	981,417	\$1,163,704	\$1,490,660	\$1,768,100	\$2,028,099	\$2,310,586
Maintenance and Registration	1,108,418	\$1,430,786	\$1,231,181	\$1,019,214	\$995,844	\$1,057,156
Actual expenditures	\$5,814,695	\$5,161,017	\$5,483,152	\$5,154,162	\$5,712,606	\$5,925,568
Budgeted expenditures	4,469,837	5,261,529	5,235,820	4,628,049	4,586,079	6,044,968
Variance	1,344,858	(100,512)	247,332	526,113	1,126,527	(119,400)

Source: Information Responses 85 and 811

During this period of time (2002 to 2007), PAWC made no capital expenditures related to the transportation/fleet function.⁴²⁶

In response to an information request for an explanation of the reason that the budget numbers were significantly exceeded in 2002, 2004, 2005, and 2006, PAWC provided the following explanations:⁴²⁷

- ◆ Capitalized transportation credits have a direct relationship to capitalized payroll. More or less than the budgeted capitalized payroll produces more or less than budgeted capitalized transportation credits.
- ◆ The vehicle lease cost component is influenced by the sale of vehicles that are coming off of lease, which are credited back to the vehicle lease expense account. If sales are delayed or otherwise do not occur as planned, credits are not recognized as were budgeted. Also, delays in the arrival of replacement vehicles are the direct cause of delays in disposing of old vehicles.
- ◆ Unstable and rapidly increasing fuel costs also contributed significantly to overages in the 2004 to 2006 timeframe. While the actual total transportation expenses for 2007 were under budget, fuel costs were again significantly above the budgeted figure.

ARI fees are included in the contract on a monthly per-vehicle basis (i.e., a set amount for handling maintenance for that vehicle for the month). The American Water SER Fleet Manager gets a monthly bill from ARI that is detailed on a per-vehicle basis. The SER Fleet Manager reviews and approves these bills on a monthly basis, but they are paid by American Water in Voorhees. The charges that are paid by AWWSC on behalf of PAWC are subsequently charged back to PAWC.⁴²⁸

Exhibit IV-27 presents data on the amount of the annual billings from ARI to PAWC for its services for the period 2003 through 2007.⁴²⁹

Exhibit IV-27
ARI Annual Billings to PAWC
2003 to 2007

	2003	2004	2005	2006	2007
Lease Expense	\$95,724	\$1,036,152	\$2,082,177	\$3,454,779	\$4,439,703
Miscellaneous Expense*	545,753	2,640,581	2,879,208	2,932,938	3,224,110
Total	\$641,477	\$3,676,733	\$4,961,385	\$6,387,717	\$7,663,813

* The Miscellaneous Expense category is composed of expenses related to maintenance, fuel, and licensing.
Source: Information Responses 363 and 813

ARI did not become PAWC's leasing company until mid-2003, replacing GE Fleet Services. As such, the total annual leasing expense to PAWC is a combination of the leasing expenses from GE and ARI. This data is presented in *Exhibit IV-28* which follows.⁴³⁰

Exhibit IV-28
Total Vehicle Leasing Expense
2003 to 2007

	2003	2004	2005	2006	2007	Total % Increase from 2003 - 2007
GE Lease Costs	\$4,677,151	\$3,211,687	\$2,283,635	\$1,458,202	\$763,899	
ARI Lease Costs	95,724	1,036,152	2,082,177	3,454,779	4,439,703	
Total	\$4,772,875	\$4,247,839	\$4,365,812	\$4,912,981	\$5,203,602	9.0%

Source: Information Response 814

It should be noted that the above data represents only leasing expenses and does not include any credits accrued from the sale of used vehicles.⁴³¹

Major Processes and Systems

Vehicle Acquisition

The standardized vehicle replacement schedule, as contained in the American Water Fleet Program Governance guidelines, drives the vehicle-ordering process. The American Water SER Fleet Manager electronically creates and transmits in the ARI system the recommended vehicle order to the PAWC Network Operations Manager for approval. The actual vehicle ordering is done through ARI's online computer system for all vehicles other than large trucks. The PAWC Network Operations Manager's electronic approval in the ARI system triggers the resulting purchase order for ARI to acquire the vehicle.⁴³²

The American Water SER Fleet Manager can access an ordered-vehicle status report, which presents the delivery-schedule status for each vehicle that is on order. This scheduling information is incorporated into any decisions as to whether to make major repairs on an existing vehicle. There is an expeditor at ARI who monitors the status of vehicles that are on order for American Water. The expeditor also monitors the schedule related to completing the new vehicle up-fitting process.⁴³³

The ordered vehicles are delivered by the manufacturer through a local dealer. This dealer performs the dealer preparation work on each vehicle. The up-fitting (addition of necessary truck-mounted equipment and storage facilities) of large trucks is done by the New Harrisburg Truck Body Company, under a national contract with Knapheide. Knapheide also up-fits pickup trucks and vans.⁴³⁴

There are negotiated standard prices for all vehicles with the respective manufacturers. Contracts are established with the manufacturers for a contract period of one to two years by the AWWSC Supply Chain group. As of November 2007, American Water worked with three vehicle manufacturers, those being:⁴³⁵

- ◆ International for utility trucks and dump trucks
- ◆ Daimler Chrysler for light trucks and cars
- ◆ Toyota for pickup trucks

In September 2007, the AWWSC Fleet Manager developed and sent out a request for pricing for light trucks and automobiles to the various manufacturers that are capable of providing such vehicles. The request for quote (RFQ) was sent to the Big 3 U.S. automobile manufacturers (Ford, General Motors, and Chrysler) as well as Toyota. The selection decision will be made in conjunction with the local fleet managers, with a decision schedule slated by the end of the 2007 calendar year. The evaluation and analysis of the bids will be done by the AWWSC Fleet Manager, in conjunction with members of the AWWSC Supply Chain group. The standardized bid-evaluation criteria and procedures of the Supply Chain group serve as the basis of this evaluation.⁴³⁶

ARI works with American Water representatives at the annual Vehicle Specification Review meeting. The purpose of the meeting is to analyze vehicle specifications with the intention of standardizing the American Water-approved vehicle listing to the greatest extent possible. If a request is made for a vehicle that is different from the standard specification vehicle, the requestor must validate the special request with a business case.⁴³⁷

Vehicle Maintenance and Repair

ARI provides a maintenance packet that is placed in the glove compartment of each new light truck or automobile. This package includes the PM schedule and maintenance coupons that are to be submitted to the maintenance service provider. That information is then sent to ARI for entry into their vehicle-maintenance database. After the maintenance service is completed, the service provider must furnish information on the service that was performed on the invoice. This invoice can be transmitted to ARI either in paper format, online, or, in the case of national accounts (such as those with Goodyear and

Firestone), bundled in a bulk monthly billing. Oil changes and general maintenance are to be performed every 5,000 miles.⁴³⁸

ARI provides a Maintenance Exception Report once a month that comes to the American Water SER Fleet Manager. This report lists the maintenance work that should have been performed during the month but was not completed. The American Water SER Fleet Manager then sends out copies of this report to the various responsible supervisors to inform them of the situation and for enforcement of the maintenance-policy guidelines with their assigned employees. Most of the exceptions are related to oil changes that were missed. This list normally contains about 60 vehicles (about 10% of the fleet) in a typical month. Large vehicles do not have maintenance packets that are issued to them. Therefore, it is up to the supervisors to ensure that the required maintenance and repairs are performed in accordance with the American Water Fleet Maintenance policy.⁴³⁹

ARI approves the vendors that are to be used for repair and maintenance work and maintains a list thereof. If a regional group has dealt with a local vendor and has had a good experience with that vendor, they can request that this vendor be added to the approved list. It generally takes ARI only about a day to certify a new vendor. ARI-certified vendors give a discount on the maintenance and repairs they perform for American Water companies. Because using the services of ARI-approved vendors is not compulsory, the AWWSC Fleet Manager estimates that there is currently approximately 85% compliance with using ARI-approved vendors for service and repairs performance. Replacement tires are acquired from Firestone/Bridgestone based on a national contract.⁴⁴⁰

State inspections are the responsibility of the assigned vehicle driver. There are no standardized reports or data collected on the status of state inspections. ARI handles all of the vehicle-licensing and renewal processes.⁴⁴¹

In the case of vehicle repairs, the service provider must call ARI to get the repair approved prior to providing any repair service. When the invoice is submitted to ARI for payment, the repair information provided on the invoice is compared to the repair's original authorization before payment is approved.⁴⁴²

In the case of service being provided by a vendor that has not been previously certified by ARI, the potential vendor must call ARI. ARI will then set up the vendor in its system and provide that vendor with ARI-certified status.

In those situations where ARI representatives have a question they cannot answer (such as whether to up-fit a truck with non-standardized equipment), ARI will call the American Water SER Fleet Manager for an answer or an approval. This protocol also applies to fleet management policy-enforcement issues, for which ARI does not have responsibility.⁴⁴³

Fuel Supply

ARI employs a fuel card system for purchasing fuel and monitoring transactions associated with such purchasing. The fuel cards that are used are from the Wright Express Company and are referred to as

WEX cards. WEX cards are used for fuel purchases by most fleet vehicles. These cards are used just like a credit card and are accepted at approximately 80% of service stations nationwide. Each vehicle is assigned an individual card, and at the time of the purchase, the driver must enter the mileage on the vehicle and the driver's PIN to validate the transaction as authorized.⁴⁴⁴

The WEX cards are used at private gas stations and the data is recorded by the ARI database. As of the end of 2007, American Water was not realizing a discount on fuel from the private gas suppliers. A new strategy of using fewer vendors to achieve discounts on fuel was reviewed at one time, but it would require the use of a very limited number of vendors, a requirement which would be very inconvenient considering the widespread locations of the American Water operations nationwide. Currently, fuel and maintenance expenses are tracked on an area-by-area weekly basis.⁴⁴⁵

Only the Pittsburgh and Hershey Districts maintain a bulk-fuel supply for their vehicles. PAWC operations personnel are responsible for the acquisition of bulk fuel, but this policy is currently being reviewed by the AWWSC Supply Chain group. Data concerning the vehicle and driver must be entered at the PAWC pumps in order to get fuel. This data is used to track the amount of fuel that is pumped for each transaction and for each of the two facilities in total. Such data is maintained in separate databases that are run at each of the two facilities.⁴⁴⁶

The American Water SER Fleet Manager receives two other monthly exception reports from ARI, those being:⁴⁴⁷

- ◆ A listing of vehicles that were fueled with more than 40 gallons of fuel in one day (usually due to large trucks with dual tanks)
- ◆ Vehicles that had more than one fueling transaction in one day

The Regional Fleet Manager transmits this information to the appropriate managers or supervisors so that they can investigate and take corrective action, as required.⁴⁴⁸

ARI Processes

ARI is responsible for the provision of the following services for PAWC:⁴⁴⁹

- ◆ Vehicle registration and registration renewal program
- ◆ Fuel card program – from which fuel usage data can be collected
- ◆ Accident management – the vehicle operator calls in to ARI to report the accident and ARI then records the information, oversees the repairs, and files a claim against the third parties, if applicable
- ◆ Vehicle-title management program – ARI maintains possession of the titles for all American Water vehicles that were leased from ARI
- ◆ Vehicle acquisition and leasing

ARI maintains an 800 number that is used to check on the status of new vehicles, to register vehicles, or for fleet maintenance.⁴⁵⁰

ARI also provides an accident management function to American Water companies. For accidents that are determined to be the fault of the PAWC driver, ARI manages the repair process but does not get involved with the third party. This third-party contact would be handled by the PAWC Risk Management group through the Company's insurance carrier. ARI uses Collision Experts, Inc. (CEI) whose representatives investigate the accident, if required, and oversee the repair of the PAWC vehicle using CEI-certified body shops.⁴⁵¹

Subrogation is the filing and collection on claims against third parties as a result of accidents that are caused by the action of the third party. ARI takes the responsibility for investigating these accidents and for submitting, negotiating, and collecting on the claim. For its services, ARI is paid 20% of the amount that is collected as a result of the claim.⁴⁵²

Exhibit IV-29 presents data on the amounts recovered as a result of subrogation by ARI for the period 2003 through 2007.

Exhibit IV-29
Accident Dollars Recovered Due to
Subrogation by ARI
2003 to 2007

	2003	2004	2005	2006	2007
Accident Amount Recovered	\$6,724	\$14,282	\$3,876	\$8,478	\$39,805

Source: Information Response 815

To perform the vehicle disposal function, ARI normally uses an auction house although it may be occasionally carried out through eBay. ARI charges \$100 per vehicle for this disposal service.⁴⁵³

ARI Systems

The internal ARI fleet-management information application is named Fleet Track. Fleet Track is a workflow management application that is used for tracking questions and requests. Additionally, ARI's Insights program is used for tracking vehicle data and maintenance records. Insights is a homegrown package that was developed internally at ARI based on the application that was previously used. It was implemented on January 1, 2007. ARI posts monthly performance data reports to its website. These monthly reports include the following:⁴⁵⁴

- ◆ Current vehicle inventory
- ◆ Fuel analysis
- ◆ Insurance claims analysis
- ◆ Maintenance analysis

- ◆ Savings analysis – documentation of the money recovered
- ◆ Vehicle cycling analysis
- ◆ Vehicle expense summary
- ◆ Vehicle order analysis
- ◆ Vehicle remarketing analysis
- ◆ Vehicle remarketing summary
- ◆ Vendor analysis

These reports are posted to the ARI website between the fifth and the tenth of the month for the previous calendar month. Tracked data are also made available in a real-time mode through ad hoc reporting. It is the assigned responsibility of the American Water SER Fleet Manager to review these reports on a regular basis. Additionally, all vehicle-related documents are maintained in the system and available online. Such documents include vehicle invoices, vehicle registration, licensing, title, and order specifications.⁴⁵⁵

There are also two “push reports” that are transmitted to the American Water SER Fleet Manager on a monthly basis, those being:⁴⁵⁶

- ◆ A preventive-maintenance exception report that lists vehicles that are past due for their standard preventive maintenance (i.e., over 5,000 miles or six months)
- ◆ A fuel exception report that presents cases where a vehicle was refueled three times or more in a 24-hour period or where more than \$150 in fuel was purchased in this same period

The ARI fleet management reports are quite detailed in nature. ARI has an internal programmer who makes any required changes to the reports. The AWWSC Fleet Manager stated that ARI has been very responsive to requests for report modifications.⁴⁵⁷

ARI maintains an online vehicle database for PAWC. All of the information that is transmitted from the maintenance and repair shops is entered into this database.⁴⁵⁸

Internal Audit of the Fleet Management Function

An internal audit of the fleet management function was completed in November 2005 by the AWWSC Audit Services group. As stated in the audit report, the purpose of the audit was: “We reviewed and evaluated the adequacy, effectiveness, and efficiency of internal controls and compliance with corporate and regional policies relating to billing, payroll, and fleet vehicle management.” The audit scope for the fleet vehicles’ portion of the internal audit was limited to the Wilkes-Barre/Scranton District. The final audit report included negative findings in relation to the following topics:⁴⁵⁹

- ◆ Improper reporting of taxable benefits relating to employer-provided vehicles – The resulting recommendation stated that there needs to be a reassessment of the PAWC policy relating to the use of employer-provided vehicles that are used for personal purposes in order to be in compliance with IRS regulations.

- ◆ Records relating to the business use of vehicles – The recommendation for implementing vehicle logs that detail the date, miles driven, destination, and purpose of the travel was satisfied in early 2006.
- ◆ Non-compliance with Corporate Vehicle Utilization Policy – As intended by the Vehicle Utilization Policy, pool vehicles should be provided to employees only during normal business hours and are to be taken home only when the employee is scheduled to be on call. The investigation found that this policy was being violated in the Wilkes-Barre/Scranton District.
- ◆ Lack of development and approval of a comprehensive fleet-vehicle policy – The recommendation was that a Corporate Fleet Program Governance Policy be developed. This comment has been addressed since the time of the audit.
- ◆ A physical inventory of vehicles leased from ARI had not been performed since 2003. In response to this finding PAWC used a temporary employee to collect this vehicle inventory information in late 2005/early 2006.

Findings & Conclusions

Finding IV-13 **The current American Water employee vehicle assignment policy does not include a provision for an annual review of the requirements of employees for vehicles and, therefore, it does not address changes in employee job titles and positions.**

Over the course of time, it can be expected that PAWC employees will change positions and therefore their job responsibilities will change. In some cases, it can be expected that employees who were properly assigned a vehicle based on their driving requirements will transition to a new job that does not have the same driving requirements. As a result, they will no longer require the assignment of a vehicle. Under the current procedures, this change in job status and requirements could easily be missed due to the lack of a formal annual-review process. It could be reasonably expected that if such a review process were established, situations would be identified where vehicles could justifiably be taken back from employees. This tendency might present the opportunity to reduce the size of the fleet or to avoid having to procure a new, additional vehicle for an employee who rightfully requires one.

Finding IV-14 **A regularly scheduled physical inventory of vehicles leased from ARI is not performed.**

This deficiency was one that was pointed out in the internal audit that was conducted in November 2005 but regular physical inventories of vehicles are still not being performed. A physical inventory of the entire fleet, as provided by ARI, should be undertaken on a regularly scheduled basis to ensure that the vehicles on the fleet-inventory listing are still in the possession of PAWC and that the information that has been recorded in relation to these vehicles is correct.

Finding IV-15 **There is an exception report for multiple fuel transactions in one day but not for apparently excessive fuel usage over a period of time (i.e., weekly or monthly).**

Daily data on fuel transactions is currently being collected by ARI, but the resulting reports are produced only on a daily basis. This results in a lot of data to be inspected and may not easily identify systemic problems with fuel usage. Because the data is already being collected and is available, a computer program should be developed that would aggregate this data and report it on a weekly or monthly basis. Such resulting reports would be much easier to review and would clearly call out systemic problems, rather than just one-day or very short-term aberrations.

Finding IV-16 **Neither the ARI contract nor the resultant invoices have been audited by the AWWSC Internal Auditing group.**

The amount of money that is being paid to ARI for fleet management services is very significant. Therefore, an internal audit of the contract, the resulting transactions, and the monthly invoices would be a good precautionary action. It is also possible that such an audit would be able to identify ways to expedite or improve the current processes.

Finding IV-17 **Continued use of the two PAWC mechanics in the Pittsburgh District goes against the recommended policies of American Water and may not be cost-effective.**

American Water began using ARI for all of its state-operating companies to achieve economies of scale in relation to the fleet management function. The intention of this initiative was to achieve cost savings. Failure to follow this policy based primarily on past precedent may not be resulting in PAWC attaining the maximum savings it could if ARI and its approved service providers were being used consistently. The economic costs and benefits of using in-house mechanics have not been reviewed or evaluated by PAWC.

Finding IV-18 **The improper reporting of taxable benefits relating to employer-provided vehicles that was identified in the internal audit conducted in November 2005 has yet to be addressed in a satisfactory manner.**

The internal audit recommendation stated that there needs to be a reassessment of the PAWC policy relating to the use of employer-provided vehicles for personal purposes in order to be in compliance with IRS regulations. Such a full evaluation has yet to be performed, so problems with this reporting could potentially still exist.

Finding IV-19 **There are no standardized reports or data collected on the status of state inspections for vehicles in the PAWC fleet.**

State inspections are currently the responsibility of the assigned vehicle driver. This policy could result

in problems if the driver is not vigilant and attentive. While the vehicle operators may be very well intentioned, it is always possible to miss a required date. This could potentially result in a problem for PAWC from a liability perspective if an uninspected vehicle were to be involved in an accident. Additionally failure to have the vehicle inspected per the established state inspection schedule could conceivably create safety issues for both PAWC employees and the general public.

Recommendations

Recommendation IV-12 **Initiate a formal procedure requiring an annual review of the requirements for each employee to have an assigned vehicle based on his or her current job assignment. (Refer to Finding IV-2.)**

Performing such an annual review should be a relatively uncomplicated process that could be done in conjunction with the operating staff and the Human Resources Department. The current rule is that vehicles are assigned to those employees who regularly drive more than 14,000 miles a year (excluding any personal mileage). Strict monitoring and enforcement of this rule could result in significant cost savings to PAWC based on a potential reduction in the size of the fleet required. In future years, once the initial review has been completed, the review would need to focus only on those employees whose job title, position, or responsibilities have changed during the preceding year to determine if their vehicular requirements have been impacted.

Recommendation IV-13 **Develop a formal procedure that details a requirement for the performance of a regularly scheduled annual physical inventory of the vehicles that are leased from ARI. (Refer to Finding IV-14.)**

It is good operating practice to regularly inspect the vehicles in a fleet to ensure that they are all accounted for and that all of the information included on each one is accurate. Development of a new formalized physical inventory procedure will provide guidance to this practice. It will also ensure that the inventory is performed on a regularly scheduled basis and in a structured and consistent manner.

Recommendation IV-14 **Develop an exception report that would clearly identify excessive fuel usage by specific vehicles or employees on a weekly or monthly basis. (Refer to Finding IV-15.)**

Such a computer program would simply aggregate the daily data that is already available and report it on a weekly or monthly basis, which is a much more useful format. This type of reporting would allow for a more expeditious and easily performed review of the data to identify any systemic problems that are occurring.

Recommendation IV-15 Perform an internal audit of the ARI contract and the resultant invoices using the AWWSC Internal Auditing group. (Refer to Finding IV-16.)

Considering the size of the payments that are made to ARI and the transactional volume of the services it provides, performance of such an audit is very important. It could potentially result in cost savings and/or improvements in operational and transactional efficiency.

Recommendation IV-16 Perform a cost/benefit analysis to determine whether the continued use of the two PAWC mechanics in the Pittsburgh District is cost effective. (Refer to Finding IV-17.)

The basic reason for using the services of ARI is to allow the state-operating companies of American Water to be able to gain economic benefits through the economies of scale that are achieved. Therefore it does not seem justifiable for one district to perform these tasks on an internal basis, even if limited in scope. However, there may be extenuating circumstances due to the specific circumstances and the area demographics that would make continuing the practice justifiable. A formalized cost/benefit analysis that considers all relevant factors would provide the basis for a proper determination of a future course of action.

Recommendation IV-17 Perform a reassessment of the PAWC policy relating to the use of employer-provided vehicles that are used for personal purposes in order to be in compliance with IRS regulations. (Refer to Finding IV-18.)

Performance of such an evaluation is important to determine with surety whether the current policy is compliant with IRS regulations. If problems are found with the current PAWC policy, the policy should be modified and a retrospective financial assessment should be performed to determine the extent of the errors in reporting that were created in the past.

Recommendation IV-18 Develop a computerized tracking system that is capable of monitoring the completion of the annual state-vehicle inspections for the individual vehicles in compliance with the established schedule. (Refer to Finding IV-19.)

It is important that the state inspections be performed in accordance with the prescribed schedules. With all of the other data that is being collected relative to vehicle operations and maintenance (O&M) and compliance with PM schedules, it should be relatively easy to add tracking of state-inspection completion to the data being monitored. Tracking of this data would allow for monitoring of the state inspections status from one centralized point of review. Problem situations could be quickly identified and accordant corrective action taken.

C. Facilities and Property Management

This chapter provides a discussion of facilities and property management services provided by either American Water Works Service Company (AWWSC) or Pennsylvania-American Water Company (PAWC) in relation to the facilities and properties that are owned or used by PAWC.

Background & Perspective

Organization & Staffing

Since RWE Thames Water Utilities left American Water in 2006, there has been no formal corporate group for the facilities and properties management function. The group that was established by RWE Thames Water Utilities was primarily intended for the divestment of excess properties and facilities. As such, there is currently no formal organization or staffing that is focused on the facilities and properties management function at either PAWC or American Water.⁴⁶⁰

Various individuals are assigned the part-time responsibility for managing and budgeting the operations and maintenance (O&M) and capital expenses programs for the various PAWC operating and office facilities. These designated individuals are usually managers or supervisors who work out of the facility for which they are responsible. For example, the Bethel Distribution Center, which is located in the Pittsburgh District, is the responsibility of the Supervisor of Network Operations who is based there. Facilities and properties-related work is done on a part-time basis in addition to regularly-assigned responsibilities. Each designated employee is responsible for his or her assigned site only. The Regional Supply Chain Manager, who is located in Hershey, is responsible for the bidding process for the acquisition and contracting of facility and property O&M services. The designated responsible local employee who is assigned the duty of overseeing the normal O&M function has direct input into the vendor-selection process for contractors.⁴⁶¹

The O&M budgeting process for each district is the final responsibility of the District Operations Manager. Standard maintenance work is included under the maintenance budget for each specific facility.⁴⁶²

Facility and land acquisition at American Water is done as part of the capital-budgeting effort and occurs via one of two distinct procedures. Generally, facilities and land acquired through the acquisition of other water and wastewater systems (one of the six types of projects that must go through the commercial development process, including fixed asset investments, material contracts, financial investments, land/property, joint ventures/alliances, and American Water consultancy projects) are approved by a regional Commercial Development Committee (CDC)⁴⁶³. The regional CDC is composed of the following members:⁴⁶⁴

- ◆ Business Unit (BU)/AWE President (Chair)
- ◆ Vice President (VP) Finance
- ◆ Legal Counsel
- ◆ VP Service Delivery/Operations
- ◆ State President

The CDC evaluates and approves or disapproves all non-routine transactions that the operating company may potentially enter into for the purpose of generating revenue, including water and wastewater utility acquisitions. Key operational, economic, and financial information, as well as risk analysis, is evaluated by the CDC during review of the proposed transaction.⁴⁶⁵

The American Water Commercial Development Committee (AWCDC) is required to approve any real estate sales or purchases having a value in excess of \$500,000.⁴⁶⁶ The AWCDC is composed of the following members:⁴⁶⁷

- ◆ Chief Operating Officer (Chair)
- ◆ Chief Financial Officer
- ◆ VP Planning & Reporting
- ◆ Associate Corporate Counsel
- ◆ VP of Operations Services
- ◆ Senior VP (SVP) Sales & Business Development

Facility and land acquisition outside of utility acquisitions are reviewed and approved by the Capital Investment Management Committee (CIMC).⁴⁶⁸ The CIMC responsible for regional BUs is composed of the following members:⁴⁶⁹

- ◆ PAWC President
- ◆ PAWC VP of Engineering
- ◆ PAWC VP of Operations
- ◆ PAWC Capital Programs Manager
- ◆ Southeast Region Finance Director

Necessary specific facilities that are to be acquired to make capital improvements, such as land for booster or chlorination stations, tank sites, etc. or buildings for offices or operations centers, are reviewed and approved by the CIMC in accordance with capital-investment management governance.⁴⁷⁰

According to the listing of property values that was used to renew PAWC's insurance coverage for 2007, the insurable value of PAWC's buildings (replacement cost of buildings only, as land is not insured) was \$456,341,137 (original cost totaling \$275,789,614). It was stated in the data response that the age and square footage of the individual properties were not readily available.⁴⁷¹

The realty holdings of PAWC fall into three general categories:⁴⁷²

- ◆ *Utility water* – the portion of PAWC’s land and plant that is devoted to its water operations, i.e., the land and plant that is used and useful in providing water service to customers.
- ◆ *Utility wastewater* – the portion of PAWC’s land and plant that is devoted to its wastewater operations, i.e., the land and plant that is used and useful in providing wastewater service to customers.
- ◆ *Non-utility water* – the portion of PAWC’s land and plant that is not used and useful in providing service to customers, i.e., land held for future use or land and buildings removed from utility plant in service and awaiting disposition.

A source for PAWC’s utility water realty-holdings valuation is the 2006 Public Utility Realty Tax Act (PURTA) Report. The PURTA Report is an annual report that is filed with the State of Pennsylvania’s Department of Revenue. It reports, by county and by individual parcel, the county-assessed real estate and state-taxable value amounts. Parcels listed on the PURTA Report are not subject to local real estate taxation. The 2006 PURTA Report, which summarizes PAWC’s utility water realty holdings on a county-by-county basis, shows that the total utility water realty holdings of PAWC have a county-assessed value of \$36,599,321 and a state taxable value of \$106,132,611. The original cost of utility water land and buildings held at December 31, 2007 totaled \$277,215,597.⁴⁷³

Utility wastewater and non-utility water are not required to be reported on the PURTA Report; however, a local real estate tax is assessed on these properties. Individual assessment values were not provided by PAWC during this audit; however, the original cost of utility wastewater and non-utility water holdings of PAWC at December 31, 2007 was \$17,565,198 and \$474, 407, respectively.⁴⁷⁴ The total original cost of all PAWC holdings for utility water, utility wastewater, and non-utility water at December 31, 2007 was \$295,255,202.⁴⁷⁵

Space-planning studies and analyses for PAWC facilities have been handled in the recent past by designated representatives of the PAWC Human Resources and Engineering groups on an as-needed basis. Studies that have been performed in the recent past were for the purpose of space planning in advance of the lease of a new facility in Wilkes-Barre and of space configuration changes at the Hershey and Mechanicsburg office facilities. The final office-layout designs were developed by an architectural/engineering consultant.⁴⁷⁶

Expenditures

In the response to a request for the actual and budgeted facilities and property-management operating and maintenance (O&M) and capital expenditures, it was stated that PAWC does not have a department that is charged with the responsibility to manage and control facility and property-management functions. Therefore, there is no specific budget for these activities. Actual O&M expenses and capital expenditures that are incurred in carrying out these activities are not captured by the company in a manner that permits such data to be readily available to serve as a management tool.⁴⁷⁷ For PAWC’s accounting of both O&M expense and capital expenditures, its detailed chart of accounts is mapped to NARUC’s broader 1996 uniform system of accounts (USOA) for Class A water and wastewater utilities.

For O&M expenses, costs are assigned to the BU to which a particular building is assigned. For capital expenditures, a work order captures expenditures associated with a particular project, following which the expenditures are transferred from construction work in progress to a utility plant account upon completion of the project.⁴⁷⁸ As a result, a meaningful analysis of O&M expenses or capital expenditures for management purposes cannot be efficiently or effectively performed.⁴⁷⁹

PAWC's current capital construction program, which includes the existing facilities' expansion plans, is included in the PAWC capital budget.⁴⁸⁰ A review of the PAWC capital-budget data, as included in the latest approved version (Q2) of the company's 2007–2011 Strategic Capital Expenditure Plan (SCEP) dated June 13, 2007, was not able to determine the amount of money that was budgeted specifically for land and facilities acquisitions. Rather, the data was presented on a cumulative project basis.⁴⁸¹

Major Processes and Systems

In other utility organizations, frequently a centralized real estate and facilities group is responsible for activities such as acquisition and disposal of holdings, managing revenues associated with lease or sale activities, and management and/or oversight of any maintenance work (ongoing and project work) associated with land and buildings. Centralization of this function generally allows a utility to ensure that activities are performed when appropriate and in a cost efficient manner. For example, decisions as to use of internal versus external resources can be more effectively performed when looking at the whole picture. In addition, use of a work management system allows a utility to determine the proper mix of preventive versus reactive maintenance work. Having such a group also allows professional project managers to perform oversight of major projects to ensure timely and quality completion within budgets.⁴⁸² However, due to the lack of a group that is responsible for the facilities and property management function at PAWC or American Water, there are no major processes or systems that are used in relation to this function.⁴⁸³

Metrics

Many different performance metrics can be used by a utility organization, depending on the focus of its facilities and property management function. Some examples noted by Schumaker & Company consultants in past audits include financial management metrics (O&M versus budget, capital expenditures versus budget, cost per square foot (office/non-office), revenue, and others) and operational execution/system reliability metrics (customer satisfaction, % of work planned, scheduled work completed, meeting acquisition or disposal dates in strategic plan, and others).⁴⁸⁴ Due to the lack of a group that is responsible for the facilities and property management function, there are no metrics that are recorded and monitored at PAWC or American Water in relation to this function.⁴⁸⁵

Findings & Conclusions

Finding IV-20 **There is no integrated Facilities and Property Management group at either American Water or at PAWC.**

The lack of this dedicated Facilities and Property Management group results in these activities being performed in varying ways and with no overriding standards. The decision on how to conduct the included activities is up to the judgment of the various employees who are assigned to handle specific functions, with very little in the way of standardized policies and procedures to guide the activities. It should be noted that none of these employees is a professional property manager. This oversight can result in a significant variation in the results that are achieved. Additionally, because PAWC does not have a department that is assigned the responsibility of managing and controlling the facilities and property management functions, there are no specific budgets for these activities. Moreover, there are no actual and capital expenditures that are captured by PAWC in a manner that permits such data to be readily available to serve as a management tool. This oversight makes the analysis of the efficiency and cost-effectiveness of such activities impossible to judge.⁴⁸⁶

Finding IV-21 **There are no formal policies and procedures to guide the performance of the facilities and properties management function at PAWC or at American Water.**

There are no standardized policies and procedures to guide the everyday conduct of the facilities and properties management function at PAWC. The only procedures that exist are in relation to the acquisition of property or facilities through the CDC or CIMC, which are generic investment policies, not facilities and property management guidelines.⁴⁸⁷

Recommendations

Recommendation IV-19 **Establish a single point of responsibility for the facilities and properties management function at PAWC. (Refer to Finding IV-2.)**

The position of Facilities and Property Manager should be established at PAWC to ensure a singular point of focus and standardization for these activities. Assigning this role would ensure that all of the included activities are performed to an established standard, rather than being based on the judgment of the various employees who are assigned to handle these tasks.

Recommendation IV-20 Develop a set of formal policies and procedures to guide the performance of the facilities and properties management function at PAWC and American Water. (Refer to Finding IV-14.)

A formal set of facilities and properties management policies and procedures would ensure that all of the included activities are performed to an established standard and are consistent with each other across PAWC. This standardization would serve to validate that the activities performed in this regard were cost-effective and in the best overall interests of the PAWC ratepayers.



D. Procurement Services and Materials Management

This section provides a discussion of the procurement services and materials management services provided by either American Water Works Service Company (AWWSC) or Pennsylvania-American Water Company (PAWC) in relation to the material, supplies, and services that are used by PAWC in the course of its daily operations. Because the procurement services and materials management services at AWWSC and PAWC are two totally separate functions, rather than being integrated into the same organization as is found at most utilities, this section of the report is divided into two distinct segments, with one devoted to each function.

Procurement Services

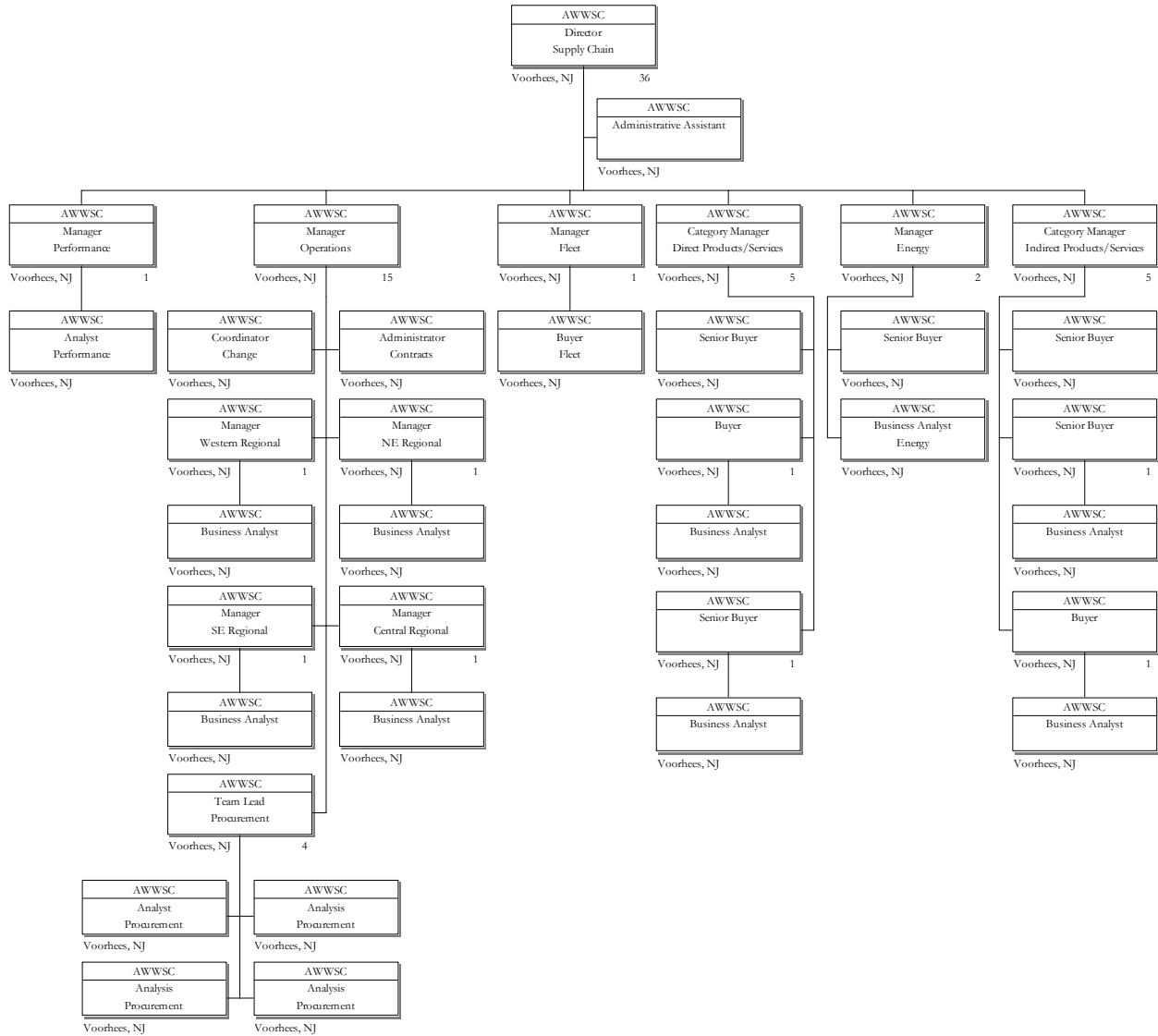
Background & Perspective

Organization & Staffing

The AWWSC Supply Chain (SC) group was approved by the AWWSC executive management team (EMT) in December 2003 and staffing began 2004. It is currently considered by American Water management to be primarily a strategic sourcing group. The SC organization originally included an AWWSC Inventory Management group until 2006, when that group was disbanded and the inventory management function transferred to the state-operating companies. This transfer was done based on a decision made by the presidents of the regions to pull the inventory function back into the individual operating companies. The operations regional managers for the state-operating companies focus more on local purchases than regional sourcing, for which the SC group is responsible.⁴⁸⁸

The SC organization at AWWSC is composed of several functional groups. This organization is presented in *Exhibit IV-30* and described in the text that follows.⁴⁸⁹

**Exhibit IV-30
Supply Chain Organization
as of December 31, 2007**



Source: Information Response 1

- ◆ The Category Manager Direct Products and Services, the Category Manager Indirect Products and Services, and their organizations are tasked with carrying out the strategic supply function. The strategic supply function is responsible for the identification of potential sources of supply, monitoring the timing of purchases, and the attainment of supplier diversity objectives.
- ◆ The Operations group is responsible for assisting other SC groups with their daily operations and internal workings. This group is subdivided into two general functions, those being:

- The Procurement group is responsible for the development of procurement contracts with vendors. Additionally, the group performs supplier address-book updates in the JD Edwards (JDE) system and validates that this information is accurate, correcting it as required. The group reviews the pricing of all purchase orders (POs) and validates them before they are transmitted to the vendors. The group also produces an Open POs report on a monthly basis and performs PO training for field personnel to ensure that the proper procedures are followed. In addition, the group produces reports on inaccurate POs and vendor address-book additions. In those situations where an inaccurate PO is identified, it is corrected and sent back to the Field Operations group that originated it for new approvals. Such PO problems are generally attributable to the use of inactive suppliers or incorrect prices. In the AWWSC Procurement group there are two primary categories of employees, those being:⁴⁹⁰
 - *Category Managers* – responsible for obtaining items that are of the best quality with the best service at the best price for American Water operating companies for all products and services that are purchased
 - *Buyers* – responsible for setting up contracts, administering contracts, monitoring on-time delivery of purchased products, etc.
- The four Regional Managers in the Operations group along with their support staffs are responsible for the following primary functions:
 - Focusing on contracts that are sourced on a local basis such as those for paving, dealing with residuals, and operations and maintenance (O&M) that are not covered under national contracts.
 - Obtaining feedback from the field operations personnel as to what equipment is in place and who is used for service provision of this equipment.
- ◆ The Performance Management group produces the budgeting forecast, quarterly reforecasts, volume reporting, and other data reporting as related to the procurement function.
- ◆ The Fleet Management group is responsible for managing the overall fleet management function for all American Water companies. American Water has outsourced a majority of this function to an external contractor, Automotive Resources International (ARI). The AWWSC Fleet Manager meets with ARI representatives on a quarterly basis to discuss the service level agreement (SLA) performance results for the previous quarter. On a regular basis, the AWWSC Fleet Manager meets with the operations people in the field and sometimes takes representatives of ARI with him. ARI does produce annual benchmarking studies that are relevant to the various services it provides to AWWSC. More details on the functions of this group can be found in this chapter's *Transportation and Fleet Management* section.⁴⁹¹
- ◆ The Energy Manager reviews energy costs and attempts to identify ways to reduce them. He is also responsible for performing energy audits of various American Water facilities, again with the intention of identifying means to reduce energy costs.

In relation to the procurement activities on behalf of PAWC, a Southeastern Regional Manager in the SC Operations group is designated by the American Water state-operating companies of the Southeastern Region as being responsible for purchasing. As such, this person is responsible for overseeing the SC activities in six Southeastern Region state-operating companies. A key objective of this position is to better align the business needs of the operating companies with the AWWSC procurement process.⁴⁹² His primary responsibilities include the following:⁴⁹³

- ◆ Focusing on the viability of those contracts that are sourced on a local basis, typically such as those for paving, dealing with residuals, and O&M work. These contracts are usually relatively small local ones that are not covered under national contracts. This responsibility includes monitoring the status of these localized contracts for potential problems with performance and for expiration dates to ensure that they are renewed in a timely fashion. The Southeastern Regional Manager also provides some guidance to the PAWC Field Operations groups in relation to using national contracts (as required).
- ◆ Attempting to identify those local contracts that could be bundled into state-wide or national contracts. Major areas of procurement (referred to as spend areas) of the business have been established previously by product code and by suppliers. When the Southeastern Regional Manager identifies an area of opportunity, he will attempt to aggregate the needs across the various districts of the state-operating company. This aggregation is intended to reduce both the number of vendors and the cost of the product based on a greater volume of sales. He is also responsible for obtaining feedback from the Field Operations personnel on what equipment is in place and who is used for service provision of this equipment. While the SC group drives the contract-development process, the local operations management personnel have their input into contract-related decisions.

Most of the national contracts with vendors are master service agreements that last for two years, but this duration can vary. A strategy meeting is held with all of the SC organization managers in attendance to discuss each new contract that is to be established.⁴⁹⁴

The SC Southeastern Regional Manager employs the AWWSC standardized seven-step process for developing new contracts, with the primary steps being the identification of an opportunity, the formation of a team to identify the available vendors, the development of the request for proposal (RFP), and the selection process. The final decision is made by the operating company with input from the SC Southeastern Regional Manager.⁴⁹⁵

The seven-step strategic sourcing process, as used by the AWWSC SC organization, is as follows:⁴⁹⁶

1. *Assess Opportunities* – Prior to initiating a strategic sourcing project, an assessment is conducted to identify sourcing categories and to estimate potential savings. The intention of this step is to identify the procurement categories for which the implementation of a strategic sourcing methodology may be applicable.

2. *Profile Category* – After identifying the categories to be strategically sourced, the second step, Profile Category, involves a detailed internal and external analysis to understand a category from market, vendor, and internal perspectives.
3. *Develop Strategy* – Once the Category Profile analyses have been completed, the appropriate category-specific sourcing strategy is developed. This task is accomplished through the development of a best-fit, category-specific strategy that will achieve the lowest total cost.
4. *Qualify Vendors* – After sourcing strategies have been developed, vendors must be qualified to ensure that they can meet the defined procurement requirements. This step is performed with the intention of narrowing down the list to a short list of possible vendors that best meet the specified requirements.
5. *Execute RFP/Selection* – Once the short list has been determined, a request for proposal is formulated to support the detailed evaluation and selection process. The intention is to provide an “apples-to-apples” format that would assist in the identification of those vendors that would be suitable for the negotiation process.
6. *Negotiate Agreement* – After analyzing the submitted responses to the RFPs to determine which vendor best meets the specified requirements, specific strategies are developed for negotiating with that vendor. The intention is to achieve a formal agreement in a “win-win” situation that allows both parties to see marked improvements in their ability to conduct business.
7. *Implement Category Plan* – After completing the agreement, the implementation process must be managed to ensure that changes are effectively introduced into the organization. This oversight will ensure that the agreements are fully utilized and that internal customers understand the changes and the implications of the developed sourcing methodology.

For example, in September 2007 the Southeastern Regional Manager was reviewing the grounds-keeping contracts for PAWC districts because they were scheduled to expire in the near future. After he identified the available suppliers, a scope of work was developed that became part of the standardized RFP document. The work plan was then developed and approved by the appropriate managers in the SC group and the designated PAWC Category Lead who is responsible for this function (who, in the case of lawn maintenance, would be the PAWC Network Manager).⁴⁹⁷

Pre-qualification of vendors to be included in the various bidding processes, including both requests for proposals (RFPs, generally used for services) and requests for quotations (RFQs, generally used for material purchases) processes, is typically accomplished through the use of work experience questionnaires (WEQs). Review of vendor-submitted responses to a WEQ is used to determine whether a vendor is to be included in a bidding, RFP, or RFQ process. Once pre-qualified, vendors will submit bids, proposals, or quotes in a sealed bid or electronic format as prescribed in bid documents.⁴⁹⁸

The received responses to RFPs are analyzed by a designated team that is composed of operating company personnel who are directly involved with the function. The Southeastern Regional Manager summarizes the received bids to facilitate this evaluation and selection process. The evaluation is done

primarily on the basis of the contact's cost, the range of services offered, and the quality of such services. Once a selection is made, negotiation is initiated with the selected bidder based on any number of identified issues. The majority of the time, the contract is awarded to the lowest bidder—it is relatively unusual to select other bids. The selection team tries to evaluate the quality of the bidder's service or product offerings up front in the selection process. That way, they can make sure that no unqualified bidders are included in the evaluation process. Time is then spent reviewing the responses to the RFP questions that relate to work experience, personnel resources, safety, and the financial status of the bidders.⁴⁹⁹

AWWSC reserves the right to select vendors based solely on bid, RFP, or RFQ information provided, to conduct discussions, or to request proposal revisions, if deemed necessary. The vendor that is awarded the bid will be chosen on the basis of which one would potentially provide the greatest anticipated overall benefit to the operating companies of American Water. AWWSC reserves the right to have no obligation to reveal to the bidding firms how vendor proposals were assessed. Schumaker & Company consultants performed a review of the documentation related to the bidder evaluation and selection process. This review revealed that a sufficient amount of data and detail is included in the process to allow for a proper selection to be made. Additionally, a process to include adequate purchasing-approval authority documentation is included in the vendor evaluation process.⁵⁰⁰

The next step in the vendor-selection process involves finalizing the contract. This phase usually consists of a standardized contract with an attached scope of work, prices, and terms and conditions that are specific to the subject contract. The final contract must be approved by the following groups or individuals: the AWWSC Legal Department, the AWWSC Finance Department, the contract signer (frequently the Network Manager from the state-operating company), and the SC Southeastern Regional Manager. The approved contract is then sent to the winning vendor for its signature.⁵⁰¹

The SC Southeastern Regional Manager normally has four to 10 contracts in the works at any given time, with some being small and others large. As an example, for lawn maintenance, PAWC had approximately 18 vendors that would be contracted with (due to the localized nature of the lawn maintenance business).⁵⁰²

The Southeastern Regional Manager also has responsibilities in relation to the American Water supplier diversity program. He documents diversity activities for his designated state companies in strategy documents. His personal key performance indicators (KPIs) state that every new purchase that is put out to bid (referred to as supplier events) must attempt to include a minority vendor. If this effort is unsuccessful, the attempts made are documented, including the reasons why it was not possible to include a minority vendor. The Southeastern Regional Manager was responsible for the development of the PAWC diversity document for 2006. Minority vendors must be price competitive. There is no advantage given to minority vendors in the bidding process. More information on the vendor diversity process is included in *Chapter IX – Diversity & EEO*.⁵⁰³

Other activities in which the Southeastern Regional Manager is involved include the following:⁵⁰⁴



- ◆ Supplier management and maintenance function, which includes working with the suppliers to ensure that the established agreements are followed.
- ◆ Identifying new opportunities for contract development.
- ◆ Addressing issues of vendor non-performance – In these situations, he is responsible for communication with the supplier (including on national contracts). He tries to resolve the problems by working with the vendor. He has the authority to release the vendor if it is not performing to the established specifications.
- ◆ Reviewing and addressing non-compliance spend, which deals primarily with Field Operations groups that are not using the established national contracts – He reviews the monthly non-compliance reports for problems and would address them when identified.
- ◆ Sign-offs on the contract approval form for local contracts only.
- ◆ Attempting to get out into the field on a regular basis to talk to the customer businesses about their needs and problems – On these trips, he meets primarily with the field superintendents and supervisors.

Under the applicable SLA requirements for the American Water operating companies, as an aggregate, various primary vendors are responsible for providing monthly reports on their performance. For example, in the fleet function the vendor (ARI) produces reports that detail its performance in the following functional areas:⁵⁰⁵

- ◆ Fleet size
- ◆ Average speed of answer
- ◆ Vehicles ordered
- ◆ Vehicles delivered
- ◆ Fuel purchasing volumes
- ◆ Maintenance and repair spend by region
- ◆ Summary statistics on the savings achieved
- ◆ Specific data on the vendor's results in meeting the key performance indicators included in the SLA, including:
 - Customer service
 - Material issuance
 - Vehicle remarketing
 - Major component issues

The SC group aggregates these individual vendor SLAs into aggregate reports for the overall SC function. These reports are produced on a quarterly basis.⁵⁰⁶

As of 2007, there were 1,049 American Water product codes that provide assistance in identifying purchased products by category. These finer gradation product codes are aggregated into product categories that include products of a similar nature or use. A sampling of typical product categories includes the following:⁵⁰⁷

- ◆ Water treatment chemicals
- ◆ Water infrastructure
- ◆ Tools and small equipment
- ◆ Storage tanks
- ◆ Professional services
- ◆ Pipe and fittings
- ◆ Outside legal services
- ◆ Meters
- ◆ Instrumentation
- ◆ Fleet
- ◆ Facilities maintenance
- ◆ Electrical
- ◆ Chemical feed
- ◆ Administration and general

The Commodity Report is published in April of each year and is updated in June and November by the SC group. This document is a research report that is intended to provide an internal analysis of the market demand and price trends for various commodities that are purchased on a regular basis by American Water state-operating companies. It also includes an assessment as to how these commodities will affect various designated procurement categories. This research information is provided to assist in the forecasting of budget requirements for the various designated categories. The report includes a brief summary of projections and recommendations on how specific commodity categories with historically high spend levels will be affected by market changes.⁵⁰⁸

Additionally, the Commodity Report contains more detailed information on the predicted market trends for nine selected commodities. These commodities were selected for a higher level of analysis based on their potential impact on the products and services purchased by American Water state-operating companies. These commodities typically exhibit high volatility in the marketplace and, as such, can have a significant impact on budget forecasts in the short-term future. Included in this analysis are evaluations of supply and demand, future price projections, worldwide market news and trends, and an update of the existing market for the commodity. These nine selected commodities include the following:⁵⁰⁹

- ◆ Chlorine
- ◆ Copper
- ◆ Crude Oil
- ◆ Electricity
- ◆ Labor

- ◆ Natural Gas
- ◆ Pulp/Paper
- ◆ Scrap Iron
- ◆ Steel

The Supplier Quality Report is used by the SC group to document problems with all supplier performance, or with non-conformance to either specification requirements or a service level agreement (SLA). The document also serves to notify the supplier of the problem and to advise that an investigation is to be initiated to determine the root cause of the problem. It then serves as the basis in developing the proper corrective action to avoid a recurrence of the situation. The supplier must reply in writing, utilizing the report, with the solution to the problem. No formal vendor-performance postmortems are performed other than the above-listed reports.⁵¹⁰

Vendor Scorecard Reports are produced by the SC group with the intention of providing performance ratings of selected vendors. These standardized scorecards rate the selected vendors based on 11 evaluation criteria, those being:⁵¹¹

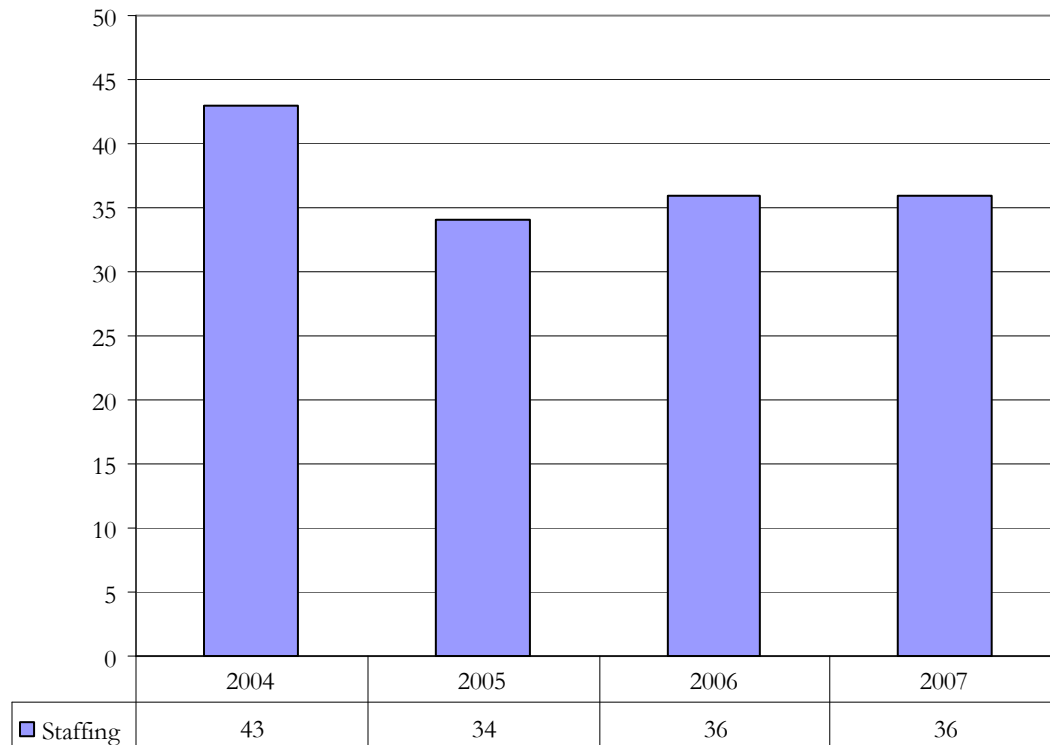
- ◆ *Customer Support* – response time/rate (timely, courteous, capable) and technical support capabilities
- ◆ *Accuracy* – delivery is complete per order (size, quantity, type)
- ◆ *Non-quality Returns* – efficient processing of non-compliant goods
- ◆ *Delivery Performance* – deliveries to date and time specified and agreed upon
- ◆ *Presentation* – packaged and labeled according to specifications and delivered in good condition
- ◆ *Packaging/ Documentation Requirements* – correct bar codes, packing slips, presort, grouping, invoicing, etc.
- ◆ *Communications* – reports, delivery status, product recalls
- ◆ *Quality* – adherence to quality standards established by the Category Managers
- ◆ *Capabilities* – sufficient production capabilities to meet planned demand
- ◆ *Product Innovation* – introduction and implementation of the use of new products
- ◆ *Product Value* – meeting the overall expectation for the products

These individual criteria ratings are then aggregated into a summary rating for that vendor.

Staffing Levels

PAWC does not have its own supply chain function; therefore, there are no actual or budgeted positions within PAWC. Instead supply chain services are provided to PAWC by the AWWSC Supply Chain group,⁵¹² whose staffing levels for 2004 to 2007 are shown in *Exhibit IV-31*.⁵¹³

Exhibit IV-31
AWWSC Supply Chain Staffing Levels
2004 to 2007



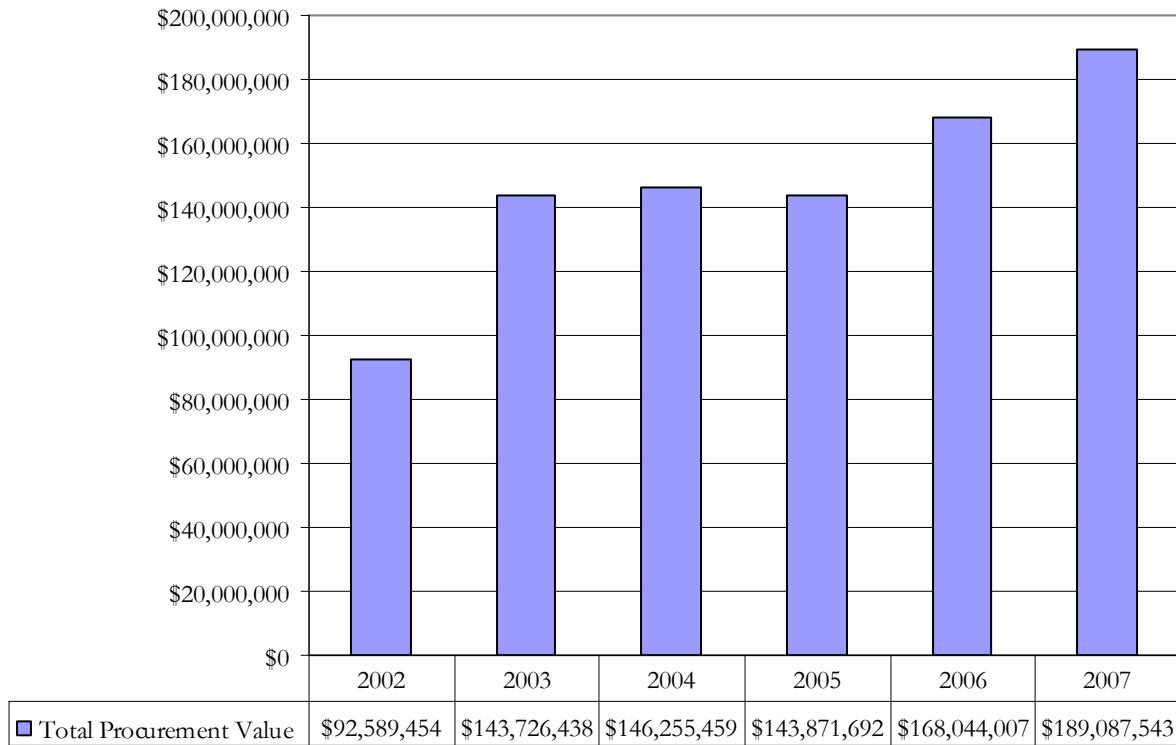
Source: Information Response 852

The SC staffing levels dropped by nine in May 2005 from 43 to 34. After reviewing internal control requirements defined by Sarbanes-Oxley (SOX), AWWSC determined that the accounts payable function should no longer be located within the same organizational structure as strategic sourcing function. Consequently, the accounts payable function was transferred from the Supply Chain group to the Shared Services financial group. In 2006, two Procurement Analyst positions were added to comply with procurement-to-pay (P2P) SOX remediation.⁵¹⁴

Expenditures

Because PAWC does not have its own supply chain function, no budget or actual-to-budget operating expense data is available at the state level for a supply chain function.⁵¹⁵ The only budgeting the AWWSC SC group does is related to the group's annual salaries and other operating expenses. It does not specifically budget state purchases.⁵¹⁶ Instead, annual budgeting for purchases is done by the field forces in each of the state-operating companies. It is based on aggregated forecasts, for example, of how much ductile iron pipe would be required over the course of the coming year.⁵¹⁷ *Exhibit IV-32* illustrates PAWC's total procurement value (purchases) for 2002 to 2007.⁵¹⁸

Exhibit IV-32
PAWC Total Procurement Value
2002 to 2007



Source: Information Response 834

Major Business Processes

Representatives of the SC group communicate with vendors on a regular basis. A Supplier Complaint Log is used to track all complaints that are made against vendors. However, there is no report of vendor problems that is automatically generated by the JDE procurement software. There is an online Supplier Complaint Report (SCR) form that is filled out by operations personnel in the field to report problems with vendors. This form contains information on the problems that were encountered, including:⁵¹⁹

- ◆ Information on the employee who reported the problem
- ◆ Details of the problem
- ◆ The supplier name
- ◆ Proposed action to be taken to resolve the problem
- ◆ Status of the complaint's resolution

The SC group has conducted surveys of its customers in the Field Operations groups to obtain additional input. The Vice President of the SC group makes it a practice to visit regional sites once a year to have face-to-face meetings with the field representatives.⁵²⁰

The SC group reviews the cost drivers for its vendors. Such drivers include the cost of purchased scrap iron, which is a major component of the vendor's cost for producing ductile iron pipe.⁵²¹

A monthly cost savings report, which includes the following items, is produced on the cost savings generated by the SC group in relation to the procurement process.⁵²²

- ◆ *Procurement performance* – the difference between the price paid by American Water and the average price of the bids that were received for the item.
- ◆ *Purchasing results* – a comparison of the old price for the material versus the new price for the material, with no adjustment for market conditions and with the goal of beating the consumer price index (CPI).
- ◆ *Return on investment (ROI)* – For the SC group, a comparison of the costs of operating the group with the resultant cost savings obtained by that group.

It is the objective of the AWWSC SC group to put as much of the purchasing as possible under national (blanket) contracts, which this group is responsible for establishing. It is believed that because of the volume purchasing discounts that can be achieved under national contracts, item and material costs can be driven to lower levels. A quarterly report is produced by the SC group on the total sourceable spend incurred for each month versus the amount covered by national agreements. Spend data is not routinely published at the state-operating company level. Rather, the reports are produced at the regional and American Water levels. These reports show the amount of dollars spent under national contracts as a percentage of the total sourceable spend dollars for the business unit. The data for 2007 shows this usage of national contracts to be 81% for PAWC; the SC group has a target of 71% to 75%. On a quarterly basis, these compliance reports are sent to the operations managers who are responsible for compliance in the field. The intention of this undertaking is to increase the use of national contracts.⁵²³

The SC group attempts to identify new opportunities for the sourcing of additional items that could be included under national contracts. The compliance reports identify those areas where the national contracts are not being used to their fullest extent.⁵²⁴

In relation to the quality of the material purchased, the individual state-operating companies develop their own product specifications, a function that is normally performed by the Engineering groups. The state-operating company personnel in the field who receive the material into inventory are responsible for determining and verifying the quality of that material. If the material is damaged, the receiving personnel would return it to the subject vendor without any involvement on the part of the SC group. The SC group would only become involved in those situations of very large or systemic problems.⁵²⁵

There are two general categories of purchased materials in the AWWSC SC group, those being:⁵²⁶



- ◆ Direct materials are defined as products that come into contact with water in the process of treating it or delivering it to the customer, including the chemicals that are used.
- ◆ Indirect materials are defined as purchases that do not come into contact with water, which include such categories as legal, uniforms, consulting, temporary labor, information technology, communications, office supplies, etc. At the end of 2005, the SC group implemented commodity codes that enabled them to better track procurement volumes.

An example of the steps involved in a typical purchasing process for a state-operating company includes the following:⁵²⁷

- ◆ The Field Operations organization would issue a PO and it would be approved in accordance with the established PO approval process.
- ◆ This PO would go directly to the vendor under a national contract.
- ◆ The buyer would get involved only if there were a problem with the purchase or the price.

On the AWWSC internal intranet site are listings of the preferred vendors with established national contracts, including a buyer's guide and pricing list. If a specific item is not listed on the intranet site, the Field organization either calls an AWWSC buyer for assistance or sources it locally. The contracts with the preferred national suppliers are not exclusive contracts. American Water operating companies have the right to purchase items from other vendors (with no approval required from the SC group) without violating the terms of the contracts.⁵²⁸

Each of the SC buyers receives a monthly report of the amount that is purchased from preferred suppliers under national contracts versus the quantity that is purchased from non-preferred suppliers. The buyer checks for situations of significant use of non-preferred vendors and, in such cases, would question the originator of the PO. The buyer also uses this information to identify opportunities for additional sourcing under national contracts.⁵²⁹

The buyers do not receive monthly reports on vendor performance. However, vendor performance surveys are sent out to the field on an annual basis to obtain field input on current suppliers.⁵³⁰

Major Systems

The primary software application used by the SC group is the JDE Enterprise Resource Planning (ERP) procurement module running on an AS400. The JDE software version that is being used is from 1996. The AWWSC SC group uses the JDE procurement module, but it does not use the accompanying distribution requirements planning (DRP) module for the materials management function. The AWWSC Inventory Committee is currently working on how to implement and use the JDE DRP module to the greatest benefit at American Water state-operating companies.⁵³¹

AWWSC and representatives of the operating companies participated in an American Water program, with the purpose of studying and evaluating how to implement the SAP ERP package at all of the

American Water companies. The decision had already been made to go with SAP as it was the package used in Europe by RWE. The group had finished the flowcharting of the processes when the project was called off because of the divestiture announcement from RWE earlier in 2007.⁵³²

The AWWSC SC group has built and maintains an internal intranet website. This website is available to any state-operating company employee with the proper security clearance. This website includes, among others, the following data reports:⁵³³

- ◆ American Water's seven-step strategic sourcing process
- ◆ A listing of new suppliers that have been added to the supplier master list
- ◆ Supplier complaint log
- ◆ Supplier quality report
- ◆ Purchase orders issue report
- ◆ Supplier management reporting log

Diversity databases and the Internet are used by AWWSC SC personnel to attempt to identify available minority vendors so that these vendors might be offered the opportunity to participate in the bidding process for contracts with AWWSC. There is an American Water Supplier Diversity policy that states that minority vendors are to be included in the process for each sourcing event (which is defined as any time new bids are solicited for an item). The SC group tracks how many minority vendors were included in each bidder pool and how many were successful. SC representatives also attend purchasing fairs and expositions with the specific intention of identifying new minority vendors. The individual buyers each have KPIs as part of their performance assessment process. These KPIs evaluate the results that were achieved in relation to increasing the diversity of suppliers. The SC group also surveys existing suppliers to gain information on those suppliers' own internal diversity programs. However, this data has proven to be hard to collect because many of the vendors do not gather such information.⁵³⁴

At the national level, it has proven to be difficult to find diverse suppliers because of the size of the national contracts and the amount of materials that is purchased. For example, pipe suppliers must be very large for them to be able to fulfill the overall requirements of the American Water state-operating companies.⁵³⁵

Findings & Conclusions

Finding IV-22 The current procurement module of the ERP system is 12 years old and lacks significant amounts of capability that would be expected from a state-of-the-art current application.

As with most computer technology, great strides have been made in the capability and speed of the ERP procurement technology in the past 12 years. Capability and functionality have been significantly enhanced thanks to improved software designs and more powerful hardware. Most importantly, current

procurement applications take full advantage of the greater efficiencies that are offered by the use of the Internet for procurement purposes. Such Internet-capable applications can greatly improve the efficiency and speed with which the procurement process takes place. At the same time, they can provide for much greater availability of relevant data and statistics. An additional benefit is that these applications allow for a significant reduction in the amount of paper that has to be generated and dealt with. e-Procurement, as it is called, is definitely the wave of the future. Implementation of a robust procurement system that would avoid such tasks as the production of paper POs would improve and expedite the procurement process. However, due to a lack of applicable data, a quantification of these savings would not be valid. The AWWSC Procurement group is currently doing too much manual work, which cuts down on the time that is available for performing strategic-sourcing-related tasks.

Additionally, a contemporary ERP procurement application would be seamlessly integrated with the materials management/inventory module, thereby allowing for direct transfers of data between the two systems. For example, when the inventory module detected an item in a storeroom that had fallen to a stock level below its predetermined minimum level, it would, through the procurement module, develop a recommended requisition order. This order could then be approved by the proper company employee(s). This approval process would automatically generate a PO, which would be electronically placed with the designated vendor. The process requires no paper and is very efficient and expeditious. The current procurement application that is in place at PAWC and AWWSC has this functionality, but it has never been implemented at PAWC or AWWSC.

Finding IV-23 The use of preferred suppliers under national contracts is not mandated and likely is having a negative financial implications for the operating companies as a result of not maximizing the use of suppliers that have been subjected to a bidding and negotiation process.

Currently, the use of national contracts for purchasing equipment and supplies is basically a voluntary practice. Neither the contracts with the vendors nor AWWSC procedures require that state-operating companies, which perform the actual purchasing transactions, make use of the established national contracts. Because these national contracts are the result of a formal bidding, evaluation, and selection process, which is heavily based on pricing of the required items, it can be assumed that the prices included in the contracts are very competitive in relation to the marketplace. Using vendors other than these preferred vendors does not take advantage of this bidding/negotiation process. Therefore, the resulting prices could be higher than those that are included in the national contract. Most companies, both utilities and other types of firms, require that their operating organizations purchase items only under their blanket contracts, with the exception of emergency or time-critical situations. Not doing so negates the advantages gained from a larger company-wide contract, especially in terms of pricing. Additionally, use of national contracts allows for enhanced monitoring of vendor performance and for more expeditious resolution of the problems that are identified.

Finding IV-24 **The lack of PAWC-specific data that is collected in relation to the procurement function renders it difficult for the PAWC management to evaluate and assess the effectiveness of that function's performance at PAWC.**

The vast majority of the data that is collected by the AWWSC SC group is aggregated on either an American Water or regional basis. Relatively little data that is reported on is specific to the state-operating companies such as PAWC. This aggregation of data “averages out” the performance results and would not readily identify operational problems that were specific to a state-operating company. Moreover, a company such as PAWC would have a difficult time in performing an assessment of the operational efficiency and effectiveness of the procurement function that is specific to its localized operations. The relevant raw data appears to be available through the existing data-collection systems; it is just the presentation format that limits its usefulness. Such modifications in the reporting should not be very difficult to implement and could result in large benefits to the state-operating companies through their ability to identify and resolve operational problems and/or process efficiency and effectiveness deficiencies.

Recommendations

Recommendation IV-21 **Initiate a software identification, selection, and evaluation process for a new integrated procurement/materials management application. (Refer to Finding IV-22)**

Numerous vendors offer very robust procurement/materials management applications that run on the latest and most powerful technology. The task is to determine which of the applications is the best fit for the specific requirements presented by the American Water state-operating companies. Even among the various companies, there will be differences in requirements. As such, an application will have to be found that will be able to adequately address all of the various needs. In some cases, the business processes of the individual companies may need to be modified, but this situation typically arises in an ERP implementation project. Representatives of AWWSC and the state-operating companies already have recent experience in this process through the Standardized Technology Enabled Processes (STEP) program. This program was conducted to evaluate the implementation process for the SAP software package.

Recommendation IV-22 **Evaluate in detail the impacts of not mandating the use of national contracts with preferred vendors by the state-operating companies, especially in terms of the financial impacts, and determine whether mandating this practice would be beneficial to the operating companies. (Refer to Finding IV-2.)**

As stated previously, most utilities require that their operating groups purchase items only under their blanket contracts, with the exception of emergency or time-critical situations. The reasons for this



mandate are to standardize the purchasing process and to take maximum advantage of the prices that are negotiated under these contracts. The use of the national blanket contracts is not voluntary, but rather mandatory. AWWSC needs to work toward getting to this methodology of doing business. PAWC reports that compliance with the use of national vendors for purchased items that are under national contracts is 93.3%. However, PAWC also reports that compliance with the use of national contracts for all purchases (for both those items that are under national contracts and those that are not) is at 81%. This percentage could be improved, thereby resulting in financial benefits to PAWC (through mechanisms such as volume pricing discounts). Not doing so results in a failure to take advantage of the work of the SC group in obtaining the best possible prices with reliable vendors that can meet their commitments. Because of the nature of the various state-operating companies, including PAWC, some flexibility needs to be included in the policy for including lower cost alternatives. In a company that is as operationally and geographically diverse as PAWC, special considerations may have to be given to certain parts of the company operations. These situations, however, should be the limited exceptions and should include a bidding process where possible (i.e., a preset price for emergency assistance). The recommended review should also be used as an opportunity to identify those specific material purchasing situations that do not have established national contracts but should for reasons of cost efficiency. A focus could then be put on establishing such national contracts for these identified material purchases.

Recommendation IV-23 Initiate a study to determine how best to present the operational and performance data on a state company basis and to evaluate the potential benefits of such reporting changes. (Refer to Finding IV-24.)

The ability to easily review operational performance data and results on a state-operating company-specific basis would result in a better ability on the part of the individual companies' (such as PAWC) management to evaluate the effectiveness of these operations in their state. This facility would apply to both the operations that are conducted within the state-operating companies as well as those that are performed for them by the AWWSC SC group. Such data would give the respective managers of the state-operating company more state-operations-specific data. This information could then be used as the basis for making informed decisions concerning the operations of the state company.

Materials Management

Background & Perspective

Organization & Staffing

As of the end of December 2007, there is no designated Inventory or Materials Management group at either AWWSC or at PAWC. The Supply Chain (SC) organization originally included an AWWSC Inventory Management group until 2006 when that group was disbanded and the inventory

management function was transferred to the state-operating companies. This transfer was done based on a decision made by the presidents of the regions to pull the inventory function back into the individual operating companies. At PAWC, certain operations supervisors are designated to be in charge of their storeroom's inventory function. There are 31 storerooms that are maintained by PAWC.⁵³⁶

Expenditures

Due to the fact that there is no centralized inventory management function at PAWC, there were no available costs or expenditures associated with the operations of a Materials Management group. The costs associated with the personnel who participate in the materials management function are recorded as normal operating expenses for the operations department of which they are a part.⁵³⁷

Major Business Processes

Because of the past lack of centralization and leadership in the materials management function at American Water operating companies, including PAWC, there were no standardized procedures and processes that were used across the company. Rather, it has been the designated responsibility of each storeroom to maintain its inventory in the manner that it sees as being proper. An *Inventory Management Strategy* for the American Water System was adopted on November 21, 2007. However, as it was explained to Schumaker & Company consultants, it is a strategy document, not detailed policies and procedures as are required for standardization of operations. Also it remains to be seen if this strategy will be enforced at all of the PAWC storerooms.⁵³⁸

The only area where there is some company-wide standardization of inventory procedures is in relation to the designation of items that are in inventory. Inventory part-type classifications include:⁵³⁹

- ◆ *Stocked parts* – inventoried parts or supplies that are used on a regular basis.
- ◆ *Expensed items* – primarily maintenance items that are not tracked in the inventory system and are not included in the calculations that are done in relation to inventory turns.

Within the stocked parts category, there are three stock types that are used in the PAWC materials management system, those being:⁵⁴⁰

- ◆ Stock C parts – These are chemicals that are inventoried.
- ◆ Stock D parts – This category is used for fuel.
- ◆ *Stock E parts* – These are inventoried parts that are used on a regular basis. These items are tracked in the inventory system and are included in the inventory turns calculations.

Maintenance of the Parts Master File is the responsibility of the Fixed Assets (FA) group at AWWSC. The FA group is responsible for the following materials-management-related tasks:⁵⁴¹

- ◆ Updating of the Parts Master File to reflect changed part descriptions or specifications, which is done upon receipt of requests for updates from the operating companies.
- ◆ Setup of new parts in the Parts Master File, which again is done upon receipt of requests from the operating companies for new parts to be included.
- ◆ Coordination of the annual physical-inventory results and identification of the occurrence of significant variances that are to be investigated by the storekeepers in the field.
- ◆ Production of reports relating to the Parts Master File.

Strategic stock, sometimes called emergency stock, is defined as items that must be maintained in inventory despite very low usage rates. Such parts are long-lead-time, specialized items that would be required if an emergency repair were to be required. In the opinion of PAWC representatives, the potential exists for consolidating these items into fewer locations, thereby enabling a reduction in inventory levels.⁵⁴²

A listing of surplus or obsolete inventory in each storeroom is no longer produced as it was when there was an Inventory Manager in charge of inventory management functions. Rather, employees now have to look at each individual storeroom to determine surplus levels. At PAWC, prior to 2007, an annual request was sent to the individual storerooms by one of the operations supervisors. This request asked for lists of obsolete items in each storeroom, but it is no longer done (due primarily to lack of time on the part of the person who previously initiated it).⁵⁴³

At 2007 year-end there was no standardization of part numbers in AWWSC or in PAWC across the various storerooms. There is an established American Water Parts Number Cleanup Committee that is a subcommittee of the American Water Inventory Strategy group. This effort has been in process for about three years, and this committee has several established goals, including:⁵⁴⁴

- ◆ Developing a standardized part-numbering system for use at all American Water operating companies.
- ◆ Making consensus decisions as to which items are to be classified as Stock E (inventoried items) versus maintenance items for American Water operating companies as a whole.
- ◆ Developing a standardized part-numbering scheme to be used for new items.

There is an ABCD inventory-classification system that is in use. The top 80% of items in terms of usage are classified as A items. B items comprise the next 15% in terms of usage. C items are defined as items that have not been used in that storeroom in the past 12 months, but that have been used elsewhere in the PAWC storeroom system during that timeframe. D items are classified as those that have not been used anywhere in the PAWC storeroom system in the past 12 months. This ABCD analysis is performed once or twice a year using the JDE procurement application by the AWWSC SC group.⁵⁴⁵

Annual physical inventories are performed at each PAWC storeroom. The results are reviewed for apparent discrepancies by the Fixed Assets group at AWWSC. Some of the storerooms also perform informal cycle counts that are not adjusted for in the inventory database due to the existing software's lack of ability to permit daily inventory adjustments to be made. Rather, this cycle-count variance data is used to identify items that need to be ordered. That is because there is no automated reorder capability included in the JDE software that is used by PAWC.⁵⁴⁶

A complete physical-inventory count of the Stock E items is performed in each storeroom at least once per year, typically between September and November. This inventory count is performed in coordination with the Fixed Assets group at AWWSC. Each storeroom has approximately a two-week window of time in which to perform the physical inventory. The Fixed Assets group notifies each storeroom of its scheduled window and the local field operations management selects a date during the cycle to perform the physical-inventory count. On the designated date, the storeroom stops all activity for the day, including physical receipt of deliveries, receipt of materials into the JDE application, and any issuance, transfers, or other movement of goods. The storeroom location assigns personnel to perform the physical count. The storerooms perform the physical-inventory count according to the "Field Inventory Cycle Count" manual.⁵⁴⁷

The responsible PAWC employee at each storeroom logs into the JDE application and initiates the physical-inventory count procedure by creating a physical-inventory count number. A physical count sheet, which lists all of the parts with the description, is printed and distributed to the storeroom personnel. The quantity of each part in inventory is not listed on the physical count sheet. Rather, physical-inventory counts are performed "blind." The supervisor/storekeeper/assigned employee counts each part on his or her designated list, including materials on PAWC field operations trucks and vans, and enters the number counted next to each part number and description. This count is witnessed by an independent observer. After all of the parts have been counted and recorded on the physical count sheets, the physical count sheets are signed by the counters and forwarded to the responsible PAWC employee to be entered into the JDE system. Once the count numbers are entered into the JDE system, a variance report is produced from JDE. This report identifies differences between the physical count and the perpetual-inventory records.⁵⁴⁸

The local field operations manager reviews the variance report, and the physical-inventory count team recounts parts that have significant unresolved differences to verify that their original count was accurate. These counts are performed with the perpetual-inventory quantities listed on the physical-inventory list. A PAWC employee then enters the adjusted counts into the JDE application. Remaining variances will be printed on a new variance report. The recounts may be repeated two or three times until significant variances are resolved, if possible. The root cause of the remaining variances is researched and explanations are written on the variance report for significant remaining variances. The local field operations manager reviews and approves the final JDE variance report.⁵⁴⁹

The designated PAWC employee enters the final inventory count numbers into JDE for those parts that were recounted. Once the physical-inventory count has been entered into the JDE application, the



physical-inventory sheets and the approved variance reports are forwarded to the Fixed Assets group. This group is then responsible for posting the adjustments to the GL.⁵⁵⁰

A physical cycle count of chemicals (stock C) is performed once per year, typically between September and November, in coordination with the Fixed Assets group. Each location that has chemicals is required to perform the cycle count according to the “Field Inventory Cycle Count” manual. Upon completion of this count, the results are forwarded to the Fixed Assets group for posting of the adjustments.⁵⁵¹

A physical count of fuel (Stock D) is performed monthly. PAWC has two locations that have fuel storage facilities, those being the service centers at Bethel and Hershey. Each location that has fuel is required to perform the cycle count according to the “Field Inventory Cycle Count” manual. Upon completion of this count, the results are forwarded to the Fixed Assets group for posting of the adjustments.⁵⁵²

The physical movement of items in PAWC includes the following forms of transactions:⁵⁵³

- ◆ Issuance of inventory to contractors
- ◆ Issuance of inventory to contractors’ warehouses
- ◆ Issuance of inventory to PAWC employees for new construction, repairs, and maintenance
- ◆ Transfers between PAWC storerooms
- ◆ Chemicals transactions
- ◆ Fuel transactions

The following forms are used in the movement of materials and supplies at PAWC:⁵⁵⁴

- ◆ *Materials Estimates Form* – This form contains the details of the scheduled work that is to be performed. The contractor or PAWC employee uses this form as guidance as to the details of the work that needs to be completed.
- ◆ *Tap Order Form* – Tap orders are used for new services installations. The tap order form contains the address where the work is to be performed, the G/L account coding for the work to be performed, a sketch of the work to be performed, and a list of the service materials and supplies that need to be issued for the job. Service materials and supplies are service parts that are used to connect a water line to a property (i.e., copper tubing, meter pit setting, etc.).
- ◆ *271 Form* – The 271 form contains a list of all inventory items charged from stock or returned to stock with the associated account coding for each material.
- ◆ *Contractor Invoices* – PAWC is invoiced by the various contractors based on the amount of work they have performed (i.e., feet of pipe installed).
- ◆ *Daily Job Sheets* – The job sheet contains detailed information of the work performed either by PAWC crews or contractors. It includes the amount of parts and material used by type and the date the work was performed. The PAWC Inspector completes this form and signs off on it.

The material usage and issuance data that is contained on these forms is entered into the JDE procurement module. This data is used to decrement (or replenish in the case of returns of material to the storeroom) the on-hand inventory balances that are included in the JDE database.⁵⁵⁵

Materials are also issued to PAWC employees for new construction, repairs, and maintenance. Non-service materials are issued directly from inventory to a job or are expensed to maintenance. To return non-service material to the storeroom, a 271 form is prepared and is given to the designated reviewer and approver. Service materials can be issued from the storeroom or vehicle (rolling stock) directly to the job, or they can be expensed to maintenance depending on their use. When service material is maintained on PAWC vehicles, it remains part of the storeroom inventory in the JDE application until it is placed into use. Field Operations employees can replenish their trucks at any time by requesting service materials with a form, by making a verbal request of the storekeeper, or by retrieving the materials and supplies directly from the storeroom and filling out the requisite forms. At the conclusion of each service-installation job, when material is used from the vehicle rolling stock, the employee completes a stock issue form (Form 271 or tap order). This form indicates all of the materials used for the job as well as the associated accounting code for each item. The employee is required to sign the stock issue form and submit it to the designated PAWC reviewer and approver (this person would normally be a supervisor or inspector). The document(s) is then forwarded for review and entry into the JDE application to decrement the on-hand balance inventory.⁵⁵⁶

After all tap order forms and 271 forms have been reviewed and approved, they are forwarded to the designated Field Operations group's administrative personnel for recording. The materials and supplies are not relieved from inventory or issued back into inventory until the administrative personnel member enters them into the JDE application. However, the policy at PAWC is that these orders are to be entered within five business days. As they are entered at only a few designated locations and the data must be transmitted to these locations, the entry of data that decrements the inventory is by no means timely and results in inaccuracies in the inventory on hand balance numbers. The administrative personnel member writes the issue or return document number on the 271 form and indicates the JDE document number. Such a notation serves as evidence that the goods transfer was entered into the JDE application. The issuing and receiving function is locked by the AWWSC's Fixed Assets group at month-end during the closing period, which lasts approximately three to five days. During this time, issuances and receipts are maintained until the beginning of the following month. The issuances and receipts can then be entered into the JDE application. The Fixed Assets group is responsible for performing the reconciliation of the perpetual inventory to G/L to verify that the goods movement has been properly recorded.⁵⁵⁷

There are two types of materials transfers between storerooms, those being:⁵⁵⁸

- ◆ Intra-company transfers are transactions that take place between PAWC storerooms. The intra-company transfer is authorized by e-mail from the requesting storeroom to the transferring storeroom. The transferring storeroom completes the 271 form and enters the transfer into the JDE application. It then ships the requested material. The requesting storeroom inspects the material upon receipt and, if material is refused, contacts the transferring storeroom.



- ◆ Inter-company transfers are transactions that take place between PAWC storerooms to/from other American Water operating companies' storerooms. The receiving company sends an e-mail to request a transfer of inventory. The company releasing the inventory e-mails the Fixed Assets group, copying the receiving company. This e-mail contains the part number, description, quantity, from-the-storeroom number, from location (if applicable), and to-storeroom number. This e-mail represents authorization of the inventory transfer. The company receiving the inventory is to confirm receipt of the transfer with an e-mail to the Fixed Assets group. The "to" storeroom number and the "to" location (if applicable) are to be included in this correspondence. The e-mail represents authorization for the inventory receipt. The Fixed Assets group, upon receipt of notification from both parties, processes an inventory transfer. AWWSC will record the transaction only upon receiving an e-mail confirmation from both the receiving and transferring storerooms. The requesting company inspects the material upon receipt and, if material is refused, contacts the transferring company.

Chemicals are ordered as needed against a national agreement (blanket PO). Upon delivery to the appropriate facility, the chemicals receipt documentation is entered into the JDE procurement application by the responsible PAWC operations representative and is matched against the appropriate purchase order (PO). At least once a month, an inventory cycle count is performed and issues are made from inventory to record the quantity of chemicals used during the period. The monthly count and issues from inventory are prepared and approved by the local Field Operations group. A full physical inventory of chemicals is also performed on an annual basis⁵⁵⁹

Fuel is received as needed at the appropriate fuel storage and distribution facility and is placed into inventory. Once a month, a fuel-volume physical inventory is performed and the inventory is adjusted as needed. Adjustments to fuel inventory are prepared and approved by the local Field Operations group. The approved adjustment is recorded into the JDE application locally and is then posted by the AWWSC Fixed Assets group.⁵⁶⁰

All inventory movements are entered into the JDE application by a designated Field Operations group administrative personnel member. Only the designated administrative personnel have the ability to enter inventory movements in the JDE application. Access to the JDE application is requested and approved by the individual's supervisor by completing a User Access Request (UAR) form. The completed UAR form is submitted to the system administrator in the PAWC Information Technology Services department.⁵⁶¹

Major Systems

PAWC is currently using the JDE Enterprise Resource Planning (ERP) procurement application, but PAWC is not using the Distribution Requirements Planning (DRP) inventory module that is offered as part of the application. The JDE system produces four monthly inventory-related raw data reports from the World Writer system.⁵⁶²

1. Assets (on-hand balances of parts)

2. Monthly transactions of parts taken out of inventory
3. Cost per item in inventory (average cost of the item times the number of parts in inventory) for each item in each storeroom
4. Monthly transactions of parts received into inventory (both item quantities and dollars)

An Inventory Scorecard Report and a Summary Report, which are based on the above raw data that is extracted from the JDE system, are produced by the SC Procurement group. The data in the raw-data reports is not easily available online, and therefore one would have to contact the Fixed Assets group to get current version of this information. The Fixed Assets group also has inventory-related functions in relation to the ownership and maintenance of the parts-number listing and inventory-level data.⁵⁶³

The AWWSC SC group maintains two Access databases that are inventory related and are populated with the raw data that is extracted from the JDE system. One contains information on the various storeroom facilities. The other contains item-related data, such as part numbers, part descriptions, min/max information, ABCD analysis, and part classifications.⁵⁶⁴

These Access databases and the JDE raw data are then pulled into an Excel spreadsheet that was created about three years ago by a consultant. The spreadsheet, which is produced on a monthly basis, contains six sections, as follows:⁵⁶⁵

1. An instructional page
2. A high-level overview of the inventory turns for the month by region, state, district, and storeroom – This data is not presented by item number, but rather by the following inventory categories:
 - Pipe turns
 - Non-pipe turns
 - Chemical turns
3. A graphical presentation of the inventory turns data that was presented on the second page, showing historical trends in the inventory turns for the last approximately 18 to 24 months
4. A database page that calculates what inventory items each storeroom has that are over its designated maximum-inventory on-hand balance level – this report includes only overages, not shortages. Its data is classified according to three categories: within maximum (max), slightly over, and over by a large amount.
5. Detailed information on parts, part numbers, part classifications, minimums (mins), maximums (maxs), recommended levels (usually basically an average of min and max), on-hand balances (in quantities and dollars), identification of parts that are below their listed mins, calculation of the dollar amount in inventory for each item, etc. (Note: PAWC does not identify or track safety stock levels per se, but rather uses mins as a substitute.)
6. Inventory turns detail, including monthly demand, quantity on hand, and turns by item by storeroom.

These reports are posted on the American Water QuickPlace Intranet site, where they are accessible to designated employees.⁵⁶⁶

From the above data, another set of monthly reports is created. These reports present summarized inventory-turns data on a state-by-state basis. Such reports include three numbers for each state:⁵⁶⁷

- ◆ Month-end on-hand inventory in dollars.
- ◆ Demand during the month in dollars.
- ◆ Summary of total monthly inventory turns for the state.

This summary report goes to managers and the individual storekeepers. It also contains the same set of three numbers, in an historical sense, for the last twelve months. While this report can be run by request at any time, it is generally only run at year end and is very seldom requested more frequently.⁵⁶⁸

An internal audit of selected aspects of the inventory function was completed in November 2005 by the American Water Internal Audit Services group. As stated in the audit report, the purpose of the audit was to review and evaluate the adequacy, effectiveness, and efficiency of internal controls and to determine compliance with corporate and regional policies relating to billing, payroll, and fleet vehicle management.⁵⁶⁹ The audit scope for the inventory portion of the internal audit was statewide. The final audit report included negative findings in relation to the following topics:⁵⁷⁰

- ◆ “Information in the inventory database is not complete or accurate.”
- ◆ “There has been no analysis of inventory quantities for excess and obsolete items and there is no written inventory management plan for reducing excess and obsolete inventory.”

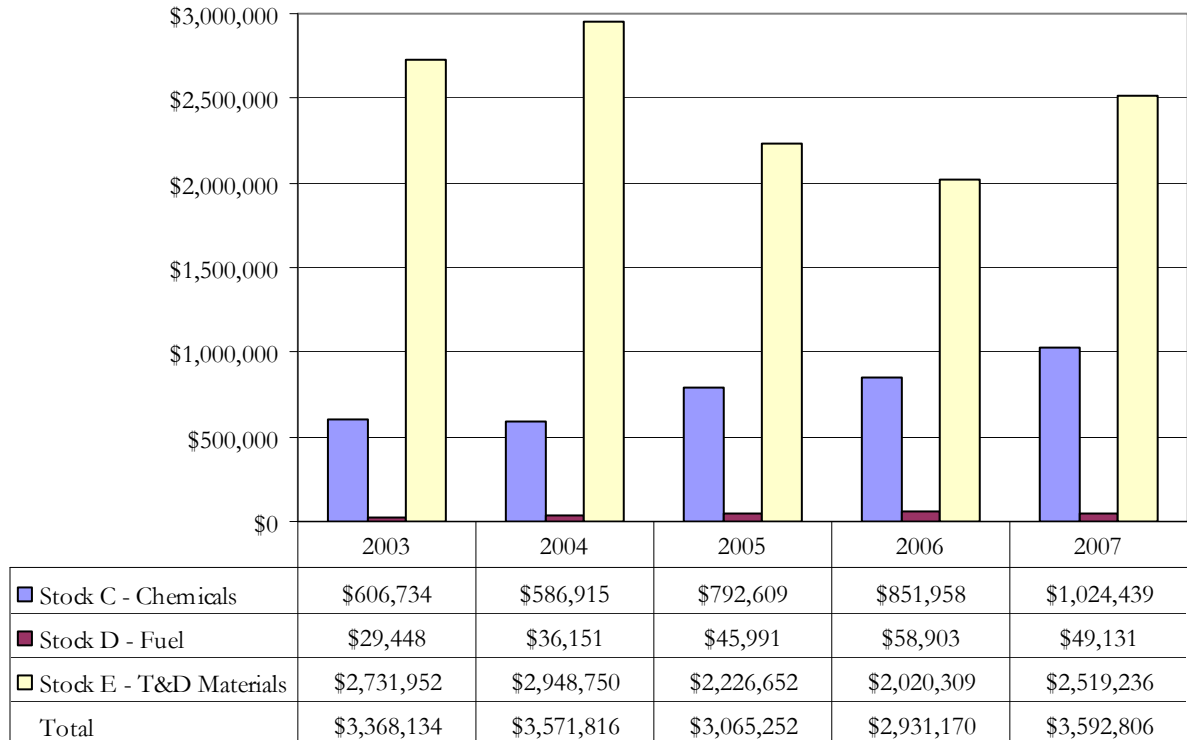
Findings & Conclusions

Finding IV-25 Based on the numerous inventory procedures and systems deficiencies that were identified during the course of this audit, it appears that the inventory data and calculations that are produced by PAWC are inaccurate to some extent.

With the number of significant deficiencies that were identified in the inventory procedures and systems (such as a lack of standardized policies and procedures, deficiencies in storekeeper training, and differences among the storerooms in the physical security measures used), it would be hard to conclude that the inventory numbers that are in use every day at PAWC are accurate. A similar conclusion was reached as a result of an internal audit that was conducted in November 2005, which stated that “Information in the inventory database is not complete or accurate.” Because the inventory procedures and systems that are in place at PAWC are not significantly different from or improved upon since 2005, Schumaker & Company has found that this conclusion is still correct.⁵⁷¹

Due to a lack of overall data that is maintained and in light of the data collection techniques and systems that are used, the accuracy of the following data that was provided to Schumaker & Company, especially the data related to inventory turn rates, is highly suspect. (See *Finding IV-26.*) *Exhibit IV-33* displays PAWC's inventory values, by type, for 2003 to 2007 as provided by PAWC.⁵⁷²

Exhibit IV-33
PAWC Inventory Levels by Stock Type
as Reported by PAWC
2003 to 2007

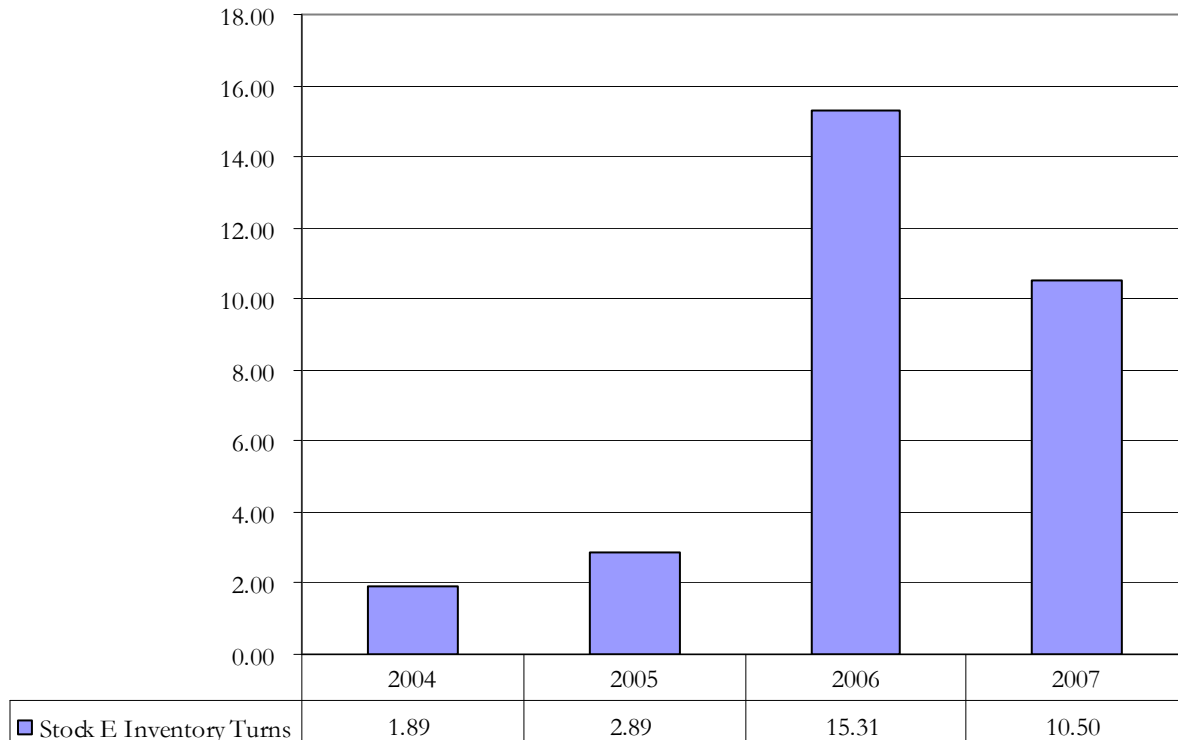


Source: Information Response 858

It should be noted that the Schumaker & Company analysis of the inventory levels identified a discrepancy between two pieces of documentation related to inventory levels that were provided by PAWC. To be exact, the inventory levels that were reported for EOY 2005 were different by \$63,000. In response to an inquiry for an explanation, PAWC management stated that it believes the discrepancy is due to closing the books for year-end early in December for the years 2003-2005. PAWC management further stated that it was unable to reconcile the difference, but believed the reports used to provide a response to information response 321, which came from the inventory accounting system, was not run at the exact time the books were closed in 2005. Conversely, information used in PAWC's response to information response 858 came from the JDE financial software, which serves as the basis for amounts appearing on the balance sheet.⁵⁷³

Exhibit IV-34 displays PAWC’s Stock E inventory turn data for 2004 to 2007, as reported by PAWC. (The first year PAWC began tracking inventory turns was 2004; also, pipe was not included in the calculation until 2006.) No data is available for Stock C or D turns, as PAWC does not track this data. The formula that PAWC uses for calculating inventory turns is 12-month running demand divided by month-end inventory level, which is the industry standard calculation methodology. Again it must be stated that the accuracy of the following data is suspect due to inconsistency in the data collection procedures and the absence of a viable and fully functional inventory management computer system. This accuracy problem is demonstrated by the extreme increase in the inventory turns data between 2005 and 2006, although part of this increase was explained by PAWC as being due to the fact that prior to 2006, American Water Companies, including PAWC, did not include distribution piping in the inventory turns calculation. However, Schumaker & Company consultants have never before seen inventory turns that were this high at any of the many utilities that we have previously audited. This observation, combined with the operational problems presented by inadequate inventory data collection and monitoring computer systems and the overall lack of materials management procedures and oversight, leads to even more reason to question the veracity of this data.⁵⁷⁴

Exhibit IV-34
PAWC Stock E Inventory Turns
as Reported by PAWC
2003 to 2007



Source: Information Responses 319, 856, and 857

Again Schumaker & Company consultants identified discrepancies in the inventory turns data between two documents that were supplied by PAWC. In response to an inquiry concerning this, PAWC replied that they believed that this was also due to timing errors related to the times that the reports were run.⁵⁷⁵

Exhibit IV-35 illustrates Stock E inventory turns by warehouse for 2004 to 2007, as supplied by PAWC. Again, this data is highly suspect for the reasons that were stated above.⁵⁷⁶

Exhibit IV-35
PAWC Stock E Inventory Turns by Warehouse
as Reported by PAWC
2004 to 2007

District	Dec-04	Dec-05	2005 Targets	Dec-06	2006 Targets	Dec-07	2007 Targets
PENNSYLVANIA	1.89	2.89	5.05	15.31	6.60	10.50	14.08
PA- ABINGTON	6.65	11.07	10.89	23.62	22.50	14.49	23.25
PA- BANGOR	1.18	4.82	3.89	15.01	6.46	26.32	11.50
PA- BERWICK	0.92	0.58	6.98	6.62	1.08	5.87	3.25
PA- BROWNSVILLE	1.06	6.92	2.75	63.14	10.47	23.03	21.25
PA- BUTLER	2.62	3.96	9.96	16.62	6.97	3.82	12.00
PA- CLARION	-0.12	7.02	3.47	17.53	12.11	2.44	13.20
PA- COATESVILLE	1.32	1.33	8.14	4.59	3.48	5.10	4.00
PA- FRACKVILLE	1.80	1.15	3.35	5.43	3.70	2.94	4.50
PA- HERSHEY	3.30	2.48	7.95	14.67	6.89	10.16	9.50
PA- INDIANA	1.18	3.32	7.98	21.75	6.73	8.29	7.80
PA- KANE	2.10	3.93	2.40	27.24	2.00	11.37	10.00
PA- LEHMAN PIKE	2.09	4.60	2.52	62.09	2.50	18.28	22.00
PA- MCMURRAY	1.53	2.57	4.43	28.80	7.70	17.00	16.90
PA- MECHANICBURG	2.80	3.23	9.06	16.52	11.57	13.30	12.25
PA- MILTON	1.53	5.24	4.44	11.41	8.40	7.80	12.00
PA- MON VALLEY	3.29	3.22	5.77	19.63	6.16	26.67	13.50
PA- NAZARETH	1.94	12.34	1.15	40.19	16.91	25.00	28.00
PA- NEW CASTLE/ ELLWOOD	2.42	4.01	5.36	27.67	14.42	18.35	16.00
PA- NORRISTOWN	3.81	4.05	5.65	30.87	9.45	23.57	10.40
PA- PHILIPSBURG	2.04	7.47	9.79	16.14	14.54	18.74	15.50
PA- PITTSBURGH	1.69	1.93	4.14	8.68	4.98	7.70	6.45
PA- POCONO	1.48	18.16	7.17	68.30	19.51	19.37	38.00
PA- ROYERSFORD	4.17	7.27	6.15	17.65	6.24	34.74	11.80
PA- SUSQUEHANNA	2.61	4.05	7.13	24.88	6.46	6.00	16.20
PA- UNIONTOWN/ CONNELLSVILLE	1.56	6.24	6.32	61.98	7.59	24.94	31.00
PA- WARREN	2.32	1.11	7.76	7.59	4.23	1.70	8.25
PA- WILKES BARRE/ SCRANTON	2.06	2.80	4.08	11.70	4.82	7.99	7.75
PA- WYOMISSING	0.29	6.22	9.55	12.01	14.82	15.05	16.00
PA- YARDLEY	0.96	1.59	4.65	9.92	4.89	5.81	6.10
PA- GLENN ALSACE	N/A	N/A	N/A	N/A	N/A	29.78	N/A
PA- POCONO SEWER	N/A	N/A	N/A	N/A	N/A	21.83	N/A
PA- PUNXSUTAWNEY	N/A	N/A	N/A	N/A	N/A	2.76	N/A

Source: Information Responses 319 and 856

Many factors can influence the turn rate from one warehouse to the next. According to PAWC management, an explanation of variances would require significant inventory analysis; therefore, it was

not provided. PAWC management did provide some general statements that were made to support the fact that differences occurred. Specifically, PAWC management stated the following:⁵⁷⁷

- ◆ The turn rate is much higher in areas with low maintenance requirements and high project requirements, which would cause the stocking locations to keep a relatively small amount of normal O&M inventory on hand, but still have a large demand for materials to be used on projects.
- ◆ Pipe sizes located within the territory served by each warehouse are different, thereby a territory system that has a large range of pipe sizes is required to keep a larger amount of inventory on hand. Having this larger amount of materials in inventory increases the dollar value of the inventory at such a location and therefore decreases the turn rate.

An inquiry was made to PAWC concerning an explanation of the reason that most of the warehouses experienced higher turn rates in 2006, then these turn rates dropped again in 2007. PAWC responded that early in PAWC's 2005-06 inventory reduction initiative, individuals responsible for inventory levels at the local warehouses reduced levels to achieve higher targeted turn rates. Experience demonstrated that the levels were too low. Also, during this time, delivery lead times for certain stock items increased significantly. Consequently, adjustments were made to balance operational requirements and fiscal responsibility and, as a result, Stock E balances increased and inventory turns decreased.⁵⁷⁸

Incorrect operational data makes running a viable and efficient materials management operation all the more difficult. When actions and conclusions are made based on inaccurate data, in many cases, the resulting actions also tend to be incorrect. Data accuracy in the inventory function is an essential requirement of being able to run an effective inventory system, be it in a utility, a manufacturing firm, or any other business operation. Commonly-accepted materials-management best practices place great emphasis on the accuracy and integrity of the data that is used to manage an inventory function.

Finding IV-26 The inventory management computer systems that are currently in use are very out of date and the data that is collected is by no means sufficient to maintain proper control of inventory.

PAWC does not use a company-wide, integrated inventory-management computer application. As of the end of 2007, PAWC was using a 12-year-old version of the JDE procurement application as its materials management system. While such a module does have some inventory-monitoring capabilities, they are very limited at best. What's more, they require numerous workarounds and additional computer programs to be able to function as even a very minimal materials management system. This limitation results in a lack of both accurate data and detail on the inventory as well as a severe lack of the operational features and functionality that would be included in a contemporary ERP materials management module. This deficiency is critical in nature and has a significant deleterious impact on the ability of the PAWC materials management function to properly support the operations of the Field Operations groups.

Because PAWC does not use a company-wide, integrated inventory-management computer application, it is difficult to tell at this time what its inventory levels should be. Using the levels shown in *Exhibit IV-33*, Schumaker & Company believes that PAWC should at least be able to reduce its Stock E – T&D Materials inventory levels to \$2,100,000, approximately what it experienced in average between 2005 and 2006, as a result of improved and timelier information on inventory levels at each location. The use of an integrated inventory management system (which we have been told American Water has, but PAWC does not use) would likely allow PAWC to reduce its inventory levels from those recorded for 2007. Based on achieving a \$2,100,000 Stock E inventory level, PAWC would be able to reduce its Stock E inventory valuation by approximately \$400,000 (difference between 2007 level and \$2,100,000), a one-time savings. Assuming 25% inventory carrying charges (which is the general industry standard), PAWC would also be able to reduce its annual costs by approximately \$100,000 (25% x \$400,000). While PAWC has stated that in 2005 and 2006 it experienced operational problems when running at these inventory levels, the implementation of an integrated inventory-management system should allow PAWC to achieve these levels and operate with few problems due to the significantly improved availability of accurate and timely inventory information.

Finding IV-27 There is no centralization or leadership in the materials management function at American Water operating companies, including PAWC.

There are no clearly defined levels of authority or designated responsibility for the management of inventory at PAWC. As a result of the Supply Chain group having no responsibility for inventory management and control, there is no central point of inventory management and focus within AWWSC. Rather, this function is left to the responsibility of the individual state-operating companies, with essentially no guidance. This is also true at PAWC with the exception that one of the Network Operations supervisors has taken it upon himself to oversee some of the activities of the various storerooms. However he has no designated authority to force that correction to procedures and processes to be made at the individual storerooms outside of the Pittsburgh district. (He has been given this authority in that district, but it is still on a part-time basis due to his having other assigned responsibilities.)

In the past, this Network Operations supervisor performed more inventory-related functions such as producing a listing of surplus or obsolete inventory based on data that was sent to him by the individual storerooms. However, because of his time constraints, he has had to curtail these activities. As such, there is now no listing produced of these obsolete items within PAWC.

The lack of designated management of the materials management function at both AWWSC and PAWC has resulted in each storeroom performing its assigned functions in the manner it best sees fit. Inspection of several storerooms performed by Schumaker & Company consultants found a wide range of daily operating procedures, housekeeping, and physical security measures for the inventory as employed by the individual storerooms.

Finding IV-28 No standardized, comprehensive inventory-management policies and procedures exist for either American Water in general or for PAWC.

In response to the Schumaker & Company request for copies of the “materials management, inventory and warehouse/stores procedures manuals,” two documents were provided, those being:⁵⁷⁹

- ◆ A copy of the “2006 Sarbanes-Oxley 404 Program Process Narrative,” which was last revised in March 2007 – At just six pages in length, this document provides only an overview of portions of the inventory process that was developed to satisfy the requirements of the Sarbanes-Oxley Act. It does not contain nearly the amount of detail that would be found in a good set of materials management procedures. For a company the size of PAWC, it would be expected that a comprehensive materials-management procedures manual would be quite voluminous. Only a reference document of such mass would allow for the presentation of a sufficient level of detail as required to perform the materials management function in a standardized and comprehensive manner. Also, because it is not in the format of a procedure, referencing and looking-up procedures requires a manual scan of the document for the topic of interest. Moreover, revision control can be applied only to the document as a whole.
- ◆ A copy of an American Water PowerPoint presentation on the topic of “Inventory Cycle Count Training” – Unfortunately, the presentation is completely based on how to conduct cycle counts using the JDE Distribution Requirements Planning module that PAWC does not own. Therefore, it is of no use to PAWC. Additionally, because it is presented in the format of a presentation rather than a structured procedure, it is essentially useless for reference and lookup purposes. And because it is not in the form of a procedure, revision control and recording would be impossible.

Finding IV-29 Insufficient inventory-skills training is provided to storeroom personnel.

The PAWC employee who is responsible for the operation of the storerooms is generally a supervisor in the Network Operations group who handles the function on a part-time basis. Upon being given these responsibilities, no formalized training program, either internally or externally, was provided to instruct these former field operations personnel in the proper procedures to be followed in maintaining and tracking the inventory. Rather, training is done on an informal basis by someone who has some “limited” knowledge of the function.

Finding IV-30 There is currently no standardization of part numbers across the PAWC storerooms or American Water operating companies in general, although this situation is being reviewed at the current time.

An AWWSC Part Number Standardization Committee was established in 2006 and has been working on the development of a standardized part-numbering scheme that is to be used across all American Water operating companies. As of December 2007, this effort was still in progress. When this effort is completed, PAWC should be an early adopter of this part-numbering format. In that way, it would

eliminate many of the problems and much of the administrative work that results from having a non-standardized part-numbering system. This adoption will facilitate the ordering of items, improve communication between stockrooms, and is essential if an ERP materials management application is to be implemented.

Finding IV-31 **There are no inventory grid systems in the PAWC storerooms, making the location of parts difficult and time consuming for those who are not familiar with the inventory layout at that particular storeroom.**

An inventory grid system (row, rack, and bin) is critical to the efficient functioning of a storeroom. While the primary storekeeper may know the locations of items, others who need to find parts would have a hard time locating them without a grid locator system and clear labeling of the physical rows, racks, and bins. Additionally, the lack of an inventory grid system presents the opportunity for “losing” parts that are put in a different location than normal or parts that are not used on a regular basis. The current software system that is used for materials management will not support the identification of item locations as it does not have that functionality. However, a contemporary ERP materials management module would certainly have this capability.

Finding IV-32 **There is no standardized, formal cycle-counting program in place.**

Each storeroom is left to decide whether and how to do cycle counting. There should be a standardized procedure and frequency for this process that is to be followed by all of the storerooms. Because the current materials management application does not support cycle counting, a temporary workaround would have to be developed for this process until a new ERP materials management module was implemented.

Finding IV-33 **PAWC does not have a mechanism to identify and report on material that is obsolete or held in excessive quantities.**

The identification of obsolete and excess material is at best difficult. Because such an obsolete/excess analysis has not been performed since at least 2006, when the AWWSC Inventory Management group was eliminated, it is fair to assume that there are significant quantities of obsolete/excess material in some, if not all, of the storerooms. This obsolete/excess material is truly a waste of money in that it has to be maintained and counted with no resulting benefit. It also takes up valuable inventory storage space in the storerooms. Without a computerized analysis and report of inventory movement, this identification process would be manual and difficult to undertake. Additionally, there should be a standardized inventory-management plan that addresses how to deal with this topic. Unfortunately, no such plan exists, and without the data, it would be almost impossible to perform anyway.

It should be noted that the internal audit of the inventory function that was conducted in 2005 that identified the existence of this problem.

Finding IV-34 Maintenance items are not inventoried and therefore can only be reordered based on visual inspections.

The current materials management application is not being used for those items that are labeled maintenance items, despite the fact that such items were relatively numerous in the storerooms that Schumaker & Company consultants visited. Therefore, the on-hand balances of maintenance items must be determined through visual inspection. Such visual inventory monitoring is fraught with the potential for errors and this practice could result in stockout situations.

Finding IV-35 The strategic parts inventory could be reduced for PAWC by consolidating them into a few strategic inventory locations.

Strategic parts are those that are used on an infrequent basis, but are necessary for emergency repair situations. However, this necessity does not mean that all of the parts have to be stored in all of the storerooms. Rather, a few storerooms that are geographically diverse could be designated as the repositories for these parts. Then, all of the strategic parts could be centralized in these locations, which should present an opportunity for reducing the numbers that are kept in inventory. When a need for these parts arises, the required parts would be shipped, by whatever means necessary, to the location needing the parts. Based on the geographical diversity of the centralized strategic parts storerooms, this storage strategy should result in a delay of only, at most, a few hours. Because the requirement for these parts is very infrequent, this minor delay is a worthwhile tradeoff for being able to reduce an expensive portion of the PAWC inventory. Furthermore, most delays in part arrivals would occur concurrently with preparatory work at the work sites.

Finding IV-36 Inventory maintenance and control is inconsistent across the PAWC storerooms and the control of inventory was observed to cover the range from inadequate to sufficient.

Proper inventory maintenance and control is the result of several factors, among them:

- ◆ Ability to track the inventory levels and movements in an automated fashion.
- ◆ Proper physical security in the storeroom to guard against items being taken from inventory without the proper paperwork/data entry and shrinkage.
- ◆ Consistent adherence to proper inventory-control procedures including item receipts, item transfers, item issuing, and cycle counting.

Observation at several storerooms by Schumaker & Company consultants found that adherence to the above tenets was very inconsistent. While some of the storerooms appeared to have a reasonable level of inventory control, others were seriously lacking in this regard. Much of this problem is the result of a lack of proper, standardized inventory-control procedures, deficiencies in the training of the storekeepers, and a seriously deficient materials management computer system.

Finding IV-37 **The vast majority of the storerooms that were visited by Schumaker & Company consultants did not have a computer terminal in the storeroom area; rather, data entry and lookup were the responsibility of an administrative person in the each of the service center front offices.**

Contemporary materials management best-operating practices call for computer terminals to be located in the storeroom area. They also mandate that data entry be done by the person who is responsible for control of the inventory. This storeroom location provides several advantages, including:

- ◆ Significant reduction in the number of inventory transactions that are not entered (or entered improperly) into the system – It has been found that if the computer is right there at the point of transactions, there is a much better chance of the data being entered in a timely and accurate manner.
- ◆ More incentive for the consistent use of the computer terminal by the storekeeper and a greater requirement that he/she learn how to use the system properly.
- ◆ Elimination of transcription or interpretation errors due to having an employee who is not part of the materials management operation performing the data-entry function based on hand-written detail of the transactions.

Each of the above items would serve to render the materials management operation more consistent and accurate. With the advent of a new materials management application, these local computer terminals will be an absolute requirement.

Finding IV-38 **Under the current procedures, rolling stock (that being the inventory that is carried on the field operations trucks) is tracked as part of the on-hand balance of parts.**

The on-hand balance that is shown on the existing computer system is composed of the items that are stored in the materials management bins and the items that are carried in trucks. Inventory items issues are not recorded at the time the material is taken out of the storeroom. Rather, the on-hand balance inventory is decremented with the completion and closeout of a work order (which contains a parts list). In the numerous materials management reviews that Schumaker & Company consultants have performed, we have never seen this type of operational procedure before. Standard operating practice is to decrement the item on-hand balances at the time material is issued from the storeroom. The current PAWC procedure presents many problems, among those:

- ◆ The amount of material that is on the storeroom shelves is not reflected accurately in the current materials management application. That is because the on-hand balance numbers include the rolling stock and rolling stock is not easily located when needed. This inaccuracy leads to a requirement for reordering to be done on the basis of visual inspections rather than computer-generated data. The visual-inspection method of inventory control presents significant problem in terms of the possibility for stockout situations to occur and is very

manual in nature.

- ◆ In order to do a physical inventory (which is done on an annual basis), all of the rolling stock must be counted. This task requires that the inventories be done at night while the trucks are in the garage. Having to inventory stock in multiple trucks increases the possibility for errors in counting. It also makes the physical inventory process much more complicated and time consuming. Furthermore, it makes cycle counting essentially impossible.
- ◆ If a work-order materials list contains inaccurate information as to the material that is required, inaccuracies in the computer system's on-hand balance numbers will result from improper decrementing of inventory.

This method of tracking inventory is fraught with problems and should be modified to a more standard method of operation.

Recommendations

Recommendation IV-24 Perform an internal audit of the inventory data that is produced and used by PAWC to determine the accuracy thereof. (Refer to Finding IV-25.)

Performance of an internal audit is the best means to determine if a problem exists with the inventory data that is produced and used by the various PAWC storerooms. Such an audit would also gauge the severity of such data inaccuracies if they are, in fact, identified. It is the recommendation of Schumaker & Company that such an audit focus on a wide range of the PAWC storerooms due to the inconsistencies in operations that were identified. It is our belief that the data at some of the larger storerooms, such as the Bethel facility in the Pittsburgh District, will be reasonably accurate thanks to the attention to procedures and details that was observed at that facility. However, the smaller storerooms that are often run by employees who do not have significant experience with or training in materials management would be more likely to have data compromises and accuracy problems. Schumaker & Company consultants observed more inconsistencies at the small PAWC storerooms than at larger facilities.

Recommendation IV-25 Initiate an ERP materials management module evaluation and selection process with the intention of identifying a fully integrated ERP application that would serve the needs of the PAWC materials management function. (Refer to Finding IV-26.)

This materials management application evaluation and selection process should be performed as a part of an American Water-wide initiative to identify, evaluate, and select an ERP software package that would satisfy the needs of all its operating companies. While PAWC could, theoretically, purchase a standalone, off-the-shelf materials management package, such a package would not serve the requirement of having integration between the procurement module and the materials management

module. This programmatic link and the ability of each program to provide data to the other are critical to the efficient and effective operations of the materials management function. While an integrated procurement and materials management module could be purchased and implemented, it would certainly be more beneficial if it were part of a full ERP package. That benefit, again, is derived from the integration among all of the modules, particularly with the financial and workforce management and planning modules.

Recommendation IV-26 Establish a central point of management and responsibility for the materials management function at both AWWSC and PAWC. (Refer to Finding 0-6.)

Schumaker & Company consultants have never previously reviewed a utility organization that did not have centralized management and control of the materials management function. As a matter of fact, this centralization is normally a major point of focus for most utilities. Without standardization and discipline of the materials management function, the operation of the company can be expected to suffer from both an operational and a financial perspective.

Therefore, it is very important that PAWC and AWWSC establish this formal, centralized materials management structure on a priority basis. Not doing so presents a major risk factor in their operations. The primary focus of this Materials Management group would be to develop and enforce a standard set of procedures that would be used to guide and control the operation of the various storerooms across all of the American Water operating companies. Additionally, a materials manager should be named or brought onto staff at PAWC. It would be the primary function of this employee to ensure standardization of the storeroom operations within PAWC. For a company as geographically diverse as PAWC is, this standardization on the proper way to handle the materials management function is even more critical. Additionally, this materials manager would be responsible for monitoring the results achieved by each of the storerooms and for addressing any performance issues that were identified.

Recommendation IV-27 Develop a comprehensive and detailed materials management procedures manual that is specific to PAWC. (Refer to Finding IV-14.)

Such a comprehensive and detailed materials management manual would serve numerous purposes, including the following:

- ◆ It ensures the standardization of processes across PAWC.
- ◆ It would be very detailed and written in cookbook fashion to allow it to be used as a step-by-step guide to performing various material management procedures in the proper manner.
- ◆ It can be used as a reference guide for existing employees who are unsure of the proper method of performing a task.
- ◆ It would provide lookup and indexing capability, thereby making it a quick and easy reference



tool.

- ◆ It would be written in a manner that was specific to the unique situation and operating environment of PAWC, thereby ensuring applicability in all situations.
- ◆ It would provide the capability to revise and track revisions to the procedures in the future.
- ◆ It can be used for the training of new employees.

Developing such a manual is a very significant undertaking, but the benefits to be derived from its use are also significant. This significance especially holds true in a situation like that of PAWC, where a major emphasis is standardizing procedures across the diverse geography of the company in Pennsylvania. It is important that it be written in standard procedural format to allow for a step-by-step description of the included procedures and for proper revision control to be implemented.

Recommendation IV-28 Establish a formalized training program at PAWC for the personnel who have been designated as being responsible for the materials management function at the various storerooms. (Refer to Finding IV-29.)

Such training could be done on either an internal or external basis. The important consideration is that it be done in conjunction with a set of standardized procedures that are specific to PAWC. This effort should serve to ensure that standardization of materials management procedures is achieved at all PAWC storerooms. A series of refresher courses should also be established that would be held on a regular basis for existing storekeepers to reinforce their knowledge of proper operating procedures and to educate them as to new procedures and/or systems that had been put into place.

Recommendation IV-29 Adopt and expeditiously implement at PAWC the standardized part-number format that is being developed by the Part Number Standardization Committee. (Refer to Finding IV-30.)

As stated previously, implementation and use of a standardized part-numbering system will facilitate the materials management function at PAWC by facilitating the ordering of stock items and by improving the ability of stockrooms to communicate with each other. Additionally, such a standardized numbering system is required to perform a full ERP materials management application implementation and will permit the software to be used to its greatest advantage. PAWC should expedite the adoption and implementation of this part-numbering scheme to the greatest extent possible as it will render immediate benefits to the operation.

Recommendation IV-30 Design and implement a standardized inventory-grid location system at all PAWC storerooms. (Refer to Finding IV-31.)

An effective inventory-grid location system is not difficult to design or implement in smaller storerooms such as those that are used by PAWC. A logical layout of the numbering system and clear marking of

the physical bins are keys to making the system work effectively. A master design should be developed concerning location-identification nomenclature that would be used by all of the storerooms. The individual storerooms would then decide how to apply this system to their particular storeroom, because all of the PAWC storerooms have different physical layouts. Also, a standard-location labeling practice should be developed and implemented to ensure that the labeling at all storerooms is as legible as possible. These location and labeling protocols will have to be implemented and used before an ERP materials management module is put into place. Because the current PAWC materials management software does not have the capability to handle this information, a relatively simple spreadsheet could be developed that would contain this information for each storeroom. Having this data already developed and available would certainly facilitate the implementation of an ERP materials management module.

Recommendation IV-31 Develop and implement a standardized procedure for performing cycle counting that is to be used at all storerooms. (Refer to Finding IV-32.)

A standardized procedure will be a requirement at the time of the implementation of a contemporary ERP module. While the process would have to be temporarily manually driven, it still could be standardized to some extent in determining what and how many items should be counted and how frequently they should be counted.

Recommendation IV-32 Develop an inventory management plan that addresses how to identify and handle obsolete and excess material. (Refer to Finding IV-33.)

It would be beneficial for PAWC to develop an inventory management plan to address the subject of obsolete and excess material. Despite not currently having an automated program that identifies this material, it would be good to have this plan in place for the time when a contemporary materials management application is implemented. That way, it could easily be put to use at that time.

In the interim, it may be possible in some cases to use the “dust test” to identify very slow-moving material. This test involves nothing more than identifying items that have accumulated significant quantities of dust. These items could then be checked through the Supply Chain group to determine whether they are still active and being purchased. While this procedure is, at best, a stopgap measure, it would still be better than no program at all.

Recommendation IV-33 Incorporate maintenance items into the current materials management application to gain better inventory control over these items. (Refer to Finding IV-34.)

While maintenance items are not as critical to the operation as stocked parts, they still can create operational problems if a stockout situation occurs. Including them into the materials management application will also avoid having to perform constant visual inspections to determine whether a reorder

is required. Again, with a contemporary ERP materials management module, these items would be included in the inventory. As such, it is better to add them to the system in advance to facilitate later implementation into a state-of-the-art materials management system. While it is likely that implementation of this recommendation may require some additional resources, it can be expected that the economic benefits that would be achieved, in terms of improved inventory control and operational performance, would outweigh the additional costs.

Recommendation IV-34 Establish a system of a few centralized storerooms that are to be used for strategic parts storage. (Refer to Finding IV-35.)

A few (two or three) storeroom locations across the PAWC serviced territory should be selected based on their centralized geographic location in relation to other districts in their part of the state. These locations would be designated as storage locations for strategic parts and all of the strategic parts inventory would be transferred to them. After the parts have been aggregated, decisions can be made, based on historical usage (if this data is available) or accumulated knowledge of the operations groups, as to how many of the parts should be kept on hand to properly service that portion of the state. The excess parts should be disposed of in whatever is the most financially beneficial manner. In the future, when a need for any of these strategic parts arises, which is infrequent, they can be shipped or transported on PAWC vehicles to the requesting location.

Recommendation IV-35 Implement a program at PAWC to standardize the inventory maintenance and control procedures across the PAWC storerooms. (Refer to Finding 0-15.)

While some of this standardization will result from the implementation of a new materials management application, other items (such as physical security in the storerooms and knowledge of proper procedures by the storekeepers) will need to be reviewed and addressed separately. This review and the resulting procedural changes should be applied in a consistent manner across all of the PAWC storerooms to ensure standardization.

Recommendation IV-36 Install computer terminals in secure locations at all of the PAWC storerooms. (Refer to Finding IV-37.)

The standard practice in contemporary materials management is to have the warehouse/storeroom personnel be responsible for the entry of data in relation to inventory transactions. This centralization of responsibility empowers the warehouse/storeroom personnel with complete control over the integrity of the inventory for which they are responsible. It also makes it necessary that they learn to use the inventory management software and become knowledgeable of its functionality. At the same time, it serves to eliminate the errors that tend to occur with the handwritten recording of transactions and the input of this information by an administrative person with no direct connection to the inventory transactions. Such proximity of computer terminals and their use by the storeroom personnel will be a requirement in the implementation of a new materials management software package.

Recommendation IV-37 Develop and implement a procedural modification that stipulates that material is decremented from the inventory at the time of issue from the storeroom, not at the time that it is used in the field. (Refer to Finding IV-38.)

This new procedure is a necessity if proper control of inventory and inventory accuracy are to be maintained. Decrementing the storeroom on-hand inventory at the time of issue is a standard procedure in materials management. That is because it is the only way to maintain proper and accurate control of the on-hand balances in the storeroom. It puts the responsibility for proper control on inventory accuracy right where it should be—with the storekeeper. Again, such an industry standard procedure will be a requirement if a new materials management application is to be implemented.



E. Risk Management

This section provides a discussion of risk management services provided by American Water Works Service Company (AWWSC) on behalf of Pennsylvania-American Water Company (PAWC).

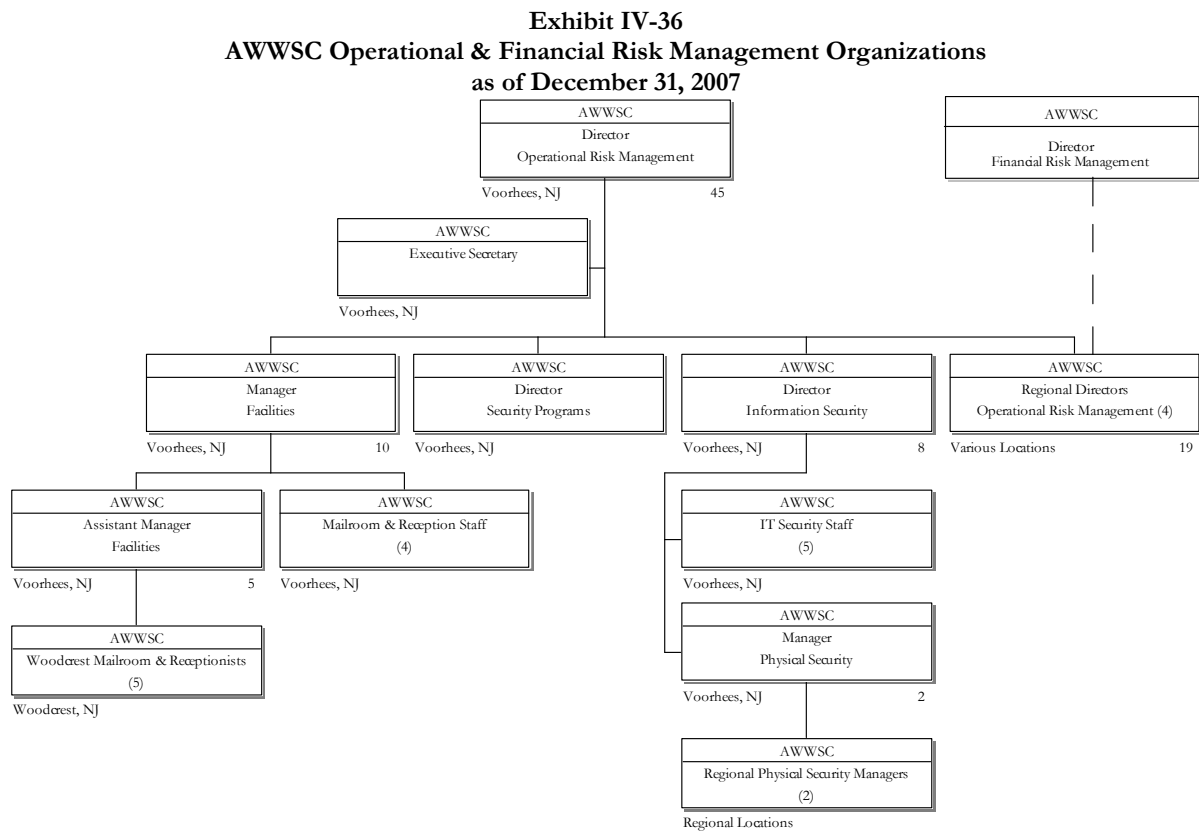
Background & Perspective

Organization & Staffing

Risk management services are provided to PAWC through AWWSC's Operational Risk Management and Financial Risk Management organizations.⁵⁸⁰

Operational Risk Management

Exhibit IV-36 illustrates the various risk management organizations, which are located in Voorhees (NJ) and at various regional offices.⁵⁸¹



Source: Information Response 257 and Interviews 42 and 161

This organization’s major areas of responsibility at the corporate organization in Voorhees include strategy, governance, functional coordination, and support resources in the areas of:⁵⁸²

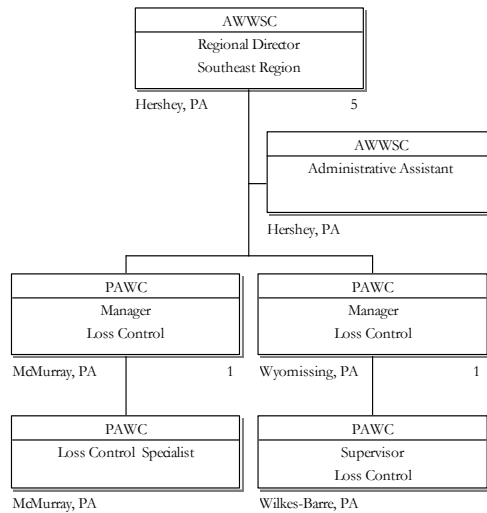
- ◆ Insurance services – bonding, certification of insurance, buildings risk, etc.
- ◆ Workplace safety
- ◆ Physical, operational, and information-systems security*
- ◆ Business-continuity management*
- ◆ Workers’ compensation and liability claims management
- ◆ Event management

* Refer to *Chapter III – Support Services* (Information Technology and *Chapter V – Water Operations* for further discussion regarding Chapter 101 compliance about information-systems security and physical operational security and business-continuity management, respectively, impacting PAWC operations.

Previously, physical security was the responsibility of each region; however, in late 2007, this function was centralized at the corporate organization as a means of enhancing standardization across the American Water organization.⁵⁸³

One of the four Regional Directors of Operational Risk Management, as shown in *Exhibit IV-36*, heads the Southeast Region Operational Risk Management organization, which is headquartered in Hershey (PA). Reporting to this director are employees located in various Southeast Region states, including Pennsylvania. The Southeast Regional Director and those employees in McMurray, Wyomissing, and Wilkes-Barre (PA) who are dedicated to PAWC operations are shown in *Exhibit IV-37*.⁵⁸⁴

Exhibit IV-37
AWWSC Operational Risk Management Organizations
Southeast Region – Pennsylvania Only
as of December 31, 2007



Source: Information Response 1 and Interviews 42 and 161

The primary functions provided by this organization include:⁵⁸⁵

- ◆ Employee safety and health, including Occupational Safety & Health Administration (OSHA) compliance
- ◆ Insurance services
 - Bonding
 - Builder's risk
 - Certificates of insurance
- ◆ Claims/litigation management and administration for all types of insurance coverage, especially workers' compensation, general liability, and automobile liability and event management
- ◆ Event and emergency management administration

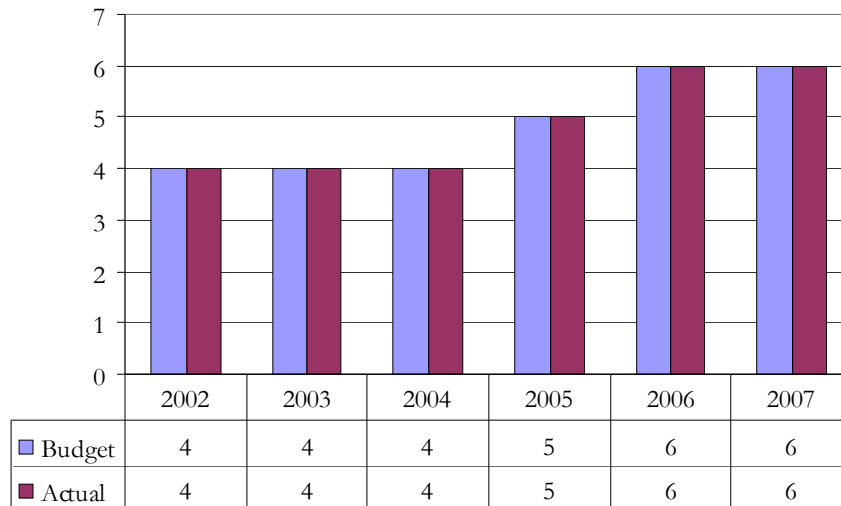
Operational Risk Management employees serving Pennsylvania include two Loss Control Managers (LCMs), who report directly to the Southeast Regional Director, and their direct reports. The LCM in McMurray handles western Pennsylvania and the LCM in Wyomissing handles eastern Pennsylvania. Major activities performed by this group include:⁵⁸⁶

- ◆ OSHA inspections
- ◆ Initial investigation/reporting of claims (if a higher level of response is needed, then the Regional Director gets involved)
- ◆ Coordination of safety training (OSHA, defensive driving, etc.) in which the following tasks occur:⁵⁸⁷
 - Annual schedule of anticipated training is made for upcoming March–February timeframe, with modifications as necessary.
 - Weekly safety-meeting topics list is sent to each Pennsylvania supervisor.
 - Training is provided either through J.J. Keller Safety & Health, weekly construction talks, contractors/vendors, the AWWSC safety library, or the Operational Risk Management group itself.
- ◆ Working together with Traveler's adjusters and attorneys (along with the Director and AWWSC attorneys, if necessary) on claims and litigation

The Director of Operational Risk Management typically meets quarterly with all four Regional Directors for a one- to two-day meeting that is supplemented by bi-weekly conference calls.⁵⁸⁸ The purpose of the meetings and calls is to ensure standardization and coordination in implementing the risk management policies and practices.⁵⁸⁹

The number of employees handling Pennsylvania operational risk management activities from 2002 through 2007 is shown in *Exhibit IV-38*.⁵⁹⁰

Exhibit IV-38
Operational Risk Management Staffing Levels for PAWC Activities
2002 to 2007



Source: Information Response 114

Actual and budget levels for 2005 include one AWWSC employee.

Actual and budget levels for 2006 and 2007 include two AWWSC employees.

Other employees reporting to the Southeast Regional Director (not shown in *Exhibit IV-37*) serve other Southeast Region states.⁵⁹¹

One of the key operational risk management targets at PAWC has been lost work days. American Water management believes that through management commitment, training, coordinated efforts with its labor unions, and other pro-active actions, PAWC has reduced the frequency of lost work-day cases by 75% since 2004 (to 2007), or approximately 25% per year. Also, in 2007, the lost work-day case rate (LWDC) for PAWC was approximately 71% below the Bureau of Labor Statistics' (BLS) published 2005 rate (latest available) for the water and wastewater industry (0.67 PAWC versus 2.30 industry).⁵⁹² American Water management indicates that it will be revising its targets to focus on a reduction of overall injuries (not just lost work days). It will strive for this aim by incorporating OSHA reportable cases.⁵⁹³

Financial Risk Management

The Financial Risk Management organization is a one-person "group" consisting of the Director of Financial Risk Management in Voorhees (NJ). This organization is responsible for financial/insurance risk management activities. Previously, this position held responsibility for loss control, underwriting, and claims; however, loss control (health and safety) is now handled by the Operations Risk Management organizations.⁵⁹⁴

The Director of Financial Risk Management position is responsible for managing all types of insurance coverage, except health, life, and disability, which are handled by the Human Resources organization.⁵⁹⁵ Types of American Water insurance coverage include:⁵⁹⁶

- ◆ Automobile liability (AL)
- ◆ Comprehensive crime (employee dishonesty)
- ◆ Directors and officers (D&O) liability and excess D&O liability
- ◆ Employment practices liability
- ◆ Environmental impairment liability
- ◆ Fiduciary liability and excess fiduciary liability
- ◆ General liability (GL) and umbrella/excess liability
- ◆ Group travel accident
- ◆ Special kidnap and ransom
- ◆ Property (PR)
- ◆ Workers' compensation (WC)

On January 10, 2003, the RWE acquisition of American Water became effective. At that time, Traveler's Insurance provided GL, AL, WC, and PR coverage to American Water. Starting on October 1, 2003, American Water's coverage periods were extended to January 1, 2004 to match RWE's coverage periods. This extension put American Water on a calendar-year basis. At the same time, most American Water types of insurance coverage were subsumed under RWE's global insurance, except those that needed to remain domestic-based (32 states and Canada), such as GL, AL, WC, and fiduciary liability types. In November 2005, when RWE announced its divestiture of American Water, American Water management began preparations to become a stand-alone company. By January 1, 2007, all types of insurance coverage involving the American Water organization, except directors and officers (D&O) coverage, had been removed from RWE global insurance coverage. D&O will be removed once the RWE divestiture of American Water has been completed.⁵⁹⁷ American Water uses Traveler's Insurance for claims, which it has used for most years since the early 1960s.⁵⁹⁸ Regarding these claims, individuals at the regional organizations assist the Director of Operational Risk Management by performing the initial field investigations for claims in their geographic area. Resolution of claims requires review and approval as shown in *Exhibit IV-39*.⁵⁹⁹

Exhibit IV-39
Resolution of Claims Review and Approval Limits
as of December 31, 2007

	Resolution Amount Lower Limit	Resolution Amount Higher Limit
AWWSC Regional Operations Risk Management Director		≤ \$25,000
AWWSC Regional Finance Director	> \$25,001	≤ \$100,000
AWWSC Financial Risk Management Director	> \$100,000	≤ \$1,000,000
AWWSC VP & Treasurer	> \$1,000,000	≤ \$2,000,000
AWWSC Chief Financial Officer	> \$2,000,000	

Source: Interview 41

Over the years, American Water has had a number of insurance brokers to help it in obtaining insurance coverage. Initially, the broker was locally based, and then in 1999, these activities were moved to Frenkel & Co, Inc. In 2004, after RWE took over, American Water used Willis Group Holdings (Willis) as its insurance broker for a brief period of time. In 2005, it moved to Marsh, Inc. (Marsh), and then recently it kept Marsh as its broker for property and casualty products (the bulk of its coverage) but went back to Willis for its financial products.⁶⁰⁰ Its choice of broker has historically been based on factors such as service, knowledge, and experience of the staff providing services.⁶⁰¹

The broker and insurance companies regularly provide American Water with insurance market information, including industry trends, losses, and underwriting results, that impacts pricing and coverage terms and conditions available for its lines of insurance. American Water management believes that 2002 was particularly challenging as the events of September 11, 2001, the collapse of Enron, Worldcom, and Arthur Andersen, and other influences adversely impacted the global insurance market. Coincidentally, RWE announced its intention to acquire American Water in September 2001, which, subject to regulatory approval in several states, was completed on January 10, 2003. In preparation for completion of the acquisition, American Water’s insurance broker at the time conducted research and analyses to identify a “runoff” policy. The goal of this investigation was to protect the interest of American Water’s directors and officers for six years following the completion of the acquisition (up to January 10, 2009) in the event of claims made for the period prior to January 10, 2003 (i.e., American Water is not liable for any claims made after January 10, 2009 related to the period prior to January 10, 2003).⁶⁰²

From 2003 to 2005, RWE annually evaluated the structure of its insurance program. Insurance brokers and/or insurance companies were reviewed on the anniversary renewal of each insurance-type coverage and were replaced if service was deemed unacceptable. American Water maintained responsibility for the placement of its primary property and casualty insurance, including general liability, auto liability, and workers’ compensation. During this same time period, its insurance brokers and insurance companies were also subject to anniversary review and potential change. American Water management believes

that best practices indicate going out to the market every three years and that American Water has gone out too frequently in recent years (partially due to RWE changes). Despite this history, last year American Water was oversubscribed (more demand than necessary, indicating that the issue may not be a problem). American Water was required to go out for excess liability and property again in late 2007.⁶⁰⁵

Operating Expenses

Insurance Coverage Expenses

Exhibit IV-40 displays annual insurance premium expense, other than group, for PAWC and American Water from 2004 to 2007.⁶⁰⁴ Trends in premium expense for PAWC are consistent with those of American Water as a whole. (Percentage changes from 2004 to 2007 for both PAWC and American Water are also shown in *Exhibit IV-40*.) With the exception of workers' compensation, property, and excess liability coverage, premium expense has been flat or decreasing. With these other coverage types, American Water management believes that it has been fairly aggressive in attempting to contain costs, despite, for example, increasing replacement costs for property coverage and increasing limits for excess liability coverage.⁶⁰⁵

Exhibit IV-40
Annual Insurance Premium Expense, Other Than Group, for PAWC and American Water
2004 to 2007

Type of Coverage	1/1/04 to 1/1/05*		1/1/05 - 1/1/06		1/1/06 - 1/1/07		1/1/07 - 1/1/08		% Change	
	PAWC	AW	PAWC	AW	PAWC	AW	PAWC	AW	PAWC	AW
Property & Casualty										
General Liability	\$6,269,540	\$18,241,216	\$6,252,430	\$17,999,170	\$5,524,455	\$16,297,190	\$5,612,452	\$16,582,488	-10.5%	-9.1%
Workers' Compensation	\$1,628,569	\$9,975,064	\$1,876,067	\$10,733,464	\$1,711,323	\$10,743,810	\$1,932,900	\$10,982,807	18.7%	10.1%
Auto Liability	\$481,382	\$3,123,261	\$324,055	\$2,464,670	\$249,780	\$2,143,232	\$270,965	\$1,851,414	-43.7%	-40.7%
Excess Liability	\$494,237	\$3,741,748	\$527,032	\$3,763,400	\$481,125	\$3,260,886	\$883,216	\$5,814,394	78.7%	55.4%
Property	\$642,592	\$4,650,000	\$876,877	\$5,057,011	\$999,458	\$5,758,224	\$1,124,009	\$5,978,941	74.9%	28.6%
Financial Products										
Employment Practice Liability	\$29,980	\$222,862	\$25,131	\$210,102	\$23,011	\$156,000	\$22,481	\$148,000	-25.0%	-33.6%
Fiduciary Liability	\$25,169	\$187,100	\$22,783	\$202,807	\$23,681	\$160,542	\$23,874	\$157,169	-5.1%	-16.0%
Comprehensive Crime - Employee Dishonesty	\$13,322	\$111,375	\$9,807	\$81,984	\$14,072	\$95,397	\$12,000	\$79,000	-9.9%	-29.1%
Special: Kidnap & Ransom	3 Yr included in 2002		\$816	\$6,822	\$1,212	\$8,216	\$2,296	\$15,115	181.4%	121.6%
Directors & Officers Liability	Provided by RWE beginning January 10, 2003, without any premium charge.									
Travel Accident	3 Yr included in 2002		\$3,358	\$28,075	3 Yr included in 2005		3 Yr included in 2005			
Retrospective adjustments**	\$747,329	\$3,103,604	\$387,145	\$1,694,792	(\$1,179,695)	(\$4,597,345)				

* Inception/anniversary date of PAWC's annual policy period for property and casualty insurance, prior to acquisition by RWE, was October 1. Once the acquisition was approved on January 10, 2003, RWE instructed PAWC to extend its October 1, 2003 expiration to January 1, 2004 to coincide with the anniversary date of RWE's global insurance program.

** Retrospective adjustments include loss-sensitive insurance, including general liability, workers' compensation, and auto liability beginning with each policy period from 1975 to 2006.

Source: Information Response 387

American Water self-funds general liability (also including products coverage), automobile liability, and workers' compensation insurance through large retentions, as shown in *Exhibit IV-41*.⁶⁰⁶

**Exhibit IV-41
Self-Funding Retentions
as of December 31, 2007**

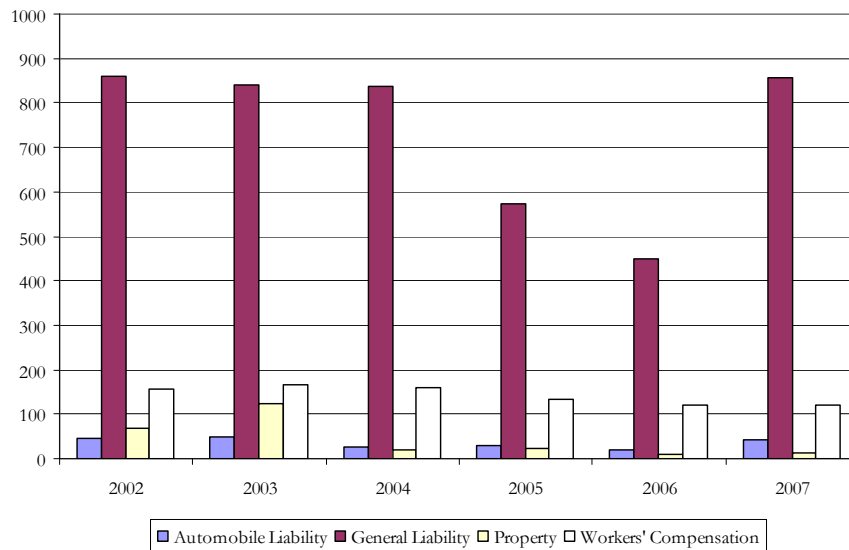
	Retention Per Occurrence
GL	\$1,000,000
AL	\$500,000
WC	\$500,000

Source: Interview 41

Claims History (#/\$)

Exhibit IV-42 displays the number of claims by accident year: 2002 to 2007. For all types of claims (AL, GL, PR, and WC), PAWC's number of claims generally have been decreasing until 2007, when the number of AL and GL claims increased significantly to the levels experienced during 2002 to 2004.⁶⁰⁷

**Exhibit IV-42
PAWC Claims By Accident Year
2002 to 2007**



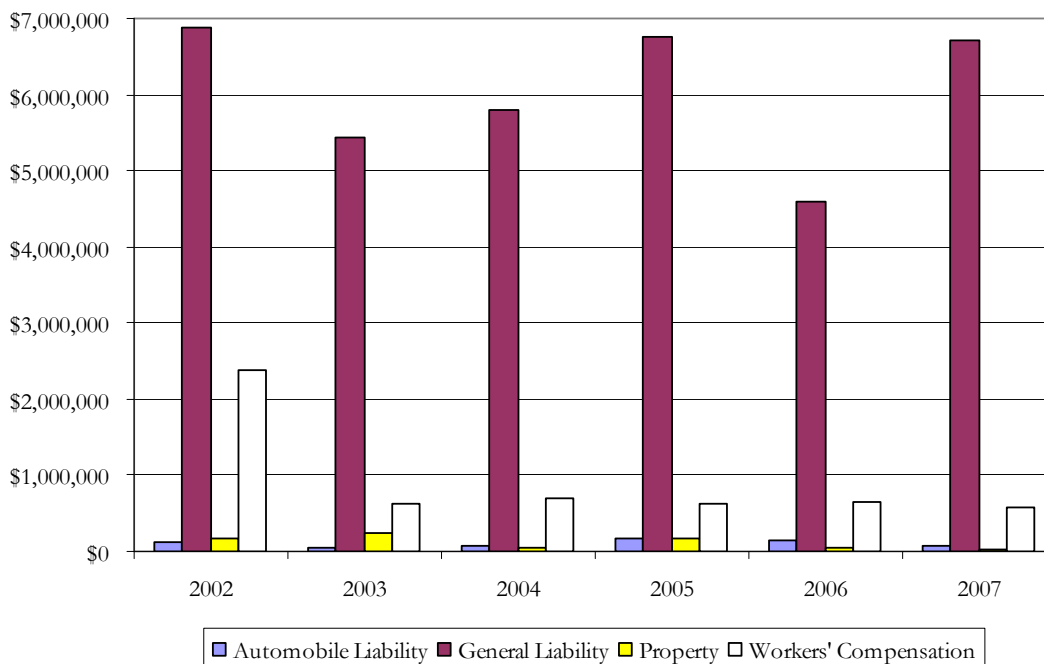
	2002	2003	2004	2005	2006	2007	Compound Growth/Loss
Automobile Liability	44	50	27	30	21	43	-0.5%
General Liability	861	839	837	573	451	856	0.0%
Property	67	124	19	23	11	13	-3.2%
Workers' Compensation	157	165	161	135	122	122	-0.5%

General liability includes product coverage.
Source: Information Responses 119 and 730

Although the number of AL claims incidents were higher again in 2007 (as PAWC reports all incidents, including those not caused by company drivers), PAWC's total incurred dollars were less than any previous year except 2003. The number of GL claims were also higher in 2007, due primarily to severe and fluctuating weather patterns in the Northeast United States according to PAWC management.⁶⁰⁸

Exhibit IV-43 displays the dollars incurred for PAWC claims by accident years 2002 to 2007. For AL, PR, and WC claims, dollars incurred by PAWC generally have been decreasing. For GL claims, however, the dollars incurred by PAWC have varied substantially by year (the dollars increased in 2007 after decreasing in 2006 following a general increase for the prior three years).⁶⁰⁹

Exhibit IV-43
\$ PAWC Claims Incurred By Accident Year
2002 to 2007



	2002	2003	2004	2005	2006	2007	Compound Growth/Loss
Automobile Liability	\$110,673	\$47,426	\$83,600	\$164,797	\$150,933	\$65,094	-10.1%
General Liability	\$6,891,609	\$5,425,615	\$5,788,737	\$6,759,073	\$4,583,954	\$6,710,623	-0.1%
Property	\$166,014	\$240,837	\$53,215	\$160,765	\$45,586	\$18,918	-4.3%
Workers' Compensation	\$2,375,784	\$616,801	\$688,651	\$636,567	\$654,146	\$578,065	-2.8%

2002 includes two outstanding claims totaling \$1,514,000.

Source: Information Responses 119 and 730

As with the number of claims in *Exhibit IV-42*, the dollars associated with GL claims were also higher in 2007, due primarily to severe and fluctuating weather patterns in the Northeast United States according to PAWC management.⁶¹⁰

Exhibit IV-44 illustrates PAWC’s 2002 to 2007 loss control expenditures and claimed losses for AL and WC claims.⁶¹¹

Exhibit IV-44
PAWC Loss Control Expenditures as % of Claimed Losses
2002 to 2007

	2002	2003	2004	2005	2006	2007
Loss Control Expenditures	\$115,063	\$79,667	\$82,054	\$73,852	\$222,390	\$104,839
Claimed Losses	\$2,486,457	\$664,227	\$772,251	\$801,364	\$805,079	\$643,159
	5%	12%	11%	9%	28%	16%

2002 includes two outstanding claims totaling \$1,514,000.
Source: Information Responses 119, 120, and 730

The Operational Risk Management organization associates loss control expenditures only with AL and WC claims, and specifically excludes GL/product liability claims. That is because PAWC’s Operational Risk Management organization believes that it cannot affect the number and/or outcomes of main breaks and associated liability claims through regular Operational Risk Management activities.⁶¹² (Examples of loss control expenditures include safety training, safety talks, and other activities designed to prevent or control AL or WC claims, etc.) Also, in calculating loss control expenditures, the organization also typically excludes security costs because it considers security a deterrent as opposed to a loss prevention technique. This consideration arises because the organization can put security devices in place to deter potential perpetrators from causing harm to company property but cannot affect the behavior of someone from outside the PAWC organization if his or her intent is to bring harm to company property.⁶¹³

Approximately 62% of PAWC’s GL claims typically involve main breaks, which American Water indicates are due primarily to factors such as aging of infrastructure, weather conditions (causing pipe contractions in winter (primarily December, January, and February) and summer (primarily June, July, and August)), significant variations in elevations, etc. As such, in *Exhibit IV-44*, American Water excluded GL/property claims in calculating the dollar amount and associated percentage of annual expenditures for its loss prevention programs. (As stated previously, that is because the risk management function says it cannot affect the number and/or outcome of main breaks and associated liability claims.)⁶¹⁴ One of the areas in PAWC’s service territory that has received considerable press coverage with regard to main breaks has been the western PA area. In late 2003, PAWC initiated engineering solutions in this area and completed them in early 2005 whereby pressure relief valves (PRVs) were installed in its mountainous-terrain regions. PAWC management indicates that it reduced PR claims in this area by 15% in the first year of the program.⁶¹⁵

The majority of PAWC’s insurance claim payments between 2002 and 2007 have been the result of GL/property damage (PD) claims (between 74% and 91% in the time period shown in *Exhibit IV-43*). For example, in 2007, GL/PD claims accounted for approximately 91% of claims payments.⁶¹⁶

Therefore, American Water introduced a GL/PD initiative in 2004 whereby PAWC took an aggressive (and unusual) position in declining to accept all property damage claims as a result of main and service line breaks. American Water management based this initiative on Elizabethtown Water Company's success, as a result of precedence established through litigation in NJ, and its ability to also prevail upon appeal, which had modest success (in NJ). American Water management realized that this initiative failed to consider that common law was not consistent in the jurisdictions across the country.

Therefore, the initiative was modified to a more reasonable position, in which PAWC's insurance company was able to mitigate losses by establishing criteria for accepting claims where negligence was likely to be found in favor of a claimant. Such favorability for a claimant tended to arise when it could be established that PAWC had either a history of line breaks in the area or when the company was late or unduly delayed in responding to the claim.⁶¹⁷

Schumaker & Company believes that PAWC can impact GL claims through proper main repair and replacement programs. Refer to *Chapter V – Water Operations* and *Chapter XI – Operational Performance* for further discussion of such programs.

Findings & Conclusions

Finding IV-39 A formal enterprise risk management program was established in 2003 when RWE acquired American Water, but this program must now evolve as American Water (and therefore PAWC) changes its focus to SEC/SOX compliance.

With regard to overall risk management, American Water management believes that, although the risk management community across the country has discussed enterprise risk management (ERM) for the past ten years, ERM was implemented across American Water when RWE acquired the company in 2003.⁶¹⁸ According to American Water management, formality of the ERM program occurred when RWE acquired American Water. As a result of legislation in Europe and the United Kingdom, all publicly-owned European companies, including RWE, were required to identify all risks that could have an adverse financial impact. RWE provided American Water with a risk management toolkit and process that enabled American Water to formally identify its risks as well as retain, mitigate, transfer, accept, or decline those risks. Additionally, management and Board members in Europe can be civilly and criminally prosecuted; and American Water management indicates that if the company experiences adverse financial impacts they can, as well.⁶¹⁹ Among the formal activities taken as part of American Water's ERM are the following:⁶²⁰

- ◆ Documentation
 - Risks
 - Responsible individuals
 - Responsibilities
 - Practices

- ◆ Categorization of risk
 - Financial
 - Operational
 - Structural
 - All other
- ◆ Analytical tools (Excel spreadsheets ~24 modules)
 - Type of risk
 - Assessment if risk exists
 - Quantification
 - Qualification (probability)
 - Priority

The ERM process was established in 2003 to identify and evaluate business risks. By focusing on key uncertainties—either risks or opportunities—and factoring them in to business plans, American Water management believes it is better prepared to achieve its business objectives. The goal of American Water’s Risk Management Committee (RMC) is to maximize the potential for gain and minimize the potential for loss associated with uncertain events. American Water management believes that this diversity allows PAWC to discuss and act on unnecessary risks and to effectively manage accepted risks by fostering risk awareness and establishing a value-driven risk culture.⁶²¹

The American Water organization uses a bottom-up ERM process. In Pennsylvania, it starts with business units (BUs) developing their key top risks (report/heat map) through the use of American Water analytical tools. These reports must be approved by the State President (prior to having State Presidents, the risk owner in the BUs approved the list of risks). This information is then provided to the regional organizations, which follow a similar process.⁶²² The Southeast Region Risk Operations Management Committee (ROMC) meets approximately three times annually and is composed of a cross-section of individuals from all PAWC/Southeast Region functions, including:⁶²³

- ◆ Director, Engineering
- ◆ Director, Production
- ◆ Director, Network
- ◆ Director, Legal
- ◆ Director, Human Resources
- ◆ Director, Maintenance Service
- ◆ Director, Customer Service
- ◆ Director, External Affairs
- ◆ Director, Business Development
- ◆ Director, Environmental Compliance
- ◆ Manager, Operational Risk (2)
- ◆ Director, Business Performance
- ◆ Manager, Network

- ◆ Manager, Production
- ◆ Director, Finance
- ◆ Director, Risk Management

The regional reports must be approved by the respective Region President. In PAWC's case, it is currently the Southeast Region President,⁶²⁴ although American Water management indicates that this may change as the company reorganizes and decentralizes.⁶²⁵

Finally, the ERM process reaches the American Water level, where another series of analyses and reports occurs. At that level, the RMC is involved.⁶²⁶ The RMC was established in 2003 (when the ERM process began) to identify and evaluate business risks and is composed of the Executive Management Team (EMT) (Chair, President, COO, CFO, General Counsel, SVP Communications, VP Internal Audit) and designated risk management representatives. The Director of Financial Risk Management serves as Secretary of this committee.⁶²⁷ The RMC typically meets three times annually. The last RMC meeting was scheduled for September 2007 but was postponed until October 2007.⁶²⁸

For approximately the last year (2007), American Water has been studying options to modify its ERM process. The aim of this evaluation is to adapt from compliance with European legislation to governance under Security & Exchange Commission (SEC) regulations and Sarbanes-Oxley (SOX) requirements. This adaptation process is spearheaded by the VP Internal Audit (IA), the Director of Financial Risk Management, and the Assistant General Counsel, who are having discussions with EMT members about possible changes. When asked about what kind of changes, the Director of Financial Risk Management indicated that American Water is attempting to make its risk model more consistent across the entire American Water organization via an investigation of software for improving the analytical tools currently in use.⁶²⁹

Recommendations

Recommendation IV-38 Develop a formal implementation plan for changing the focus of the ERM process to include SEC/SOX compliance. (Refer to Finding IV-2.)

The American Water organization has appropriately recognized the need to change the focus of its ERM process to include SEC/SOX compliance; however, all investigations and analyses to date to effect that change have been informally conducted. A formal implementation plan that identifies steps and associated timelines and resources should be developed, monitored, and reported to senior management.

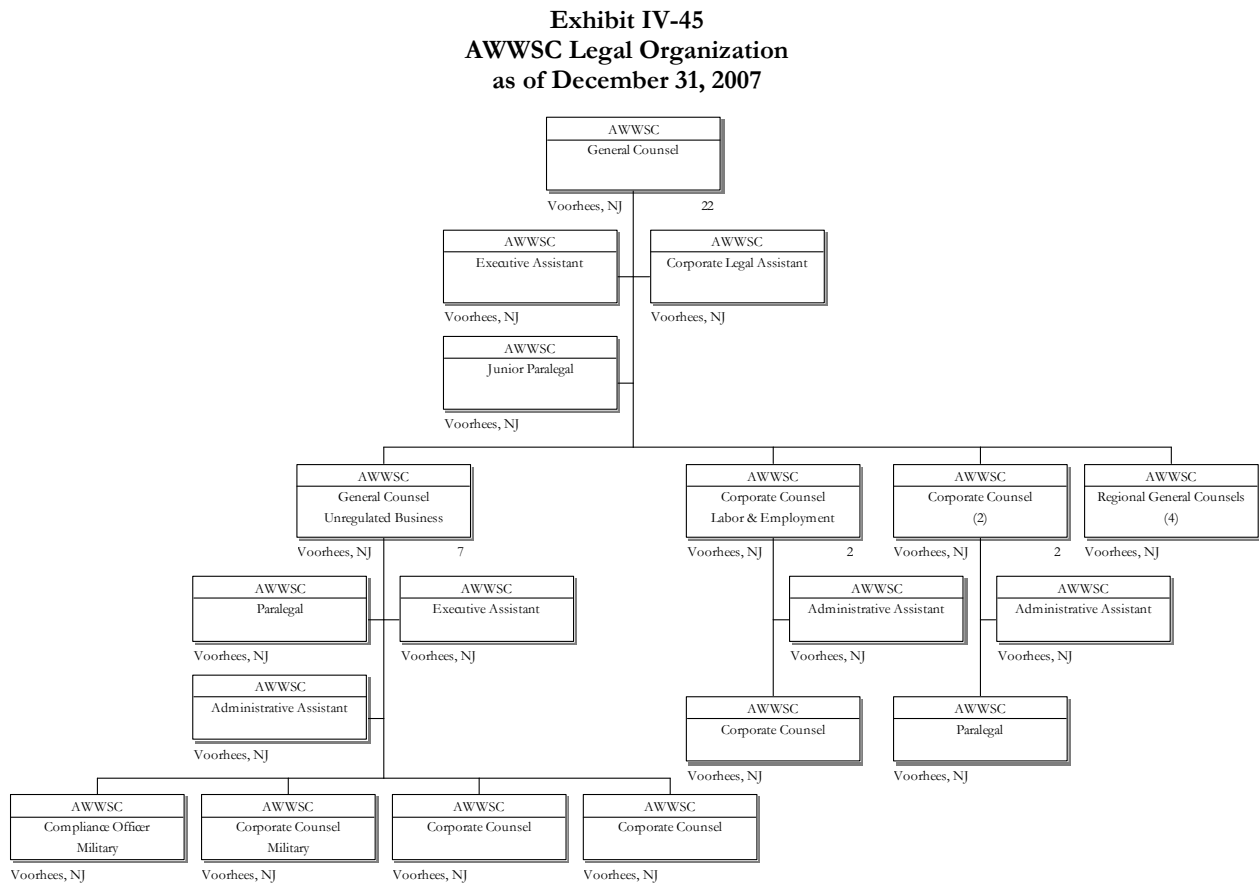
F. Legal Services

This section provides a discussion of legal services provided by American Water Works Service Company (AWWSC) on behalf of Pennsylvania-American Water Company (PAWC).

Background & Perspective

Organization & Staffing

The AWWSC Legal organization is shown in *Exhibit IV-1*.⁶³⁰



Source: Information Response 257 and Interview 51

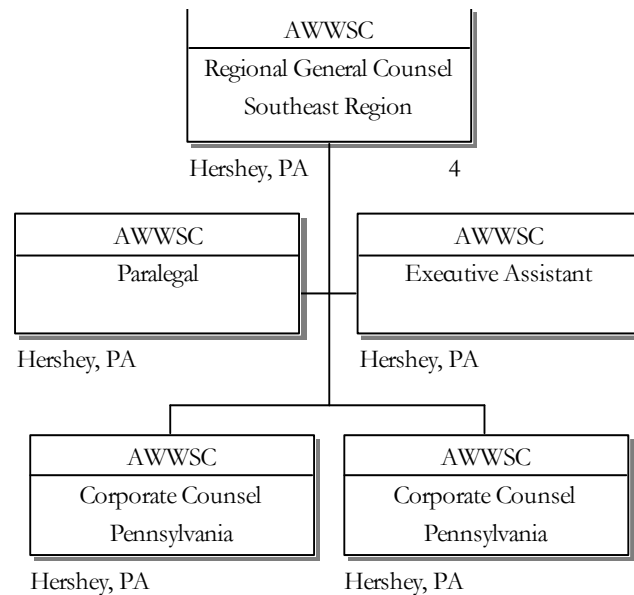
The Legal organization, headquartered in Voorhees, New Jersey (NJ), is led by the Senior Vice President (SVP) Legal & General Counsel (GC). This organization as a whole is responsible for providing legal services to all American Water businesses. The Voorhees Legal group (also referred to as the Legal

business center) primarily is responsible for providing legal services to American Water unregulated businesses as well as providing subject matter experts (SMEs), typically in labor/employment and securities areas, for American Water, as a whole, or to all regulated and unregulated businesses.⁶³¹ The Legal business center in Voorhees is composed of the following functions:⁶³²

- ◆ An Unregulated Business group that provides services to only the American Water non-regulated entities.
- ◆ A Labor & Employment group that provides services to American Water entities, primarily other AWWSC departments and state utility organizations (such as PAWC), if external counsel is not designated by a Regional General Counsel (RGC). Even then, an RGC often confers with this group, because many of the RGC organizations do not have specific expertise in this area. It is typically a joint decision as to whether internal or external resources are used. The Corporate Counsel who heads this group is also American Water's internal compliance officer. In this secondary role, the CC is responsible for monitoring the hotline (staffed externally), although very few calls come from Pennsylvania, a tendency which the General Counsel attributes to a long, continuous, stable management and the resulting culture. As internal compliance officer, the CC performs the following:
 - Reviews each hotline call
 - Approves each hotline call
 - If approved, often involving discussions with Internal Audit, assigns someone internally to investigate, usually someone from the Human Resources (HR) or Legal organizations.
 - Performs database monitoring and maintenance of calls
- ◆ A Securities & Commission group headed by another CC, who has been very focused on the divestiture.
- ◆ A General Corporate group, also headed by another CC.

Additionally, four Regional Counsel organizations report to the SVP Legal & General Counsel.⁶³³ One of these Regional Counsel organizations is the Southeast Regional Counsel organization, shown in *Exhibit IV-46*, which is headquartered at the Pennsylvania-American Water Company headquarters' office in Hershey (Pennsylvania). The headquarters' office in Hershey is the sole location where attorneys who provide legal services to PAWC reside. Also reporting to the Southeast Region RGC is a Charleston (West Virginia) office that provides legal services to Virginia, Maryland, and West Virginia, and a Lexington (Kentucky) office that provides legal services to Kentucky and Tennessee.⁶³⁴ The primary reason given for having legal resources dedicated to Pennsylvania within the region is the size and scope of PAWC's operations and its associated legal issues, including the state's Chapter 56 PaPUC customer service regulations, which American Water considers to be more stringent than many other states' regulations.⁶³⁵

**Exhibit IV-46
AWWSC Southeast Region Legal Organization Providing PAWC Legal Services
as of December 31, 2007**



Source: Information Response 1 and Interview 12

The old RGC structure was to have the RGC reporting to Regional Presidents, with dotted line reporting to the GC. The GC believes that the structure of the Legal organization should follow how the business really functions, an aim he feels the Legal organization accomplishes. Specifically, RGCs now simultaneously report to State Presidents, who report to Division Presidents, and to the GC. Little change has occurred (or is expected to change) in the Southeast Region. Although American Water only recently shifted in late 2007 from a regional focus to a state focus, attorneys in the Southeast Region previously resided in individual states. This is not necessarily true for other regions, where centralization at the regional headquarters may be more prevalent. Because each RGC is really a GC for the region, it is up to the RGC to determine how to handle their operations. In essence, the American Water GC is primarily a sounding board for each RGC. The RGCs make their own decisions. For example, each RGC decides the mix of internal versus external counsel use. The GC is involved in making offers to attorneys. He is typically not involved in the initial interviews of candidates for regional attorney positions (except those applying for the RGC position); however, the GC may be involved in the final interview process. The GC makes a determination regarding the extent to which he will be involved in the final candidate interviews based on a review of the candidate's background and discussions with the RGC. He also can veto a RGC's recommendation if he desires.⁶³⁶

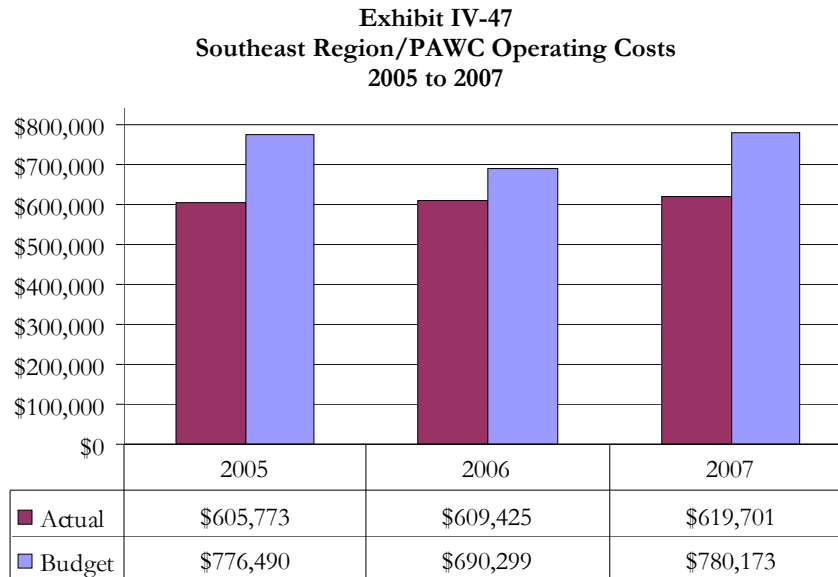
The regional attorneys are typically generalists, with varying backgrounds and areas of expertise, who are able to handle a broad spectrum of issues.⁶³⁷ Although the Corporate Counsel attorneys in Hershey primarily provide Pennsylvania services, they may perform occasional services to American Water, as a whole, or to other states in the Southeast Region. (As discussed in *Chapter VIII – Affiliate Interests*, the

AWWSC time reporting system allows attorneys to specify a code when recording their time, which is used by the AWWSC cost allocation module to indicate what groups benefit from their services and allocate costs accordingly.) An example is a document-retention policy-review project that got under way in late 2006 and is being spearheaded by one of the Hershey-based attorneys.⁶³⁸

The Southeast Region attempts to handle legal services internally, if it can; however, in some situations, it requires external resources: either AWWSC corporate resources or local outside organizations. When using these resources, the Regional General Counsel for the Southeast Region estimates that approximately 25% of the time, the region does not have enough time to perform the required services. The other approximately 75% of the time, it requires subject matter expertise, typically involving human resources/employment, environmental, rates, or litigation issues. The RGC's philosophy has been to use local legal firms for litigation, although it has used AWWSC corporate or local resources for other issues.⁶³⁹

Expenditures

Exhibit IV-47 illustrates operating costs (excluding outside counsel costs) for PAWC for 2005 to 2007.⁶⁴⁰

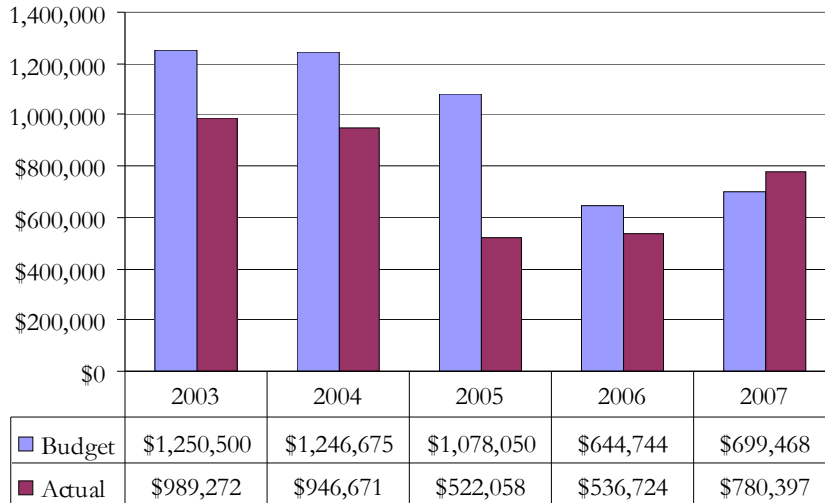


Source: Information Responses 121 and 622

Information is not available prior to 2005 as the reorganization creating the regional AWWSC organizations was primarily implemented during 2004, when most of the Legal headcount transferred to the regional AWWSC organizations at the end of 2004. Therefore, no 2002 or 2003 regional data exists, and no meaningful 2004 data exists due to the timing of the transfers. In the last three years, PAWC's portion of the Southeast Region AWWSC organization's operating expenses have been budgeted at approximately 60% of the entire region, as Pennsylvania is the largest state within the region. Actual expenses were roughly 54% in 2005 and 2006, but increased to roughly 59% in 2007.⁶⁴¹ *Exhibit IV-15*

displays PAWC’s outside legal costs for the 2003 to 2007 time period.⁶⁴² According to AWWSC management, outside legal counsel costs are generally decreasing over time, as the AWWSC Southeast Region Legal organization has made an attempt to increase its use of internal resources, except in those cases where it lacks the time or expertise to do itself.⁶⁴³

Exhibit IV-48
PAWC Outside Legal Counsel Costs
2003 to 2007



Source: Information Responses 121 and 731

Major Processes and Systems

Processes

Each of the Regional General Counsels interacts with each other (every one to two months) via conference call. The purpose of these calls is to identify legal trends and to provide professional development opportunities. Approximately two times annually, face-to-face meetings are held. At one of these meetings, the RGCs meet with the GC. At the other meeting, the RGCs meet for one to two days in conjunction with all AWWSC attorneys. At least one of these days is focused on professional development.⁶⁴⁴

Each of the Regional General Counsels provides a monthly report to the General Counsel. This report includes both legal issues and a spreadsheet showing dollars involved in those issues where such dollars are applicable.⁶⁴⁵ From that report, the GC provides information to the American Water Board (pending major legal issues, not all, not materiality based) and to the Accounting function for SFAS 5 adherence (spreadsheet of material costs).⁶⁴⁶

Any time spent by AWWSC attorneys (as with other AWWSC employees) in providing services to all business units is recorded on weekly time sheets. The time spent providing services directly to regulated

or non-regulated business units (BUs) (such as PAWC) are directly charged to the billing number specific to those BU(s). The time spent providing services in common with similar services that are provided to other regulated and non-regulated BUs is allocated based on formulas as discussed in *Chapter VIII – Affiliate Interests*.⁶⁴⁷ In the Southeast Region, time spent by those Corporate Counsel (CC) employees in Pennsylvania generally defaults to PAWC (while time for those in other states default elsewhere), unless the CC specifically identifies hours to a different code. Meanwhile, the time spent by the Regional General Counsel generally defaults to all states within this region unless the RGC specifically identifies hours to a different code.⁶⁴⁸

Systems

The Legal organization uses Hummingbird's DOCS Open software (PC DOCS) to store, locate, share, and manage document-based information, such as deeds, easement documents, etc. This software, however, is not being used to store all Legal documents. DOCS Open is a client/server, Windows-based solution that gives organizations the ability to create centralized repositories, or libraries, that contain unstructured data generated by the organization. Search and retrieval tools make this information easily available for use and collaboration across the entire enterprise. Although DOCS Open is not used as a case management tool, the Legal organization can use it to associate a document with other documents.⁶⁴⁹

In anticipation of having to be Sarbanes-Oxley (SOX) compliant when American Water is no longer a part of RWE AG of Essen, Germany (RWE) and becomes a public company, in 2007 AWWSC began to identify, assemble, image, and store electronically all major documents, including contracts, debt covenants, and commitment/contingency documentation, in a legal vault⁶⁵⁰ using SharePoint software.⁶⁵¹ By May 1, 2007, American Water Works Service Company had all of these legacy documents completed and available on the SharePoint internal site. Subsequently, the Legal organization has taken several steps to ensure that these types of documents are being handled correctly. Those steps are as follows:⁶⁵²

- ◆ Before any contract can be entered into, a contract approval form must be properly completed and signed by persons with the requisite signing authority, including (where required) review by the Legal, Finance, and/or Supply Chain organizations. Once a contract has been executed by all parties, a copy of the contract and the completed contract approval form must be scanned into portable document format (PDF) and sent to the Legal organization.
- ◆ A checklist for debt instruments has been created, of which the Legal organization is the holder and performs a quarterly review (in conjunction with other American Water personnel) to make sure that each instrument is in compliance.⁶⁵³
- ◆ When reviewing contract approval forms, all commitments and contingencies must be identified so that the Finance organization is held responsible for monitoring and tracking these items.

Findings & Conclusions

Finding IV-40 **When looking to outside legal organizations for help in addressing PAWC's legal needs, the Southeast Region Legal organization does not rely on competitive bidding to develop a master list of pre-qualified legal firms.**

Competitive bids are not used to develop a list of preferred external counsel firms (as PAWC had longstanding relationships with many firms), nor does PAWC periodically request competitive bids from external legal firms to ensure that cost-effective rates are being provided by these firms. Generally, only in the case of selected projects does the Southeast Region issue RFPs.⁶⁵⁴

Therefore, the Southeast Region uses a number of outside legal organizations, many of which it has used for many years as AWWSC management knows and respects their capabilities and values their institutional knowledge of PAWC and its operations.⁶⁵⁵ PAWC has long term relationships with several firms, which handle certain special practices areas. Included among these legal organizations are Morgan Lewis (regulatory), Dechert/Reed Smith (tax), and LeBouef, Lamb, Green & MacRae (environmental), as well as others. AWWSC management may go directly to one of these firms, may request estimates from several organizations, or, when knowledge of PAWC is not critical (and time/materials is an option) may issue a request for proposal (RFP). It does not periodically issue an RFP to establish a pre-qualified list from which to choose.⁶⁵⁶ It can informally add external law firms, as needed. During 2007, for example, PAWC used the services of 15 law firms, ranging in size from hundreds of attorneys to one person operations. Three of the firms were new to PAWC in 2007; two others were new to the company in 2006. One of the most substantial regulatory matters during 2007 was PAWC DSIC petition, for which it used a new firm relationship (Saul Ewing) for the first time.⁶⁵⁷

Approximately four years ago (2003), the Legal organization worked closely with AWWSC's procurement function to analyze how to obtain the best service for reasonable dollars.⁶⁵⁸ Specific activities performed during this analysis were:⁶⁵⁹

1. Development of standard rules of engagement for engaging and retaining the services of law firms.
2. Review and assessment of the 2003 Pennsylvania rate-case expense for outside legal counsel and consultants.
3. Development of a sourcing strategy for outside legal services in the practice areas of condemnation defense, labor and employment, operation and maintenance, Pennsylvania Infrastructure Investment Authority project loans, and regulatory matters.

The sourcing strategy focused on a make/buy (internal/external) analysis and the creation of preferred external-counsel firm relationships, where the use of external resources was considered preferential to the use of internal attorneys.⁶⁶⁰



The lack of having such a pre-qualified list does not indicate that external legal costs are increasing. (*Exhibit IV-48*, in fact, shows that they have been generally decreasing). It may, however, indicate that PAWC is not saving as much as it could (as having a pre-qualified list could force law firms to contain/limit their costs/charges to PAWC) or is failing to identify other potential candidates for provision of service.⁶⁶¹ Schumaker & Company is unable to quantify savings, if any, because of lack of data. When we asked AWWSC management how it controls costs, the Legal organization asserted that it monitors outside firms through the use of the engagement letter it has with each firm and ensuring that services provide agree with the letter.⁶⁶² The Southeast Region does not use a software system to track cases/matters or the internal/external hours associated with each, although it does require outside legal firms to report by project. (Refer to *Finding IV-2* for further discussion about AWWSC legal systems.)

The use of competitive bidding is not to say that evaluations of external law firms for a pre-qualified list should be solely based on cost. Other factors, such as competence, experience, depth, credibility, reputation, relationships, institutional knowledge, and other intangibles must also be considered, especially for crucial litigation, such as rate cases, etc.

Finding IV-41 The AWWSC Legal organization has not evaluated the use of standard legal management software across its various entities; therefore, the Southeast Region (and ultimately PAWC) may not be benefiting from processes associated with the use of a “best in class” system.

Unlike private organizations where consistency in systems is important, at American Water no single legal management system exists for performing functions such as:

- ◆ Tracking matters and caseloads
- ◆ Recording inside lawyer time and expenses against cases/matters
- ◆ Billing back clients through the Finance organization
- ◆ Tracking and reporting outside counsel expenditures
- ◆ Compiling metrics and benchmarking statistics
- ◆ Preparing service level arrangements (SLAs) for clients
- ◆ Recording and monitoring client budgets
- ◆ Handling routing lists for outside counsel invoice approvals
- ◆ Tracking files both onsite in central files and offsite

Now that American Water is becoming a public organization (with its SOX compliance issues), management realizes that it needs to build process and system uniformity; however, the GC is not sure when or if the Legal organization will look at standardizing systems in the near future. That is because American Water has been too busy with SOX compliance. Also, the GC believes that cost and disruption must be considered before changing systems, as he believes that current practices are working.⁶⁶³ Nevertheless, standardization of systems should be formally considered, and, at the same time, an investigation is warranted to see if implementation of alternative systems, such as case/matter

management tools, would be beneficial to AWWSC legal entities, including the Southeast Region organization supporting Pennsylvania.

Recommendations

Recommendation IV-39 Establish a formal mechanism for developing a pre-qualified list of external legal firms by periodically reviewing proposals from potential candidates. (Refer to Finding IV-2.)

Within utility legal organizations, the best practices for identifying external legal firms typically result from the periodic issuance of an RFP. Such a strategy helps uncover potential candidates for inclusion in a pre-qualified list of external legal firms. A legal organization should periodically (at least every three to five years) develop a pre-qualified list of external legal firms. By using such a process, a legal organization not only formally provides alternative legal firms that it may not have considered in the past, but it helps to ensure that it receives quality legal services at a reasonable cost by encouraging containment of costs by the firms used.

Recommendation IV-40 Perform a formal cost/benefit analysis regarding standardization of legal management software throughout the American Water system. (Refer to Finding IV-14.)

As part of its investigation into the appropriateness of standardizing American Water legal management software, Legal management should evaluate case/matter management software, including reporting tools, for the functions previously described. Management should also consider e-invoicing software to manage receipt, validation, routing, approval, and payment of invoices from external law firms.

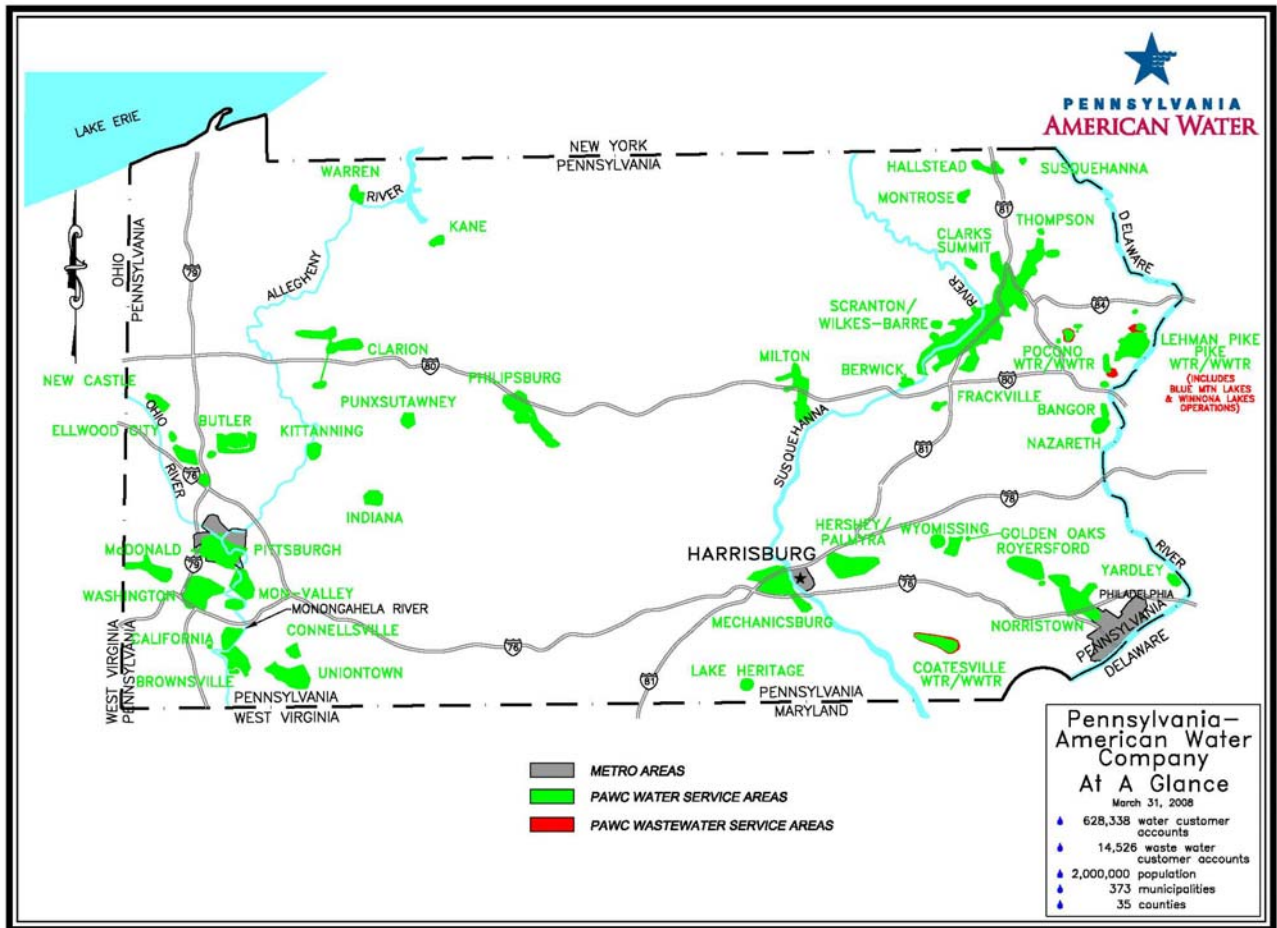
For these functions, American Water should not only consider systems that it currently uses in some of its legal entities but should also open the investigation to “best in class” systems currently found in the industry. Any investigation must not only look at quantitative benefits and costs, but also consider qualitative benefits and costs.



V. Water Operations

Pennsylvania-American Water Company (PAWC) operates and manages approximately 35 different water district across Pennsylvania as shown in *Exhibit V-1*.⁶⁶⁴

Exhibit V-1
PAWC Water Districts
as of December 31, 2007



Source: Information Response 136

Water district operations statistics are shown in *Exhibit V-2*.⁶⁶⁵

**Exhibit V-2
Water District Statistics
as of December 31, 2007**

Water District	Estimated Service Area (square miles)	Customers		
		Water	Wastewater	Employees
Pittsburgh	131	132,208		174
McMurray	319	49,701		63
Mon-Valley	92	21,835		26
Uniontown/Connellsville	42	13,762		19
Brownsville	19	4,359		8
New Castle / Ellwood	71	24,957		48
Butler	49	16,529		27
Indiana	13	7,362		14
Punxsutawney	14	3,588		8
Clarion	46	4,042		9
Kittanning	2	1,998		4
Warren	12	5,452		7
Kane	11	2,123		6
Norristown	43	30,855		32
Yardley	20	12,107		13
Abington	13	5,543		7
Susquehanna	23	2,602		8
Bangor	8	3,614		8
Nazareth	39	9,351		9
Poconos	17 \1	10,915		6
Poconos Wastewater			4,774	5
Wyomissing - Glen	48	8,678		6
Mechanicsburg	60	35,608		42
Hershey	53	17,276		14
Wyomissing - Penn	16	11,570		12
Royersford	51	14,053		13
Coatesville Water	28 \2	11,053		18
Coatesville Wastewater			5,892	9
Lake Heritage	1	814		0
Lehman Pike Water	13 \3	6,086		11
Lehman Pike Wastewater			3,910	1
Milton	76	12,172		24
Philipsburg	109	7,262		11
Berwick	8	6,180		7
Frackville	3	2,345		4
Scranton/Wilkes-Barre	221	134,094		207
Corporate				101
Total	1,671	630,094	14,576	981

\1 There are three square miles of wastewater service territory within the company's water service territory footprint.

\2 There are two square miles of wastewater service territory within the company's water service territory footprint.

\3 There are three square miles of wastewater service territory within the company's water service territory footprint.

Source: Company Comments in Task Report Response

Each of these water districts contain:

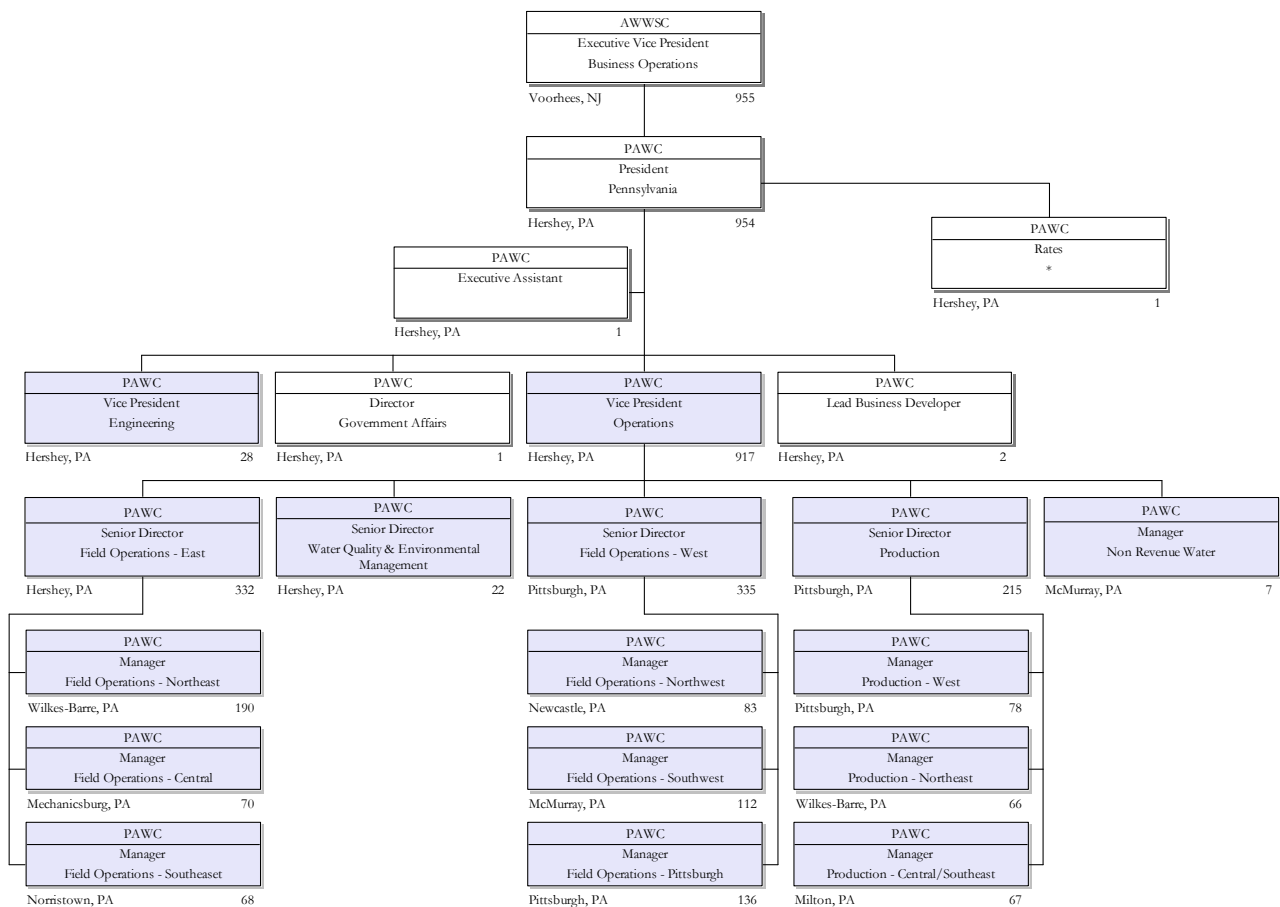
- ◆ *Water Source* – Either a surface water source from rivers or reservoirs or ground water from wells. Most of PAWC's water sources are surface water. In some water districts, water is purchased from a neighboring water system.
- ◆ *Water Treatment Facility* – One or more water treatment plants in each district or connections to neighboring water utilities to purchase water. For example, all water in the Connellsville system

is purchased from a third party. Water in the Uniontown system is purchased from a third party or transferred from PAWC's Brownsville system.

- ◆ *Water Distribution Network* – underground piping, above-ground storage tanks, and booster stations.
- ◆ In some water districts, PAWC also operates wastewater treatment facilities.

Water operations are performed by two major groups and four support groups within PAWC/American Water, as shown in *Exhibit V-3* with the highlighted boxes.⁶⁶⁶

**Exhibit V-3
PAWC Water Operations Organization
as of December 31, 2007**



Source: Information Response 257 Addendum

* Dual reporting to Finance and dotted line reporting to the PAWC President

These two groups are:⁶⁶⁷

- ◆ *Production* – PAWC employees who are responsible for the operations and maintenance of water productions facilities (i.e., treatment plants and filter facilities). There are approximately 215

employees located in the production area

- ◆ *Field Operations (Network)* – PAWC employees who are responsible for the distribution of the water from the production facilities to the individual customers. Most U.S. water companies refer to this group as the distribution organization, whereas the term network is generally used in Europe. There are approximately 667 employees located in the field operations (distribution/network) area.

In addition, the following organizations provide critical support to the above groups, specifically:⁶⁶⁸

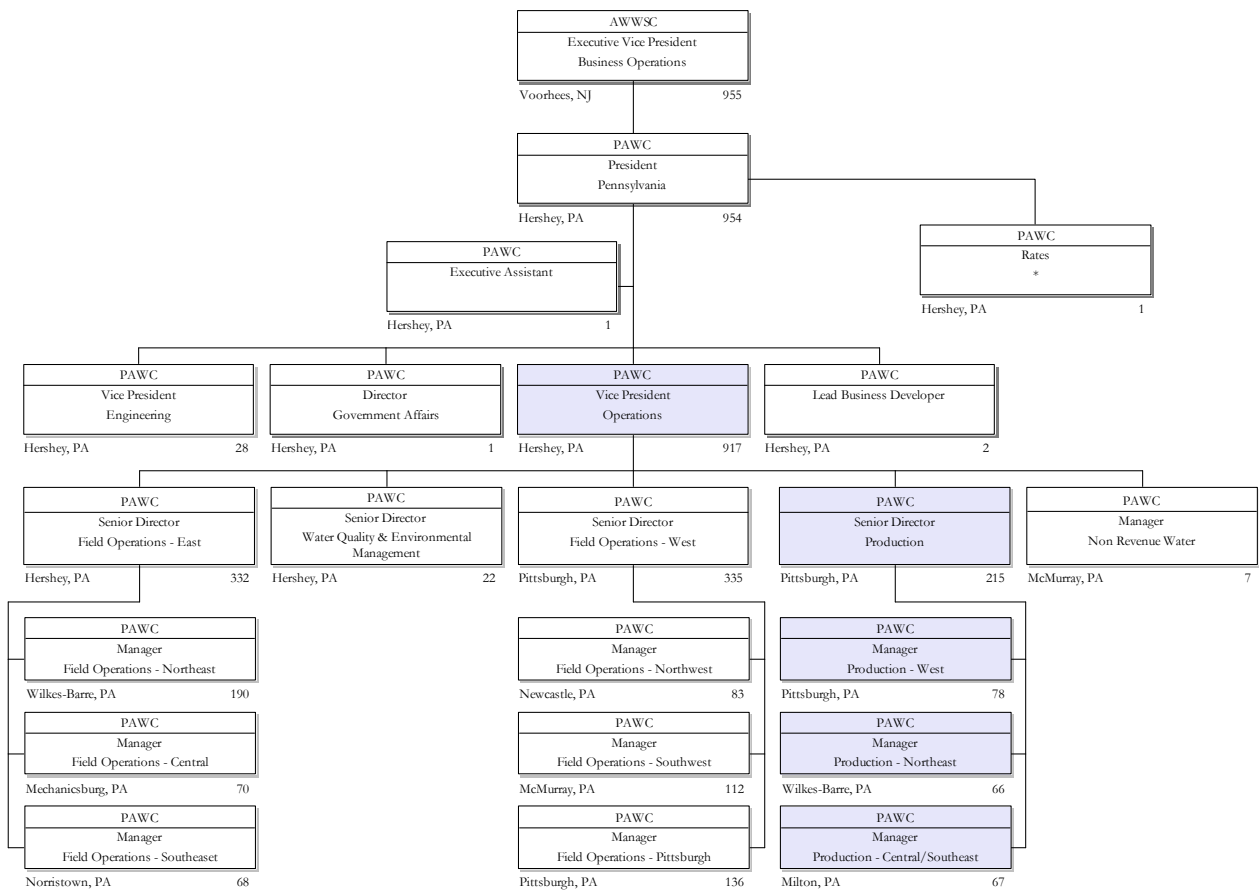
- ◆ *Engineering Department* – The PAWC Engineering Department is responsible for providing engineering technical support, design, and construction management to both production and network facilities. There are approximately 28 employees located in the engineering area.
- ◆ *Water Quality and Environmental Management* – This group is responsible for water quality at each of the plants and for other environmental matters. On an operational basis, much of the basic water-quality sampling and testing is done by plant personnel; however, this group is responsible for performing more complicated testing and for providing oversight for all plants relative to environmental issues. There are approximately 22 employees located in the water quality and environmental management area.
- ◆ *Maintenance Services* – The American Water Maintenance Services organization is responsible for providing various technical and testing services in support of ongoing maintenance of PAWC production and, to some extent, network facilities. At the start of our review in July of 2007, Maintenance Services was a separate part of the PAWC Operations. The group has since been moved to American Water Works Service Company (AWWSC) (national versus Pennsylvania only) during the recent reorganizations which occurred during the first quarter of 2008. There are approximately 22 employees located in the maintenance services area.
- ◆ *Non Revenue Water* – This group is responsible for non-revenue and unaccounted-for-water monitoring and reporting processes throughout PAWC. There are seven employees located in the non-revenue water area.

A. Production

Background & Perspective

The Production Department is responsible for the operations and maintenance of 36 water treatment plants and 85 groundwater well stations in 35 different water districts throughout Pennsylvania. The department also operates and maintains four wastewater treatment plants. The Production Department is organized as shown in *Exhibit V-4* with the highlighted boxes.

**Exhibit V-4
PAWC Production Department Organization
as of December 31, 2007**



Source: Information Response 257 Addendum

* Dual Reporting to Finance and dotted line reporting to the PAWC President

As shown in *Exhibit V-4*, the Production Department is organized on a geographic basis in a West, Northeast, and Central/Southeast scheme. In addition to the Production Department, the Water Quality and Environmental Department also has personnel stationed at some of the plants. Although individual water quality is nominally assigned to a plant, from a water quality and environmental perspective, the department is typically responsible for overseeing the operations of several water plants within its geographic area.⁶⁶⁹

Findings & Conclusions

Finding V-1 PAWC production facilities are well operated.

Schumaker & Company consultants physically reviewed the operations of several production plants within Pennsylvania, including those shown in *Exhibit V-5*.⁶⁷⁰

Exhibit V-5 Production Facility Tours as of December 31, 2007				
	Plant Nominal Capacity	Water Source	Estimated Population Served	Plant Design
Pittsburgh Area				
E. H. Aldrich	50 MGD	Monongahela River	500,000	Aldrich Purifications Units – Flocculation, Sedimentation, Clarification, Filters
Hays Mine	60 MGD	Monongahela River		Super Pulsator Design – Flocculation, Sedimentation, Clarification, Filters
Hershey				
	9 MGD	Manada and Swatara Creeks/City of Lebanon	41,754	Super Pulsator Design – Flocculation, Sedimentation, Clarification, Filters
West Shore				
West Shore Regional	12 MGD	Yellow Breeches Creek	88,000	Super Pulsator Design – Flocculation, Sedimentation, Clarification, Filters
Silver Springs Plant	8 MGD	Conodoquinet Creek		Aldrich Purifications Units – Flocculation, Sedimentation, Clarification, Filters
Coatesville				
Rock Run Water Treatment	5 MGD	West Branch of Brandywine Creek and Chambers Lake	35,800	Mixing Units – Clarification and Granular Media Filtration
Wilkes-Barre				
Scranton	33 MGD	Lake Scranton Reservoir	140,000	Mixing Units – Clarification and Granular Media Filtration
Crystal Lake	6.5 MGD	Crystal Lake	14,000	Mixing Units – Clarification and Granular Media Filtration
Philadelphia Area				
Royersford	3.7 MGD	Schuylkill River	43,500	Mixing Units – Clarification and Granular Media Filtration
Norristown	18 MGD	Schuylkill River	101,000	Super Pulsator Design – Flocculation, Sedimentation, Clarification, Filters
Yardley	5.4 MGD	Delaware River	49,000	Mixing Units – Clarification and Granular Media Filtration

Source: Information Response 126

One of the facilities visited was the Coatesville Wastewater treatment plant. *Exhibit V-6* and *Exhibit V-7* are two different pictures taken at those facilities.⁶⁷¹

Exhibit V-6
Coatesville Wastewater Treatment Facility
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

Exhibit V-7
Coatesville Wastewater Treatment Facility
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

The Coatesville Water Treatment Plant is shown in *Exhibit V-8*. It is located across the street from one of the reservoirs that provided intake water to the facility. A picture of the retaining dam across the street from the Coatesville Water Treatment Plant is shown in *Exhibit V-9*.⁶⁷²

Exhibit V-8
Coatesville Water Treatment Plant
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

Exhibit V-9
Coatesville Retaining Dam on Reservoir
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

Exhibit V-10 illustrates the water source, Conodoquinet Creek, showing a small amount of green algae, for the Silver Springs Plant. *Exhibit V-11* and *Exhibit V-12* show the intake facility for the Silver Springs Plant.⁶⁷³

Exhibit V-10
Silver Springs Water Source Conodoquinet Creek
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

Exhibit V-11
Silver Springs Water Intake Showing Exterior Screen
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

Exhibit V-12
Silver Springs Water Intake and Pump Station
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

Exhibit V-13 is a picture of the water treatment buildings at the Silver Springs Plant in Mechanicsburg.⁶⁷⁴

Exhibit V-13
Silver Springs Aldrich Purification Units
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

Exhibit V-14 is a picture of the Silver Springs lagoons that have recently been completed. These lagoons have been reworked in the last several years to replace older facilities.⁶⁷⁵

Exhibit V-14
Silver Springs Lagoons
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

Exhibit V-15 is a picture of the West Shore Plant in Mechanicsburg that Schumaker & Company consultants toured during our review.⁶⁷⁶

Exhibit V-15
West Shore Plant
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

This plant is one of PAWC's newer water production facilities. All of the equipment is contained within one large, totally enclosed building as contrasted with some of the older facilities that have different buildings located around the site.⁶⁷⁷

Schumaker & Company consultants also reviewed many of the monthly reports that are used in the monitoring of water production operations. At many of the various facilities that were toured, Schumaker & Company consultants observed various performance charts being displayed as shown in *Exhibit V-16*.⁶⁷⁸

Exhibit V-16
Performance Charts on Coatesville Water District Office
as of December 31, 2007



Source: Schumaker & Company Consultant Plant Tours

PAWC has been an active participant in the Partnership for Safe Water program at all of its plants. As a result of this participation, PAWC has been recognized for changes (improvements) that have been achieved at its various water production facilities, an example of which is shown in *Exhibit V-17*. During our tour of many of the water production facilities, we were impressed with the willingness of PAWC plant personnel to test changes in plant operations or test new technologies in an effort to improve the delivered water quality or to lower operating costs.⁶⁷⁹

Exhibit V-17
Partnership Annual Report for Pennsylvania-American Water Company – Butler 2006–2007
as of December 31, 2007

The Pennsylvania-American Water Company – Butler Water Treatment Plant successfully completed the Phase III self-assessment portion of the Partnership for Safe Water program. In March of 2000, this facility was awarded the Environmental Protection Agency's (EPA) "Director's Certificate of Recognition" for this effort. In 2005, the Butler Water Treatment Plant received the five-year recognition award. In order to maintain the Phase III status, this annual report noting improvements or changes that brought about a more consistent plant performance, is submitted. Listed below are issues that have contributed to the continuing ability to meet this performance level:

The combined filter effluent 99% turbidity from June 2006 to May 2007 was 0.05 NTU, with a high reading of 0.07 NTU.

The settled 95% turbidity from June 2006 to May 2007 was 0.79 NTU. The settled 99% turbidity from June 2006 to May 2007 was 0.93 NTU. The goal of optimal settling continues to be visually monitored on a constant basis by plant operators. Flocculator speeds are adjusted in relationship to pumpage rates whenever visual observations and settled turbidity measurements indicate solids carryover. In addition, these observations are used along with jar tests, zeta meter readings, and SCD readings to optimize coagulant dosage.

The raw water 99% turbidity from June 2006 to May 2007 was 19 NTU.

Action level charts have been updated to reinforce any operation changes that have been implemented.

Annual review and training sessions have been held for all operating personnel concerning regulations, operational and treatment goals, action level charts, log charts, and other pertinent details.

The high percentage rate of water recycle through the plant was a concern for the PEAC committee. After the submittal of the Phase III report, the recycle rates were reduced from 2800 gpm to 1400 gpm.

The use of a PACL during cold weather months has significantly increased the efficiency of the coagulation processes. If found to be necessary in the future, other substitute coagulants, coagulant aids, or filter aids will be evaluated.

A bench model CCA 3100 Chemtrac Coagulant Charge Analyzer was purchased in November of 2006 to help optimize treatment, and the unit is used at least once a shift in conjunction with the online SCD to help optimize treatment.

Definitions:

PEAC – Program Effectiveness Assessment Committee – Committee of mostly peer water utilities members, but some regulatory members, also. The committee reviews and approves the Partnership for Safe Water Phase III self-assessment.

PACL – Polyaluminum chloride coagulant – An alternative to alum in the water treatment process that is useful in cold water treatment.

SCD – Streaming current detector – An online instrument used to measure and control the coagulant feed rate.

Source: Information Response 131

Several types of regular reports are made to supervisors and management on the performance of PAWC's water and wastewater systems, including the following examples:⁶⁸⁰

- ◆ Water quality reports issued monthly by Water Quality technical staff
- ◆ Periodic inspections of water storage tank structures
- ◆ Weekly and monthly system-delivery pumpage reports
- ◆ Monthly energy management reports for American Water regions



- ◆ Monthly fuel and power consumption for all Pennsylvania utility accounts
- ◆ Regular reports of condition-based maintenance tests performed on critical process equipment

Finding V-2 PAWC uses state-of-the-art, computerized supervisor control and data acquisition (SCADA) systems to continuously monitor critical pumping and treatment processes, as well as distribution system hydraulic conditions, at most of its treatment plants and associated remote facilities.

Schumaker & Company consultants observed PAWC's SCADA system at several of the plants visited. The various operations' SCADA capabilities are available for review in PAWC's offices and plants. The SCADA system monitors and reports various conditions regarding water plant operations and network conditions, including flows, pressures, tank levels, etc. Within a given geographic area, SCADA information is available at the water plants, and review of remote operations, operating valves, pumps, etc. can be performed.⁶⁸¹

There are different levels of SCADA system automation throughout PAWC's operations. In certain smaller plants, a given shift (usually the overnight shift) might not be staffed and either the plant is not operated at all, but is capable of being monitored from another manned plant or the plant operates unmanned, with operating control being performed from another plant via the SCADA system. The ongoing development and support for the SCADA system is provided by in-house staff. PAWC employs plant operators to manually monitor the SCADA systems, alarms, and other plant processes on a 24/7 basis.⁶⁸²

PAWC has adopted a common platform for its SCADA system and is in the process of integrating the various plants and networks onto this common platform. Certain aspects of the SCADA system are available via the Internet to personnel with the correct security credentials – although this features only allows appropriate management access to view SCADA information but does not allow them to control plant operations. Therefore, if an event occurs that requires attention (all plants use dialing equipment that progressively call out based on a dialing chain), management and supervisory personnel are able to monitor the plant and/or network from remote (home) locations.⁶⁸³

Recommendations

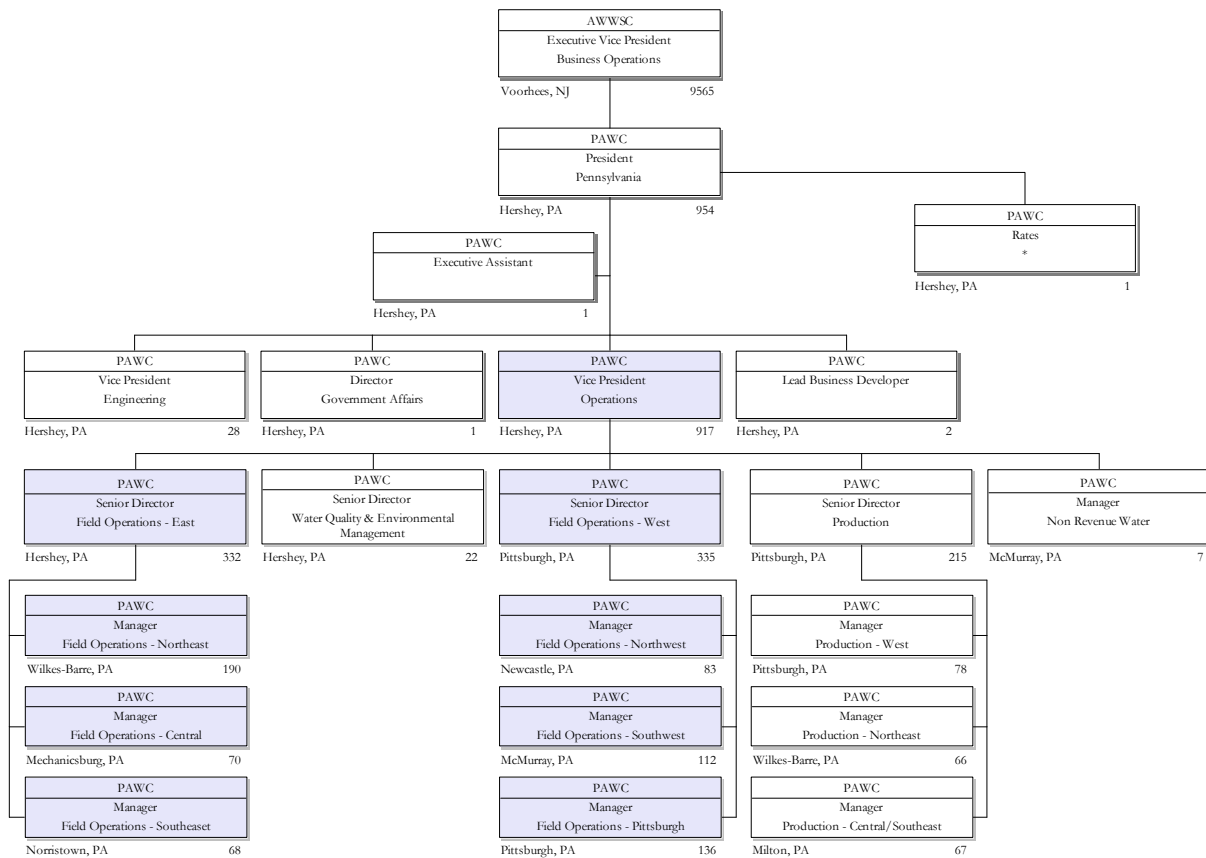
None

B. Network Operations and Maintenance

Background & Perspective

The Network Department is responsible for main installation and maintenance, service line installation and maintenance, leak investigations and repair, and other operations and maintenance activities associated with the underground water delivery systems.⁶⁸⁴ Network Operations and Maintenance, or what is now referred to as Field Operations, is organized on a geographic basis. There is an Eastern and Western organization, as shown in *Exhibit V-18*. In addition to the Field Operations personnel and similar to the Water Production Department, the Non Revenue Water Department provides an oversight role in the operation of the water delivery systems. The ongoing reporting and monitoring of non-revenue water is an indicator of the condition of the water delivery system.⁶⁸⁵

Exhibit V-18
PAWC Network Department Organization
as of December 31, 2007



Source: Information Response 257 Addendum

* Dual reporting to Finance and dotted line report to the PAWC President

Findings & Conclusions

Finding V-3 Best practices are not necessarily shared or implemented by the various water districts.

On one hand, each of the Water Production and Network organizations operate fairly autonomously. Although this tendency might be good in some instances, the shift composition and staffing composition for example varies from plant to plant based on the characteristics (size and technologies) of each plant. However, some basic business processes that should be standardized throughout the organization have not been standardized, which should be a benefit of PAWC being a part of a larger organization.

On the network side, the business practices employed in each district vary in their design and implementation. Some basic business processes, such as leak tracking, valve operations, hydrant flushing, pavement cut tracking, permit tracking, etc., should be standardized throughout the organization. Schumaker & Company consultants recognize that some of these business processes are currently anticipated to be incorporated into the new computerized maintenance management system.

This area is discussed in greater detail in the *Chapter XII – Phase III Water Operations*.

Finding V-4 Although PAWC has built a good SCADA system for operating the plants and distribution network, its implementation of technology for managing the day-to-day monitoring and reporting on various aspects of the business processes within network needs significant improvement.

Although PAWC has implemented an enterprise resource planning (ERP) system that deals with most of its financial requirements, many of the operational business processes are either at a state of:⁶⁸⁶

- ◆ *No computerization* – relies on manual paper systems that are too difficult or labor intensive to provide timely management reporting.
- ◆ *Minimal computerization* – requires manual entry of information into Excel spreadsheets and a fair amount of manual manipulation of the information in those spreadsheets.
- ◆ *Various different business processes and the corresponding different manual or computer systems* – Different water districts have different manual/computer systems for accomplishing a similar business process.

Some of these business processes involve maintenance management, leak tracking and reporting, non-revenue water tracking and reporting (although an extensive set of linked spreadsheets has been developed over the last two years (2006 -2007) to support these business processes), valve operation and testing, hydrants flushing, pavements cuts, permits, etc.

This area is discussed in greater detail in the *Chapter XII – Phase III Water Operations*.

Finding V-5 The number of reported leaks/breaks by water district indicates that certain water districts are up to 10 times worse than others.

Exhibit V-19 shows the leaks/breaks experienced in each water district in Pennsylvania over the last five years.⁶⁸⁷ As shown in *Exhibit V-19*, the highest number of leaks occur in the Pittsburgh, Wilkes-Barre/Scranton, and McMurray water districts. These districts also happen to be the areas with the highest number of miles of main.⁶⁸⁸

**Exhibit V-19
PAWC Leaks/Breaks by Water District by Year
2002 to 2006**

Water District	Miles of Main	Leaks/Breaks By Year				
		2002	2003	2004	2005	2006
Pittsburgh	1373	N/A	1127	1269	1519	1447
Wilkes-Barre/Scranton	1925	460	460	525	448	404
McMurray	1099	373	310	304	324	373
Mon/Valley	427	295	334	281	255	308
New Castle/Ellwood	443	185	183	129	173	142
Uniontown	224	125	159	132	128	175
Butler	270	150	87	78	73	102
Norristown	376	79	96	68	119	104
Mechanicsburg	478	98	74	74	74	125
Brownsville	101	59	59	52	39	53
Indiana	111	47	49	58	62	40
Philipsburg	262	42	50	44	43	38
Abington	105	46	46	36	47	32
Hershey/Palmyra	299	31	38	26	49	25
Punxy	85	23	31	42	37	24
Milton	227	21	18	21	34	14
Pocono	161	14	9	6	26	50
Warren	91	15	22	22	15	14
Nazareth (Blue Mountain)	151	24	10	20	17	17
Clarion	124	6	17	17	21	20
Susquehanna	61	5	20	16	11	23
Coatesville	174	N/A	16	22	10	27
Lehman Pike (Hickory/Silver)	90	23	19	12	1	N/A
Kittanning	25	N/A	N/A	N/A	N/A	13
Berwick	84	8	10	13	23	8
Bangor	61	6	24	12	10	4
Penn-Wyomissing (ST)	153	9	10	3	22	10
Glen Alsace (A-E)	130	6	6	8	11	10
Yardley	183	9	10	3	11	5
Royersford (Home)	222	7	6	7	7	7
Lake Heritage	12	3	6	8	3	5
Frackville	27	4	3	8	0	0
Kane	47	0	6	1	2	3

Source: Information Request 134

Using the information from *Exhibit V-19*, Schumaker & Company consultants developed a leak/break frequency analysis that essentially normalizes the information based on the miles of main within each water district. This information, shown in *Exhibit V-20*, is sorted from highest to lowest. Again, the western Pennsylvania water districts experience the highest frequency of leaks/breaks.⁶⁸⁹

Exhibit V-20
PAWC Average Leaks/Breaks Frequency by Water District by Year
2002 to 2006

Water District	Miles of Main	Leaks/Breaks Per Mile 2003-20067	Comments
Pittsburgh	1373	0.976	
Mon/Valley	427	0.690	
Uniontown	224	0.642	
Kittanning	25	0.520	One Year Only
Brownsville	101	0.519	
Indiana	111	0.461	
Lake Heritage	12	0.417	
Abington	105	0.394	
Punxy	85	0.369	
New Castle/Ellwood	443	0.367	
Butler	270	0.363	
McMurray	1099	0.306	
Norristown	376	0.248	
Susquehanna	61	0.246	
Wilkes-Barre/Scranton	1925	0.239	
Warren	91	0.193	
Mechanicsburg	478	0.186	
Bangor	61	0.184	
Philipsburg	262	0.166	
Lehman Pike (Hickory/Silver)	90	0.153	Three Years Only
Berwick	84	0.148	
Clarion	124	0.131	
Pocono	161	0.130	
Nazareth (Blue Mountain)	151	0.117	
Hershey/Palmyra	299	0.113	
Frackville	27	0.111	
Milton	227	0.095	
Coatesville	174	0.086	
Penn-Wyomissing (ST)	153	0.071	
Glen Alsace (A-E)	130	0.063	
Kane	47	0.051	
Yardley	183	0.042	
Royersford (Home)	222	0.031	

Source: Schumaker Analysis of Information Request 134

The information in *Exhibit V-20* can be used to develop an expectation of the distribution of the capital and maintenance dollars to the various water districts would have been historically based on the leak/break history and the miles of installed main. This analysis is shown in *Exhibit V-21*.⁶⁹⁰

Exhibit V-21
PAWC Capital/Maintenance Expectations Based on Leak/Break History
as of December 31, 2007

Water District	Miles of Main	Percentage of Total Mile of Main	Break Frequency Normalized	Expected Budget Percentage
Pittsburgh	1373	14.30%	11.06%	38.42%
Wilkes-Barre/Scranton	1925	20.05%	2.70%	13.17%
McMurray	1099	11.45%	3.47%	9.65%
Mon/Valley	427	4.45%	7.82%	8.44%
New Castle/Ellwood	443	4.61%	4.15%	4.65%
Uniontown	224	2.33%	7.27%	4.12%
Butler	270	2.81%	4.11%	2.81%
Norristown	376	3.92%	2.81%	2.67%
Mechanicsburg	478	4.98%	2.11%	2.55%
Brownsville	101	1.05%	5.88%	1.50%
Indiana	111	1.16%	5.23%	1.47%
Philipsburg	262	2.73%	1.88%	1.24%
Abington	105	1.09%	4.47%	1.19%
Hershey/Palmyra	299	3.11%	1.28%	0.97%
Punxy	85	0.89%	4.19%	0.90%
Milton	227	2.36%	1.08%	0.62%
Pocono	161	1.68%	1.48%	0.60%
Warren	91	0.95%	2.19%	0.50%
Nazareth (Blue Mountain)	151	1.57%	1.32%	0.50%
Clarion	124	1.29%	1.48%	0.46%
Susquehanna	61	0.64%	2.79%	0.43%
Coatesville	174	1.81%	0.98%	0.43%
Lehman Pike (Hickory/Silver)	90	0.94%	1.73%	0.39%
Kittanning	25	0.26%	5.89%	0.37%
Berwick	84	0.87%	1.67%	0.36%
Bangor	61	0.64%	2.08%	0.32%
Penn-Wyomissing (ST)	153	1.59%	0.80%	0.31%
Glen Alsace (A-E)	130	1.35%	0.71%	0.23%
Yardley	183	1.91%	0.47%	0.22%
Royersford (Home)	222	2.31%	0.35%	0.19%
Lake Heritage	12	0.12%	4.72%	0.14%
Frackville	27	0.28%	1.26%	0.09%
Kane	47	0.49%	0.58%	0.07%
	9601	100.00%	100.00%	100.00%

Source: Schumaker Analysis of Information Request 134

Expected Budget Performance - represents the expected percentage of the total capital and maintenance expenditures that would have been spent for main repair/replacement based on leak history

Finding V-6 Maintenance and capital budgets do not appear to consistently take an analysis of leak/break historical data into consideration shown in Exhibit V-24

Schumaker & Company consultants obtained both the capital and maintenance dollars spent in each water district for the last four to five years based on the availability of data. Total capital expenditures for primarily main replacement activities are shown in *Exhibit V-22*.⁶⁹¹

**Exhibit V-22
PAWC Actual Capital Expenditures – Main Replacements
2004 to 2007**

District Unit	District Name	2004	2005	2006	2007	Total Four Years	Percentage of Capital Expenditures
2411	Pittsburgh District	\$12,611,831	\$13,261,113	\$17,320,926	\$13,020,817	\$56,214,688	32.90%
2491	Wilkes-Barre/Scranton	\$6,414,997	\$6,338,775	\$10,932,675	\$9,849,399	\$33,535,846	19.63%
2421	McMurray District	\$1,754,515	\$2,364,361	\$3,189,618	\$3,646,162	\$10,954,657	6.41%
2422	Mon Valley District	\$1,637,250	\$1,704,237	\$3,445,402	\$2,167,637	\$8,954,525	5.24%
2463	Wyomissing	\$744,412	\$2,268,265	\$2,446,270	\$148,458	\$5,607,405	3.28%
2431	New Castle/Ellwood District	\$693,775	\$997,059	\$1,297,945	\$1,255,296	\$4,244,075	2.48%
2451	Norristown District	\$1,108,324	\$923,681	\$1,194,943	\$972,637	\$4,199,585	2.46%
2423	Uniontown / Connellsville District	\$436,702	\$599,804	\$2,024,172	\$1,070,682	\$4,131,361	2.42%
2461	Mechanicsburg District	\$571,770	\$778,686	\$1,168,852	\$1,028,287	\$3,547,595	2.08%
2459	Glen Alsace	\$0	\$0	\$2,028,987	\$1,124,579	\$3,153,566	1.85%
2452	Yardley District	\$432,468	\$405,040	\$716,396	\$1,493,142	\$3,047,045	1.78%
2462	Hershey/Palmyra District	\$687,748	\$177,915	\$693,278	\$921,041	\$2,479,982	1.45%
2467	Coatsville WW District	\$92,302	\$6,927	\$231,562	\$2,108,754	\$2,439,545	1.43%
2465	Coatsville District	\$225,798	\$59,853	\$872,562	\$1,222,898	\$2,381,111	1.39%
2472	Philipsburg District	\$599,562	\$198,109	\$653,483	\$827,999	\$2,279,153	1.33%
2425	Brownsville District	\$108,767	\$306,497	\$1,093,938	\$699,359	\$2,208,561	1.29%
2471	Milton District	\$425,112	\$421,243	\$789,375	\$545,806	\$2,181,536	1.28%
2433	Butler District	\$360,742	\$722,047	\$456,612	\$591,574	\$2,130,974	1.25%
2464	Royersford	\$623,345	\$158,189	\$897,062	\$278,347	\$1,956,944	1.15%
2456	Nazareth District	\$425,389	\$861,310	\$508,089	\$137,098	\$1,931,887	1.13%
2454	Susquehanna District	\$408,474	\$476,312	\$387,617	\$327,159	\$1,599,562	0.94%
2468	Lehman pike	\$226,693	\$255,809	\$711,713	\$393,072	\$1,587,288	0.93%
2457	Pocono District	\$141,392	\$188,160	\$480,490	\$677,820	\$1,487,862	0.87%
2441	Indiana District	\$172,271	\$163,971	\$727,186	\$293,070	\$1,356,498	0.79%
2473	Berwick District	\$165,437	\$11,594	\$235,974	\$888,887	\$1,301,893	0.76%
2446	Kane District	\$98,304	\$100,853	\$624,999	\$360,158	\$1,184,314	0.69%
2453	Abington District	\$236,529	\$383,591	\$334,742	\$208,907	\$1,163,769	0.68%
2445	Warren District	\$166,320	\$244,182	\$544,227	\$85,549	\$1,040,277	0.61%
2455	Bangor District	\$317,449	\$122,618	\$303,129	\$40,648	\$783,843	0.46%
2474	Frackville District	\$188,833	\$64,907	\$321,324	\$170,454	\$745,519	0.44%
2442	Punxsutawney District	\$143,415	\$96,179	\$137,869	\$168,600	\$546,063	0.32%
2443	Clarion District	\$15,337	\$153,726	\$77,556	\$128,722	\$375,342	0.22%
2444	Kittanning District	\$2,747	\$48,665	\$2,830	\$35,948	\$90,190	0.05%
2469	Lehman pike WW	\$1,022	\$7,345	\$0	\$0	\$8,367	0.00%
2458	Pocono WW District	\$5,981	\$0	\$0	\$0	\$5,981	0.00%
2466	Lake Heritage	\$0	\$0	\$2,977	\$57	\$3,034	0.00%
2481	Corporate Office	\$0	\$0	\$0	\$0	\$0	0.00%
	Totals	\$32,245,013	\$34,871,025	\$56,854,780	\$46,889,022	\$170,859,840	100.00%

Source: Information Response 721

In a similar manner, the maintenance expenditures for each water district for the last five years are shown in *Exhibit V-23*.⁶⁹²

Exhibit V-23
PAWC Maintenance Expenditures by Water District
2003 to 2007

Water District	2003	2004	2005	2006	2007	Total Five Years	Percentage of Total Maintenance Expenditures
Pittsburgh	\$4,394,129	\$3,936,568	\$4,265,013	\$4,573,774	\$5,052,767	\$22,222,250	27.68%
Scranton/Wilkes-Barre	\$4,255,288	\$4,088,102	\$4,117,968	\$4,585,152	\$5,166,809	\$22,213,319	27.67%
McMurray	\$1,098,945	\$1,030,412	\$987,537	\$871,979	\$1,224,686	\$5,213,559	6.49%
Mon-Valley	\$895,108	\$799,126	\$832,113	\$749,105	\$680,599	\$3,956,051	4.93%
New Castle / Ellwood	\$601,778	\$502,298	\$606,778	\$440,213	\$669,190	\$2,820,257	3.51%
Coatesville Water	\$487,995	\$544,479	\$468,821	\$521,334	\$552,433	\$2,575,062	3.21%
Butler	\$463,335	\$437,216	\$504,993	\$476,903	\$491,242	\$2,373,689	2.96%
Mechanicsburg	\$416,606	\$340,613	\$369,132	\$611,094	\$596,872	\$2,334,317	2.91%
Norristown	\$222,198	\$197,721	\$311,238	\$326,028	\$648,427	\$1,705,612	2.12%
Uniontown/Connellsville	\$436,976	\$307,858	\$367,793	\$196,235	\$363,482	\$1,672,344	2.08%
Hershey	\$256,245	\$168,945	\$307,386	\$343,051	\$273,465	\$1,349,092	1.68%
Wyomissing - Penn	\$229,605	\$297,017	\$307,286	\$150,051	\$193,939	\$1,177,899	1.47%
Abington	\$199,115	\$207,172	\$212,370	\$231,695	\$241,833	\$1,092,186	1.36%
Warren	\$157,461	\$146,405	\$201,145	\$163,014	\$185,509	\$853,534	1.06%
Bangor	\$184,789	\$172,721	\$92,392	\$123,410	\$167,191	\$740,503	0.92%
Milton	\$120,701	\$130,121	\$164,840	\$131,884	\$177,487	\$725,033	0.90%
Philipsburg	\$130,357	\$128,788	\$145,795	\$119,722	\$166,943	\$691,606	0.86%
Lehman Pike Water	\$133,925	\$100,335	\$128,642	\$137,374	\$170,885	\$671,162	0.84%
Nazareth	\$134,042	\$125,791	\$122,762	\$126,031	\$138,425	\$647,052	0.81%
Poconos	\$113,747	\$104,372	\$116,236	\$115,398	\$138,443	\$588,195	0.73%
Brownsville	\$141,827	\$99,582	\$100,434	\$97,597	\$128,981	\$568,422	0.71%
Indiana	\$116,925	\$134,184	\$110,355	\$83,546	\$118,451	\$563,461	0.70%
Royersford	\$87,131	\$123,701	\$141,812	\$120,076	\$67,611	\$540,330	0.67%
Kane	\$94,580	\$93,811	\$115,898	\$94,390	\$123,190	\$521,869	0.65%
Punxsutawney	\$83,058	\$75,384	\$74,857	\$85,050	\$104,187	\$422,536	0.53%
Kittanning	\$78,424	\$82,446	\$56,191	\$85,759	\$89,173	\$391,993	0.49%
Clarion	\$49,577	\$51,959	\$95,301	\$82,411	\$83,253	\$362,501	0.45%
Susquehanna	\$77,486	\$38,398	\$53,792	\$66,252	\$41,208	\$277,136	0.35%
Yardley	\$76,539	\$37,400	\$66,736	\$51,709	\$43,704	\$276,088	0.34%
Berwick	\$59,920	\$57,511	\$47,618	\$26,493	\$37,930	\$229,471	0.29%
Wyomissing - Glen	\$0	\$0	\$171	\$101,464	\$101,273	\$202,908	0.25%
Lehman Pike Wastewater	\$15,980	\$30,297	\$35,418	\$19,182	\$19,767	\$120,643	0.15%
Frackville	\$23,407	\$33,238	\$22,074	\$8,471	\$19,187	\$106,377	0.13%
Lake Heritage	\$15,783	\$7,411	\$13,862	\$23,430	\$17,281	\$77,767	0.10%
Coatesville Wastewater	\$0	\$0	\$0	\$0	\$0	\$0	0.00%
Total	\$15,852,983	\$14,631,381	\$15,564,762	\$15,939,276	\$18,295,823	\$80,284,225	100.00%

Source: Information Response 722

Compiling the last column from *Exhibit V-21*, *Exhibit V-22*, and *Exhibit V-23* into *Exhibit V-24* provides some insight into how the dollars are being spent on network facilities.⁶⁹³

Exhibit V-24
PAWC Distribution of Capital and Maintenance Expenditures by District
2003 - 2007

Water District	Miles of Main	Expected Budget Percentage	Maintenance	Capital
Pittsburgh	1373	38.42%	27.68%	32.90%
Wilkes-Barre/Scranton	1925	13.17%	27.67%	19.63%
McMurray	1099	9.65%	6.49%	6.41%
Mon/Valley	427	8.44%	4.93%	5.24%
New Castle/Ellwood	443	4.65%	3.51%	2.48%
Uniontown	224	4.12%	2.08%	2.42%
Butler	270	2.81%	2.96%	1.25%
Norristown	376	2.67%	2.12%	2.46%
Mechanicsburg	478	2.55%	2.91%	2.08%
Brownsville	101	1.50%	0.71%	1.29%
Indiana	111	1.47%	0.70%	0.79%
Philipsburg	262	1.24%	0.86%	1.33%
Abington	105	1.19%	1.36%	0.68%
Hershey/Palmyra	299	0.97%	1.68%	1.45%
Punxy	85	0.90%	0.53%	0.32%
Milton	227	0.62%	0.90%	1.28%
Pocono	161	0.60%	0.73%	0.87%
Nazareth (Blue Mountain)	151	0.50%	0.81%	1.13%
Warren	91	0.50%	1.06%	0.61%
Clarion	124	0.46%	0.45%	0.22%
Coatesville	174	0.43%	3.21%	2.82%
Susquehanna	61	0.43%	0.35%	0.94%
Lehman Pike (Hickory/Silver)	90	0.39%	0.84%	0.93%
Kittanning	25	0.37%	0.49%	0.05%
Berwick	84	0.36%	0.29%	0.76%
Bangor	61	0.32%	0.92%	0.46%
Penn-Wyomissing (ST)	153	0.31%	1.47%	3.28%
Glen Alsace (A-E)	130	0.23%	0.25%	1.85%
Yardley	183	0.22%	0.34%	1.78%
Royersford (Home)	222	0.19%	0.67%	1.15%
Lake Heritage	12	0.14%	0.10%	0.00%
Frackville	27	0.09%	0.13%	0.44%
Kane	47	0.07%	0.65%	0.69%

Source: Information Responses 134, 721, and 722

What are revealed in *Exhibit V-24* are such tendencies as:⁶⁹⁴

- ◆ Although the leak/break history and miles of installed pipe would tend to expect that Pittsburgh would be expending 38.42% of capital and maintenance dollars, Pittsburgh is expending only 27.68% of maintenance and 32.90% of capital. This discrepancy could indicate that insufficient dollars are being spent in the Pittsburgh District based on their leak/break history.
- ◆ With respect to the Wilkes-Barre/Scranton water district, one would expect that 13.17% of the dollars expended would flow to that water district; however, Wilkes-Barre/Scranton is receiving 27.67% of maintenance and 19.63% of capital.
- ◆ With respect to Coatesville, while one would expect that 0.43% of the total dollars would be directed toward that district, it is receiving 3.21% of maintenance and 2.82% of capital.

Schumaker & Company consultants recognize that there are many factors to be considered in distributing the capital and maintenance dollars among the various water districts. However, on a retrospective basis, leak history provides an overall indication of the condition of the distribution facilities. One would expect that the areas experiencing the most leaks would, simply put, be getting the most \$ resources committed to address leaks. This analysis did not necessarily show that to be the case.

Recommendations

Recommendation V-1 Aggressively pursue the identification and implementation of technology-based best practices among the water districts. (Refer to Finding V-4 and Finding V-3.)

Although American Water contains a Best Operating Practices (BOP) organization, it appears that little has been done to standardize some of these practices for the benefit of PAWC customers. BOP is a relatively new discipline within the organization. BOP's mission is to identify best operating practices and translate them into American Water policies, strategies and practices to be followed by all appropriate personnel within the American Water System.

To ensure "buy-in," individuals from all regions/states serve as representative participants in developing the proposed policy, strategy or practice. When developed, drafts of proposed policies, strategies and practices are then distributed to a broader audience across the business for comment and additional buy-in prior to the BOP team seeking Service Company Board approval that results in a formal policy, or functional approval that results in a formal strategy or practice (continued).

To BOP's defense, it appears that best operating practices are being developed, but it is up to each water district to decide what practices to adopt or implement. This approach is contrary to Schumaker & Company's experience with other larger companies that strive to identify the best way to do things and then require the implementation of those best practices throughout the organization.

According to PAWC management, all American Water policies, strategies and practices are required to be adopted. Policies dictate an effective date for adoption. What is “up to each water district to decide” is when and how to begin to implement a particular strategy or practice, which could require additional human, capital or other resources, a rate proceeding or other occurrence to permit implementation of the strategy or practice.

However, several of the practices that Schumaker & Company consultants had reviewed would in reality need some type of business process built into a computer system to effectively implement. Either the BOP Group needs to be able to translate these higher level policies into specific computer based business processes or Information Technologies Services needs to be charged with building or procuring computer-based business processes to effectively implement American Water policies, strategies and practices throughout American Water.

Recommendation V-2 Develop a business process for addressing aggressive identification of the most beneficial main segments for replacement based on an expectation of potential leak impact. (Refer to Finding V-4, Finding V-5, and Finding V-6.)

The Schumaker & Company analysis raises an issue with how the capital and O&M expenditures have been distributed among the various water districts based on the leak histories of each water district. We recognize that this is but one way, although a strong indicator, of the need for capital and O&M funding in each water district. A more complete methodology needs to be developed that not only considers leak history and other factors such as age of pipe, pipe material, size etc. but also can be applied on a pipe segment basis as opposed to a water district basis.

Schumaker & Company understands that a slightly different process was used to prioritize capital projects in the 2008 budget year. According to PAWC management in the development of the development of the PAWC’s 2008 main replacement capital program was as follows:

- ◆ District-level main replacement rates were determined, based primarily on the average main breaks per mile experienced over the 2003-2007 period and subsequently prioritized.
- ◆ Planned replacement footage and expenditure amounts were developed for each district based upon current pipeline replacement costs.
- ◆ Aggregated district expenditures levels were then reconciled with the statewide budget allocation. In certain instances, district level adjustments were made to more accurately reflect needs not identified in the above-referenced process.
- ◆ PAWC used a prioritized approach for its 2008 main replacement capital program based on desired main replacement rates and footages developed at a district level.
- ◆ Individual pipe projects were ranked in accordance with the main prioritization model. Highest ranked projects within each district were funded up to the planned district expenditure amounts.

Nonetheless, Schumaker & Company consultants still have some concerns with the process that is presented above.

- ◆ District-level main replacement rates were determined, based primarily on the average main breaks per mile experienced over the 2003-2007 period and subsequently prioritized. However, we are not sure what prioritization is involved in this process.
- ◆ Highest ranked projects within each district were funded up to the planned district expenditure amounts. However, this is still different from having the highest-ranked projects across the state funded to the state-wide expenditure level.

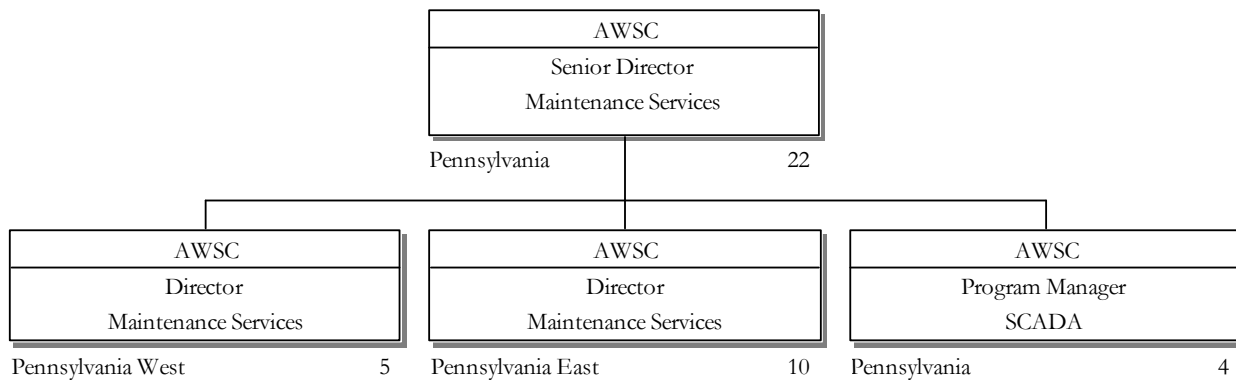
PAWC management believes that utilization of main replacement rates and footages is a more accurate way of determining desired district-level funding than utilization of main break percentages, because resultant district expenditure levels are influenced by pipeline replacement unit costs which vary by district and are dependent upon specific project characteristics. PAWC management indicated that they will continue further development of its methodology to consider other performance and service factors associated with the main asset which would be an area for the PaPUC to investigate during the follow-up review.

C. Maintenance Services

Background & Perspective

The Maintenance Services Department is responsible for two major activities: (1) development and maintenance of the supervisory control and data acquisition (SCADA) system and (2) the establishment of a proactive maintenance program throughout PAWC. PAWC has an in-house staff that has implemented and supported the PAWC SCADA system. PAWC employees within the maintenance services area are directly responsible for performing various testing on equipment and recording results according to a schedule to drive the proactive maintenance program. Maintenance Services Department is organized as shown in *Exhibit V-25*.⁶⁹⁵

Exhibit V-25
PAWC Maintenance Services Organization
as of December 31, 2007



Source: Information Response 635

Findings & Conclusions

Finding V-7 **PAWC has implemented a good proactive production equipment maintenance program.**

The purpose of PAWC’s proactive production equipment maintenance program is to utilize a strategy that includes predictive, preventive, and reactive maintenance in a combination to yield optimum equipment process reliability and maximum financial return.⁶⁹⁶

The proactive maintenance program has been primarily achieved by ranking systems and individual equipment according to their operational impact. Once this ranking is done, each piece of equipment is then placed into

a matrix that identifies maintenance practices. That matrix is arranged as follows: predictive, preventive, reactive, and maintenance improvement. The particular equipment that is assigned to one or more of these maintenance practice quadrants is dependent upon that equipment's ability to attribute to "cost savings if failure is avoided" versus "losses due to failure risk."⁶⁹⁷

- ◆ Equipment that is identified for predictive maintenance practices, such as vibration analysis, thermographic inspections, and motor winding analysis, will have maintenance functions performed based on actual machine "condition," not time. The actual condition of the machine will dictate when maintenance can be done in-house versus when it is necessary to send it out to an authorized service shop.⁶⁹⁸
- ◆ Equipment that is identified for preventive maintenance practices, such as tighten, lubricate, clean, and check for excessive noise, heat, arcing contacts, etc., has maintenance performed on a "time" or as-needed basis. This practice is primarily done in-house.⁶⁹⁹
- ◆ Equipment that is identified for reactive maintenance is equipment that can be "run to fail" items. This equipment poses no threat to operational impact if it does fail and is usually a shelf item that can be obtained quickly. There is no value in doing programmed maintenance here. This work is usually done in-house.
- ◆ Equipment that is identified as needing maintenance improvement is equipment that shows low reliability but does not have an additional impact on cost if it is allowed to degrade. Areas of improvement include upgrading to stainless steel impellers, remote terminal units (RTUs)/SCADA, ultrasonic level indicators, mechanical seals, etc. Improvements, when possible, are made to design and installation, which allows for easier access when maintenance and repair work is needed.⁷⁰⁰

All of the above-named maintenance practices are done exclusively by in-house personnel. Predictive maintenance, such as vibration analysis, motor winding analysis, ultrasonic testing, and thermographic inspections, is performed by full-time PAWC employees who are Institute Certified Specialists. Preventive, reactive, and maintenance improvements are done by trained plant personnel in conjunction with the Specialists and plant management.⁷⁰¹

A sample of the type of information that is being developed and reported as a part of this program is shown in *Exhibit V-26*.⁷⁰²

Exhibit V-26
Sample Condition-Based Maintenance Test
as of December 31, 2007

American Water
Maintenance Services Department
Quantitative Thermal Exceptions Report

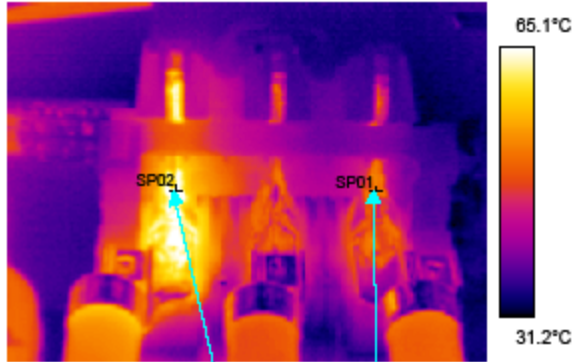
Facility	PAWC - Uniontown	Date	8/16/2005	Time	8:18:02 AM	Exception	1
Thermographer	Joseph A. Washinski	Certification Level I	#6805				

Location
West End Booster

Equipment Tested
#2 Booster Motor Starter

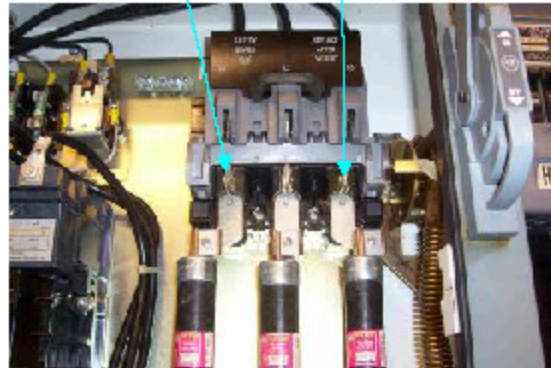
Exception Description

Infrared located a "Hot Spot" on the "A" Phase of the main disconnect switch for #2 Booster Starter.



Severity Rating
2

Ambient	20.0 C
Reference Spot 1	43.1°C
Hot Spot 2	69.4°C
Hot Spot 3	-
Degree Rise	26.32



Voltage and Current Readings:

Corrected Maintenance Action
After removing Incoming Power to disconnect, clean and inspect "stabs" and check for uniform tightness, and re-inspect.

Phase AB	Phase AC	Phase BC
XX.X	XX.X	XX.X
Leg "A"	Leg "B"	Leg "C"
XX.X	XX.X	XX.X

Source: Information Response 131

Finding V-8 **Although PAWC has implemented a good proactive production equipment maintenance program, it has failed to implement a computerized maintenance management program at the production facilities.**

At this time, each production plant manages its own plant maintenance programs without the benefit of a standardized business process, be it paper-based or computer-based. American Water and PAWC are in the process of implementing a computerized plant maintenance management system and although we have reviewed a draft business case for this project, it is too early to assess the results of this effort.

Recommendations

Recommendation V-3 **Implement a computerized maintenance management system in conjunction with the proactive production equipment maintenance program. (Refer to Finding V-8.)**

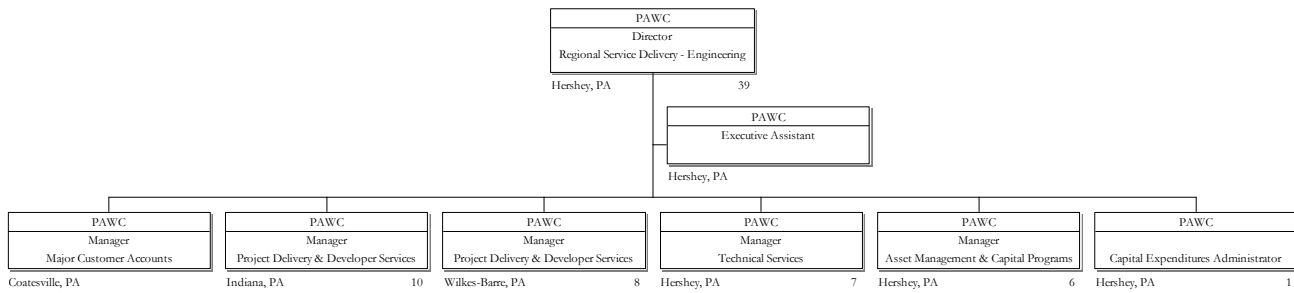
Schumaker & Company consultants recognize that PAWC is in the process implementing this system. The Maintenance Services area of AWWC has been given responsibility for the implementation of the computerized maintenance management system (CMMS). AWWC is in the process of implementing a third party maintenance program from an outside vendor. This software product has already been implemented on the unregulated side of AWWC. Naming conventions and business processes are currently being standardized throughout AWWC such that the system can be implemented in a common manner across AWWC including PAWC. A pilot is expected to be operational this summer in the Glen Alsace district and then rolled out across the state over the next several years. During the follow-up MEI review, the PaPUC should review the progress made on this project.

D. Engineering Department

Background & Perspective

The Engineering Department is organized as shown in *Exhibit V-27*.⁷⁰³

Exhibit V-27
PAWC Engineering Department Organization
as of December 31, 2007



Source: Information Response 257

The Engineering Department is organized into three major areas, specifically asset and capital planning (central coordination for all of the asset planning located in Hershey), project delivery and developer services (engineering and project oversight services with individuals located throughout the PAWC service territory), and technical services (subject matter experts on specific technologies or equipment used by PAWC). These areas are briefly described below.⁷⁰⁴

- ◆ Asset & Capital Planning
 - Strategic long-range water system planning – comprehensive planning study (CPS)
 - Tactical asset planning and system capacity evaluations
 - Capital program administration
 - Operational needs planning
 - Investment analysis
 - Asset investment plans (five-year Strategic Capital Expenditure Plan (SCEP)) and project prioritization
 - Maintenance of network asset records (inventory, hydraulic models, geographic information systems (GIS)/maps)
- ◆ Project Delivery & Developer Services
 - Capital project management
 - Capital project development, documentation, and forecasting

- Project permitting
- External resources procurement and management
- ◆ Technical Services
 - Technical standards, policies, and procedures – critical knowledge management liaison
 - Center-of-practice responsibilities (Subject Matter Experts – SMEs) for designated technical areas
 - Technical studies, design, and design management to support project delivery and operations
 - Construction management services to support project delivery
 - Training, consultancy, troubleshooting, event support
 - Business development support

Findings & Conclusions

Finding V-9 The Engineering Department generally conducts formal, comprehensive planning studies on a periodic basis for each water district.

The Engineering Department performs comprehensive planning studies on a periodic basis for each of the water districts. These studies review everything from source of water supply to treatment facilities, water delivery systems, and other items. They constitute a formal look at all aspects of a water district and serve as a baseline study from which specific engineering and construction projects are identified for future implementation. *Exhibit V-28* contains a list of all of the studies that have been performed regarding PAWC facilities. However, it is interesting to note that Pittsburgh has not had a comprehensive planning study conducted in over 18 years.⁷⁰⁵ PAWC management indicated that they expect to be conducting a CPS for Pittsburgh in the near future.⁷⁰⁶

These studies not only serve as a baseline document, but are also reviewed periodically for any major changes that might precipitate the need to perform another CPS or a small investigation of a particular aspect of a water district. Such investigations might include performing a water needs and source study, a hydrogeology study, or some other form of study as shown in *Exhibit V-28*.⁷⁰⁷

**Exhibit V-28
PAWC Inventory of Comprehensive Planning Studies and Other Studies
as of July 2007**

District No.	Operating Area	Study Title	Date	Author
53	Abington	CPS	2002	Sys Eng
55	Bangor	CPS	1999	Sys Eng
55	Bangor/Nazareth	Supply Alternatives	2004	Sys Eng
73	Berwick	CPS	1996	Sys Eng
25	Brownsville	CPS	1998	Sys Eng
33	Butler	CPS	2000	Sys Eng
33	Butler	Water Needs and Source	2007	PAW
43	Clarion	CPS	1998	Sys Eng
65	Coatesville Water	Water Needs and Source	2005	PAW
65	Coatesville Water	Alternatives Study	2006	PAW
23	Connellsville	CPS	1997	Sys Eng
91	Crystal Lake	CPS	2001	Sys Eng
31	Ellwood City	CPS	2000	Sys Eng
31	Ellwood City	Water Needs and Source	2007	PAW
74	Frackville	CPS	1996	Sys Eng
74	Frackville	Source of Supply Study	2001	Sys Eng
74	Frackville	Safe Yield Study	1996	R.E. Wright
63	Glen	Water Needs and Source	2004	PAW
71	Hershey	Water Needs and Source	2003	PAW
71	Hershey	CPS	1996	Sys Eng
62	Hershey	Demand Projections	2005	Sys Eng
62	Hershey	Demand Update	2007	PAW
41	Indiana	CPS	1997	Sys Eng
46	Kane	CPS	1999	Sys Eng
44	Kittanning	CPS	1997	Sys Eng
66	Lake Heritage	CPS	2006	PAW
21	McDonald	CPS	1997	Sys Eng
61	Mechanicsburg	CPS	1998	Sys Eng
71	Milton	CPS	1997	Sys Eng
71	Milton	Milton WTP Treatment Study	2000	Gannett Fleming
22	Monongahela	CPS	1997	Sys Eng
54	Montrose	CPS	1998	Sys Eng
31	New Castle	CPS	2000	Sys Eng
51	Norristown	CPS	1996	Sys Eng
72	Philipsburg	CPS	1997	Sys Eng
72	Philipsburg	Water Needs and Source	2007	PAW
72	Philipsburg	Hydrogeologic Study	2005	Meiser & Earl
72	Philipsburg	Moshannon Valley District Safe Yield	2000	Gannett Fleming
72	Philipsburg	Source of Supply	2000	Gannett Fleming
72	Philipsburg	Drane Study	2002	PAWC-Eng
11	Pittsburgh	CPS	1989	Sys Eng
11	Pittsburgh	Water Needs and Source	2005	PAW
57	Pocono-Pike	CPS	2001	Sys Eng
57	Pocono-Pike	Water Needs and Source	2007	PAW
42	Punxsutawney	CPS	1997	Sys Eng
63	Royersford	Water Needs and Source	2007	Sys Eng
91	Scranton/ Chinchilla	CPS	2001	Sys Eng
63	Spring Twp	Water Needs and Source	2005	Sys Eng
54	Susquehanna/Hallstead	CPS	1998	Sys Eng
54	Thompson	CPS	1998	Sys Eng
23	Uniontown	CPS	1997	Sys Eng
22	Valley	CPS	1997	Sys Eng
45	Warren	CPS	1998	Sys Eng
21	Washington	CPS	1997	Sys Eng
52	Yardley	CPS	2001	Sys Eng
52	Yardley	CPS	1996	Sys Eng
52	Yardley	Update	2005	Sys Eng

Source: Information Request 147

Finding V-10 **With the most recent budgeting process (2008 Budget Year), the Engineering Department has implemented a more analytical main replacement decision-making methodology.**

PAWC's distribution system improvement program currently addresses replacement or rehabilitation of small diameter mains (six inches and under) that have reached, or are nearing, the end of their useful life and larger diameter mains (eight inches and over) that are experiencing performance-related issues (e.g., high number of breaks). American Water replaces older, small-diameter mains to resolve customer service and reliability issues and to restore hydraulic capacities within its distribution system. Small diameter mains represent 35% of PAWC's distribution system, and at least two-thirds of the small-diameter mains are made of cast iron, with approximately 40% being unlined cast iron pipe (pre-1930s) that are nearing the end of their useful life. As these pipes continue to age, they tend to break more often, thereby leading to customer service disruptions and a general inconvenience to the public. Approximately 75% of PAWC's reported water main breaks/leaks are associated with these small diameter mains, with a disproportionately greater frequency of main break/leaks on four-inch and under pipe sizes. In addition to having a high break rate, they have low carrying capacity and can contribute to water-quality problems.⁷⁰⁸

As in the case with smaller-diameter mains, performance-related issues associated with larger-diameter mains constitute a key driver for replacing or rehabilitating these mains. Although the frequency of leaks/breaks on large-diameter mains is significantly less than that of smaller-diameter mains, when a break does occur on a large-diameter main, customer service and reliability issues, together with associated liability and remediation expenses, are greater. Larger-diameter main projects are evaluated on a case-by-case basis regarding replacement versus rehabilitation options. Generally, open trench-pipe installation is the most cost-effective and frequently used when unobstructed site conditions allow for a new parallel main installation and significant service work is involved. Rehabilitation is considered if service work is limited, the hydraulic needs of the distribution system can be satisfied, and the cost is favorable to rehabilitate.⁷⁰⁹

Capital investment programs and projects are needs based and prioritized within a strategic-planning process that utilizes drivers associated with various asset-investment strategies (such as regulatory compliance, reliability, capacity, customer satisfaction, etc.) Within a five-year strategic capital expenditure plan, American Water has established longer-term funding levels for main replacement/rehabilitation based on program needs.

On an annual basis, funding levels are established at a district level that is consistent with a detailed implementation plan. PAWC uses a state-wide method for assessing and prioritizing distribution-system-improvement projects as part of AWWSC's overall capital program. The main replacement prioritization process is based on standardized, weighted-performance factors such as leaks/breaks and a qualitative assessment of the value of the improvements in terms of water quality, flow capacity, and service reliability. During such assessments, consideration is given to the potential for coordination with street-paving work.⁷¹⁰



For the 2008 capital budget, PAWC has developed a more quantitative approach for prioritization main replacement projects. The Excel spreadsheet model uses a pairwise comparison (weighting of pipe segment attributes) of various factors—such as decade installed, existing diameter, joint type, and approximately 20 other variables—to calculate a weighted score for the purpose of prioritizing projects once they have been identified by field personnel.⁷¹¹

Recommendations

Recommendation V-4 Continue to develop a risk-assessment-based approach for identifying main replacement projects. (Refer to Finding V-9.)

The year 2008 will be the first year for which a risk-assessment model has been used in the prioritization of main replacement projects. Much of the information for the model needs to be manually collected by field personnel from various company records for the model to be used. If this process were more automated, the whole water distribution system, not just the projects identified by field personnel based on their memory, could be more easily analyzed.

Recommendation V-5 Continue to periodically perform CPS studies. (Refer to Finding V-9.)

PAWC has no preset schedule for performing comprehensive planning studies (CPS) for each water district. According to PAWC management, CPS studies are periodically reviewed to identify if there are any significant changes that would warrant the performance of a new comprehensive planning study for a water district. These reviews should be documented and schedules created to ensure that these documents are formally reviewed on a periodic basis.

¹ / Interview 121

² / Information Response 181(1), p. 4

³ / Interview 121

⁴ / Information Responses 257 & 779

⁵ / Information Responses 257(1), p.4, p.26 & 779

⁶ / Information Response 178

⁷ / Information Response 178(1), Interview 5 indicated some changes forced on them by RWE

⁸ / Information Response 483

⁹ / Information Response 1(2), pp. 2, 3, and 4 and 257 Addendum

¹⁰ / Information Response 1, p.9 and Information Response 4: Attachment 3

¹¹ / Information Response 3, Interview 3, Interview 121, CEO indicated the major organizational changes came about as a result of his talking with employees and customers for two years after he came aboard as CEO. The state presidents are responsible for flushing out their individual organizations in discussions with CEO and as justified through the budgeting process, plus Information Response 3. Also see Information Response 780.

¹² / Information Response 2. Also see Information Response 781.

-
- ¹³ / Discussions with PAWC President
- ¹⁴ / Information Response 6
- ¹⁵ / Information Response 7
- ¹⁶ / Examples on the company intranet
- ¹⁷ / Information Response 291. Note: Information Response 8, which asked the question about development and maintenance of policies and procedures, referenced Information Response 130 (Ops and Maintenance Plans for community water systems required by regulations), Information Response 149 (Emergency Response Plans for community water systems required by regulations), and Information Response 190 (a written description—not a procedure—of cost-allocation methods and rationale), plus Information Response 751 and 543 (40)
- ¹⁸ / AWWC S-1 Filing pp. 3, 4, 100, and 101
- ¹⁹ / Information Response 9
- ²⁰ / Information Response 51 Attach. 1, p. 4 of 36. My interpretation of flow chart and comment on p. 7 of 36
- ²¹ / Information Response 9. Also see Information Responses 736, 658, 735, 737, & 738
- ²² / Information Response 11, Attachments 1–3
- ²³ / Information Request 750
- ²⁴ / Information Response 282
- ²⁵ / Information Responses 300 and 749
- ²⁶ / Information Response 11, Attachments 1–3
- ²⁷ / Author's evaluation of Information Response 12 and Information Response 13
- ²⁸ / Information Response 292, Attachment 1
- ²⁹ / Information Response 402
- ³⁰ / Information Response 54
- ³¹ / Information Response 209
- ³² / Information Response 110
- ³³ / Information Responses 313, 324, and 402
- ³⁴ / Information Response 750. Note: IR 51 is the introduction/summary of the procedures for developing business plans. Whereas business plans appear to be financial/budgeting documents, specific references are made to American Water strategy and business unit strategy as an input to the business plans (p.4 and 7 of 36). Also, these business plans are supposed to contain non-financial aspects. American Water Business Plans were not provided (Information response 738)
- ³⁵ / Information Response 14
- ³⁶ / Information Responses 1, 178, 257, 433, 504, 510, 545, and 575
- ³⁷ / Information Responses DR3, and DR780. Interviews 2 and 121
- ³⁸ / Analysis of Information Response 450; all vehicles summarized in background.
- ³⁹ / Information Response 449
- ⁴⁰ / Information Responses 448 and 746. Splash Point meetings are the same as Tailhook meetings.
- ⁴¹ / Information Response 291(1), slide 11. Also see Information Request 752, Attachment 2
- ⁴² / Information Request 752, Attachments 1 and 3
- ⁴³ / Information Response 291(1), slide 15
- ⁴⁴ / Information Responses 751 & 291
- ⁴⁵ / Information Responses 291, 752, & 753
- ⁴⁶ / Interviews 2 and 121; Analysis of Information Responses
- ⁴⁷ / Evaluation of Information Responses 9, 10, 11, 12, 13, and 51
- ⁴⁸ / Information Response 444
- ⁴⁹ / Information Response 257(1), p. 4. Information Response 779(1)
- ⁵⁰ / Information Response 443, Attachment 1
- ⁵¹ / Information Response 443, Attachments 2–6
- ⁵² / Information Response 444
- ⁵³ / Information Response 444, Attachment. Note: Information Response 1(1), slide 6, shows SE Region Director with two direct reports (Communications and CR, and Government and Regulatory Affairs) for Pennsylvania.
- ⁵⁴ / Information Response 447(1)

-
- ⁵⁵ / Information Response 447(2)
⁵⁶ / Information Response 447(3)
⁵⁷ / Information Response 447(4)
⁵⁸ / Information Response 447(5)
⁵⁹ / Information Response 445
⁶⁰ / Evaluation of Information Response 445. Note: Information Response 446 identifies charitable and grant monies that are widely dispersed (no single expenditure over \$10,000) and amount to \$140,000 actual for 2006 (American Water).
⁶¹ / Information Response 15(1)
⁶² / Information Responses 17 & 757
⁶³ / Information Responses 18 & 759
⁶⁴ / Information Response 16
⁶⁵ / Interviews 2, 5, 68, and 121
⁶⁶ / Evaluation of Information Response 444, Interview 68
⁶⁷ / Interview 68 and Information Response 758
⁶⁸ / Information Response 758
⁶⁹ / Information Response 444
⁷⁰ / Information Response 443
⁷¹ / Interview 43 and Information Response 748. Note: Although interviewee indicated the existence of responsibility matrices that defined contact points and responsibilities, they were not provided in the follow-up information response.
⁷² / Evaluation of Information Response 447(1)
⁷³ / Evaluation of Information Response 447(2)
⁷⁴ / Interviews 2, 5, 121, and 121, and Kickoff presentation
⁷⁵ / Evaluation of Information Response 447(4)
⁷⁶ / Evaluation of Information Response 447(5)
⁷⁷ / Interview 68. Evaluation of Information responses 443, 444, 447, and 760. Information on recently filled position came via Company comments to this task report.
⁷⁸ / Interviews 21 and 22, Information Response 1, and Company Comments
⁷⁹ / Interviews 21 and 22, Information Response 257, and Company Comments
⁸⁰ / Information Response 433 and Company Comments
⁸¹ / Interview 28
⁸² / Information Response 433 and Company Comments
⁸³ / Information Response 286
⁸⁴ / <http://www.oracle.com/applications/jdedwards-world.html>
⁸⁵ / Information Response 341
⁸⁶ / Information Response 341
⁸⁷ / Information Response 341
⁸⁸ / Information Response 341
⁸⁹ / <http://www.peopleclick.com/solutions/rms.asp>
⁹⁰ / Interview 22
⁹¹ / Information Response 287
⁹² / Information Response 287
⁹³ / Information Response 1
⁹⁴ / Interview 28 and Company Comments
⁹⁵ / Information Response 433
⁹⁶ / Company Comments
⁹⁷ / Interview 26
⁹⁸ / Information Response 625
⁹⁹ / Information Response 192
¹⁰⁰ / Interview 7

101 / Information Response 289
102 / Interviews 7, 22, 24 and 29
103 / Interviews 110, 177
104 / Interview 24
105 / Interview 110
106 / Interviews 110, 145, 146, 147
107 / Information Response 712
108 / Interview 28 and Other Casual Conversations
109 / Company Comments
110 / Interview 109
111 / Interview 109
112 / Interview 109
113 / Interview 27
114 / Company Comments
115 / Information Response 409
116 / Interview 27
117 / Company Comments
118 / Company Comments
119 / Information Responses 424 and 426
120 / Information Response 424
121 / Information Response 426
122 / Information Response 424
123 / Interview 5
124 / Interview 109
125 / Information Response 264
126 / Information Response 440
127 / Information Response 440
128 / Interview 28
129 / Information Response 440
130 / Information Response 624
131 / Information Response 289
132 / Information Response 806
133 / Interview 24
134 / Information Response 341
135 / Interview 24
136 / Information Response 253
137 / Information Response 794 and 795
138 / Information Response 284
139 / Information Response 287
140 / Information Response 284
141 / Information Response 284
142 / Information Response 284
143 / Information Response 289
144 / Information response 489
145 / Information Response 272 and 273
146 / Interview 28
147 / Interview 26
148 / Information Response 436
149 / Information Response 605



150 / Interview 24
151 / Interview 109
152 / Interviews 24 & 109
153 / Interview 26
154 / http://www.clomedia.com/content/templates/clo_feature.asp?articleid=91
155 / Information Response 1 (American Water organization chart) and Information Response 532
156 / Interview 1 and Company Comments
157 / Information Response 532 and Company Comments
158 / Interview 70 and Information Responses 1 (American Water organization chart) and 532
159 / Interview 124
160 / Interview 125
161 / Interview 126
162 / Interview 65
163 / Interview 77
164 / Interview 128
165 / Interview 137
166 / Interview 136
167 / Interview 129
168 / Interviews 134 and 138
169 / Interview 135
170 / Interview 133
171 / Interview 141
172 / Interview 142
173 / Interview 157
174 / Interviews 74 and 132
175 / Information Response 38
176 / Interview 44
177 / Interview 76
178 / Information Response 38 and Company Comments
179 / Interview 136 and Information Response 763
180 / Information Response 553
181 / Information Response 553
182 / Information Response 531
183 / Interview 76
184 / Information Response 182
185 / Interview 72 and Information Response 535
186 / Information Response 41
187 / Information Response 43
188 / Interview 138
189 / Interview 138 and Information Response 536
190 / Information Response 41
191 / Information Response 41
192 / Information Response 41
193 / Interview 72
194 / Information Response 534
195 / Information Response 533
196 / Information Responses 1 (American Water Organization Chart), 532, and 545
197 / Interviews 70 and 76 and Information Responses 1 (American Water Organization Chart) and 545
198 / Interview 76

199 / Interviews 76 and 129 and Information Response 547
200 / Interview 129
201 / Interview 129
202 / Interview 76
203 / Interview 129
204 / Interview 76 and Company Comments
205 / Information Response 756
206 / Information Response 549
207 / Interview 137
208 / Information Response 546
209 / Interview 76
210 / Information Response 49 and Company Comments
211 / Interview 76 and Company Comments
212 / Interview 129
213 / Interview 76
214 / Interview 129
215 / Interview 76
216 / Information Response 49
217 / Information Response 553
218 / Interview 76 and Information Response 551
219 / Interview 76 and Information Response 551
220 / Interview 76 and Information Response 551
221 / Interview 125
222 / Interview 51 and Information Response 52
223 / Information Response 55
224 / Information Response 52
225 / Interviews 4 and 123 and Information Response 300
226 / Information Response 299
227 / Interview 123
228 / Interview 4
229 / Information Response 300
230 / Interview 123
231 / Information Response 59
232 / Information Response 532 and Business Center Structure Charts for American Water
233 / Interviews 65 and 70 and Company Comments
234 / Interviews 65 and 70 and Company Comments
235 / Interview 65
236 / Information Response 525
237 / Interview 65
238 / Information Response 521
239 / Information Response 766
240 / Information Response 766
241 / Interview 65
242 / Information Response 61
243 / Information Response 61
244 / Interview 65
245 / Information Response 59
246 / Information Response 732 and Company Comments
247 / Information Response 531



248 / Information Response 56
249 / Information Response 766
250 / Information Response 769
251 / Information Response 766
252 / Information Response 168
253 / Information Response 62
254 / Various Interviews
255 / Interviews 59 and 169 and Information Response 488
256 / Interviews 59, 60, 61, 62, and 64
257 / Interview 59 and Information Response 62
258 / Interview 59 and Information Response 257
259 / Interview 59
260 / Information Responses 67 and 765
261 / Interview 62
262 / Information Response 257 and Company Comments
263 / Interview 62
264 / Interview 62 and Information Response 619
265 / Interview 62
266 / Information Responses 618 and 744
267 / Information Response 744
268 / Interview 62 and Information Response 493
269 / Interview 62
270 / Interviews 62, 159, and 172
271 / Interview 62
272 / Interview 62
273 / Information Response 614
274 / Information Responses 614 and 755
275 / Information Response 755
276 / Information Response 257 and Company Comments
277 / Interview 63 and Information Response 619
278 / Interview 63 and Information Responses 561 and 745
279 / Information Response 745
280 / Interview 63
281 / Interview 63 and Information Response 71
282 / Interview 63
283 / Interview 63
284 / Interview 63 and Information Response 555
285 / Interview 63 and Company Comments
286 / Interview 63
287 / Interview 63
288 / Interview 63
289 / Interview 63 and Information Response 556
290 / Interview 63
291 / Information Response 558
292 / Interview 63 and Information Response 557
293 / Information Response 557
294 / Information Response 257 and Company Comments
295 / Interviews 64 and 160
296 / Information Response 742

297 / Interviews 63 and 64
298 / Interview 160
299 / Interview 60 and Information Response 257
300 / Interview 60
301 / Interview 60
302 / Information Response 77
303 / Information Response 77 and Interview 172
304 / Interview 172
305 / Information Response 257
306 / Interview 61
307 / Interview 169
308 / Interview 61
309 / Interview 61 and Information Response 492
310 / Interview 169
311 / Information Response 57
312 / Information Responses 68 and 770
313 / Information Response 68
314 / Information Responses 69 and 70
315 / Information Response 75
316 / Interview 63/Data Center Tour
317 / Information Response 637
318 / Information Response 637
319 / Interview 63/Data Center Tour and Information Response 75
320 / Information Response 75
321 / Information Response 75
322 / Information Response 75
323 / Information Response 75
324 / Interview 63/Data Center Tour
325 / Information Response 75
326 / Information Response 615
327 / Information Response 615
328 / Interview 169
329 / Interview 59 and Information Responses 484, 485, 487, 491, and 616
330 / Interviews 59, 60, 62, and 172
331 / Interview 62
332 / Interview 62
333 / Interview 59
334 / Information Response 490
335 / Interview 59
336 / Interview 59
337 / Information Response 64
338 / Interview 59
339 / Information Response 63
340 / Information Response 64
341 / Information Response 65
342 / Interview 62
343 / Information Response 489
344 / Interview 59
345 / Consultant's Opinion



346 / Interview 59 and Information Response 63
347 / Interviews 59, 60, 62, and 172
348 / Information Response 73
349 / Interview 62 and Information Response 614
350 / Interview 59
351 / Interview 67 and Information Responses 743 and 770
352 / Information Response 169
353 / Information Response 67 and 765
354 / Interview 159
355 / Information Responses 78 and 468
356 / Information Responses 78 and 468
357 / Interview 60
358 / Interview 172 and Information Response 494
359 / Interview 62
360 / Interview 160 and Information Response 741
361 / Interview 59
362 / Interviews 59 and 63
363 / Interview 59
364 / Information Response 743
365 / Interview 59
366 / Interview 59
367 / Various Interviews
368 / Interview 62
369 / Information Response 617
370 / Consultant's Opinion
371 / Interview 62
372 / Information Responses 76 and 560
373 / Information Response 617
374 / Interview 59
375 / Interview 205 and Information Responses 514 and 874
376 / <http://www.pacode.com/secure/data/052/chapter101/chap101toc.html>
377 / Information Responses 563 and 874
378 / Company Draft Report Comments
379 / Company Draft Report Comments
380 / Company Draft Report Comments
381 / Company Draft Report Comments
382 / Interview 63/Data Center Tour
383 / Interview 161
384 / Information Response 169
385 / Interview 63
386 / Interview 63
387 / Information Response 74
388 / Interview 63
389 / Information Response 812 and Company Comments
390 / Company Comments
391 / Interview 63
392 / Information Response 743
393 / http://searchdatacenter.techtarget.com/sDefinition/0,,sid80_gci1070272,00.html (April 20, 2007)
394 / http://searchdatacenter.techtarget.com/sDefinition/0,,sid80_gci1070272,00.html (April 20, 2007)

395 / Interview 78
396 / Interview 78
397 / Interview 39 and Information Responses 84 and 88
398 / Interview 149
399 / Interviews 149 and 150
400 / Interview 78 and Information Response 81
401 / Interview 78
402 / Information Response 84
403 / Interview 78 and Information Response 83
404 / Interview 39
405 / Information Response 82
406 / Interview 78
407 / Interview 78
408 / Interview 78
409 / Information Response 357
410 / Information Response 357
411 / Interview 39
412 / Information Response 814
413 / Information Response 814
414 / Information Response 814
415 / Interview 78
416 / Interview 39 and Information Response 364
417 / Interview 78
418 / Interview 39 and Information Response 90
419 / Information Response 90
420 / Information Response 808
421 / Information Response 808
422 / Information Response 808
423 / Information Response 808
424 / Information Response 87
425 / Information Response 85
426 / Information Response 85
427 / Information Response 811
428 / Interview 78
429 / Information Response 363
430 / Information Responses 810 and 814
431 / Information Responses 809, 810, and 814
432 / Interview 78 and Information Response 84
433 / Interview 98
434 / Interview 78
435 / Interview 78 and Information Response 90
436 / Interview 39
437 / Interview 98
438 / Interview 98 and Information Response 358
439 / Interview 78 and Information Response 84
440 / Interview 39
441 / Interview 78
442 / Interview 98
443 / Interview 98



444 / Interview 98
445 / Interview 39
446 / Interview 78
447 / Interview 78
448 / Interview 78
449 / Interview 98
450 / Interview 98
451 / Interview 98
452 / Interview 98
453 / Interview 98
454 / Interview 98
455 / Interview 98
456 / Interview 98
457 / Interview 39
458 / Interview 78
459 / Information Response 46
460 / Interviews 35, 38, and 107
461 / Interview 35
462 / Interview 35
463 / Information Responses 92, 93, and 817
464 / Information Response 92 Attachment 1 (Page 3-4) and 817
465 / Information Responses 92 and 93
466 / Information Responses 92, 93, and 816
467 / Information Response 92 Attachment 1 (Pages 3-4) and 816
468 / Information Responses 92 and 93
469 / Information Response 92 Attachment 2 (Appendix C) and 818
470 / Information Response 92
471 / Information Responses 95 and 820
472 / Information Response 820
473 / Information Responses 98 and 820
474 / Information Responses 98 and 820
475 / Information Response 820
476 / Interview 38 and Information Responses 99 and 626
477 / Information Responses 91 and 97
478 / Information Response 821
479 / Information Responses 91 and 97
480 / Information Response 96
481 / Information Response 132
482 / Other Schumaker & Company Audit Project Experience
483 / Information Responses 91 and 97
484 / Other Schumaker & Company Audit Project Experience
485 / Information Responses 91 and 97
486 / Interviews 35, 38, and 107 and Information Response 91
487 / Interviews 35, 38, and 107 and Information Response 92
488 / Interviews 43 and 71 and Information Response 852
489 / Interviews 43 and 71 and Information Response 1
490 / Information Response 100
490 / Information Response 105
490 / Interviews 43, 71, and 102

491 / Information Response 462
492 / Interviews 99, 103, and 104
493 / Interviews 99, 103, and 104
494 / Interview 102
495 / Interviews 99, 103, and 104
496 / Information Response 463
497 / Interviews 99, 103, and 104
498 / Information Response 106
499 / Interviews 99, 103, and 104
500 / Information Responses 367, 106, and 109
501 / Interviews 99, 103, and 104
502 / Interviews 99, 103, and 104
503 / Interviews 99, 103, and 104
504 / Interviews 99, 103, and 104
505 / Information Response 462 and 472
506 / Information Response 462 and 472
507 / Information Response 459
508 / Information Response 477
509 / Information Response 477
510 / Information Responses 106, 108, and 466
511 / Information Response 460
512 / Information Response 100
513 / Information Response 852
514 / Information Response 852
515 / Information Response 105
516 / Interviews 43 and 71
517 / Interviews 43 and 71
518 / Information Response 834
519 / Interviews 43 and 71 and Information Response 473
520 / Interviews 43 and 71
521 / Interviews 43 and 71
522 / Interviews 43 and 71 and Information Response 474
523 / Interviews 43 and 71 and Information Response 468
524 / Interviews 43 and 71 and Information Response 468
525 / Interviews 43 and 71
526 / Interviews 43, 71, and 102
527 / Interview 102
528 / Interviews 102 and 108 and Information Response 386
529 / Interview 102 and Information Response 468
530 / Interview 102
531 / Interviews 43, 71, and 144
532 / Interview 102
533 / Interview 108 and Information Response 386
534 / Interviews 43 and 71
535 / Interviews 43 and 71
536 / Interviews 43 and 71
537 / Interviews 35 and 144
538 / Interviews 35 and 144
539 / Interviews 35 and 144

540 / Information Response 111
541 / Interview 35 and Information Response 111
542 / Interviews 35 and 144
543 / Interviews 35 and 144
544 / Interviews 35 and 144
545 / Interviews 35, 144, and 194
546 / Interviews 35 and 144
547 / Information Response 111
548 / Information Response 111
549 / Information Response 111
550 / Information Response 111
551 / Information Response 111
552 / Information Response 111 and Interview 194
553 / Information Response 111
554 / Interview 144 and Information Response 111
555 / Interview 144 and Information Response 111
556 / Interview 144 and Information Response 111
557 / Information Response 111 and Interview 194
558 / Information Response 111
559 / Information Response 111
560 / Information Response 111
561 / Interview 144 and Information Response 111
562 / Interview 102
563 / Interview 102
564 / Interview 102
565 / Interview 102
566 / Interview 102
567 / Interview 102
568 / Interview 102
569 / Information Response 46
570 / Information Response 46
571 / Information Response 46
572 / Information Response 858
573 / Information Responses 321 and 858
574 / Information Responses 319, 856, and 857
575 / Information Responses 319 and 855
576 / Information Response 319 and 856
577 / Information Response 856
578 / Information Responses 319 and 856
579 / Information Response 111
580 / Interviews 41 and 42
581 / Information Response 257 and Interviews 42 and 161
582 / Information Response 161, Interview 256, and Draft Task Report Company Comments
583 / Interview 161
584 / Information Response 1, Interviews 42 and 161, and Draft Task Report Company Comments
585 / Interview 42
586 / Interview 42 and Draft Task Report Company Comments
587 / Information Response 383
588 / Interview 161

589 / Draft Task Report Company Comments
590 / Information Response 114
591 / Interview 42
592 / Information Response 256; COO Presentation
593 / Interview 161
594 / Interview 41
595 / Interview 41
596 / Information Response 337
597 / Interview 41, Information Response 115, and Draft Task Report Company Comments
598 / Interview 41
599 / Interview 41 and Draft Task Report Company Comments
600 / Interview 41
601 / Interview 158
602 / Information Response 115 and Interview 158
603 / Interview 41 and Information Response 115
604 / Information Response 387
605 / Interview 158
606 / Interview 41
607 / Information Responses 119 and 730 and Draft Task Report Company Comments
608 / Draft Task Report Company Comments
609 / Information Responses 119 and 730
610 / Draft Task Report Company Comments
611 / Information Response 120
612 / Information Response 120 and Draft Task Report Company Comments
613 / Information Response 120
614 / Interview 41 and Information Response 761
615 / Information Response 116 and Interview 158
616 / Information Response 119
617 / Information Response 116 and Interview 158
618 / Interview 41 and Draft Task Report Company Comments
619 / Interview 41 and Information Response 117
620 / Interview 41 and Information Response 117
621 / Information Response 385
622 / Interview 41 and Information Response 117
623 / Information Responses 385 and 764
624 / Interview 41 and Information Response 117
625 / Draft Task Report Company Comments
626 / Interview 41 and Information Response 117
627 / Information Response 385 and Draft Task Report Company Comments
628 / Interview 41 and Information Responses 117, 385, and 764 and Draft Task Report Company Comments
629 / Interviews 41 and 158
630 / Information Response 257 and Interview 12
631 / Information Response 257 and Interview 12
632 / Interview 51
633 / Information Response 257 and Interviews 12 and 51
634 / Information Response 1, Interview 12, and Draft Task Report Company Comments
635 / Information Response 1, Interview 12, and Draft Task Report Company Comments
636 / Interview 51
637 / Interview 12

638 / Interview 12 and Information Response 338
639 / Interview 12
640 / Information Responses 121 and 622
641 / Information Response 622
642 / Information Responses 121 and 731
643 / Interview 12
644 / Interviews 12 and 51
645 / Interview 51 and Information Response 482
646 / Interview 51 and Information Response 482
647 / Interview 12 and Information Response 190
648 / Interview 12
649 / Information Response 125 and Interview 12
650 / Information Response 125 and Interview 12
651 / Interview 159
652 / Interview 12 and Draft Task Report Company Comments
653 / Information Response 339
654 / Interview 12
655 / Information Response 293
656 / Information Response 293
657 / Draft Task Report Company Comments
658 / Interview 12 and Draft Task Report Company Comments
659 / Information Response 293
660 / Interview 12 and Information Response 293
661 / Schumaker & Company's Opinion
662 / Interview 12
663 / Interview 51
664 / Information Response 136
665 / Company Comments
666 / Information Response 257 and Kick-off Meetings
667 / Information Response 257 and Kick-off Meetings
668 / Information Response 257 and Kick-off Meetings
669 / Information Response 257 and Kick-off Meetings
670 / Information Response 126
671 / Water Plant Tours
672 / Water Plant Tours
673 / Water Plant Tours
674 / Water Plant Tours
675 / Water Plant Tours
676 / Water Plant Tours
677 / Water Plant Tours
678 / Water Plant Tours
679 / Water Plant Tours and Information Response 131
680 / Information Response 131
681 / Water Plant Tours
682 / Information Response 129 and Water Plant Tours
683 / Information Response 129 and Water Plant Tours
684 / Information Response 257 and Kick-off Meetings
685 / Information Response 257 and Kick-off Meetings
686 / Water Plant Tours

⁶⁸⁷ / Information Response 134
⁶⁸⁸ / Information Response 134
⁶⁸⁹ / Schumaker Analysis of Information Response 134
⁶⁹⁰ / Schumaker Analysis of Information Response 134
⁶⁹¹ / Information Response 721
⁶⁹² / Information Response 722
⁶⁹³ / Information Responses 134, 721, and 722
⁶⁹⁴ / Information Responses 134, 721, and 722
⁶⁹⁵ / Information Response 635
⁶⁹⁶ / Information Response 130 and Interview 139
⁶⁹⁷ / Information Response 130 and Interview 139
⁶⁹⁸ / Information Response 130 and Interview 139
⁶⁹⁹ / Information Response 130 and Interview 139
⁷⁰⁰ / Information Response 130 and Interview 139
⁷⁰¹ / Information Response 130 and Interview 139
⁷⁰² / Information Response 131
⁷⁰³ / Information Response 257
⁷⁰⁴ / Information Response 257 and Kick-off Meetings
⁷⁰⁵ / Information Response 147
⁷⁰⁶ / Interview 182
⁷⁰⁷ / Information Response 147
⁷⁰⁸ / Information Response 249
⁷⁰⁹ / Information Response 249
⁷¹⁰ / Information Response 249
⁷¹¹ / Information Response 800



Schumaker & Company



Final Report
Volume II of III

Stratified Management & Operations Audit
of
Pennsylvania-American Water Company
for the
Pennsylvania Public Utility Commission
Bureau of Audits

Docket No. D-06MGT029

August 2008



Table of Contents

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1
A. Objectives and Scope.....	2
B. Functional Evaluation Summary	3
C. Summary of Estimated Benefits.....	5
Priority.....	5
Benefits.....	6
D. Summary of Recommendations.....	7
Phase I – Diagnostic Review.....	8
Chapter II – Executive Management, External Relations, and Human Resources.....	8
Chapter III – Financial Management	9
Chapter IV – Support Services.....	9
Chapter V – Water Operations	12
Phase II – Pre-Identified Issues Review.....	13
Chapter VI – Corporate Governance.....	13
Chapter VII – Corporate Culture, Management Structure, & Staffing Levels.....	13
Chapter VIII – Affiliate Interests	14
Chapter IX – Diversity and EEO.....	14
Chapter X – Customer Service.....	15
Chapter XI – Operational Performance	16
Phase III – Focused Area Analysis.....	16
Chapter XII – Phase III Water Operations – Distribution Business Systems.....	16
Chapter XIII – Phase III Human Resources	17
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19
A. Executive Management	19
Background & Perspective	19
Findings & Conclusions.....	27
Recommendations	29

Table of Contents (continued)

B. External Relations and Corporate Communications	31
Background & Perspective	31
Findings & Conclusions.....	34
Recommendations	36
C. Human Resources	38
Background & Perspective	38
Findings & Conclusions.....	44
Recommendations	55
III. FINANCIAL MANAGEMENT	59
A. Background & Perspective	59
Financial Requirements Planning and Cash Management.....	62
Cash Management.....	62
Financial Requirements Planning.....	64
Managerial Reporting, Accounting, and Controls	67
Processes	67
Systems	69
Performance Metrics.....	70
Budget Management, Reporting, and Control	73
Internal Auditing.....	78
B. Findings & Conclusions	82
Financial Requirements Planning and Cash Management.....	82
Managerial Reporting, Accounting, and Controls	83
Budget Management, Reporting, and Control	84
Internal Auditing.....	86
C. Recommendations.....	87
Financial Requirements Planning and Cash Management.....	87
Managerial Reporting, Accounting, and Controls	88
Budget Management, Reporting, and Control	88
Internal Auditing.....	88

Table of Contents (continued)

IV. SUPPORT SERVICES.....	91
A. Information Technology and Systems	91
Background & Perspective	91
Mission, Focus, & Objectives.....	91
Organization & Staffing	92
Business Solutions	95
Infrastructure & Operations	101
Client Services & Support	105
Project Management Office	107
Global Strategy & Architecture	109
Planning & Performance	111
Expenditures	112
Backup/Recovery, Disaster Recovery, and Security/Protection	113
Backup/Recovery	113
Disaster Recovery	113
Security/Protection	114
Technology Audits	115
Governance Processes.....	116
Findings & Conclusions.....	118
Recommendations	127
B. Transportation and Fleet Management	133
Background & Perspective	133
Organization & Staffing	133
Fleet Operating Performance Statistics and Trends.....	137
ARI	138
Fleet Composition and Annual Expenditures.....	139
Major Processes and Systems	143
Vehicle Acquisition.....	143
Vehicle Maintenance and Repair	144
Fuel Supply	145
ARI Processes	146
ARI Systems	147
Internal Audit of the Fleet Management Function	148
Findings & Conclusions.....	148
Recommendations	150

Table of Contents (continued)

C. Facilities and Property Management	153
Background & Perspective	153
Organization & Staffing	153
Expenditures	155
Major Processes and Systems	156
Metrics	156
Findings & Conclusions.....	157
Recommendations	157
D. Procurement Services and Materials Management	159
Procurement Services.....	159
Background & Perspective	159
Organization & Staffing	159
Staffing Levels.....	167
Expenditures	168
Major Business Processes.....	169
Major Systems	171
Findings & Conclusions.....	172
Recommendations.....	174
Materials Management	175
Background & Perspective	175
Organization & Staffing	175
Expenditures	176
Major Business Processes.....	176
Findings & Conclusions.....	183
Recommendations.....	193
E. Risk Management.....	199
Background & Perspective.....	199
Organization & Staffing.....	199
Operating Expenses.....	205
Findings & Conclusions.....	210
Recommendations	212
F. Legal Services	213
Background & Perspective.....	213
Organization & Staffing.....	213
Expenditures	216
Major Processes and Systems	217
Findings & Conclusions.....	219
Recommendations	221

Table of Contents (continued)

V. WATER OPERATIONS	223
A. Production.....	226
Background & Perspective	226
Findings & Conclusions.....	228
Recommendations	236
B. Network Operations and Maintenance.....	237
Background & Perspective	237
Findings & Conclusions.....	238
Recommendations	246
C. Maintenance Services.....	249
Background & Perspective	249
Findings & Conclusions.....	249
Recommendations	252
D. Engineering Department.....	253
Background & Perspective	253
Findings & Conclusions.....	254
Recommendations	257



Table of Contents (continued)

Volume II

VI. CORPORATE GOVERNANCE.....	255
A. Background & Perspective	255
B. Findings & Conclusions	258
C. Recommendations.....	267
VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS	269
A. Background & Perspective	269
Multiple Reorganizations	269
Performance Management	273
B. Findings & Conclusions	274
C. Recommendations.....	281
VIII. AFFILIATE INTERESTS	283
A. Background & Perspective	284
Affiliate Relationships	284
Organizations.....	284
Agreements	292
Affiliate Transactions	294
Services Provided To/From PAWC.....	294
Services Provided by Affiliates to PAWC.....	295
Services Provided by PAWC to Affiliates.....	296
Personnel Transfers From/To PAWC.....	296
Property Transfers From/To PAWC	297
Major Processes and Systems.....	298
Cost Accumulation & Assignment	298
Pennsylvania-American Water Company	298
AWWSC.....	298
Direct Charges/Cost Allocation	299
Systems	302
Invoicing and Payment Methodologies	302

Table of Contents (continued)

Restrictions.....	302
Dividends.....	302
Other Restrictions	303
B. Findings & Conclusions	304
From PAWC to Affiliates	305
From Affiliates to PAWC	306
C. Recommendations.....	312
IX. DIVERSITY/EEO.....	315
A. Background & Perspective.....	315
Organization & Staffing.....	318
Employer Diversity	318
Supplier Diversity	319
Major Processes & Systems.....	320
Employer Diversity	320
Supplier Diversity	321
Statistical Data	323
Employer Diversity	323
Diversity Composition.....	323
Equal Employment Opportunity Commission Complaints	326
Supplier Diversity	326
B. Findings & Conclusions	327
C. Recommendations.....	339
X. CUSTOMER SERVICE	343
A. Background & Perspective.....	343
Call Center Operations.....	344
Organization & Staffing	348
Call Center Technology.....	350
Call Routing and Management	350
Workforce Management.....	350
Customer Relations.....	352
Organization & Staffing	352
Service First Program	355
Customer Surveys	357



Table of Contents (continued)

Customer Accounting and Billing	357
Systems	358
Billing Cycle	359
Credit and Collections	361
Meter Management.....	367
Theft of Service Management.....	369
B. Findings & Conclusions	370
Informal Complaints.....	380
Mediation Complaints	380
Complaint Turnaround Time	381
Formal Complaints.....	381
Executive Complaints.....	382
C. Recommendations.....	386

XI. OPERATIONAL PERFORMANCE..... 391

A. Damage Prevention Programs and Practices.....	391
Background & Perspective	391
Findings & Conclusions.....	392
Recommendations	394
B. Chapter 101 Compliance.....	395
Background & Perspective	395
Findings & Conclusions.....	396
Recommendations	399
C. Unaccounted-For-Water	401
Background & Perspective	401
Findings & Conclusions.....	403
Recommendations	412
D. Capital Investment and Operating Expense Levels	413
Background & Perspective	413
Findings & Conclusions.....	415
Recommendations	420

**Table of Contents
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

A. Background & Perspective.....	421
Prior Findings.....	421
Prior Recommendations.....	421
B. Findings & Conclusions	422
Current Status.....	423
Planned Status	427
C. Recommendations.....	434
D. Overall Summary Conclusions.....	439
E. Implementation Plan.....	441
Assumptions	441
Project Staffing.....	442
Project Plan.....	442
Project Schedule.....	443
Project Costs Estimates	445

XIII. PHASE III HUMAN RESOURCES 447

A. Background & Perspective.....	447
B. Project Team Deliverables	448
Human Capital Scorecard	448
Financial Measures	449
Customer Measures.....	449
Process Measures.....	451
Employee (Learning and Growth).....	451
Workforce Planning and Replenishment	451
Aging Workforce.....	451
Changing Demographics.....	452
Growing Demand for Operators.....	452
Implications.....	452
PAWC’s Aging Workforce.....	453



**Table of Contents
(continued)**

Workforce Planning and Replenishment.....454
 Critical Knowledge Risk Management455
 Workforce of the Future455
 Retiree Retention456
Project Plan456
Strategic Alignment456
 External Focus.....457
 Growth.....458
C. Findings & Conclusions458
D. Recommendations459

XIV. APPENDIX A: DATA AND STATISTICS 461

A. Section 1 – PAWC464
 Total Net Plant in Service465
 Water Sales by Volume (millions of gallons)466
 Operating Revenue468
 Residential Revenue versus Water Sold469
 Commercial Revenue versus Water Sold.....470
 Industrial Revenue versus Water Sold471
 Wholesale Revenue versus Water Sold472
 Governmental Authority Revenue versus Water Sold.....473
 Fire Service Revenue versus Water Sold.....474
 Other (Utility & Non-Utility) Revenue.....475
 Total Average Number of Customers (year-end)476
 Total Employees (year-end)477
 Total Operation and Maintenance Expense478
 Production Expense479
 Purification Expense.....480
 Transmission and Distribution Expense480
 Customer Accounting Expense481
 Administrative and General Expense.....482
 Miles of Main in Service483
 Performance Ratios484
 Performance Ratios per Million Gallons485
 Performance Ratios per One Thousand Customers.....485
 Performance Ratios per Mile of Main.....486
 Performance Ratios - Average Number of Customers per Employee.....486
 Performance Ratios - Gross Utility Plant in Service per Average Number of
 Customers487

Table of Contents
(continued)

B. Section 2 – Comparative	489
Total Net Plant in Service.....	490
Water Sales by Volume (millions of gallons)	491
Residential Water Sold.....	492
Commercial Water Sold.....	493
Industrial Water Sold	494
Wholesale Water Sold.....	495
Governmental Authority Water Sold	496
Fire Service Water Sold	497
Other Water Sold	498
Operating Revenue	499
Residential Revenue	500
Commercial Revenue.....	501
Industrial Revenue.....	502
Wholesale Revenue	503
Governmental Authority Revenue.....	504
Fire Service Revenue.....	505
Other Revenue.....	506
Total Average Number of Customers (year-end)	507
Residential Average Number of Customers.....	508
Commercial Average Number of Customers.....	509
Industrial Average Number of Customers	510
Wholesale Average Number of Customers	512
Governmental Authority Average Number of Customers	513
Fire Service Average Number of Customers	514
Other Average Number of Customers	516
Total Employees (year-end)	517
Total Operation and Maintenance Expense	518
Production Expense.....	519
Purification Expense.....	520
Transmission and Distribution Expense	521
Customer Accounting Expense.....	522
Administrative and General Expense.....	523
Miles of Main in Service.....	524

Table of Contents
(continued)

Performance Ratio Expense.....525

 Operation and Maintenance Expenses per Million Gallons.....526

 Production Expenses per Million Gallons.....527

 Purification Expenses per Million Gallons.....527

 Transmission & Distribution Expenses per Million Gallons528

 Customer Accounting Expenses per Million Gallons528

 Administrative & General Expenses per Million Gallons.....529

 Operation and Maintenance Expenses per Thousand Customers530

 Production Expenses per Thousand Customers531

 Purification Expenses per Thousand Customers531

 Transmission & Distribution Expenses per Thousand Customers532

 Customer Accounting Expenses per Thousand Customers532

 Administrative & General Expenses per Thousand Customers533

 Operation and Maintenance Expenses per Mile of Main534

 Production Expenses per Mile of Main535

 Purification Expenses per Mile of Main535

 Transmission & Distribution Expenses per Mile of Main536

 Customer Accounting Expenses per Mile of Main536

 Administrative & General Expenses per Mile of Main537

XV. APPENDIX B: GLOSSARY 539

Table of Exhibits

Volume I

I. INTRODUCTION AND REPORT SUMMARY1	
Exhibit I-1	Functional Evaluation Summary Phase I – Diagnostic Review4
Exhibit I-2	Functional Evaluation Summary Phase II – Pre-identified Issues Review4
Exhibit I-3	Functional Evaluation Summary Phase III – Focused Area Analysis5
Exhibit I-4	Summary of Priority Totals.....6
Exhibit I-5	Summary of Benefits.....6
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES 19	
Exhibit II-1	American Water Organization, as of December 31, 2007.....20
Exhibit II-2	American Water Eastern Division Reorganization, as of December 31, 2007.....22
Exhibit II-3	Pennsylvania-American Water Company Organization, as of December 31, 2007.....23
Exhibit II-4	AWWSC Communications and External Affairs Organization, as of December 31, 2007.....31
Exhibit II-5	Summary of Expenditures for AWWSC External-Relations Activities, 2003 to 200733
Exhibit II-6	AWWSC Human Resources Organization, as of December 31, 2007.....38
Exhibit II-7	AWWSC Benefits Services Center, as of December 31, 2007.....39
Exhibit II-8	Pennsylvania-American Water Company Human Resources, as of December 31, 2007.....40
Exhibit II-9	HR-Process Improvement Objectives, September 11, 200742
Exhibit II-10	American Water Business Strategy, September 13, 200748
Exhibit II-11	Retirement Forecast Thru 2021, Normal and Early Retirement.....50
Exhibit II-12	Pennsylvania-American Water Company Staffing Requisitions and Average Time to Fill 2003 to 2007 (through February 2007).....53
III. FINANCIAL MANAGEMENT59	
Exhibit III-1	AWWSC Financial Functions, as December 31, 2007, Page 1 of 2.....60
Exhibit III-1	AWWSC Financial Functions, as of December 31 2007, Page 2 of 2.....61
Exhibit III-2	PAWC Mellon Lockbox Account Daily Balances, 2003 to 2007.....62
Exhibit III-3	Example of SSC Cash Management Metrics, June 2006 through September 200763

**Table of Exhibits
(continued)**

Exhibit III-4	Cash Management Sample Excerpt from Reconciliation Summary for Month ended August 2007.....	64
Exhibit III-5	AWCC Long-term Debt and Commercial Paper Ratings, 2003 to 2007.....	66
Exhibit III-6	Systems Supporting American Water’s and PAWC’s Accounting and Finance Functions.....	70
Exhibit III-7	SSC Payroll, General Accounting, Rates, General Tax, & Accounts Payable Metrics, June 2006 through September 2007.....	71
Exhibit III-8	Training Provided to SSC Personnel 2006 and 2007, as of October 31, 2007.....	72
Exhibit III-9	Budget Process Flows from American Water to PAWC as of December 31 2007.....	73
Exhibit III-10	American Water Budget Process, as of December 31, 2007.....	74
Exhibit III-11	American Water Second-Quarter Budget Reforecast Timetable.....	76
Exhibit III-12	Internal Audits Completed by Year, 2003 to 2004.....	80
Exhibit III-13	Internal Audits Completed by Year, 2005 to 2006.....	81
Exhibit III-14	PAWC Key Financial Statistics (\$ Thousands) 2002 to June 30, 2007.....	85

IV. SUPPORT SERVICES 91

Exhibit IV-1	AWWSC Information Technology Services Organization, as of December 31, 2007.....	93
Exhibit IV-2	ITS Staffing Levels, 2004 to 2007.....	94
Exhibit IV-3	ITS Business Solutions Organization, as of December 31, 2007.....	95
Exhibit IV-4	ITS Business Solutions Organization Functional Applications, as of December 31, 2007.....	96
Exhibit IV-5	ITS Business Solutions Organization Technical Applications, as of December 31, 2007.....	97
Exhibit IV-6	KPIs for the ITS Director of Business Solutions, as of December 31, 2007....	98
Exhibit IV-7	Typical Testing Performed and Responsible Group as of December 31, 2007.....	100
Exhibit IV-8	ITS Infrastructure & Operations Organization as of December 31, 2007.....	101
Exhibit IV-9	KPIs for the ITS Director of Infrastructure & Operations, as of December 31, 2007.....	102
Exhibit IV-10	Major Infrastructure & Operations Initiatives, as of December 31, 2007.....	104
Exhibit IV-11	ITS Client Services & Support Organization, as of December 31, 2007.....	105
Exhibit IV-12	ITS Project Management Office Organization, as of December 31, 2007.....	107
Exhibit IV-13	ITS Global Strategy & Architecture, as of December 31, 2007.....	109
Exhibit IV-14	High-Priority List of Standards, as of December 31, 2007.....	110

**Table of Exhibits
(continued)**

Exhibit IV-15	PAWC Information Technology Costs, 2003 to 2007	112
Exhibit IV-16	Example Disaster-Recovery-Plan (DRP) Testing Cycle, as of December 31 2007.....	113
Exhibit IV-17	IT/IS-Related Audits, 2003 to 2007.....	115
Exhibit IV-18	Mix of ITS Resources Approved by ITSC, as of December 31, 2007.....	117
Exhibit IV-19	Actual versus Budget ITS Staffing Levels, 2004 to 2007	120
Exhibit IV-20	ITS Performance Metrics, 2005 to 2007 (through First Half of 2007 Only) ..	123
Exhibit IV-21	American Water Vehicle Replacement Criteria as of January 24, 2006.....	135
Exhibit IV-22	PAWC Annual Fleet Operating Performance Statistics 2005 to 2007.....	138
Exhibit IV-23	PAWC EOY Vehicle Fleet Composition and Trends by Vehicle Class, 2003 to 2007.....	139
Exhibit IV-24	PAWC Revised EOY Vehicle Count, 2003 to 2007	140
Exhibit IV-25	PAWC Fleet Utilization Statistics, as of August 31, 2007	141
Exhibit IV-26	Operations and Maintenance Budget Versus Actuals, 2002 to 2007.....	141
Exhibit IV-27	ARI Annual Billings to PAWC, 2003 to 2007.....	142
Exhibit IV-28	Total Vehicle Leasing Expense, 2003 to 2007	142
Exhibit IV-29	Accident Dollars Recovered Due to Subrogation by ARI, 2003 to 2007.....	146
Exhibit IV-30	Supply Chain Organization, as of December 31, 2007.....	160
Exhibit IV-31	AWWSC Supply Chain Staffing Levels, 2004 to 2007.....	168
Exhibit IV-32	PAWC Total Procurement Value, 2002 to 2007	169
Exhibit IV-33	PAWC Inventory Levels by Stock Type as Reported by PAWC, 2003 to 2007.....	184
Exhibit IV-34	PAWC Stock E Inventory Turns as Reported by PAWC, 2003 to 2007.....	185
Exhibit IV-35	PAWC Stock E Inventory Turns by Warehouse, as Reported by PAWC, 2004 to 2007.....	186
Exhibit IV-36	AWWSC Operational & Financial Risk Management Organizations, as of December 31, 2007.....	199
Exhibit IV-37	AWWSC Operational Risk Management Organizations Southeast Region – Pennsylvania Only, as of December 31, 2007.....	200
Exhibit IV-38	Operational Risk Management Staffing Levels for PAWC Activities, 2002 to 2007.....	202
Exhibit IV-39	Resolution of Claims Review and Approval Limits, as of December 31, 2007.....	204
Exhibit IV-40	Annual Insurance Premium Expense, Other Than Group, for PAWC and American Water, 2004 to 2007	205
Exhibit IV-41	Self-Funding Retentions, as of December 31, 2007.....	206
Exhibit IV-42	# PAWC Claims By Accident Year, 2002 to 2007.....	207
Exhibit IV-43	\$ PAWC Claims Incurred By Accident Year, 2002 to 2007	208

**Table of Exhibits
(continued)**

Exhibit IV-44	PAWC Loss Control Expenditures as % of Claimed Losses, 2002 to 2007.....	209
Exhibit IV-45	AWWSC Legal Organization, as of December 31, 2007	213
Exhibit IV-46	AWWSC Southeast Region Legal Organization Providing PAWC Legal Services, as of December 31, 2007.....	215
Exhibit IV-47	Southeast Region/PAWC Operating Costs, 2005 to 2007	216
Exhibit IV-48	PAWC Outside Legal Counsel Costs, 2003 to 2007	217

V. WATER OPERATIONS..... 223

Exhibit V-1	PAWC Water Districts, as of December 31, 2007	223
Exhibit V-2	Water District Statistics, as of December 31, 2007	224
Exhibit V-3	PAWC Water Operations Organization, as of December 31, 2007	225
Exhibit V-4	PAWC Production Department Organization, as of December 31, 2007.....	227
Exhibit V-5	Production Facility Tours, as of December 31, 2007	228
Exhibit V-6	Coatesville Wastewater Treatment Facility, as of December 31, 2007.....	229
Exhibit V-7	Coatesville Wastewater Treatment Facility, as of December 31, 2007.....	229
Exhibit V-8	Coatesville Water Treatment Plant, as of December 31, 2007.....	230
Exhibit V-9	Coatesville Retaining Dam on Reservoir, as of December 31, 2007.....	230
Exhibit V-10	Silver Springs Water Source Conodoquin Creek, as of December 31, 2007.....	231
Exhibit V-11	Silver Springs Water Intake Showing Exterior Screen, as of December 31, 2007.....	231
Exhibit V-12	Silver Springs Water Intake and Pump Station, as of December 31, 2007.....	232
Exhibit V-13	Silver Springs Aldrich Purification Units, as of December 31, 2007.....	232
Exhibit V-14	Silver Springs Lagoons, as of December 31, 2007	233
Exhibit V-15	West Shore Plant, as of December 31, 2007.....	233
Exhibit V-16	Performance Charts on Coatesville Water District Office, as of December 31, 2007.....	234
Exhibit V-17	Partnership Annual Report for Pennsylvania-American Water Company – Butler 2006–2007, as of December 31, 2007	235
Exhibit V-18	PAWC Network Department Organization, as of December 31, 2007	237
Exhibit V-19	PAWC Leaks/Breaks by Water District by Year, 2002 to 2006	240
Exhibit V-20	PAWC Average Leaks/Breaks Frequency by Water District by Year, 2002 to 2006.....	241
Exhibit V-21	PAWC Capital/Maintenance Expectations Based on Leak/Break History, as of December 31, 2007	242

**Table of Exhibits
(continued)**

Exhibit V-22	PAWC Actual Capital Expenditures – Main Replacements, 2004 to 2007	243
Exhibit V-23	PAWC Maintenance Expenditures by Water District, 2003 to 2007	244
Exhibit V-24	PAWC Distribution of Capital and Maintenance Expenditures by District, 2003 - 2007.....	245
Exhibit V-25	PAWC Maintenance Services Organization, as of December 31, 2007	249
Exhibit V-26	Sample Condition-Based Maintenance Test, as of December 31, 2007.....	251
Exhibit V-27	PAWC Engineering Department Organization, as of December 31, 2007.....	253
Exhibit V-28	PAWC Inventory of Comprehensive Planning Studies and Other Studies, as of July 2007	255

**Table of Exhibits
(continued)**

Volume II

VI. CORPORATE GOVERNANCE..... 255

VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS269

Exhibit VII-1 PAWC Positions Subject to Reorganization, as of April 2004.....272

VIII. AFFILIATE INTERESTS 283

Exhibit VIII-1 American Water Works Company, Inc. Organization,
as of December 31, 2007.....286

Exhibit VIII-2 TWH, LLC Organization, as of December 31, 2007.....287

Exhibit VIII-3 American Water Enterprise, Inc. Organization, as of December 31, 2007.....288

Exhibit VIII-4 AWWSC Corporate Organization, as of December 31, 2007289

Exhibit VIII-5 Affiliate Agreements involving PAWC and Other American Water Entities,
as of December 31, 2007.....293

Exhibit VIII-6 Summary of Charges Involving Affiliated Services
Provided To/From PAWC, 2002 to 2007294

Exhibit VIII-7 Summary of Charges Involving Affiliated Services
Provided To/From PAWC by Affiliate/Type, 2002 to 2007295

Exhibit VIII-8 PAWC’s Share of AWWSC Expenses (\$ Thousands), 2002 to 2007.....295

Exhibit VIII-9 Percentage of Direct Charges versus Allocations for AWWSC Charges to
PAWC, 2005 to 2007296

Exhibit VIII-10 Personnel Transfers From/To PAWC and its Affiliates, 2003 to 2007297

Exhibit VIII-11 AWWSC Expense Categories, as of December 31, 2007301

Exhibit VIII-12 PAWC Dividend Payments to American Water, 2002 to 2007303

IX. DIVERSITY/EEO 315

Exhibit IX-1 Southeast Region HR Organization, as of December 31, 2007318

Exhibit IX-2 AWWSC Supply Chain Organization, as of December 31, 2007319

Exhibit IX-3 Diversity Composition of PAWC Employees, as of December 31, 2006323

Exhibit IX-4 Diversity Composition of PAWC Employees, as of December 31, 2007324

Exhibit IX-5 PAWC Consolidated AAP Data, 2004 to 2006
(as of August of Each Year)325

Exhibit IX-6 Number of PAWC Agreements with Women and Minority Vendors,
2005 to 2007326

**Table of Exhibits
(continued)**

Exhibit IX-7	Annual Spend Value and Percentage of Total Spend by PAWC with M/WBE Suppliers, 2002 to 2007	327
Exhibit IX-8	Location Validation Activities for AAP/EEO-1 Reporting by Area, as of December 31, 2007.....	330
Exhibit IX-9	Summary of American Water Progress against Diversity Plan, as of December 31, 2007, Page 1 of 3.....	332
Exhibit IX-9	Summary of American Water Progress against Diversity Plan, as of December 31, 2007, Page 2 of 3.....	333
Exhibit IX-9	Summary of American Water Progress Against Diversity Plan, as of December 31, 2007, Page 3 of 3.....	334
Exhibit IX-10	PAWC Women and Minority Utilization, as of December 31, 2006	336

X. CUSTOMER SERVICE 343

Exhibit X-1	American Water National Call Center, as of December 31, 2007.....	344
Exhibit X-2	Inside Alton Call Center, as of December 31, 2007.....	346
Exhibit X-3	Inside Pensacola Call Center, as of December 31, 2007	347
Exhibit X-4	Customer Service Center Organization, as of December 31, 2007	348
Exhibit X-5	AWWSC Eastern Division Organization, as of December 31, 2007	352
Exhibit X-6	AWWSC Southeast Region Customer Relations Organization, as of December 31, 2007.....	353
Exhibit X-7	PAWC Appointment Windows, as of December 31, 2007	356
Exhibit X-8	PAWC Met Appointments, 2005 to 2007	356
Exhibit X-9	Collection and Termination Practices, as of December 31, 2007	362
Exhibit X-10	PAWC Account Hold for Medical Condition, 2003 to 2008	362
Exhibit X-11	PAWC Customers Enrolled in Various Programs, as of December 31, 2007.....	363
Exhibit X-12	PAWC Accounts Receivable Aging Trends, 2002 to 2007	364
Exhibit X-13	PAWC Late Payment Revenues, 2002 to 2007	365
Exhibit X-14	PAWC Agency Collections, 2004 to 2007	365
Exhibit X-15	PAWC Allowance for Uncollectible Trends (\$ Thousands), 2004 to 2007.....	366
Exhibit X-16	Agreements Created/Broken, 2003 to 2007.....	366
Exhibit X-17	PAWC Full-time Meter Readers, 2004 to 2007	367
Exhibit X-18	Meter Age Histogram, as of December 31, 2007	368
Exhibit X-19	Meter Testing Rates, 2003 to 2007	369
Exhibit X-20	Theft of Service Statistics, as of December 31, 2007.....	370
Exhibit X-21	PAWC and American Water % of Calls Answered within 30 Seconds, 2002 to 2007.....	371
Exhibit X-22	PAWC Customers' Unanswered Calls (Alton and Pensacola) 2002 to 2007.....	372

**Table of Exhibits
(continued)**

Exhibit X-23	American Water and PAWC Call Abandoned Rates, 2002 to 2007	373
Exhibit X-24	PAWC Average Handle Time (Seconds), 2002 to 2007	374
Exhibit X-25	American Water CSR Turnover Rates By Call Center,2003 to 2007	374
Exhibit X-26	CSR Staffing Level Changes for American Water as a Whole, 2005 to 2007.....	377
Exhibit X-27	Number of PAWC Informal and Mediation Complaints, 2006.....	379
Exhibit X-28	PAWC Informal Complaints, 2003 to 2007.....	380
Exhibit X-29	PAWC Mediation Complaints, 2003 to 2007.....	381
Exhibit X-30	PAWC Average Turnaround Time for Complaints (Days), 2003 to 2007	381
Exhibit X-31	PAWC Formal Complaints, 2003 to 2007.....	382
Exhibit X-32	PAWC Executive Complaints, 2004 to 2007	382
Exhibit X-33	PAWC Dispute Trends, 2002 to 2007	383
Exhibit X-34	PAWC Billing Errors, 2003 to 2007.....	384
Exhibit X-35	Additional Costs From Over Estimates, as of December 31, 2006	385
Exhibit X-36	PAWC Consecutive No Read Progress, as of December 31, 2007	388

XI. OPERATIONAL PERFORMANCE 391

Exhibit XI-1	PAWC Emergency Response Exercises, as of December 31, 2006	397
Exhibit XI-2	Table Top Exercises Completed in 2007, as of December 31, 2007	398
Exhibit XI-3	PAWC Unaccounted-for Water, 2003 to 2007	403
Exhibit XI-4	PAWC Unaccounted-for-Water by Water District, 2005 to 2007	404
Exhibit XI-5	PAWC Unaccounted-for Water Reported to PaPUC, as of December 31, 2006	407
Exhibit XI-6	Analysis of PAWC Reported Unaccounted-For Water, 2005 to 2007.....	408
Exhibit XI-7	PAWC Unaccounted For Real Losses Calculation, as of December 31, 2007.....	409
Exhibit XI-8	System Pressure Impact on Report UFW, 2005 to 2007	410
Exhibit XI-9	PAWC Wilkes-Barre District Metering Areas, as of December 31, 2007.....	411
Exhibit XI-10	PAWC Capital Investment Program Expenditures, 2003 to 2007	413
Exhibit XI-11	PAWC Miles of Main Replacement by Water District, 2003 to 2007	414
Exhibit XI-12	PAWC Total Number of Employees, 1998 to 2007	416
Exhibit XI-13	PAWC Distribution Overtime Hours 2005 to 2007	417
Exhibit XI-14	Production Overtime Hours, 2005 to 2007	418
Exhibit XI-15	PAWC Maintenance Trends Pittsburgh, 2003 to 2007	419
Exhibit XI-16	PAWC Valve Operations, 2003 to 2007	420
Exhibit XI-17	PAWC Production Overtime, 2005 to 2007	421

**Table of Exhibits
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Exhibit XII-1	Distribution Business Processes, as of March 31, 2008.....	428
Exhibit XII-2	Valve and Hydrant Asset Performance Distribution Business Processes, as of March 31, 2008.....	431
Exhibit XII-3	Workforce Management and Parts and Inventory Distribution Business Processes, as of March 31, 2008.....	432
Exhibit XII-4	Leak Tracking and Reporting Distribution Business Processes, as of March 31, 2008.....	433
Exhibit XII-5	Recommended Distribution Business Processes Road Map as of March 31, 2008.....	435
Exhibit XII-6	Project Resource Estimates.....	442
Exhibit XII-7	Project Plan and Schedule.....	444
Exhibit XII-8	Project Cost Estimate, Page 1 of 2.....	445
Exhibit XII-8	Project Cost Estimate, Page 2 of 2.....	446

XIII. PHASE III HUMAN RESOURCES 447

Exhibit XIII-1	PAWC Human Capital Scorecard, as of March 31, 2008.....	450
Exhibit XIII-2	Percentage of Employees Eligible for Early Retirement in the Next Five Years by Selected Locations, as of April 1, 2008.....	454
Exhibit XIII-3	Strategy Matrix, April 1, 2008.....	457

XIV. APPENDIX A: DATA AND STATISTICS..... 461

Exhibit XIV-1	Total Net Plant in Service.....	465
Exhibit XIV-2	Total Water Sold.....	466
Exhibit XIV-3	Operating Revenue.....	468
Exhibit XIV-4	Residential Revenue.....	469
Exhibit XIV-5	Commercial Revenue.....	470
Exhibit XIV-6	Industrial Revenue.....	471
Exhibit XIV-7	Wholesale Revenue.....	472
Exhibit XIV-8	Governmental Authority Revenue.....	473
Exhibit XIV-9	Fire Service Revenue.....	474
Exhibit XIV-10	Other (Utility & Non-Utility) Revenue.....	475

**Table of Exhibits
(continued)**

Exhibit XIV-11	Total Average Number of Customer (year-end).....	476
Exhibit XIV-12	Total Employees (year-end).....	477
Exhibit XIV-13	Total Operation and Maintenance Expense.....	478
Exhibit XIV-14	Production Expense.....	479
Exhibit XIV-15	Purification Expense.....	480
Exhibit XIV-16	Transmission and Distribution Expense	480
Exhibit XIV-17	Customer Accounting Expense.....	481
Exhibit XIV-18	Administrative and General Expense.....	482
Exhibit XIV-19	Miles of Main in Service	483
Exhibit XIV-20	Performance Ratios	484
Exhibit XIV-21	Performance Ratios per Million Gallons	485
Exhibit XIV-22	Performance Ratios per One Thousand Customers	485
Exhibit XIV-23	Performance Ratios per Mile of Main	486
Exhibit XIV-24	Performance Ratios – Average Number of Customers per Employee	486
Exhibit XIV-25	Performance Ratios – Gross Utility Plant in Service per Average Number of Customers	487
Exhibit XIV-26	Utility Plant in Service Less Depreciation	490
Exhibit XIV-27	Total Water Sold (millions of gallons).....	491
Exhibit XIV-28	Residential Water Sold (millions of gallons).....	492
Exhibit XIV-29	Commercial Water Sold (millions of gallons).....	493
Exhibit XIV-30	Industrial Water Sold (millions of gallons).....	494
Exhibit XIV-31	Wholesale Water Sold (millions of gallons).....	495
Exhibit XIV-32	Governmental Authority Water Sold (millions of gallons)	496
Exhibit XIV-33	Fire Service Water Sold (millions of gallons)	497
Exhibit XIV-34	Other Water Sold (millions of gallons)	498
Exhibit XIV-35	Total Operating Revenue (\$'s).....	499
Exhibit XIV-36	Residential Revenue (\$'s).....	500
Exhibit XIV-37	Commercial Revenue (\$'s).....	501
Exhibit XIV-38	Industrial Revenue (\$'s).....	502
Exhibit XIV-39	Wholesale Revenue (\$'s).....	503
Exhibit XIV-40	Governmental Authority Revenue (\$'s)	504
Exhibit XIV-41	Fire Service Revenue (\$'s)	505
Exhibit XIV-42	Other Revenue (\$'s)	506
Exhibit XIV-43	Total Average Number of Customers (year-end).....	507
Exhibit XIV-44	Residential Average Number of Customer.....	508
Exhibit XIV-45	Commercial Average Number of Customers.....	509
Exhibit XIV-46	Industrial Average Number of Customers	510
Exhibit XIV-47	Wholesale Average Number of Customers	512
Exhibit XIV-48	Governmental Authority Average Number of Customers	513
Exhibit XIV-49	Fire Service Average Number of Customers	514

**Table of Exhibits
(continued)**

Exhibit XIV-50	Other Average Number of Customers.....	516
Exhibit XIV-51	Total Number of Employees (year-end)	517
Exhibit XIV-52	Total Operation & Maintenance Expense	518
Exhibit XIV-53	Production Expense.....	519
Exhibit XIV-54	Purification Expense.....	520
Exhibit XIV-55	Transmission & Distribution Expense.....	521
Exhibit XIV-56	Customer Accounting Expense.....	522
Exhibit XIV-57	Administrative & General Expense	523
Exhibit XIV-58	Miles of Main in Service	524
Exhibit XIV-59	Performance Ratio Expense Background Data Total Average Number of Customers per Employee Gross Utility Plant in Service per Total Average Number of Customers	525
Exhibit XIV-60	Expenses per Million Gallons.....	526
Exhibit XIV-61	Production Expenses per Million Gallons.....	527
Exhibit XIV-62	Purification Expenses per Million Gallons	527
Exhibit XIV-63	Transmission & Distribution Expenses per Million Gallons.....	528
Exhibit XIV-64	Customer Accounting Expenses per Million Gallons.....	528
Exhibit XIV-65	Administrative & General Expenses per Million Gallons	529
Exhibit XIV-66	Expenses per Thousand Customers	530
Exhibit XIV-67	Production Expenses per Thousand Customers	531
Exhibit XIV-68	Purification Expenses per Thousand Customers.....	531
Exhibit XIV-69	Transmission & Distribution Expenses per Thousand Customers	532
Exhibit XIV-70	Customer Accounting Expenses per Thousand Customers	532
Exhibit XIV-71	Administrative & General Expenses per Thousand Customers.....	533
Exhibit XIV-72	Expenses per Mile of Main	534
Exhibit XIV-73	Production Expenses per Mile of Main	535
Exhibit XIV-74	Purification Expenses per Mile of Main.....	535
Exhibit XIV-75	Transmission & Distribution Expenses per Mile of Main	536
Exhibit XIV-76	Customer Accounting per Mile of Main	536
Exhibit XIV-77	Administrative & General Expenses per Mile of Main.....	537

XV. APPENDIX B: GLOSSARY 539

Table of Findings

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19
Finding II-1	In general the American Water/PAWC organization adequately supports current ratepayer and corporate objectives.27
Finding II-2	Organizational planning and development at American Water/PAWC is largely informal and could be improved.....27
Finding II-3	Management communications and control are adequate.28
Finding II-4	Administrative procedures and controls are appropriate.28
Finding II-5	American Water and PAWC lack a formal, systematic strategic-planning process.29
Finding II-6	American Water’s external relations function has been recently strengthened and is well positioned to support corporate objectives and regional/state efforts; however, the role of the Southeast Regional Director should be better defined.34
Finding II-7	American Water has recently developed a number of strategic external-relations programs; however, these programs have not yet been rolled out, and there are no regional or state-specific operational plans.....35
Finding II-8	AWWSC Human Resources has no direct accountability to PAWC.44
Finding II-9	PAWC does not have a service level agreement with AWWSC that specifies the level of HR support to be provided.....45
Finding II-10	Human Resources does not have standard metrics and does not make regular reports of its contribution.45
Finding II-11	Data integrity problems in the JD Edwards human resources information system makes for additional manual effort, creates opportunity for errors, and limits PAWC HR’s ability to measure its effectiveness.46
Finding II-12	American Water Works Service Company and regional/local HR have extremely limited training and development capacity to support of the strategic HR needs of PAWC.....46
Finding II-13	Pennsylvania training and development is focused on technical training and has not aligned to the broader strategic HR needs of PAWC.....47
Finding II-14	PAWC’s Human Resources and executive management have recognized the loss of human capital and the potential for a large number of retirements in coming years but has not developed a plan to respond to these needs.49
Finding II-15	PAWC does not have effective position control.....51

**Table of Findings
 (continued)**

Finding II-16	A lack of reliable information on employee capabilities (bench strength) hinders PAWC’s ability to respond effectively to current demands and plan for future growth.	52
Finding II-17	PAWC has not met its goal to reduce time-to-hire by 10%.....	53
Finding II-18	PAWC uses a time and attendance system with limited functionality that was developed in-house	53
Finding II-19	American Water/PAWC does not have a formal management development process.	54
Finding II-20	PAWC does not have a learning management system.....	55
III. FINANCIAL MANAGEMENT		59
Finding III-1	PAWC cash is managed in an efficient and cost-effective manner by corporate cash management functions.....	82
Finding III-2	Long-term debt is obtained at favorable rates.	83
Finding III-3	The consolidated managerial reporting, accounting, and control functions serving PAWC are efficient and closely monitored.....	83
Finding III-4	American Water’s general ledger system is not current and has not recently been updated to add needed functionality.	83
Finding III-5	The AWWSC’s Shared Services Center provides an extensive amount of employee training.	84
Finding III-6	The function of reporting actual financial results compared to budgets is managed and controlled effectively.	84
Finding III-7	Several key PAWC financial statistics have been deteriorating in recent years. .	85
Finding III-8	The Internal Audit Department is not sufficiently isolated from the Financial Management organization.	86
Finding III-9	The number of internal audits conducted has declined significantly during the past five years.....	86
IV. SUPPORT SERVICES.....		91
Finding IV-1	American Water’s long-range IT planning activities have been on hold since SOX compliance efforts began in 2006 following RWE’s December 2005 decision to divest of American Water.	118
Finding IV-2	ITS has made little progress in recent years with regard to addressing the technology needs of American Water’s business units, including those impacting PAWC operations.	118
Finding IV-3	The PMO has developed project-management documentation that is extensive in scope; however, materials to help employees effectively apply these standards has not yet been included as part of such documentation.	120

Table of Findings (continued)

Finding IV-4	The ITS organization is not placing adequate emphasis on certain staff's achievement and maintenance of project-management certifications.....121	121
Finding IV-5	The ability of the Client Services & Support group to electronically deploy software upgrades to workstations is hindered by American Water's network, which results in additional costs to ITS customers, such as PAWC.121	121
Finding IV-6	ITS management is not appropriately focusing its employee-training and development efforts through the use of a skills inventory for individual employees.121	121
Finding IV-7	The ITS organization does not have sufficient client-satisfaction information and data with which to evaluate its ability to serve AWWSC or PAWC departments.....122	122
Finding IV-8	The ITS organization has not developed service-level agreements with its client groups.....122	122
Finding IV-9	ITS' performance versus its targets show varying, and in some cases, poor results.123	123
Finding IV-10	Although ITS backup/restoration and security/protection plans and activities are generally reasonable, its disaster recovery plan is inadequate and appropriate testing activities are not being performed, despite its recent Chapter 101 self-certification reports that PAWC has met all required elements.124	124
Finding IV-11	The IT security function is not part of the ITS organization, which is atypical of industry practices.....126	126
Finding IV-12	The data center space has recently been expanded in large part as a result of American Water not effectively performing a consolidation of its servers.126	126
Finding IV-13	The current American Water employee vehicle assignment policy does not include a provision for an annual review of the requirements of employees for vehicles and, therefore, it does not address changes in employee job titles and positions.....148	148
Finding IV-14	A regularly scheduled physical inventory of vehicles leased from ARI is not performed.....149	149
Finding IV-15	There is an exception report for multiple fuel transactions in one day but not for apparently excessive fuel usage over a period of time (i.e., weekly or monthly).....149	149
Finding IV-16	Neither the ARI contract nor the resultant invoices have been audited by the AWWSC Internal Auditing group.149	149
Finding IV-17	Continued use of the two PAWC mechanics in the Pittsburgh District goes against the recommended policies of American Water and may not be cost-effective.149	149
Finding IV-18	The improper reporting of taxable benefits relating to employer-provided vehicles that was identified in the internal audit conducted in November 2005 has yet to be addressed in a satisfactory manner.150	150

Table of Findings (continued)

Finding IV-19	There are no standardized reports or data collected on the status of state inspections for vehicles in the PAWC fleet.....	150
Finding IV-20	There is no integrated Facilities and Property Management group at either American Water or at PAWC.....	157
Finding IV-21	There are no formal policies and procedures to guide the performance of the facilities and properties management function at PAWC or at American Water.....	157
Finding IV-22	The current procurement module of the ERP system is 12 years old and lacks significant amounts of capability that would be expected from a state-of-the-art current application.....	172
Finding IV-23	The use of preferred suppliers under national contracts is not mandated and likely is having a negative financial implications for the operating companies as a result of not maximizing the use of suppliers that have been subjected to a bidding and negotiation process.....	173
Finding IV-24	The lack of PAWC-specific data that is collected in relation to the procurement function renders it difficult for the PAWC management to evaluate and assess the effectiveness of that function's performance at PAWC.	174
Finding IV-25	Based on the numerous inventory procedures and systems deficiencies that were identified during the course of this audit, it appears that the inventory data and calculations that are produced by PAWC are inaccurate to some extent.	183
Finding IV-26	The inventory management computer systems that are currently in use are very out of date and the data that is collected is by no means sufficient to maintain proper control of inventory.	187
Finding IV-27	There is no centralization or leadership in the materials management function at American Water operating companies, including PAWC.	188
Finding IV-28	No standardized, comprehensive inventory-management policies and procedures exist for either American Water in general or for PAWC.	189
Finding IV-29	Insufficient inventory-skills training is provided to storeroom personnel.....	189
Finding IV-30	There is currently no standardization of part numbers across the PAWC storerooms or American Water operating companies in general, although this situation is being reviewed at the current time.....	189
Finding IV-31	There are no inventory grid systems in the PAWC storerooms, making the location of parts difficult and time consuming for those who are not familiar with the inventory layout at that particular storeroom.	190

**Table of Findings
(continued)**

Finding IV-32 There is no standardized, formal cycle-counting program in place.....190
Finding IV-33 PAWC does not have a mechanism to identify and report on material that is
obsolete or held in excessive quantities.190
Finding IV-34 Maintenance items are not inventoried and therefore can only be reordered
based on visual inspections.....191
Finding IV-35 The strategic parts inventory could be reduced for PAWC by consolidating
them into a few strategic inventory locations.191
Finding IV-36 Inventory maintenance and control is inconsistent across the PAWC
storerooms and the control of inventory was observed to cover the range from
inadequate to sufficient.191
Finding IV-37 The vast majority of the storerooms that were visited by
Schumaker & Company consultants did not have a computer terminal in the
storeroom area; rather, data entry and lookup were the responsibility of an
administrative person in the each of the service center front offices.....192
Finding IV-38 Under the current procedures, rolling stock (that being the inventory that is
carried on the field operations trucks) is tracked as part of the on-hand balance
of parts.192
Finding IV-39 A formal enterprise risk management program was established in 2003 when
RWE acquired American Water, but this program must now evolve as
American Water (and therefore PAWC) changes it focus to SEC/SOX
compliance.....210
Finding IV-40 When looking to outside legal organizations for help in addressing PAWC’s
legal needs, the Southeast Region Legal organization does not rely on
competitive bidding to develop a master list of pre-qualified legal firms.219
Finding IV-41 The AWWSC Legal organization has not evaluated the use of standard legal
management software across its various entities; therefore, the Southeast
Region (and ultimately PAWC) may not be benefiting from processes
associated with the use of a “best in class” system.220

V. WATER OPERATIONS..... 223

Finding V-1 PAWC production facilities are well operated.....228
Finding V-2 PAWC uses state-of-the-art, computerized supervisor control and data
acquisition (SCADA) systems to continuously monitor critical pumping and
treatment processes, as well as distribution system hydraulic conditions, at most
of its treatment plants and associated remote facilities.....236
Finding V-3 Best practices are not necessarily shared or implemented by the various water
districts.238

Table of Findings (continued)

Finding V-4	Although PAWC has built a good SCADA system for operating the plants and distribution network, its implementation of technology for managing the day-to-day monitoring and reporting on various aspects of the business processes within network needs significant improvement.	238
Finding V-5	The number of reported leaks/breaks by water district indicates that certain water districts are up to 10 times worse than others.	239
Finding V-6	Maintenance and capital budgets do not appear to consistently take an analysis of leak/break historical data into consideration shown in <i>Exhibit V-24</i>	243
Finding V-7	PAWC has implemented a good proactive production equipment maintenance program.	249
Finding V-8	Although PAWC has implemented a good proactive production equipment maintenance program, it has failed to implement a computerized maintenance management program at the production facilities.	252
Finding V-9	The Engineering Department generally conducts formal, comprehensive planning studies on a periodic basis for each water district.	254
Finding V-10	With the most recent budgeting process (2008 Budget Year), the Engineering Department has implemented a more analytical main replacement decision-making methodology.	256

**Table of Findings
(continued)**

Volume II

VI. CORPORATE GOVERNANCE..... XIII

Finding VI-1 The review, selection, and compensation of American Water’s Board are appropriate.258

Finding VI-2 American Water has adopted a substantive Code of Ethics document; however, the Code does not explicitly apply to all contractors and vendors who do business with American Water.260

Finding VI-3 Board compensation appears to be appropriate; however, American Water has not recently reviewed Board compensation and has delayed the recruitment of new independent directors.261

Finding VI-4 The American Water Board maintains adequate oversight and is taking further steps to increase its role in ensuring proper controls.262

Finding VI-5 American Water is taking steps to strengthen oversight through the Audit and Corporate Governance Committees.263

Finding VI-6 The Board exercises appropriate control over the external auditors; however, a process has not been established to ensure that cost comparisons for external audit services are performed on a periodic basis.264

Finding VI-7 The Internal Audit Department has adequate interaction with the American Water Board Audit Committee, but its reporting relationship to the American Water Board Audit Committee and American Water management is unclear.265

Finding VI-8 American Water is taking substantive steps to comply with SOX/NYSE requirements for internal controls.265

VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS 269

Finding VII-1 PAWC’s culture under RWE could best be defined as *insular*.274

Finding VII-2 PAWC, like American Water, operates various systems with substantial differences in how each entity is run with respect to certain fundamental business processes.274

Finding VII-3 Divestiture from RWE presents a significant opportunity to refocus American Water and to strengthen PAWC by leveraging best practices across the enterprise.275

Finding VII-4 PAWC has not surveyed its employees since 2003 and has no current data on employee attitudes, management practices, and other key elements of corporate culture.276

**Table of Findings
 (continued)**

Finding VII-5	PAWC does not have a management development process.....	276
Finding VII-6	Human Resources does not have the capacity to support the change management requirements of PAWC.....	278
Finding VII-7	PAWC does not have any enterprise-wide improvement initiatives that fully engage employees at all levels.	279
Finding VII-8	PAWC has limited management succession planning and workforce management capability, thereby making it difficult to assess the adequacy of staffing levels.....	279
Finding VII-9	American Water’s ethics policies and practices have been substantially communicated to all employees.	279
Finding VII-10	Ethics allegations are properly recorded and promptly investigated.	281
VIII. AFFILIATE INTERESTS.....		283
Finding VIII-1	Cost allocation documentation was disjointed and poorly organized, which required Schumaker & Company auditors to meet with multiple individuals and to review multiple documents in order to understand how affiliate relationships and cost allocations are handled at American Water.....	304
Finding VIII-2	The cost-allocation methodologies impacting PAWC are generally reasonable, although the use of number of customers for allocating AWWSC costs among regulated utilities is essentially a simplification mechanism that is not based on cost causative factors.....	305
Finding VIII-3	Although American Water engaged an independent consultant in 2006 and 2007 to perform cost-to-market comparisons for AWWSC charges to three of its regulated utilities, it does not perform these comparisons on a regular basis.	307
Finding VIII-4	The AWWSC/PAWC affiliate agreement is not up to date and a new version has not been provided to the PaPUC for review and approval.	309
Finding VIII-5	Ongoing training updates to AWWSC employees on timekeeping procedures, which could potentially impact affiliate charges, is not being provided.....	310
Finding VIII-6	Affiliate charges from RWE/Thames have been appropriately handled.....	310
Finding VIII-7	Most activities undertaken for monitoring and ensuring the appropriate implementation of cost-allocation processes are reasonable; however, internal audits of affiliate transactions and the systems that are used for creating affiliate charges are not regularly performed.	311

**Table of Findings
(continued)**

IX. DIVERSITY/EEO 315

Finding IX-1 The American Water/PAWC diversity program is primarily policy and affirmative-action-compliance oriented.327

Finding IX-2 Employee location data used for EEO-1 reporting from American Water’s JD Edwards human resources information system (HRIS) are often incorrect, thereby causing the company to conduct a manual verification process.329

Finding IX-3 PAWC and American Water do not have standard processes and use inconsistent methods for preparing affirmative action utilization and EEO-1 reports, which leads to reporting errors.329

Finding IX-4 No senior executive or officer of American Water reviews and approves the EEO-1 report prior to submittal to the federal government.331

Finding IX-5 American Water has developed a comprehensive diversity plan but has failed to effectively implement it.331

Finding IX-6 PAWC has a fully compliant affirmative action plan, but could be more aggressive in setting affirmative action hiring goals and attracting women and minority job candidates.335

Finding IX-7 The supplier diversity program is informally conducted.337

Finding IX-8 Over the 2003 to 2007 time period, PAWC has neither consistently submitted or fully complied with the filing guideline requirements for diversity reports submitted to the PaPUC.338

X. CUSTOMER SERVICE..... 343

Finding X-1 American Water call centers have failed to meet industry standard service levels. 370

Finding X-2 Customer service representatives are taking longer to complete calls and follow-up work.373

Finding X-3 The Pensacola CSC CSR turnover rate exceeds industry standards.374

Finding X-4 American Water has made no effort and has no plans to implement initiatives aimed at reducing employee turnover.375

Finding X-5 More than one in four newly hired CSRs leave prior to completing all initial training and close monitoring.376

Finding X-6 After several years of a decreasing number of CSRs, American Water now plans to hire additional CSRs.377

Finding X-7 Despite the company’s unfavorable service levels, PAWC customers appear to be generally satisfied with the contact they have with the company.377

**Table of Findings
(continued)**

Finding X-8	The Help Queue has proven effective in improving consistency of answers to customers and allowing supervisors to focus more of their time on CSR coaching and development.....	378
Finding X-9	Neither American Water nor PAWC have a customer accessible website to provide basic customer self assistance.....	378
Finding X-10	Neither American Water nor PAWC supports electronic billing at this time.	378
Finding X-11	American Water has very limited customer self-serve options available on its IVR system.	378
Finding X-12	The trends in various types of complaints (informal, mediation, executive, and formal) are generally increasing.	379
Finding X-13	The number of disputes has increased significantly since 2004.	383
Finding X-14	There is a significant amount of over estimating in the billing process.....	384
Finding X-15	A business case has been developed for an upgrade to the Advantex software used in FRCC operations.	385
XI. OPERATIONAL PERFORMANCE		391
Finding XI-1	PAWC is unable to provide a complete and extensive third-party line-hit damage history for the last five years because of lack of good business processes.....	392
Finding XI-2	PAWC’s recently developed third party line hit standardized reporting form has inherent deficiencies and is not integrated with other key business processes or systems to effectively manage this function.....	393
Finding XI-3	The latest Chapter 101 self-certifications indicate that PAWC has met all required elements.....	396
Finding XI-4	PAWC maintains a physical security plan for each of its operating plant facilities.	396
Finding XI-5	Business-continuity planning is less complete than our experience with other utilities.	396
Finding XI-6	Emergency-preparedness planning has been tested via tabletop exercises.....	397
Finding XI-7	The systems used for maintaining the operations and maintenance plans for each facility are labor intensive, subject to potential inaccuracies, and not as clearly defined as we have seen elsewhere in the utility industry.....	398
Finding XI-8	Unaccounted-for-water on a system-wide basis has improved as reported to the PaPUC since 2004; however, individual districts are experiencing high levels of unaccounted-for-water.	403

Table of Findings (continued)

Finding XI-9	PAWC has developed a fairly extensive spreadsheet for reporting and monitoring non-revenue water and unaccounted-for water.	405
Finding XI-10	The linked Excel spreadsheets are a good prototype for building an improved NRW and UFW reporting and monitoring program, but the database platform would be a better technology upon which to build the tool.	405
Finding XI-11	PAWC has implemented an allowance for unavoidable real losses using an AWWA methodology (still under development) in reporting its unaccounted-for-water numbers to the PaPUC on an annual basis.	406
Finding XI-12	PAWC was unable to provide an engineering justification for the 100 psi pressure used in its calculation at this time.	409
Finding XI-13	PAWC is in the process of metering water usage within various parts of a water district as another indicator of possible leakage.	410
Finding XI-14	The collection of complete operating statistical data on production and network operations is complicated by a lack of standard data-collection and reporting systems.	415
Finding XI-15	Production field force staffing levels appear to be inadequate as overtime hours are increasing.	415
Finding XI-16	Valve operations and maintenance programs are not completely implemented across the PAWC distribution network.	419

Table of Findings (continued)

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Finding XII-1	There is no common leak tracking system used throughout PAWC.	423
Finding XII-2	None of the current Access databases are scalable for a state-wide or enterprise-wide application.	424
Finding XII-3	Distribution operations personnel are very knowledgeable of their current leak tracking database.....	424
Finding XII-4	PAWC’s current plans are to develop the leak tracking database as a part of CMMS; however, several key requirements may have been overlooked.	424
Finding XII-5	The main replacement prioritization process that PAWC implemented in 2008 is a reasonable algorithm for prioritization and is similar to methods used in the natural gas industry; however, it has not been developed to the point of having automatic interfaces to PAWC performance reporting systems.	425
Finding XII-6	The CMMS being implemented is a commercial product that allows significant user customization.	426
Finding XII-7	Valve operation tracking and reporting and hydrant flushing tracking and reporting are being appropriately integrated into CMMS.....	431
Finding XII-8	Based on Schumaker & Company’s review, it is not clear that CMMS will provide the work management capabilities needed for managing PAWC’s distribution workforce.	431
Finding XII-9	The parts and inventory portion of CMMS is not being fully implemented at this time.	432
Finding XII-10	Incorporating the leak tracking and reporting system into CMMS may not be the best approach.....	433
Finding XII-11	It may be more appropriate to integrate the leak tracking and reporting application with an enterprise GIS instead of CMMS.	434
Finding XII-12	There are currently no plans to integrate the NRW tracking and reporting with the leak tracking and reporting databases nor are there plans to integrate pavement tracking and reporting, permit tracking and reporting, or hit facilities tracking and reporting with a leak tracking and reporting system.	434

Table of Findings (continued)

XIII. PHASE III HUMAN RESOURCES	447
Finding XIII-1 The models and plans developed as part of this Phase III project provide clear direction for HR’s efforts to assist PAWC management in meeting its strategic priorities. Substantial work remains to implement these projects.	458
Finding XIII-2 PAWC HR does not have all the resources necessary to implement the projects defined in the Phase III effort.....	458
XIV. APPENDIX A: DATA AND STATISTICS	461
XV. APPENDIX B: GLOSSARY	539

Table of Recommendations

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1	
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19	
Recommendation II-1	Develop a systematic organizational-planning and development process. (Refer to Finding II-2.)	29
Recommendation II-2	Develop a formal and integrated strategic-planning process. (Refer to Finding II-5.)	30
Recommendation II-3	Develop a regional/state operational external-communications plan. (Refer to Finding II-6 and Finding II-7.)	36
Recommendation II-4	Strengthen HR accountability to the PAWC President. (Refer to Finding II-8.)	55
Recommendation II-5	Assess PAWC's HR needs and staff accordingly. (Refer to Finding II-8 and Finding II-10.)	55
Recommendation II-6	Develop an HR service level agreement with AWWSC. (Refer to Finding II-9.)	56
Recommendation II-7	Develop a Pennsylvania-specific HR scorecard. (Refer to Finding II-10.)	56
Recommendation II-8	Align HR services to the strategic priorities of PAWC. (Refer to Finding II-8 and Finding II-12.)	56
Recommendation II-9	Consider outsourcing technical training. (Refer to Finding II-13.)	56
Recommendation II-10	Implement a learning management system. (Refer to Finding II-20.)	57
Recommendation II-11	Conduct comprehensive workforce planning for all levels of the organization and provide necessary resources for implementation. (Refer to Finding II-12 and Exhibit II-12.)	57
Recommendation II-12	Complete the Organizational Capability Review for all levels of PAWC management. (Refer to Finding II-16.)	57
Recommendation II-13	Implement a leadership-development program and provide sufficient resources to sustain. (Refer to Finding II-19 .)	58
Recommendation II-14	Implement position control. (Refer to Finding II-15)	58
Recommendation II-15	Evaluate the costs and benefits associated with a more sophisticated time and attendance system. (Refer to Finding II-18.)	58

Table of Recommendations (continued)

Recommendation II-16 Analyze recruitment and selection process, implement process improvements, measure performance, and provide additional resources if necessary. (Refer to Finding II-16 and Finding II-17.) .58

III. FINANCIAL MANAGEMENT 59

Recommendation III-1 Research and develop plans for upgrading or replacing the current ERP system. (Refer to Finding III-4.) 88

Recommendation III-2 Investigate why key PAWC financial statistics have been deteriorating, develop and implement a plan for improving PAWC's financial health as appropriate. (Refer to Finding III-7.) 88

Recommendation III-3 Assess the need for internal audits of American-Water-regulated utility operations and develop and implement plans to meet the internal audit requirements. (Refer to Finding III-9.) 88

IV. SUPPORT SERVICES 91

Recommendation IV-1 Expedite efforts to develop a long-range IT plan, and subsequently perform yearly review and update activities. (Refer to Finding IV-1 and Finding IV-2.) 127

Recommendation IV-2 Update ITS documentation as part of an ongoing program to include all aspects of a well-managed technology organization, including (but not limited to) operational, governance, and project management/QA functions. (Refer to Finding IV-2 and Finding IV-3.) 128

Recommendation IV-3 Address organizational issues involving vacancy of director positions, the appropriateness of staffing size of the various ITS groups, and the reporting location of the information systems' security function within American Water's organization structure. (Refer to Finding IV-2 and Finding IV-11.) 128

Recommendation IV-4 Expand American Water's commitment to project-management principles by requiring all ITS employees who are actively involved in project work to achieve PMP certification and by closely monitoring related activities to ensure that timely progress is made. (Refer to Finding IV-4.) 129

Recommendation IV-5 Enhance the American Water network to enable electronic deployment of software updates to PAWC employees. (Refer to Finding IV-5.) 129

Recommendation IV-6 Improve training and development efforts for ITS employees. (Refer to Finding IV-6) 129

Table of Recommendations (continued)

Recommendation IV-7	Develop a plan to regularly conduct ITS client-satisfaction surveys and implement the first survey in a timely manner. (Refer to Finding IV-7.)	130
Recommendation IV-8	Establish ITS service-level agreements with major client groups. (Refer to Finding IV-8.)	130
Recommendation IV-9	Implement a relevant ITS scorecard. (Refer to Finding IV-9.)	130
Recommendation IV-10	Update the ITS disaster recovery plan and begin routinely reviewing and testing disaster-recovery plans and documenting results. (Refer to Finding IV-10.)	131
Recommendation IV-11	Perform a server consolidation study and implement study recommendations. (Refer to Finding IV-12.)	132
Recommendation IV-12	Initiate a formal procedure requiring an annual review of the requirements for each employee to have an assigned vehicle based on his or her current job assignment. (Refer to Finding IV-2.)	150
Recommendation IV-13	Develop a formal procedure that details a requirement for the performance of a regularly scheduled annual physical inventory of the vehicles that are leased from ARI. (Refer to Finding IV-14.) ..	150
Recommendation IV-14	Develop an exception report that would clearly identify excessive fuel usage by specific vehicles or employees on a weekly or monthly basis. (Refer to Finding IV-15.)	151
Recommendation IV-15	Perform an internal audit of the ARI contract and the resultant invoices using the AWWSC Internal Auditing group. (Refer to Finding IV-16.)	151
Recommendation IV-16	Perform a cost/benefit analysis to determine whether the (continued) use of the two PAWC mechanics in the Pittsburgh District is cost effective. (Refer to Finding IV-17.)	151
Recommendation IV-17	Perform a reassessment of the PAWC policy relating to the use of employer-provided vehicles that are used for personal purposes in order to be in compliance with IRS regulations. (Refer to Finding IV-18.)	151
Recommendation IV-18	Develop a computerized tracking system that is capable of monitoring the completion of the annual state-vehicle inspections for the individual vehicles in compliance with the established schedule. (Refer to Finding IV-19.)	152
Recommendation IV-19	Establish a single point of responsibility for the facilities and properties management function at PAWC. (Refer to Finding IV-2.)	157
Recommendation IV-20	Develop a set of formal policies and procedures to guide the performance of the facilities and properties management function at PAWC and American Water. (Refer to Finding IV-14.)	158

Table of Recommendations (continued)

Recommendation IV-21	Initiate a software identification, selection, and evaluation process for a new integrated procurement/materials management application. (Refer to Finding IV-22)	174
Recommendation IV-22	Evaluate in detail the impacts of not mandating the use of national contracts with preferred vendors by the state-operating companies, especially in terms of the financial impacts, and determine whether mandating this practice would be beneficial to the operating companies. (Refer to Finding 0-2.).....	174
Recommendation IV-23	Initiate a study to determine how best to present the operational and performance data on a state company basis and to evaluate the potential benefits of such reporting changes. (Refer to Finding IV-24.)	175
Recommendation IV-24	Perform an internal audit of the inventory data that is produced and used by PAWC to determine the accuracy thereof. (Refer to Finding IV-25.)	193
Recommendation IV-25	Initiate an ERP materials management module evaluation and selection process with the intention of identifying a fully integrated ERP application that would serve the needs of the PAWC materials management function. (Refer to Finding IV-26.)	193
Recommendation IV-26	Establish a central point of management and responsibility for the materials management function at both AWWSC and PAWC. (Refer to Finding 0-6.).....	194
Recommendation IV-27	Develop a comprehensive and detailed materials management procedures manual that is specific to PAWC. (Refer to Finding IV-14.)	194
Recommendation IV-28	Establish a formalized training program at PAWC for the personnel who have been designated as being responsible for the materials management function at the various storerooms. (Refer to Finding IV-29.)	195
Recommendation IV-29	Adopt and expeditiously implement at PAWC the standardized part-number format that is being developed by the Part Number Standardization Committee. (Refer to Finding IV-30.).....	195
Recommendation IV-30	Design and implement a standardized inventory-grid location system at all PAWC storerooms. (Refer to Finding IV-31.).....	195
Recommendation IV-31	Develop and implement a standardized procedure for performing cycle counting that is to be used at all storerooms. (Refer to Finding IV-32.)	196
Recommendation IV-32	Develop an inventory management plan that addresses how to identify and handle obsolete and excess material. (Refer to Finding IV-33.)	196

Table of Recommendations (continued)

Recommendation IV-33	Incorporate maintenance items into the current materials management application to gain better inventory control over these items. (Refer to Finding IV-34.).....	196
Recommendation IV-34	Establish a system of a few centralized storerooms that are to be used for strategic parts storage. (Refer to Finding IV-35.)	197
Recommendation IV-35	Implement a program at PAWC to standardize the inventory maintenance and control procedures across the PAWC storerooms. (Refer to Finding 0-15.).....	197
Recommendation IV-36	Install computer terminals in secure locations at all of the PAWC storerooms. (Refer to Finding IV-37.).....	197
Recommendation IV-37	Develop and implement a procedural modification that stipulates that material is decremented from the inventory at the time of issue from the storeroom, not at the time that it is used in the field. (Refer to Finding IV-38.)	198
Recommendation IV-38	Develop a formal implementation plan for changing the focus of the ERM process to include SEC/SOX compliance. (Refer to Finding IV-2.)	212
Recommendation IV-39	Establish a formal mechanism for developing a pre-qualified list of external legal firms by periodically reviewing proposals from potential candidates. (Refer to Finding IV-2.)	221
Recommendation IV-40	Perform a formal cost/benefit analysis regarding standardization of legal management software throughout the American Water system. (Refer to Finding IV-14.)	221

V. WATER OPERATIONS 223

Recommendation V-1	Aggressively pursue the identification and implementation of technology-based best practices among the water districts. (Refer to Finding V-4 and Finding V-3.).....	246
Recommendation V-2	Develop a business process for addressing aggressive identification of the most beneficial main segments for replacement based on an expectation of potential leak impact. (Refer to Finding V-4, Finding V-5, and Finding V-6.).....	247
Recommendation V-3	Implement a computerized maintenance management system in conjunction with the proactive production equipment maintenance program. (Refer to Finding V-8.).....	252
Recommendation V-4	Continue to develop a risk-assessment-based approach for identifying main replacement projects. (Refer to Finding V-9.).....	257
Recommendation V-5	Continue to periodically perform CPS studies. (Refer to Finding V-9.).....	257

**Table of Recommendations
(continued)**

Volume II

VI. CORPORATE GOVERNANCE..... 255

Recommendation VI-1 Require contractors, vendors, and others doing business with American Water to conduct themselves ethically when dealing with American Water entities. (Refer to Finding VI-2.).....267

Recommendation VI-2 Expand the American Water Board in anticipation of going public and review Board compensation as soon as possible. (Refer to Finding VI-3.)267

Recommendation VI-3 Implement a process to periodically perform cost comparisons for external audit services. (Refer to Finding VI-6.)268

Recommendation VI-4 Modify the Internal Audit Department reporting structure so that it no longer administratively reports to the American Water CFO. (Refer to Finding VI-7 and Finding III-8.)268

VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS269

Recommendation VII-1 Expedite efforts to define and support a high-performing organizational culture. (Refer to Finding VII-1, Finding VII-2, and Finding VII-3.)281

Recommendation VII-2 Implement an employee survey process with appropriate feedback and action-planning components. (Refer to Finding VII-4.)282

Recommendation VII-3 Implement a formal management development process. (Refer to Finding VII-5.)282

Recommendation VII-4 Fill open Organization Development positions in American Water and assess the need for additional change management resources for PAWC. (Refer to Finding VII-5, Finding VII-6, and Finding VII-7.)282

Recommendation VII-5 Implement workforce management processes at PAWC. (Refer to Finding VII-8.)282

VIII. AFFILIATE INTERESTS 283

Recommendation VIII-1 Develop formal, comprehensive documentation for affiliate relationships and cost allocations, and assign the responsibility for affiliate transactions to the appropriate manager. (Refer to Finding VIII-1.).....312

Table of Recommendations (continued)

Recommendation VIII-2	Perform a detailed analysis to verify that the use of the number of customers for allocating AWWSC costs among regulated utilities is reasonable and reasonably approximates the use of cost-causative factors; subsequently make modifications, as appropriate. (Refer to Finding VIII-2.).....	312
Recommendation VIII-3	Regularly evaluate the cost of services provided to PAWC by its affiliates so as to verify that PAWC ratepayers are not being harmed by charging these services at cost rather than market. (Refer to Finding VIII-3.).....	313
Recommendation VIII-4	Update the AWWSC/PAWC affiliate agreement, as necessary, and submit it to the PaPUC for review and approval. (Refer to Finding VIII-4.).....	313
Recommendation VIII-5	Provide ongoing training updates to AWWSC employees on proper use of billing numbers for charging affiliates when reporting time. (Refer to Finding VIII-5.).....	313
Recommendation VIII-6	Regularly conduct internal audits of affiliate transactions and associated cost allocations. (Refer to Finding VIII-7.).....	314
 IX. DIVERSITY/EEO.....		315
Recommendation IX-1	Update the diversity action plan, provide resources, and implement the plan in a timely manner and give consideration to a Pennsylvania-specific initiative. (Refer to Finding IX-1 and Finding IX-5.).....	339
Recommendation IX-2	Complete efforts to assure data integrity in the JD Edwards human resources information system. (Refer to Finding IX-2.).....	339
Recommendation IX-3	Develop and implement a standard data-verification process for EEO-1 reporting. (Refer to Finding IX-3.).....	340
Recommendation IX-4	Require the AWWSC Human Resources Vice President to review and approve EEO-1 reports prior to submission. (Refer to Finding IX-4.).....	340
Recommendation IX-5	Define, document, and implement more aggressive hiring plans for women and minorities. (Refer to Finding IX-6.).....	340
Recommendation IX-6	Formalize the supplier diversity program and explore the use of spend targets in the Supply Chain performance objectives. (Refer to Finding IX-7.).....	341
Recommendation IX-7	Submit comprehensive diversity reports to the PaPUC annually. (Refer to Finding IX-8.).....	341

Table of Recommendations (continued)

X. CUSTOMER SERVICE.....		343
Recommendation X-1	Invest in new customer interfacing technology, including IVR, electronic billing, and web self-service capabilities. (Refer to Finding X-1, Finding X-2, Finding X-6, Finding X-7, Finding X-9, Finding X-10, and Finding X-11)	386
Recommendation X-2	Analyze employee turnover at the Pensacola Call Center and develop strategies to reduce turnover. (Refer Finding X-3 and Finding X-4)	386
Recommendation X-3	Strengthen recruitment, selection, and training practices to improve the quality of new CSR hires. (Refer to Finding X-1, Finding X-2, Finding X-3, Finding X-4, Finding X-5, Finding X-6, Finding X-7, and Finding X-8).....	386
Recommendation X-4	Develop a Pennsylvania-specific customer service scorecard and regularly report associated metrics to the PAWC President. (Refer to Finding X-1, Finding X-2, and Finding X-7).....	387
Recommendation X-5	Perform an analysis of the increase in complaint trends that PAWC is currently experiencing. (Refer to Finding X-12)	387
Recommendation X-6	Perform an analysis of the growth in PAWC disputes. (Refer to Finding X-13).....	387
Recommendation X-7	Initiate actions to lower the number of over estimates in meter reading. (Refer to Finding X-14)	387
Recommendation X-8	Complete the upgrade project for Advantex. (Refer to Finding X-15)	388
XI. OPERATIONAL PERFORMANCE.....		391
Recommendation XI-1	Develop a comprehensive damage prevention program. (Refer to Finding XI-1 and Finding XI-2.)	394
Recommendation XI-2	Improve business-continuity planning. (Refer to Finding XI-4). ...	399
Recommendation XI-3	Perform a review and incorporate better technologies for preparing, distributing, and updating the emergency and the operations and maintenance manuals including the intranet site. (Refer to Finding XI-7.).....	400
Recommendation XI-4	Continue to strengthen the unaccounted-for-water program. (Refer to Finding XI-8).....	412
Recommendation XI-5	Incorporate the methodologies in the currently evolving UFW spreadsheets into a more appropriate technology, specifically a backend database with a client server or web interface. (Refer to Finding XI-10.)	412

Table of Recommendations (continued)

Recommendation XI-6	Refine the reporting of unaccounted-for water to the PaPUC. (Refer to Finding XI-11 and Finding XI-12.)	412
Recommendation XI-7	Investigate the reasons for the increase in overtime that has occurred in the Production Department. (Refer to Finding XI-15)	420
Recommendation XI-8	Implement standard systems for monitoring and reporting key statistical information in network operations. (Refer to Finding XI-1, Finding XI-14, and Finding XI-16.)	421

**Table of Recommendations
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Recommendation XII-1	Structure the design of business applications for the distribution operations function as shown in Exhibit XII-5. (Refer to Finding XII-1, Finding XII-2, Finding XII-3, Finding XII-4, and Finding XII-10)434
Recommendation XII-2	Develop the leak tracking and reporting database as a part of a larger, long-term effort to integrate with other supporting performance reporting business processes such as NRW, permits, pavement tracking, and hit facilities. (Refer to Finding XII-10 and Finding XII-12).....436
Recommendation XII-3	Adopt the multi-organizational reporting structure (upon which CMMS is being implemented) across both the workforce management business process and supporting performance business processes. (Refer to Finding XII-6).....436
Recommendation XII-4	Engage AWWSC ITS to assist in the development of the supporting performance reporting process systems identified in Exhibit XII-5. (Refer to Finding XII-6).....436
Recommendation XII-5	Address the deficiencies in the current plans regarding the incorporation of leak tracking and reporting into the design of CMMS. (Refer to Finding XII-4).....437
Recommendation XII-6	Consider integration of leak tracking and reporting with the eventual GIS system versus integration with CMMS. (Refer to Finding XII-5, Finding XII-10, and Finding XII-11).....437
Recommendation XII-7	Ensure that the leak history is migrated into the eventual leak tracking and reporting database from all existing databases with good data. (Refer to Finding XII-4)437
Recommendation XII-8	Electronically connect leak and other records to the main prioritization model. (Refer to Finding XII-4)438

Table of Recommendations (continued)

Recommendation XII-9	Allocate infrastructure improvement budgets on a state-wide basis not just district by district. (Refer to Finding XII-5)	438
Recommendation XII-10	Consider the eventual implementation of the parts and inventory component of CMMS. (Refer to Finding XII-9).....	438
Recommendation XII-11	Recognize that a more robust distribution workforce management application may eventually be required to support future business processes. (Refer to Finding XII-8).....	439
XIII. PHASE III HUMAN RESOURCES		447
Recommendation XIII-1	Provide resources and perform timely implementation of the six deliverables developed as part of this Phase III project. (Refer to Finding XIII-1 and Finding XIII-2).....	459
XIV. APPENDIX A: DATA AND STATISTICS.....		461
XV. APPENDIX B: GLOSSARY		539

VI. Corporate Governance

This chapter addresses the corporate governance policies, practices, and procedures of American Water Works Company, Inc. (American Water) and Pennsylvania-American Water Company (PAWC). It will also review American Water's adherence to the Sarbanes-Oxley Act of 2002 (SOX). Specifically, this chapter will review the makeup and activities of the Board of Directors (Board) and its committees, Board interfaces with external and internal auditors, and actions to comply with the spirit of the requirements of both the Sarbanes-Oxley Act of 2002 and the New York Stock Exchange (NYSE).

A. Background & Perspective

Publicly traded companies have long been subject to financial and disclosure laws and regulations (e.g., The Securities Exchange Act of 1934 and the Foreign Corrupt Practices Act, which among other conditions required companies to have internal controls). The financial and business community at large has been active in strengthening corporate governance principles through efforts such as the National Commission on Fraudulent Financial Reporting (Treadway Commission/Report) and the General Accounting Office. In 1998, the NYSE and the National Association of Securities Dealers (NASD) sponsored a committee known as the Blue Ribbon Committee that developed recommendations to improve the effectiveness of audit committees. Subsequently, NYSE, NASD, and the Securities and Exchange Commission (SEC) revised listing standards and developed new rules concerning the corporate governance roles of audit committees.¹ Nevertheless, recent events surrounding several spectacular company collapses (e.g., Enron in 2001, and WorldCom and Global Crossing in 2002) and the allegations of misdeeds by corporate executives, independent auditors, and other market participants have undermined investor confidence in the U.S. financial markets. In response, Congress passed, and the President signed into law, the Sarbanes-Oxley (SOX) Act of 2002, which effected sweeping corporate disclosure and financial-reporting reform. This act directed the SEC to enact new rules to meet its intent. The SEC took and considered comments from interested parties and published the new rules in 2003.² The most applicable sections of SOX as they apply to large, publicly traded corporations involve the following:³

- ◆ Strengthening auditor independence
- ◆ Increasing the roles and responsibilities of the company auditing committees
- ◆ Requiring senior management to certify and otherwise be generally held responsible for the accuracy of financial statements
- ◆ Increasing the disclosure and transparency of financial information in quarterly and annual reports
- ◆ Enhancing company internal controls (to include the establishment of a code of ethics)



Although American Water is not publicly traded (and therefore not subject to SOX), the company has indicated that it intends to go public in the near future and is taking steps to become SOX compliant.⁴ Whether or not American Water becomes a public company, as it operates public utilities, it should incorporate appropriate corporate governance practices.⁵

The American Water Board of Directors is responsible for corporate governance for American Water.⁶ The American Water Board consists of seven members: the President and CEO of American Water (inside), three senior managers of RWE (inside), and three outside, independent directors.⁷ The American Water Board has three committees: Audit, Compensation, and Nominating/Corporate Governance.

The Audit Committee and Nominating/Corporate Governance Committee have three directors (two outside, independent directors; one inside director), while the Compensation Committee has four directors (three outside, independent directors; one inside director). The Compensation Committee and Nominating/Corporate Governance Committee were formed in September 2007.⁸

Corporate governance responsibilities lie primarily with the American Water Audit Committee and the American Water Nominating/Corporate Governance Committee.

The American Water Audit Committee is responsible for:⁹

- ◆ Representing and assisting the Board as a whole in overseeing the adequacy, effectiveness, quality, and integrity of American Water's internal controls, financial statements, compliance with regulatory and legal requirements, independent auditor's qualifications and independence, and internal audit performance
- ◆ Appointing, compensating, retaining, terminating, and overseeing American Water's independent auditor
- ◆ Promulgating American Water's Code of Ethics and overseeing its enforcement
- ◆ Ensuring SEC required reports are included in American Water's annual proxy statement or annual report

Although the Audit Committee charter states that Internal Auditing reports directly to the Audit Committee, American Water organization charts show the Vice President of Internal Auditing reporting directly to American Water's Senior Vice President (Finance) and Chief Financial Officer. American Water's Director of Internal Controls reports to the Controller, who in turn reports to the Senior Vice President (SVP) and Chief Financial Officer (CFO).¹⁰

The American Water Nominating/Corporate Governance Committee is responsible for:¹¹

- ◆ Identifying and evaluating potential members for the Board of Directors and recommending nominees to the full Board
- ◆ Developing and recommending to the Board of Directors corporate governance principles for

American Water, annually reviewing corporate governance guidelines, and recommending changes to the Board

- ◆ Recommending members to serve as Chair of the Board, committee chairs, and committee members to the full Board
- ◆ Overseeing an annual evaluation of the Board of Directors, committees of the Board of Directors, and executive management
- ◆ Reviewing the charters, composition, and performance of Board committees and recommending changes as appropriate
- ◆ Taking the leadership role in shaping corporate governance at American Water

The American Water Board delegates to the CEO the selection of directors for subsidiaries (which includes PAWC) or representatives serving on the Boards of any joint ventures. The subsidiary president must be consulted prior to naming subsidiary directors. Other governance responsibilities pertaining to PAWC are addressed by the PAWC Board as a whole.¹²

PAWC is required by its bylaws to have a Board of Directors. The PAWC Board of Directors is broadly responsible for the direction and oversight of the company's management, and control of PAWC, to the extent prescribed by statute.¹³ In practice, the PAWC Board provides more detailed oversight on PAWC specific issues (e.g. real estate matters, PAWC-specific financial matters, operational matters, customer service matters, state-specific regulatory and communication matters), and acts as a conduit to ensure that PAWC is complying and coordinating with American Water corporate direction (e.g. SOX compliance, internal audits, external audits, issues management)¹⁴ The American Water and PAWC boards are separate. Currently, the Chairman of the American Water Board also serves on the PAWC Board (and chairs PAWC's Board Audit Committee).

The PAWC Board has seven directors, three of whom are outside/ independent.¹⁵ The PAWC Board has two committees: the Executive Committee (three members, no independents) and the Audit Committee (three members, all outside/independent).¹⁶ Two of the PAWC Audit Committee members have immaterial financial/vendor relationships with PAWC, both of which have been fully disclosed.¹⁷ The Executive Committee exists to exercise the powers of the PAWC Board of Directors in managing PAWC's routine and ordinary business affairs during intervals between regularly scheduled meetings. This responsibility includes appointing PAWC officers, determining questions of general policy, and authorizing contracts involving real property of less than \$500,000 per transaction. Executive Committee actions are reported to and approved by the Board of Directors at the Board's next regularly scheduled meeting.¹⁸ The PAWC Audit Committee provides an open avenue of communication between internal auditors, American Water and PAWC management, and the Audit Committee of the American Water Board of Directors. American Water's external auditor meets annually, in executive session, with the PAWC Audit Committee.¹⁹ The Chairman of the PAWC Audit Committee also sits on the American Water Audit Committee.²⁰ The Chief Executive Officer (CEO) of American Water selects subsidiary Board members (in consultation with the subsidiary president).²¹ There are no guidelines restricting Board member service (e.g., retirement age, tenure).²² PAWC external Board members are



paid an annual retainer plus attendance fees. Internal Board members do not receive additional compensation for their Board participation.²³

The PAWC Audit Committee is responsible for:²⁴

- ◆ The adequacy and effectiveness of PAWC's system of internal controls
- ◆ The quality and integrity of PAWC's financial statements
- ◆ PAWC's compliance with legal and regulatory requirements
- ◆ The performance of PAWC's internal and external controls

The PAWC Board and its Audit Committee generally meet quarterly. The Executive Committee meets on an as-needed basis. In 2007, the PAWC Board and Audit Committee met three times.²⁵

American Water has an Internal Controls Group, which is led by a director who reports to the Vice President and Controller in the Finance Department. This group is responsible for developing and maintaining frameworks and processes to enhance internal controls, reporting on the design and effectiveness of internal controls, leading and supporting significant financial and operational compliance efforts, and providing a liaison with external auditors to support their assessment of internal controls. Documenting flow of transactions and significant control points in order to better determine where material misstatements could occur because of fraud or error is an important activity of this group. Besides the Director, there are two senior analysts, one devoted to Information Technology.²⁶

Over the past year, most of this group's work activities have been in support of enhancing internal controls in preparation to meet SOX requirements (Sections 302 and 404).²⁷ This significant effort (with assistance from outside consultants Ernst & Young) is almost complete.²⁸

B. Findings & Conclusions

Finding VI-1 The review, selection, and compensation of American Water's Board are appropriate.

American Water's Board consists of seven directors, of whom only three are outside (independent) directors. Of the other four (none of whom are independent), three of the directors work for American Water's owner, RWE, while the American Water President and CEO is the only inside company director. SOX requires that a majority of the Board's members be independent and that all members of the Audit Committee be independent. American Water is taking steps to comply with those requirements as discussed in the next paragraph. All directors have senior-level management experience in water company operations,²⁹ financial/banking,³⁰ legal,³¹ and government administration.³² The Board is well educated, with most members having advanced degrees and all Board members having educational backgrounds suitable to their responsibilities. At least four Board members (two of whom are independent) have extensive financial expertise. The three committees are composed, in the

majority, of independent directors, with two independent directors serving on two committees and one independent director serving on three committees.³³ The two independent directors on the Audit Committee have served on that committee for over four years.

American Water has indicated that the Board will be expanded by at least three more independent directors, bringing the total up to ten, once American Water goes public. If RWE maintains a percentage ownership after the public offering (e.g., 50%), it intends to maintain a relative portion of the number of directors (e.g. three directors). As its percentage of ownership declines, RWE may decrease its number of directors accordingly (to be replaced by independent directors). American Water presently contemplates that once RWE divests all ownership in American Water, the Board will consist of nine independent directors and one inside director (CEO). Also, once American Water goes public, the Board Audit Committee will have one year to ensure that all members of the Board Audit Committee will be independent directors.³⁴

American Water's director-selection policies and practices are formally specified in the American Water Works Company, Inc. Corporate Governance Guidelines documentation. Personal criteria for Board members include:³⁵

1. Ethics, integrity, and no conflicts of interest
2. Accountability
3. Judgment
4. Responsibility and ability to interact with other directors in an open, challenging, and informed manner
5. High performance standards
6. Commitment and enthusiasm toward their responsibilities as directors
7. Courage to express their views openly, even in the face of opposition
8. Willingness to devote their time and energy toward carrying out Board duties and responsibilities

Board members must also be able to read and understand financial statements and information to evaluate the financial performance of American Water and its subsidiary companies.³⁶ The newly formed Nomination/Corporate Governance Committee will be responsible for recruiting and selecting new directors.³⁷

Directors currently serve until death, resignation, or removal, but American Water has indicated that once it goes public, directors will be elected annually. There are no plans to classify the Board.³⁸

Finding VI-2 American Water has adopted a substantive Code of Ethics document; however, the Code does not explicitly apply to all contractors and vendors who do business with American Water.

SOX/NYSE requires public companies to adopt a Code of Ethics that applies to directors, officers, and employees (or to disclose an explanation of why it has not adopted such a code).³⁹

In July 2006, American Water updated its corporate Code of Ethics⁴⁰ (previously version dated 2001) to include policy components required by the NYSE rules and SOX. This document was reviewed and approved by the Board of Directors.⁴¹ It is concise, easy to read, and includes major sections dealing with the following areas:

- ◆ *Basic Standards* – who is covered, importance of accepting personal responsibility, defined standards of personal conduct
- ◆ *Conflicts of Interest* – includes what is considered a significant relationship, use of proprietary information or financial interests, and loans to directors and executive officers (prohibited), employees serving as outside directorships, accepting and giving business gifts, and accepting entertainment
- ◆ *Fair Dealing* – with customers, vendors, competitors, and outside publics
- ◆ *Handling Sensitive Information* – safeguarding and using what constitutes non-public, insider information; also includes a discussion on cooperating with legal proceedings and investigations
- ◆ *Safeguarding Financial Records and Controls* – ensuring accuracy and completeness
- ◆ *Government Relations* – dealing with public officials, political contributions, and involvement in political campaigns and political action committees
- ◆ *Conduct in the Workplace* – equal opportunity, affirmative action, prohibitions against harassment, health and safety, and illegal substances and alcohol, use of American Water resources, and respecting the privacy of customers
- ◆ *Administration* – where and how to report violations, no retaliation policy, and responsibilities for maintaining ethics policies

A confidential ethics hotline has been established and is operated by an outside agency, which maintains records on all calls, investigations, and resolutions. All allegations of wrongdoing, even if reported up through management, must be submitted to the hotline. As such, the hotline is the central repository of all allegations of ethical violations.⁴²

To assist with compliance, American Water has established an Ethics Committee consisting of the Chief Financial Officer (CFO), the Chief Operating Officer (COO), the Senior Vice President (SVP) of Human Resources, the Vice President (VP) of Internal Audit, and the General Counsel. This committee has the responsibility and authority to define and interpret principles in the Code, and to ensure consistent application and overall compliance (management still has responsibility for code compliance).

The American Water Board of Directors has ultimate oversight of this policy.⁴³ The Ethics Committee reviews allegations from the hotline and reports results to the Board's Audit Committee. The Audit Committee has the authority to hire outside expertise to investigate any allegation or incident.⁴⁴

All employees and directors are required annually to sign a Code of Ethics Acknowledgement form indicating that they have received and read the American Water Code of Ethics and that they are not aware of any violations of that code. This form also requires disclosure of any possible exceptions.⁴⁵

Although the Code addresses employees' ethical behavior with contractors and vendors (and even suggests that they make a copy of the Code available to them), there are no requirements for outside contractors or vendors to abide by, or at least acknowledge, American Water's Code of Ethics.⁴⁶

Finding VI-3 Board compensation appears to be appropriate; however, American Water has not recently reviewed Board compensation and has delayed the recruitment of new independent directors.

Non-management members of the Board of Directors receive compensation based on an annual retainer and per-meeting fees. The annual compensation of a non-management American Water Board member is between \$50,000 and \$60,000 a year.⁴⁷ Inside Board members receive no fees or additional benefits beyond their company compensation.⁴⁸

Currently, there are no other forms of compensation (e.g., non-cash compensation),⁴⁹ although the draft Corporate Governance Guidelines provide for the Compensation Committee and the Board to at least annually review the compensation level of directors in comparison to directors of like corporations.⁵⁰ As of January, 2008 there has been no review of Board compensation levels.⁵¹ (The issue is whether director compensation levels are adequate enough, in the post SOX era, to attract qualified candidates.) These guidelines also provide for/encourage, but do not require, stock ownership as a part of a director's compensation or as a condition of Board service. Pension benefits will not be a part of an independent director's compensation.⁵²

American Water has indicated that it intends to expand the Board to 10 total members and replace RWE representatives on the Board with independent directors (as RWE's ownership stake decreases). This intention means that American Water will have to recruit up to six independent directors (more if any of the three current independent directors leaves the Board).⁵³ SOX has placed a greater workload and added responsibilities on public company Boards, and the competition for qualified directors has increased over the past few years.⁵⁴ In anticipation of SOX, the American Water Board has recently established a Nominating/Corporate Governance Committee whose responsibilities include recruiting qualified directors, deciding on director compensation, and determining the number, structure, and independence of Board committees.⁵⁵ To date, no director compensation surveys have been conducted or contracted for by American Water.⁵⁶

When RWE decided in 2006 to take American Water public, recruiting efforts began for adding independent directors. When RWE decided in 2007 to delay the public offering, this effort was put on

hold. American Water plans to resume this effort in time to add additional directors after the company finally goes public.⁵⁷

Finding VI-4 The American Water Board maintains adequate oversight and is taking further steps to increase its role in ensuring proper controls.

American Water's full Board met five times in 2006 (one special meeting to address compensation issues) and eight times in 2007. In addition to receiving and discussing Audit Committee reports and approving key recommendations (e.g., external auditor's fees and work plans including discussion of audit and non-audit work, internal audit work plans, and audits of interest, internal controls), the Board addressed a wide range of policy-level issues. These issues included efforts to comply with SOX and SEC requirements (for public companies) and associated compliance programs, executive development, succession and compensation, business plans and performance, and various financial and operational issues. Specifically, the Board addressed the process for selecting additional directors in anticipation of the public offering, thereby establishing Corporate Guidelines and additional Board proposals to address American Water's strategic planning needs after the public offering, and for future External Communication strategies. The Board met frequently in executive session with external auditors, internal auditors, and other American Water management as needed.⁵⁸

American Water has also recently developed Corporate Governance Guidelines that define principles by which the Board of directors will organize and execute its responsibilities. This includes sections on General Principles (commitment of time and effort, carrying out duties with due care, loyalty and good faith, ability to read and understand financial statements, and personal characteristics), director qualification standards (qualifications and selection of directors, independence and added independence standards for directors on the Audit Committee), Board committees (number, structure, independence, and responsibilities), director access to management, employees, and independent advisors (including funding authority for independent advisors), director compensation, director orientation and continuing education, management succession and development, internal audit (including the requirement that the Director of Internal Audit report directly to the Board), and Code of Ethics. This document closely matches SOX/SEC and NYSE requirements and gives the Board appropriate direction and governance authority. As mentioned earlier, this document has just been developed and the Board has not been able to implement all of its features.⁵⁹

American Water has a stated Policy on Authorization and Limitation of Corporate Authority (adopted by the American Water Board of Directors, last amended in February 2007), which establishes uniform standards for conferring, limiting, and delegating the authority to enter into corporate transactions on behalf of American Water. This policy gives specific authorizations to the CEO, broken down by various types of transactions. The monies for these transactions must be within a Board-approved budget or business plan. This policy also contains specific transactions that only the Board can approve (e.g., political contributions).⁶⁰

The PAWC Board met five times in 2006 and three times in 2007. In addition to reviewing updates on important corporate-wide activities (e.g., internal audits specific to PAWC, SOX and other compliance efforts, costs of and coordination with external auditors), its members addressed important local operational issues (e.g., main breaks) and local real estate transactions.⁶¹

Finding VI-5 American Water is taking steps to strengthen oversight through the Audit and Corporate Governance Committees.

The NYSE Blue Ribbon Committee laid out a number of requirements concerning Board Audit Committees, which include:⁶²

- ◆ Publishing formal, written charters
- ◆ Requiring that outside auditors to be accountable directly to the Board and that the Audit Committee, which nominates, hires, and fires the auditor and company management, not be in that reporting line
- ◆ Bringing outside and internal auditors into the same line of communication
- ◆ Having outside auditors discuss with the Audit Committee the quality of American Water's accounting principles (e.g., process used by management in formulating particularly sensitive accounting estimates)
- ◆ Ensuring the Audit Committee doesn't become overloaded with duties

American Water's Audit Committee has a documented charter that clearly covers the purpose and roles of the committee, and its structure and operations. This charter includes the composition of the committee and the qualifications of its members, the appointment and removal of members, and the designation and responsibilities of the Committee Chairman. The charter further requires the committee to meet at least quarterly (more frequently as required) and to do so in private session (no other American Water management present) with the independent auditor, the internal auditor, the General Counsel, and the Chief Compliance Officer. Responsibilities and duties are detailed and include matters concerning the independent auditor (including discussing issues regarding accounting principles), the internal auditor, ethics, risk and control environment, and legal, systems, technology, and security issues that may impact financial controls. The committee has full authority and resources to carry out its duties. For example, the committee has the authority and budget to hire outside expertise at its sole discretion.⁶³

The issue of Audit Committee overwork has been addressed by the recent (September 2007) creation of two additional committees: the Compensation Committee and the Nominating/Corporate Governance Committee. Both of these committees have formal charters (similar in form and type of information found in the Audit Committee Charter) that define their responsibilities. The Compensation Committee includes among its responsibilities an annual review of director compensation (formally performed by the Audit Committee). The Nominating/Corporate Governance Committee is responsible for developing and maintaining American Water's Corporate Governance Guidelines (i.e., principles by



which the Board of Directors will organize and execute its responsibilities). This committee also has responsibilities of ensuring that directors are not overcommitted by serving on more than two other boards, considering questions of director independence, overseeing a director continuing-education program, and, among other duties, carrying out any additional functions and adopting policies and procedures in light of changing business, legislative, regulatory, legal, or other conditions. Overall, this committee takes the lead in shaping American Water's corporate governance, thereby leaving the Audit Committee to focus on financial control issues.⁶⁴

The American Water Audit Committee met eight times in 2006 and eight times in 2007 (PAWC Audit Committee met three times in 2007). It fully addressed a variety of issues including financial audits (inclusive of audit and non-audit work of the external auditors), internal audits, Code of Ethics, SOX compliance, American Water financial statements, Committee Charters and Corporate Guidelines, management compensation and succession, among other items (including changes in financial and governance requirements).⁶⁵ The PAWC Audit Committee addressed internal audit issues, financial statements and management, audit fees, and provided updates and coordination on American Water governance efforts (e.g. SOX, internal controls, ethics).⁶⁶ There are no minutes available for the Compensation Committee or the Nominating/Corporate Governance Committees (which have only recently been formed).⁶⁷

Finding VI-6 The Board exercises appropriate control over the external auditors; however, a process has not been established to ensure that cost comparisons for external audit services are performed on a periodic basis.

The American Water Board's Audit Committee meets quarterly with the external auditors. This meeting includes time in executive session. Recurring items include reviews of annual and quarterly financial statements, Board approval of audits and expenses, review of external audit work plans, discussions of issues related to internal controls and accounting principles, new accounting and financial-reporting requirements, reports on audit and non-audit fees, and various other financial issues (e.g., tax, impairments). During every meeting, the Audit Committee meets in executive session with the external auditors.⁶⁸

PricewaterhouseCoopers LLC (PwC) has been the external auditors for American Water and its subsidiary companies for the past five years.⁶⁹ American Water requires external audit partners to rotate every five years (as per SOX/SEC requirements), but it does not proactively compare costs for external audit services on a periodic basis.⁷⁰

Finding VI-7 The Internal Audit Department has adequate interaction with the American Water Board Audit Committee, but its reporting relationship to the American Water Board Audit Committee and American Water management is unclear.

SOX/SEC/NYSE rules recognize the importance of Internal Auditing's independence from management pressure and have expressed that the internal auditor should have a direct-line reporting relationship with the Board of Directors (Audit Committee).⁷¹ SOX/SEC rules stop short of mandating that this relationship include administrative reporting, although they could still bring pressure to bear on the internal auditor.⁷²

American Water's internal audit function has a high level of visibility with the American Water Board Audit Committee. The VP of Internal Audit meets with the Audit Committee once a quarter, and minutes of those meetings reflect regular and consistent internal audit reports and executive sessions with the committee.⁷³ At each meeting, Audit Committee members are presented results of audit plans and significant findings of audits to date, analysis of open audit items, the status of internal audit SOX activities, audit staff overview, and special management requests.⁷⁴ This information package also highlights any recommended actions not completed in a timely fashion and includes a required explanation by the responsible functional manager.⁷⁵

The American Water Audit Committee Charter states that Internal Audit reports directly to the Audit Committee, while reporting administratively to the Chief Executive Officer. Organization charts show the VP of Internal Audit reporting directly to the CFO.⁷⁶ In practice, American Water's VP of Internal Audit reports to the CFO with a dotted-line reporting relationship to the CEO and the Chair of the American Water Board Audit Committee.⁷⁷ As discussed in *Chapter III – Financial Management*, the CFO prepares the performance review for VP of Internal Audit. This performance review is then reviewed by the CEO and the Chair of the Audit Committee. The CFO also authorizes the VP of Internal Audit's personal leave and approves Internal Audit staffing levels, the speed of replacements, and internal auditor pay-grade levels, which effectively impacts the department resource levels. The CFO does not direct the internal audit work effort nor does she approve audit projects, although she does have input into the audit planning process. This chain of command appears to place the Internal Audit function at least in part under the CFO, who is responsible for all the financial operations of American Water, including PAWC.

Finding VI-8 American Water is taking substantive steps to comply with SOX/NYSE requirements for internal controls.

The three main parts of SOX/SEC specifying requirements for compliance that are most applicable to American Water/PAWC are:

- ◆ *Section 302* establishes corporate responsibility for security reports. The CEO and CFO must prepare a statement that certifies financial statements and disclosures.



- ◆ *Section 404* establishes the need to assess internal controls. An internal control report must accompany an annual report, with management taking responsibility for and assessing the effectiveness of internal controls.
- ◆ *Section 409* requires real-time disclosure of security issues. Material changes affecting financial disclosures must be reported on a rapid and current basis.⁷⁸

SOX also requires attorneys who represent issuers before the SEC to report any evidence of wrongdoing to management up through the Chief Legal Officer and the Board.⁷⁹

American Water has embarked on a major effort to strengthen internal controls to comply with *Section 302* and *Section 404* of SOX. It has done so by designing an internal-control assessment process that will be subjected to American Water's independent, registered public accounting firm's evaluation under Public Company Accounting Oversight Board (PCAOB) *Standard No. 2* and its current and prospective interpretations and amendments. The American Water effort uses company and outside consulting expertise. This effort is being conducted in four stages as follows:

- ◆ *Stage One* – Develop and document a methodology and framework to complete the SOX requirements.
- ◆ *Stage Two* – Document key controls and transactional flows, assess their design and effectiveness, pinpoint necessary improvements, identify testing and tracking processes, and develop a framework and processes for follow-up as well as a framework and standards for the quarterly sub-certification process.
- ◆ *Stage Three* – Implement testing strategies, updates to process documentations, design remediation plans, and tracking of control issues and recommendations.
- ◆ *Stage Four* – Develop ongoing project-status reporting, quality-control review processes, methods for incorporating leading practices and new issues, and updating of all designed processes.⁸⁰

As noted earlier, the American Water Board of Directors has given considerable attention to the efforts to meet SOX/SEC requirements.⁸¹ American Water has taken a number of steps to enhance business practices so they comply with SOX. A policy panel has been established to guide an effort toward updating all policies and practices, both SOX and non-SOX.⁸² As mentioned earlier, American Water has embarked (with outside assistance) on a major effort to identify and enhance internal controls so they comply with sections 302 and 404 of SOX.⁸³ A SOX Steering Committee and a Deficiency Committee consisting of senior management has been monitoring the compliance efforts mentioned above. Key Control points have been identified throughout the American Water system and upgraded controls are being implemented and tracked.⁸⁴ This process is close to completion.⁸⁵

American Water, through its Internal Control group, has undertaken a number of company-wide training efforts on both SOX and the changes coming from compliance with these new requirements. These initiatives include:

- ◆ *Control Road Shows* – location-based group meetings with designated process owners and others led by a representative of the Internal Control group and the respective president (or designee). These meetings provide updates on the SOX program, new internal controls, new systems for monitoring and implementing SOX, and other relevant information (e.g., highlights of information technology considerations).
- ◆ *SOX University* – ongoing program of conference calls with process owners and others to deliver process-based risk and control information. Process owners are then expected to hold similar meetings with other employees.
- ◆ *Movaris SOX Tool* – a series of meetings and presentations on conducting internal control activities (e.g., evaluations) and the systematic tools used to document these evaluations.⁸⁶

C. Recommendations

Recommendation VI-1 Require contractors, vendors, and others doing business with American Water to conduct themselves ethically when dealing with American Water entities. (Refer to Finding VI-2.)

This requirement for ethical (not just lawful) conduct can be stated in requests for proposals/bids and in contracts or other governing documents. If someone doing business with American Water already has a Code of Ethics, then it should also be provided to American Water as part of any contractual agreement. Regardless, copies of American Water's Code of Ethics can either be made available to vendors or vendors can be referred to the company Web site. In this manner, American Water will clearly indicate to all who do business with the company that American Water takes ethical conduct seriously and also that ethical violations will not be tolerated. Implementation does not necessarily require American Water to specifically audit for compliance, but provides the company with a mechanism to terminate the relationship if subsequently it finds that one of these entities has not complied with ethics requirements.

Recommendation VI-2 Expand the American Water Board in anticipation of going public and review Board compensation as soon as possible. (Refer to Finding VI-3.)

American Water has indicated it will expand its Board to 10 members when it goes public, but as of late 2007 the initial public offering date had been delayed. Nonetheless, as plans to issue the IPO have not changed, American Water should continue its recruiting efforts and bring on qualified directors when they are identified rather than waiting until the company goes public. RWE's percentage of representation on the American Water Board should decline in proportion as their percentage of ownership declines.

Although SOX (and the American Water Corporate Governance Guidelines) only requires that the majority of the Board be independent, American Water should ensure (and state its preference) that the



Board is substantially independent (e.g., eight or nine of the 10 directors should be independent). Also, the Nominating Committee should continue director recruiting efforts after the Board reaches 10 members with the anticipation of replacing RWE directors as RWE reduces its ownership stake. The Board can temporarily be increased to above 10 directors if needed.

The newly created Board Compensation Committee is tasked with the responsibility of reviewing Board compensation. Board compensation studies are readily available through Human Resources and executive recruiting firms. Because American Water will require up to six new independent Board members in the short term and because the market for qualified directors is getting more competitive, determining appropriate director compensation should be a high priority. Director compensation should require and include significant stock ownership (addressed, but not clearly defined in the Compensation Committee charter) and should not include any pension or like benefits.

Recommendation VI-3 Implement a process to periodically perform cost comparisons for external audit services. (Refer to Finding VI-6.)

This formal effort could be conducted every five years to correspond with the SOX-required changing of external audit managing partners (responsible for the American Water account). Competitive bidding is a vehicle to ensure high-quality services (e.g., oversight) at the best overall value. It is also a way of encouraging fresh and more independent reviews/points of view.

Recommendation VI-4 Modify the Internal Audit Department reporting structure so that it no longer administratively reports to the American Water CFO. (Refer to Finding VI-7 and Finding III-8.)

American Water should establish an organizational reporting relationship that results in the Internal Audit Department reporting functionally to the American Water Board Audit Committee (reflecting the Audit Committee Charter) and administratively to either an American Water officer other than the CFO or through a governance organization that reports directly to the Board. This reporting relationship will further ensure the independence of American Water's Internal Audit function and enable it to be truly independent of the financial and operational management of PAWC and AWWSC. This independence is necessary for perception as well as management and internal control purposes.

VII. Corporate Culture, Management Structure, and Staffing Levels

This chapter examines the effects of the 2003 RWE acquisition of American Water with respect to corporate culture, management structure, and staffing levels. More specifically, we will discuss the effect of these changes on Pennsylvania-American Water Company's (PAWC's) operations. Finally, we will give consideration to the impact on the divestiture from RWE and on the planned redirection of PAWC.

A. Background & Perspective

Corporate culture is most easily understood as *the way things are done*. These ways of doing things are, intentionally or unintentionally, taught to employees, thereby yielding a consistent and observable pattern of organizational behavior. The culture of an organization may support or detract from an organization's performance. Many of today's most successful organizations make conscious efforts to shape their organizational culture through mission statements, explicit values, company policies, employee education, organizational assessments, individual performance management, and leadership practices.⁸⁷

PAWC's culture is a function of many variables, but perhaps the most significant effects are related to company history and changes in ownership. The entities that came to comprise the American Water Works Company originally consisted of more than a hundred small, local water companies, created for the most part between 1870 and the late 1920s. Over time, these local systems were consolidated into a few dozen larger companies. These, in turn, were gathered into a handful of multi-system holding companies, which finally were combined through acquisition or merger to create the company in its present form. The forces that brought these companies into being and the problems that beset their early days are not merely typical of hundreds of other companies started then or since, but they reflect the essential realities—social, political, financial—of running a community water business to this day.⁸⁸

Multiple Reorganizations

In November 2003, American Water Works Company (American Water) announced a system-wide restructuring. This reorganization resulted in American Water's existing seven regions being consolidated into four regions. PAWC was one of American Water's six regulated subsidiaries that became part of the Southeast Region. The PAWC President assumed the additional role of managing director of the Southeast Region. Eventually, he was replaced by a new President of the Southeast Region and the PAWC President position was combined with the role of Southeast Region President. The PAWC corporate office in Hershey, Pennsylvania, also became the headquarters of the Southeast



Region, which included the states of Kentucky, Maryland, Pennsylvania, Tennessee, Virginia, and West Virginia.

This restructuring was driven by four key objectives:⁸⁹

1. Create a greater customer service and performance culture
2. Accelerate business growth
3. Develop common processes to continue to enhance standards
4. Pursue efficiency while maintaining operational integrity
5. This restructuring process occurred in four phases. Phase 1 was announced on November 19, 2003. Phase 4 was announced on April 28, 2004. The restructuring and reassignment of employees appears to have been largely complete by mid-July 2004.⁹⁰

A major element of this restructuring was the redeployment of management personnel. Managers were required to bid for a position within the new structure and, in some cases, to rebid for their own jobs. This process included all levels of management, including first-line supervision and other exempt professional and non-management employees.⁹¹ Managers completed an assessment center process that was designed to assess an individual's skills, knowledge, and experience against required competencies for the newly designed roles. The assessment process varied depending on the specific role. American Water utilized two outside firms to conduct these assessments. Personnel Decisions International (PDI) was engaged to conduct senior management assessments, with a focus on leadership behaviors. Phase 4 assessments focused more on technical and professional roles and were conducted by a firm with not only experience in this area but also the capacity to handle a high volume of assessments. Both vendors had worked previously with RWE on assessments for recruitment, selection, and development purposes.⁹²

During this reorganization, virtually all management and professional positions were redefined using the RWE competency model. Positions were reviewed between November 2003 and July 2004 as part of the RWE organizational restructuring. Positions that were not redefined were not posted, but all redefined positions were posted internally, and all American Water employees had an opportunity to apply for any posted position. Many employees applied for more than one position. Employees who did not wish to apply for one of the posted positions were offered an enhanced severance package, as were employees who applied for a new position but were not selected.⁹³

After internal applications were received, a short list of candidates was selected for consideration; candidates were assessed, and the decision to select internal candidates was made. If no internal candidate was deemed acceptable for a particular role, that role was advertised externally.⁹⁴

The review occurred in four phases, beginning with direct reports to the President & CEO of American Water. PAWC positions were included in Phase 3 (primarily manager titles) and Phase 4 (superintendents, supervisors, and other exempt professional and technical employees). The overall objectives of the review were to:⁹⁵

- ◆ Position the right people in the right roles
- ◆ Conduct an open, fair, and robust selection process
- ◆ Position the business to deliver the 2004–2008 business plan
- ◆ Complete the management organization structure by the end of July 2004
- ◆ Maintain organization and culture change momentum

Personnel Decisions International conducted the assessments for Phases 1, 2, and 3. These assessments were conducted at PDI offices in various locations throughout the United States. External candidates who applied for one for these positions were also required to participate in the assessment process. SHL performed the assessments for Phase 4, in concert with trained company interviewers. These assessments occurred at company sites.⁹⁶

American Water sought a process that was objective, transparent, fair, and open. It was designed to review an individual's skills, knowledge, experience, and behavioral attributes for the role(s) for which they applied, based on the critical behavioral competencies for that particular job cluster. Key elements of the PDI assessment included:⁹⁷

- ◆ A structured interview
- ◆ A series of business simulations
- ◆ Standardized tests of cognitive thinking skills
- ◆ A personality questionnaire
- ◆ Feedback on individual performance

Key elements of the SHL assessment process included:⁹⁸

- ◆ Completion of an Occupational Personality Questionnaire that linked to the American Water competencies being evaluated
- ◆ A competency-based interview with a panel composed of both SHL and American Water staff
- ◆ Analytical problem-solving
- ◆ Depending on the specific position, additional job-related tests

About 1,800 management and supervisory positions were affected by the restructuring. Originally, American Water sought to reduce the number of its management positions by 350, or approximately 20% of management and supervision. In Phase 4 of the restructuring, that number was reduced to approximately 300, reflecting the need to maintain operational reliability and integrity. The American Water President recognized that, as a result, “some good people will be leaving our company.”⁹⁹ A total of 214 PAWC employees applied for 193 advertised positions. Of those who were not selected for a posted position, some were terminated and some remained in their (non-posted—i.e., hourly) existing positions. A total of 39 PAWC employees were terminated with enhanced severance at the conclusion of the process. Those terminated included individuals who chose not to apply for a position, individuals who were offered a position that would require relocation and declined that position, and individuals

who were not offered a position. All 193 PAWC positions were ultimately filled, whether by internal or external candidates.¹⁰⁰

Exhibit VII-1 lists positions and the number of PAWC employees in each position affected by the restructuring.¹⁰¹

Exhibit VII-1
PAWC Positions Subject to Reorganization
as of April 2004

Job Title	Number of Positions
Associate General Counsel	2
Business Development Manager	4
Communications & CSR Manager	3
Engineering Technician (Senior)	1
Financial Analyst (Senior)	1
Financial Analyst	2
Government & Regulatory Affairs Manager	1
Human Resources (HR) Manager	2
Human Resources Generalist	1
Lab Analyst	3
Loss Control Manager	2
Loss Control Specialist	2
Maintenance Manager (Large)	1
Maintenance Supervisor	7
Network/Field Services Manager	2
Network/Field Services Superintendent	10
Network/Field Services Supervisor	86
Non-Revenue Water Supervisor	3
Operations Engineer (Senior)	3
Operations Specialist/CAD	2
Planning Engineer (Senior)	1
Project Delivery & Developer Services Manager	2
Project Manager (Senior)	9
Production Manager	2
Production Superintendent	5
Production Supervisor	23
Training & Development Manager	1
Water Quality Manager	3
Water Quality Supervisor	9
Total	193

Source: Information Response 822

On July 31, 2006, American Water's Chief Operating Officer announced a reorganization of the company aimed at strengthening the state president/general manager role across American Water, while maintaining the regional organization.¹⁰²

On June 15, 2007, he announced that the company had hired a new PAWC President. Later that month, on June 29, American Water's President announced that American Water would begin the process of eliminating the four regions created in 2003 and transition those regions to two divisions. PAWC would become part of the Eastern Division, and each state within the division would be headed by a state president. This reorganization sought to return American Water to a more state-focused organization by restoring the full-time position of PAWC President and changing roles so that many former regional or functional positions are now PAWC positions that report to the PAWC President.

Performance Management

PAWC has a comprehensive annual-planning and performance-management process that is linked to overall corporate objectives and leadership competencies. American Water company-wide performance targets are announced in January. Concurrent with this announcement is the setting of regional and functional performance targets related to the corporate objectives. During January and February, employee performance is evaluated against the prior year's objectives as well as new departmental and individual performance targets for the coming year. These comparative results are expected to be consistent with the regional/functional targets.¹⁰³

Performance targets are organized in a common "balanced scorecard" format. Throughout American Water, performance targets are related to one of four categories: Finance, Customer, Process, and Employee Development.¹⁰⁴

Management performance is also evaluated against a set of corporate behavioral competencies that outline standards for leadership behavior and reflect American Water company values.¹⁰⁵ These competencies are defined in a "competency dictionary" that helps guide the selection process, evaluation, and manager development.¹⁰⁶

A final step in the performance-planning and evaluation process is the setting of individual development plans. The first component is specific development activities related to behavioral competencies. These activities are listing of actions—such as self-study, company-sponsored training, and on-the-job assignments—that are aimed at improving individual performance. Employees also complete career development plans that include learning and job-experience activities related to career and professional development growth.¹⁰⁷ None of these activities is related to a formal leadership-development process.¹⁰⁸ (See *Finding VII-5*.) In March of each year, merit pay increases are set based on individual performance evaluations.

B. Findings & Conclusions

Finding VII-1 PAWC's culture under RWE could best be defined as *insular*.

Under the reorganization begun in 2003, American Water fundamentally altered its relationship with end customers, communities, regulators, and other key stakeholders. Local utility organizations were to be focused on delivering service, influencing regulators, and shaping the market.¹⁰⁹ These local utility organizations were functionally designed and were expected to adopt common ways of working.¹¹⁰ The American Water Works Service Company (AWWSC) was designed to serve the regions, beginning with the announcement of the American Water Executive Team, and to provide strategy, policy, and governance. The regional organization (Southeast Region is now part of the Eastern Division) was intended to serve its customers, which were the operating companies, who in turn served the end customers.¹¹¹

The reorganization appears to not have fully realized its objectives. Under RWE, PAWC has had less presence at the Pennsylvania Public Utility Commission.¹¹² We are unclear as to how the Southeast Region organization has served customers. In fact, the primary point of customer contact is now the national call centers in Pensacola, FL and, to a lesser degree for Pennsylvania, Alton, IL.¹¹³ (See *Chapter X – Customer Service*.)

PAWC is clearly operationally focused. (See *Chapter V – Water Operations*.) We do not find fault with a focus on strong operations, but at PAWC, such focus appears to have been accomplished without robust relationships with external stakeholders.

The company appears to recognize the problem. The July 31, 2006 reorganization had the explicit purpose to increase the company's external focus.¹¹⁴ The PAWC President, who was recently appointed in the middle of 2007, was hired, in part, to address this deficiency and has expressed the need to reshape the culture of the organization and make it more externally focused.¹¹⁵

Finding VII-2 PAWC, like American Water, operates various systems with substantial differences in how each entity is run with respect to certain fundamental business processes.

From American Water's beginnings, one of its driving factors was to provide a central organization to allow greater access to capital markets and centralized engineering expertise that predecessor smaller water organizations were incapable of obtaining as independent entities unaffiliated with American Water. Throughout its history, American Water continued to operate in this manner. Only recently has this begun to change. Beginning in late 2003 American Water began to consolidate the various water companies into common larger organizations (as discussed in the *Background & Perspectives* section of this chapter). However, there are still many different systems located within the various operating water companies that, although they serve the same business function, have different business processes, often

for historical reasons. For example, several of the systems within PAWC were previously part of Citizens Utilities, which was not only non-union but also had different business processes that PAWC management has allowed to continue to exist.¹¹⁶

While there are benefits to this flexibility (such as the differing work schedules that have been established, based on employee input, at various water production facilities), there are even greater benefits to identifying and adopting best operating practices as common business processes across all of the water systems. For instance, there are several different leak tracking databases in existence within PAWC. Specifically, a separate Microsoft Access database is in existence in the Wilkes-Barre/ Scranton water systems, different Microsoft Access databases (programmed to provide similar yet different business processes) in the Western PA water districts, and a third rough application that has been recently put forth by the Best Operating Practices group, which is currently not being used anywhere within PAWC – but is being considered as a model for a future system. Several other examples are provided in *Chapter XII Phase – III – Water Operations*.

Furthermore, as discussed in *Chapter IV – Support Services*, inventory maintenance and control is inconsistent across the PAWC storerooms and the control of inventory was observed to cover the range from inadequate to sufficient. Observation at several storerooms by Schumaker & Company consultants found that adherence to the above tenets was very inconsistent. While some of the storerooms appeared to have a reasonable level of inventory control, others were seriously lacking in this regard. Much of this problem is the result of a lack of proper, standardized inventory-control procedures, deficiencies in the training of the storekeepers, and a seriously deficient materials management computer system. Several other examples are provided in *Chapter IV – Support Services*.

Finding VII-3 Divestiture from RWE presents a significant opportunity to refocus American Water and to strengthen PAWC by leveraging best practices across the enterprise.

While a case may be made that global manufacturing enterprises create enormous efficiencies and strengthen global market penetration, it is difficult to make the same case for the regulated water utility industry. Throughout our investigations, Schumaker & Company has found no evidence that foreign ownership strengthened American Water or improved service quality for ratepayers.

With divestiture from a foreign parent, American Water in general, and PAWC in particular, has the opportunity to create a high-performing culture that is oriented toward operational excellence and customer service. We would expect American Water and PAWC to be more responsive to state regulators, U.S. shareholders, and local stakeholder interests. In addition, PAWC can benefit from the implementation of company best practices and not be required to implement management practices dictated by a foreign parent that operates in a distinctly different culture. Finally, divestiture presents greater opportunity for reinvestment in infrastructure, service improvements, and growth.



Finding VII-4 PAWC has not surveyed its employees since 2003 and has no current data on employee attitudes, management practices, and other key elements of corporate culture.

The last time American Water conducted a comprehensive employee survey was in 2003—about the time of the RWE acquisition.¹¹⁷ This comprehensive survey was followed by an abbreviated “pulse” (sample) survey in 2004.¹¹⁸ The 2004 “pulse” survey was not Pennsylvania specific.¹¹⁹ A great deal has transpired in the company since then, including widespread management changes, multiple reorganizations, and now the pending divestiture. Yet the company has no reliable indication of employee attitudes, management practices, and corporate culture.

Having current and reliable information on employee attitudes, management practices, and corporate culture is critical to understanding and managing corporate culture. When Schumaker & Company requested corporate culture indicators for the last five years from PAWC, we were given the response data from selected items from the 2003 and 2004 employee surveys.¹²⁰ Such a response suggests that American Water agrees on the importance of these indicators but also confirms that no other more current indicators exist.

Given the importance of employee survey data and the significant changes American Water is undergoing, we would expect the gathering of such information to be a priority for the company. In 2007, it appears that there was no senior management support for a survey and resources were not allocated for one.¹²¹ American Water has said it plans to issue an RFP for a survey in 2008,¹²² but as of December 2007, no project plan for implementation had been developed.¹²³

Updated responses from American Water indicate that a comprehensive employee survey is planned for September 2008 and a smaller “pulse” survey for 2009.¹²⁴ The statement of work with the survey vendor did not include a timeline for the project.¹²⁵ As of March 13, 2008, the agreement with the survey vendor had not been finalized and no timeline was provided with our request for an update.¹²⁶

Finding VII-5 PAWC does not have a management development process.

Leadership defines corporate culture. Over that last 20 years, many of the most successful companies have made substantial commitments to management and leadership development. These programs strengthen management skills and align management practices to corporate values. They are seen as crucial to developing a strong and effective corporate culture.

During 2004 and 2005, PAWC offered a management development program called License to Manage. This program was selected because it supported the identified managerial competencies and balanced scorecard metrics.¹²⁷ It consisted of 10 modules:¹²⁸

1. *License to Manage Introduction* – designed to give an overview, to provide a business context for the program (balanced scorecard, performance management, etc.), and to create an understanding of organizational behaviors, including intercultural sensitivity, people development, team-working, interpersonal communication, and performance management.
2. *Leading Change* – designed to assist the leaders of the organization in adapting to a changing workplace through commitment and involvement. Participants will explore the many effects of change and how it impacts the individual, the teams, and the organization.
3. *Employee Relations* – a program that allows managers to gain knowledge and insight on the fundamental employment laws, labor-relations processes, interviewing techniques, and management of a union workforce.
4. *Working in a Diverse Team Environment* – helps managers realize the impact that today’s changing demographics have on the workplace, understand the connection between diversity and their organization’s present and future success, and realize the important role they play as change agents in helping to create a workplace in which people of all cultures and backgrounds have a chance to succeed.
5. *Coaching* – focuses on conflict management styles and coaching steps. Managers will participate in a series of activities to learn the coaching fundamentals, including conflict resolution, good decision-making, anticipation of obstacles, motivation of employees, and personal assessment of leadership and communication styles.
6. *Building a Strong Team* – designed to provide an understanding of the importance of teamwork. Participants will see the advantages of working in strong, cohesive teams and how such teams can benefit the organization.
7. *Driving Performance* – provides managers with knowledge surrounding the performance management process and goal-setting (key performance indicators). Managers will learn how to effectively evaluate performance, how to give and receive valuable feedback, and how to have ongoing performance discussions with their team members.
8. *Continuous Process Improvement* – involves problem-solving, critical thinking, analyzing, and interpreting data to ensure quality. This course will provide management with an overall understanding of the importance of process improvement and when to use which tools. Participants will gain a more in-depth awareness of root-cause analysis, an expansion of their thinking, and a clear understanding of problem-solving methods.
9. *Delighting Customers* – provides managers with the fundamentals of exceeding customer expectations and how to convey this information to their team. Participants will learn to greet, build rapport, uncover needs, listen, clarify, explain, and handle difficult customers as well as challenging situations.
10. *Capstone* – culmination of all the other modules in which participants practice skills and reinforce what was learned previously via a simulation taken from “real life” at American Water.



In September 2005, Southeast Region graduated 313 managers (196 from Pennsylvania) from the program. Soon after, the company announced its divestiture from RWE and stated that “there was not a lot of support for the program to continue.”¹²⁹ The decision was made to discontinue the program and instead focus on individual development plans.¹³⁰ The Training & Organization Development Manager, who had been hired to support the program, shifted her focus to other priorities.¹³¹

American Water also offered a five-day leadership development program for managers, provided by external consultants. RWE had an advanced leadership program at the London School of Economics.¹³² These two programs ended in the fall of 2005 or earlier. In addition, RWE had several leadership programs, including a director-level program (in Amsterdam) and a VP-level program (in Switzerland).¹³³

As of early 2008, no formal management-development process exists at PAWC.¹³⁴ The company has made the decision to discontinue License to Manage (although it may continue to use modules in a limited manner where appropriate, such as call center supervisors).¹³⁵ PAWC is working on developing a common approach to management/supervisor development. This approach will aim to have common core modules and then specific modules to meet local needs. However, no one in PAWC has formal responsibility for this effort.¹³⁶

While Schumaker & Company supports this effort, we are concerned that PAWC is more than a year away from having an explicit plan.¹³⁷ Given its focus on reshaping the culture of the organization, management and leadership development would seem to be a critical need.

Finding VII-6 Human Resources does not have the capacity to support the change management requirements of PAWC.

During times of significant organizational change, such as a divestiture and new public offering, we would expect Human Resources in general and organization development (OD) staff in particular to play a key role in helping to guide American Water and its employees through the difficult process. Unfortunately, all organizational development positions at American Water remain vacant. The one person in corporate Human Resources who was hired to provide OD support has been reassigned to be the HR manager for corporate services.¹³⁸

PAWC’s Training & Organization Development Manager is focused primarily on technical training and not the broader change-management needs of the company. (*See Chapter II – Executive Management, External Relations, & Human Resources.*)

Once again, given PAWC’s focus on reshaping the culture, organizational development support would seem to be a critical need.

Finding VII-7 PAWC does not have any enterprise-wide improvement initiatives that fully engage employees at all levels.

Central to a high-performance organizational culture is a process to engage employees at all levels in organizational improvements. Employee teams are common to quality and customer service improvement initiatives in all types of business enterprises. We found no current initiatives aimed at employee involvement at PAWC.

The last such initiative at PAWC was called *Ideas into Action*. That initiative was active for 12 months, from July 2003 to June 2004. The review process continued for a subsequent six to eight months and the program was closed in 2005. Specific to PAWC, approximately 300 employees submitted roughly 650 ideas, of which 100 ideas were approved in Pennsylvania and 71 of these were implemented as of October 12, 2005. Thirty-one employees, including hourly and management, were directly involved as either volunteer panel members or pathfinders.¹³⁹

Finding VII-8 PAWC has limited management succession planning and workforce management capability, thereby making it difficult to assess the adequacy of staffing levels.

This topic is addressed extensively in *Chapter II – Executive Management, External Relations, & Human Resources*, specifically in *Finding II-7, Finding II-8, Finding II-9, Recommendation II-7, Recommendation II-8, and Recommendation II-9* in that chapter.

We reiterate the findings and recommendations herewith as it is a requirement of this task to assess the adequacy of American Water's management structure and staffing levels. While we may make general observations about the adequacy of the existing management structure, we cannot fully evaluate these areas. Based on the absence of comprehensive Organizational Capability Survey data and a comprehensive workforce plan, Schumaker & Company reiterates our concern with these areas.

Finding VII-9 American Water's ethics policies and practices have been substantially communicated to all employees.

In July 2006, American Water updated its Ethics Policy. (See *Chapter VI – Corporate Governance*.) This policy provides for an outside, independent entity to receive allegations of ethical violations and wrongdoing. The telephone number to report allegations is listed in the policy, and persons reporting allegations to the outside, independent entity can remain anonymous. A compliance officer in the American Water Works Service Company (AWWSC) Legal organization was named to monitor Ethics Policy implementation and training. American Water also has an Ethics Committee, made up of senior managers, which meets quarterly to review ethics issues. The American Water Board Audit Committee is charged with the responsibility of ensuring that the ethics program at American Water is fully implemented.

American Water requires all employees to attend Code of Ethics (COE) training. American Water also requires all non-union employees to sign annual certification statements indicating that they understand the COE and that they are not aware of any violations or, if they are aware of any violations, that they have reported them. Union employees are requested, but cannot be required, to sign these annual statements. American Water is in the process of electronically automating the process of updating these annual statements, although manual forms will still be available to employees.¹⁴⁰

Since the American Water Code of Ethics was rolled out in July 2006, ethics training has been conducted (September 2006 through January 2007) for employees at every level. Supervisors received an additional hour of training. During this time, 70 training sessions at PAWC were conducted involving almost 900 employees. In addition, 38 training sessions were held for over 150 supervisors. Class sizes for these sessions were small, ranging from four to 35 for employees and from one to 13 for supervisors. Since January 2007, all new employees have undergone ethics training by Human Resources. American Water is currently evaluating the need for additional and ongoing training needs.¹⁴¹

In each of these training sessions, attendees are given a Code of Ethics brochure, which covers Code of Ethics content and features examples of unethical behavior. The attendees are also required to sign a sheet indicating that they received the brochure and attended the training session. All new hires must sign a similar form after receiving the training. Trainers are given detailed implementation guides for training as well as a facilitator's guide to accompany the Microsoft PowerPoint training presentation. The training session itself covers all aspects of the ethics policy and makes use of case discussion and exercises to further emphasize proper conduct. Five trainers have been designated to support this effort for PAWC.¹⁴²

The American Water Code of Ethics is available on the American Water intranet, and American Water management indicated that it will be posted on the Investor Relations section of the American Water website when American Water completes its initial public offering (IPO).¹⁴³

American Water also features ethics as an ongoing feature of its internal communications. The bi-monthly newsletter "Splash" regularly features ethics information and announcements on training. The weekly e-mail "News You Need to Know" also includes reminders on ethics certification.¹⁴⁴ Intranet communications to all employees also provide information on ethics and related topics (e.g., diversity, corporate goals, performance, major changes and impacts).¹⁴⁵

American Water indicated that in 2008 it plans to continue communications on the Code of Ethics and to offer "Insider Training" regarding information related to a publicly-traded entity (although specific dates and accountability for the efforts have not been established).¹⁴⁶

On a broader note, American Water has used several internal communications vehicles (e.g., Change Partner Network, Splash Points/tailgate meetings) to further publicize ethics and company strategies. (See *Chapter II – Executive Management, External Relations, & Human Resources*.)¹⁴⁷ In late 2007, PAWC's newly appointed President conducted a series of meetings with employees and managers at various PAWC facilities across the state. These meetings (17 between October and December 2007) were

conducted with the purposes of introducing the President to PAWC employees and of discussing important operations, issues, and expectations going forward. In addition, a two-day meeting was conducted (November 2007) with PAWC management for the PAWC President to discuss her vision and expectations for a more performance-based company, among other strategic issues.¹⁴⁸

Finding VII-10 Ethics allegations are properly recorded and promptly investigated.

All allegations of wrongdoing or ethical violations (even those originally reported inside American Water) are reported to an outside, independent entity. The person making the report can remain anonymous, if s/he so chooses. The allegation is then reported to the American Water Compliance Officer (in the American Water Legal organization) and is logged into a computer system designed specifically for the purpose of tracking ethical allegations. The Compliance Officer then assigns the case to an in-house investigator (all in-house investigators—many of them in the American Water Legal Department—receive specific training on properly conducting investigations). In some cases, as the situation warrants (e.g., no in-house investigator available at the location, case has unusual sensitivity), an outside investigator (usually an outside law firm or outside accounting firm) will be employed for the investigation.¹⁴⁹

As an investigation progresses, the investigator logs written narratives of his or her findings. At the conclusion, results, recommendations, and outcome (including any disciplinary actions) are recorded and the file is closed out. The Compliance Officer can track all cases as they progress and must approve the final actions and closeout. A summary of all new, open, and recently closed cases is reviewed quarterly by the Ethics Committee and a summary report is made to the Audit Committee of the American Water Board of Directors at each meeting.¹⁵⁰

The tracking system is fully documented, well laid out, and easy to use. Summary-level information on cases includes the type of allegation, who is assigned to investigate, the status of the investigation, and key dates. The system can be drilled down for more details on the investigation. The system also allows for ad-hoc reporting (e.g., trends in types of allegations or allegations by geographic location) for analysis purposes. We conducted an onsite random review of allegations in several categories and found, in all cases, that the investigations were promptly and thoroughly conducted and that resolutions/disciplinary actions were documented.¹⁵¹

C. Recommendations

Recommendation VII-1 Expedite efforts to define and support a high-performing organizational culture. (Refer to Finding VII-1, Finding VII-2, and Finding VII-3.)

The new President of PAWC has begun to define a new organizational culture with a strategic direction on external focus and growth. Human Resources, in conjunction with Schumaker & Company's support, has begun to align its efforts in support of this emerging strategy and culture. We strongly



support these efforts and encourage further clarification of the values, strategies, and leadership practices that will support PAWC efforts to serve its customers and align to the interests of key stakeholders. We also strongly support the implementation of best operating practices across the American Water and PAWC organizations.

Recommendation VII-2 Implement an employee survey process with appropriate feedback and action-planning components. (Refer to Finding VII-4.)

Based on the documents presented, we believe that American Water is committed to implementing a comprehensive employee survey in 2008. We have some concern about the level of support for this effort and reiterate our strong belief that understanding employee attitudes is critical to driving the cultural changes envisioned for PAWC.

Recommendation VII-3 Implement a formal management development process. (Refer to Finding VII-5.)

Strengthening corporate culture is a function of clear vision and strong leadership. Schumaker & Company believes that it is imperative that PAWC leaders be supported through common values and leadership practices. This support is best accomplished through a formal leadership development process. While we do not intend to define a specific approach here, we are convinced that American Water must commit resources to defining and implementing a leadership development initiative.

Recommendation VII-4 Fill open Organization Development positions in American Water and assess the need for additional change management resources for PAWC. (Refer to Finding VII-5, Finding VII-6, and Finding VII-7.)

The 2003 restructuring was intended to leverage high-quality operations and to develop common ways of working. As we have noted in *Chapter IV – Support Services*, American Water and PAWC have not been entirely successful in this effort. We have made further note of the absence of employee engagement initiatives and leadership development. In *Chapter II – Executive Management, External Relations, & Human Resources, Finding 5, Finding 11, and Finding 12*, we have made extensive discussion of the lack of organizational development support for these kinds of training and organizational development efforts. Without additional resources, PAWC will be slowed in its change efforts. At minimum, the open positions at American Water should be filled and the company should give consideration to additional resources in Pennsylvania.¹⁵²

Recommendation VII-5 Implement workforce management processes at PAWC. (Refer to Finding VII-8.)

We reiterate our recommendations from *Chapter II – Executive Management, External Relations, & Human Resources, Recommendation II-8 and Recommendation II-9*, because we believe they are essential to addressing any questions related to the adequacy of the management structure and staffing levels.

VIII. Affiliate Interests

Pennsylvania-American Water Company (PAWC), the largest regulated water utility in Pennsylvania (PA), is headquartered in Hershey, PA, and is part of the Eastern Division/Southeast Region organization of American Water Works Company, Inc. (American Water). In turn, American Water is a business segment of RWE AG of Essen, Germany (RWE) (although RWE has announced its upcoming plans to divest of American Water). PAWC holds responsibility for the delivery of safe, reliable, and economic water distribution, as well as customer service to residential and business customers in PA.

With regard to affiliated relationships and transactions, Schumaker & Company conducted an in-depth review of PAWC's affiliate interests that impact the company's regulated utility operations in Pennsylvania. In this case, an affiliate interest is defined as a business entity that directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with the regulated utility. Control is defined as the power to dictate or influence the policy of an entity, whether through the ownership of voting securities, by contract, or otherwise. This chapter provides a discussion of PAWC's affiliate relationships and associated transactions. In particular, this review determines the extent to which, if at all, ratepayers are compromised by PAWC's plans or activities in relation to affiliate interests. Our review of affiliate interests identified and assessed all relationships between PAWC and its affiliated entities. That review included the following activities:

- ◆ An identification and summarization of supporting documentation, billings, and charges to and from PAWC and its affiliates for the last five years
- ◆ An evaluation of the fairness and equity of the cost-allocation methodologies used by or impacting PAWC, including the reasonableness of overhead factors utilized
- ◆ A determination as to whether each centralized function is provided most effectively and efficiently on a centralized rather than decentralized basis, and an assessment of whether the function could be provided at a lower cost by an outside party
- ◆ An analysis of PAWC's adherence to law as established in Public Utility Code 66 Pa.C.S. §2102
- ◆ A determination of the extent to which PAWC's financial strength is impacted by or insulated from its affiliated (regulated or unregulated) companies
- ◆ A determination as to whether any of PAWC's, or its affiliates', financial instruments contain credit-rating triggers or provisions leading to collateral calls that carry the potential to unduly affect the regulated utility's liquidity
- ◆ A determination of the existence of formal dividend policies impacting PAWC, a summary of such policies including internally and externally imposed restrictions, and an analysis of PAWC's adherence to the policies
- ◆ A determination of the extent to which PAWC is protected from bankruptcy by the parent and other entities of the holding company

A. Background & Perspective

Affiliate Relationships

Prior to American Water's acquisition by RWE AG of Essen, Germany (RWE), as part of its Thames Water Utilities organization (subsequently divested by RWE), most American Water subsidiaries were regulated entities. Following its acquisition by RWE, RWE/Thames/American Water management decided that the company needed to grow its non-regulated business revenue, which now account for approximately 10% to 13%¹⁵³ of its operations. At the current time, American Water still intends to grow but with a focus on all aspects of its operations (likely not as many non-regulated opportunities).¹⁵⁴ Currently, American Water has operations in 32 states, including regulated operations that are subject to utility commission oversight in Arizona, California, Hawaii, Illinois, Indiana, Iowa, Kentucky, Maryland, Missouri, New Jersey, New Mexico, New York, Ohio, Pennsylvania, Tennessee, Texas, Virginia, and West Virginia.¹⁵⁵

Organizations

The American Water Works Company (AWWC) is the parent company. All costs within AWWC are kept there and are not passed down to any subsidiary. Costs include those of the President/CEO, the SVP/CFO, and their executive assistants. Also the charges from American Water Works Service Company (AWWSC) to AWWC are not passed down to American Water subsidiaries.¹⁵⁶ The parent company has the following major subsidiaries:¹⁵⁷

- ◆ *American Water Works Service Company* is a service company that is designed to aid, assist, and advise other subsidiaries, such as PAWC, in their business operations by providing accounting, administration, communications, corporate secretarial, engineering, financial, human resources, information technology, operations, rates and revenue, risk management, and water quality services. Because AWWSC comprises the major affiliate costs for PAWC, how AWWSC charges are allocated to PAWC is discussed later in *Finding VIII-2*.
- ◆ *American Water Capital Corporation (AWCC)* is the financing arm for AWWC, AWWSC, and regulated entities only. It was started in 2000 (as a not-for-profit entity) to consolidate financing operations (and potentially vehicles) as they were previously decentralized at each American Water entity. At that time, American Water had roughly \$2.3 billion (system-wide) in debt. As of December 31, 2007, it had approximately \$4.8 billion in debt, with \$2.8 billion through AWCC, due primarily to infrastructure replacements and growth. The AWWSC VP & Treasurer is responsible for AWWC financings and for the agreement with PAWC that documents how affiliate transactions are handled. American Water management believes that consolidation of debt provides economies of scale, thereby allowing lower administrative charges and interest rates to regulated entities. As discussed in *Chapter III – Financial Management*, Schumaker & Company concurs that PAWC cash (investments and borrowings) is managed in an efficient and cost-effective manner by corporate cash-management functions and that long-term debt is obtained at favorable rates.

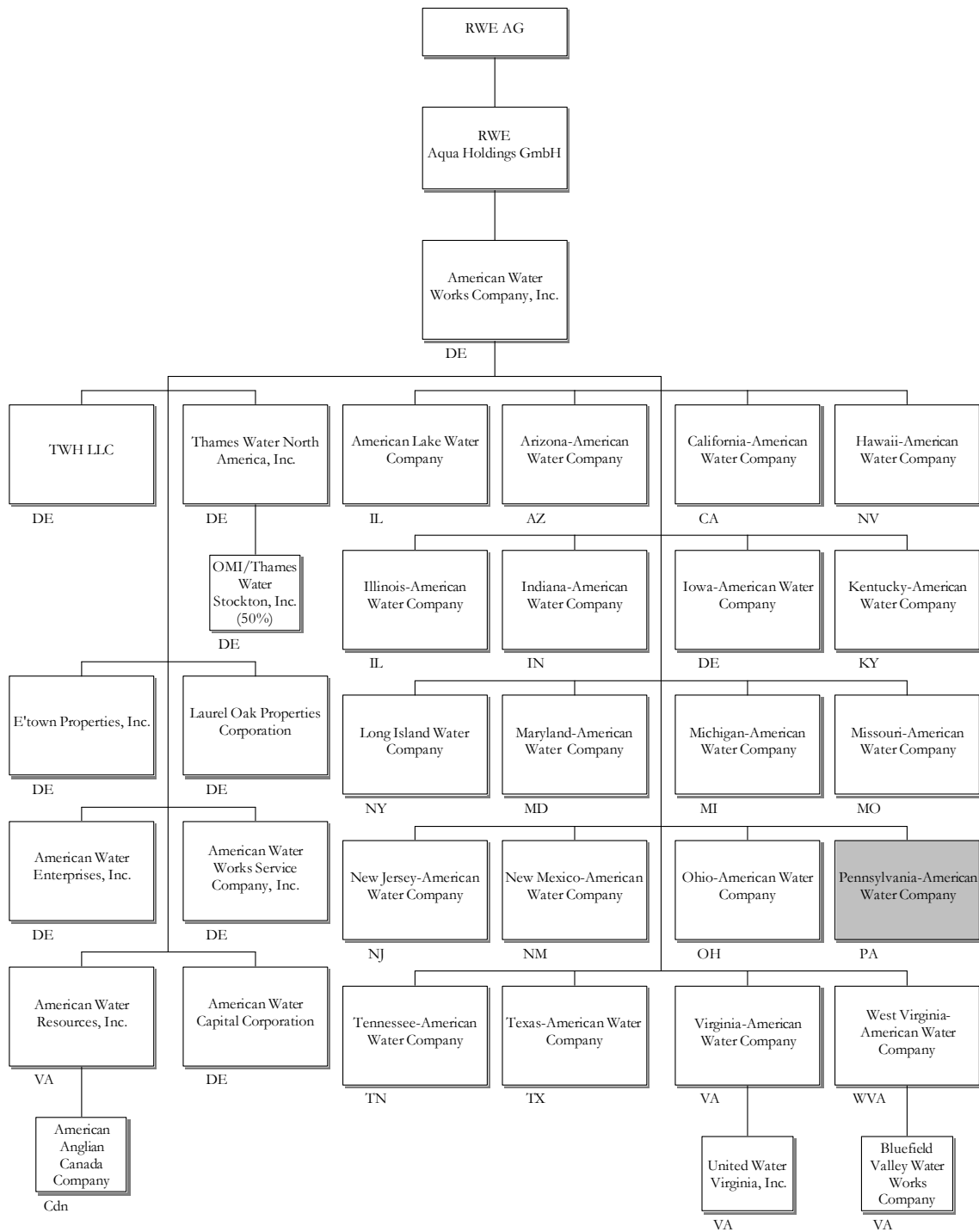
- ◆ *American Water Enterprises* (AWE) holds operations and maintenance (O&M) contracts with various municipalities (none in Pennsylvania).
- ◆ *American Water Resources* (AWR) provides homeowner protection-plan services directly to PAWC and other American Water utility customers.¹⁵⁸ Specifically AWR provides specialized water line protection, sewer line protection, and in-home plumbing emergency protection services for repairs to the water and/or sewer lines running from a home to the street and for plumbing repairs that occur within the home. Because most homeowners' insurance policies do not cover this type of damage, these protection programs are designed to insulate homeowners from unexpected high repair costs associated with water or sewer line failures and with in-home plumbing repairs. Claim coverage amounts are up to \$5,000 for water lines and up to \$8,000 for sewer lines.¹⁵⁹
- ◆ *Applied Water Management* (AWM) is a wholly-owned subsidiary of E'town LLC, which is a wholly-owned subsidiary of TWH LLC. TWH LLC, in turn, is a wholly-owned subsidiary of American Water. AWM provides environmental management in various states, but not Pennsylvania; projects include Battery Park in NYC, Tampa Bay desalination, etc.

Also providing services to PAWC is American Carbon Services (ACS), which provides carbon regeneration services to utility organizations, both inside and outside the American Water organization. ACS is not a standalone legal entity, but rather is a line of business of AAET L.P.¹⁶⁰

Exhibit VIII-1 illustrates the American Water organization within the RWE organization, with state of incorporation shown in the lower left corner of each box. Pennsylvania-American Water Company is highlighted in gray to showcase its location within the American Water organization.¹⁶¹

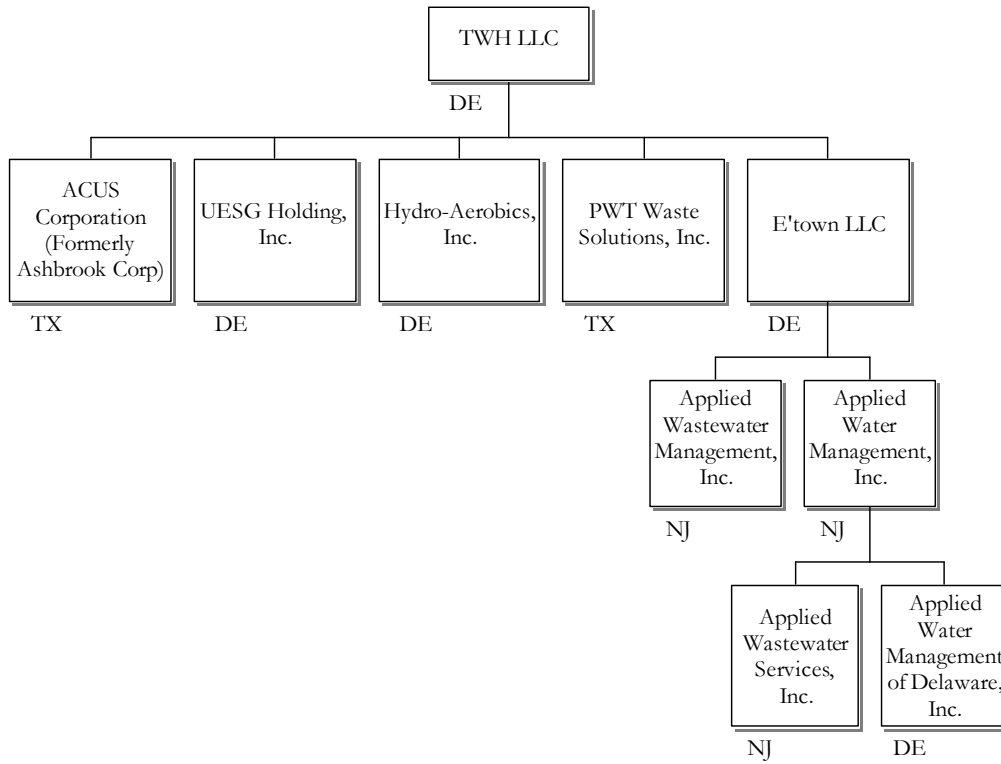
The subsidiaries of TWH, LLC¹⁶² and American Water Enterprises, Inc. (AWE) are shown respectively in *Exhibit VIII-2* and *Exhibit VIII-3*.¹⁶³

Exhibit VIII-1
American Water Works Company, Inc. Organization
as of December 31, 2007



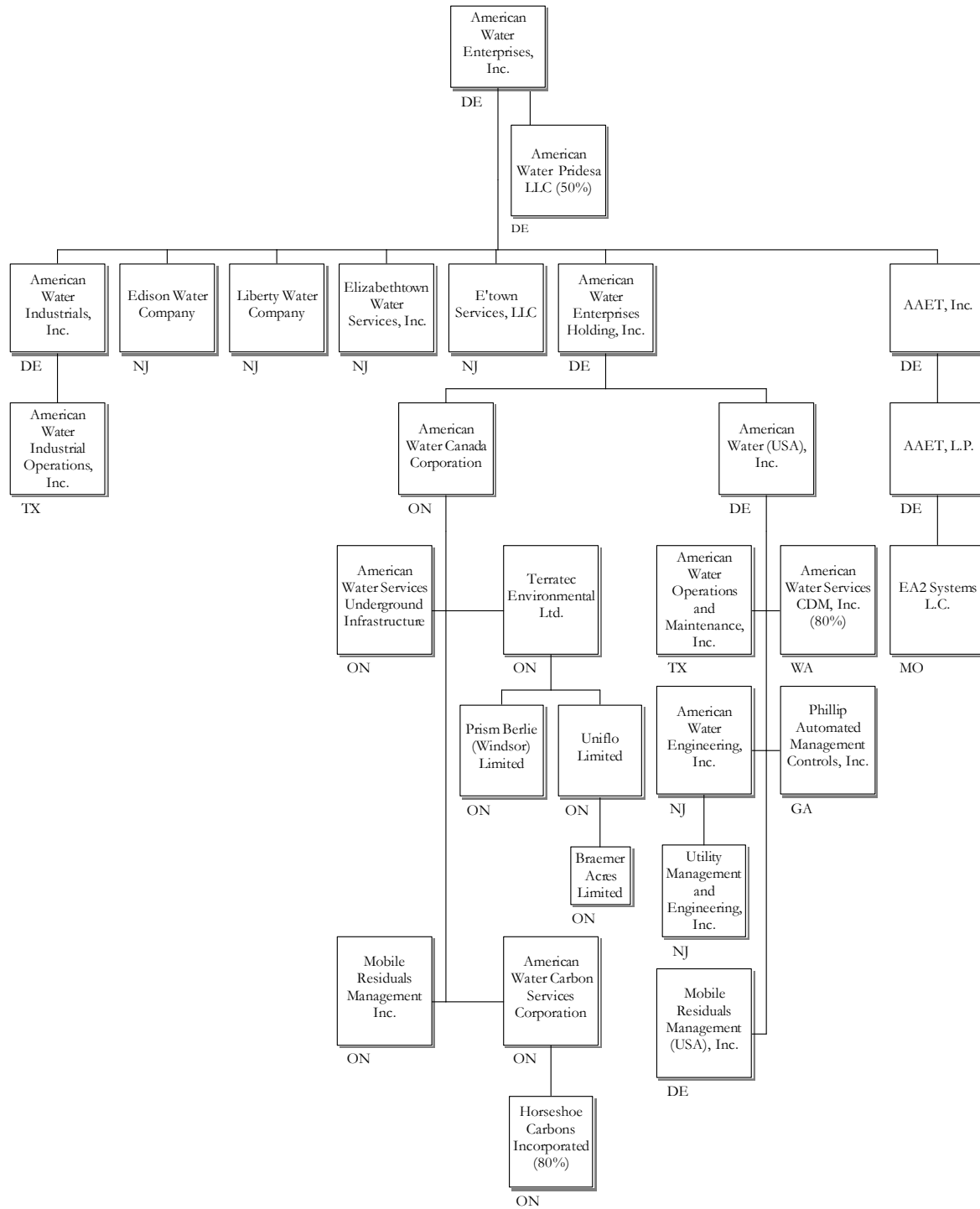
Source: Information Response 181 and Company Comments

**Exhibit VIII-2
TWH, LLC Organization
as of December 31, 2007**



Source: Information Response 181

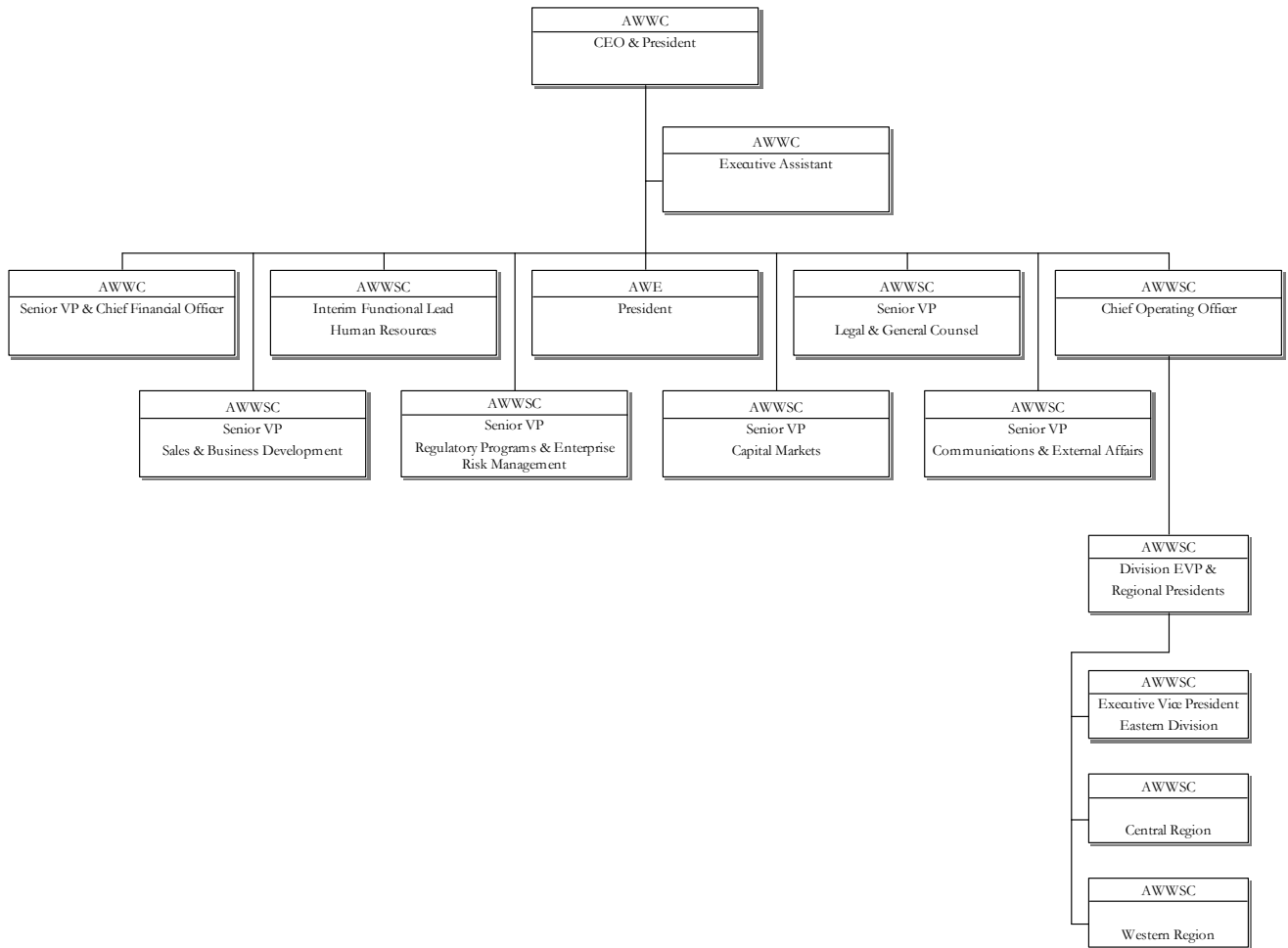
**Exhibit VIII-3
American Water Enterprise, Inc. Organization
as of December 31, 2007**



Source: Information Response 181 and Company Comments

AWWSC has both a corporate group in Voorhees as well as two divisions (Eastern and Western). The divisions are composed of two regional organizations, which are located in various locations throughout American Water’s service territories.¹⁶⁴ *Exhibit VIII-4* illustrates the AWWSC corporate organization.¹⁶⁵

Exhibit VIII-4
AWWSC Corporate Organization
as of December 31, 2007



Acronyms at top of each box represent the employee’s company affiliation. Although most employees are AWWSC employees, some are actually American Water Works Company (AWWC) employees or American Water Enterprises (AWE) employees.
 Note: Regional presidents are also EMT members.
 Source: Information Response 257

As stated in a service agreement between AWWSC and PAWC, in addition to corporate guidance, AWWSC provides PAWC with the following services:¹⁶⁶

- ◆ *Accounting* – assist with preparation and implementation of accounting methods and procedures to determine that they conform fully to the requirements, rules, and regulations of governmental authorities having jurisdiction and review.
- ◆ *Administration* – perform or assist in performance of corporate activities, thereby keeping abreast of economic, regulatory, governmental, and operational developments and conditions.
- ◆ *Communication* – recommend procedures to promote satisfactory relations with employees, customers, communities, and the general public and assist in preparation of communication materials.
- ◆ *Corporate Secretarial* – assist in preparation and/or maintain documents such as minute books, by-laws, contracts, stocks, deeds, and other corporate records, and administer an orderly program of records retention.
- ◆ *Engineering* – assist and provide engineering services (i.e., system surveys, hydraulic analyses, inspections, field investigations) to aid in planning for, operating, maintaining, and constructing facilities, and provide a materials management program for volume purchase.
- ◆ *Financial* – assist in cash management and in the development and implementation of financing programs, advice on securities' market conditions, and preparation of financial reports.
- ◆ *Human Resources* – assist in obtaining qualified personnel and in carrying out training programs for the development of personnel, assure compliance of employment laws, and advise with pension and benefit plans.
- ◆ *Information Systems* – provide electronic data-processing services, including customer billing and accounting, financial statements, and other reports required by federal and state agencies.
- ◆ *Operation* – develop and assist the implementation of operating procedures to promote efficient and economic operation.
- ◆ *Rates and Revenue* – recommend changes in rates, rules, and regulations and assist in conduct of proceedings before, and in compliance with the rulings of, regulatory bodies having jurisdiction over operations.
- ◆ *Risk Management* – assist in the establishment of safety and security programs to avoid or minimize risk and loss, provide a risk management program to review exposures to accidental loss, recommend efficient methods of protection, arrange for purchase of insurance coverage, and supervise any investigation procedures.
- ◆ *Water Quality* – assist in compliance with standards of governmental agencies, provide design criteria for processes and technical assistance, and help establish and attain water quality objectives; also provide laboratory services for programmed analyses as required by drinking water regulations and any special analyses required by PAWC.

The AWWSC organization provides services to PAWC and other utilities within the Southeast Region states of Kentucky, Maryland, Tennessee, Virginia, and West Virginia. The list below reflects organizations/services provided to PAWC prior to the organization realignment that occurred in the latter part of 2007. These organizations/services include:¹⁶⁷

- ◆ Business Development
 - Wastewater Business Performance & Environmental Compliance
 - Client Business Development
 - Business Development Support
 - Project Management
- ◆ External Affairs
 - Communications and Customer Relations
 - Governmental & Regulatory Affairs
- ◆ Finance
 - Rates & Regulations
 - Performance, Planning, & Reporting
 - Controls & Compliance
- ◆ Human Resources
- ◆ Legal
- ◆ Regional Service Delivery
 - Business Performance
 - Operational Excellence
 - Contract Operations
 - Customer Relations
 - Field Resource Coordination Center (FRCC)
 - Collections & Compliance
 - Dispatch Center & Customer Service Center (CSC)
 - Major Customer Accounts Management
 - Engineering
 - Project Delivery & Developer Services
 - Technical Services
 - Asset Management & Capital Programs Management
 - Major Customer Accounts Management
 - Environmental Management & Compliance
 - Water Quality Management
 - Environmental Compliance

- Maintenance
 - Reliability
 - SCADA Management
- Network
- Operational Risk Management
 - Loss Control
 - Security & Event Management
- Production
- ◆ Pennsylvania-American Water Company Service Delivery – Network & Production
- ◆ Kentucky-American Water Company Service Delivery – Network & Production
- ◆ Tennessee-American Water Company Service Delivery – Network & Production
- ◆ Virginia- & Maryland-American Water Company Service Delivery – Network & Production
- ◆ West Virginia-American Water Company Service Delivery – Network & Production

Agreements

Exhibit VIII-5 lists specific affiliate agreements involving PAWC and American Water entities.¹⁶⁸ All of the agreements have been previously approved by the Pennsylvania Public Utility Commission (PaPUC); however, Schumaker & Company believes that the AWWSC/PAWC agreement is not up-to-date and should be resubmitted to the PaPUC for review and approval, as discussed later in *Finding VIII-4*.¹⁶⁹

Exhibit VIII-5
Affiliate Agreements involving PAWC and Other American Water Entities
as of December 31, 2007

Type	Parties	Term
Service agreement for services provided by AWWSC to PAWC	AWWSC/PAWC	01/01/89–Ongoing Amended 09/18/89
Lease agreement for building office space provided by PAWC to AWWSC at 800 West Hersheypark Drive in Hershey, PA	PAWC/AWWSC	Original Date 01/24/00 Latest Amendment 01/01/05–02/28/15
Furniture, equipment, and computer hardware and software agreement for provision of electronic data-processing services by AWWSC to water utilities using PAWC’s equipment	PAWC/AWWSC	01/01/94–Ongoing
Financial services agreement	AWCC/PAWC	06/15/00–Ongoing
Customer support and call center services for water line protection program between PAWC and AWR	PAWC/AWR	05/09/00 Ongoing
Customer support and call center services for sewer protection program between AWR and PAWC	AWR/PAWC	11/25/03 Ongoing
Customer in-home plumbing emergency protection program between AWR and PAWC	AWR/PAWC	5/12/06 Ongoing
Granular activated carbon (GAC) agreement for Montrose Water Treatment Plant with AWR d/b/a American Carbon Services (ACS)	Montrose Water Treatment Plant/AWR	01/01/02–12/31/04 *
GAC agreement for Pittsburgh with AWR d/b/a ACS	Pittsburgh System (Hays Mine Treatment Plant and Aldrich Water Treatment Plant)/AWR	01/01/04–12/31/07
GAC agreement for Huntsville Water Treatment Plant with AWR d/b/a ACS	Huntsville Water Treatment Plant/AWR	01/01/05–12/31/07
GAC agreement for Ceasetown Water Treatment Plant with AWR d/b/a ACS	Ceasetown Water Treatment Plant/AWR	01/01/05–12/31/07
GAC agreement for West Shore Regional Water Treatment Plant with AWR d/b/a ACS	West Shore Regional Water Treatment Plant/AWR	11/01/05–12/31/09
GAC agreement for Silver Spring Water Treatment Plant with AWR d/b/a ACS	Silver Spring Water Treatment Plant/AWR	01/01/07–12/31/09
GAC agreement for Norristown Water Treatment Plant with AWR d/b/a ACS	Norristown Water Treatment Plant/AWR	03/02/07–03/01/09
GAC agreement for New Castle Water Treatment Plant with AWR d/b/a ACS	New Castle Water Treatment Plant/AWR	01/01/07–12/31/08
GAC agreement for Hershey Water Treatment Plant with AWR d/b/a ACS	Hershey Water Treatment Plant/AWR	01/01/07–12/31/09

* The most recent GAC contract executed for the Montrose Water Treatment Plant expired on 12/31/2004. A complete filter rebuild of the two filters at the plant occurred recently. The first filter was rebuilt in 2006, the other in 2007. At that time, virgin GAC media was installed in the filters. No contract with American Carbon Services was required because its services were not required. PAWC expects to execute a contract with American Carbon Services in 2008 to cover regeneration of the GAC in the filters.

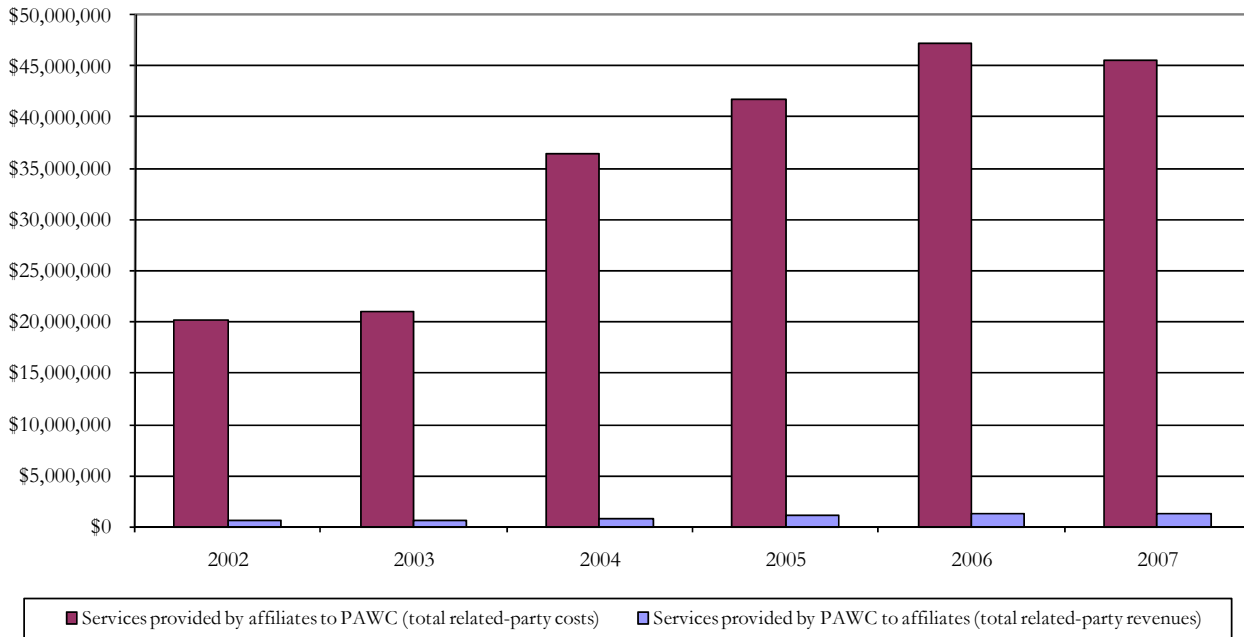
Source: Information Responses 182, 183, 192, 845, 853, and 863

Affiliate Transactions

Services Provided To/From PAWC

Exhibit VIII-6 illustrates the summary charges associated with services provided from/to PAWC.¹⁷⁰

Exhibit VIII-6
Summary of Charges Involving Affiliated Services Provided To/From PAWC
2002 to 2007



Source: Information Responses 183, 723, 881, 882, 883, 884, 885, 886, 887, 888, and Company Comments

Exhibit VIII-7 displays the details of charges from affiliates to PAWC (PAWC related-party costs) and from PAWC to affiliates (PAWC related-party revenues).¹⁷¹ As anticipated by Schumaker & Company consultants, the costs that PAWC pays to AWWSC for services are the largest component of PAWC's affiliate transactions.

**Exhibit VIII-7
Summary of Charges Involving Affiliated Services Provided To/From PAWC by Affiliate/Type
2002 to 2007**

	2002	2003	2004	2005	2006	2007	Compound Growth Rate
Services provided by AWWSC to PAWC							
O&M expenses	\$16,495,000	\$11,359,000	\$31,150,000	\$32,351,000	\$40,396,000	\$40,610,000	19.7%
Capitalized costs	\$2,719,000	\$7,604,000	\$3,594,000	\$7,911,000	\$3,664,000	\$3,321,000	4.1%
Services provided by AWWSC to PAWC	\$19,214,000	\$18,963,000	\$34,744,000	\$40,262,000	\$44,060,000	\$43,931,000	18.0%
Line of credit fees paid to AWCC	\$342,000	\$221,000	\$192,000	\$187,000	\$263,000	\$217,000	-8.7%
Interest paid to AWCC on intercompany borrowings	\$437,000	\$964,000	\$382,000	\$279,000	\$1,834,000	\$869,000	14.7%
Preliminary cost of long-term financings with AWCC	\$245,000	\$69,000	\$57,000	\$0	\$0	\$0	-100.0%
Purchase of granular activated carbon from ACS	\$0	\$760,000	\$987,000	\$1,071,000	\$1,019,000	\$438,000	3275.2%
Work by WVAWC employee on behalf of PAWC following transfer	\$0	\$0	\$0	\$0	\$0	\$5,300	1295.9%
Services provided by affiliates to PAWC (total related-party costs)	\$20,238,000	\$20,977,000	\$36,362,000	\$41,799,000	\$47,176,000	\$45,460,300	17.6%
Lease of building office space by AWWSC	\$241,000	\$271,000	\$319,000	\$638,000	\$691,000	\$706,000	24.0%
Rental of furniture and equipment by AWWSC	\$371,000	\$323,000	\$299,000	\$220,000	\$205,000	\$189,000	-12.6%
Billing and collection services provided to AWR	\$0	\$150,000	\$227,000	\$308,000	\$373,000	\$478,000	3334.7%
Services provided by PAWC to affiliates (total related-party revenues)	\$612,000	\$744,000	\$845,000	\$1,166,000	\$1,269,000	\$1,373,000	17.5%

WVAWC: West Virginia-American Water Company

Source: Information Responses 183, 723, 881, 882, 883, 884, 885, 886, 887, 888, and Company Comments

Services Provided by Affiliates to PAWC

As anticipated, the largest share of affiliate charges to PAWC are for AWWSC services, followed by AWCC and ACS charges, respectively. *Exhibit VIII-8* displays PAWC's share of AWWSC expenses from 2002 to 2007.¹⁷²

**Exhibit VIII-8
PAWC's Share of AWWSC Expenses
(\$ Thousands)
2002 to 2007**

	2002	2003	2004	2005	2006	2007	Compound Growth 2002-2007
Total AWWSC Expenses Billed to All Affiliates, Including PAWC	\$106,899	\$124,896	\$198,745	\$232,277	\$264,825	\$254,255	18.9%
PAWC's Share of AWWSC Expenses							
Capital Construction	\$2,719	\$7,604	\$3,594	\$7,911	\$3,664	\$3,321	4.1%
O&M Expenses	\$16,495	\$11,359	\$31,150	\$32,351	\$40,396	\$40,610	19.7%
Total Capital Construction and O&M Expenses	\$19,214	\$18,963	\$34,744	\$40,262	\$44,060	\$43,931	18.0%
Total PAWC's % of AWWSC Expenses	17.97%	15.18%	17.48%	17.33%	16.64%	17.28%	

Source: Information Response 724



Information available for the last three years (2005 to 2007) indicates that direct charges having ranged from approximately 7.5% to 15.6% of total charges from AWWSC to PAWC.¹⁷³

Exhibit VIII-9
Percentage of Direct Charges versus Allocations for AWWSC Charges to PAWC
2005 to 2007



Source: Information Response 829

With regard to AWWSC services, PAWC’s charges are on an at-cost, not-for-profit basis as specified in the agreement between the two entities. A portion of these services are capitalized as part of PAWC’s utility plant assets.¹⁷⁴

Services Provided by PAWC to Affiliates

The largest portion of affiliate charges from PAWC to affiliates is for lease of office space and associated furniture and equipment at the PAWC headquarters location in Hershey to AWWSC for use by its Southeast Region staff. Other charges for affiliate charges from PAWC to affiliates are related to billing and collection services provided by PAWC to AWR involving AWR’s water line protection, sewer line protection, and in-home plumbing emergency protection services provided to PAWC’s customers.¹⁷⁵ (PAWC’s customers pay AWR for these programs, resulting in revenue to AWR, then AWR pays PAWC for billing and collection services provided by PAWC.)

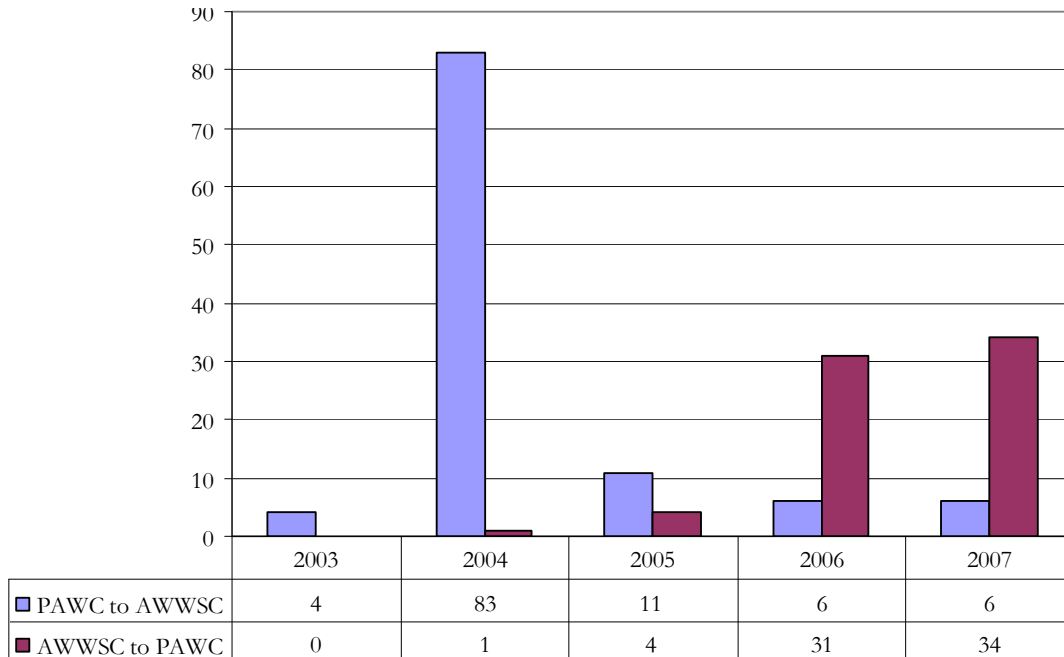
Personnel Transfers From/To PAWC

When employees are transferred from/to PAWC and its affiliates, the transfers are accounted for by American Water at the headcount level only. That is, costs previously incurred (up to the time of transfer) for salaries/wages, employee benefit costs, and related budget dollar amounts (such as training

costs) remain with the group from which the employee transferred. Costs subsequently incurred (after the time of transfer) are charged to the group to which the employee transferred.¹⁷⁶

Exhibit VIII-10 illustrates the headcount of individuals transferred between PAWC and AWWSC during the years spanning 2003 through 2007.¹⁷⁷

Exhibit VIII-10
Personnel Transfers From/To PAWC and its Affiliates
2003 to 2007



Source: Information Responses 184 and 723

The reorganization that created the regional AWWSC organizations was primarily implemented during 2004 and is the reason for the higher 2004 transfers of PAWC personnel to AWWSC. The higher level of personnel transfers in 2006 from AWWSC to PAWC reflects the transfer back of individuals who were part of regional organizations (e.g., network and engineering) but were dedicated to PAWC.¹⁷⁸ The 2007 number includes year-end transfers resulting from American Water's most recent realignment.¹⁷⁹

Property Transfers From/To PAWC

There have been no affiliated transactions involving property transfers during the past five years. Additionally, Pennsylvania-American Water Company is the owner of real property that has been improved with a two-story building located at 800 West Hersheypark Drive in Hershey (PA). On January 24, 2000, PAWC and AWWSC entered into a lease agreement whereby AWWSC agreed to lease office space at the Hershey location. Four subsequent addendums to the agreement have added to the office space under lease by AWWSC.¹⁸⁰

Major Processes and Systems

Cost Accumulation & Assignment

Pennsylvania-American Water Company

PAWC's time and attendance system is primarily for payroll purposes.¹⁸¹ The PAWC system, which interfaces with the AWWSC's JDE time and attendance system, produces a default time sheet for each PAWC employee based on predetermined information provided. Labor distribution is validated. Leave balances (vacation, sick days, etc.) are created and validated against the available balance. Job-type codes are used to calculate a base rate. The system is also designed to consider applicable shift differentials so that the employee's total gross pay can be calculated. All hours reflected in the time and attendance system are verified with those hours transferred to the JDE payroll module.¹⁸²

Unlike the JDE cost-allocation module that automatically determines AWWSC charges to American Water affiliates, the regional AWWSC organization must manually create an invoice if, and when, PAWC performs services for other American Water entities.¹⁸³ Charges from PAWC to AWWSC or other American Water affiliates are processed via an inter-company request form. An example of such a charge is the monthly rental charge to AWWSC for Hershey office space. Only in rare and exceptional cases, however, does PAWC bill other regulated affiliates for goods and/or services. In such situations, the inter-company billing request form is also used. Both the initiating and receiving parties must agree on the charges before processing. Billing is at actual cost of the goods or services.

AWWSC

Time spent by AWWSC employees to provide services to all business units is recorded on weekly time sheets. The time spent to provide services directly to regulated or non-regulated business units (BUs) is directly charged to the billing number (sometimes referred to as a charge code) that is specific to the BU(s). The time spent providing services shared in common with similar services provided to other regulated and non-regulated BUs is allocated based on formulas as discussed in the *Cost Allocation* section as *Tier One* charges.¹⁸⁴

Three major types of billing numbers are used within AWWSC for cost accumulation as follows:¹⁸⁵

- ◆ *Authorizations* – These billing numbers are used to segregate costs for specific tasks or projects that benefit a specific group of BUs (i.e., water quality research for surface water treatment plants) or a more all-encompassing group of BUs (i.e., the start-up costs for the Call Center project). *Tier One* charges to regulated and non-regulated BUs that benefit from the completion of a project billed through an authorization billing number are determined through the use of a cost-allocation formula.¹⁸⁶

- ◆ *Task Orders* – These billing numbers are used to segregate costs for specific tasks or projects that are primarily associated with specific capital projects. In most instances, time charges can be directly assigned to the individual BU that is authorized to complete a capital project.¹⁸⁷
- ◆ *Formulas* – These billing numbers are used to record charges for time spent providing services to two or more BUs (i.e., purchasing, payroll, tax preparation, etc.). Formulas are used to segregate and allocate the costs incurred in providing similar services among the group of BUs that benefit from that service.¹⁸⁸

Additionally, overhead billing numbers are used by support staff and facilities services for support staff labor, utility bills, rent, depreciation, etc. In this way, they serve as a means of assigning overhead costs either directly in support of one operating company (direct charges) or in allocation to several operating companies (allocations).¹⁸⁹

Direct Charges/Cost Allocation

The hierarchy of how AWWSC charges are billed to other American Water affiliates is as follows:

- ◆ First, direct charges are made to a subsidiary or a group of subsidiaries based on time reporting; direct charges are made for services provided to an identifiable business unit or, for employees performing transactional services, on the basis of a sample period of detailed time sheet records.¹⁹⁰
- ◆ Second, AWWSC costs are then split between regulated and non-regulated entities based on what American Water considers cost causative factors, also referred to by American Water as *Tier One* charges. This was a new step that began in 2005 based on work performed by a cost-allocation committee with input from an outside consulting firm (Deloitte Touche). The role of the committee was to review AWWSC's cost-allocation procedures, particularly with regard to the allocation of AWWSC costs to the non-regulated entities. In this way, the committee could ensure that an appropriate portion of AWWSC costs was allocated to the non-regulated entities, based on the nature of any services provided to them. The committee was formed in late 2003 and work (including interviews with all AWWSC functional leads) continued until 2004. Its results (a matrix of factors by group and associated rationales) were then approved and submitted to a "billing rewrite process" group as one of the inputs in making changes to American Water's cost-allocation process. Implemented at the beginning of 2005, training was provided to all AWWSC employees by the Human Resources (HR) organization.¹⁹¹ The metrics currently being used for allocating these *Tier One* charges among regulated and non-regulated entities include:¹⁹²
 - 1) *3-Factor Formula* – includes the primary cost drivers of (1) operating revenues, (2) net property, plant, and equipment, and (3) employees that are common to the operation of regulated and non-regulated BUs. Each of these drivers is equally weighted within the formula. Also, these metrics include only those non-regulated BUs that are receiving services.
 - 2) *2-Factor Formula* – includes the primary cost drivers of operating revenues and employees, with each of these drivers equally weighted within the formula. Also, these metrics include only those non-regulated BUs that are receiving services.



- 3) *Revenue Factor* – Operating revenues were selected as a surrogate for customers, because certain affiliates do not have their own customers. For example, this factor is the primary cost driver for external communication. Also, this metric includes only those non-regulated BUs that are receiving services.
- 4) *Personal Computer Factor* – includes the number of personal computers as the primary cost driver for those Information Technology Services (ITS) organization services associated with acquiring and supporting personal computers (PCs).
- 5) *Total Premises Factor* – includes the number of premises¹ maintained on the AS/400 database as the primary cost driver for ITS services associated with operation of AS/400 computers.
- 6) *Employee Factor* – includes the number of employees as the primary cost driver for general employee-related services such as human resources and payroll. Also, this metric includes only those non-regulated BUs that are receiving services.
- 7) *Budgeted Capital Projects and Engineering Project Management Factor* – includes the dollar value of budgeted capital expenditures for the year as the primary cost driver for services associated with capital projects as well as costs not directly assignable to task orders.
- 8) *Research Authorization Project Factor* – includes the dollar value of budgeted research projects for the year as the primary cost driver for services associated with water quality research projects. This metric includes only those non-regulated BUs that are receiving services.
- 9) *Accounts Payable Factor* – includes the number of invoices, purchase orders, and P-Card transactions processed on an annual basis as the primary cost driver for transactional services associated with purchasing and paying invoices for goods and services.
- 10) *Employee and Retiree Factor* – includes the sum of the number of employees and retirees as the primary cost driver for Human Resource’s Benefits Call Center services and its benefits support communications.
- 11) *Procurement Volume* – includes the procurement volume (in dollars) for the previous year as the primary cost driver for transactional services associated with procurement and supply chain for goods and services.
- 12) *Paychecks Issued* – includes the number of paychecks processed for the previous year as the primary cost driver for transactional services associated with processing paychecks for employees of all business units.
- 13) *Purchasing Factor* – includes the number of annual purchase orders as the primary cost driver for services associated with purchasing goods and services under supply contracts.
- 14) *ITS Servers Allocator* – includes the number of servers dedicated to each function as the primary cost driver for services associated with computer servers that are dedicated to regulated business units versus non-regulated business units.

¹ The term “premises” is the reference to a location/customer record in ORCOM. Billing is done for some non-regulated customers as well as regulated customers. The statistic is easily obtained from ORCOM records.

- ◆ Third, the number of customers is used to split regulated costs among the various utility organizations, also referred to by American Water as *Tier Two* charges. The number of customers at year end is used for allocations in the following year (unless significant changes occur). American Water management uses the number of customers for splitting costs among regulated entities because all of its regulated customers are considered to receive essentially the same services.¹⁹³
- ◆ Fourth, overhead costs are charged to both directly charged and allocated costs.¹⁹⁴

The above description is conceptually the hierarchy of how direct charges/cost allocations occur, although the computer system actually performs the first three items simultaneously and then applies overhead costs accordingly.¹⁹⁵

AWWSC expenses are categorized in *Exhibit VIII-11*, which shows whether a category results from being directly charged, allocated, or potentially both.¹⁹⁶

Exhibit VIII-11
AWWSC Expense Categories
as of December 31, 2007

Expense Category	Description	Direct Charged	Allocated	Comments
Labor	Base pay (salaries) of managerial, professional, and technical employees	X	X	Professional personnel working for one or several operating companies
Support	Wages and salaries of office support personnel, including secretaries, clerical personnel, telephone operators, and mail clerks		X	Administrative personnel supporting the professional staff; thus support costs are allocated on the basis of professional labor
Labor-related Overheads	Employee benefit costs (payroll taxes, medical coverage, pensions, disability insurance) and other general expenses	X	X	Primarily employee benefit costs that relate directly to labor
General overheads	Office rent, equipment leases, telephone, electric, office supplies, property taxes, office maintenance		X	Allocated on the basis of professional labor
Vouchers/journals	<ul style="list-style-type: none"> ◆ Travel expenses incurred by AWWSC personnel ◆ Other items submitted for reimbursement by employees, including professional association dues ◆ Outside service contracts for such things as actuarial services ◆ Various other expenditures, including data center expenses for software licenses and hardware maintenance 	X	X	May be either directly in support of one operating company (e.g., an engineer traveling from the Corporate Office to the operating company) or allocated to several operating companies

Source: Information Response 831

The VP Planning & Reporting is responsible for cost-allocation oversight at AWWSC. On behalf of PAWC, the AWWSC Southeast Region Finance Director is responsible for cost-allocation oversight at PAWC.¹⁹⁷ The Financial Planning & Analysis group reporting to the Southeast Region Finance Director reviews the AWWSC bills on a monthly basis to ensure that charges are appropriate.¹⁹⁸

Systems

AWWSC uses JD Edwards (JDE) from Oracle for its financial enterprise resource planning (ERP) system, and as such, it is the system used to support direct billing and/or cost allocation to affiliated companies. Additionally, AWWSC and PAWC use internally-constructed time and attendance modules that are downloaded into the JDE software.¹⁹⁹

Invoicing and Payment Methodologies

AWWSC bills monthly for the cost it incurs in providing affiliate services. All charges that pass through AWWSC must be billed at the end of each period; therefore, according to AWWSC management, a high-level verification of the AWWSC profit and loss (P&L) statement is performed to ensure that all expenses were billed.²⁰⁰

A monthly bill (AWWSC to PAWC) showing a description of service (by function), number of associated hours (by function), associated payroll dollars (by function), associated expense dollars (by function), and total dollars (by function), along with summary totals is provided for current-month charges. The total amount due includes total current month charges minus payment for prior estimated billing, plus estimated current-month billing.²⁰¹

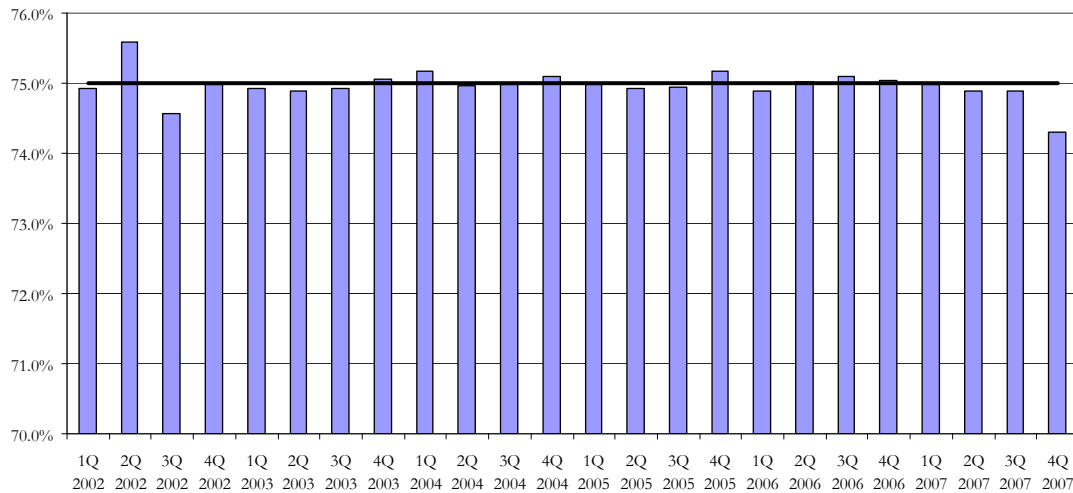
Restrictions

Dividends

The *American Water Subsidiary Dividend Policy* establishes the requirements for the payment of common stock dividends by American Water subsidiaries. American Water is a holding company whose principal asset is the common stock of its subsidiaries. This policy has been designed, according to American Water management, to provide American Water with the necessary cash to meet its obligations to its subsidiaries and shareholders. At the same time, it is designed to strike a balance between an appropriate capital structure for each subsidiary and maintenance of an appropriate dividend payout to shareholders. The *Regulated Utility Subsidiary* section of this policy discusses the payment of dividends by regulated utility subsidiaries, including PAWC. All dividend payouts made by PAWC must be approved in advance by its Board of Directors and associated dividend calculations are to be made in accordance with provisions of this policy. The latest common stock dividend-declaration resolution during audit fieldwork was presented at the July 26, 2007 meeting of PAWC's Board of Directors²⁰²

Exhibit VIII-12 illustrates PAWC’s dividend payments from 2002 to 2007 to its parent company expressed as a percentage of the relevant year’s net income to common stock.²⁰³ The level of dividend payments has been within a reasonable range in that it is similar to, although possibly on the high side of, the net income percentage that other utility organizations typically pay out.

Exhibit VIII-12
PAWC Dividend Payments to American Water
2002 to 2007



Source: Information Response 729

Other Restrictions

PAWC’s financial instruments, specifically its mortgage bonds, have fairly typical covenants, such as:²⁰⁴

- ◆ With respect to amount and type of dividend payments
- ◆ Regarding sale of all, or substantially all, of company property subject to indenture
- ◆ With respect to payment of monies paid by trustee regarding monies held
- ◆ With respect to issuance of additional bonds
- ◆ Providing financial information to trustee on a periodic basis
- ◆ Providing default notice in the event of default

Other financial instruments include promissory notes to various entities, including American Water Capital Corporation and Pennsylvania Infrastructure Investment Authority (PENNVest), with fairly standard terms and conditions.²⁰⁵

Schumaker & Company did not note any credit-rating triggers or provisions leading to collateral calls that carry the potential to unduly affect the regulated utility’s liquidity.

B. Findings & Conclusions

Finding VIII-1 **Cost allocation documentation was disjointed and poorly organized, which required Schumaker & Company auditors to meet with multiple individuals and to review multiple documents in order to understand how affiliate relationships and cost allocations are handled at American Water.**

In its initial information requests, Schumaker & Company requested “any cost accumulation and assignment documentation” plus “any cost billing/allocation documentation, including any documentation describing methodologies, bases, and factors used for direct billing and/or cost allocation, and/or segregating regulated and unregulated costs, including (but not limited to) finance manuals, assignment policies, and cost-allocation manuals.” The response to these requests was a four-page document titled *Rationale for Allocation of Service Company Costs*, in which the cover sheet did not discuss *Tier One* allocation methodologies as part of the hierarchy for affiliate charges. The supporting documentation, however, did address such methodologies.²⁰⁶ In another initial information request, Schumaker & Company requested a “description of daily accounting standards and recordkeeping methods and procedures that support the daily operations between PAWC and its affiliates.” The response to this request was a three-page presentation that did not discuss overhead charges.²⁰⁷ Another three-page document was provided late in the audit, which discussed AWWSC expense categories, charging of AWWSC time and expenses, and the methodology for allocating regulated and non-regulated companies’ common costs.²⁰⁸ In Schumaker & Company’s opinion, none of these documents was a comprehensive cost-accumulation, assignment, and allocation manual.

Additionally, to obtain a detailed discussion of the 14 factors used for allocating *Tier One* charges, Schumaker & Company was required to subsequently request a “description of the Cost Allocation Committee (composition, mission/purpose) and actions taken, plus a resultant four- to five-page matrix of factors and associated rationales developed for segmenting regulated and non-regulated AWWSC costs.” The aim of this request was to obtain the “draft” suggested methodologies that were the basis for those that were eventually implemented.²⁰⁹ A discussion of these allocation factors was not part of the initial information responses.

These audit responses dealt only with AWWSC and not other American Water affiliates. To understand how affiliate charges were handled for other American Water affiliates, Schumaker & Company auditors had only the affiliate agreements and discussions with staff to document what was happening.

The lack of a cohesive set of comprehensive affiliate relationship and cost allocations documentation for all American Water affiliates presents an ongoing issue for American Water employees in understanding how affiliate transactions are supposed to work (or actually work) within the American Water organization. The lack of documentation also raises questions about American Water’s ability to consistently adhere to a set of guidelines, if the guidelines are not clearly specified.

Making our efforts even more difficult was the lack of centralization at American Water regarding responsibility for affiliate relationships and associated cost allocations. Although the AWWSC VP Planning & Reporting has oversight responsibility for cost allocations, our primary contacts for affiliate relationships and cost allocation discussions were the AWWSC VP Regulatory Programs and the AWWSC Southeast Region Finance Director.

Finding VIII-2 The cost-allocation methodologies impacting PAWC are generally reasonable, although the use of number of customers for allocating AWWSC costs among regulated utilities is essentially a simplification mechanism that is not based on cost-causative factors.

Although the methodologies currently used for affiliate charges involving PAWC are different for major affiliates, these methodologies are generally reasonable, as follows:²¹⁰

From PAWC to Affiliates

- ◆ *Lease of PAWC Office Space to AWWSC* – Rental charges are made to AWWSC on a per-square-foot charge basis. In 2004 (just before the latest agreement amendment was created in 2005), the rates were set at \$12.60 for office space and \$8.95 for mailroom space.²¹¹ These rates were based on a review of space lease, or available for lease, in the spring of 2004, which was conducted by one of the largest real estate firms in central Pennsylvania.²¹² These rates can be adjusted each year in proportion to the increase in the All Cities Consumer Price Index (CPI) for all Urban Companies, which is published by the Bureau of Labor Statistics of the United State Department of Labor.²¹³ Additional rental charges are allocated to AWWSC based on its proportionate share of real estate taxes and assessments, building maintenance, and utilities. Also any leasehold improvements specifically requested by AWWSC are directly charged.²¹⁴
- ◆ *Provision of PAWC Furniture & Equipment to AWWSC* – For use of the furniture, equipment, and hardware/software provided by PAWC, AWWSC pays the sum of the following multiplied by the ratio of the aggregate of the total number of customers of PAWC plus the total number of customers of those other water companies for whom AWWSC provides electronic data-processing services and who use the equipment. That figure is then divided into the total number of customers of those other water companies from whom AWWSC provides services and uses the equipment.²¹⁵
 - Depreciation expense
 - A return on the equipment based on the pre-tax return authorized in PAWC's latest rate case before the PaPUC
 - All applicable sales taxes
- ◆ *Billing and Collection Services Provided to AWR by PAWC* – AWR receives payments directly from PAWC customers for these programs. In return, AWR pays PAWC for its expenses plus 15% to provide customer support and call center services for the water line program, customer support



dispatch and billing services for the sewer line program, and customer support and billing services for the in-home plumbing emergency protection services program.²¹⁶ The 15% represents margin on the fully-distributed pre-tax costs to PAWC.²¹⁷

From Affiliates to PAWC

- ◆ *Line of Credit Fees and Interest Paid to AWCC on Intercompany Borrowings Paid to AWCC* – These costs are allocated as follows to PAWC and other American Water entities:²¹⁸
 - The costs incurred by AWCC in connection with its bank credit lines and short-term public borrowings are divided among co-participants in proportion to the maximum principal amount that each co-participant requests be made available to it during the course of a year.
 - The costs incurred by AWCC in connection with each long-term borrowing is divided among co-participants in proportion to the principal amount of that borrowing that is loaned to each co-participant.
 - The amount of AWCC's overhead costs are allocated among the co-participants in the same proportion as each co-participant's long-term and maximum requested short-term borrowing and investments in a calendar year relative to all of the long-term and maximum short-term borrowings and investments by all co-participants during the same year.
- ◆ *Purchase of GAC from ACS* – Charges are made to PAWC on a per-cubic-foot basis, with escalation of these unit prices typically occurring on a yearly basis.
- ◆ *AWWSC Services Provided to PAWC* – Charges are made to PAWC and other American Water affiliates as follows:
 - First, direct charges are made to a subsidiary or a group of subsidiaries based on time reporting; direct charges are made for services provided to an identifiable business unit or, for employees performing transactional services, on the basis of a sample period of detailed time sheet records.²¹⁹
 - Second, AWWSC costs are then split between regulated and non-regulated entities based on what American Water considers cost-causative factors, also referred to by American Water as *Tier One* charges. This was a new step that began in 2005 based on work performed by a cost-allocation committee with input from an outside consulting firm (Deloitte Touche).²²⁰
 - Third, the number of customers is used to split regulated costs (and revenues) among the various utility organizations, also referred to by American Water as *Tier Two* charges. The number of customers at year end is used for allocations in the following year, unless significant changes occur. American Water management uses the number of customers for splitting costs among regulated entities, because all of its regulated customers are considered to receive essentially the same services.²²¹

Only portions of the AWWSC methodology are questionable, specifically those for *Tier Two* charges. The use of direct charges, whenever possible, over allocations for AWWSC charges is appropriate. Moreover,

Schumaker & Company normally prefers to see allocations made based on cost-causative factors. Ideally, the split not only between regulated and non-regulated entities (*Tier One*), but also between regulated entities (*Tier Two*) would be based on cost-causative factors. Specifically, the *Tier Two* methodology for AWWSC charges is questionable because the use of the number of customers to split regulated costs (and revenues) among the various utility organizations is theoretically incorrect. An exception is for those AWWSC functional areas where the cost-causative factor would be the number of customers.²²²

Nevertheless, American Water management believes that the existing hierarchy with its associated methodologies is simpler and results in substantially the same amount of charges to regulated entities, as illustrated by the following historical changes. From roughly 1971 to 1989, American Water considered its cost-allocation hierarchy to be complex and confusing. After direct charges were considered, cost-causative factors were then used to split AWWSC costs. Then in 1989, simplification occurred with direct charges followed by number of customers for allocating costs. In 2005, as described above, a middle step was added. That is because American Water management believed that a non-regulated customer was not the same as a regulated customer. For example, where AWE provides O&M services to a municipality, it has only one customer. If customers were used to split costs between regulated and non-regulated entities, then regulated entities would be providing an unfair share of AWWSC costs.²²³

Schumaker & Company concurs that, in this particular situation, little difference in actual allocations is likely, although it cannot be substantiated as part of this audit's scope. Because American Water has 14 cost-causative factors that it uses for allocating costs between regulated and non-regulated entities, as well as an associated system module for performing these allocations, it should be able to provide quantitative analysis as to the extent to which differences occur.

Finding VIII-3 Although American Water engaged an independent consultant in 2006 and 2007 to perform cost-to-market comparisons for AWWSC charges to three of its regulated utilities, it does not perform these comparisons on a regular basis.

Although American Water does not have a formal program for routinely and systematically comparing the use of AWWSC/affiliates versus that of outsourced vendors to ensure that PAWC is not being harmed by affiliate charges at cost rather than market, it has performed three such studies in other American Water states. Specifically, it studied Kentucky, West Virginia, and New Jersey in preparation for rates cases in those states. These 2006 and 2007 studies were undertaken to answer the following three questions concerning the services provided by AWWSC to each of these three states:²²⁴

1. Was the regulated water utility charged the lower of cost or market for managerial/professional services provided by AWWSC during a 12-month test year?
2. Were the 12 months of AWWSC's customer accounts services, including those of the National Call Centers, reasonable?
3. Are the services the regulated water utility receives from AWWSC reasonably necessary for the provision of service to its customers?



Regarding question # 1, the independent consultant formed the following conclusions from these studies:²²⁵

- ◆ The regulated water utility was charged the lower of cost or market for managerial and professional services during the 12-month test period.
- ◆ On average, the hourly rates for outside service providers were higher than AWWSC's hourly rates (ranging from 44% to 66% higher).
- ◆ The managerial and professional services provided by AWWSC are vital and could not be procured externally by the regulated water utility without careful supervision on the part of the regulated water utility. If these services were contracted entirely to outside providers, the regulated water utility would have to add at least one position to manage the activities of outside firms. This position would be necessary to ensure the quality and timeliness of services provided.
- ◆ If all the managerial and professional services now provided by AWWSC had been outsourced during the 12-month test period, the regulated water utility and its ratepayers would have incurred substantially additional expenses. Such expenses would have included the higher cost of outside providers and the cost of a regulated utility position needed to direct the outsourced work.
- ◆ The hourly rate comparison actually understates the cost advantages that accrue to the regulated water utility from its use of AWWSC. Outside service providers generally bill for every hour worked. AWWSC personnel, on the other hand, charge a maximum of eight hours per day, even when they work more. If the overtime hours of AWWSC personnel had been factored in to the hourly rate calculation, AWWSC would have had an even greater annual dollar advantage than the amounts cited in these studies.
- ◆ It would be difficult for the regulated water utility to find local service providers with the same specialized water industry expertise as that possessed by AWWSC staff. AWWSC personnel spend substantially all their time serving operating water companies. This specialization brings with it a unique knowledge of water utility operations and regulation that is most likely unavailable from local service providers.
- ◆ AWWSC fees do not include any profit markup. Only its actual cost of service is being recovered from the regulated water utility ratepayers.

Regarding question # 2, the independent consultant determined that the costs of AWWSC's customer accounts services, including those provided by the National Call Center, were within a reasonable range of the neighboring electric utility comparison group's average cost per customer. It was determined that this group of companies provided a reasonable size and scope proxy for comparison with the regulated water utility. During the 12-month test year, the customer accounts costs for the regulated water utility customers were compared to the average for neighboring electric utilities.²²⁶

Regarding question # 3, the following conclusions were drawn by the independent consultant:²²⁷

- ◆ The services that AWWSC provides are necessary and would be required even if the regulated water utility were, in fact, a standalone water utility.
- ◆ There is no redundancy or overlap in the services provided by AWWSC to the regulated water utility.

Based on the results of these studies, Schumaker & Company has no reason to believe that a similar study for PAWC would result in a different outcome, especially given the recent timeframe and location of these regulated water utilities. Nevertheless, as discussed in *Recommendation VIII-3*, American Water should continue to periodically perform these studies, including Pennsylvania in its investigations and analyses, even if not related to a rate case proceeding.

Additionally, AWWSC management provided the following examples where subsidiaries have opted not to use AWWSC to provide selected services:²²⁸

- ◆ Many of the non-regulated entities do not receive AWWSC charges because they have their own groups to perform the same functions. If they request services not previously performed by AWWSC employees, then the split of costs between regulated and non-regulated entities kicks in. It is up to the AWWSC supervisor to have his or her employees use the appropriate codes.
- ◆ Michigan-American Water Company (MAWC) does not use call center services performed by Alton or Pensacola, as described in the Customer Service chapter. MAWC serves 4,000 water-only customers in Calumet, Michigan. Its staff performs not only call center activities but also other administrative tasks. MAWC management believed that it was not efficient to have Alton/Pensacola perform call center functions and have administrative staff not fully utilized.

However, no examples involving PAWC were provided.²²⁹

Finding VIII-4 The AWWSC/PAWC affiliate agreement is not up to date and a new version has not been provided to the PaPUC for review and approval.

The AWWSC/PAWC affiliate agreement, as is, does not reflect the existing organizational structure. Therefore, some major services, such as legal, external affairs, and business development/sales activities, are provided by AWWSC to PAWC, even though they are not specifically listed in the current affiliate agreement.²³⁰ According to American Water management, the nomenclature for referencing such services has changed since January 1, 1989, when the affiliate agreement between AWWSC and PAWC was executed (subsequently approved by the PaPUC pursuant to an order dated January 12, 1989 at Docket No. G-880131). At the time, legal services were provided through the corporate secretarial function, external affairs were provided through the communication function, and business development was provided through the operation function.²³¹ Nevertheless, the PaPUC should be provided an up-to-date list of existing major services provided by affiliates to PAWC.



Additionally, the affiliate agreement mentions direct charges to PAWC (Section 2.3) and allocation of costs to regulated water companies based on the number of customers (Section 2.4). It also addresses overhead associated with these two items (Section 2.5). It does not mention in any way the allocation of costs among regulated and non-regulated entities using cost-causative factors, referred to by American Water management as *Tier One* charges.²³² American Water management indicates that no change in procedures has occurred with the addition of *Tier One* charges; however, Schumaker & Company disagrees with this conclusion.

Finding VIII-5 Ongoing training updates to AWWSC employees on timekeeping procedures, which could potentially impact affiliate charges, is not being provided.

In 2005, following the addition of *Tier One* charges to AWWSC's cost-allocation methodology, the Human Resources organization performed training for all AWWSC employees on cost-allocation policies, practices, and procedures. Since then, however, no training updates have been conducted.²³³ The potential for errors in applying AWWSC's timekeeping procedures is increased by not regularly training updates.

Finding VIII-6 Affiliate charges from RWE/Thames have been appropriately handled.

Over the last several years, various roles within the AWWSC organization were filled by individuals who were leant to American Water by either Thames Water International Services Limited (Thames) or RWE. In that capacity, these employees performed activities that were typically within the general framework of work provided by AWWSC. Costs for these employees performing work directly for the AWWSC were billed by Thames or RWE on an at-cost basis. They were then subsequently allocated by AWWSC to affiliated American Water system companies consistent with the general AWWSC formula allocation process.²³⁴

Thames, an affiliate and wholly-owned subsidiary of RWE, provided services of expatriate employees to AWWSC, which amounted to \$1.67 million in 2006, \$3.63 million in 2005, and \$2.95 million in 2004. These amounts were allocated to subsidiaries and affiliated companies based on the general service company allocation, with PAWC being billed for \$472,195 in 2006, \$464,351 in 2005, and \$62,551 in 2004 for AWWSC roles filled by Thames employees. No charges were billed to AWWSC by Thames in 2007 or prior to 2004.²³⁵

Management charges provided to American Water Works Company (parent company) by Thames amounted to \$1.4 million in 2006, \$9.2 million in 2005, and \$11.5 million in 2004. These charges were not allocated to American Water subsidiaries.²³⁶

Finding VIII-7 Most activities undertaken for monitoring and ensuring the appropriate implementation of cost-allocation processes are reasonable; however, internal audits of affiliate transactions and the systems that are used for creating affiliate charges are not regularly performed.

According to American Water management, the following activities are undertaken for monitoring and ensuring the appropriate implementation of cost-allocation processes:²³⁷

- ◆ Billing formulas are reviewed and updated annually by the corporate finance function to reflect current data relative to formula drivers, such as customer counts. This process ensures that the allocation of charges is conducted consistently with the composition of American Water’s business.
- ◆ Because the most significant component of allocable costs is labor, the AWWSC time entry system requires approvals by managers who review time charges for appropriateness and accuracy.
- ◆ Upon processing all costs each month, the Shared Services team conducts a review of the general ledger and prepares account reconciliations to provide assurance that charges are properly distributed.
- ◆ A series of management reports are prepared for presentation through a financial reporting package that provides an additional level of review and analysis for AWWSC costs.
- ◆ When AWWSC bills are distributed, a bill review is conducted (under the direction of the finance officer of each recipient location) and any appropriate modifications are effectuated.

However, internal audits of affiliate transactions and associated cost allocations are not regularly performed, according to AWWSC management.²³⁸ Yet in the PaPUC’s 2000 management audit of PAWC, it stated that the AWWSC Internal Audit (IA) function, at that time, performed periodic reviews of direct billing charges and cost allocations to/from AWWSC and PAWC, although IA reports were not made readily available to PAWC and other American Water operating companies.²³⁹

Additionally, only two operational audits have been performed by AWWSC IA staff in the past five years, one in 2004 and one in 2005.²⁴⁰ In the report dated March 19, 2004, the Internal Audit organization noted that the PAWC Hershey office had recently become the Southeast Region center, which raised Internal Audit’s concerns regarding the allocation of regional costs to business units within the region. It suggested that an inventory of AWWSC costs that might require allocation, and the processes and maintenance of associated records, might be a “worthy exercise” toward anticipating future questions that might surface. At that time, only expenses had been addressed; therefore, implementation of a complete allocation methodology was targeted for July 19, 2004. In the report dated November 22, 2005, this tendency was no longer an issue.²⁴¹

The PAWC-audited financial statements include an opinion by PricewaterhouseCoopers LLP that the balance sheet and related statements of income, capitalization, changes in common stockholders’ equity,

and cash flows present fairly, in all material respects, the financial position of PAWC. The results of its operations and cash flows are also in conformity with accounting principles generally accepted in the United States.²⁴² Getting this type of “clean” opinion, however, does not indicate that cost-accumulation, assignment, and allocation methodologies among various regulated and unregulated affiliates is being done in the best interest of PAWC ratepayers.

C. Recommendations

Recommendation VIII-1 Develop formal, comprehensive documentation for affiliate relationships and cost allocations, and assign the responsibility for affiliate transactions to the appropriate manager. (Refer to Finding VIII-1.)

Because American Water has many subsidiaries, such as PAWC, in the regulated utility industry, any entities having affiliate relationships and associated transactions should have formal, comprehensive documentation that fully describes how affiliate charges are handled. Also, unlike many utility organizations of similar (or larger) size, American Water does not appear to have a single point of responsibility for affiliate relationships and associated affiliate charges, including responsibility for the development of comprehensive documentation. Someone should be identified who has that responsibility. In the future when auditors are reviewing this area, it should be clearly delineated who the primary point of contact is—that individual who has responsibility for affiliate transactions and associated affiliate charges.

Recommendation VIII-2 Perform a detailed analysis to verify that the use of the number of customers for allocating AWWSC costs among regulated utilities reasonably approximates the use of cost-causative factors; subsequently make modifications, as appropriate. (Refer to Finding VIII-2.)

Schumaker & Company understands that number of customers is a straightforward, easily understood, and relatively inexpensive cost allocation factor to implement. Although it may be a simpler mechanism than cost-causative factors to implement, many utilities have found that use of cost allocation modules as part of technology systems negates the work of implementing use of cost-causative factors. PAWC, as a regulated utility, should be able to provide evidence to the PaPUC and PAWC’s ratepayers that number of customers is a close approximation to the use of cost-causative factors – and that one state’s customers are not advantaged or disadvantaged by American Water’s cost allocation methodology. Just because American Water “believes” that use of number of customers is reasonable does not make it so. Therefore, initially AWWSC and PAWC should perform a detailed analysis, perhaps on a test-year basis, to determine whether number of customers for allocating costs among regulated utilities is reasonable, and the results should be provided to PaPUC Management Audit staff as a follow-up to this audit. If

the outcome of this analysis indicates that number of customers does not approximate cost-causative factors, then AWWSC should make modifications, as appropriate. Subsequently, every three to five years (or more often if major changes to American Water's organization occur), American Water should revisit whether its methodology and associated factor(s) are appropriate.

Recommendation VIII-3 Regularly evaluate the cost of services provided to PAWC by its affiliates so as to verify that PAWC ratepayers are not being harmed by charging these services at cost rather than market. (Refer to Finding VIII-3.)

The use of studies by independent consultants is a reasonable approach to verify that ratepayers are not being harmed by charging these services at cost rather than market. However, because PAWC recently proposed a rate hike in 2007, Schumaker & Company was surprised that such a study has not recently been performed on behalf of PAWC ratepayers. Such studies should regularly be performed by American Water, not just before rate cases, but periodically to ensure the reasonableness of AWWSC's costs.

Recommendation VIII-4 Update the AWWSC/PAWC affiliate agreement, as necessary, and submit it to the PaPUC for review and approval. (Refer to Finding VIII-4.)

Because the current AWWSC/PAWC affiliate agreement is out of date (last filed and approved in 1989 or 19 years ago), at this point in time, it needs to be revised. Different actions are possible to satisfactorily address this recommendation, such as:

- ◆ PAWC could submit a revised affiliate agreement for review and approval to the PaPUC; however, the company is reluctant to do so, given that it operates in a multiple-state environment. Because similar agreements have been approved in other states, Schumaker & Company understands why American Water believes this alternative may not be desirable. However, if this path is chosen, then AWWSC/PAWC should consider revising its agreement structure such that organization structure and allocation factors are included as attachments to the agreement, rather than imbedded into the agreement body, making it easier for PAWC to notify the PaPUC when changes for these items occur, rather than requiring a full agreement resubmission for review and approval.
- ◆ PAWC could submit to the PaPUC an informal information update regarding its affiliate agreement and request a waiver from filing a revised affiliate interest agreement for formal review and approval. Then, if this waiver request is accepted by the PaPUC, whenever major changes to the AWWSC organization structure occur or to how affiliate charges are conceptually distributed, PAWC should revise its affiliate agreement and resubmit it to the PaPUC.

These alternatives go hand-in-hand with Schumaker & Company's recommendation to develop comprehensive documentation, as discussed previously in *Recommendation VIII-1*.

Regardless of which path the company takes, *Recommendation VIII-2* should be performed before the affiliate agreement is revised (or an information update is provided), so as to determine if number of customers is still a reasonable approximation for allocating costs to PAWC, as the results of this study could possibly impact the content of the affiliate agreement.

Recommendation VIII-5 Provide ongoing training updates to AWWSC employees on proper use of billing numbers for charging affiliates when reporting time. (Refer to Finding VIII-5.)

The use of proper billing numbers by AWWSC staff when reporting time is necessary to ensure that proper affiliate charges are made. This type of training should be periodically refreshed and provided to all AWWSC employees.

Recommendation VIII-6 Regularly conduct internal audits of affiliate transactions and associated cost allocations. (Refer to Finding VIII-7.)

American Water's internal audit function should routinely incorporate audits of affiliate transactions and the associated direct billing/cost allocations in its audit plan/schedule based on its risk assessment activities. The frequency for this type of audit must be factored into this analysis, although given that American Water is in the regulated utility industry, Schumaker & Company would expect that such audits should be performed no less than every three years or sooner, if significant changes occur.

IX. Diversity/EEO

This chapter addresses the diversity and equal employment opportunity (EEO) practices at Pennsylvania-American Water Company (PAWC) and addresses both employee and supplier diversity areas.

A. Background & Perspective

PAWC management indicates that its diversity vision is to create a culture where everyone feels valued, respected, and included. One part of the building block that makes up PAWC's diversity is its organizational culture, which management describes as one in which employees not only feel respected and included but also have an opportunity to develop and reach their full potential.²⁴³ (Refer to *Chapter VII – Corporate Culture, Management Structure, and Staffing Levels* for Schumaker & Company's discussion of American Water's and PAWC's corporate culture.) To foster such a culture, PAWC management indicates that it:²⁴⁴

- ◆ Recognizes that a diverse workforce and views adds value to the organization.
- ◆ Openly communicates the importance of compassion, sensitivity, benevolence, inclusiveness, and kindness.
- ◆ Respects and encourages all employees based on their own identity, creativity, and originality.

In American Water's code of ethics (which governs PAWC employees as well as all other American Water employees), one of the basic tenets involves "conduct in the workplace," which states that "to meet this expectation, employees must comply with all company policies as well as all federal, state, and local laws. Examples include ensuring that all applicants and employees receive equal employment opportunity that is free from all forms of unlawful employment discrimination" Furthermore, under the *Equal Opportunity, Affirmative Action and Prohibition against Harassment* section of the code of ethics, the following paragraphs state:²⁴⁵

"American Water is committed to complying with all federal, state, and local equal employment opportunity laws and ensuring that all applicants and employees receive equal employment opportunity that is free from all forms of unlawful employment discrimination. American Water employees must comply with all company policies."

"To this end, the company will not, and no employee is permitted to, take any of the following actions based on gender, marital status, race, color, national origin, religion, age, disability, veteran status, sexual orientation, or any other characteristic protected by law:

- Hire or promote a person or fail to hire or promote a person,



- Treat a person differently with regard to any other employment matters, including transfer, recruitment, selection for training, discipline, layoff, or rates of pay and other compensation,
- Harass any person or permit any harassment, including verbal, nonverbal, or physical attacks,
- Segregate or sponsor any function that segregates, except where respect for privacy based on gender is concerned, or
- Retaliate against anyone who makes a complaint about discrimination or harassment.”

“American Water is committed to ensuring an environment that respects the dignity and worth of each applicant and employee, and is free from all forms of unlawful employment discrimination and harassment. The American Water group of companies will not tolerate any such discrimination or harassment. This policy applies to all harassment arising out of the work environment whether in the office, at work assignments outside the office, at office-sponsored social functions, or elsewhere.”

“Employees at each level of the company are responsible for helping to ensure that harassment and discrimination do not occur by conducting themselves in accordance with American Water policy and by promptly reporting any observed harassment or discrimination. Adherence to these policies is a condition of employment at the company, and employees who violate them will be subject to appropriate disciplinary action, up to and including discharge.”

On its website, American Water states its diversity perspective as follows:²⁴⁶

“At American Water, we see diversity as a vital element in creating an environment where differences are accepted, and are important to the company’s success. In March 2005, American Water appointed a Diversity Officer to help embed diversity into our culture and actions.”

“We will encourage, honor, and celebrate differences in our workforce, including race, gender, spiritual practice, age, nationality, physical capabilities, education, and personal style.”

In roughly the 1997–1998 timeframe, the American Water Diversity Council was established. Its focus was not only to attract a diverse workforce but also to gauge and retain a diverse cross-section of employees.²⁴⁷ Its composition included representatives from the Customer & Shared Business Services, External Affairs, Human Resources, Internal Communications, Legal, Maintenance & Operations Services, Meter Reading, and Operations organizations as well as the President of the Local Utility Workers union.²⁴⁸ According to American Water management, the Diversity Council was active for the first three years; however, from 2004 to 2006, it met nine times and it had not met since January 19, 2006 until early 2008.²⁴⁹ Additionally, some of the Diversity Council members and its associated Executive Sponsors have since left American Water and have not been replaced.²⁵⁰ Diversity Champions (not necessarily Diversity Council members) were assigned at various American Water organizations, including PAWC. The role of a Diversity Champion is to act as a catalyst for diversity throughout his or her assigned organization by inviting, encouraging, and inspiring excellence with regard to diversity. The

Diversity Champion for PAWC is the Manager of Government Affairs; however, her involvement in this role has been limited because of the lack of diversity initiatives undertaken.²⁵¹

Additionally, in 2006, diversity was one of the roughly 10 American Water performance targets, but it was not included as a 2007 target.²⁵² (See *Chapter II – Executive Management, External Relations, and Human Resources* for further discussion about American Water strategic goals and performance targets.)

The American Water Chief Operating Officer (COO) also has been the Chief Diversity Officer (CDO) for the whole American Water organization since March 2005.²⁵³ His role as CDO involves:²⁵⁴

- ◆ Being the executive sponsor and champion for initiatives like expanding eligibility for health care benefits.
- ◆ Making speeches that incorporate American Water’s commitment to diversity, including discussions as part of “change partner network system,” wherein, every two to four weeks, the COO has conference calls with cross-section of employees about company status. Diversity is one of many topics that may be discussed during these calls.
- ◆ Being the Diversity Council executive sponsor, although this group (as previously stated) is currently inactive.

About the same time as the RWE/Thames acquisition of American Water in 2003, American Water realized that it needed leadership at the top concerning diversity—diversity has a very narrow definition in Europe, primarily referring to inclusion of black and women employees and vendors. Because American Water has had many initiatives in the last few years, the COO opted not to initiate a diversity initiative. Rather, he chose to simply keep a lower profile and to begin taking actions to change American Water’s culture. Some of these actions included:²⁵⁵

- ◆ Developing a code of ethics
- ◆ Establishing an ethics hotline
- ◆ Providing respect training to employees
- ◆ Providing non-harassment training to employees

The COO works with the Human Resources (HR) and Communications organizations to create a company diversity image. In addition to incorporating occasional articles on diversity into American Water publications and providing employees with a diversity calendar, part of the “subliminal” message American Water wishes to achieve is through the use of pictures in these publications showing diverse individuals.²⁵⁶ In addition to some of the actions previously noted, one of the ways American Water infiltrates its diversity message is by making diversity visible to employees at the top of its organizations. As part of its mid 2007 reorganization, American Water hired or promoted female, black, and gay representatives into various senior management positions.²⁵⁷

Examples of other key actions American Water management noted include:²⁵⁸

- ◆ Making American Water a good place for young people to work by adjusting HR policies, such as adding a flexible work-time option.
- ◆ Investigating the possibility of expanding health care benefits to non-married couples, whether same sex or not.

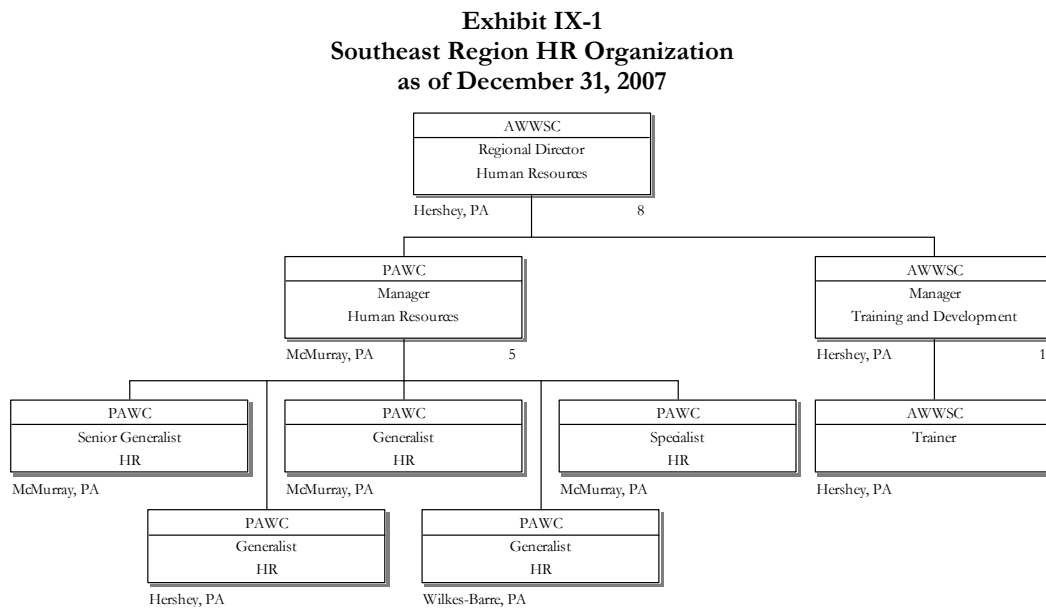
When the COO was asked what top items he would like to accomplish in the near term with regard to diversity, he indicated the following:²⁵⁹

- ◆ Diversity coaching at American Water’s executive level
- ◆ Merging diversity into the development program
- ◆ Embedding diversity into the performance management system
- ◆ Incorporating diversity measures into American Water’s goals and objectives

Organization & Staffing

Employer Diversity

The HR Generalists within the AWWSC Southeast Region HR organization, shown in *Exhibit IX-1*, with assistance from corporate, are responsible for the PAWC affirmative action plan (AAP) /EEO-1 compliance reporting.²⁶⁰

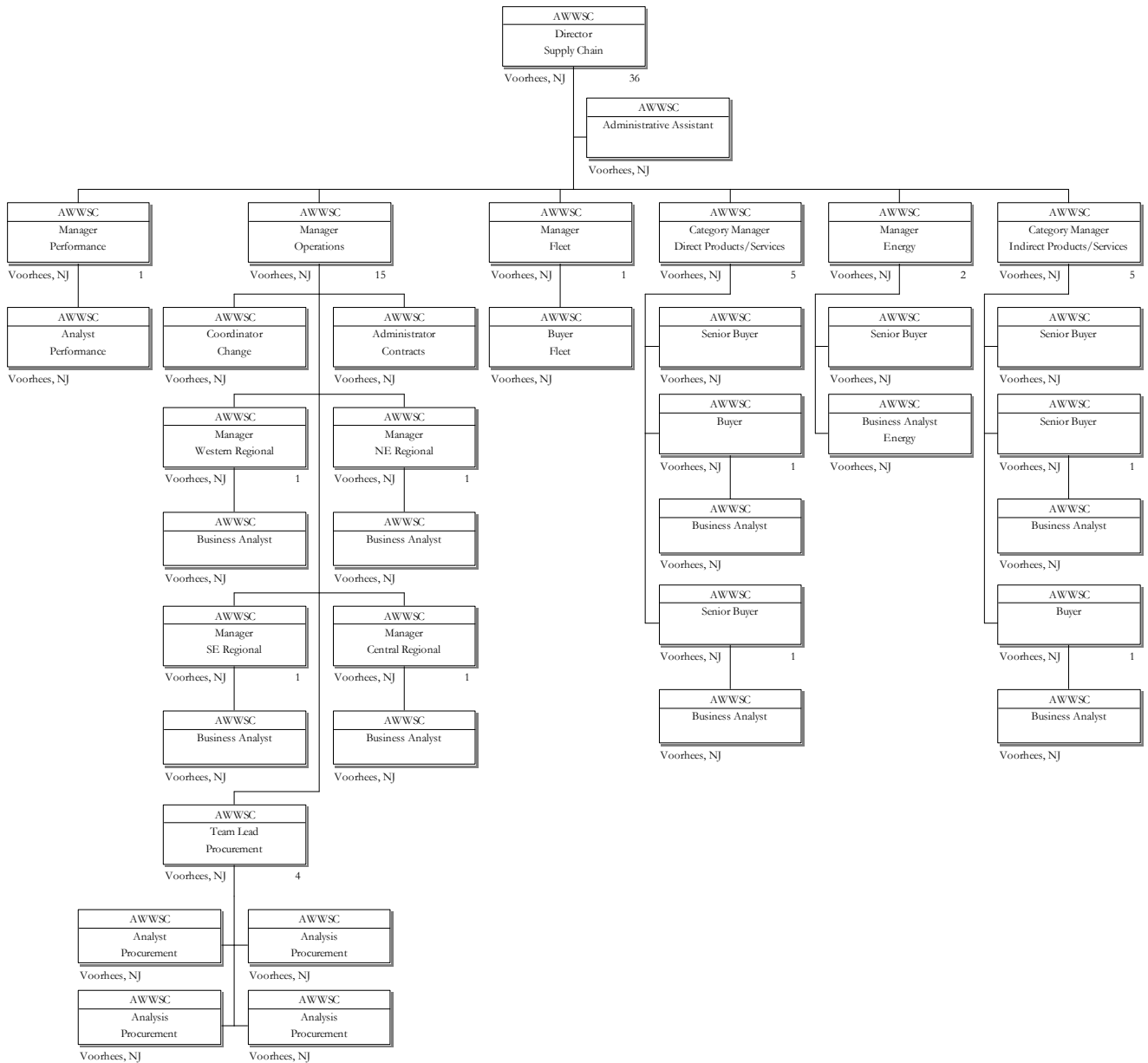


Source: Information Response 433

Supplier Diversity

The AWWSC Supply Chain organization, shown in *Exhibit IX-2*, is responsible for most American Water (including PAWC) supplier diversity activities.²⁶¹

Exhibit IX-2
AWWSC Supply Chain Organization
as of December 31, 2007



Source: Information Response 257

Major Processes & Systems

Employer Diversity

American Water and all of its subsidiaries use the same national/regional recruiting resources to recruit employees. Specifically, in Pennsylvania, PAWC management indicates that to recruit females, minorities, veterans, and disabled persons PAWC uses the following:²⁶²

- ◆ CareerBuilder.com
- ◆ Engineer-jobs.com
- ◆ Civilengineeringjobs.com
- ◆ Beyond.com
- ◆ CareerMVP.com
- ◆ Careerbank.com
- ◆ CPAREcruiter.com
- ◆ Theladders.com
- ◆ Enviromentaljobsite.com
- ◆ Indeed.com
- ◆ Accounting.com
- ◆ Monster.com
- ◆ Financial Executive Networking Group
- ◆ Society of Wetland Scientists
- ◆ National Association for the Advancement of Colored People (NAACP)
- ◆ CareerBuzz
- ◆ League of Women Voters
- ◆ Office of Vocational Rehabilitation
- ◆ Harrisburg Young Professionals
- ◆ AHEDD (organization for employment of individuals with disabilities)
- ◆ Urban League of Pittsburgh
- ◆ Urban League of Broome County
- ◆ Lackawanna Human Development Agency
- ◆ Keystone Rehabilitation
- ◆ Progressive Community Center
- ◆ Scranton Business & Professional Women's Group
- ◆ Mental Health and Mental Retardation Program
- ◆ New Pittsburgh Courier (minority newspaper)
- ◆ PA Career Link
- ◆ Valleta Ritson & Co (minority recruiter)
- ◆ Employment Opportunity & Training Center (EOTC) (organization for individuals with disabilities)
- ◆ Native American Media
- ◆ Society of Women Engineers

- ◆ National Society for Black Engineers
- ◆ Department of Environmental Protection (DEP)
- ◆ Employee referrals
- ◆ Local newspapers

For example, American Water management indicates that CareerBuilder.com has 1,100 diversity partners. When job candidates search a diversity website, they are able to link to CareerBuilder.com, where they have access to American Water job postings.²⁶³

Supplier Diversity

The administration of the supplier diversity program is the responsibility of the Supply Chain organization, although all American Water employees are expected to work as a team to actively support and implement the program.²⁶⁴

American Water has an informal policy on supplier diversity, which has been approved by its COO. American Water Supply Chain management indicated that it anticipates it will become a written formalized policy/practice in 2008.²⁶⁵ This policy states that it is an American Water course of action to encourage and afford opportunities to diverse suppliers (including but not limited to women business enterprises (WBEs), minority business enterprises (MBEs), and disabled veteran business enterprises (DVBES), which together are referred to as WMDVBEs), while simultaneously ensuring that the best combination of quality, service, and price is provided in accordance with the highest ethical and professional standards.²⁶⁶ Although similar in focus to many supplier diversity programs, Supply Chain management indicates that it encourages participation by other diverse suppliers, such as disabled non-veteran organizations. However, it does not have specific initiatives in place at this time for these other groups²⁶⁷

American Water's philosophy is to put WMDVBE suppliers at an equal basis with other vendors, through activities such as sourcing events. The key performance indicators (KPIs) for the AWWSC Supply Chain organization include participation in a pool of potential vendors by WMDVBE suppliers. They do not include spend targets with WMDVBE suppliers, although Supply Chain tracks this spend, or information about inclusion of WMDVBE suppliers and if such suppliers (as prime contractors) are awarded contracts. Use of diverse subcontractors is not reported by American Water's vendors. Use of WMDVBE suppliers at the national level is often at the subcontractor level, with more WMDVBE suppliers at the prime contractor level occurring at the regional level.²⁶⁸

Vendors and contractors that have satisfactorily met the requirements for inclusion in the bidding process are invited to submit bids.²⁶⁹ The Supply Chain organization recently established in 2006 that at least one MWDVBE supplier should be included in every strategic sourcing process administered by the department.²⁷⁰ The bid format may consist of a request for sealed bids, an electronic request for proposal (RFP), or a request for quote (RFQ), or it may include participation in an online reverse auction. A bid package is forwarded to vendors or contractors to complete and return in accordance with the bid documents. Following the bid-opening session, during which bids are opened and

responses are documented, an analysis of the bids is prepared and a determination of the apparent low bidder is made. Subsequent vendor or contractor contact is made to discuss awarding of the agreement or contract for the specific work.²⁷¹

The Supply Chain organization has a standard practice document relative to the receiving and opening of competitive bids for strategic sourcing. It also has a sample RFP template; however, other functions, such as Operations Services (for engineering consulting and capital design/build construction projects), follow a similar, although not exact, protocol.²⁷² Those bids processed by Operations Services (not processed by Supply Chain) typically include only major capital projects that have not been pre-purchased by Supply Chain. Most routine projects, such as main extensions, tank construction, small main replacements, paving contracts, and others are typically processed by Supply Chain through master service agreements or blanket purchase orders.²⁷³

In 2006, American Water's Supply Chain organization was a member of the National Minority Supplier Development Council (NMSDC) and gained access to that council's database of minority suppliers (called MBISYS). Supply Chain management anticipated such access would help expand the number of MWDVBE suppliers invited to bid on American Water RFPs, and subsequently actually used. American Water dropped its NMSDC membership in 2007 because it found that other databases, especially its own internal databases, were more useful. In future years, however, Supply Chain management indicates that American Water will likely join NMSDC again to take advantage of speakers/education and other benefits.²⁷⁴ Also, PAWC, through its parent company, maintains a membership with the National Minority Supplier Development Council.²⁷⁵

For most Operations Services bids, potential diverse suppliers (usually subcontractors) contact PAWC. PAWC does not actively pursue such suppliers' involvement, although they routinely advertise prequalification requirements when advertising large projects.²⁷⁶

The Supply Chain organization holds quarterly meetings to review existing MWDVBE efforts in Pennsylvania and across American Water's other service territories. Supply Chain management believes that these meetings serve as a great vehicle for best practice sharing and benchmarking. That is because they are attended by Supply Chain managers from each of American Water's service regions, as well as other American Water groups, including a representative of the Military Services group, the Supply Chain Operations Manager, two Supply Chain Analysts, and a Supply Chain Strategic Sourcing Senior Buyer.²⁷⁷ Other outreach efforts, such as attendance at conferences, fairs, forums, and speaking engagements at meetings, focused on minority participants.²⁷⁸

Statistical Data

Employer Diversity

Diversity Composition

Exhibit IX-3 shows PAWC’s diversity composition by gender and race on December 31, 2006, as reported by PAWC in its 2006 Pennsylvania Public Utility Commission (PaPUC) diversity report.²⁷⁹ (See *Exhibit IX-5* for a discussion of trends in PAWC data.)

**Exhibit IX-3
Diversity Composition of PAWC Employees
as of December 31, 2006**

Job Categories	Overall Totals	Male					Female				
		White	Black	Hispanic	Asian or Pacific	American Indian or Alaskan	White	Black	Hispanic	Asian or Pacific	American Indian or Alaskan
					Islander	Native				Islander	Native
Officials and Managers	176	146	4	0	0	0	24	2	0	0	0
Professionals	65	37	2	0	0	0	25	1	0	0	0
Technicians	4	3	0	0	0	0	1	0	0	0	0
Sales Workers	0	0	0	0	0	0	0	0	0	0	0
Office and Clerical	60	6	0	0	0	0	50	4	0	0	0
Craft Workers	251	217	7	1	0	0	25	0	1	0	0
Operatives	388	313	19	8	0	0	44	1	3	0	0
Laborers	1	1	0	0	0	0	0	0	0	0	0
Total	945	723	32	9	0	0	169	8	4	0	0

Job Categories	Overall Totals	Male					Female				
		White	Black	Hispanic	Asian or Pacific	American Indian or Alaskan	White	Black	Hispanic	Asian or Pacific	American Indian or Alaskan
					Islander	Native				Islander	Native
Officials and Managers	100.0%	83.0%	2.3%	0.0%	0.0%	0.0%	13.6%	1.1%	0.0%	0.0%	0.0%
Professionals	100.0%	56.9%	3.1%	0.0%	0.0%	0.0%	38.5%	1.5%	0.0%	0.0%	0.0%
Technicians	100.0%	75.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%
Sales Workers	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Office and Clerical	100.0%	10.0%	0.0%	0.0%	0.0%	0.0%	83.3%	6.7%	0.0%	0.0%	0.0%
Craft Workers	100.0%	86.5%	2.8%	0.4%	0.0%	0.0%	10.0%	0.0%	0.4%	0.0%	0.0%
Operatives	100.0%	80.7%	4.9%	2.1%	0.0%	0.0%	11.3%	0.3%	0.8%	0.0%	0.0%
Laborers	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	76.5%	3.4%	1.0%	0.0%	0.0%	17.9%	0.8%	0.4%	0.0%	0.0%

Source: Information Response 610 (2006 PaPUC Report)

Exhibit IX-4 shows PAWC’s diversity composition by gender and race on December 31, 2007, as reported by PAWC in its 2007 PaPUC diversity report.²⁸⁰ While PAWC’s total employees increased by 41 over 2006, the percentage of women and minorities decreased.

**Exhibit IX-4
Diversity Composition of PAWC Employees
as of December 31, 2007**

Job Categories	Overall Totals	Number of Employees						Number of Employees				
		Male						Female				
		White	Black	Hispanic	Asian or Pacific Islander	American Indian or Alaskan Native	White	Black	Hispanic	Asian or Pacific Islander	American Indian or Alaskan Native	
Officials and Managers	171	148	4	2	0	0	17	0	0	0	0	
Professionals	42	25	1	0	0	0	15	1	0	0	0	
Technicians	3	1	0	0	0	0	2	0	0	0	0	
Sales Workers	0	0	0	0	0	0	0	0	0	0	0	
Office and Clerical	46	7	0	0	0	0	37	2	0	0	0	
Craft Workers	295	256	10	3	0	0	25	0	1	0	0	
Operatives	428	356	17	7	0	0	45	2	1	0	0	
Laborers	1	1	0	0	0	0	0	0	0	0	0	
Total	986	794	32	12	0	0	141	5	2	0	0	

Job Categories	Overall Totals	Percentage of Employees						Percentage of Employees				
		Male						Female				
		White	Black	Hispanic	Asian or Pacific Islander	American Indian or Alaskan Native	White	Black	Hispanic	Asian or Pacific Islander	American Indian or Alaskan Native	
Officials and Managers	100.0%	86.5%	2.3%	1.2%	0.0%	0.0%	9.9%	0.0%	0.0%	0.0%	0.0%	
Professionals	100.0%	59.5%	2.4%	0.0%	0.0%	0.0%	35.7%	2.4%	0.0%	0.0%	0.0%	
Technicians	100.0%	33.3%	0.0%	0.0%	0.0%	0.0%	66.7%	0.0%	0.0%	0.0%	0.0%	
Sales Workers	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Office and Clerical	100.0%	15.2%	0.0%	0.0%	0.0%	0.0%	80.4%	4.3%	0.0%	0.0%	0.0%	
Craft Workers	100.0%	86.8%	3.4%	1.0%	0.0%	0.0%	8.5%	0.0%	0.3%	0.0%	0.0%	
Operatives	100.0%	83.2%	4.0%	1.6%	0.0%	0.0%	10.5%	0.5%	0.2%	0.0%	0.0%	
Laborers	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Total	100.0%	80.5%	3.2%	1.2%	0.0%	0.0%	14.3%	0.5%	0.2%	0.0%	0.0%	

Source: Information Responses 708, 789, and 790 (2007 PaPUC Report)

Although information included in PaPUC reports are as of December year end, AAP data has typically been as of August of each year. (Slight differences between PaPUC and AAP reporting percentages may occur due to the different points in time when percentages are calculated; plus, AAP data uses information only on locations over 50 employees.)

To see the differences by PAWC geographical region, for example, one must look at AAP data. At PAWC, the company segments its AAP data into three geographical regions, specifically the Southeast, West, and Northeast regions. Additionally over 90% of the jobs offered by PAWC fall into the Officials and Managers, Craft Workers, and Operatives categories. The labor force census data for these categories at PAWC in the Hershey/Harrisburg, Wilkes-Barre/Scranton, and Pittsburgh areas, which roughly equate to the Southeast, Northeast, and West areas, show percentages of females and minorities in the labor force that are higher than what PAWC employs. Based on 2006 PAWC data, for example, the profile of women and minorities in PAWC's workforce relative to the labor force in the Southeast, Northeast, and West geographic areas was as follows:²⁸¹

- ◆ *Women* – In each area (as well as Pennsylvania in total), the percentage of females in the labor force for PAWC’s major job codes is between 21.4% and 25.1%. These figures are greater than PAWC’s overall 12.3% figure or its percentage by PAWC area, which was 16.2% (Southeast), 6.6% (Northeast), and 13.9% (West). (Percentages were derived by dividing the number of women employees in these job categories by the total number of employees in the same job codes.)
- ◆ *Minorities* – In each PAWC area, the percentages of minorities in the labor force in PAWC’s major job codes are approximately 9.6% (Southeast), 2.9% (Northeast), and 6.4% (West). For Pennsylvania (in total) minorities in these job codes in the labor force represent approximately 10.7% and for the three PAWC areas where PAWC recruits employees the total is 6.4%. For PAWC, its percentage by area was 4.9% (Southeast), 2.1% (Northeast), and 7.0% (West), or approximately 5.4% overall in Pennsylvania. (Percentages were derived by dividing the number of minority employees in these job codes by the total number of employees in the same job codes.)

This state-wide data, above, does not align exactly to the communities from which PAWC recruits. For example, state-wide data includes Philadelphia. This urban center contains a higher percentage of minorities than PAWC’s service territory and is not a market from which PAWC presently recruits employees. This data is, nonetheless, a starting point for understanding how well the PAWC workforce reflects the demographic make-up of the state and regions in which it operates.

Furthermore, Schumaker & Company makes the point in *Recommendation IX-5* that PAWC should look more broadly than its local labor market when recruiting – even when they are considered fully utilized and compliant within a specific job category.

Exhibit IX-5 gives some historical perspective on PAWC’s composition of employees by gender and race, using its AAP data. (Because this data is from August of each year, it will not necessarily agree with PAWC’s PaPUC diversity report. A primary reason for the difference in figures is the movement of existing staff from AWWSC to PAWC due to reassignment and reorganization.)²⁸²

Exhibit IX-5
PAWC Consolidated AAP Data
2004 to 2006
(as of August of Each Year)

	2004			2005			2006		
	Females	Males	Total	Females	Males	Total	Females	Males	Total
PAWC-Consolidated									
Black	10	39	49	8	35	43	6	31	37
Hispanic	3	8	11	2	8	10	2	9	11
Asian	0	0	0	0	0	0	0	0	0
American Indian	0	0	0	0	0	0	0	0	0
Minority	13	47	60	10	43	53	8	40	48
White	176	781	957	138	687	825	149	699	848
Total PAWC-Consolidate	189	828	1017	148	730	878	157	739	896

Source: Information Response 196 (PAWC Consolidated AAP Data)

Equal Employment Opportunity Commission Complaints

From 2003 to 2007, PAWC had nine Equal Employment Opportunity Commission (EEOC) complaints against it. At 2007 year end, two complaints were withdrawn, four complaints were dismissed (although one was issued the right to sue and the complaint is pending in U.S. District Court), and three complaints are pending.²⁸³

Supplier Diversity

The Supply Chain organization cannot systematically identify spend or suppliers under agreement that are specific to PAWC prior to 2005. That is because the existing AWWSC enterprise resource planning (ERP) system did not track this information prior to 2005. (Any dollar figures provided in subsequent exhibits, such as *Exhibit IX-7*, were calculated for prior years via another means; however, the Supply Chain organization was established in 2004 and does not know how 2002 to 2004 figures were developed.) The number of suppliers under agreement through the Supply Chain organization and the percentage held with women and minorities for PAWC goods and services purchased for the years spanning 2005 through 2007 are shown in *Exhibit IX-6*.²⁸⁴

Exhibit IX-6
Number of PAWC Agreements with Women and Minority Vendors
2005 to 2007

Year	# of Suppliers under Agreement	% of Women and Minority Vendors
2007	265	11.70%
2006	275	11.64%
2005	280	10.71%

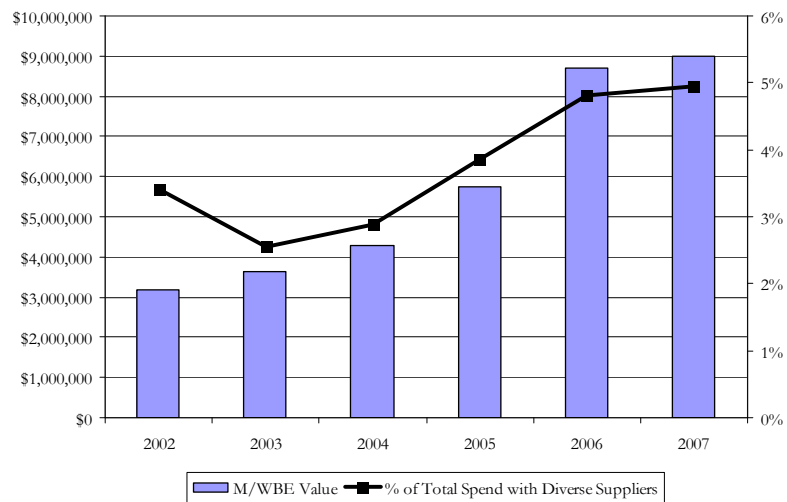
Source: Information Responses 200 and 785

In American Water’s JD Edwards address book of WMDVBE suppliers, it lists approximately 130 potential WMDVBE vendors that can potentially provide services to PAWC.²⁸⁵ In 2007, for example, 31 women and minority suppliers had contracts involving PAWC or 22.3% of the 130 potential WMDVBE vendors (11.70% times 265).²⁸⁶

From 2002 through 2007, PAWC spent approximately \$34.5 million with diverse suppliers, overwhelmingly with WBE suppliers. *Exhibit IX-7* illustrates PAWC’s annual spend from 2002 through 2007, which increased approximately 183% over the six-year period.²⁸⁷

Exhibit IX-7 also shows the percentage of W/MBE spend to total PAWC spend over the same time period.

Exhibit IX-7
Annual Spend Value and Percentage of Total Spend by PAWC with M/WBE Suppliers
2002 to 2007



2006 figures do not agree with the PaPUC report for same year, as the 2006 PaPUC report excluded self-certified MWDVBE organizations.

Source: Information Responses 788 and 834

As shown, diversity spend at PAWC has been generally increasing over this time period, despite American Water changing its reporting of WMDVBE spend in 2006 to require certification proof, as described further in *Finding IX-8*.²⁸⁸

B. Findings & Conclusions

Finding IX-1 The American Water/PAWC diversity program is primarily policy and affirmative-action-compliance oriented.

PAWC appears to meet all federal EEO/affirmative action requirements. In fact, PAWC successfully completed three OFCCP audits (one in each of the three geographic areas) in the last two years, and was found to be in full compliance.²⁸⁹ In addition, American Water and PAWC management state that their policies show their commitment to diversity. Each new employee receives a copy of these policies on his or her first day of employment with PAWC to foster a culture of inclusion. PAWC views those policies that are most relevant to its diversity program as:²⁹⁰

- ◆ Alternative work schedule policy
- ◆ Educational assistance plan
- ◆ Employees' guide of conduct
- ◆ EEO policy

- ◆ Harassment-free workplace policy
- ◆ No retaliation policy
- ◆ System-wide staffing policy
- ◆ Violence-free workplace policy

The company points to its offering of a training program called “respect.”²⁹¹ The objectives of the Respect Program were:²⁹²

- ◆ Define/discuss what is meant by mutual respect in the workplace, and why it is important.
- ◆ Define harassment and have a working knowledge of the company’s policies against harassment.
- ◆ Identify unacceptable behavior and be familiar with employee’s responsibility when confronted with the behavior.
- ◆ Understand employee/supervisor role and responsibility for ensuring that our workplace is free of harassment.
- ◆ Understand the legal implications both business and personal.
- ◆ Describe the complaint procedure and how it works.
- ◆ Describe the company’s policies on “no retaliation.”

This program utilizes small group discussions of case studies to review the definitions, practice responses, and list harassing behaviors. A 23 minute video is shown that reviews the types of harassment that may occur in the workplace that employees may not have been aware of. Discussion follows the video regarding employee/supervisor reactions. In addition, laws pertaining to harassment are reviewed and there is discussion of what it may cost both in actual dollars as well as costs to the human spirit is also discussed. Finally, prevention measures are reviewed and discussed, followed by a summary of all key points.²⁹³

Preventing harassment in the workplace is an important goal and this training appears to be well designed. But preventing harassment and avoiding its legal and financial consequences does not, in and of itself, constitute a commitment to diversity. It is one step in creating an inclusive workplace and a component of a comprehensive diversity initiative.

It appears that the company’s diversity commitment does not extend beyond adherence to policies, avoidance of harassment, and the creation of affirmative action plans and EEO-1 reports. Schumaker & Company found little to suggest that the company was committed to implementing a full-fledged diversity initiative. Nondiscrimination and the recruitment, promotion, and retention of members of “protected classes” are important goals, but they fall short of a commitment to diversity.

Dr. Roosevelt Thomas, Jr., perhaps the foremost authority on workplace diversity, was the first to argue for a strategic approach to diversity.²⁹⁴ He suggested that a diverse workforce and an inclusive organizational environment were, in fact, strategic advantages. He cites improved decision-making, the ability to attract and retain top talent, and a more fully engaged workforce as examples. More recently, Dr. Thomas has suggested that diversity is “the differences, similarities, and related tensions that exist in

any mixture.” Dr. Thomas describes diversity management as “making quality decisions” in the midst of these “differences, similarities, and tensions.”²⁹⁵

As such, companies that approach diversity as a competitive advantage have invested in initiatives that foster inclusion, employee engagement, and leadership development. Diversity leadership is often a core leadership competency. Workplace practices aimed at inclusion and engagement are valued and widespread. We find no such practices at PAWC.

Finding IX-2 Employee location data used for EEO-1 reporting from American Water’s JD Edwards human resources information system (HRIS) are often incorrect, thereby causing the company to conduct a manual verification process.

An HR Analyst in the AWWSC Financial Shared Services group extracts employee data from JD Edwards and is entered into Excel pivot tables. The data is then distributed to regional directors to be broken down by location and verified by local HR staff. Such verification is required largely because the EEO-1 reporting mechanism in JD Edwards does not work correctly at American Water and the company is not sure why.²⁹⁶

We have discussed Human Resources’ data-integrity problems in *Finding II-11* from *Chapter II – Executive Management, External Relations, & Human Resources*. The problems with EEO-1 reporting appear to result, in part, from incorrect use of data codes when entering employee information and also from the fact that prior to 2007 location codes were not stored in the JD Edwards system.²⁹⁷

Efforts to enhance the JD Edwards HRIS system have been scaled back while the company considers implementing a new ERP system. Schumaker & Company was provided assurances that the efforts to enhance data integrity in JD Edwards would continue, even if functional enhancements are delayed or cancelled.²⁹⁸

Finding IX-3 PAWC and American Water do not have standard processes and use inconsistent methods for preparing affirmative action utilization and EEO-1 reports, which leads to reporting errors.

At American Water, reporting of data is done by location, as required by the U. S. Equal Employment Opportunity Commission, for locations with 50 or more employees. For locations with fewer than 50 employees, data are grouped together without reference to their reporting location. Therefore, because some PAWC employees report to a location with fewer than 50 employees, reviewing figures for all PAWC locations may not include all of the company’s employees.²⁹⁹

Additionally, American Water has handled the development of AAP/EEO-1 reporting data differently over the past few years, thereby making comparison between years difficult. Some reasons why include:³⁰⁰

- ◆ For 2005 and 2006, PAWC’s EEO-1 reporting was “as of August 31,” while its affirmative action plan was dated December 31 for each year. In 2007, this discrepancy appears to have been rectified. The data reported in the 2007 EEO-1 will be “as of August 31” and the same data will be used as the basis for the 2008 affirmative action plan. Schumaker & Company was not able to confirm this change, because the 2008 plan was not complete at the time of this report.
- ◆ For 2005 and 2006, the three Pennsylvania reporting locations (Northeast, West, and Southeast) were handled differently. PAWC and AWWSC employees are included in PAWC’s AAP data for the Northeast and West areas. These AWWSC employees are also included in AWWSC’s AAP data. AWWSC employees in the two Pennsylvania areas are not necessarily dedicated 100% to PAWC, but they were included because they report to a Pennsylvania office location. For Hershey (in the Southeast area), reportedly only PAWC employees were included in PAWC’s AAP data and no AWWSC employees were included. However, in our review of 2006 data, Schumaker & Company found at least one case where an AWWSC employee was included. (This is further evidence of the location data integrity problem noted in *Finding IX-2*.) Then in 2007, American Water began having employees included in only one AAP, specifically in the location to which they report. It is simply too early to tell if the company has fully resolved its inconsistent methods, double reporting, and inaccurate data problems.

Furthermore, AWWSC staff in the Human Resources organization has a standard checklist for the creation of the AAP/EEO-1 reporting data;³⁰¹ however, one of the steps (local HR Generalists to review/validate locations and submit issues) is handled differently, even within the three major Pennsylvania areas, as shown in *Exhibit IX-8*.³⁰²

Exhibit IX-8
Location Validation Activities for AAP/EEO-1 Reporting by Area
as of December 31, 2007

Southeast Area	Northeast Area	West Area
Receive spreadsheet report from HR at Voorhees (includes all employees in locations included in area)	Receive spreadsheet report from HR at Voorhees (includes all employees in locations included in area)	Receive spreadsheet report from HR at Voorhees (includes all employees in locations included in area)
Verify location code of each individual employee shown on report	Download list by name so HR Generalist can compare against spreadsheet	Focus on situations like route code equal to “mail” because those employees get their paycheck at home rather than at their location
E-mail corrections to HR in Voorhees	Verify location code of each individual employee shown on report Modify spreadsheet to reflect changes or deletions E-mail summary of changes and corrected spreadsheet to HR in Voorhees	Add column to spreadsheet to highlight changes HR Manager reviews spreadsheet and discusses with HR Generalist as needed E-mail summary of changes and corrected spreadsheet to HR in Voorhees

Source: Interviews 145, 146, and 147

While these differences appear to be small, they reflect the lack of standardization and offer opportunities for error.

Finding IX-4 No senior executive or officer of American Water reviews and approves the EEO-1 report prior to submittal to the federal government.

Submission of the Federal EEO-1 report requires a certification by an *authorized official* of American Water.³⁰³ Authorized official is not well defined in the law, but Schumaker & Company believes that certification should be made by an American Water officer. Schumaker and Company further believes the Vice President of Human Resources is the most logical choice for this task

In *Finding IX-3* we noted that PAWC uses inconsistent methods of validating the data for the EEO-1 report. The data for each location (for all of American Water) that has been corrected using inconsistent methods is submitted to the HR Analyst at AWWSC Shared Services. The HR Analyst enters it into the federal online report. Once all locations have been reported and entered, she submits the report to U.S. Equal Employment Opportunity Commission. There is no review of the report by any American Water senior manager or officer.³⁰⁴

Finding IX-5 American Water has developed a comprehensive diversity plan but has failed to effectively implement it.

In 2005, American Water initially developed a nine-month diversity plan (through its Diversity Council) but push-back from management (given the many other initiatives that were underway) resulted in the Diversity Council revising it to a 27-month plan with targets starting in January 2006 and continuing through March 2008. As of September 2007, however, only a few of the key targets have been met. The COO expressed intentions to add Top 5 items (not yet implemented from the 27-month diversity plan) to American Water's performance targets in fiscal year (FY) 2008. Then, in FY2009, he hopes to include measures (as described in the plan) to targets.³⁰⁵

Exhibit IX-9 illustrates the progress made against the diversity-plan targets.³⁰⁶

Exhibit IX-9
Summary of American Water Progress against Diversity Plan
as of December 31, 2007
Page 1 of 3

LEADERSHIP ACCOUNTABILITY			
No.	Diversity Target	Target Date	Status
1	Integrate diversity targets into American Water's region and business-unit balanced scorecards, business process reengineering (BPR), Executive Management Team (EMT) meetings, and individual performance objectives for EMT members.	1Q '06	Done
2	Identify diverse candidate slates in sourcing for current executive (ML 1-3) openings.	1Q '06	Ongoing
3	Integrate diversity plan with business strategy.	2Q '06	Not Done
4	EMT participates in a group Diversity Awareness workshop.	2Q '06	Partially Done (a)
5	Identify and appoint local Diversity Champions.	2Q '06	Done
6	Regional Presidents, CEO, COO, and Chief Growth Officer (CGO) participate in quarterly diversity coaching.	3Q '06	Not Done
7	EMT members partner with their local Diversity Champion and visit a local business that has been cited for diversity excellence to understand best practices.	4Q '06	Not Done
TALENT MANAGEMENT			
8	Integrate a diversity focus within the company-wide succession-planning process.	1Q '06	Done
9	Develop a recruitment and selection process/tools that enable diverse and balanced slates.	2Q '06	Done
10	Assess the current workforce representation (e.g., age, gender, race, disability) company wide.	4Q '06 Annually	Not Done
BUSINESS GROWTH			
11	Add diversity factors in bid review process.	1Q '06 (Ongoing)	Not Done
12	Implement standard proposal language that supports diversity.	2Q '06	Not Done
13	Review diversity implications within the business growth plan.	4Q '06	Not Done
AWARENESS BUILDING			
14	Enhance procurement tracking of relationship with women, minority, and disabled-owned businesses.	2Q '06 (Bi-annually)	Done
15	Integrate diversity awareness into procurement practices.	2Q '06	Done
16	Incorporate diversity awareness focus into EMT meeting agendas.	3Q '06 (Quarterly)	Not Done

Source: Information Responses 258, 355, and 786
(a) Held three-hour awareness discussion at EMT meeting

Exhibit IX-9
Summary of American Water Progress against Diversity Plan
as of December 31, 2007
Page 2 of 3

No.	Diversity Target	Target Date	Status
EMPLOYEE ENGAGEMENT			
17	Identify and integrate three to five core diversity messages (relative to key company objectives) into executive/leadership road shows and internal communications.	2Q '06 (Ongoing)	Done
18	Identify diversity trends in exit interview information.	2Q '06	Not Done
19	Enhance employee work/life balance by augmenting current sick-day policy to include "family" sick days.	3Q '06	Done
LEADERSHIP ACCOUNTABILITY			
20	Align diversity questions on next employee survey with key diversity targets.	1Q '07	In-Progress
21	Appoint a Diversity Manager/Coordinator.	2Q '07	Not Done (b)
TALENT MANAGEMENT			
22	Incorporate diversity awareness focus into regional/AWE leadership meeting agendas.	1Q '07 Quarterly	Not Done
EMPLOYEE ENGAGEMENT			
23	Encourage increased employee involvement in company-sponsored social-responsibility activities.	1Q '07	Not Done
24	Enhance employee work/life balance by developing a policy that provides consistent guidelines for telecommuting (where feasible).	2Q '07	Not Done
25	Enhance employee work/life balance by developing a policy that provides consistent guidelines for variable/flex time (where feasible).	2Q '07	Done
AWARENESS-BUILDING			
26	Integrate diversity into key American Water development programs.	1Q '07 (Ongoing)	Not Done
LEADERSHIP ACCOUNTABILITY			
27	Create a recognition program that reinforces individual and team performance on effective achievement of business performance targets—that enhance diversity target achievement.	1Q '08	Not Done
AWARENESS-BUILDING			
28	Perform local and corporate review of customer survey feedback in current footprint to determine if there are diversity implications.	1Q '08 Annually (Ongoing)	Not Done
29	Review corporate strategy for sustainable giving that builds on the brand and increases recognition of American Water.	1Q '08 (Ongoing)	Not Done

Management Actions = EMT/Regional Presidents/ Local Line Manager **Actions**
(b) Director, Talent Management to assume responsibilities on March 31, 2008
 Source: Information Responses 258, 355, and 786

Exhibit IX-9
Summary of American Water Progress Against Diversity Plan
as of December 31, 2007
Page 3 of 3

No.	Diversity Target	Target Date	Status
EMPLOYEE ENGAGEMENT			
30	Establish process for enabling employee input on enhancing diversity.	1Q '08	Not Done
31	Increase diversity of employees (e.g., union/non-union, age, race, gender) in development programs/activities.	1Q '08	Not Done

Management Actions = EMT/Regional Presidents/Local Line Manager **Actions**
Source: Information Responses 258, 355, and 786

In early 2007, an internal assessment report of diversity at American Water (performed by one of the regional HR Directors on behalf of the COO) stated the following:³⁰⁷

“Because there are so many items, it is hard for some to get their heads around what we as a business are specifically doing and it appears that not much is happening. In reality, that is not the case. We are not where we would like to be, but much has been accomplished and there are projects currently underway, as well. To that end, I would like to propose that we look at and talk diversity in another way, so that it becomes clearer to people what we really are out to accomplish as well as the successes that we are having along the way.”

This report went on to state the following:³⁰⁸

“As a business, we have been reviewing and making adjustments to various policies that impact diversity. As each has come up for review, we have critically looked at them with a ‘true diversity lens’ and we have made business changes. The ones that come to mind immediately are our policies on a ‘Harassment Free Workplace’ and our policy on ‘Alternate Work Schedules.’ In addition, there are several other policies that are currently being worked on. The challenge going forward will be to ensure that the policies are being embraced and implemented throughout our business. We need to think about how to get feedback on the success of each policy, as well as how to continuously work to improve upon each.”

The report goes on to state that the 31 targets fall into four major categories: things that impact American Water’s employee population, its community, its employee satisfaction, and its relationships with suppliers. It also states that if people focused on those four areas and on the implications of diversity in each, the reasons for many of the targets on American Water’s list would perhaps be validated. More importantly, the report has the potential to significantly simplify and put into understandable terms what management is trying to achieve.³⁰⁹ Additionally associated with this assessment report was a recommended communications plan,³¹⁰ which to some extent has been used.³¹¹ However, as of December 2007, American Water has made little progress toward achieving these 31

targets and timely implementing this 27-month diversity plan. The diversity plan had targets starting in January 2006 and continuing through March 2008. American Water management indicated that little progress had been made as a result of competition with other initiatives. Nevertheless, diversity is important and none of these targets should continue to be ignored.

Finding IX-6 PAWC has a fully compliant affirmative action plan, but could be more aggressive in setting affirmative action hiring goals and attracting women and minority job candidates.

Utilization analysis of women and minorities is a somewhat arcane process. Results are affected by what geographic area is used to determine workforce availability and what method is used to calculate underutilization. The utilization analysis compares the actual percentage of minorities and females in each job group (from the job group analysis) with the calculated percentage availability of minorities and females (from the availability analysis). It then uses the results of this comparison to determine whether minorities and females are “underutilized” in any job group. “Underutilization” is defined as “having fewer minorities or women in a particular group than would reasonably be expected by their availability.” There are four accepted methods used to calculate underutilization:³¹²

1. *Any difference* – This approach is the simplest and suggests that underutilization exists if there is any difference between the availability of women or minorities, as compared to their percentages in the employer's actual workforce.
2. *Difference greater than or equal to one person* – This suggests that if the difference between utilization level and the weighted availability level is one or more, a job category is considered to be underutilized and would therefore set a recruiting target for this job category.
3. *80% rule* – This approach suggests that if the utilization level is within 80% of the weighted availability then the job category is considered to have an acceptable utilization level; goals are set for job categories where the utilization level falls below 80%.
4. *Two standard deviations rule* – This approach uses a more sophisticated statistical test to determine whether the utilization level falls within an acceptable range. If utilization is more than two standard deviations from the weighted availability figure then a job category is considered to be underutilized. American Water would then set a hiring goal for this job classification.

PAWC reports underutilization using three of these four methods, as it does not report utilization using the *any difference method*.³¹³

Exhibit IX-10 shows underutilization using the three methods for all seven job groups in each of the three reporting areas for PAWC.³¹⁴



**Exhibit IX-10
PAWC Women and Minority Utilization
as of December 31, 2006**

Job Group	Western		Northeast		Central	
	Women	Minorities	Women	Minorities	Women	Minorities
Officials and managers	11 of 73 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	1 of 73 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No	5 of 49 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No	0 of 49 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No	10 of 58 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	4 of 58 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No
Professionals	1 of 3 Diff. ≥ 1: No 80%: Yes 2 Std. Dev: No	0 of 3 Diff. ≥ 1: No 80%: Yes 2 Std. Dev: No	4 of 4 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	0 of 4 Diff. ≥ 1: No 80%: Yes 2 Std. Dev: No	8 of 19 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	1 of 19 Diff. ≥ 1: No 80%: Yes 2 Std. Dev: No
Technicians	3 of 4 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	0 of 4 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	12 of 13 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	3 of 13 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	1 of 2 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	0 of 2 Diff. ≥ 1: No 80%: No 2 Std. Dev: No
Office and clerical	10 of 12 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	0 of 12 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No	19 of 24 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	1 of 24 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	18 of 23 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	4 of 23 Diff. ≥ 1: No 80%: No 2 Std. Dev: No
Craft workers	12 of 93 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	7 of 93 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	4 of 81 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No	0 of 81 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No	7 of 65 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: Yes	2 of 65 Diff. ≥ 1: No 80%: No 2 Std. Dev: No
Operatives (semi-skilled)	33 of 236 Diff. ≥ 1: Yes 80%: No 2 Std. Dev: No	20 of 236 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No	7 of 111 Diff. ≥ 1: Yes 80%: Yes 2 Std. Dev: No	5 of 111 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	13 of 62 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	3 of 62 Diff. ≥ 1: No 80%: No 2 Std. Dev: No
Laborers (unskilled)	0 of 1 Diff. ≥ 1: No 80%: Yes 2 Std. Dev: No	0 of 1 Diff. ≥ 1: No 80%: Yes 2 Std. Dev: No	0 of 0 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	0 of 0 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	0 of 0 Diff. ≥ 1: No 80%: No 2 Std. Dev: No	0 of 0 Diff. ≥ 1: No 80%: No 2 Std. Dev: No

Source: Information response 710

While the two standard deviations rule is an accepted method for calculating variance from the expected utilization level, it is also the method that is least likely to produce a determination of underutilization. PAWC uses this method to make a determination of underutilization; however, it does not appear to meet the spirit of the Commission's intent to foster diversity within Pennsylvania's utility industry. At PAWC, affirmative action hiring goals are made only when the utilization level is less than two standard

deviations. In *Exhibit IX-10* there are several job categories where the one person and 80% rules suggest underutilization, but the two standard deviations rule does not. Utilizing the two standard deviations method for determining underutilization, PAWC has only set a hiring goal for female craft workers in the Central Region. *Exhibit IX-10* indicates that had the other methods been used instead, an additional 16 goals would have been set for PA.³¹⁵ The diversity action plan speaks only to minority candidate pools for executive level positions.³¹⁶ A more aggressive approach to affirmative action would suggest hiring goals in additional categories and a corollary commitment in the diversity action plan.

For example, craft-worker jobs are relatively high paying (family sustaining). This category includes maintenance and crew supervisors, licensed operators, and skilled maintenance workers. It is obvious from the availability data that there is a small pool of qualified minorities for these jobs. A minimal compliance view says that American Water is not underutilized even when, as in Northeast PA, there are no minorities in the 81 craft-worker jobs in the company.³¹⁷ A broader commitment to diversity might look at ways to develop minority interest in these jobs, minority job training, hiring goals, and aggressive recruiting.

The affirmative action plan indicates no hiring goals or any strategies that have been employed to develop minority interest in these positions.³¹⁸ When Schumaker & Company requested a summary of efforts made to recruit women and minority candidates that were not reported in the affirmative action plan, the company provided 2007 statistics for PAWC ethnicity/gender groups by job categories as shown in the 2006 PaPUC diversity report.³¹⁹ This data is essentially the same as contained in the AAP (although may be from a different reporting date). More to the point, there is no indication of strategies employed to attract minority and women candidates.

Finding IX-7 The supplier diversity program is informally conducted.

As stated previously, American Water has an informal policy on supplier diversity, which has been approved by its COO. American Water Supply Chain management indicated that it anticipates it will become a written formalized policy/practice in 2008.³²⁰

In addition, the supplier diversity targets are based on participation of MWDVBE suppliers in the bidding process, not spend. For example, target measure examples for Supply Chain staff include:³²¹

- ◆ Assure that qualified and available minority, women-owned, or small business enterprises are included in all competitive bidding events. Total participation (invited to bid) rate should be documented and range from 50% to 70% of bidding events.
- ◆ Implement the requirement of certifications from all verified WMDVBE suppliers in American Water Company's ERP system and provide data for the regional Diversity Reports by the end of February 2007.
- ◆ Implement use of new Diverse Supplier databases and provide training to Supply Chain by the end of 2007.

- Ensure that new supplier diversity reporting requirements in Pennsylvania, New Jersey, and California are followed.
- Update supplier diversity program on intranet by the end of 2007.
- Facilitate at least four supplier diversity program meetings paced throughout the year by year end.
- ◆ Provide three to five *Supply Chain Link* articles throughout the year to explain supplier agreement management processes or Supply Chain efforts in supplier diversity.

Although the Supply Chain Director has the same process target (continuous improvement in all Supply Chain areas) as other Supply Chain staff, she does not always have a specific performance measure related to supplier diversity, as staff does.³²² In 2006, she did, in 2007 she did not, and in 2008, she does. According to American Water management, the Supply Chain Director had many possible targets, so supplier diversity participation was not included.³²³

No Supply Chain management or staff personnel have actual diversity spend as a target.³²⁴

Finding IX-8 **Over the 2003 to 2007 time period, PAWC has neither consistently submitted or fully complied with the filing guideline requirements for diversity reports submitted to the PaPUC.**

A Diversity Report, showing both employee and supplier diversity, was not filed with the PaPUC for the years 2003 through 2005. The first PAWC report in recent years was submitted for 2006 (submitted in March 2007).³²⁵ PAWC also submitted a 2007 report in February 2008.³²⁶

In its 2006 employee diversity report, workforce composition statistics did not include five years of data, as requested by the PaPUC most recent filing guidelines. PAWC included only its 2006 workforce data, not the prior four years'.³²⁷ In its 2007 employee diversity report, it also failed to include historical data.³²⁸

In its 2006 supplier diversity report, PAWC indicated that only suppliers that produced a certification of minority status (WMDVBEs) were reported. That is because the Supply Chain organization had recently implemented a policy that only spend with certified suppliers would be included in its WMDVBE spend reports. In the past, PAWC spend with WMDVBEs had been based on a self-certification form that was completed by PAWC's responding suppliers. When instituting this new policy, Supply Chain sent letters requesting evidence of each supplier's certification status. In addition, the department contacted approximately 75% of these suppliers via telephone.³²⁹ In its 2007 supplier diversity report, PAWC included self-certifying, as well as certified, WMDVBE organizations.³³⁰

Also of note is PAWC's comment that "no significant innovative approaches have been undertaken by Pennsylvania-American Water Company or the Supply Chain organization to encourage minority/women/persons with disabilities-owned business development, partnering, subcontracting, joint venturing, and venture capital projects."³³¹ The report also states that barriers presently preclude the inclusion of MWDVBE participation in many of PAWC's sourcing category efforts because some

PAWC sourcing strategies preclude MWDVBE participation. Such strategies include, but are not limited to, purchased water, water treatment chemicals, telecommunications services, electrical power, and regulatory expenses, which PAWC management represents as a significant portion of PAWC's annual spend.³³²

PAWC also mentions that Supply Chain's systems are unable to accurately identify expenditures by prime contractors with minority subcontractors.³³³

C. Recommendations

Recommendation IX-1 Update the diversity action plan, provide resources, and implement the plan in a timely manner and give consideration to a Pennsylvania-specific initiative. (Refer to Finding IX-1 and Finding IX-5.)

American Water assures us that with the divestiture from RWE behind them, it will be able to refocus on many initiatives that were set aside during the transition. Most notably is a recommitment to the diversity initiative. Given the time that has passed, we believe the plan will need updating, with emphasis placed on the business case for diversity. In addition, resources will need to be allocated to the effort. Most notably, a Diversity Coordinator should be identified. Schumaker & Company strongly believes that this person should be of a sufficiently senior level to establish credibility and have sufficient influence on American Water's policies and practices. This person should be tasked with re-establishing the Diversity Council and implementing all aspects of the plan. The Diversity Coordinator should make regular progress reports to both the PAWC President and American Water as a whole.

Schumaker & Company believes HR should take an active role in the process and that diversity should be a key driver in its workforce planning and recruitment initiative (see *Recommendation IX-5*). We also believe consideration should be given to a Pennsylvania-specific initiative. Given the size of the Pennsylvania organization and the anticipated level of hiring, we think it would be justified to allocate resources to PAWC to implant its diversity effort and to link to the overall corporate initiative.

Recommendation IX-2 Complete efforts to assure data integrity in the JD Edwards human resources information system. (Refer to Finding IX-2.)

While the issue of HRIS data integrity has broad ramifications for American Water, this recommendation is specific to data used to create the affirmative action report. It is imperative that location and other relevant employee data be accurate. This will reduce the need for the manual verification and enhance the integrity of PAWC's affirmative action plan.

American Water appears to have identified key data-integrity issues and continues to work toward resolution. We are concerned with the unstable nature of the JD Edwards' enhancement project and the

potential move to a new ERP platform, although a new HRIS system could ultimately completely address the issue. Nonetheless, we accept American Water's assurance that data-integrity issues are being addressed. We would expect periodic reporting from the HR VP regarding progress on this issue.

Recommendation IX-3 Develop and implement a standard data-verification process for EEO-1 reporting. (Refer to Finding IX-3.)

American Water HR should develop a standard data-verification process for all reporting locations. The PAWC HR manger should ensure that all steps are followed in all locations. When complete, she should review and approve all submissions prior to their submission to AWWSC HR.

Recommendation IX-4 Require the AWWSC Human Resources Vice President to review and approve EEO-1 reports prior to submission. (Refer to Finding IX-4.)

The HR Analyst who compiles the data for the EEO-1 reports should not be the person who certifies the report. The lack of separation in responsibilities does not meet the federal requirement and does not assure proper oversight. While Schumaker & Company is in no way faulting the HR Analyst's efforts, we believe that certification should come from another person at a higher level and that the AWWSC HR Vice President seems most appropriate for this task.

Recommendation IX-5 Define, document, and implement more aggressive hiring plans for women and minorities. (Refer to Finding IX-6.)

The two standard deviation method for determining underutilization is an acceptable EEOC method and assures that PAWC is in compliance. Nonetheless, Schumaker & Company believes Pennsylvania-American Water Company could be more aggressive in developing minority and women interest in the water utility industry in general and in PAWC in particular. In *Chapter II – Executive Management, External Relations, & Human Resources*, we give extensive consideration to the high level of expected retirements PAWC will face, and we have worked with PAWC in *Phase III* to develop a plan to address this issue. The high level of expected turnover creates a significant opportunity to attract a more diverse workforce to the organization.

The recruiting plan developed as a result of the workforce planning initiative, which was begun in *Phase III*, should specifically address women and minority hiring. It should include outreach to specific communities and strategies for developing women and minority interest in a water utility career. The company might also look outside the local job market (from which the availability data is drawn).

The plan should also set specific goals to assure accountability. These may include applicant pool goals or hiring goals for women and minorities beyond those necessitated by underutilization calculations in the affirmative action plan. This recruitment plan may or may not be incorporated into American

Water's affirmative action plan, but it must be documented and success should be measured and reported to PAWC executive management.

Recommendation IX-6 Formalize the supplier diversity program and explore the use of spend targets in the Supply Chain performance objectives. (Refer to Finding IX-7.)

American Water should create a formal supplier diversity policy/practice as Supply Chain management has stated it intended to complete in 2008. Furthermore, Schumaker & Company understands American Water's philosophy that management does not want to give contracts to diverse suppliers that are not competitive, and we agree. However, the lack of spend targets does not hold Supply Chain accountable for increasing actual spend dollars with diverse suppliers. American Water management should explore the inclusion of such targets, along with participation objectives, as part of the group's (and the Director's) objectives. Safeguards can be put in place to prevent Supply Chain from awarding bids to non-competitive diverse suppliers.

Recommendation IX-7 Submit comprehensive diversity reports to the PaPUC annually. (Refer to Finding IX-8.)

Each year, PAWC should submit comprehensive diversity reports that incorporate five years of historical data in compliance with the most recent PaPUC reporting guidelines. If five years of historical data is not available, then PAWC should build an historical picture as it goes. For example, the 2008 report (submitted in early 2009) should at least include three years of data, the 2009 report should at least include four years of data, and the 2010 (and later) reports should include five years of data.

X. Customer Service

Pennsylvania-American Water Company (PAWC) provides an essential service to its customers – and must provide this service in a prompt, accurate, and responsive manner. Planning, organization, procedures, and philosophy are all essential components in delivering appropriate and effective customer service. Effective customer service operations act as a bridge, serving the needs of both the utility’s external ratepayers and internal departments. This chapter addresses the activities that will be examined with respect to customer service operations.

- ◆ Customer service, complaints, and inquiries (call center)
- ◆ Customer accounting and billing
- ◆ Credit and collections
- ◆ Meter management
- ◆ Theft of service management

A. Background & Perspective

Among the items that we investigated in this area included the following:

- ◆ The reasonableness of American Water’s system-wide call center (which PAWC utilizes) staffing levels and overall performance (e.g., call abandonment rate, percentage of call answered within 30 seconds, etc.) to include validation of telephone access statistics, and a determination of the adequacy in response and rate of timely resolution of customer concerns/complaints
 - Are the customer service center(s) appropriately configured and adequately staffed for the level of telephone inquiries and customer visits?
 - Do PAWC customers who contact the call center with a question, complaint, or request receive a prompt, courteous, consistent, timely, and accurate response?
- ◆ PAWC’s customer complaint procedures, including a review of their compliance with the Pennsylvania Public Utility Commission (PaPUC) dispute handling procedures
 - Is information from customer complaints collected and used to identify the underlying root causes of customer questions and problems?
 - Are customer service standards utilizing both quantitative and qualitative measures?
 - Is there a visible and formal appeal process through a review officer within PAWC for responding to customers who remain dissatisfied after a front line contact?
- ◆ The trend of PAWC’s consumer complaint rates, justified complaint rates, and complaint response times



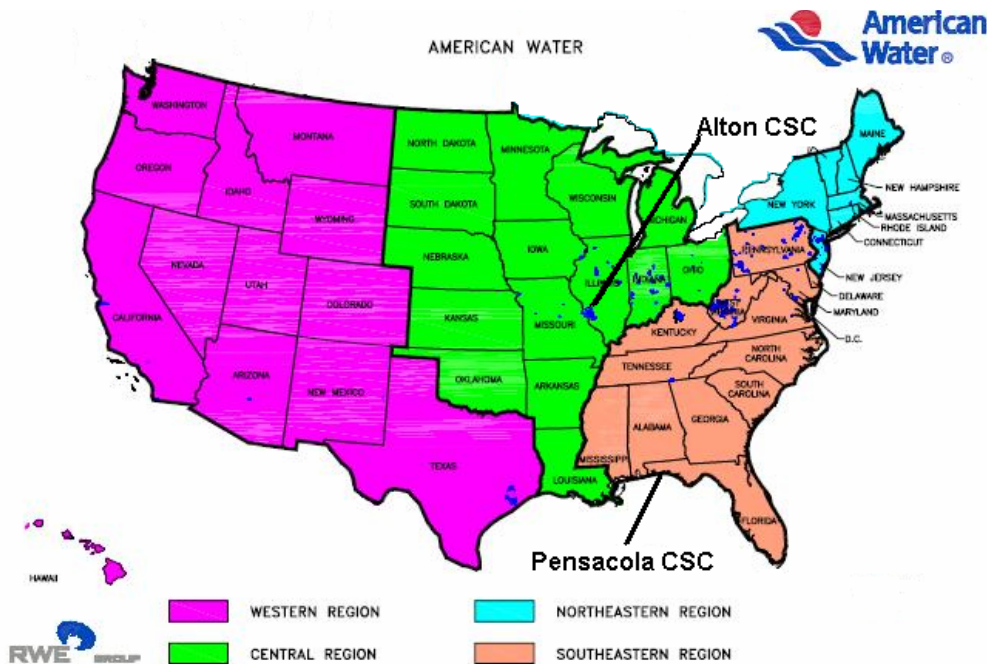
When evaluating PAWC’s customer service, billing, and collection policies and procedures, we considered all applicable PaPUC regulations in Title 52 of the *Pennsylvania Code*, including the changes that have occurred as a result of the recently enacted state law known as Act 201 of 2004, codified as Chapter 14 of Title 66 of the Pennsylvania Consolidated Statutes (or Public Utility Code).

The responsibility for the various customer service functions for Pennsylvania are held by the Customer Relations/Field Resource Coordination Center (FRCC) Southeast Region organization of the Eastern Division of American Water Works Service Company (AWWSC) and in the national call center located in Alton, Illinois and Pensacola, Florida.³³⁴

Call Center Operations

The Customer Service Center (CSC) for the American Water Works Company, Inc. (American Water) organization provides many of the activities involving customer service, particularly call center operations and centralized billing, credit, and collections activities. Although the CSC is physically located in two different locations, it operates as one organization, as illustrated in *Exhibit X-1*. The Alton (Illinois) Call Center was opened in April 2001 and the Pensacola (Florida) Call Center was opened in 2004.³³⁵

Exhibit X-1
American Water National Call Center
as of December 31, 2007



Source: Information Response 256

Due to some of the special regulatory requirements of the PaPUC, over 90% of the Pennsylvania calls are handled by customer service representatives (CSR) located at the Pensacola Call Center location. After-hours calls are routed to Alton, as it is the only call center open on a 24 hour by 7 day (24x7) basis. The Pensacola representatives are trained to the specific requirements of the Customer Assistance Program (CAP) and other specific regulatory requirements in Pennsylvania.³³⁶

There are 177 different full-time and 24 part-time shifts in the call centers. Each shift is a schedule for reporting to work. Employees rebid for these shifts every 90 days, thus employees have the ability to change their work schedule every 90 days based on seniority. More than five years of call history is currently available from which to forecast expected call volumes. A software tool, Blue Pumpkin, is currently used to forecast volumes and monitor adherence to schedules. In addition, call center management has the ability to monitor both the audio and screen navigation of individual CSRs to provide ongoing coaching.³³⁷ All CSRs are monitored, as a minimum, on a monthly basis.³³⁸

Calls are routed to the first available representative using a skills based routing scheme. There are currently six different skills for Pennsylvania calls, as follows:³³⁹

- ◆ *35 - PA Other*: Originally set up as general calls but currently used to track the number of customers who respond to the “update your information request”
- ◆ *36 - PA Billing*: Originally set up as billing skill, but no longer used; monitored by Ordering & Provisioning (O&P) daily
- ◆ *39 - PA Collections*: Currently used for the toll-free numbers associated with PAWC collection notices
- ◆ *55 - PA Billing NEW*: Currently used for reporting callers who choose the billing option in the IVR
- ◆ *56 - PA Other NEW*: Currently used for general customer questions (not billing-related)
- ◆ *60 - PA Emergency*: Set up as a result of the separation of PAWC business and currently used as a method of directing PAWC emergency calls to the CSRs who received specialty training made necessary by PA PUC regulations



A picture of the inside of the Alton Call Center is shown in *Exhibit X-2*.³⁴⁰

Exhibit X-2
Inside Alton Call Center
as of December 31, 2007



Source: Interview 97 (Tour of Facilities)

A picture of the inside of the Pensacola Call Center is shown in *Exhibit X-3*.³⁴¹

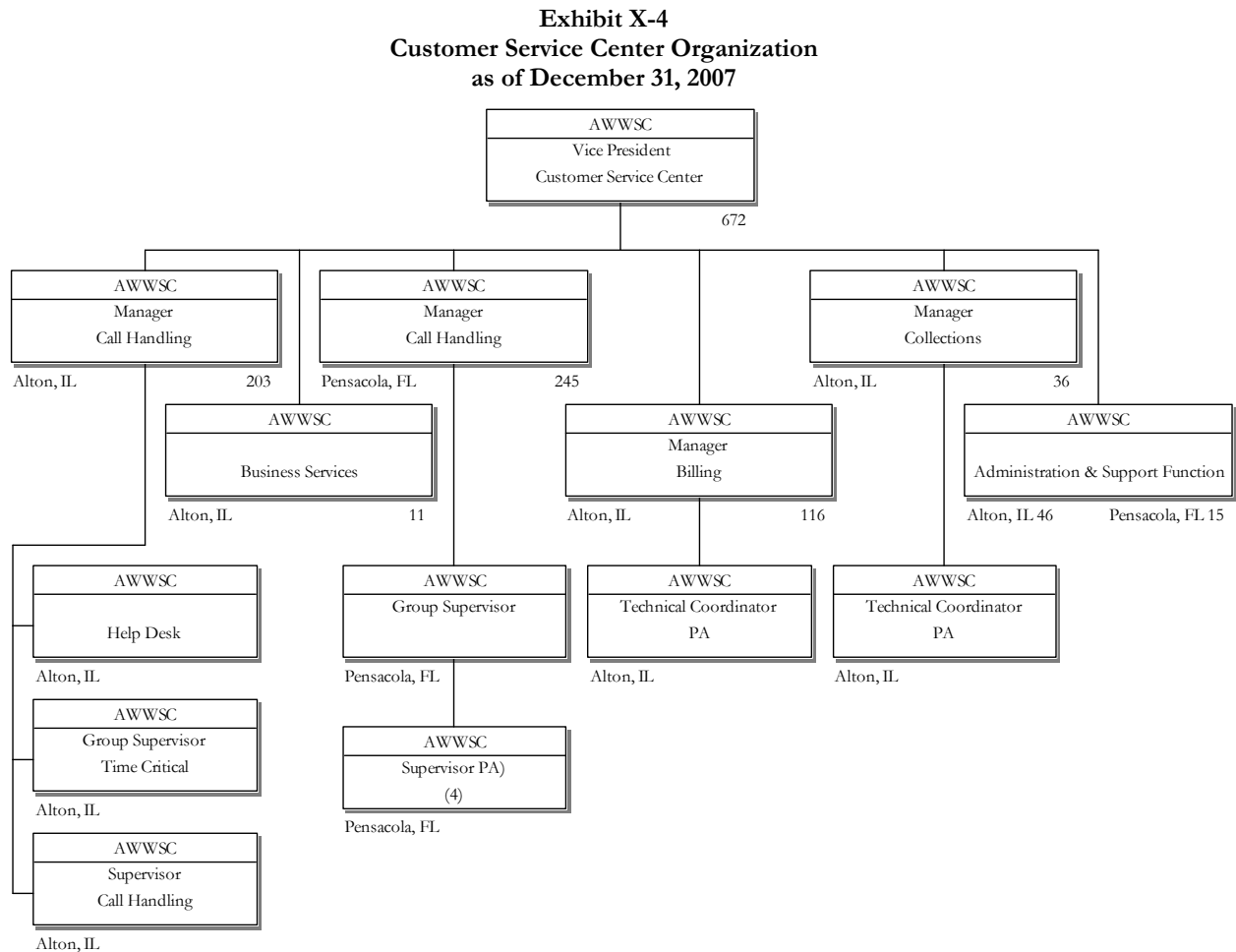
Exhibit X-3
Inside Pensacola Call Center
as of December 31, 2007



Source: Information Response 256

Organization & Staffing

The CSC organization is shown in *Exhibit X-4*.³⁴²



Source: Information Response 256

CSC responsibilities include the following.³⁴³

- ◆ *Call Handling* – inbound customer calls and correspondence (mail, fax, e-mail) regarding billing, collections, and services, and responses to customer needs, creation of service orders as required
- ◆ *Billing* – customer bills, process adjustments, resolve billing issues, special accounts billing, and managed accounts
- ◆ *Collections* – collection of unpaid bills, issuance of notices, outbound calling, issuance of shutoff orders, resolution of collection disputes, and bankruptcy processing
- ◆ *Time Critical* – timely processing of high priority service needs (i.e., emergencies) and dispatch of field services 24-hour/365-day coverage, handoff from FRCCs

- ◆ *Education & Development* – new hire training, refresher training, new position training, local district training, and testing
- ◆ *Quality* – quality monitoring of call handling, provision of reports to CSC leadership for coaching and ongoing development, and service order accuracy review and reporting
- ◆ *Support Functions* – finance, work force management, human resources, information technology, and administration functions, including cost control, recruitment, human resource, staffing, scheduling, overtime needs, administrative functions, and system/desktop support
- ◆ *Business Liaisons* – interface with each of the regions on all matters concerning call center operations

The CSC has identified specific goals and objectives for the organization, which apply to all states, including.³⁴⁴

- ◆ Call handling
 - 90% efficiency on quality assessments
 - 85% on service order quality reviews
 - Attendance (based on points assessed for unexcused absences)
 - 90% adherence to schedule
- ◆ Billing
 - Total bill corrections to water service not greater than 2.5% of active accounts
 - Achieve 10% reduction in utility contacts over same period of prior year
- ◆ Collections
 - Issue greater than 95% of eligible collections notices
 - Issue greater than 95% of eligible collections shutoff orders
- ◆ Time criticality
 - Dispatch greater than 85% of emergency orders within 30 minutes of creation (24 x 365 basis)
- ◆ Operations
 - Answer greater than 80% of calls within 30 seconds
 - Handle greater than 95% of calls offered
 - Greater than 78% for first call resolution
 - Greater than 90% of correspondence handled within three business days



Call Center Technology

Call Routing and Management

The CSC operates redundant Avaya S8700 Media Servers running Avaya Call Manager v2.2.2 to route and deliver calls to agents, which at American Water are generally referred to as CSRs. In addition, the system uses Avaya CTI for screen-pop delivery to CSRs, Avaya IR v1.1 with speech recognition for self-service functionality, Intuity Audix for voice mail and fax capabilities, and redundant Avaya Call Management System (CMS) servers for real-time and historical call statistics and reporting.³⁴⁵

Supervisor coaching of agents relies on Nice Call Recording v8.x with 60 channels for quality assurance and agent recording, MicroCall Call Accounting Server, and Avaya Operations Analyst for reporting.³⁴⁶

Operational continuity is assured by redundant Cisco routing and switching for personal computers and the voice network. Backups are performed off site using IBM's Tivoli Storage Resource Manager. The CSC uses PowerWare UPS Systems for battery backup. In addition, it maintains a 24 x 7 Avaya Maintenance Agreement for on-site or remote technical support.³⁴⁷

The primary local exchange carrier and toll free provider is ATT, which furnishes a SONET ring and DS3 voice connectivity (DS3 = 28 T1 lines in which each T1 has 23 to 24 lines each depending on configuration or trunking). A SONET ring is a redundant network connection that has one termination at ATT's Florissant MO operations center and the other termination at a Collinsville, IL location. In the event one connection experiences issues or is severed, calls immediately begin to route across the redundant connection. In addition, this connection has dual-entry points into the building with one entering from the front and one entering from the rear to prevent downtime due to a line being severed.³⁴⁸

The Pennsylvania group has 3 X T1s (70 dedicated circuits) plus access to 4 X T1s (94 shared circuits) for a maximum of 164 concurrent inbound callers.³⁴⁹

Workforce Management

The CSC uses Blue Pumpkin v4.6 SP2 Workforce Management Suite for agent adherence and scheduling. Blue Pumpkin is a workforce management tool that allows the user to schedule staff, measure performance, and analyze trends and opportunities, while learning and making suggestions to adjust call center staffing. A telephone call center is a collection of agents, telecommunication equipment, and management software, organized for the sole purpose of handling customer contact through telephone calls. As calls are received, they are identified by an automatic call distributor (ACD) according to type (e.g., sales calls, service calls) and are either delivered to a waiting agent or are queued pending agent availability.³⁵⁰

The CSC is currently working to replace Blue Pumpkin with Impact 360 and is in the very beginning stages of this update. The Impact 360 vendor recently completed a validation study that included some

clean-up suggestions to be sure that the CSC could migrate to the latest version of Impact 360's Workforce tool. The CSC is now researching pricing and internal financing options to develop a business case for approval.³⁵¹

The CSC expects significant improvements from the switch to Impact 360,³⁵² including the following enhancements to improve service levels:³⁵³

- ◆ *Queue Hopping and Flexible Duration Shift Activities:* witness forecasting and scheduling supports the creation of queue-hopping activities, where agents work (and are scheduled to work) on different queues at different times during the shift.
- ◆ *Five Minute Shift Activities:* schedule shift activities that have a granularity of five minutes at any interval (e.g. 5,10,15,20,25,30,35 minutes).

Enhancements that help increase agent satisfaction include:³⁵⁴

- ◆ *Time-Off Report and Agent View:* a new Time off Calendar View option displays total time-off hours allocated, total scheduled time-off taken and pending, and total time-off remaining. There are two views: a Personal View for agents and an Organization View for managers.
- ◆ *Partial Shift Swaps:* allow agents to post a portion of a shift, as opposed to their entire shift, to be swapped with another agent. Another agent can pick up a portion of a posted shift or multiple agents can each accept a portion of a posted shift.
- ◆ *Shift Bid Sorting And Filtering:* makes it easier for agents to find their ideal shift for which to bid.

Enhancements that help improve visibility into call center performance include:³⁵⁵

- ◆ *New Reporting Engine with Ad-Hoc Querying:* same (Congas) reporting engine as rest of Workforce solution with new ad-hoc querying capabilities for more sophisticated and custom analysis of contact center performance.
- ◆ *Employee Effective Dates:* changes to key attributes of the employee information are associated with a date or date range on which the change became effective, which helps more accurately track changes to the business and employees.

Enhancements that help with long term planning include:

- ◆ *Weekly Scenarios and Simulation:* a strategic planning solution has been enhanced to facilitate long-term planning in weekly scenarios in addition to monthly scenarios.

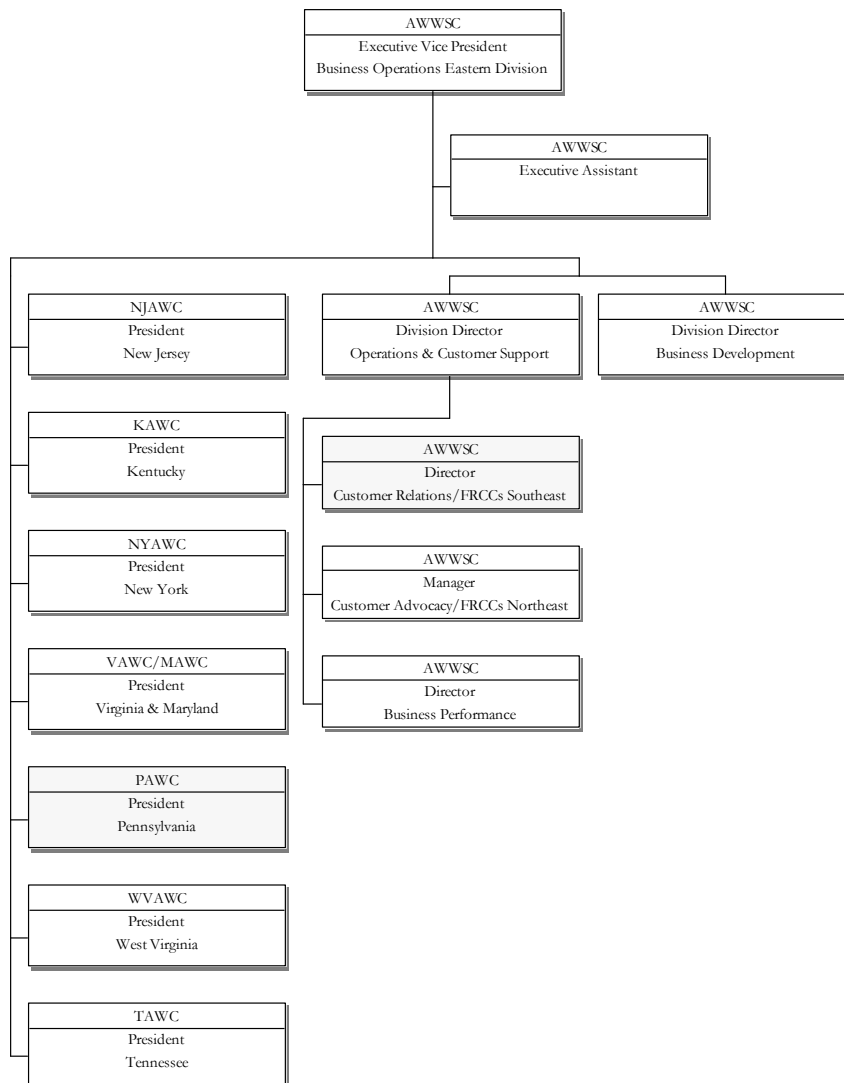
The CSC also recognizes that PAWC is continuing to use multiple 800 numbers in Pennsylvania and that these should be consolidated to a single 800 number routed to the Pennsylvania group in Pensacola. A single 800 number is expected to improve call management and allow better tracking of Pennsylvania specific calls. This project has not begun and the company reports it does not yet have a project plan.³⁵⁶

Customer Relations

Organization & Staffing

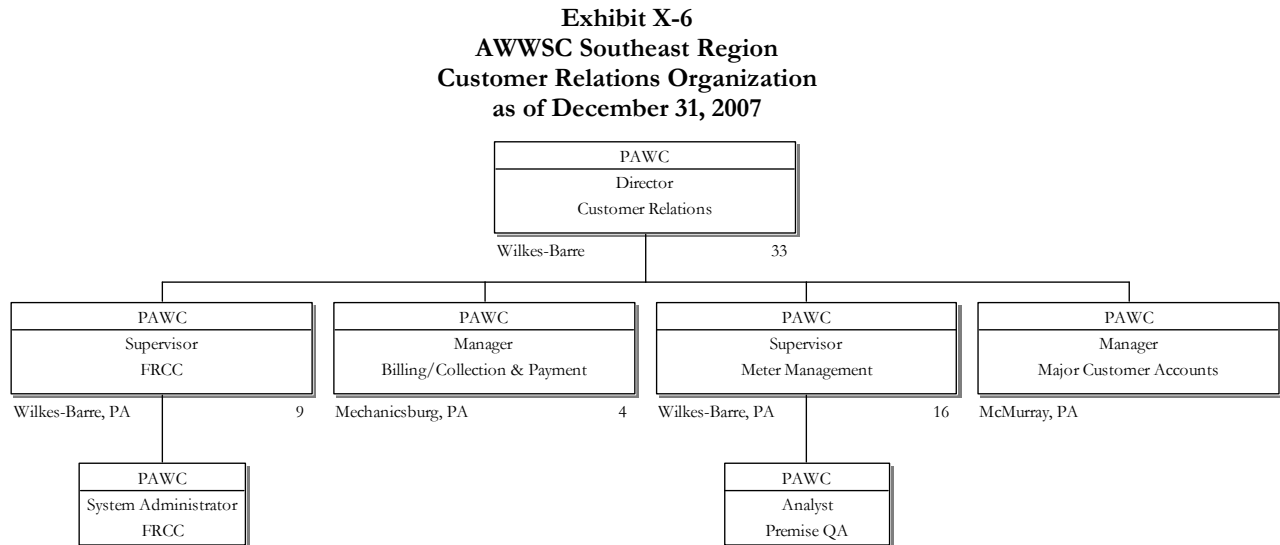
The responsibility for other various customer service functions are contained within the Customer Relations/FRCC Southeast organization of the Eastern Division, as highlighted in *Exhibit X-5*.³⁵⁷ Customer Relations/FRCC is responsible for all customer relations activities across the region, which includes Pennsylvania.³⁵⁸

**Exhibit X-5
AWWSC Eastern Division Organization
as of December 31, 2007**



Source: Information Responses 257 and 890

The Southeast Region Customer Relations organization is shown in *Exhibit X-6*.³⁵⁹ This organization is primarily responsible for the regional management and dispatching of field technicians, the overall management and monitoring of meter upload, download, and Electronic Customer Information System (ECIS) edit reports, compliant handling, and serving as the local interface with the national call center on customer and state/local issues.³⁶⁰



Source: Information Response 1 page 12 and Company Comments

As shown in *Exhibit X-6*, the Customer Relations organization is composed of four separate areas:

- ◆ *Field Resource Coordination Center* – This group, which operates from 7:00 am to 7:00 pm Monday through Friday, is responsible for the day-to-day dispatch of field technicians. The FRCC is responsible for overseeing the dispatch of approximately 100 field technicians in Pennsylvania on any given day. These field technicians are primarily involved in meter change outs, new service, turn on/turn offs, and acting as first responders on water leak reports. Approximately 90% of the scheduled workload is automatically assigned to field technicians on a nightly basis with the dispatch coordinators primarily managing and monitoring the orders during the day.³⁶¹ Time critical orders, such as reported water leaks, are handled by the CSC Time Critical group in conjunction with the appropriate FRCC for a region. Orders are usually dispatched using the Advantex dispatching software during the same day.³⁶² Activities within the FRCC include:³⁶³
 - Dispatching service work, ensuring that appointments are met and emergency orders are responded to in a timely manner
 - Acting as a liaison primarily between Field Service operations and the CSC Time Critical group
 - Supporting the customer service activities of network supervisors, field technicians, and the CSC Time Critical group

- Coaching field service representatives in work-quality issues to help drive performance
- Working with field service representatives and supervisors to enhance scheduling, reduce travel time and improve overall system functionality
- ◆ *Billing/ Collection and Payment* – This group is currently responsible for the handling of all complaints, including all informal and mediation complaints. Complaints to the PaPUC generally fall into two categories. Informal complaints are primarily billing and/or service related issues, while mediation complaints are primarily related to collection action for delinquent payments. The responsibilities for billing/collections have been transferred to the CSC, although the name of the group has not changed.³⁶⁴ Activities include:³⁶⁵
 - Acting as the liaison between PAWC and the PaPUC Bureau of Consumer Services
 - Performing investigations on both informal and mediation complaints
 - Monitoring call center and PAWC districts for collections and compliance issues; providing training as required
 - Performing account investigation in conjunction with PaPUC heating shut-off regulation (hot water heating customers)
 - Partnering with Be-Utility Wise and the Pennsylvania Energy Utilities and Aging Consortium to provide education to communities through social services to PAWC’s aging community
- ◆ *Meter Management* – The group is composed of four individuals who manage the processing of the meter reading exception reports. The actual meter reading is a field force responsibility (reports to different group) with this group responsible for the final quality assurance on the meter reading results prior to the information being submitted into the billing system. A typical review includes high consumption, closed with usage (closed accounts that are soft closed – i.e., a service technician is not necessarily dispatched to perform a hard shut off, but the meter is just monitored), and meters identified with bad dials. In many cases, these items might result in the creation of a service order to a field service technician. PAWC customers are currently billed every month, although not all meters are read every month. Some are read every other month and estimated on the off month.³⁶⁶
- ◆ *Quality Assurance Analysts* – This group is composed of two individuals who perform weekly validation audits to confirm that premises are set up in accordance with established methods and procedures. Mismatch and metric reports are reviewed in addition to critical error conditions. Follow-up on exceptions are recorded in a monthly scorecard, and documented in a Communication Log that measures and monitors certain business processes within the organization.³⁶⁷
- ◆ *Service Support Representatives* – This group is composed of ten individuals who perform the “Back Office” functions in regard to follow up requests to both completed and in-completed service order conditions coded by field technicians. Activities within the Service Support group include:³⁶⁸

- Ensuring that follow-up activities related to field service orders are reviewed in a timely manner and that additional follow up work is completed (i.e.: service order error conditions, office review, meter remove, and additional work required)
- Closing paper-based service orders
- Reviewing accounts for non-revenue water (NRW) related activity and creating service orders as applicable for estimates and stopped meters
- Review and coding accounts related to collection activity for water and sewer terminations
- Uploading and posting routes for billing
- ◆ *Major Accounts* – This is a one-person group that is primarily responsible for coordination with municipalities and large customers on the selling of usage data for those customers’ billing systems.³⁶⁹ Activities include:³⁷⁰
 - Negotiating contracts relating to wastewater billing and revenue collection, usage data, and shut offs
 - Working closely with large commercial, industrial, and municipal entities in an effort to develop and maintain good relationships
 - Developing trends and analyses regarding month-to-month usage on individual meters of a specific size to detect stuck or problem meters more quickly

Service First Program

In 2004, PAWC undertook a Service First program, which was tied to the implementation of the existing service order software (Advantex). As part of this implementation, service orders were generated in the call center and routed to individual field technicians through Advantex and transmitted via the Verizon cellular network to Panasonic Toughbooks located in the field technician’s vehicle. Every service order has an average job-duration time, which is used to schedule and assign service orders to field technicians. At the start of the Service First project, the job-duration time was estimated based on a field service survey.³⁷¹ After implementation, actual reports were developed to capture the true job-duration times and individual job durations have been adjusted throughout the years to enhance scheduling efficiency.³⁷²

PAWC offers three-hour appointment windows to customers, in addition to a 30-minute call-ahead option, as shown in *Exhibit X-7*.³⁷³

**Exhibit X-7
PAWC Appointment Windows
as of December 31, 2007**

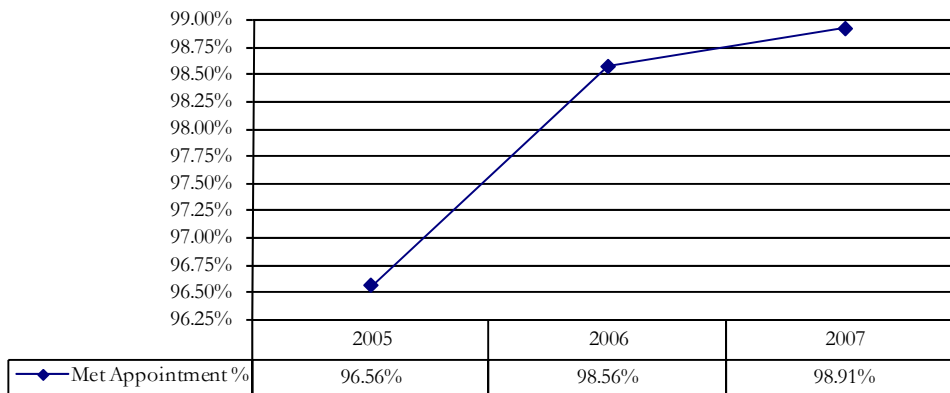
Appointment Window	Start Time	End Time
8 a.m. to 11a.m.	8:00 a.m.	11:00 a.m.
9 a.m. to noon	9:00 a.m.	12:00 p.m.
12:30 p.m. to 3:30 p.m.	12:30 p.m.	3:30 p.m.
1:30 p.m. to 4:30 p.m.	1:30 p.m.	4:30 p.m.
3:30 p.m. to 6:30 p.m.	3:30 p.m.	6:30 p.m.
All day appointment	8:00 a.m.	9:00 p.m.

Source: Information Response 268

The FRCC monitors customer appointments. If an appointment is in danger of being missed, the FRCC will communicate with the assigned technician. If it is determined that the appointment cannot be kept, the FRCC will either reassign the work to an available technician or the FRCC or technician contacts the customer to inform them of the delay. If necessary the FRCC will extend the appointment window to the newly agreed upon time or reschedule the service order for a new day.³⁷⁴

PAWC performance in meeting appointments is shown in *Exhibit X-8*.³⁷⁵

**Exhibit X-8
PAWC Met Appointments
2005 to 2007**



Data available starting January 2005

Source: Information Response 268

Customer Surveys

American Water uses Opinion Research Corporation (ORC) to conduct annual customer satisfaction surveys and quarterly service-quality assessments, which include separate results for PAWC customers. The customer satisfaction survey is conducted in the fourth quarter, and seeks to measure customer satisfaction with the American Water brand. The service quality assessments are summarized quarterly, based on monthly interviews with randomly-selected customers who had recent contact with the Customer Service Center. These transactional-based surveys seek to measure customer satisfaction with that specific contact experience.³⁷⁶ The steps PAWC has taken in response to the survey are as follows:³⁷⁷

- ◆ PAWC created standard alert templates (messages regarding planned and unplanned outages) to ensure the use of customer focused language, thus making it easier for customers to understand when using the interactive voice response (IVR) system. PAWC also created refresher training material to remind users how to properly enter alerts with an emphasis on timely system updates.
- ◆ PAWC created and issued laminate cards to field personnel. On these cards were stated PAWC's pledge to customers and simple steps for field personnel to use when interacting face-to-face with customers.
- ◆ The FRCC works on optimizing scheduling capabilities (as part of the appointment-setting process) in an effort to accommodate the number of service-order requests for a given day.
- ◆ PAWC communicates survey results to all users in "Splash," the American Water newsletter and internally generated posters, in an effort to increase awareness regarding customer opinion regarding the company.
- ◆ Special attention and direct follow up are provided to customers who express severe dissatisfaction with PAWC. These customers are flagged in an alert database where the national call center or PAWC company personnel can contact the customer to resolve any complaint.

Customer Accounting and Billing

The CSC provides customer service and customer accounting services for PAWC and its customers. These documented policies and procedures are contained in the CSC Customer Service Manual, as well as via on-line resources (credit and collections/service orders). The CSC is responsible for customer billing. The Billing group is responsible for getting the "billing file" ready for transmission to the Hershey Data Center (for posting to the customer account) and to the outside third party that actually prints and mails customer bills. The Billing group is divided into various billing teams, which are assigned to various geographic areas and are responsible for preparing the "billing file" for a given geographic area. The goal is to have the "billing file" transmitted to the Hershey Data Center and the outside third-party by the third day after the initial meter reading, so that that the bill can be mailed by the fourth to sixth day.³⁷⁸

Systems

American Water uses the Electronic Customer Information System from Alliance Data Systems as its customer service database. This package tracks customer, account, premise, and service information. It also performs cash, billing, and collections functions. The ECIS interacts with several other applications, including Advantex: Functions and associated applications include:³⁷⁹

- ◆ *Field Service Work* – provides real-time field-service support through a collection of Service First applications and interfaces, which allow field-service workers to receive new work assignments on their mobile computers and manage the scheduling of appointments. Some of the work performed includes meter change outs, turn-ons and turn-offs of service, and emergency repairs.
- ◆ *Meter Reading* – uses multiple meter reading applications for readings captured either manually or automatically. American Water has both fixed-based and drive/walk-by radio frequency meters installed, as well as touch-pad and ARB (pin) devices.
- ◆ *Online Account Manager* – an American Water created utility allows access to an operations and management (O&M) contract customer to view a standard set of reports containing information about the customers that belong to its municipality. Access is controlled through a secure web site.
- ◆ *Usage Data* – exports consumption data collected through the meter reading process to sewer authorities, who in turn use this data to bill their customers.
- ◆ *Letter Generation System (LGS)* – This is an American Water created utility that is used to generate letters to customers. Letters can be auto generated using defined processes or manually requested by a customer service representative.
- ◆ *IVR* – automated telephone menu system that aids in the routing of customer calls to the appropriate call center personnel. Customers can receive account and outage information, and request some types of service work without speaking to a representative.
- ◆ *J. D. Edwards* – ECIS transfers summarized sales and cash information to the American Water's financial information system.
- ◆ *Cash Processing* – cash payment information is received into ECIS from multiple vendors using a standard interface protocol developed by American Water. The vendors include banks and other third-party payment locations.
- ◆ *Third-Party Collections* – post charge-off collection information is transmitted to collection agencies over secure connections. The information is limited to a customer's past-due amount and contact information. The initial collection effort is performed by the American Water Collections group located at the Alton Call Center.
- ◆ *Bill & Letter Printing* – the printing and mailing of bills and letters has been outsourced to a third-party agency. Data is transferred over a secure connection to the agency. The actual billing function is performed by American Water at the Alton Call Center. Billing is a core ECIS function.

Billing Cycle

The duration of each element of the billing cycle is driven by the billing process, as described below.³⁸⁰

◆ Day 1

- Creation of meter batches by local operations; data is downloaded to handheld meter reading devices.
- Meter routes are read by local operations.
- Local operations exports read routes from Equinox to ECIS.
- Service Support uploads completed routes, print edit exceptions, and post meter batches.
- Meter reading information is transmitted to the Billing group.
- The Meter Reading Edit report is worked by the Meter Management group.
- The Meter Reading Edit orders are issued to obtain missed readings or readings that need to be verified.

◆ Day 2

- Local operations continue to review the Equinox meter reading edit file to identify accounts coded by meter readers for skip or trouble codes. Follow up service orders may be created when necessary to obtain an actual reading.
- Any remaining meter readings from the previous day are completed, which would include partially-read routes or skipped reads; readings obtained on this day are manually updated in ECIS by local operations.

◆ Day 3

- Meter read routes are pulled for billing.
- Accounts containing terminal billing exceptions are reviewed by the Billing group. Accounts that contain pending meter edit service orders are transferred to an exception batch allowing time for the order to be worked. If an account requires further follow up, the billing group issues a bill read service order that requests verification of the current reading, and the account is transferred to an exception batch.
- Accounts in which no terminal exception was flagged or those that have been resolved are sent to the Hershey Data Center for processing.
- At the end of Day 3 the non billing exception bills are transmitted for processing and issued, which occurs the early morning of Day 4 or three days after the meter was read. This would usually be 99.1% to 99.8% of the accounts that were read on Day 1.³⁸¹
- Meter Edit service orders continue to be worked until 12:00 pm central standard time (CST).

◆ *Days 4*

- Non billing exception bills (99.1% to 99.8% of the billing for that cycle) are issued by the third-party billing service agent.
- Pending bill read/meter edit service orders are worked and closed.
- The Billing group monitors those accounts that are contained in an exception batch and require further follow up. Upon completion of the pending bill read/meter edit service orders, accounts are processed for billing using the service order reading obtained.
- On Day 4 some of the remaining accounts that were previously billing exceptions and could not be billed at that time have been cleared. (In this example this would be less than 1% of the remaining bills), and are transmitted for billing. This would occur the early morning of Day 5 or four days after the meter was read.

◆ *Day 5*

- Remaining non billing exception bills (less than approximately 0.5% of the billing for that cycle) are issued by the third-party billing service agent.³⁸²
- Pending bill read/meter edit service orders are worked and closed.
- The Billing group monitors those accounts that are contained in an exception batch and require further follow up. Upon completion of the pending bill read/meter edit service orders, accounts are processed for billing using the service order reading obtained.
- On Day 5 the remaining accounts that were previously billing exceptions and could not be billed at that time have been cleared (in this example this would be less than 0.5% of the remaining bills), and are transmitted for billing. This would occur the early morning of Day 6 or five days after the meter was read.³⁸³

◆ *Day 6*

- Pending bill read/meter edit service orders are worked and closed.
- The Billing Team monitors those accounts that are contained in an exception batch and required further follow up. Upon completion of the pending bill read/meter edit service orders and the resolution of billing exceptions the remaining accounts are processed for billing.
- Remaining non billing exception bills (less than approximately 0.5% of the billing for that cycle) are issued by the third-party billing service agent.³⁸⁴

Therefore, most billings are printed and sent out three days (Day 4 of the account billing process) after meter reading; however, those accounts requiring a reread or some other review are usually issued on the fifth or sixth day. Billing errors are corrected by either adjusting the bill or canceling and reissuing the bill. In short by the end of Day 6, all accounts would have been billed in three batches as follows:

- ◆ Day 4 – 99% for the accounts read on day one
- ◆ Day 5 – something less than 1%
- ◆ Day 6 – something less than 0.5%

Prior to November 2005, bill printing processes, along with associated costs, were analyzed and the decision was made to outsource these activities to a company that specialized in printing and mailing services. The major impetus for this transition in November 2005 was improvement of disaster recovery capabilities along with improved growth capability. PAWC's cost per bill over the last three years has been as follows:³⁸⁵

- ◆ 2004: \$ 0.36061/bill based on 7.2 million bills processed
- ◆ 2005: \$ 0.36731/bill based on 7.6 million bills processed
- ◆ 2006: \$ 0.37020/bill based on 7.7 million bills processed

Customers can remit payments by the following five methods:³⁸⁶

1. The customer can send his or her payment in the mail to a lockbox. For the period from January 1, 2006 to June 30, 2007, the Mellon Lockbox processed 518,539 transactions per month for PAWC (402,262 checks and 116,277 electronic – i.e. credit card) at an average cost of \$.105 each. The cost to the customer of this method is a \$.41 stamp.
2. The customer can pay at a payment location. There are 119 payment locations throughout PA that accept 20,000 to 27,000 payments per month. There is no cost to the customer in Pennsylvania for using this method. Checkfree receives \$.38 per item and the payment agent receives anywhere from \$.20 to \$.50, depending on transaction. The final cost to American Water is \$.58 to \$.88 per transaction and volumes are around 20,000 to 27,000 per month. There is also a \$4.00 non-sufficient funds (NSF) fee from Checkfree.
3. The customer can have funds automatically withdrawn from their account via electronic funds transfer (EFT). This method of remittance is free to the customer. There is no cost to American Water for this method of remittance.
4. The customer can pay over the telephone. If the customer provides the American Bankers Association (ABA) and routing number to pay by check, the cost to the customer is \$1.50. If the customer pays by credit card, the cost is \$1.50 per \$75.00 or 2% of the total. There is no cost to American Water for this method of remittance.
5. The customer can pay on line. If the remittance is made through the PAWC website, the cost is the same as paying by telephone. If the customer pays on line through his or her own bank, the charge is determined by the bank. There is no cost to American Water for this method of remittance.

Credit card payments via telephone and on line payments average 25,000 per month.³⁸⁷

Credit and Collections

PAWC has established business processes that are followed to conform to Pennsylvania Chapter 56 and Chapter 14 requirements. These business processes dictate the actions of CSRs in dealing with customers and also result in the generation of the various notices as shown in *Exhibit X-9*.³⁸⁸



Exhibit X-9
Collection and Termination Practices
as of December 31, 2007

Letter Name	Description of Letter Contents	Scenario or Type of Customer Used for (Notice Processing Group)
10DAYPCP	Pocono/Ctsvll Wtr/Sewer-10 Day, Chapter 56 Customers	Residential, Chapter 56 Guideline Customers, Bill Class 1
3DAYPCP	Pocono/Ctsvll Wtr/Sewer-3 Day, Chapter 56 Customers	Residential, Chapter 56 Guideline Customers, Bill Class 1
48HRPCP	Pocono/Ctsvll Wtr/Sewer-48 Hr, Chapter 56 Customers	Residential, Chapter 56 Guideline Customers, Bill Class 1
POSTPCP	Pocono/Ctsvll Wtr/Sewer-PostTm, Chapter 56 Customers	Residential, Chapter 56 Guideline Customers, Bill Class 1
10DAYRES	PAPUC - 10Day Term Notice, Active Budgets with PAPUC	Residential Customer granted a PAPUC Budget Bill
3DAYRES	PAPUC - 3Day Term Notice, Active Budgets with PAPUC	Residential Customer granted a PAPUC Budget Bill
48HRRES	PAPUC - 48Hr Term Notice, Active Budgets with PAPUC (Winter Moratorium ONLY)	Residential Customer granted a PAPUC Budget Bill
POSTRES	PAPUC - Post Term Notice, Active Budgets with PAPUC	Residential Customer granted a PAPUC Budget Bill
10DAYRES	Res - 10Day Term Notice, Residential Customers	Residential, Chapter 14 Guideline Customer, Bill Class 1
3DAYRES	Res - 3Day Term Notice, Residential Customers	Residential, Chapter 14 Guideline Customer, Bill Class 1
48HRRES	Res - 48Hr Term Notice, Residential Customers(Winter Moratorium ONLY)	Residential, Chapter 14 Guideline Customer, Bill Class 1
POSTRES	Res - Post Term, Notice, Residential Customers	Residential, Chapter 14 Guideline Customer, Bill Class 1
37DAYT/L	T/L - 37 Day Term Notice, Landlord Notification	Properties with a coded Landlord/Tenant status such as ACT54 Customers
30DAYT/L	T/L - 30 Day Term Notice, Tenant Notification	Properties with a coded Landlord/Tenant status such as ACT54 Customers
10DAYT/L	T/L - 10Day Term, Notice, Tenant Notification	Properties with a coded Landlord/Tenant status such as ACT54 Customers
POSTT/L	T/L - Post Term, Posted at Tenant Property Location	Properties with a coded Landlord/Tenant status such as ACT54 Customers

Source: Information Response 230

PAWC has documented business processes for issuing residential customer medical condition certificates in accordance with Chapter 56 requirements. Statistics regarding the certificates issued over the last five years are shown in *Exhibit X-10*.³⁸⁹

Exhibit X-10
PAWC Account Hold for Medical Condition
2003 to 2008

Year	Count
2003	162
2004	293
2005	1,157
2006	674
2007	1,072
2008	499
Total	3,857

Source: Information Response 876

PAWC offers the following help-to-others programs, which assist PAWC’s low-income customers:³⁹⁰

- ◆ *Grant Program* (Dollar Energy Hardship Fund) – Customers who are 200% or below the federal poverty guidelines may qualify for this program by making application to Dollar Energy or one of the Dollar Energy agencies listed within a community. The maximum grant amount is up to \$500 (annually) based on the customer’s balance.
- ◆ *Low Income Tariff Provision*, which offers a 65% discount off the service charge or minimum bill. Customers who are 150% or below the federal poverty guidelines qualify for this program by making application to Dollar Energy or one of the agencies listed within a community.
- ◆ *Education on Conservation Measures* conducted by Conservation Consultants, which includes ways to conserve water, including a conservation kit to assist in reducing water usage (installation for those who are unable to install it) and minor plumbing repairs for those who have leaks. All of these assist in lowering water usage. All referrals who qualify for the Low Income Tariff Provision are eligible for these services.³⁹¹

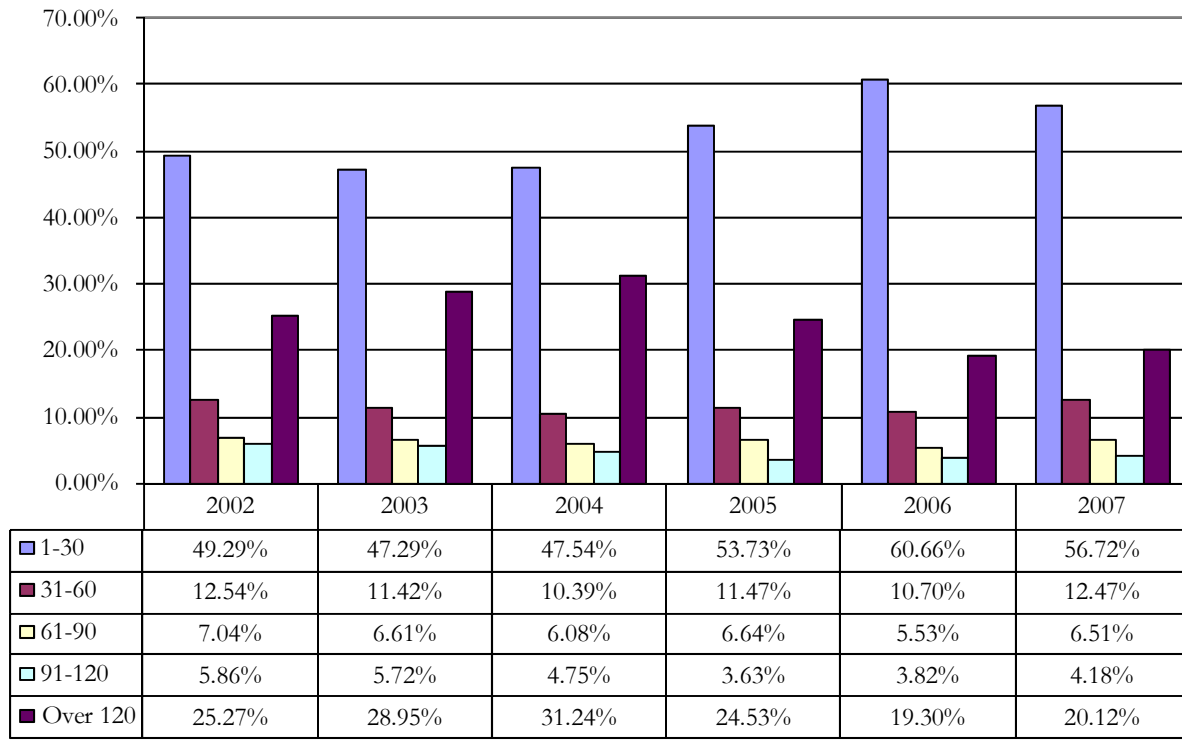
Exhibit X-11 displays the number and percentage of customers enrolled in these various programs.³⁹²

Exhibit X-11			
PAWC Customers Enrolled in Various Programs			
as of December 31, 2007			
	Number of Customers	% of Total Customers in Programs	% of Total Customers
Customers receiving Dollar Energy grants	570	5.28%	0.10%
Customers receiving the discount	6,826	63.27%	1.17%
Education information and discounts	2,258	20.93%	0.39%
Kits	1,058	9.81%	0.18%
Home visits	14	.13%	0.00%
Plumbing visits	63	.58%	0.01%
Total residential customers in programs	10,789	100.00%	
Total residential customers at 2007	581,400		1.86%

Source: Information Response 225 and Company Comments

There are approximately 30 CSC employees that handle credit and collection activities. This organization operates from 7:00 a.m. to 3:30 p.m. Monday through Friday. The PAWC accounts receivable aging (ARA) for the last six years is shown in *Exhibit X-12*. Generally, the PAWC ARA has improved since 2002. For example, the 1-30 day aging category has increased from 49.29% in 2002 to 63.17% in 2007, while the over-120 category has decreased from a high of 31.24% in 2004 to 18.33% in 2007.

Exhibit X-12
PAWC Accounts Receivable Aging Trends
2002 to 2007



Source: Information Response 231 and Task Report Comments for 2007

PAWC collected no security deposits from customers in 2006 and 2007.³⁹³ PAWC has the right to require customer deposits under both a tariff rule and Section 1404 of Act 201, the Responsible Utility Customer Protection Act, of 2004. However, the Company has not accepted customer deposits in years.³⁹⁴

Late payments revenues (penalties received on payments beyond the due date, which is roughly 20 days from bill mailing for residential customers and 15 for most other customers), but not yet considered uncollectible), as shown in *Exhibit X-13*, have generally decreased since 2002.³⁹⁵

**Exhibit X-13
PAWC Late Payment Revenues
2002 to 2007**

Year	Water	Wastewater	Total
2002	\$1,161,058	\$53,096	\$1,214,154
2003	\$1,288,746	\$74,075	\$1,362,821
2004	\$1,415,591	\$83,055	\$1,498,646
2005	\$1,407,429	\$102,471	\$1,509,900
2006	\$1,406,839	\$161,483	\$1,568,322
2007	\$1,461,460	\$180,028	\$1,641,488

Source: Information Response 226

Exhibit X-14 references activity of NARS and Phillips & Cohen, third-party collections agencies. The exact number of accounts turned over is not available. The dollar amount for the accounts sent, dollar amount collected, and percentage of dollars recovered appears as a summary in *Exhibit X-14*.³⁹⁶

**Exhibit X-14
PAWC Agency Collections
2004 to 2007**

Year	\$ Placed with Agency	\$ Collected by Agency	% Collected by Agency
2004	\$ 537,837	\$ 44,822	8.39 %
2005	\$ 7,626,411	\$ 613,249	7.66%
2006	\$ 5,354,274	\$ 389,602	7.56%
2007	\$ 4,954,859	\$ 567,968	11.46%

Source: Information Response 228

Effectiveness of the third-party outside collections agencies is not currently measured by a specific standard. American Water is working to establish a scorecard for these vendors to be used for the purpose of determining overall effectiveness. Currently, American Water pays a 23% contingency fee to each agency for funds collected on each account.³⁹⁷

Exhibit X-15 illustrates trends in PAWC's allowance for uncollectible trends.³⁹⁸

Exhibit X-15
PAWC Allowance for Uncollectible Trends
(\$ Thousands)
2004 to 2007

	Year 2004	Year 2005	Year 2006	June 30 2007 YTD
Balance at beginning of period	\$ 2,090	\$ 2,535	\$ 4,263	\$ 6,182
Provision charged to expense	7,309	9,522	7,683	2,268
Accounts written-off	(7,434)	(8,578)	(6,519)	(2,608)
Recoveries of accounts previously written off	570	784	755	264
Balance at end of period	<u>\$ 2,535</u>	<u>\$ 4,263</u>	<u>\$ 6,182</u>	<u>\$ 6,106</u>

Source: Information Response 232

Payment arrangements are those arrangements negotiated between PAWC and its customers. Results for the number of payment agreements made and the number of payment agreements broken (not completed as agreed upon) are displayed in *Exhibit X-16*.³⁹⁹

Exhibit X-16
Agreements Created/Broken
2003 to 2007

Year	Number of Agreements Created	Number of Agreements Broken
2002	61,046	12,002
2003	83,311	16,397
2004	112,145	20,194
2005	59,983	21,857
2006	53,805	19,106
2007	59,548	32,473
Total	429,838	122,029

Source: Information Response 233 and Company Comments

As shown in *Exhibit X-16*, from 2002 through 2007, in total, 429,838 agreements were created. Approximately 101,907 (28%) were broken. The PaPUC also negotiates arrangements for customer repayments. Those arrangements are categorized as budgets. As information, over the same time horizon, 101,907 budgets were arranged, and 34,930 (34%) budgets were broken.⁴⁰⁰

Meter Management

Meter management is managed by American Water on a regional level. The Meter Management group is part of the Customer Relations organization shown in *Exhibit X-6* and is physically located in Wilkes-Barre, PA. PAWC currently has approximately 71 meter readers across the state, as shown in *Exhibit X-17*, all of whom report to field services supervisors. This number does not include field support personnel who perform meter reading on a part-time basis.⁴⁰¹

Exhibit X-17
PAWC Full-time Meter Readers
2004 to 2007

Meter Readers	2004	2005	2006	2007
Actual	70	74	72	71
Budget	71	77	71	71

Data includes full-time meter readers. Field support personnel who perform meter reading on a part-time basis are not included
 Source: Information Response 234

Currently, most of PAWC water meters are manually read on either a monthly or bimonthly basis.⁴⁰²

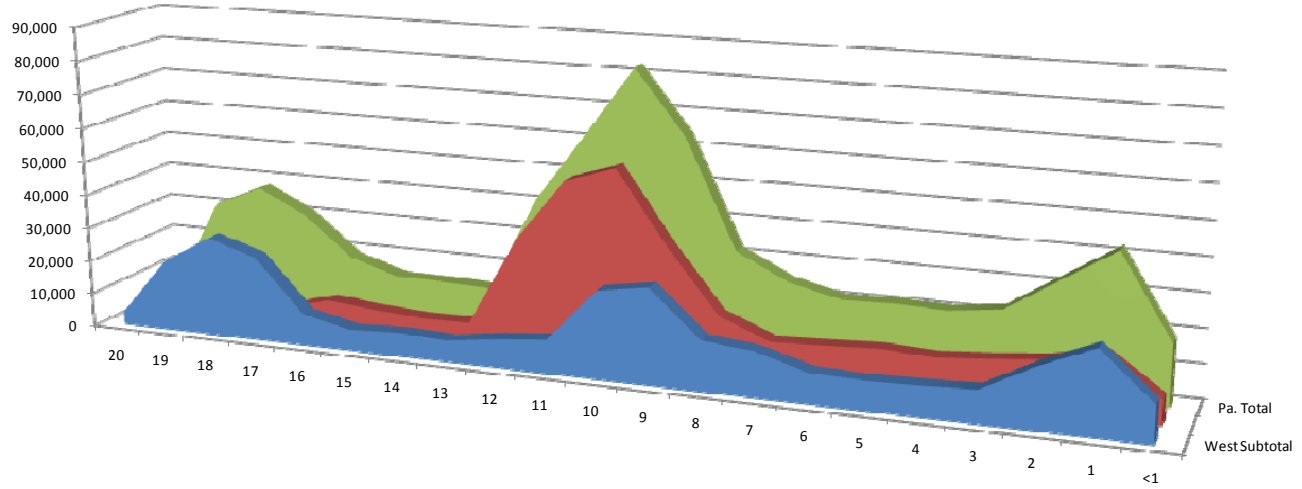
American Water developed a “Sourcing Strategy Document and Strategy Recommendation” in 2005, which evaluated meter pricing among manufacturers for standard and encoder registered meters. As a result, PAWC obtains meters on long-term (five years) contracts from a single approved vendor until a new contract is rebid in 2010.⁴⁰³

In addition, an American Water “Strategy and Standard Economic Evaluation” was developed to evaluate and implement automatic meter reading (AMR) technology at the local operation level. Several trials have been run in American Water, including one Pennsylvania trial at the Connellsville District. The current thinking at American Water is that the fixed-network advanced metering system (AMS) is the preferred AMR technology. The fixed-network more easily supports other capabilities such as backflow alerts and leak detection via acoustic monitoring, as compared to the mobile AMR (M-AMR). In short, either technology could be used to just read meters, but the fixed-network supports additional capabilities.⁴⁰⁴

PAWC maintains a length-of-service program in which meters are periodically removed from service and tested. Each water district company must either have its own meter testing facilities or use those of an affiliated company. All new meters, replacement and new installation, and appurtenances are installed by PAWC personnel and/or subcontractors. The decision to outsource contract labor is determined on a case-by-case basis, which includes a review of quantities to be replaced, labor needs, and scheduling parameters.⁴⁰⁵

The installation age of PAWC water meters is shown in *Exhibit X-18*. Water meters are usually replaced in 20 years, unless they have been replaced earlier as a part of the meter testing program. As shown in *Exhibit X-18*, PAWC meters that are approaching the 20 years replacement timeframe will be approximately 35,000 per year for the next several years.⁴⁰⁶ Western PA has a significantly larger number of meters coming due for replacement than eastern PA as shown in *Exhibit X-18*.

**Exhibit X-18
Meter Age Histogram
as of December 31, 2007**

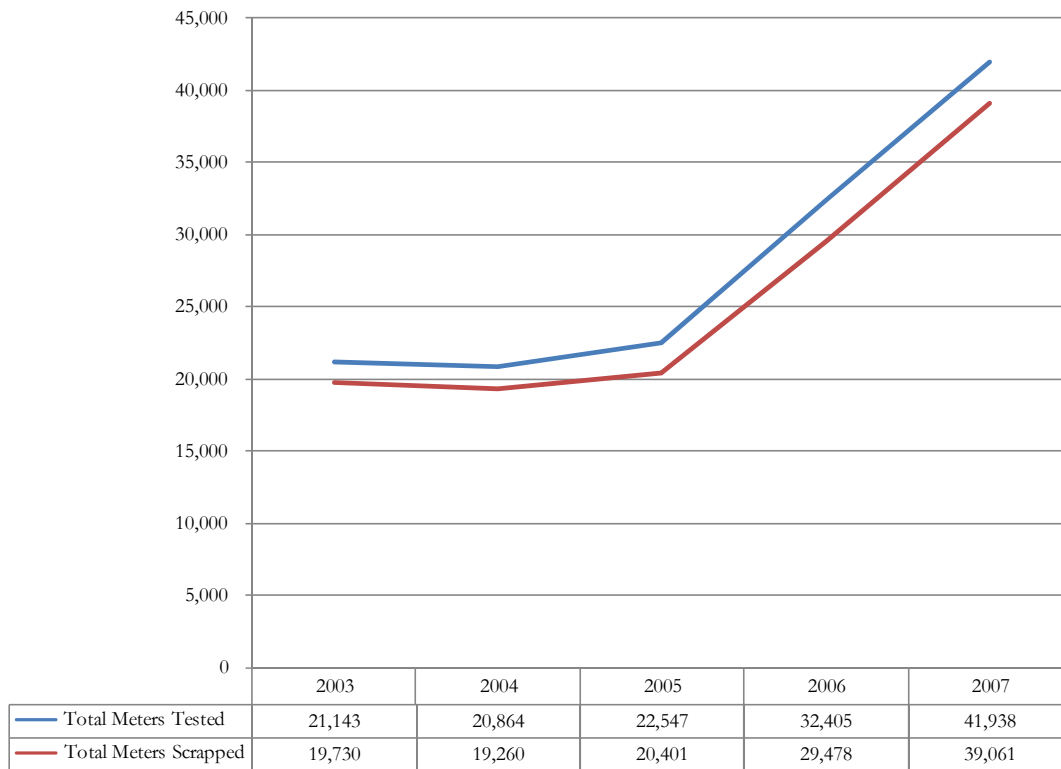


	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	<1
West Subtotal	3,712	20,902	29,284	24,825	9,226	6,154	6,887	6,246	8,285	9,768	25,601	28,001	14,594	13,146	8,844	8,473	8,805	9,514	17,685	24,244	10,784
East Subtotal	326	10,108	8,002	5,380	9,219	7,791	6,892	7,034	33,492	51,953	56,659	35,535	17,110	11,180	11,903	12,664	11,897	13,125	14,724	17,809	7,119
Pa. Total	4,038	31,010	37,286	30,205	18,445	13,945	13,779	13,280	41,777	61,721	82,260	63,536	31,704	24,326	20,747	21,137	20,702	22,639	32,409	42,053	17,903

Source: Information Response 879

As a result, PAWC has accelerated its meter testing program over the five years as shown in *Exhibit X-19*. All of the standard 5/8" and 3/4" meters are scrapped and replaced with new meters under current meter purchase contracts. Encoder 5/8" and 3/4" meters removed from service for periodic testing will be returned to service if the test results indicate that the meter is accurate at all three test rates (1/4 gallon, 2 gallon, 15 gallon). All encoder type meters and standard meters 1" or larger removed from for services for periodic testing will be returned to service if test results indicate the meter is accurate at all three test rates (1/4 gallon, 2 gallon, 15 gallon).

**Exhibit X-19
 Meter Testing Rates
 2003 to 2007**



Note: Total meters scrapped only reflects 5/8" meters
 Source: Information Response 879

Theft of Service Management

Meter readers are charged with inspecting customer locations for unauthorized connections during the meter reading process. In the 2005 to 2006 timeframe, a meter reading training manual was developed for the Southeast Region as a model for American Water. The training is co-delivered by local supervisors and subject matter experts (SMEs). The program was requested due to an Internal Audit finding that specified that there was no documented training program for employees who read meters.⁴⁰⁷

This training program contains some reference to the identification of theft as one of the responsibilities of the meter reader. It is the responsibility of the meter reader to inspect the meter for unauthorized connections during the meter reading process.⁴⁰⁸ PAWC has been investigating active premises without consumption / inactive premises with consumption to prevent theft of service. Separate reports from the ECIS system have been developed to flag such accounts for investigation. The results of these investigations are shown in *Exhibit X-20*. Since very late December 2004, as part of PAWC's efforts to

reduce non-revenue water, investigations have been intensified when meters have recorded consumption at inactive premises; or no consumption is recorded at active premises. This effort has resulted in significant back billing.⁴⁰⁹

Exhibit X-20
Theft of Service Statistics
as of December 31, 2007

Year	Usage Back Billed	Revenue Back Billed
2005	176,889,900	\$902,428
2006	100,385,100	\$667,467
2007	129,071,800	\$506,701
Total	406,346,800	\$2,076,596

Source: Information Response 875

In addition to inactive with consumption / active with no consumption investigations, local offices investigate flat-rate fire service to ensure that all are being billed correctly, and that no domestic water usage is being bypassed through the fire service check meters.⁴¹⁰

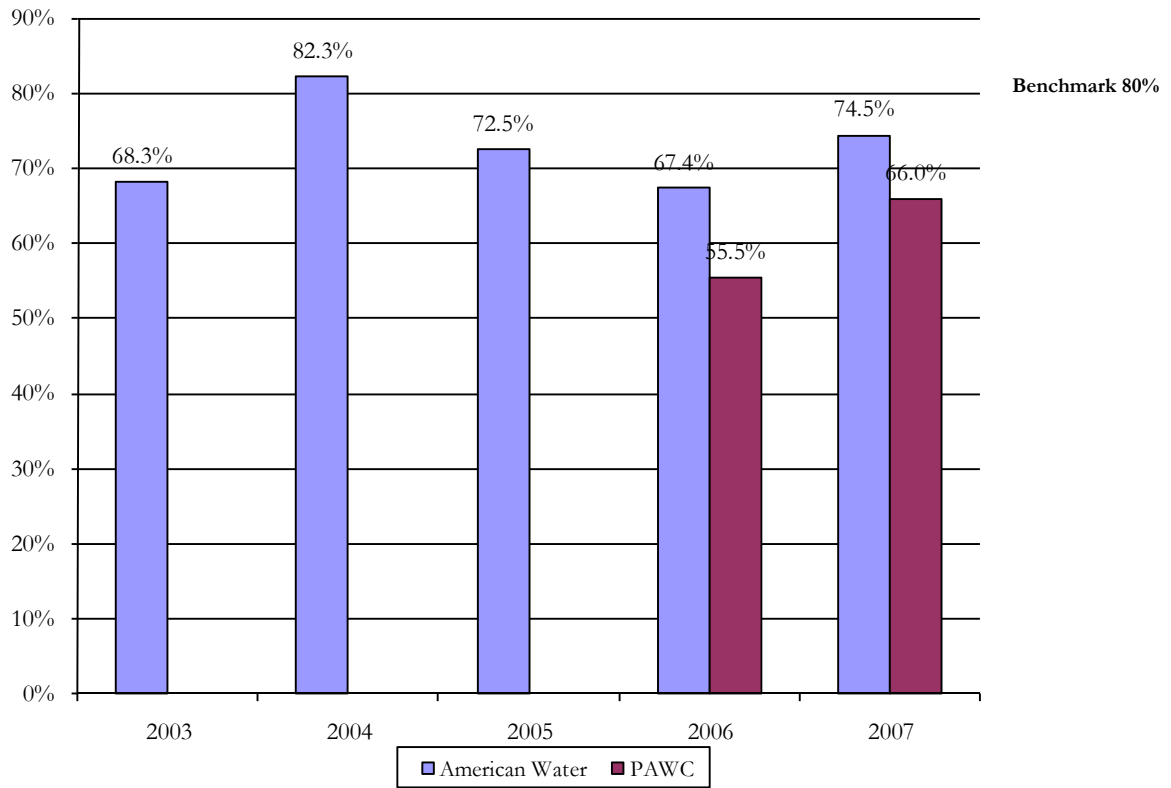
PAWC bills anyone caught taking water from a hydrant without a meter and backflow preventer, and correct straight-piped meter situations discovered while conducting its cross connection / backflow program. PAWC can back bill for a period of up to four years anyone caught taking water.⁴¹¹

B. Findings & Conclusions

Finding X-1 American Water call centers have failed to meet industry standard service levels.

Prior to 2006, customer service performance data, including percentage of calls answered within 30 seconds, were tracked and reported only for American Water as a whole. Beginning in 2006, percentage of calls answered within 30 seconds has been tracked and reported separately for PAWC. *Exhibit X-21* illustrates percentage of calls answered within 30 seconds for 2002 through 2007 for PAWC and American Water as a whole.⁴¹²

Exhibit X-21
PAWC and American Water % of Calls Answered within 30 Seconds
2002 to 2007



Source: Information Response 204

The percentage of calls answered within 30 seconds at American Water has trended up to peak at approximately 82% in 2004, and then steadily declined to approximately 67% in 2006.⁴¹³ Performance rebounded in 2007 with nearly 75% of the calls that the Alton CSC answered being within 30 seconds.⁴¹⁴ CSC performance has fallen short of the industry standard benchmark (80%) in four of the last five years. It is especially troubling that the PAWC calls have an even lower response rate. In 2007, the dedicated Pennsylvania group of call handlers in the Pensacola call center was only able to respond to 66.0% of calls within 30 seconds.

The poor service level is compounded by the fact that a high percentage of calls never get through to a representative. In 2006, 16% of all calls were met with a busy signal, meaning the call queue was full. In the first half of 2007, this number had risen to slightly over 18%. *Exhibit X-22* provides the number of calls by PAWC customers, the number of unanswered calls (where customers would hear an immediate busy signal, and calls that were delivered to the phone switch and routed to a vector directory number (VDN), which is an extension number used by Avaya ACD systems, but not answered). The percentage of unanswered calls is also presented in this exhibit.⁴¹⁵

Exhibit X-22
PAWC Customers' Unanswered Calls (Alton and Pensacola)
2002 to 2007

Year End	PA 800# Volume	# of PA Unanswered Calls	% of PA Unanswered Calls
2002	828,153		
2003	869,835		
2004	857,981	49,710	5.8%
2005	1,034,100	29,105	0.2%
2006	1,033,972	164,802	16.0%
2007	585,054	106,599	18.2%

2007 through June 30, 2007.

No blocked call data is available prior to March 2004.

Source: Information Response 202

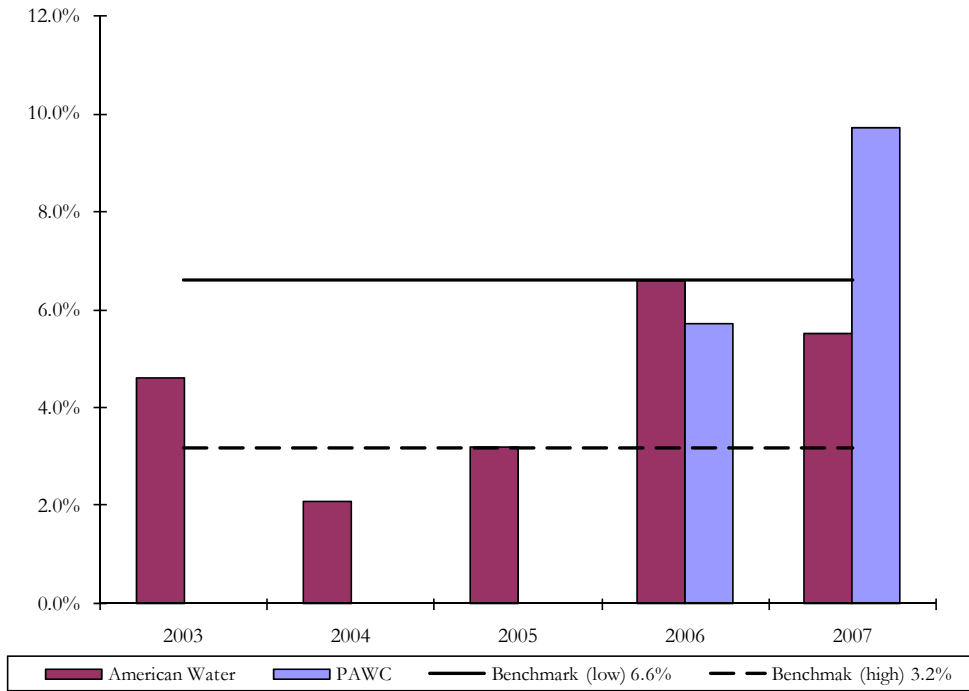
PAWC has made changes to improve its ability to answer PAWC customer calls. Two significant improvements have been made to American Water telephony:⁴¹⁶

- ◆ On February 13, 2007 a rollover trunk group was expanded from 45 trunks to 94 trunks.
- ◆ On May 3, 2007 routing was changed to ensure that all PA toll-free numbers are routed to the rollover group when the PA trunk is busied out.

Prior to May 3, 2007 the percentage of calls that received busy signals reached as high as 15.95% (period from Feb 10 - May 2). By September 19, the percentage of calls that received busy signals dropped to 8.72%.⁴¹⁷

Customers also experienced long hold times in the call queue. *Exhibit X-23* provides a comparison of the abandonment rate for American Water as a whole versus that for PAWC customers. The call abandonment rate after 30 seconds at American Water has trended downward (favorable) from 2002 to 2004; however, it has shifted upwards (unfavorable) from 2004 to 2006. Prior to 2006, customer service performance data, including percentage of calls abandoned after 30 seconds, was tracked and reported only for American Water as a whole. Beginning in 2006, abandonment rate has been tracked and reported separately for PAWC. In the first half of 2007, 5.4% of all American Water callers hung up having waited more than 30 seconds and not reached a representative. The rate was even higher for PAWC customers. In the first half of 2007, 12.4% of Pennsylvania callers hung up after waiting 30 or more seconds to speak to a company representative.⁴¹⁸

Exhibit X-23
American Water and PAWC Call Abandoned Rates
2002 to 2007



Source: Information Response 204 and Company Comments

In setting benchmarks, American Water reviewed five benchmark studies of call abandonment rates. The two used in *Exhibit X-23* are:⁴¹⁹

- ◆ *Low Benchmark* – Customer Contact Council (CCC), an industry trade organization, is a long-term benchmarking effort initiated in 2005.
- ◆ *High Benchmark* – Purdue University (Utility Industry Best) is a benchmarking study (published February 2006) representing 50 to 75 utilities.

Insufficient number of representatives, inexperienced representatives, increasing call volumes, and increasing call length are certainly all contributing factors to the poor performance at the PAWC call center operations.

Finding X-2 **Customer service representatives are taking longer to complete calls and follow-up work.**

Among the reasons for the high abandonment rate cited by the company is that the average call length is increasing and has been since 2004. The greater the average call-handle time (40 second increase or 12% since 2004), the fewer customer service representatives are available to answer customer calls.⁴²⁰

Average handle time (in seconds), including talk time, hold time, and after call work time, decreased from 2002 to 2004, as shown in *Exhibit X-24*. Then it has increased since 2004 (when it was at its low of 326 seconds) to its 2007 rate (409 seconds).⁴²¹

Exhibit X-24
PAWC Average Handle Time
(Seconds)
2002 to 2007

	2002	2003	2004	2005	2006	2007
Average Handle Time	388	349	326	337	352	409

Source: Information Response 204 and subsequent PAWC update

IT network delay problems have contributed to the increased call length. The call centers experienced periods of extreme network latency starting in April 2006, which lasted for approximately two months (with intermittent latency for the next four to five months). This caused CSRs to sometimes wait over 60 seconds for screens to refresh while assisting customers. This caused CSRs to answer fewer calls while increasing the average time to answer the next call.⁴²²

Increasing complexity (especially for Pennsylvania calls, which are frequently related to establishing payment plans), CSR turnover, and the associated problem of inexperienced staff were also cited as contributing factors.⁴²³

Finding X-3 The Pensacola CSC CSR turnover rate exceeds industry standards.

Exhibit X-25 shows the annual turnover rate at American Water’s two national call centers in Alton and Pensacola. (Data specifically for the Pennsylvania group is not available.)⁴²⁴

Exhibit X-25
American Water CSR Turnover Rates By Call Center
2003 to 2007

Year End	Alton CSC	Pensacola CSC
2003	44.79%	Not open
2004	43.67%	Not open
2005	20.45%	29.75%
2006	17.30%	40.35%
2007	14.60%	31.82%

Source: Information Response 262 and Company Comments

The company reports the CSR turnover rate in 2006 to be 17% in Alton and 40% in Pensacola. Turnover appears to have declined in 2007. The rate for last year was approximately 15% in Alton and 32% in Pensacola.⁴²⁵

A 2007 study by the International Customer Management Institute (ICMI) found that 54% of call centers had external turnover rates of 20% or less. Alton's rate would place it roughly comparable to those call centers. Of greater concern is the Pensacola call center, which is the primary center serving Pennsylvania customers. It has a rate far exceeding the average.⁴²⁶

Finding X-4 American Water has made no effort and has no plans to implement initiatives aimed at reducing employee turnover.

Schumaker & Company asked for both the company's actions to date to reduce turnover⁴²⁷ and for future plans.⁴²⁸ In both cases the company responded "Turnover in the Alton and Pensacola call centers is consistent with the expectations of a customer service environment." We assume this statement to mean that the turnover rates are average and acceptable. We find the turnover rates, especially in Pensacola, to be above average (unfavorable). Even if they were average, we would not expect a company with the resources of American Water to be content with average performance.

American Water uses a staffing agency (Express Personnel) to recruit CSRs. The CSRs remain on the staffing agency's payroll for 90 days before becoming American Water employees (temporary to hire).⁴²⁹ This arrangement allows American Water to select the highest performing representatives and not make permanent job offers to lower performing representatives. We would expect this arrangement to contribute to higher performance levels and lower turnover, but this appears to not be the case.

In addition, this allows American Water to exclude the turnover in the first 90 days from its turnover calculation for Pensacola. Whereas in Alton, the turnover rate includes CSRs who have left during the first 90 days of employment. Because of this, the turnover rates of the two centers is not an entirely *apples to apples* comparison and we would expect Pensacola to have a statistical advantage.

Insufficient and inexperienced staff is certainly contributing factors to the low service levels reported by American Water. The higher turnover rate in Pensacola is indeed consistent with the lower service levels reported for the Pennsylvania group. In fact, American Water itself sites high turnover as one of the reasons why its service level of answering calls within 30 seconds falls below the industry standard of 80% of calls answered within 30 seconds.⁴³⁰

Beyond this basic service level metric, high turnover can affect many aspects of call center performance. In its *Agent Turnover and Retention Report, 2007* ICMI states that "agent turnover adversely impacts many facets of a call center and the enterprise as a whole." According to the centers surveyed, no issue is as negatively affected by attrition as is service quality (cited by 71% of respondents), followed by productivity (64%), training and selection costs (59%), employee morale (55%), recruiting costs (47%), and stress (47%).⁴³¹



It should be noted that the CSR turnover data included in this *Exhibit X-25 (Finding X-3)* is from a resubmission by the company in response to our initial draft report. PAWC indicated that the initial submission cannot be validated by the new HR manager for the CSC. The initial turnover data differs substantially from the new submission. Schumaker & Company agrees that the new data is derived from a generally accepted calculation. The calculation method used in the company's initial submission is unknown. We make this point here to further reinforce that turnover rates were not routinely tracked and reported by the company prior to 2008.⁴³²

While the newly submitted data shows a decline in CSR turnover in Pensacola, Schumaker & Company remains troubled by the company's conclusion that "Turnover in the Alton and Pensacola call centers is consistent with the expectations of a customer service environment" given that the company appears to, until recently, have not tracked and was unable to accurately report CSR turnover in the call centers.

Finding X-5 More than one in four newly hired CSRs leave prior to completing all initial training and close monitoring.

In the first half of 2007, American Water hired 65 CSRs. Of these, 48 successfully completed all training and the "nesting pod" period. (The nesting pod is a period of four to five weeks in which a CSR takes calls, but is closely monitored by a supervisor. After completing this period, CSRs are assigned to a regular supervisor, given full responsibilities, and are subject to standard monitoring.⁴³³)

American Water reports that it costs \$2,554 to hire and train an employee in Alton and \$2,400 in Pensacola; however, these costs do not reflect the costs associated with those CSRs who do not complete all training and the nesting pod period. Spreading the hiring costs of these unsuccessful hires over the costs of successful hires increases the costs by about 35%.⁴³⁴

The American Water Vice President of Customer Service said that it is working to improve the quality of new hires by strengthening its recruitment practices.⁴³⁵ It appears that the company has not been successful at strengthening its practices. In addition, the Human Resources Director responsible for the call centers responded to our request to learn more about these changes by saying that the company has not changed any of its recruitment practices. The company also continues to use the same staffing firm under the same contract in Pensacola.⁴³⁶

As a follow-up, Schumaker and Company again asked the Human Resources Director what is being done to improve the quality of CSRs that American Water hires. He responded with the following statement: "There have been no changes in the recruiting process at either Alton or Pensacola to improve recruiting of successful CSRs, as there have been no specific problems identified in the process at this time."⁴³⁷

American Water has made some enhancements to its CSR training process, most notably being additional customer service training and refresher training for billing, collections, and service orders. In addition, the company continues to look for ways to enhance training.⁴³⁸

Schumaker & Company consultants would expect new hires in Pensacola to be fairly successful, as they typically have prior call center experience. (The Pensacola area has many national call centers.) Also, recruiting is done by an outside firm, thereby allowing the company to hire only the best CSR candidates.⁴³⁹

Finding X-6 After several years of a decreasing number of CSRs, American Water now plans to hire additional CSRs.

Although call volume and average call length has been increasing, the number of CSRs available to answer calls has been declining. *Exhibit X-26* shows the net loss of CSRs for 2005 to 2007.⁴⁴⁰ (Data specifically for the Pennsylvania group is not available.)⁴⁴¹

Exhibit X-26
CSR Staffing Level Changes for American Water as a Whole
2005 to 2007

	2005	2006	YTD 5/31/07
CSRs Lost	85	107	61
CSRs Hired	60	76	47
Net (Loss)	(25)	(31)	(14)

Source: Information Response 204

In 2008, American Water has committed to increasing the number of CSRs from 482 (September, 2007 level) to 519 (a net gain of 37). However, these new positions have not as yet been allocated between the two call centers.⁴⁴²

It should be noted again that the newly appointed HR Manager for the CSC cannot validate the data in *Exhibit X-26*. In its response to our initial task report, PAWC indicates that “New positions have been allocated between the Alton and Pensacola Customer Service Centers as evidenced by a total of five (5) new hire classes year to date 2008; three (3) in Alton and two (2) in Pensacola.”⁴⁴³ PAWC does not indicate if these new training classes will increase the overall staffing levels. Schumaker & Company remains concerned about the replenishment rate of CSRs (who leave the company or are transferred to other positions).

Finding X-7 Despite the company’s unfavorable service levels, PAWC customers appear to be generally satisfied with the contact they have with the company.

Data provided by a third-party assessment suggest that approximately 90% of those PAWC customers surveyed were “somewhat satisfied” to “extremely satisfied” with their CSC service contact. Nonetheless, dissatisfied customers rose from 8% in 2006 to 10% in 2007.⁴⁴⁴ Special attention and direct

follow up is provided to PAWC customers who express severe dissatisfaction with the company. These customers are flagged in an alert database, which allows the CSC or PAWC personnel to contact the customer as a means to resolve a complaint.⁴⁴⁵

Finding X-8 The Help Queue has proven effective in improving consistency of answers to customers and allowing supervisors to focus more of their time on CSR coaching and development.

The Help Queue (centralized CSR support), which is located in Alton, handles support calls for both call centers in an effort to provide first-call resolution to customer requests. In addition, this group handles escalated calls that the initial responding representative can not resolve. The Help Queue is currently staffed with 24 Customer Service Specialists and two Team Supervisors.⁴⁴⁶ This highly skilled group, all of whom have been trained in Pennsylvania specific rules and regulations, allows call-handling supervisors to dedicate more time to coaching, rather than dealing directly with customer problems. In fact, supervisors report that the time available for employee coaching went from about 60% (prior to the implementation of the Help Queue) to 75% to 80% (following implementation). In addition, the Help Queue appears to have had a positive effect on increasing the consistency of answers provided by all CSRs.⁴⁴⁷

Finding X-9 Neither American Water nor PAWC have a customer accessible website to provide basic customer self assistance.

Currently, there is no capability for customers to perform some basis self-service inquiries regarding their accounts. With call volumes being forecast to grow at a 2% to 2.5% rate per year, providing customers with the ability to perform some basic inquiries about their account from a secured website could possibly help to lower this growth rate.⁴⁴⁸

Finding X-10 Neither American Water nor PAWC supports electronic billing at this time.

American Water currently does not support electronic billing capabilities. Other utilities have developed the capability to electronically bill customers and are finding the number of customers electing to use electronic billing increasing each year.

Finding X-11 American Water has very limited customer self-serve options available on its IVR system.

The IVR system that went live in August 2005 has not delivered the desired results (reduction in “live” calls). The IVR was originally brought on-line January 3, 2005 but crashed on February 10, 2005. It was then on-line and off-line multiple times until August 2005. The CSC has not realized the projected decrease in live calls, which left the call centers understaffed during the busy summer season and unable to effectively respond to the actual call volume.

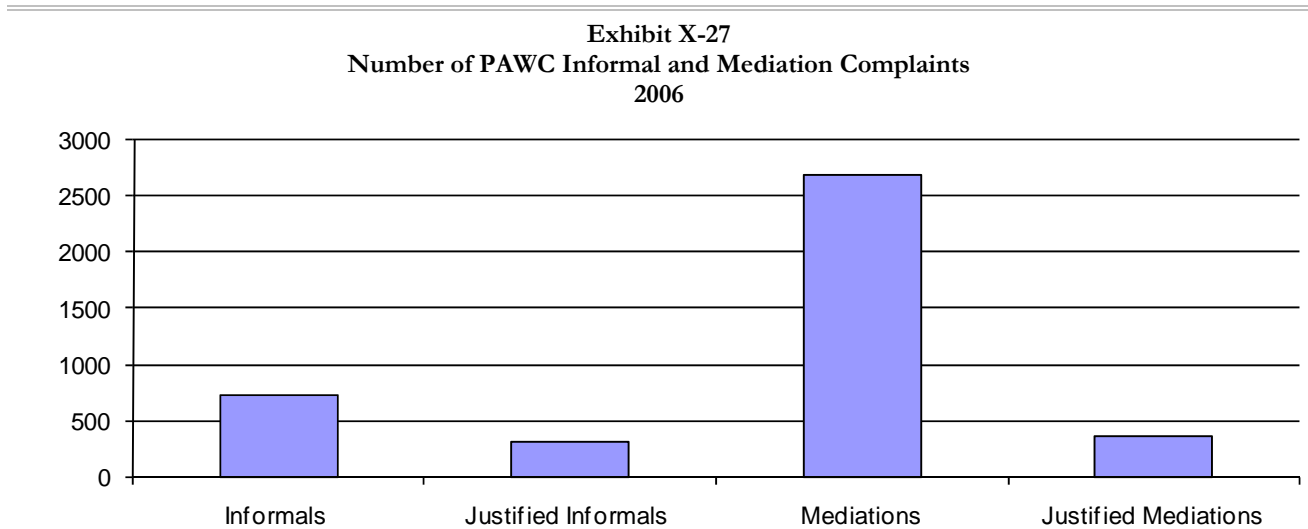
In addition, the IVR also lacks a number of self-service options, such as service turn-on, service turn-off, and automatic bill-pay features, which account for approximately 3,500 live calls per day.⁴⁴⁹ Although not all such calls would be handled by customers using the IVR and the number of calls handled by each CSR is not a precise statistic, 3,500 calls translates to approximately 60 full-time equivalent (FTE) agents.⁴⁵⁰

Finding X-12 The trends in various types of complaints (informal, mediation, executive, and formal) are generally increasing.

In some cases, an analysis of customer complaints and disputes can help identify issues concerning the relationship of an organization with its customers. PAWC tracks a number of different indications of customer complaints as various indicators of customer satisfaction. Complaints to the PaPUC generally fall into two categories.

- ◆ *Informal complaints* are primarily billing and/or service related issues.
- ◆ *Mediation complaints* are primarily related to collection action for delinquent payments.

PAWC investigates each complaint to assess process performance. The number of PAWC informal and mediation complaints in 2007 is shown in *Exhibit X-27*.⁴⁵¹



Source: Information Response 207 and Company Comments

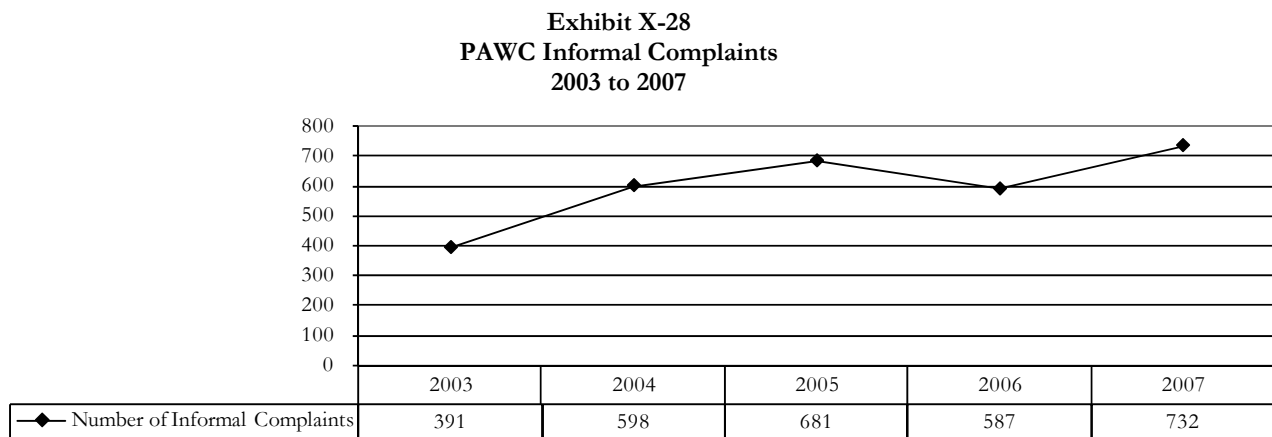
In 2007, PAWC had 732 informal complaints, of which 316 (43.17%) were potentially justified. There were 2,679 mediation complaints, of which 369 (13.77) were potentially justified. Potentially justified are based on a review and analysis by PAWC compliance representatives (based on the PaPUC’s justified rules). Subsequently violations may occur when infractions of the PaPUC regulations are found as a result of the PaPUC review of the report submitted by PAWC in response to the informal complaints.

Other types of complaints include:

- ◆ *Formal Complaints* – These complaints go directly to the PaPUC prior to being sent to the PAWC.
- ◆ *Executive Complaints* – These complaints or questions go directly to PAWC or the call center by a customer or individual, which need to be responded to by Company personnel. These complaints usually do not involve the PaPUC during the process, but are handled completely within PAWC or the executive resolution team (ERT) within the call center.
- ◆ *Disputes* – These are disputes usually handled within the call center. They usually do not involve the PaPUC in the process, but are handled completely within PAWC call center.

Informal Complaints

The number of informal complaints received by PAWC for the years from 2003 to 2007 is shown in *Exhibit X-28*.⁴⁵² As shown in *Exhibit X-28*, the trend in these complaints is increasing over time.

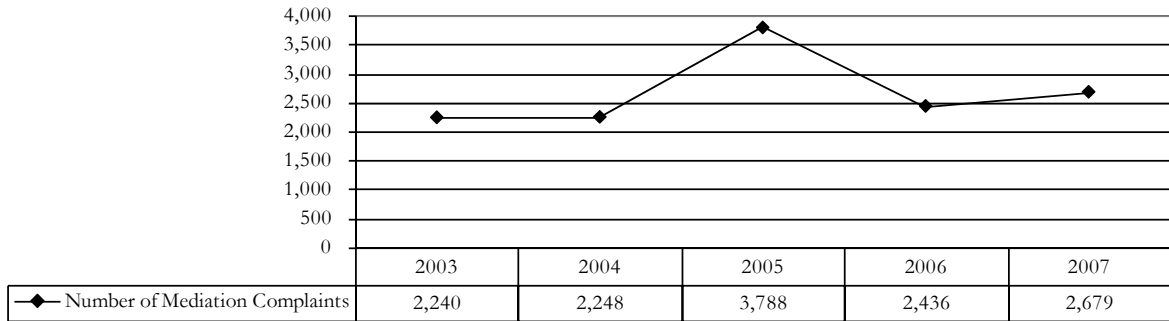


Source: Information Response 629 and Company Comments

Mediation Complaints

The number of mediation complaints received by PAWC, as documented internally, for the years from 2003 to 2007 is shown in *Exhibit X-29*.⁴⁵³ Mediation complaints spiked in 2005 with the increased volume of termination notices issued in 2005.

Exhibit X-29
PAWC Mediation Complaints
2003 to 2007



Source: Information Response 630 and Company Comments

Complaint Turnaround Time

Average turnaround time (days) for responding to informal and mediation complaints, as documented internally for the years from 2003 to 2007, is shown in *Exhibit X-30*.⁴⁵⁴

Exhibit X-30
PAWC Average Turnaround Time for Complaints
(Days)
2003 to 2007

Year	Informal Complaints	Mediation Complaints
2003	3.25	2.54
2004	3.68	5.01
2005	2.96	19.70*
2006	3.49	4.29
2007	3.11	4.01

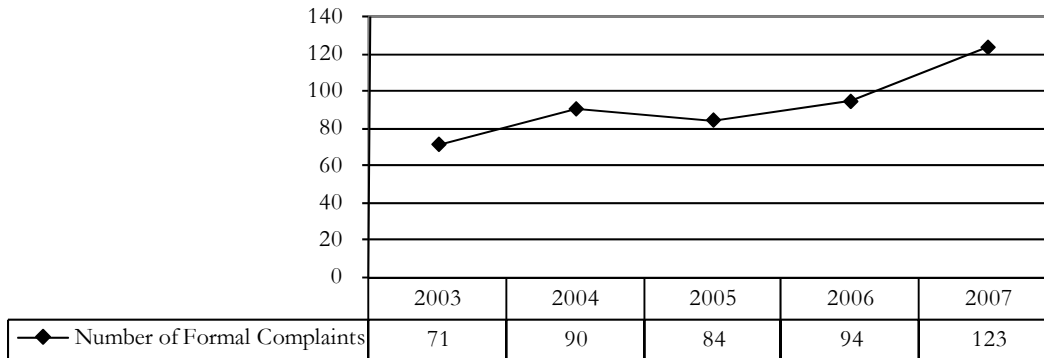
Source: information Response 633

Note: *At the PaPUC's request, PAWC stopped terminations for all customers (i.e., not just those having hot water heat) for the winter of 2004-5. It created a backlog when the PaPUC resumed terminations on April 1, 2005, and thereby increased the average turnaround time for mediation complaints in 2005.

Formal Complaints

Formal complaints are those that go directly to the PaPUC prior to being sent to the PAWC. The number of formal complaints for the years from 2003 to 2007 is shown in *Exhibit X-31*.⁴⁵⁵

Exhibit X-31
PAWC Formal Complaints
 2003 to 2007



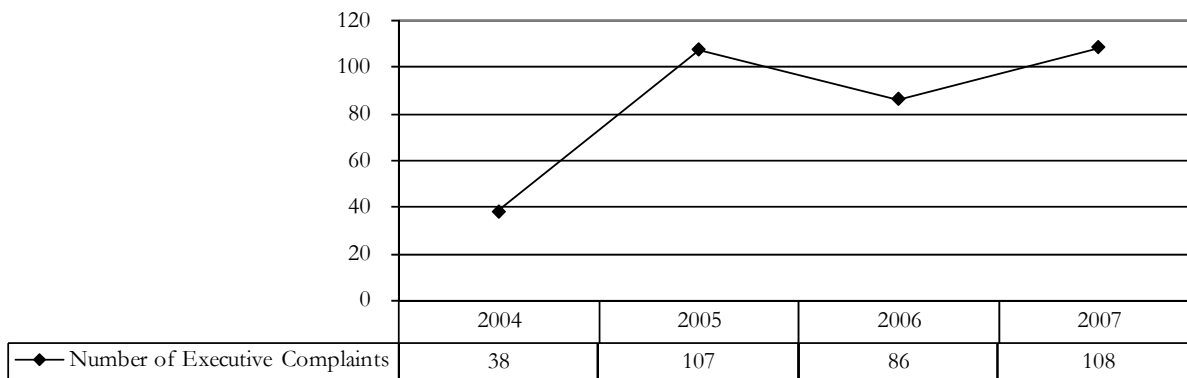
Source: Information Response 632 and Company Comments

Note: In 2007, PAWC received 23 formal complaints in response to its announced intention to introduce chloramines into the water treatment process in its Mechanicsburg service territory.

Executive Complaints

Executive complaints have only been tracked since June 2004, when the executive resolution team (ERT) was established at the Alton Call Center. The number of executive complaints for the years from 2004 to 2007 is shown in *Exhibit X-32*.⁴⁵⁶

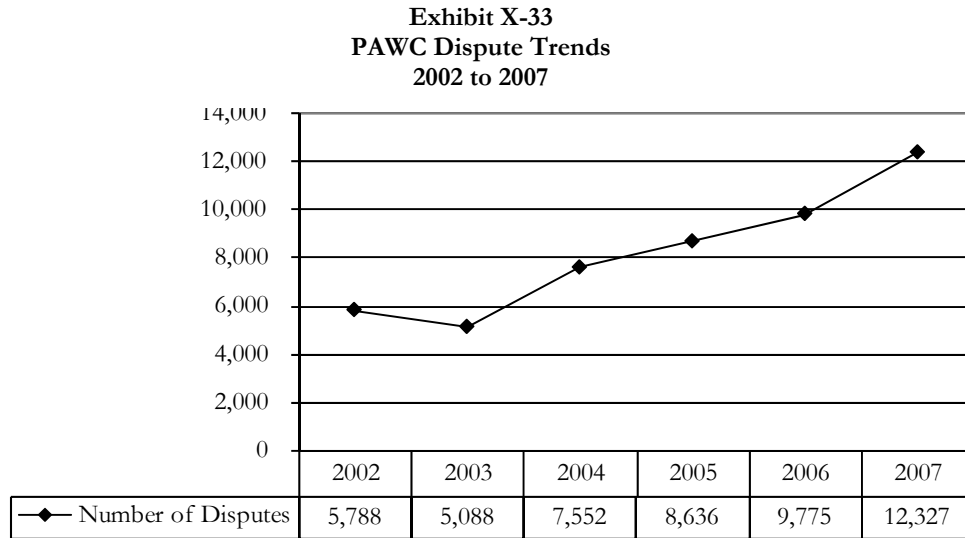
Exhibit X-32
PAWC Executive Complaints
 2004 to 2007



Source: Information Response 631

Finding X-13 The number of disputes has increased significantly since 2004.

Disputes are complaints handled by the CSC. As such, their numbers reflect customer satisfaction with various aspects of the CSC operations. The trend in disputes over the last several years is shown in *Exhibit X-33*.⁴⁵⁷ There is a significant increasing trend in disputes.



Source: Information Response 634 and Company Comments

American Water has not performed any analysis of dispute rates. A comparison of disputes to call volume over the six years indicates that disputes account for 0.58% to 1.0% of calls.⁴⁵⁸

Finding X-14 **There is a significant amount of over estimating in the billing process.**

There is a significant amount of over estimating in the billing process, as shown in *Exhibit X-34*.⁴⁵⁹

Exhibit X-34 PAWC Billing Errors 2003 to 2007					
	2003	2004	2005	2006	2007
Cancelled/Rebilled	45,531	13,807	37,084	48,273	55,046
Adjusted	24,027	150,386	313,765	308,617	280,929
Total	69,558	164,193	317,853	313,367	335,975
<i>Adjusted by Type</i>					
Billing Error	1,522	760	283	811	209
Bad Dial	9	13	5	5	6
Under Read	157	235	116	13	17
Over Estimate	19,023	146,390	309,925	302,966	273,855
Over Read	3,289	2,987	3,435	3,527	4,037
Under Estimated	19	1	0	2	123
Final Read	8	0	1	3	0
Prior Unbilled Water	0	0	0	1,290	2,644
Meter Reading Dial	0	0	0	0	38
Total	24,027	150,386	313,765	308,617	280,929

Source: Information Response 221 and Company Comments

As shown in *Exhibit X-34*, over estimating accounts for approximately 98% of billing errors.⁴⁶⁰ Considering that each of these accounts is manually reviewed and in some cases a field service technician would be dispatched to do a meter reread, this is a significant cost to PAWC.

During 2006, 302,966 over estimates occurred. Each of these bills would have required someone to review and adjust the bill (assume five minutes per bill). According to PAWC management, many of the over-estimated accounts are automatically adjusted by the software, and not manually reviewed. Auto-adjusted estimates are identified by adjustment fee types 9AOE1, 9AOE2, 9AOE3, AND 9AOE4. Using the 2006 information, the Alton call center identified 196,802 such adjustments applied by the auto-adjustment credit module for PAWC.⁴⁶¹

In addition, service orders generated to obtain meter re-reads can also be tracked, as they are coded EST (customer request for reread) or UEST (company-identified reread, which began being tracked in 2007). The number of ESTs in 2006 was 6,367.⁴⁶²

Based on this information, the number of accounts manually reviewed is 99,797 (302,966 – 196,802 – 6,367). The number of accounts manually reviewed and reread in the field is 6,367. Using Schumaker & Company’s time and cost assumptions along with the refined numbers obtained from PAWC, realistic annual potential savings of \$300,000 to \$400,000 have been estimated as shown in *Exhibit X-35*.

Exhibit X-35
Additional Costs From Over Estimates
as of December 31, 2006

Activity	Calculation	Estimated Costs Savings
Manual Review	99,797 accounts x 5 minutes per account / 60 minutes per hour x \$30 per hour	\$249,500
Field Reread	6,367 accounts x 35 minutes per account / 60 minutes per hour x \$30 per hour	\$111,500
Total Costs		\$361,000

Source: Schumaker & Company Analysis and PAWC Input

Many utilities have significantly eliminated over estimates by going to automatic meter reading. One of the biggest drivers of estimating is not being able to read each meter every month due to access problems. Water meters are typically located inside a house, and although they may be connected to a remote to the outside of a house, there is still a higher number of missed reads when meter readers must visit each location to obtain a reading rather than using an automatic meter reading system. Meter readers are still the predominate method used for reading meters at PAWC.

Finding X-15 A business case has been developed for an upgrade to the Advantex software used in FRCC operations.

The Advantex system is used for managing the field dispatching of Field Service Technicians at PAWC. Field Service Technicians are responsible for meter sets, meter change outs, meter rereads, meter turnoffs / ons, and other short duration tasks that are typically dispatched on a day before or same day basis. The current software could be characterized as a first-generation system compared to what is currently available. For example, the current version of the software does not include a good mapping interface. The interface to a mapping application combined with a global positioning system (GPS) in the vehicle would provide dispatchers with better positional information regarding field technicians, which would allow the dispatchers to more efficiently assign time-critical service orders to the closest field service technician. Furthermore, positional information would also be a safety consideration in the event that a field technician has an incident.⁴⁶³

C. Recommendations

Recommendation X-1 **Invest in new customer interfacing technology, including IVR, electronic billing, and web self-service capabilities. (Refer to Finding X-1, Finding X-2, Finding X-6, Finding X-7, Finding X-9, Finding X-10, and Finding X-11.)**

New technology has many advantages and its use is increasingly expected by customers. Customer self-service technology, such as an IVR that provides up-to-date account information and bill paying options, electronic billing, and web-based bill-pay options allow customers to perform routine transactions without talking to a CSR. This reduces call volumes as well as wait times. Thus the technology potentially increases customer satisfaction for both those customers using it and those that require the service of a CSR, and have shorter wait times.

It is beyond the scope of the audit to present a technology plan. Nevertheless, as a result of this recommendation, we do expect the company to produce an assessment and plan that leads to new technology and improved customer service. This approach seems far preferable as a long-term strategy to increasing the number of CSRs, although that may be a necessary short-term response.

Recommendation X-2 **Analyze employee turnover at the Pensacola Call Center and develop strategies to reduce turnover. (Refer Finding X-3 and Finding X-4.)**

Schumaker & Company strongly disagrees that the CSR turnover rate in excess of 50% at the Pensacola Call Center is “consistent with the expectations of a customer service environment.” Even if it were, it is inconceivable that Human Resources does not see addressing this fact as worthy of its attention. Turnover affects customer service levels and is a major cost to the organization. CSR turnover should be a major key performance indicator for the Human Resources function and a plan should be developed and implemented to address this problem.

Recommendation X-3 **Strengthen recruitment, selection, and training practices to improve the quality of new CSR hires. (Refer to Finding X-1, Finding X-2, Finding X-3, Finding X-4, Finding X-5, Finding X-6, Finding X-7, and Finding X-8.)**

Improving the quality of new CSR hires will surely have a positive effect on turnover rates. In addition we would also expect improvements in service levels. Central to a plan to improve hiring quality is the establishment of metrics for the hiring function. These might include, for example, percentage of hires that successfully complete training, first six-month performance evaluations, and supervisor satisfaction, among others. The Human Resources function should then develop and implement a plan to improve the quality of new hires and regularly report its success.

Recommendation X-4 Develop a Pennsylvania-specific customer service scorecard and regularly report associated metrics to the PAWC President. (Refer to Finding X-1, Finding X-2, and Finding X-7.)

In some cases, Schumaker & Company had trouble getting data specific to the Pennsylvania call handling group. In fairness, this is due in part to the newness of the group. Nonetheless, American Water sees Pennsylvania as being a significant operation for the company and having special needs. It stands to reason that there should be a regular produced scorecard that reports the performance of this group to PAWC management.

Recommendation X-5 Perform an analysis of the increase in complaint trends that PAWC is currently experiencing. (Refer to Finding X-12.)

All of the trends in informal, mediation, formal, and executive complaints are generally increasing. PAWC needs to perform a root cause analysis of the reasons for the increase in these numbers. Categories for each of these types of complaints should be developed, reported, and steps taken to address the root causes that are identified.

Recommendation X-6 Perform an analysis of the growth in PAWC disputes. (Refer to Finding X-13.)

PAWC needs to perform a root cause analysis of the reasons for the increase in disputes. Ideally, each dispute would have been categorized at the time it was created, such that this information could be summarized without having to physically review and categorize each individual dispute after the fact. Schumaker & Company consultants understand that the methods for resolving disputes in Pennsylvania are currently in the process of being revised and improved. Final improvements have not been implemented at this time. Specific issues being addressed are improved identification and tracking of disputes, improved adherence to process, increased awareness of time limits for resolution, and additional training. While not finalized at the end of 2007, it is expected that personnel other than the Account Resolution Team (ART) will be involved in the resolution of disputes. Because final improvements have not yet been made, it is difficult to be specific on future changes to this process. However, it is expected that changes will be finalized by November 30, 2007.⁴⁶⁴

Recommendation X-7 Initiate actions to lower the number of over estimates in meter reading. (Refer to Finding X-14.)

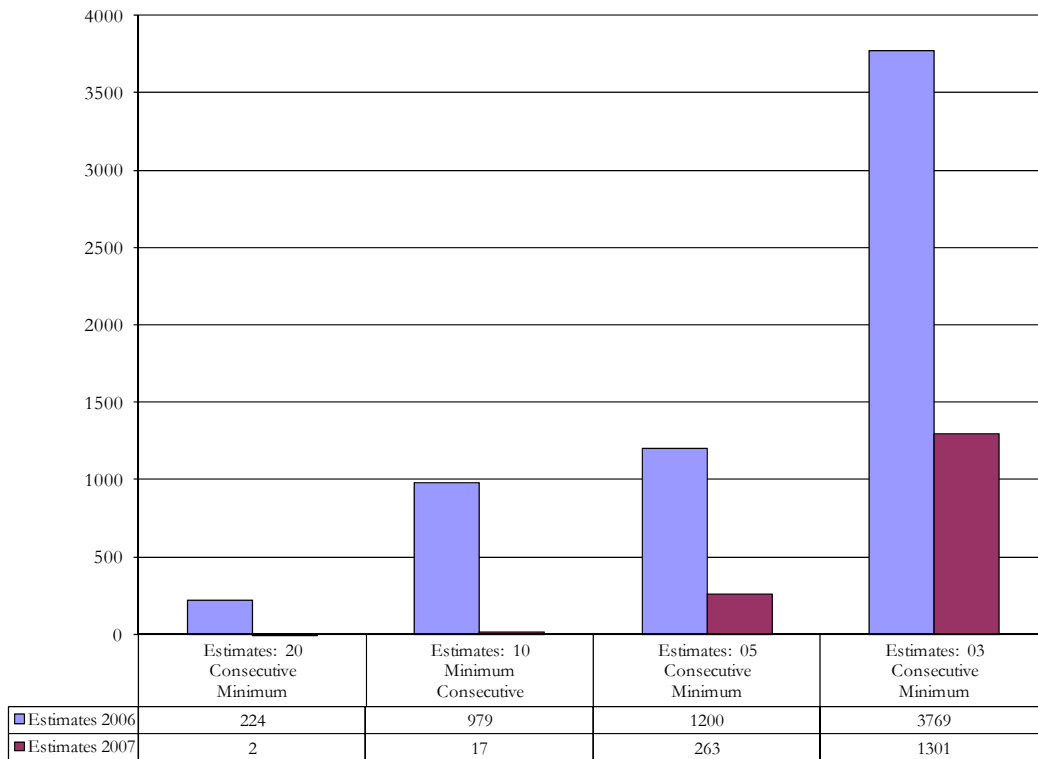
Over estimates in meter reading cause two specific problems:

- ◆ Over estimating is not good for customer relations.
- ◆ Over estimating results in additional costs associated with the billing process due to manual review of the bill and potential dispatches for rereads.

A significant amount of personnel time is spent adjusting these overestimated bills. Thus both the billing area in Alton Call center and field force personnel need to be staffed to a level to handle this workload on an ongoing basis. These costs were estimated in *Finding X-14* to be \$300,000 to \$400,000 annually in additional workload. The high number of over estimates also calls into question the estimating algorithms that are being used for estimating bills.

Schumaker & Company recognizes that, in 2006, PAWC undertook a program to reduce the number of consecutive estimates and achieved the results shown in *Exhibit X-36*.⁴⁶⁵

Exhibit X-36
PAWC Consecutive No Read Progress
as of December 31, 2007



Source: Information Response 270

Recommendation X-8 Complete the upgrade project for Advantex. (Refer to Finding X-15.)

Advantex was implemented in 2004. It has not been upgraded since that time. In an earlier draft business case (2006 to 2007 timeframe) that Schumaker & Company consultants reviewed, several minor enhancements and their improvements to the system were identified, which would be beneficial to PAWC. It is our understanding that a reconstituted project team has recently been established to revise the previous business case and move forward.

XI. Operational Performance

This chapter addresses four specific performance areas of Pennsylvania-American Water Company (PAWC). These areas include:

- ◆ *Damage Prevention Programs and Practices* – a review of PAWC’s damage prevention programs and practices including program documentation, management reporting, and tracking of third-party line hits and the associated causes; the trend of third-party line hits and damage recovery efforts; trends regarding PAWC and/or its contractors hitting other utilities’ underground facilities; electronic mapping of underground facilities; ratio of line locates to line hits; extent of gentlemen agreements utilized; and the impact of the statewide Verizon fiber to the premise (FTTP) program on PAWC’s underground infrastructure.
- ◆ *Chapter 101 Compliance* – PAWC’s compliance with the Commission’s regulations at 52 Pa. Code §101, including but not limited to filing annual self-certification forms, maintaining updated written physical security, cyber security, business continuity, and emergency response plans, and verifying such plans at the appropriate location throughout PAWC.
- ◆ *Unaccounted-For-Water Programs* – a review to determine if unaccounted-for-water (UFW)/non-revenue water levels on both a statewide and locality basis are managed appropriately. This review should assess PAWC’s UFW calculation methodology, UFW trends, leak detection policies and procedures, leak survey cycles, main replacement program documentation, main replacement and repair activity trends, and internal management reporting to monitor activity.
- ◆ *Capital Investment and Operating Expense Levels* – a review to assess capital investment and operating expense levels that have been budgeted and incurred to properly maintain and operate the PAWC system since the acquisition by RWE in 2003. This process should include a review of staffing levels, maintenance policies and procedures, maintenance activity trend levels pertaining to fire hydrants, distribution street valves, blow-off valves, production facilities, and capital investment trend levels for main replacements.

The results of our investigations into each of these areas are briefly discussed in the following sections.

A. Damage Prevention Programs and Practices

Background & Perspective

Pennsylvania-American Water Company has no written damage prevention policy. In practice, the company is an active participant of the Pennsylvania (PA) One Call System and a PAWC employee sits on PA One Call’s Board of Directors.

PAWC uses its own personnel to locate all facilities in the field. PAWC employees review company records such as distribution maps, tap orders, and as-built plans prior to field locating. These records provide employees with field reference points so that line locating may be performed accurately and efficiently. Once records are reviewed, employees use line-locating equipment to determine exact locations in the field.⁴⁶⁶

PAWC has not maintained third-party hit records in all districts within the past five years. Schumaker & Company consultants did review a spreadsheet that represented five years of data of third-party hits (damages) to PAWC's facilities. A standard Buried Facilities Damage Report was developed and implemented in 2007 for all PAWC districts.⁴⁶⁷

PAWC has recently, in 2007, developed and implemented a standard documentation and tracking system for all third-party hits. A paper form was developed for entering information although a computer application supporting this process has yet to be developed.⁴⁶⁸

Findings & Conclusions

Finding XI-1 PAWC is unable to provide a complete and extensive third-party line-hit damage history for the last five years because of lack of good business processes.

PAWC provided a summary of third-party hits on PAWC facilities for 2002 to 2006. However, PAWC management has indicated that the information may not be complete in that PAWC has not maintained third-party hit records in all districts within the past five years.⁴⁶⁹ Nonetheless, the following conclusions could be drawn from the information submitted:

- ◆ Some districts have billed for damages and some have not. In numerous instances, the information shows that the hit was not the fault of PAWC but the offender was not billed for the damages. Either the costs were not identified or no bill was sent.
- ◆ In other cases, it appears that the cause was not determined. As a result, it was not possible to make a determination on whether the offender should be billed.
- ◆ In some cases, it appears that PAWC bills a flat amount for damages, and in other cases, it charges the actual costs.
- ◆ The damages identified, recognizing that not all damages have been accounted for, amounted to approximately \$78,300 for the 2002 to 2006 time period, for which approximately 30% (\$24,900) has been collected. (Some of the damages identified are in litigation or negotiation, thereby delaying reimbursement to PAWC.)⁴⁷⁰

Finding XI-2 PAWC's recently developed third party line hit standardized reporting form has inherent deficiencies and is not integrated with other key business processes or systems to effectively manage this function.

In 2007, PAWC developed a paper form for reporting third-party hits. However, Schumaker & Company consultants would expect that more than just a paper form would have been developed to implement a business process involving third-party hits. A document describing the overall business process needs to be developed that would also describe such things as:⁴⁷¹

- ◆ Who is responsible for initiating the form?
- ◆ Is the process integrated into a work order system or a separate system?
- ◆ Is there a database for collecting and charging back for damages?
- ◆ Has the process been implemented in each district?
- ◆ Is it an American Water process or just a PAWC one?

It is unclear just how much information will be tracked in the new system. Based on our review of the existing form, the current system is a third-party hit-tracking program. However, it does not appear to be connected to a locate-ticket tracking program. Once a customer calls the PA One Call and each utility impacted is contacted, most utilities issue a locate ticket (a request to perform a facilities locate for a customer). As an assessment of the locate activity's success, many utilities measure the total number of locates performed in a year compared to the total number of locates that resulted in damage. Such information would be one of the first pieces of information that would be expected to be used in determining the effectiveness of the locating process.⁴⁷²

The buried damage report does appear to require some coding for the causes of the damages. The form provides the following coding options:

- ◆ Marked
- ◆ Not marked
- ◆ Wrong information provided
- ◆ No one call notification
- ◆ Other

However, other systems with which Schumaker & Company consultants are familiar have the following types of coding to provide a better determination of root causes for damages:⁴⁷³

- ◆ Contractor caused
 - No locate request
 - Expired locate ticket
 - Dug early
 - Marked accurately
 - Out of extent
 - Poor work practice

- ◆ Utility caused
 - Failed to mark
 - Mis-marked
 - No-show
 - Inaccurate prints
 - No print
 - Installation practices
 - Shallow facilities
 - Tracer wire

Recommendations

Recommendation XI-1 Develop a comprehensive damage prevention program. (Refer to Finding XI-1 and Finding XI-2.)

The business processes around damage prevention need to be more fully developed in order to successfully implement an adequate damage-prevention program. A document describing the overall business process needs to be developed that would also describe such things as:

- ◆ What system is used to track the number of locates performed?
- ◆ How do you measure the success of the locate process?
- ◆ Who is responsible for initiating the form?
- ◆ Is the process integrated into a work order system or a separate system? What database system is used for tracking the information?
- ◆ How does the information flow to accounts receivable to be billed to the responsible party?
- ◆ Is there a database for collecting and charging back for damages?
- ◆ How is the process to be implemented in each district?
- ◆ Is it an American Water process or just a PAWC one?

From the incomplete information that was provided, PAWC identified approximately \$78,300 in damages for the 2002 to 2006 time period, of which approximately 30% (\$24,900) has been collected. A better damage prevention program could be expected to exceed those amounts and prevent some damage from occurring once third parties recognize that PAWC has such a program in place. It could provide savings (through the collection of costs incurred for repairs) of as much as \$100,000 per year in recovery and prevention, especially in areas where there is a fair amount of construction activity.

B. Chapter 101 Compliance

Background & Perspective

Each year since 2005, PAWC has been required to submit self-certification forms to the Secretary's Bureau at the Pennsylvania Public Utility Commission (PaPUC) regarding its emergency preparedness, as required by 52 Pa. Code §§ 101.1-101.7. Subsequently, concurrent with its PaPUC annual report filing, PAWC submits its self-certification filing, in which it must indicate that the requirements were met for the entire prior year (submitted in early 2006, for example, for 2005).⁴⁷⁴

The regulation requires a jurisdictional utility to develop and maintain written physical- and cyber-security, emergency-response, and business-continuity plans, which include:⁴⁷⁵

- ◆ A physical-security plan must, at a minimum, include specific features of mission-critical equipment or facility-protection programs as well as company procedures to follow based upon changing threat conditions or situations.
- ◆ A cyber-security plan must, at a minimum, include:
 - Critical functions requiring automated processing
 - Appropriate backup for application software and data; appropriate backup may include having a separate, distinct storage media for data or a different physical location for application software
 - Alternative methods for meeting critical functional responsibilities in the absence of information technology capabilities
 - A recognition of the critical time period for each information system before the utility could no longer continue to operate
- ◆ A business-continuity plan must, at a minimum, include:
 - Guidance on the system restoration for emergencies, disasters, and mobilization
 - Establishment of a comprehensive process that addresses business recovery, business resumption, and contingency planning
- ◆ An emergency-response plan must, at a minimum, include:
 - Identification and assessment of the problem
 - Mitigation of the problem in a coordinated, timely, and effective manner
 - Notification of the appropriate emergency services and emergency-preparedness support agencies and organizations



This section discusses the physical security, business-continuity, and emergency-response plans. The disaster-recovery and cyber-security plans were discussed in *Chapter IV – Support Services (Information Technology)*.

Findings & Conclusions

Finding XI-3 The latest Chapter 101 self-certifications indicate that PAWC has met all required elements.

For 2005, PAWC submitted self-certification forms indicating that it essentially met all such requirements, with some emergency-response plans to be reviewed and updated, as appropriate, in early 2006. Then, for 2006 and 2007, PAWC submitted self-certification forms indicating that it met all such requirements.⁴⁷⁶

Finding XI-4 PAWC maintains a physical security plan for each of its operating plant facilities.

Physical security plans are incorporated into each of the water plant facilities' operating manual. All plants visited were observed to have security cameras throughout the facility and all plants maintained a perimeter fencing around the facility. Emergency procedures have been developed and tested as discussed below in Finding XI-6.

Finding XI-5 Business-continuity planning is less complete than our experience with other utilities.

According to PAWC management, business continuity directly involving the customer is typically included as part of the Emergency Response Program and O&M Manuals for each public water system identified (PWSID). Business continuity directly involving the company and its employees, such as strike plans and avian-flu staffing plans, are separately prepared plans. American Water Operational Risk Management personnel meet at least quarterly to discuss industry trends, including business continuity when applicable. At these meetings, and when applicable, personnel are identified to assume various planning roles for the entire company. Follow-up work and deadline dates are established for the work product. In late 2006 and 2007, PAWC conducted tabletop exercises to test business-continuity plans as shown later in *Exhibit XI-1* and *Exhibit XI-2*.

Chapter 101 identifies four specific types of plans, specifically:

- ◆ Physical-security plan
- ◆ Cyber-security plan
- ◆ Business continuity plan
- ◆ Emergency response plan

PAWC management believes that its emergency response plans cover business continuity. However, this is different than what Schumaker & Company have observed at other utilities that have created distinct physical security plans, cyber-security plans, business continuity plans and emergency response plans to conform with Chapter 101 requirements. Other utilities run separate business continuity and emergency response plan exercises on an ongoing basis. Some utilities have gone as far as purchasing commercially off-the-shelf (COTS) software to assist in business-continuity planning and in conducting tabletop exercises on a periodic basis—in several cases more frequently than once a year.

Finding XI-6 Emergency-preparedness planning has been tested via tabletop exercises.

In the fall of 2006, PAWC used an outside consultant to assist in conducting five emergency-response tabletop exercises across PAWC state operations. Each tabletop exercise was five and a half hours in duration. Exercises were conducted at the following locations shown in *Exhibit XI-1*.⁴⁷⁷

**Exhibit XI-1
 PAWC Emergency Response Exercises
 as of December 31, 2006**

Date	Location
October 25, 2006	Mechanicsburg, PA
November 1, 2006	New Castle, PA
November 2, 2006	McMurray, PA
November 8, 2006	Wilkes-Barre, PA
November 10, 2006	Norristown, PA

Source: Information Response 716

The exercises consisted of six separate emergency scenarios derived from the Pennsylvania Department of Environmental Protection (DEP) Public Water Supply Manual Part IV Emergency Response. These exercises were designed to:⁴⁷⁸

1. Conduct a thorough test of PAWC’s emergency-response plans
2. Check contact lists and communications methods and protocols
3. Assess emergency roles at all levels of the PAWC organization
4. Assess DEP and PaPUC notification decision-making and execution
5. Assess Public Notification formulation and execution
6. Assess functional technical response for a range of emergency situations

As a result of these tabletop exercises, five major recommendations or enhancements were made to improve the emergency-response processes. In addition, approximately 50 other recommendations were made to improve certain aspects of its emergency response. Such suggestions included the capability to remotely shut down certain facilities, the expansion of the contacts to be notified for certain types of emergencies, etc.⁴⁷⁹

These tabletop exercises addressed and tested the three items required by 52 Pa. Code §§ 101.1-101.7, specifically:

- ◆ An emergency-response plan must, at a minimum, include:
 - Identification and assessment of the problem
 - Mitigation of the problem in a coordinated, timely, and effective manner
 - Notification of the appropriate emergency services and emergency-preparedness support agencies and organizations

The company indicated that tabletop exercises were also conducted in 2007 as shown in *Exhibit XI-2*.⁴⁸⁰

Exhibit XI-2
Table Top Exercises Completed in 2007
as of December 31, 2007

Date	Location
September 11, 2007	McMurray, PA
September 12, 2007	New Castle, PA
September 18, 2007	Wilkes-Barre, PA
October 16, 2007	Hershey, PA
October 17, 2007	Norristown, PA

Source: Information Response 889

Schumaker & Company consultants briefly reviewed the emergency-response plans at various water treatment plants that were visited, including Yardley, Norristown, Royersford, and Hershey. In addition, we reviewed the Operations Department intranet website that also contains much of the emergency contact information online. We also identified that many of the plant management and operations personnel have the emergency contact numbers programmed into their cell phones so that the calls can be made without having to look up the number from another source.⁴⁸¹

Finding XI-7 The systems used for maintaining the operations and maintenance plans for each facility are labor intensive, subject to potential inaccuracies, and not as clearly defined as we have seen elsewhere in the utility industry.

In accordance with the Pennsylvania DEP regulations contained in 25 PA Code §109.702, PAWC maintains updated operations and maintenance (O&M) plans for each of its community water systems. Plans address the following information for each system:⁴⁸²

- ◆ A description of the facilities
- ◆ An explanation of startup and normal operation procedures

- ◆ A routine maintenance program
- ◆ Records and reporting system
- ◆ Sampling and analyses program
- ◆ A public notification program including appropriate advance preparations, such as public notice templates, an explanation of appropriate methods of delivery, and a designation of public-notice recipients for each tier type
- ◆ Staffing and training
- ◆ Sanitary survey program including the wellhead protection program for any water system that develops one under §109.713 (relating to wellhead protection programs)
- ◆ Safety program
- ◆ Emergency plan and operating procedures
- ◆ Manufacturer's manuals
- ◆ An interconnection, valve and blow-off exercise and testing program.

Schumaker & Company consultants reviewed the various paper manuals at the plants that were visited, although to characterize these documents as “manuals” requires a broad interpretation of the word manual. These manuals are disparate written documents that have been placed in a three-ring notebook behind the appropriate notebook “tab.” There is no overall table of contents for the whole document aside from the “tabs” (i.e., the table of contents goes down only to level 1). The format of each document is different depending on the author. Although Schumaker & Company recognizes that these manuals have met the PA DEP's satisfaction because they contain the requisite information, they should undergo a “usability” review.

In a similar manner, the intranet website should be reviewed in terms of functionality. During our review of the site, we observed the need to scroll through various documents relating to other sites (water treatment plants) in order to find the appropriate information.

Recommendations

Recommendation XI-2 Improve business-continuity planning. (Refer to Finding XI-4).

For an organization as large as PAWC, business-continuity planning should be upgraded to include written business-continuity plans that are tested via tabletop exercises. In addition, American Water and PAWC should investigate the adoption of COTS software that would assist in identifying the risks, in formulating plans, and in performing the tabletop exercises on a periodic basis.

Recommendation XI-3 Perform a review and incorporate better technologies for preparing, distributing, and updating the emergency and the operations and maintenance manuals including the intranet site. (Refer to Finding XI-7.)

There are several items that should be considered by PAWC, including:

- ◆ Standardizing the formatting of all sections to include Word automation capabilities for creating a standardized table of contents and table of exhibits for the individual chapters such that the information could be more readily found
- ◆ Investigating some type of formal document-management system for maintaining the information—possibly something like a Microsoft SharePoint site or other COTS product
- ◆ Possibly re-engineering the Operations intranet site to make the information more readily available—such that if one visits and selects Yardley as the location, then the user will be shown only the Yardley contacts and other information

On another note, it is an interesting observation that much of the information in the emergency plan was updated in the April 2006 timeframe, but the tabletop exercises were not conducted until the October/November 2006 timeframe. This tendency raises a question as to why these exercises are not conducted closer to when the information is changed.

C. Unaccounted-For-Water

Background & Perspective

The reduction of unbilled or non-revenue water (NRW) has become a focus of not only PAWC but also the water utility industry. PAWC is in the process of adopting the water audit methods of the International Water Association (IWA) and the American Water Works Association (AWWA). Water loss is a universal problem requiring a common strategy that considers local economic and infrastructure factors. PAWC is moving to use the new IWA definitions and performance indicators, which will enable the operating systems to be benchmarked and compared with other utilities in this country and the world. This movement began with the development of an Excel spreadsheet-based UFW reporting system in 2005. This plan will incorporate both the state utility commission's unaccounted-for percentage and the new IWA performance indicators in the period reporting.⁴⁸³ The plan focuses on four areas to reduce water loss:⁴⁸⁴

- ◆ Leak prevention
- ◆ Leak detection
- ◆ Metering programs
- ◆ Accounting for un-metered usages

These four areas build on the current action plan that is already operating at PAWC. The NRW Activity Report (AR) records the best practices in active leak control (ALC) methods being utilized in every district. This report tracks activities such as system survey, right-of-way inspections, stream crossing inspections, un-metered fire services, periodic meter change-outs, service line replacements, small-diameter main replacement, non-revenue use, leakage, etc. The plan adds additional emphasis on leveraging new technology in acoustical leak monitoring and pinpointing, district metering area (DMA), night-flow monitoring, surge, and pressure control implementation for the long-term solutions to water loss.⁴⁸⁵

PAWC engages in active leak control (ALC). ALC includes, but is not limited to, manual leak surveys, automatic leak surveys using acoustic loggers, and inspection of rights-of-ways and stream crossings as well as un-metered fire services for leakage.⁴⁸⁶

The Water Loss Management Plan describes PAWC's water loss program and non-revenue water (NRW) activity tracking and reporting mechanism. PAWC's unaccounted-for-water calculation methodologies are as follows:

- ◆ $UFW \text{ (volume)} = \text{System delivery} - \text{metered sales} - \text{non-revenue use}$ ⁴⁸⁷
- ◆ $UFW \text{ (percentage)} = UFW \text{ (volume)} / \text{system delivery}$ ⁴⁸⁸

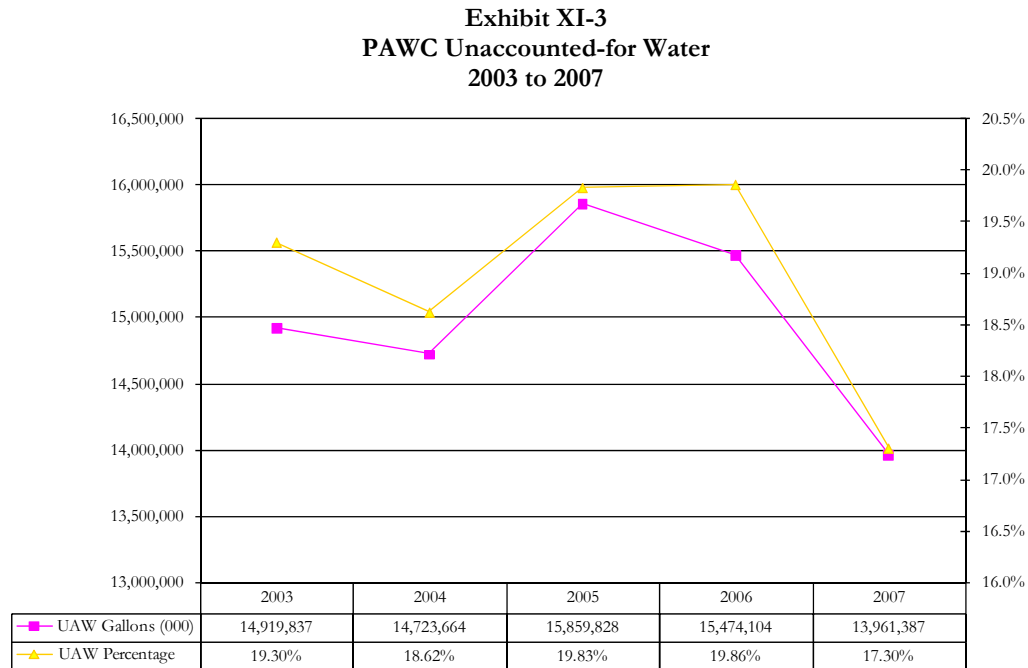
Definitions for these calculation methodologies are:

- ◆ *System delivery* – water volume delivered to the distribution system
- ◆ *Metered sales* – sales volume billed to PAWC customers
- ◆ *Non-revenue use* – water used by PAWC to provide service after delivery to the distribution system; or, authorized/unauthorized usage by others that is not billed:
 - *Company use* – main flushing, blow-off use, PAWC office use, meter shop use, and tank draining
 - *Municipal use* – street cleaning, sewer flushing, and fire use
 - *Unauthorized use* – theft of water
 - *Identified leakage* – leak-loss volume from located and repaired breaks
 - *Unavoidable real losses* (UARL) – leak losses that are uneconomical to reduce; calculated on a company level using an AWWA industry-standard formula⁴⁸⁹

Findings & Conclusions

Finding XI-8 **Unaccounted-for-water on a system-wide basis has improved as reported to the PaPUC since 2004; however, individual districts are experiencing high levels of unaccounted-for-water.**

Unaccounted-for-water trends over the last five years are shown in *Exhibit XI-3*.



Source: Information Response 128 and 870

PAWC has been successful at reducing unaccounted-for-water in certain areas of its system. Aggressive efforts by PAWC to reduce UFW since the acquisition of the water portion of Pennsylvania Gas and Water Company in 1996 has resulted in a significant reduction of UFW in that system. Prior to 1996, the total of non-revenue water and unaccounted-for-water was at approximately 47% of system delivery. By 2000, it had been reduced to approximately 26.5% of system delivery, which resulted in a decrease in overall system demand. The demand-projections scenario adopted during planning scenarios accounted for a continued decrease in non-revenue water and unaccounted-for-water to 25% by the year 2005 (the actual result was 27.2%), and a further (projected) reduction to 20% by the year 2010.⁴⁹⁰ However, no allowance derived from the UARL calculation is included these numbers since UARL is calculated on a total-company basis.

Approximately two-thirds (20 of 31) of the PAWC water districts are showing unfavorable trends or levels (either increasing percentages or percentages above the PaPUC UFW threshold of 20%) in unaccounted-for-water, as shown in *Exhibit XI-4*.

Exhibit XI-4
PAWC Unaccounted-For-Water by Water District
2005 to 2007

Eastern PA	2005	2006	2007	Trend	Three Year Trends/ Levels
Abington	17.90%	12.17%	14.94%	-2.96%	Favorable
Bangor	16.42%	14.50%	16.60%	0.17%	Unfavorable
Berwick	15.28%	18.51%	21.73%	6.45%	Unfavorable
Blue Mtn	4.11%	1.22%	8.74%	4.63%	Unfavorable
Coatesville	23.42%	23.03%	29.11%	5.70%	Unfavorable
Frackville	19.13%	17.66%	22.02%	2.90%	Unfavorable
Glen Alsace	67.64%	12.07%	12.70%	-54.94%	Favorable
Hershey	3.42%	13.44%	19.71%	16.29%	Unfavorable
Lake Heritage	3.03%	0.93%	0.56%	-2.47%	Favorable
Lehman Pike	62.58%	43.62%	22.15%	-40.42%	Favorable
Mechanicsburg	37.61%	39.21%	25.09%	-12.52%	Favorable
Milton	7.36%	9.48%	7.70%	0.34%	Unfavorable
Norristown	15.85%	24.45%	20.05%	4.20%	Unfavorable
Penn Water	-11.17%	20.86%	21.44%	32.61%	Unfavorable
Philipsburg	35.20%	38.47%	34.55%	-0.65%	Favorable
Pocono	12.79%	21.16%	31.40%	18.61%	Unfavorable
Royersford	13.84%	2.66%	13.91%	0.07%	Unfavorable
Susquehanna	36.20%	30.29%	40.79%	4.60%	Unfavorable
Wilkes Barre	27.21%	28.37%	27.33%	0.12%	Unfavorable
Yardley	17.41%	12.76%	15.44%	-1.97%	Favorable
Eastern PA Total	23.18%	24.53%	23.22%	0.05%	Unfavorable
Western PA	2005	2006	2007	Trend	Three Year Trends/ Levels
Brownsville	19.35%	12.81%	11.27%	-8.09%	Favorable
Butler	25.22%	24.43%	22.53%	-2.68%	Favorable
Clarion	29.15%	24.78%	30.39%	1.25%	Unfavorable
Indiana	15.20%	16.81%	14.39%	-0.81%	Favorable
Kane	19.14%	23.90%	22.99%	3.85%	Unfavorable
Kittanning	16.53%	-6.28%	24.87%	8.34%	Unfavorable
New Castle	21.84%	17.89%	28.40%	6.56%	Unfavorable
Pittsburgh	37.87%	37.11%	33.31%	-4.55%	Favorable
Punxsutawney	29.53%	33.82%	33.02%	3.48%	Unfavorable
Uniontown	13.96%	6.80%	6.72%	-7.24%	Favorable
Warren	-1.03%	11.27%	-44.61%	-43.59%	Favorable
Western PA Total	33.05%	31.86%	28.99%	-4.06%	Favorable
PA	27.99%	28.06%	25.96%	-2.03%	Favorable
				Favorable	13
				Unfavorable	19

Source: Information Request 873

Schumaker & Company consultants recognize that a rigorous unaccounted-for-water reporting process has only been in place for the last four years (as discussed in *Finding XI-9* and *Finding XI-10*). As shown

in *Exhibit XI-4*, some of the numbers would also appear to indicate that there are some reporting issues to be corrected in the reporting (negative or extremely low numbers in some cases).

It is our understanding that PAWC does not calculate the allowance for unavoidable real losses, discussed in *Finding XI-11*, in reporting UFW on a district basis. Therefore these numbers are higher.

Finding XI-9 PAWC has developed a fairly extensive spreadsheet for reporting and monitoring non-revenue water and unaccounted-for water.

Since 2005, PAWC has been working on a program to place more emphasis on non-revenue water and/or unaccounted-for water. An extensive set of linked spreadsheets has been developed for reporting and tracking NRW and UFW. Templates are provided for each water district to account for identified leakage on a monthly basis. The information is being collected and reported on a water-district-by-water-district basis throughout PAWC. Monthly and/or quarterly meetings (based on the size of the water district) are held with water district management to review results. In addition, efforts have been made to attempt to collect additional information —such as number of leak surveys performed.

Finding XI-10 The linked Excel spreadsheets are a good prototype for building an improved NRW and UFW reporting and monitoring program, but the database platform would be a better technology upon which to build the tool.

Since 2005, PAWC has been developing and using a non-revenue-water reporting process that records the information to calculate non-revenue water on a water-district basis (35 different water districts). Various pieces of information are collected and entered into these spreadsheets on a monthly basis and non-revenue water calculations are performed. Individual spreadsheets are located on a specific file-share and users locate that specific file-share and that water district's file to input the appropriate data. Other spreadsheets have been developed to link all of this information together and to provide summary information from the individual water district's information. Depending on the size of the water district, monthly or quarterly meetings are held with district management to discuss this information and to identify any corrective action that might be required.

Although the Excel spreadsheets have served as a good prototype for developing the non-revenue water business processes within PAWC, as the business practice is implemented, by using these linked spreadsheets, it will, in our opinion, become difficult to maintain them. PAWC would, therefore, be better served by the development of a database technology. Many of the business rules have already been identified in the Excel spreadsheets, and it would simply be a matter of converting these business rules to a database structure.



Finding XI-11 PAWC has implemented an allowance for unavoidable real losses using an AWWA methodology (still under development) in reporting its unaccounted-for-water numbers to the PaPUC on an annual basis.

Although PAWC does not calculate an allowance for UARL on an individual water-district basis, PAWC does include a calculation for UARL in its annual reporting to the PaPUC. *Exhibit XI-5* shows the information that is being reported to the PaPUC by PAWC for the year 2006. Line 29 shows the calculated Unavoidable Leakage 2,085 gpd/mile of main as 6,913,100 thousand gallons. The percentage of unaccounted-for water that would have been reported without this calculation would have been 28.6% (versus 19.8%). Line 29 Unavoidable Leakage reduces the reported unaccounted-for water by 8.8%. Without that estimate of leakage being considered “accounted-for-water,” the numbers being reported would be 44% higher, significantly higher than the 20% benchmark considered reasonable by PaPUC regulations. The Commission’s regulations at 52 Pa. Code 65.20 (4) states that the Commission has considered UFW levels to be excessive when they exceed 20%. Furthermore, unavoidable leakage was not considered at the time this Commission regulation was established.

The Unavoidable Leakage amount comes from the AWWA’s Water Loss Control Committee (WLCC) water-audit software that is used for determining water-loss standing. That software is used to calculate an infrastructure leakage index (ILI) that can be used to compare water systems’ operations among systems with significantly different dynamics, etc. The lower the amount of leakage and real losses that exist in the system, the lower the ILI value will be. The AWWA’s WLCC provided a table to assist water utilities in gauging an approximate ILI that is appropriate for their water system. PAWC’s ILI was 3.64 for 2006. The ILI for 2007 has not yet been finalized.

**Exhibit XI-5
PAWC Unaccounted-for Water Reported to PaPUC
as of December 31, 2006**

Pennsylvania American Water For the Year Ended December 31, 2006
(Company Name)

500. WATER DELIVERED INTO SYSTEM DURING YEAR

Every estimated value shall be supported by such detailed information as will permit a ready identification, analysis, & verification of all relevant facts. The Company shall be prepared to furnish to the Commission this detailed information.

Line No.	Description (a)	(Gallons) (000 omitted) (b)	(gpd) (c)
1	Water Delivered for Distribution & Sale:		
2	Water Obtained from Company Sources	78,322,565	214,582
3	Water Obtained from Other Independent Utilities		
4	Total Water Delivered	78,322,565	214,582
5	Metered Sales:		
6	Residential	29,949,297	82,053
7	Commercial	12,856,120	35,222
8	Industrial	4,965,426	13,604
9	Public	2,624,389	7,190
10	Other Water Utilities	713,339	1,954
11	Private Fire Protection		
12	Public Fire Protection		
13	Other Metered Sales Identify _____		
14	Total Metered Sales	51,108,571	140,023
15	Unmetered Sales:		
16	Residential		
17	Commercial		
18	Industrial		
19	Private Fire Protection		
20	Public Fire Protection		
21	Other Unmetered Sales Identify _____		
21	Total Unmetered Sales		
22	Total Sales	51,108,571	140,023
23	Non-Revenue Usage Allowances:		
24	Authorized Unmetered Usage:		
25	Main Flushing	372,897	1,022
26	Blow-off Use	402,760	1,103
27	Others: See Attachment below	719,287	1,971
28	Unauthorized Use	74,957	205
29	Unavoidable Leakage 2,058 gpd/mile of main	6,913,100	18,940
30	Adjustments:		
31	Located & Repaired Breaks in Mains & Services	3,221,558	8,826
32	Others Identify _____ Unaccounted for and non-revenue usage		
33	Total Allowances & Adjustments	11,704,559	32,067
34	Unaccounted-for-Water and total non-revenue usage	15,509,435	22,422,535
35	Percentage Unaccounted-for-Water	19.8%	28.6%

Page 56

△ 8.8%

Source: Information Request 867

An analysis of PAWC unaccounted-for water reported to the PaPUC for the years 2005-2007 is shown in *Exhibit XI-6*. The Unavoidable Leakage (UL) component accounts for approximately 30% (as shown on the bottom line of *Exhibit XI-6*) of the accounted for water w/o UL—lowering the UFW by 8.6 to 8.8 percentage points. Without this calculation, PAWC would be reporting UFW in the 27% to 28% range on a system wide basis.

Exhibit XI-6
Analysis of PAWC Reported Unaccounted-For Water
2005 to 2007

Description	2005		2006		2007	
	Gallons	Percent	Gallons	Percent	Gallons	Percent
Total Water Delivered	79,784,608		78,322,565		80614732	
Total Sales	52,520,704		51,108,571		52080900	
NonRevenue Water	27,263,904	34.2%	27,213,994	34.7%	28533832	35.4%
Non-Revenue Usage Allowances (no UL)	5,227,610		4,791,459		7520462	
Unaccounted For Water w/o UL	22,036,294	27.6%	22,422,535	28.6%	21013370	26.1%
Unavoidable Leakage 2,058 gpd/mile of main	6,901,000		6,913,100		7051983	
Unaccounted For Water with UL	15,135,294	19.0%	15,509,435	19.8%	13961387	17.3%
Percentage Difference		8.6%		8.8%		8.7%
Percentage of Unavoidable Leakage portion of UFW to total UFW		31.3%		30.8%		33.6%

Source: Information Response 867

Other concerns in the use of this calculation is that PAWC has based its calculation on an assumption that their average system pressure is 100 psi (233 feet of water) and that new mains and service connections are equally weighted with infrastructure approaching the end of its useful life. *Exhibit XI-7* provides the calculation used for 2007. As shown in *Exhibit XI-7*, the 2,056 gpd/mile is based on a 100 psi operating pressure. Both the 2005 and 2006 numbers that were reported to the PaPUC were also based on this operating pressure. Both the 2005 and 2006 numbers reported to the PAPUC were based on 9,189 miles of main and 699,211 service connections. In 2007, the miles of main was increased to 9,399 miles of main, an increase of 210 miles in one year, and 714,217 service connections. In essence, as new main and new service connections are added to the system, PAWC is taking credit for Unavoidable Annual Real Leakage at the same rate as the old mains and service connections. New connections and mains should in no way leak as much as old facilities unless they are improperly installed.

In Schumaker & Company's opinion, the use of this calculation on a system-wide basis is questionable, serving little more than to reduce reported UFW and obscuring the real UFW numbers. Schumaker & Company consultants are also aware of another utility (United Water) that has used this approach on a district by district basis that resulted in the reporting of negative unaccounted-for-water results, which is theoretically impossible without groundwater seepage into the mains. The application of a formula that yields impossible results raises serious questions regarding the use of the formula in the first place.

In response to the task report, PAWC provided their justification for the use of the UARL calculation by referring to a 1986 Preliminary Report presentation made to the National Association of Regulatory Commissioners Committee on Water by members of the Pennsylvania Public Utility Commission. This paper presents two different methods for calculating UFW based on the nature of the water system. Whether this paper constitutes the adoption of the UARL calculation by the Pennsylvania Public Utility

Commission was not possible for Schumaker & Company to determine in that we could find no specific orders to that effect.

**Exhibit XI-7
 PAWC Unaccounted For Real Losses Calculation
 as of December 31, 2007**

$U\text{ARL} = (5.38 * L_m + 0.15 * N_c + 7.5 * L_p) * P$ (source: Losses in Water Distribution Networks, IWA Publishing, London, UK, 2003.)

where:

UARL = Unavoidable Annual Real Leakage (gallons/day)

Lm = length of mains, miles

Nc = number of service connections (including all active and inactive premises)

Lp = total length of service lines, miles

P = average pressure, psi

PA system data:

Lm = 9,399 miles (source: Ed Mack Spreadsheet received on 3/31/08)

Nc = 714,217 connections (source: Orcom query, 3/31/08, Cheryl DiSanti)

Calculate Lp:

Assume average length of service line is 35 feet.

$L_p = 714,217 \text{ connections} * 35 \text{ feet/connection} * \text{mile}/5280 \text{ feet}$

Lp = 4,734 miles

Calculate UARL as a function of P:

$U\text{ARL} = (5.38 * 9399 + 0.15 * 714217 + 7.5 * 4734) * P$

UARL = 193205 * P

P (psi)	UARL (gpd)	UARL (thous gallon/year)	UARL (mill gallon/year)
50	9,660,250	3,525,991	3,526
60	11,592,300	4,231,190	4,231
70	13,524,350	4,936,388	4,936
80	15,456,400	5,641,586	5,642
90	17,388,450	6,346,784	6,347
100	19,320,500	7,051,983	7,052

Unavoidable Leakage = $19320500/9399 = 2056$ gpd/mile of main

Source: Information Response 867

Finding XI-12 PAWC was unable to provide an engineering justification for the 100 psi pressure used in its calculation at this time.

According to PAWC, the 100 psi average system pressure is the most accurate estimate that PAWC could develop given the limited information available incorporating system terrain and known pressures across its operations. PAWC is looking at refining this number with a more detailed analysis. Average pressures by water system are not known.

In response to the task report, PAWC provided its justification for the use of the UARL calculation by referring to a 1986 Preliminary Report presentation made to the National Association of Regulatory Commissioners Committee on Water by members of the Pennsylvania Public Utility Commission. In that report on page 2, it indicates that:

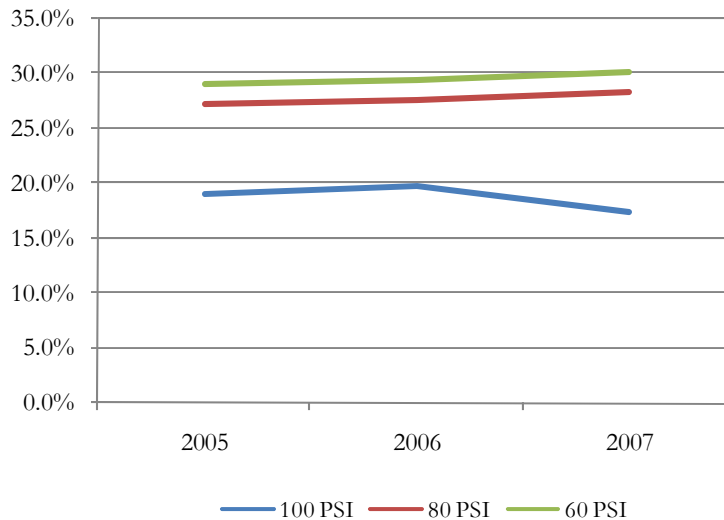
Policy on Unaccounted for Water

With the adoption of a Commission order in 1981 at R-79050616, jurisdictional water companies have been duly notified that unaccounted-for water claims in excess of 20 percent must be clearly substantiated. The Commission order states, in part:

In the future, water companies with experienced unaccounted for water of more than 20 % should be prepared to demonstrate by way of substantial evidence that their experience is both normal and reasonable. Such evidence may be a combination of engineering, operations, or historical testimony and data, but it should consist of something more than unsupported or conclusory opinions by company witnesses (R-79050616, page 2)

The number reported for unaccounted for water by PAWC would vary significantly based on the average system pressure as shown in *Exhibit XI-8*.⁴⁹¹

Exhibit XI-8
System Pressure Impact on Report UFW
2005 to 2007



Source: Information Response 867

What could be concluded from *Exhibit XI-8* is that any pressure much less than 100 psi would result in PAWC reporting UFW higher than 20%.

Finding XI-13 **PAWC is in the process of metering water usage within various parts of a water district as another indicator of possible leakage.**

In both Western PA and Eastern PA, the finished water deliveries from all water treatment plants are metered. In addition, almost all of the booster pump stations and the pressure-reducing valve stations in each district are metered as well. Because many of these metered booster-pump stations and pressure-reducing valve stations are also tied into SCADA systems, PAWC is able to track daily consumption in

discreet areas as well as monitor night flows. These capabilities allow PAWC to detect flow increases that may be indicative of a leak problem.⁴⁹²

In the two largest districts, Pittsburgh and Wilkes-Barre, PAWC actively manages DMAs.⁴⁹³

In the Pittsburgh District, PAWC monitors the North Low Meter Zone and the North Meter Zone as listed on page 2-6 in the September 2006 Gannett Fleming Report.⁴⁹⁴

In the Wilkes-Barre system, PAWC monitors 17 DMA areas as listed in *Exhibit XI-9*.⁴⁹⁵

Exhibit XI-9
PAWC Wilkes-Barre District Metering Areas
as of December 31, 2007

DMA No.	Location
1A	#4 Hill, Carbondale
1B	Jefferson St., Simpson
2A	Gordon Ave., Carb. Twp.
9C	#5 Hill, Archbald
12B	Lillibridge, Peckville
12E	Scott & Dimmick, Dickson City
19A	Owen St., Swoyersville
29A	Glen Lyon, Newport Twp.
30	Alden Pump, Newport Twp.
33A	Avondale Hill, Plymouth Twp.
36A	8 TH St., W. Wyoming
37C	Sather Dr., Pittston Twp.
80A	Sutton Rd., Trucksville
81	Hillcrest Pump, Shavertown
82	Trucksville, Suction Side of Tank
82A	Rice St., Trucksville
83	Homesite, Dallas

Source: Information response 719

Recommendations

Recommendation XI-4 Continue to strengthen the unaccounted-for-water program. (Refer to Finding XI-8)

PAWC unaccounted-for water has continued to increase especially in Western PA. Schumaker & Company consultants recognize that PAWC has made some significant changes in its UFW program over the last several years but still question if PAWC is appropriately applying the correct resources in the correct places to lower UFW numbers. Several findings were also made in *Chapter V – Water Operations* that bring to question PAWC's allocation of capital and maintenance dollars to this issue, specifically:

- Finding V-5 The number of reported leaks/breaks by water district indicates that certain water districts are up to 10 times worse than others
- Finding V-6 Maintenance and capital budgets do not appear to consistently take an analysis of leak/break historical data into consideration shown in *Finding V-5*
- Finding V-10 With the most recent budgeting process (2008 Budget Year), the Engineering Department has implemented a more analytical main replacement decision-making methodology.

Recommendation XI-5 Incorporate the methodologies in the currently evolving UFW spreadsheets into a more appropriate technology, specifically a backend database with a client server or web interface. (Refer to Finding XI-10.)

PAWC personnel recognize that the Excel spreadsheets are only an interim step in developing a UFW reporting system based on a database technology. Schumaker & Company consultants looked at the interfaces that such a system would have with other systems, such as a leak-tracking database, in the *Chapter XII -Phase III Water Operations* investigations.

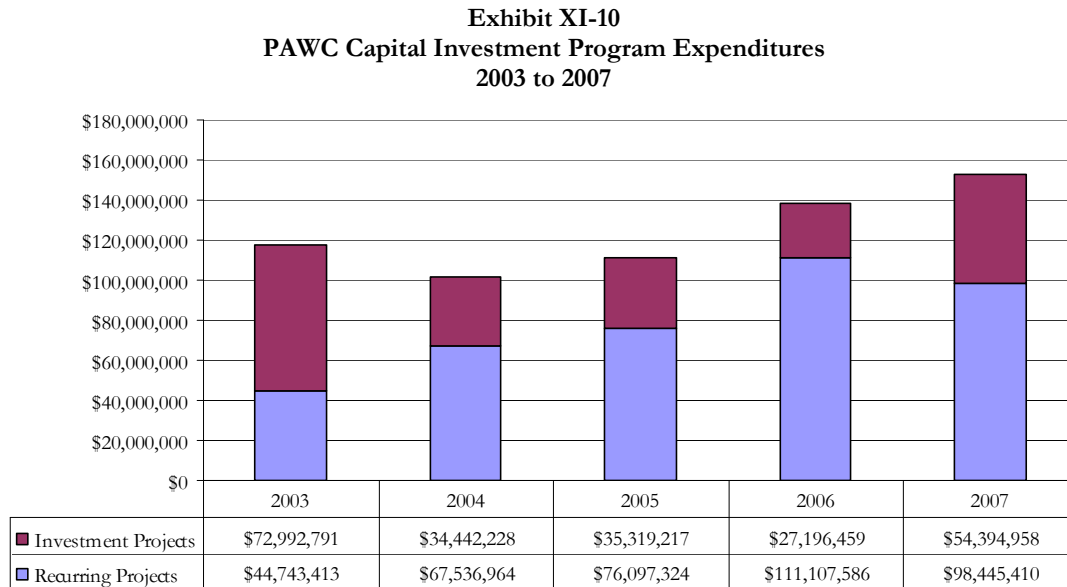
Recommendation XI-6 Refine the reporting of unaccounted-for water to the PaPUC. (Refer to Finding XI-11 and Finding XI-12.)

Whether PAWC is in compliance with its reporting of UFW is for the Commission to determine. However, what is clear is that without the UARL calculation, PAWC would be reporting UFW levels that significantly exceed 20% for the last three years. Furthermore, the UARL calculation is based on an assumed pressure of 100 psi, which PAWC claims is the most accurate number available at this time, although they are looking at refining this number with more detailed analysis. We also question the use of the AWWA's water audit software to calculate an unavoidable real losses number for incorporation into the unaccounted-for water that is reported to the PaPUC. Because the ILI calculation is being performed by PAWC, the ILI should also be provided to the PaPUC and comparisons should be provided to other water systems, which is our understanding of the ILI's intent.

D. Capital Investment and Operating Expense Levels

Background & Perspective

Capital investment program expenditures for the last five years are shown in *Exhibit XI-10*.⁴⁹⁶



Source: Information Response 252

The investment amounts include all company expenditures, including routine acquisitions and related improvements. Excluded from the numbers are the Citizens, Coatesville, and Lehman Pike acquisitions, as well as developer-funded projects.

- ◆ Recurring projects are a program or group of similar projects, all of a routine and recurring nature such as main replacement and new services installations
- ◆ Investment projects are unique, individual projects generally with a total value that is greater than \$100,000.

The miles of main replacement for the last five years are shown in *Exhibit XI-11*.⁴⁹⁷

Exhibit XI-11
PAWC Miles of Main Replacement by Water District
2003 to 2007

District No.	District	Miles of Main	Feet of Main	2004	2005	2006	2007	Four Year Average Replacement Rates
2474	Frackville	27	142,560	2,290	1,385	2,843	1,950	1.48%
2423	Uniontown/Connellsville	224	1,182,720	7,083	8,597	40,601	9,960	1.40%
2454	Susquehanna	61	322,080	5,864	4,217	3,600	3,820	1.36%
2425	Brownsville	101	533,280	1,698	3,800	14,675	8,455	1.34%
2463	Wyomissing	153	807,840	5,136	19,390	13,326	1,500	1.22%
2446	Kane	47	248,160	1,368	650	5,504	3,456	1.11%
2411	Pittsburgh	1373	7,249,440	47,817	65,296	78,891	96,006	0.99%
2455	Bangor	61	322,080	6,830	1,715	2,747	300	0.90%
2441	Indiana	111	586,080	2,272	3,640	10,834	4,015	0.89%
2422	Mon-Valley	427	2,254,560	10,341	16,220	31,550	21,695	0.88%
2468	Lehman Pike	90	475,200	0	5,406	5,200	5,160	0.83%
2452	Yardley	183	966,240	4,096	5,517	8,034	11,400	0.75%
2443	Clarion	124	654,720	13,525	2,103	2,224	1,590	0.74%
2491	Scranton/Wilkes-Barre	1925	10,164,000	63,489	52,297	82,013	95,400	0.72%
2453	Abington	105	554,400	3,929	4,545	4,287	2,455	0.69%
2459	Glen Alsace	130	686,400	0	0	12,352	6,165	0.67%
2457	Pocono	161	850,080	4,000	4,350	4,000	8,225	0.61%
2472	Philipsburg	262	1,383,360	8,812	4,900	11,451	8,300	0.60%
2431	New Castle/Ellwood	443	2,339,040	14,667	14,814	13,411	9,360	0.56%
2445	Warren	91	480,480	2,522	2,124	3,979	1,514	0.53%
2442	Punxsutawney	85	448,800	2,064	1,470	2,152	3,455	0.51%
2473	Berwick	84	443,520	3,109	0	2,156	3,750	0.51%
2471	Milton	227	1,198,560	4,900	5,908	7,618	4,640	0.48%
2421	McMurray	1099	5,802,720	14,775	24,510	33,829	36,090	0.47%
2465	Coatsville	174	918,720	0	3,085	7,050	7,040	0.47%
2451	Norristown	376	1,985,280	9,118	5,766	6,522	9,148	0.38%
2433	Butler	270	1,425,600	4,746	4,931	5,715	5,000	0.36%
2462	Hershey/Palmyra	299	1,578,720	5,147	244	9,508	7,600	0.36%
2456	Nazareth	151	797,280	2,062	4,466	2,795	1,100	0.33%
2461	Mechanicsburg	478	2,523,840	4,223	11,627	6,832	8,526	0.31%
2464	Royersford	222	1,172,160	3,645	2,710	4,750	2,100	0.28%
2444	Kittaning	25	132,000	0	550	0	500	0.20%
2466	Lake Heritage	12	63,360	0	0	0	0	0.00%
	Total System		50,693,280	259,528	286,233	440,449	389,675	0.68%

Source: Information Response 869

Findings & Conclusions

Finding XI-14 The collection of complete operating statistical data on production and network operations is complicated by a lack of standard data-collection and reporting systems.

During the course of our review, Schumaker & Company consultants experienced some difficulty in collecting certain statistics data by the various water districts. Much of this difficulty was due to the fact that the individual water districts have historically operated independently with American Water (or PAWC) and have done little to standardize business practices, processes, and systems. Therefore, without some common system for collecting and reporting such activities as the following, it was difficult to obtain such information:

- ◆ Hydrant and main flushings
- ◆ Valve operation
- ◆ Facility damage
- ◆ Other activities

Part of the problem is that some PAWC employees still view the water districts as separate entities that are charged with running their districts, with little standardization from AWWC or PAWC. One of the comments we frequently hear was that PAWC could not force the water districts to adopt standard business practices if they already had their own.⁴⁹⁸

This approach is totally opposite to what Schumaker & Company consultants have seen in other mergers and acquisitions within the utility industry. In most cases, the combined organizations assemble project teams to develop that ONE (usually considered to be the BEST process) approved business process that all entities are required to adopt.

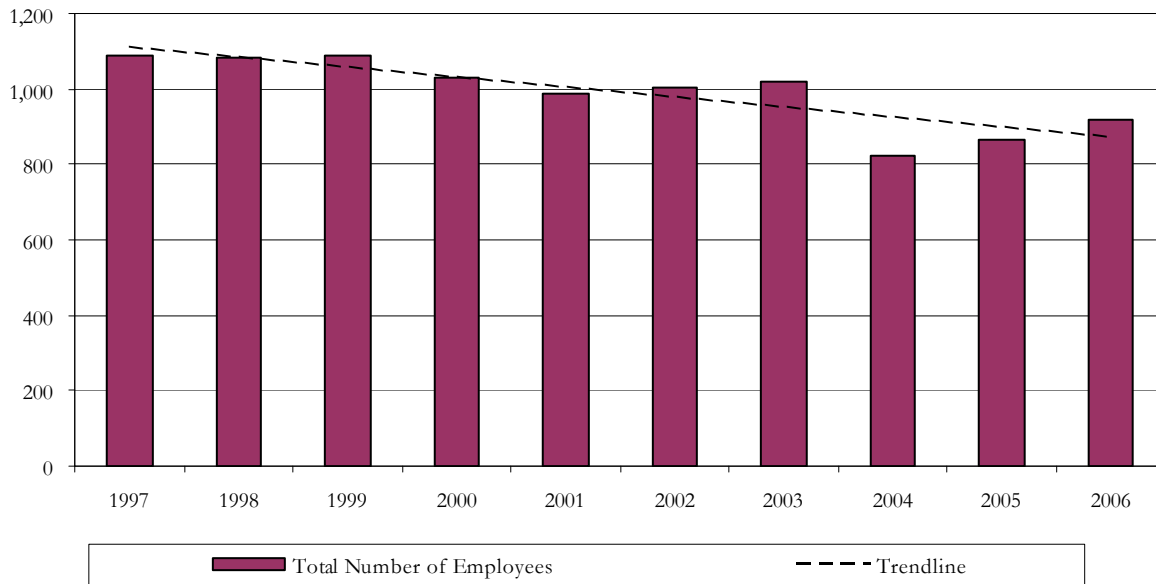
Schumaker & Company consultants perceive that this viewpoint is being changed and that more standard operating practices (including monitoring and reporting systems) are currently in the process of being developed and implemented across PAWC and American Water. As a result, this tendency should become less of an issue in coming years.

Finding XI-15 Production field force staffing levels appear to be inadequate as overtime hours are increasing.

Schumaker & Company's request for field force staffing levels from 2003 to 2007 was referred to the affirmative action plan.⁴⁹⁹ Because that information was not useful, Schumaker & Company reviewed the total number of employees reported to the PaPUC as shown in *Exhibit XI-12* and also included in *Appendix A – Data and Statistics*.⁵⁰⁰ The bulk of the employees shown in *Exhibit XI-12* would be considered field personnel. When American Water was acquired by RWE, PAWC management staffing

levels were reduced by approximately 39 personnel, as discussed in *Chapter VII - Corporate Culture, Management Structure, and Staffing Levels*.

Exhibit XI-12
PAWC Total Number of Employees
1998 to 2007



Source: PaPUC Reports

Schumaker & Company consultants obtained the overtime hours that were reported in each of the water districts over the last three years. Those figures are shown in *Exhibit XI-13* and *Exhibit XI-14*.

Exhibit XI-13 provides the overtime hours reported in the Network (distribution) Department and *Exhibit XI-14* provides the hours reported in the Production Department. With respect to the Network Department, overtime has decreased overall by 10.8%, with western PA decreasing 17.4% and eastern PA increasing 2.9%. However, overtime in the Production Department has increased by 29.4%, with the biggest increase being in eastern PA.⁵⁰¹

**Exhibit XI-13
PAWC Distribution Overtime Hours
2005 to 2007**

OPEX	DISTRICT	2005	2006	2007	Percentage Change
PITTSBURGH	110	23,503	17,683	18,857	-19.8%
MCMURRAY	210	7,929	4,795	5,961	-24.8%
MON VALLEY	220	2,761	3,531	1,315	-52.4%
CONNELLSVILLE	230C	997	788	607	-39.1%
UNIONTOWN	230U	0	0	0	0.0%
BROWNSVILLE	250	303	265	553	82.5%
NEW CASTLE	310N	3,142	2,930	3,714	18.2%
ELLWOOD	310E	0	0	0	0.0%
BUTLER	330	3,034	2,320	2,913	-4.0%
INDIANA	410	381	149	476	24.9%
PUNXSUTAWNEY	420	126	147	232	84.1%
CLARION	430	470	229	236	-49.8%
KITTANNING	440	194	183	381	96.1%
WARREN	450	51	202	182	256.9%
KANE	460	47	16	33	-30.9%
WPA	TOTALS	42,936	33,235	35,458	-17.4%
NORRISTOWN	510	2,095	1,633	1,877	-10.4%
YARDLEY	520	386	111	159	-58.9%
ABINGTON	530	403	201	341	-15.4%
SUSQUEHANNA	540	804	1,465	692	-13.9%
BANGOR	550	303	335	294	-3.0%
HICKORY	555	0	0	0	0.0%
SILVER	556	0	21	0	0.0%
BLUE MOUNTAIN	560	363	522	642	76.7%
POCONO	570	276	470	670	142.8%
POCONO WASTE WTR	580	0	64	0	0.0%
GLEN ALSACE	590	46	278	288	531.9%
MECHANICSBURG	610	1,177	1,289	924	-21.5%
HERSHEY	620	163	419	489	200.2%
WYOMISSING	630	538	547	518	-3.7%
ROYERSFORD	640	127	65	184	45.1%
COATESVILLE	650	475	895	993	109.2%
LAKE HERITAGE	660	0	1	0	0.0%
COATESVILLE WW	670	0	412	13	0.0%
LEHMAN PIKE	680	284	675	717	152.3%
LEHMAN PIKE WW			18	52	0.0%
MILTON	710	433	590	398	-8.2%
PHILIPSBURG	720	198	122	197	-0.5%
BERWICK	730	166	196	121	-27.1%
FRACKVILLE	740	124	75	112	-9.7%
MECHANICSBURG CS	870	0	0	0	
WILKES-BARRE	910	12,863	9,927	12,123	-5.8%
EPA	TOTALS	21,221	20,326	21,800	2.7%
PA	TOTALS	64,157	53,561	57,258	-10.8%

Source: Information Response 713

**Exhibit XI-14
Production Overtime Hours
2005 to 2007**

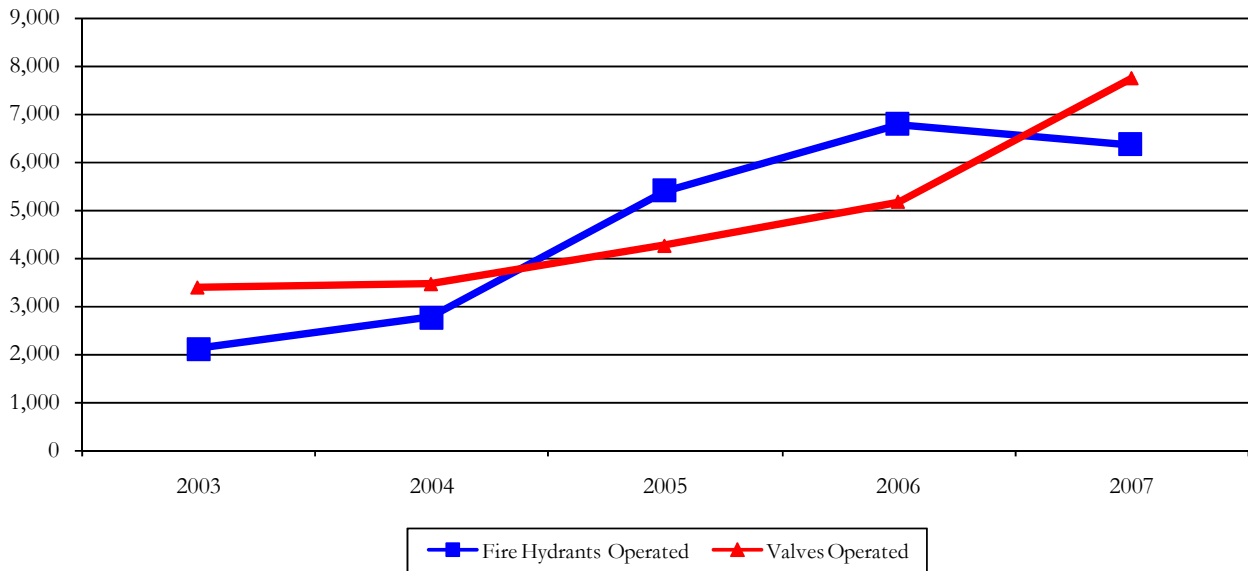
Water District	2005	2006	2007	Percentage Change
PITTSBURGH	4,935	5,007	3,697	-25.1%
MCMURRAY	105	61	124	18.7%
MON VALLEY	0	0	0	0.0%
CONNELLSVILLE	0	18	4	0.0%
UNIONTOWN	0	0	0	0.0%
BROWNSVILLE	10	62	180	1794.7%
NEW CASTLE	1,086	1,292	927	-14.6%
ELLWOOD	0	54	892	0.0%
BUTLER	664	560	654	-1.5%
INDIANA	150	544	682	356.2%
PUNXSUTAWNEY	109	136	424	287.9%
CLARION	895	316	291	-67.5%
KITTANNING	0	51	0	0.0%
WARREN	9	22	82	811.1%
KANE	96	111	46	-52.6%
WPA	8,058	8,233	8,002	-0.7%
NORRISTOWN	1,138	1,855	1,862	63.6%
YARDLEY	546	1,098	772	41.3%
ABINGTON	0	64	25	0.0%
SUSQUEHANNA	537	846	626	16.5%
BANGOR	199	345	279	40.3%
HICKORY	0	0	0	0.0%
SILVER	0	0	0	0.0%
BLUE MOUNTAIN	207	364	512	147.1%
POCONO	0	43	52	0.0%
POCONO WASTE WTR	0	281	340	0.0%
GLEN ALSACE	0	40	118	0.0%
MECHANICSBURG	962	1,462	561	-41.7%
HERSHEY	30	179	196	553.3%
WYOMISSING	0	0	141	0.0%
ROYERSFORD	0	605	865	0.0%
COATESVILLE	734	955	862	17.4%
LAKE HERITAGE	0	0	0	0.0%
COATESVILLE WW	0	155	521	0.0%
LEHMAN PIKE	350	530	302	-13.9%
LEHMAN PIKE WW			115	0.0%
MILTON	480	235	179	-62.7%
PHILIPSBURG	417	411	430	3.1%
BERWICK	50	66	26	-48.0%
FRACKVILLE	6	51	67	1008.3%
MECHANICSBURG CS	0	0	0	0.0%
WILKES-BARRE	3,290	5,079	5,149	56.5%
EPA	8,944	14,773	13,995	56.5%
PA	17,002	23,006	21,997	29.4%

Source: Information Response 713

Finding XI-16 Valve operations and maintenance programs are not completely implemented across the PAWC distribution network.

PAWC does not track maintenance trends for fire hydrants, distribution street valves, and blow-off valves. However, in its Pittsburgh District, PAWC is required by the Allegheny County Health Department to annually report the number of fire hydrants operated and flushed as well as the number of distribution street valves that are operated. The results for 2003 through 2007 (year to date) are shown in *Exhibit XI-15*.⁵⁰² There are approximately 6,352 fire hydrants and approximately 16,800 distribution street valves in the Pittsburgh District. PAWC does not track blow-off valve operation separately from distribution street valve operation.

**Exhibit XI-15
PAWC Maintenance Trends
Pittsburgh
2003 to 2007**



Source: Information Response 254 and 872

A program for Valve Operation, Inspection, and Maintenance Practice was adopted by American Water on November 21, 2007.⁵⁰³ This practice is currently limited to the following:

- ◆ Valve Inspection Procedure
- ◆ Valve Inspection Data List/Valve Attribute Data List
- ◆ Frequency Table for Valve Inspection and Locating

This practice was designed to support the implementation of the Computerized Maintenance Management System (CMMS). It therefore includes a significant data collection activity in support of CMMS. Valves are assigned high, medium, and low criticality that drives the frequency of maintenance

tasks. High critical valves are to be inspected every year. Medium critical valves are to be inspected every two to five years depending on the type of valve. Low critical valves are to be inspected every five to 10 years depending on the type of valve. All of these frequencies are defined in the Maintenance Tasks and Frequency Table. Future amendments to be considered may include:

- ◆ Guidelines and procedures for repair and replacement
- ◆ Equipment recommendations for valve operating

Prior to that time, a consistent program did not exist across PAWC—some water districts had formal programs for operating valves and others did not. Those that did operate and maintain valves recorded the size of valve operated and maintained on a yearly basis only. PAWC does not currently have a way of ensuring that all valves are operated and maintained at least once every X years. However, Schumaker & Company consultants were able to obtain some statistics for valve operations as shown in *Exhibit XI-16*.⁵⁰⁴

**Exhibit XI-16
PAWC Valve Operations
2003 to 2007**

	2005		2006		2007	
	Target	Actual	Target	Actual	Target	Actual
Eastern PA: > or equal 16"	492	230	400	421	465	521
Eastern PA: < 16"	6,670	6,350	8,284	10,617	8,037	8,089
Western PA: > or equal 16"	185	187	189	276	383	475
Western PA: < 16"	10,091	5,700	9,454	9,142	10,035	9,875

Source: Information Response 714

It is our understanding that the valve operations and maintenance program is being built in to the computerized maintenance management program that is currently under development.

Recommendations

Recommendation XI-7 Investigate the reasons for the increase in overtime that has occurred in the Production Department. (Refer to Finding XI-15)

Overtime has increased significantly in eastern PA as summarized in *Exhibit XI-17*.

**Exhibit XI-17
 PAWC Production Overtime
 2005 to 2007**

Location	2005	2006	2007	Percent Increase	2005-2007 Increase
Western PA	8,058	8,233	8,002	-0.69%	-56
Eastern PA	8,944	14,773	13,995	56.47%	5,051
Total PA	17,002	23,006	21,997	29.38%	4,995

Source: *Exhibit XI-14*

Schumaker & Company consultants recognize that some level of overtime will always exist in a production or distribution area of a water utility. However, a significant increase on a year to year basis could indicate a significant understaffing situation. The increase from 2005 to 2007 in Eastern PA was 5,051 hours, as shown in *Exhibit XI-17*, which is almost the equivalent of 3 full-time equivalents (FTEs). Using overtime to cover these requirements results in a premium rate (time and a half), which results in additional costs to PAWC over having the additional FTE. In this case, this could be approximated at 5,000 hours X \$15 (time and half incremental) which would be \$75,000 annually.

PAWC has indicated that there may be some “issues” with the numbers provided for this analysis. These “issues” would appear to indicate that the percentage changes to be somewhat lower; however, Eastern PA overtime hours have still increased significantly. Therefore, Schumaker & Company believes that further investigation should be ongoing relative to overtime. We have estimated a \$75,000 potential benefit, recognizing that it might be difficult to achieve over many small water districts but within the data, some water districts (Wilkes-Barre) have incurred a 2,000 or greater swing in overtime year to year.

Recommendation XI-8 Implement standard systems for monitoring and reporting key statistical information in network operations. (Refer to Finding XI-1, Finding XI-14, and Finding XI-16.)

Schumaker & Company consultants understand that the current thinking at PAWC is to build some of this information and reporting into the CMMS that is being implemented on an American Water wide basis. In particular, hydrant flushing and valve operations are currently being built into the CMMS. We have reviewed the status of the pilot systems currently in place. The current schedule is that the CMMS will be implemented throughout PAWC water districts over the next several years starting with the Glen Alsace Water District.

-
- ¹ / SOX/SEC 301-1
- ² / SOX/SEC 406 & 407-1
- ³ / Author's summary of SOX
- ⁴ / Information Response 121
- ⁵ / Author's professional opinion
- ⁶ / Author's evaluation of Information Responses 326, 327, 328, 329, 330, 332, 333, 334, 639, and Interview 121
- ⁷ / Information Response 330.
- ⁸ / Information Response 326
- ⁹ / Information Response 639, Attachment 1, p.1
- ¹⁰ / Information Response 257, p.6
- ¹¹ / Information Response 327, Attachment 1, p.1
- ¹² / Information Response 155
- ¹³ / Information Response 646, Attachment 3
- ¹⁴ / Information Response 161& 162 Interview 188/189
- ¹⁵ / Note: Two of the three PAWC Board's outside directors have a financial relationship as vendors with PAWC. Monies paid to Ronald Simms have been immaterial. Monies paid to John McCarthy have been over \$250,000 (most through McCarthy Realty). See Information Response 648.
- ¹⁶ / Information Response 154, Information Response 158, Attachment 1, Information Response 162. Audit Committee initiated meetings starting in 2005
- ¹⁷ / Information Response 648 - Two outside members of the PAWC Board and Audit Committee have a financial/vendor relationship with PAWC. One of these directors (Simms) has an immaterial relationship of \$18,000 in 2007, with minor amounts in 2005 and 2006). The other director (McCarthy) has a real estate firm that does approximately \$250,000 a year (2005 to 2007) in business with PAWC. Given that major financial governance is the responsibility of the American Water Board and presuming no significant increase in annual sums paid to McCarthy's companies, we do not take issue with McCarthy's independence.
- ¹⁸ / Information Response 646, Attachment 2. Note: Since 2003, only two meetings of the Executive Committee have taken place and both were called to approve local real estate matters (see Information Response 334).
- ¹⁹ / Information Responses 161 & 162
- ²⁰ / Information Response 646, Attachment 1. Information Response 158 and 159. Note: Two members of the PAWC Audit Committee have financial dealings with PAWC and cannot be considered independent. Whereas the PAWC Audit Committee Charter mirrors most of the same functions and responsibilities as the American Water Audit Charter, the PAWC Audit Committee cannot provide the governance that is the responsibility of the American Water Board and American Water Audit Committee.
- ²¹ / Information Response 155
- ²² / Information Response 156
- ²³ / Information Response 157
- ²⁴ / Information Response 646, Attachment 1
- ²⁵ / Information Response 160
- ²⁶ / Information Response 452
- ²⁷ / Information Response 452, Interview 67
- ²⁸ / Information Response 645. At the end of March 2008, only six high-impact controls (out of a total of 183) remained to be implemented.
- ²⁹ / Correll and Marrazzo
- ³⁰ / Pohlig, Zetzsche, Goss, MacKenzie
- ³¹ / Doss
- ³² / Marrazzo
- ³³ / Information Responses 330 and 326
- ³⁴ / Interview 121
- ³⁵ / Information Response 327, Attachment 2
- ³⁶ / Information Response 327, Attachment 2

-
- ³⁷ / Information Response 327, Attachment 1
- ³⁸ / Information Response 649
- ³⁹ / SOX/SEC 406
- ⁴⁰ / Information Response 334, 10/06/06 Audit Committee Minutes. Note: Ethics training and communication is addressed in more detail in the Corporate Culture Chapter.
- ⁴¹ / Information Response 334, Attachment p. 57, Audit Committee minutes 2/15/06
- ⁴² / Information Response 163, Attachment 1
- ⁴³ / Information Response 163, Attachment. American Water Code of Ethics
- ⁴⁴ / Information Response 334, Attachment. Note 8/23/06 and 10/6/06 meeting minutes.
- ⁴⁵ / Information response 642, Interview 122
- ⁴⁶ / Information Response 163, Attachment 1. Interview 122. Note: The American Water Board Audit Committee on 10/06/06 discussed issues arising out of relationships with vendors and contractual provisions requiring adherence to a Code of Ethics on their part (see Information Response 334).
- ⁴⁷ / Information Response 329, Attachment
- ⁴⁸ / Information Responses 157, 329, and 647. Interview 122. AW S-1 Filing.
- ⁴⁹ / Interview 122
- ⁵⁰ / Information Request 327, Attachment 1
- ⁵¹ / Information Request 641. Note: Nominating/Corporate Governance Committee responsible for this has just been formed and has only had one meeting.
- ⁵² / Interview 122. Information Responses 329 and 647. Note: American Water Nominating/Corporate Governance Committee Charter (Information Request 327 Attachment 2, part F) also states director compensation to be only in fees and company stock (pension or deferred compensation only for prior service that is not contingent on future service on the Board).
- ⁵³ / Interview 121
- ⁵⁴ / Author's professional judgment
- ⁵⁵ / Information Response 327, Attachment 2
- ⁵⁶ / Information Response 641
- ⁵⁷ / Interview 121
- ⁵⁸ / Review of Information Response 333. Also of note: Agendas showed listing and tracking of recurring discussion items. The Audit Meeting Planner also shows good detail concerning agenda items.
- ⁵⁹ / Information Response 327, Attachment 2. Note: Board minutes over the past three years (see Information Response 333) reflect considerable legal department research into SEC, SOX, NYSE, PCAOB, and Federal Sentencing guidelines while preparing committee charters, Code of Ethics, and Corporate Guidelines. There was also considerable Board discussion on these topics.
- ⁶⁰ / Information Response 336
- ⁶¹ / Information Response 161
- ⁶² / AICPA "Principle Blue Ribbon Committee Recommendations"
- ⁶³ / Information Response 639, Attachment 1
- ⁶⁴ / Information Response 327, Attachments 1 and 2
- ⁶⁵ / Review of Information Response 162
- ⁶⁶ / Review of Information Response 162
- ⁶⁷ / Review of Information Response 334
- ⁶⁸ / Review of Information Response 334
- ⁶⁹ / Information Response 167
- ⁷⁰ / Information Responses 650 and 166
- ⁷¹ / AICPA "Principle Blue Ribbon Committee recommendations" and broad review of SOX/SEC/NYSE rules
- ⁷² / Author's professional judgment
- ⁷³ / Information Response 334, American Water Board Audit Committee minutes. Also Interview 65
- ⁷⁴ / Information Response 526



⁷⁵ / Information Response 59. We also noted audits conducted over the past five years (Information Responses 46, 60, and 61) and a review of internal auditor training over the past twelve months (Information Response 521).

⁷⁶ / Information Response 639, Attachment 1, p.8

⁷⁷ / Interview 65. VP Internal Audit performance reviews are prepared by the CFO and go up to the Board Audit Committee via the CEO.

⁷⁸ / Summary of SOX/SEC Titles 3 and 4

⁷⁹ / SOX/SEC Rule 307, especially 307-4

⁸⁰ / Information Response 294

⁸¹ / Review of Information Responses 333 and 334

⁸² / Information Response 291

⁸³ / Information Response 294. Note: costs associated with this development effort are not being charged to Pennsylvania rate payers. Cost and budget information was not provided. See Information Response 644.

⁸⁴ / Information Response 454

⁸⁵ / Information Response 645. Of 183 high-impact controls, 161 have been implemented as of January 11, 2008. Another 16 are scheduled to be implemented in the first quarter of 2008, with the remaining six (all concerning acquisitions) to be determined.

⁸⁶ / Information Response 455

⁸⁷ / Many treatments of this topic can be found in business literature; perhaps none better than Edgar H. Schien *Organizational culture and leadership*. 1985. Jossey-Bass.

⁸⁸ / Cross, Gilbert. *Dynasty of Water: the Story of American Water Works Company*. 1991, American Water Works Company, pp. 14-15.

⁸⁹ / Information Response 178

⁹⁰ / Information Response 178

⁹¹ / Information Response 178

⁹² / Information Response 178

⁹³ / Information Responses 178 and 414

⁹⁴ / Information Response 178

⁹⁵ / Information Response 178

⁹⁶ / Information Response 822

⁹⁷ / Information Response 822

⁹⁸ / Information Response 822

⁹⁹ / Information Response 178

¹⁰⁰ / Information Response 822

¹⁰¹ / Information Response 822

¹⁰² / Information Response 4

¹⁰³ / Information Response 413

¹⁰⁴ / Information Response 412

¹⁰⁵ / Information Response 413

¹⁰⁶ / Information Response 414

¹⁰⁷ / Information Response 413

¹⁰⁸ / Information Response 413

¹⁰⁹ / Information Response 178

¹¹⁰ / Information Response 178

¹¹¹ / Information Response 178

¹¹² / Interview 5 and Confidential interview

¹¹³ / Interview 21

¹¹⁴ / Information Response 4

¹¹⁵ / Interview 173

¹¹⁶ / Various Interviews

¹¹⁷ / Interview 7

-
- 118 / Interview 7
 - 119 / Information Response 298
 - 120 / Information Response 171
 - 121 / Interview 21
 - 122 / Interview 21
 - 123 / Information Response 565
 - 124 / Information Response 776
 - 125 / Information Response 776
 - 126 / Information Response 833
 - 127 / Interview 26
 - 128 / Information Response 421
 - 129 / Interview 26
 - 130 / Interview 24
 - 131 / Interview 26
 - 132 / Interview 26
 - 133 / Information Response 33
 - 134 / Interview 24
 - 135 / Interviews 21 and 109
 - 136 / Interview 109
 - 137 / Interview 109
 - 138 / Interview 109
 - 139 / Information Response 823
 - 140 / Information Response 837
 - 141 / Information Response 835
 - 142 / Information Response 836
 - 143 / Information Response 844
 - 144 / Information Response 840
 - 145 / Information Response 842
 - 146 / Information Response 843
 - 147 / See also Information Responses 448, 450, and 746
 - 148 / Information Response 841
 - 149 / Information Response 528 onsite follow-up with American Water Compliance Officer. Information Response 865
 - 150 / Information Response 528 onsite follow-up with American Water Compliance Officer. Information Responses 865 ad
866
 - 151 / Information Response 528 onsite follow-up with American Water Compliance Officer. Information Response 865

 - 153 / 11.4% S1 filing
 - 154 / Interview 57
 - 155 / Interview 57 and Information Response 290
 - 156 / Interview 57 and Information Response 483
 - 157 / Interview 57, Information Responses 181 and 827, and Company Comments
 - 158 / Interview 57
 - 159 / Information Response 773 and http://www.amwater.com/awpr1/paaw/service_line/index.html
 - 160 / Information Responses 192 and 827
 - 161 / Information Response 1
 - 162 / Information Response 1
 - 163 / Information Response 181 and Company Comments
 - 164 / Interview 1
 - 165 / Information Response 257

-
- 166 / Information Response 192
 - 167 / RFP Materials and Information Response 1
 - 168 / Information Responses 182, 183, 192, 845, and 863
 - 169 / Information Response 825
 - 170 / Information Response 183, 723, 881, 882 883, 884, 885, 886, 887, 888, and Company Comments
 - 171 / Information Responses 183, 723, 881, 882, 883, 884, 885, 886, 887, 888, and Company Comments
 - 172 / Information Response 724
 - 173 / Information Response 829
 - 174 / Information Response 185
 - 175 / Information Responses 183 and 723
 - 176 / Interview 57 and Information Response 184
 - 177 / Information Responses 184 and 723
 - 178 / Information Responses 727 and 723
 - 179 / Company Comments
 - 180 / Interview 57 and Information Responses 186 and 192
 - 181 / Consultant's Opinion
 - 182 / Information Response 728
 - 183 / Interview 57
 - 184 / Information Response 190
 - 185 / Information Responses 190 and 191
 - 186 / Information Response 190
 - 187 / Information Response 190
 - 188 / Information Response 190
 - 189 / Information Responses 191 and 831
 - 190 / Interview 57 and Information Response 190
 - 191 / Interview 57 and Information Response 495
 - 192 / Information Responses 190 and 495
 - 193 / Interview 57
 - 194 / Information Responses 190 and 831
 - 195 / Interview 162
 - 196 / Information Response 831
 - 197 / Interview 57
 - 198 / Interview 166
 - 199 / Information Response 193
 - 200 / Information Response 191
 - 201 / Information Response 499
 - 202 / Information Response 188
 - 203 / Information Response 729
 - 204 / Information Response 187
 - 205 / Information Response 187
 - 206 / Information Responses 189 and 190
 - 207 / Information Response 191
 - 208 / Information Response 831
 - 209 / Information Response 495
 - 210 / Information Response 192
 - 211 / Information Response 192
 - 212 / Information Response 862
 - 213 / Information Response 192
 - 214 / Information Response 192

215 / Information Response 863
216 / Information Response 192
217 / Company Comments
218 / Interview 57 and Information Responses 181 and 827
219 / Interview 57 and Information Response 190
220 / Information Responses 190 and 495
221 / Interview 57
222 / Schumaker & Company's Opinion
223 / Interview 57
224 / Information Response 726
225 / Information Response 726
226 / Information Response 726
227 / Information Response 726
228 / Interview 57
229 / Interviews 163–167
230 / Evaluation of Information Response 192
231 / Information Response 828
232 / Information Response 192
233 / Interview 57 and Information Response 496
234 / Information Response 500
235 / Information Response 500
236 / Information Response 500
237 / Information Response 498
238 / Interview 168, which was cancelled because no audits are routinely performed
239 / 2000 PAWC Management Audit Report conducted by Management Audit Branch staff
240 / Information Response 46
241 / Information Response 46
242 / Information Response 194
243 / Information Response 610
244 / Information Response 610
245 / Information Response 163, pp. 13-14
246 / http://129.41.243.229/awpr1/wvaw/about_american_water/corporate_information/diversity/index.html
247 / Interview 29 and Information Response 389
248 / Information Response 389
249 / Information Response 389
250 / Information Response 390, Attachment 2
251 / Interview 140
252 / Interview 29
253 / Interviews 1 and 29 and American Water website
254 / Interview 29
255 / Interview 29
256 / Interview 29 and Information Response 392
257 / Interview 29
258 / Interview 29
259 / Interview 29
260 / Information Response 433
261 / Information Response 257
262 / Information Responses 22, 388, and 610
263 / Information Response 388

-
- 264 / Information Response 608
 - 265 / Information Response 608
 - 266 / Information Response 608
 - 267 / Interview 181
 - 268 / Interview 43
 - 269 / Information Response 199
 - 270 / Information Responses 610 and 611 and Interview 181
 - 271 / Information Response 199
 - 272 / Information Response 199
 - 273 / Interview 190
 - 274 / Information Responses 610 and 611 and Interview 181
 - 275 / Information Responses 610 and 611
 - 276 / Interview 190
 - 277 / Information Responses 610 and 611
 - 278 / Information Responses 610 and 611
 - 279 / Information Response 610
 - 280 / Information Responses 708, 789, and 790
 - 281 / Information Response 196 and Interviews 145, 146, 147, and 148
 - 282 / Information Response 196 and Company Comments
 - 283 / Information Response 296
 - 284 / Information Responses 200 and 785
 - 285 / Information Response 609
 - 286 / Consultant's Analysis
 - 287 / Information Responses 788 and 834
 - 288 / Information Response 612
 - 289 / Informal Conversations and Company Comments
 - 290 / Information Response 610
 - 291 / Company response to draft report
 - 292 / Information Response 422
 - 293 / Information Response 422
 - 294 / *Beyond Rage And Gender*, 1991
 - 295 / *Building on the Promise of Diversity: How we can move to the next level in our workplaces, our communities, and our society*, 2006
 - 296 / Interview 110 and Company Comments
 - 297 / Interview 110
 - 298 / Interview 177
 - 299 / Interview 148
 - 300 / Interview 148
 - 301 / Information Response 600
 - 302 / Interviews 145, 146, and 147
 - 303 / The U.S. Equal Employment Opportunity Commission, STANDARD FORM 100, REV. January 2006, EMPLOYER INFORMATION REPORT EEO-1
 - 304 / Interview 110
 - 305 / Interview 29 and Information Response 258
 - 306 / Information Response 355
 - 307 / Information Response 390
 - 308 / Information Response 390
 - 309 / Information Response 390
 - 310 / Information Response 390
 - 311 / Interview 29

312 / http://www.shrm.org/hrresources/whitepapers_published/CMS_000320.asp
313 / Information Response 710
314 / Information Response 710
315 / Information Response 710
316 / Information Response 258
317 / Information Response 710
318 / Information Response 710
319 / Information Response 851
320 / Information Response 608
321 / Information Response 613 and Interview 181
322 / Information Response 613
323 / Interview 181
324 / Interview 181
325 / Information Response 610
326 / Information Response 789
327 / Information Response 610
328 / Information Response 789
329 / Information Responses 610 and 611
330 / Information Response 789 and Interview 181
331 / Information Responses 610, 611, and 789
332 / Information Responses 610, 611, and 789
333 / Information Responses 610, 611, and 789
334 / Interview 6
335 / Information Response 256
336 / Interview 88
337 / Interview 88
338 / Interview 88
339 / Interview 88
340 / Information Response 256
341 / Information Response 256
342 / Information Response 256
343 / Information Response 256
344 / Information Response 256
345 / Information Response 203
346 / Information Response 203
347 / Information Response 203
348 / Information Response 203
349 / Information Response 203
350 / Information Response 503
351 / Information Response 505
352 / Information Response 503
353 / Information Response 505
354 / Information Response 505
355 / Information Response 505
356 / Information Response 509
357 / Information Response 257
358 / Information Responses 257 and 890
359 / Information Response 1 Page 12 and Company Comments
360 / Interview 9

361 / Interview 9
362 / Interview 9
363 / Information Response 256
364 / Interview 9
365 / Information Response 256
366 / Company Comments
367 / Company Comments
368 / Company Comments
369 / Interview 9
370 / Information Response 256
371 / Information Response 267
372 / Interview 9
373 / Information Response 268
374 / Information Response 268
375 / Information Response 268
376 / Information Response 209
377 / Information Response 209
378 / Interview 90
379 / Information Response 214
380 / Information Response 219
381 / Information Response 892
382 / Information Response 892
383 / Information Response 892
384 / Information Response 892
385 / Information Response 222
386 / Information Response 223
387 / Information Response 224
388 / Information Response 230
389 / Information Response 876
390 / Information Response 225
391 / Information Response 225
392 / Information Response 225 and Company Comments
393 / Information Response 227
394 / Information Response 227
395 / Information Response 226
396 / Information Response 228
397 / Information Response 229
398 / Information Response 232
399 / Information Response 233
400 / Information Response 233
401 / Information Response 234
402 / Interview 9 and 53
403 / information Request 239
404 / Information Response 239
405 / Information Response 879
406 / Information Response 879
407 / Information Response 235
408 / Information Response 235
409 / Information Response 875

410 / Information Response 875
411 / Information Response 875
412 / Information Response 204
413 / Information Response 204
414 / Company Comments
415 / Information Response 202 and subsequent PAWC clarifications
416 / PAWC response to chapter draft
417 / PAWC response to chapter draft
418 / Information Response 204
419 / Information Response 204 and Company Comments
420 / Information Response 204
421 / Information Response 204 and subsequent PAWC updates
422 / Information Response 204
423 / Information Response 204
424 / Information Response 262 and Company Comments
425 / Information Response 262 and Company Comments
426 / International Customer Management Institute, *Agent Turnover and Retention Report*, 2007.
427 / Information Response 569
428 / Information Response 570
429 / Interview 21
430 / Information Response 204
431 / International Customer Management Institute, *Agent Turnover and Retention Report*, 2007, p.6.
432 / Company Comments
433 / Interview 92
434 / Information Response 564
435 / Interview 96
436 / Information Response 599
437 / Information Response 783
438 / Information Response 581
439 / Information Response 598
440 / Information Response 204
441 / Information Response 202
442 / Information Response 579
443 / PAWC response to initial chapter draft
444 / Information Response 209
445 / Information Response 209
446 / Information Response 507
447 / Information Response 113 and 114
448 / Interview 88
449 / Information Response 204
450 / Information Response 777
451 / Information Response 207
452 / Information Response 629 and Company Comments
453 / Information Response 630 and Company Comments
454 / Information Response 633
455 / Information Response 632 and Company Comments
456 / Information Response 631
457 / Information Response 634 and Company Comments
458 / Information Response 205

459 / Information Response 221 and Company Comments
460 / Information Response 221
461 / Company Comments
462 / Company Comments
463 / Interview 52
464 / Information Response 217
465 / Information Response 270
466 / Information Response 241
467 / Information Response 242
468 / Information Response 241
469 / Information Response 242
470 / Schumaker & Company analysis and Information Response 242
471 / Schumaker & Company analysis and Information Response 242
472 / Schumaker & Company analysis and Information Response 242
473 / Schumaker & Company analysis
474 / Interview 205 and Information Response 514
475 / <http://www.pacode.com/secure/data/052/chapter101/chap101toc.html>
476 / Information Response 563
477 / Information Response 716
478 / Information Response 716
479 / Information Response 716
480 / Interview 152
481 / Interview 203
482 / Information Response 130
483 / Information Response 248
484 / Information Response 248
485 / Information Response 248
486 / Information Response 248
487 / Information Response 247
488 / Information Response 247
489 / Information Response 247
490 / Information Response 280, page xvii
491 / Information Response 867
492 / Information Response 719
493 / Information Response 719
494 / Information Responses 719 and 317
495 / Information Response 719
496 / Information Response 252
497 / Information Response 869
498 / Numerous interviews
499 / Information Request 253
500 / PaPUC Reports
501 / Information Response 713
502 / Information Response 254
503 / Information Response 714
504 / Information Response 714

Schumaker & Company



Final Report

Volume III of III

Stratified Management & Operations Audit
of
Pennsylvania-American Water Company
for the
Pennsylvania Public Utility Commission
Bureau of Audits

Docket No. D-06MGT029

August 2008



Table of Contents

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1
A. Objectives and Scope.....	2
B. Functional Evaluation Summary.....	3
C. Summary of Estimated Benefits.....	5
Priority.....	5
Benefits.....	6
D. Summary of Recommendations.....	7
Phase I – Diagnostic Review.....	8
Chapter II – Executive Management, External Relations, and Human Resources.....	8
Chapter III – Financial Management	9
Chapter IV – Support Services.....	9
Chapter V – Water Operations	12
Phase II – Pre-Identified Issues Review.....	13
Chapter VI – Corporate Governance.....	13
Chapter VII – Corporate Culture, Management Structure, & Staffing Levels.....	13
Chapter VIII – Affiliate Interests	14
Chapter IX – Diversity and EEO.....	14
Chapter X – Customer Service.....	15
Chapter XI – Operational Performance	16
Phase III – Focused Area Analysis.....	16
Chapter XII – Phase III Water Operations – Distribution Business Systems.....	16
Chapter XIII – Phase III Human Resources	17
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19
A. Executive Management	19
Background & Perspective	19
Findings & Conclusions.....	27
Recommendations	29



Table of Contents (continued)

B. External Relations and Corporate Communications	31
Background & Perspective	31
Findings & Conclusions.....	34
Recommendations	36
C. Human Resources	38
Background & Perspective	38
Findings & Conclusions.....	44
Recommendations	55
III. FINANCIAL MANAGEMENT	59
A. Background & Perspective	59
Financial Requirements Planning and Cash Management.....	62
Cash Management.....	62
Financial Requirements Planning.....	64
Managerial Reporting, Accounting, and Controls	67
Processes	67
Systems	69
Performance Metrics.....	70
Budget Management, Reporting, and Control	73
Internal Auditing.....	78
B. Findings & Conclusions	82
Financial Requirements Planning and Cash Management.....	82
Managerial Reporting, Accounting, and Controls	83
Budget Management, Reporting, and Control	84
Internal Auditing.....	86
C. Recommendations.....	87
Financial Requirements Planning and Cash Management.....	87
Managerial Reporting, Accounting, and Controls	88
Budget Management, Reporting, and Control	88
Internal Auditing.....	88

Table of Contents (continued)

IV. SUPPORT SERVICES.....	91
A. Information Technology and Systems	91
Background & Perspective	91
Mission, Focus, & Objectives.....	91
Organization & Staffing	92
Business Solutions	95
Infrastructure & Operations	101
Client Services & Support	105
Project Management Office	107
Global Strategy & Architecture	109
Planning & Performance	111
Expenditures	112
Backup/Recovery, Disaster Recovery, and Security/Protection	113
Backup/Recovery	113
Disaster Recovery	113
Security/Protection	114
Technology Audits	115
Governance Processes.....	116
Findings & Conclusions.....	118
Recommendations	127
B. Transportation and Fleet Management	133
Background & Perspective	133
Organization & Staffing	133
Fleet Operating Performance Statistics and Trends.....	137
ARI	138
Fleet Composition and Annual Expenditures.....	139
Major Processes and Systems	143
Vehicle Acquisition.....	143
Vehicle Maintenance and Repair	144
Fuel Supply	145
ARI Processes	146
ARI Systems	147
Internal Audit of the Fleet Management Function	148
Findings & Conclusions.....	148
Recommendations	150



Table of Contents (continued)

C. Facilities and Property Management	153
Background & Perspective	153
Organization & Staffing	153
Expenditures	155
Major Processes and Systems	156
Metrics	156
Findings & Conclusions.....	157
Recommendations	157
D. Procurement Services and Materials Management	159
Procurement Services.....	159
Background & Perspective	159
Organization & Staffing	159
Staffing Levels.....	167
Expenditures	168
Major Business Processes.....	169
Major Systems	171
Findings & Conclusions.....	172
Recommendations.....	174
Materials Management	175
Background & Perspective	175
Organization & Staffing	175
Expenditures	176
Major Business Processes.....	176
Findings & Conclusions.....	183
Recommendations.....	193
E. Risk Management.....	199
Background & Perspective.....	199
Organization & Staffing.....	199
Operating Expenses.....	205
Findings & Conclusions.....	210
Recommendations	212
F. Legal Services	213
Background & Perspective.....	213
Organization & Staffing.....	213
Expenditures	216
Major Processes and Systems	217
Findings & Conclusions.....	219
Recommendations	221

Table of Contents (continued)

V. WATER OPERATIONS	223
A. Production.....	226
Background & Perspective	226
Findings & Conclusions.....	228
Recommendations	236
B. Network Operations and Maintenance.....	237
Background & Perspective	237
Findings & Conclusions.....	238
Recommendations	246
C. Maintenance Services.....	249
Background & Perspective	249
Findings & Conclusions.....	249
Recommendations	252
D. Engineering Department.....	253
Background & Perspective	253
Findings & Conclusions.....	254
Recommendations	257



**Table of Contents
(continued)**

Volume II

VI. CORPORATE GOVERNANCE.....	255
A. Background & Perspective	255
B. Findings & Conclusions	258
C. Recommendations.....	267
VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS	269
A. Background & Perspective	269
Multiple Reorganizations	269
Performance Management	273
B. Findings & Conclusions	274
C. Recommendations.....	281
VIII. AFFILIATE INTERESTS	283
A. Background & Perspective	284
Affiliate Relationships	284
Organizations.....	284
Agreements	292
Affiliate Transactions	294
Services Provided To/From PAWC.....	294
Services Provided by Affiliates to PAWC.....	295
Services Provided by PAWC to Affiliates.....	296
Personnel Transfers From/To PAWC.....	296
Property Transfers From/To PAWC	297
Major Processes and Systems.....	298
Cost Accumulation & Assignment	298
Pennsylvania-American Water Company	298
AWWSC.....	298
Direct Charges/Cost Allocation	299
Systems	302
Invoicing and Payment Methodologies	302

Table of Contents (continued)

Restrictions.....	302
Dividends.....	302
Other Restrictions	303
B. Findings & Conclusions	304
From PAWC to Affiliates	305
From Affiliates to PAWC	306
C. Recommendations.....	312
IX. DIVERSITY/EEO.....	315
A. Background & Perspective.....	315
Organization & Staffing.....	318
Employer Diversity	318
Supplier Diversity	319
Major Processes & Systems.....	320
Employer Diversity	320
Supplier Diversity	321
Statistical Data	323
Employer Diversity	323
Diversity Composition.....	323
Equal Employment Opportunity Commission Complaints	326
Supplier Diversity	326
B. Findings & Conclusions	327
C. Recommendations.....	339
X. CUSTOMER SERVICE	343
A. Background & Perspective.....	343
Call Center Operations.....	344
Organization & Staffing	348
Call Center Technology.....	350
Call Routing and Management	350
Workforce Management.....	350
Customer Relations.....	352
Organization & Staffing	352
Service First Program	355
Customer Surveys	357



Table of Contents (continued)

Customer Accounting and Billing	357
Systems	358
Billing Cycle	359
Credit and Collections	361
Meter Management.....	367
Theft of Service Management.....	369
B. Findings & Conclusions	370
Informal Complaints.....	380
Mediation Complaints	380
Complaint Turnaround Time	381
Formal Complaints.....	381
Executive Complaints.....	382
C. Recommendations.....	386

XI. OPERATIONAL PERFORMANCE..... 391

A. Damage Prevention Programs and Practices.....	391
Background & Perspective	391
Findings & Conclusions.....	392
Recommendations	394
B. Chapter 101 Compliance.....	395
Background & Perspective	395
Findings & Conclusions.....	396
Recommendations	399
C. Unaccounted-For-Water	401
Background & Perspective	401
Findings & Conclusions.....	403
Recommendations	412
D. Capital Investment and Operating Expense Levels	413
Background & Perspective	413
Findings & Conclusions.....	415
Recommendations	420

**Table of Contents
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

A. Background & Perspective.....	421
Prior Findings.....	421
Prior Recommendations.....	421
B. Findings & Conclusions	422
Current Status.....	423
Planned Status	427
C. Recommendations.....	434
D. Overall Summary Conclusions.....	439
E. Implementation Plan.....	441
Assumptions	441
Project Staffing.....	442
Project Plan.....	442
Project Schedule.....	443
Project Costs Estimates	445

XIII. PHASE III HUMAN RESOURCES 447

A. Background & Perspective.....	447
B. Project Team Deliverables	448
Human Capital Scorecard	448
Financial Measures	449
Customer Measures.....	449
Process Measures.....	451
Employee (Learning and Growth).....	451
Workforce Planning and Replenishment	451
Aging Workforce.....	451
Changing Demographics.....	452
Growing Demand for Operators.....	452
Implications.....	452
PAWC’s Aging Workforce.....	453

**Table of Contents
(continued)**

Workforce Planning and Replenishment.....454
 Critical Knowledge Risk Management455
 Workforce of the Future455
 Retiree Retention456
Project Plan456
Strategic Alignment456
 External Focus.....457
 Growth.....458
C. Findings & Conclusions458
D. Recommendations459

XIV. APPENDIX A: DATA AND STATISTICS 461

A. Section 1 – PAWC464
 Total Net Plant in Service465
 Water Sales by Volume (millions of gallons)466
 Operating Revenue468
 Residential Revenue versus Water Sold469
 Commercial Revenue versus Water Sold.....470
 Industrial Revenue versus Water Sold471
 Wholesale Revenue versus Water Sold472
 Governmental Authority Revenue versus Water Sold.....473
 Fire Service Revenue versus Water Sold.....474
 Other (Utility & Non-Utility) Revenue.....475
 Total Average Number of Customers (year-end)476
 Total Employees (year-end)477
 Total Operation and Maintenance Expense478
 Production Expense479
 Purification Expense.....480
 Transmission and Distribution Expense480
 Customer Accounting Expense481
 Administrative and General Expense.....482
 Miles of Main in Service483
 Performance Ratios484
 Performance Ratios per Million Gallons485
 Performance Ratios per One Thousand Customers485
 Performance Ratios per Mile of Main.....486
 Performance Ratios - Average Number of Customers per Employee.....486
 Performance Ratios - Gross Utility Plant in Service per Average Number of
 Customers487

Table of Contents
(continued)

B. Section 2 – Comparative	489
Total Net Plant in Service.....	490
Water Sales by Volume (millions of gallons)	491
Residential Water Sold.....	492
Commercial Water Sold.....	493
Industrial Water Sold	494
Wholesale Water Sold.....	495
Governmental Authority Water Sold	496
Fire Service Water Sold	497
Other Water Sold	498
Operating Revenue	499
Residential Revenue	500
Commercial Revenue.....	501
Industrial Revenue.....	502
Wholesale Revenue	503
Governmental Authority Revenue.....	504
Fire Service Revenue.....	505
Other Revenue.....	506
Total Average Number of Customers (year-end)	507
Residential Average Number of Customers.....	508
Commercial Average Number of Customers.....	509
Industrial Average Number of Customers	510
Wholesale Average Number of Customers	512
Governmental Authority Average Number of Customers	513
Fire Service Average Number of Customers	514
Other Average Number of Customers	516
Total Employees (year-end)	517
Total Operation and Maintenance Expense	518
Production Expense.....	519
Purification Expense.....	520
Transmission and Distribution Expense	521
Customer Accounting Expense.....	522
Administrative and General Expense.....	523
Miles of Main in Service.....	524

Table of Contents
(continued)

Performance Ratio Expense.....525

 Operation and Maintenance Expenses per Million Gallons.....526

 Production Expenses per Million Gallons.....527

 Purification Expenses per Million Gallons.....527

 Transmission & Distribution Expenses per Million Gallons528

 Customer Accounting Expenses per Million Gallons528

 Administrative & General Expenses per Million Gallons.....529

 Operation and Maintenance Expenses per Thousand Customers530

 Production Expenses per Thousand Customers531

 Purification Expenses per Thousand Customers531

 Transmission & Distribution Expenses per Thousand Customers532

 Customer Accounting Expenses per Thousand Customers532

 Administrative & General Expenses per Thousand Customers533

 Operation and Maintenance Expenses per Mile of Main534

 Production Expenses per Mile of Main535

 Purification Expenses per Mile of Main535

 Transmission & Distribution Expenses per Mile of Main536

 Customer Accounting Expenses per Mile of Main536

 Administrative & General Expenses per Mile of Main537

XV. APPENDIX B: GLOSSARY 539

Table of Exhibits

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1	
Exhibit I-1	Functional Evaluation Summary Phase I – Diagnostic Review	4
Exhibit I-2	Functional Evaluation Summary Phase II – Pre-identified Issues Review	4
Exhibit I-3	Functional Evaluation Summary Phase III – Focused Area Analysis	5
Exhibit I-4	Summary of Priority Totals	6
Exhibit I-5	Summary of Benefits	6
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19	
Exhibit II-1	American Water Organization, as of December 31, 2007	20
Exhibit II-2	American Water Eastern Division Reorganization, as of December 31, 2007	22
Exhibit II-3	Pennsylvania-American Water Company Organization, as of December 31, 2007	23
Exhibit II-4	AWWSC Communications and External Affairs Organization, as of December 31, 2007	31
Exhibit II-5	Summary of Expenditures for AWWSC External-Relations Activities, 2003 to 2007	33
Exhibit II-6	AWWSC Human Resources Organization, as of December 31, 2007	38
Exhibit II-7	AWWSC Benefits Services Center, as of December 31, 2007	39
Exhibit II-8	Pennsylvania-American Water Company Human Resources, as of December 31, 2007	40
Exhibit II-9	HR-Process Improvement Objectives, September 11, 2007	42
Exhibit II-10	American Water Business Strategy, September 13, 2007	48
Exhibit II-11	Retirement Forecast Thru 2021, Normal and Early Retirement	50
Exhibit II-12	Pennsylvania-American Water Company Staffing Requisitions and Average Time to Fill 2003 to 2007 (through February 2007)	53
III. FINANCIAL MANAGEMENT	59	
Exhibit III-1	AWWSC Financial Functions, as December 31, 2007, Page 1 of 2	60
Exhibit III-1	AWWSC Financial Functions, as of December 31 2007, Page 2 of 2	61
Exhibit III-2	PAWC Mellon Lockbox Account Daily Balances, 2003 to 2007	62
Exhibit III-3	Example of SSC Cash Management Metrics, June 2006 through September 2007	63



**Table of Exhibits
(continued)**

Exhibit III-4	Cash Management Sample Excerpt from Reconciliation Summary for Month ended August 2007.....	64
Exhibit III-5	AWCC Long-term Debt and Commercial Paper Ratings, 2003 to 2007.....	66
Exhibit III-6	Systems Supporting American Water’s and PAWC’s Accounting and Finance Functions.....	70
Exhibit III-7	SSC Payroll, General Accounting, Rates, General Tax, & Accounts Payable Metrics, June 2006 through September 2007.....	71
Exhibit III-8	Training Provided to SSC Personnel 2006 and 2007, as of October 31, 2007.....	72
Exhibit III-9	Budget Process Flows from American Water to PAWC as of December 31 2007.....	73
Exhibit III-10	American Water Budget Process, as of December 31, 2007.....	74
Exhibit III-11	American Water Second-Quarter Budget Reforecast Timetable.....	76
Exhibit III-12	Internal Audits Completed by Year, 2003 to 2004.....	80
Exhibit III-13	Internal Audits Completed by Year, 2005 to 2006.....	81
Exhibit III-14	PAWC Key Financial Statistics (\$ Thousands) 2002 to June 30, 2007.....	85

IV. SUPPORT SERVICES 91

Exhibit IV-1	AWWSC Information Technology Services Organization, as of December 31, 2007.....	93
Exhibit IV-2	ITS Staffing Levels, 2004 to 2007.....	94
Exhibit IV-3	ITS Business Solutions Organization, as of December 31, 2007.....	95
Exhibit IV-4	ITS Business Solutions Organization Functional Applications, as of December 31, 2007.....	96
Exhibit IV-5	ITS Business Solutions Organization Technical Applications, as of December 31, 2007.....	97
Exhibit IV-6	KPIs for the ITS Director of Business Solutions, as of December 31, 2007....	98
Exhibit IV-7	Typical Testing Performed and Responsible Group as of December 31, 2007.....	100
Exhibit IV-8	ITS Infrastructure & Operations Organization as of December 31, 2007.....	101
Exhibit IV-9	KPIs for the ITS Director of Infrastructure & Operations, as of December 31, 2007.....	102
Exhibit IV-10	Major Infrastructure & Operations Initiatives, as of December 31, 2007.....	104
Exhibit IV-11	ITS Client Services & Support Organization, as of December 31, 2007.....	105
Exhibit IV-12	ITS Project Management Office Organization, as of December 31, 2007.....	107
Exhibit IV-13	ITS Global Strategy & Architecture, as of December 31, 2007.....	109
Exhibit IV-14	High-Priority List of Standards, as of December 31, 2007.....	110

**Table of Exhibits
(continued)**

Exhibit IV-15	PAWC Information Technology Costs, 2003 to 2007	112
Exhibit IV-16	Example Disaster-Recovery-Plan (DRP) Testing Cycle, as of December 31 2007.....	113
Exhibit IV-17	IT/IS-Related Audits, 2003 to 2007.....	115
Exhibit IV-18	Mix of ITS Resources Approved by ITSC, as of December 31, 2007.....	117
Exhibit IV-19	Actual versus Budget ITS Staffing Levels, 2004 to 2007	120
Exhibit IV-20	ITS Performance Metrics, 2005 to 2007 (through First Half of 2007 Only) ..	123
Exhibit IV-21	American Water Vehicle Replacement Criteria as of January 24, 2006.....	135
Exhibit IV-22	PAWC Annual Fleet Operating Performance Statistics 2005 to 2007.....	138
Exhibit IV-23	PAWC EOY Vehicle Fleet Composition and Trends by Vehicle Class, 2003 to 2007.....	139
Exhibit IV-24	PAWC Revised EOY Vehicle Count, 2003 to 2007	140
Exhibit IV-25	PAWC Fleet Utilization Statistics, as of August 31, 2007	141
Exhibit IV-26	Operations and Maintenance Budget Versus Actuals, 2002 to 2007.....	141
Exhibit IV-27	ARI Annual Billings to PAWC, 2003 to 2007.....	142
Exhibit IV-28	Total Vehicle Leasing Expense, 2003 to 2007	142
Exhibit IV-29	Accident Dollars Recovered Due to Subrogation by ARI, 2003 to 2007.....	146
Exhibit IV-30	Supply Chain Organization, as of December 31, 2007.....	160
Exhibit IV-31	AWWSC Supply Chain Staffing Levels, 2004 to 2007.....	168
Exhibit IV-32	PAWC Total Procurement Value, 2002 to 2007	169
Exhibit IV-33	PAWC Inventory Levels by Stock Type as Reported by PAWC, 2003 to 2007.....	184
Exhibit IV-34	PAWC Stock E Inventory Turns as Reported by PAWC, 2003 to 2007.....	185
Exhibit IV-35	PAWC Stock E Inventory Turns by Warehouse, as Reported by PAWC, 2004 to 2007.....	186
Exhibit IV-36	AWWSC Operational & Financial Risk Management Organizations, as of December 31, 2007.....	199
Exhibit IV-37	AWWSC Operational Risk Management Organizations Southeast Region – Pennsylvania Only, as of December 31, 2007.....	200
Exhibit IV-38	Operational Risk Management Staffing Levels for PAWC Activities, 2002 to 2007.....	202
Exhibit IV-39	Resolution of Claims Review and Approval Limits, as of December 31, 2007.....	204
Exhibit IV-40	Annual Insurance Premium Expense, Other Than Group, for PAWC and American Water, 2004 to 2007.....	205
Exhibit IV-41	Self-Funding Retentions, as of December 31, 2007.....	206
Exhibit IV-42	# PAWC Claims By Accident Year, 2002 to 2007.....	207
Exhibit IV-43	\$ PAWC Claims Incurred By Accident Year, 2002 to 2007	208

**Table of Exhibits
(continued)**

Exhibit IV-44	PAWC Loss Control Expenditures as % of Claimed Losses, 2002 to 2007.....	209
Exhibit IV-45	AWWSC Legal Organization, as of December 31, 2007	213
Exhibit IV-46	AWWSC Southeast Region Legal Organization Providing PAWC Legal Services, as of December 31, 2007.....	215
Exhibit IV-47	Southeast Region/PAWC Operating Costs, 2005 to 2007	216
Exhibit IV-48	PAWC Outside Legal Counsel Costs, 2003 to 2007	217

V. WATER OPERATIONS..... 223

Exhibit V-1	PAWC Water Districts, as of December 31, 2007	223
Exhibit V-2	Water District Statistics, as of December 31, 2007	224
Exhibit V-3	PAWC Water Operations Organization, as of December 31, 2007	225
Exhibit V-4	PAWC Production Department Organization, as of December 31, 2007.....	227
Exhibit V-5	Production Facility Tours, as of December 31, 2007	228
Exhibit V-6	Coatesville Wastewater Treatment Facility, as of December 31, 2007.....	229
Exhibit V-7	Coatesville Wastewater Treatment Facility, as of December 31, 2007.....	229
Exhibit V-8	Coatesville Water Treatment Plant, as of December 31, 2007.....	230
Exhibit V-9	Coatesville Retaining Dam on Reservoir, as of December 31, 2007.....	230
Exhibit V-10	Silver Springs Water Source Conodoquinet Creek, as of December 31, 2007.....	231
Exhibit V-11	Silver Springs Water Intake Showing Exterior Screen, as of December 31, 2007.....	231
Exhibit V-12	Silver Springs Water Intake and Pump Station, as of December 31, 2007.....	232
Exhibit V-13	Silver Springs Aldrich Purification Units, as of December 31, 2007.....	232
Exhibit V-14	Silver Springs Lagoons, as of December 31, 2007	233
Exhibit V-15	West Shore Plant, as of December 31, 2007.....	233
Exhibit V-16	Performance Charts on Coatesville Water District Office, as of December 31, 2007.....	234
Exhibit V-17	Partnership Annual Report for Pennsylvania-American Water Company – Butler 2006–2007, as of December 31, 2007	235
Exhibit V-18	PAWC Network Department Organization, as of December 31, 2007	237
Exhibit V-19	PAWC Leaks/Breaks by Water District by Year, 2002 to 2006	240
Exhibit V-20	PAWC Average Leaks/Breaks Frequency by Water District by Year, 2002 to 2006.....	241
Exhibit V-21	PAWC Capital/Maintenance Expectations Based on Leak/Break History, as of December 31, 2007	242

**Table of Exhibits
(continued)**

Exhibit V-22	PAWC Actual Capital Expenditures – Main Replacements, 2004 to 2007	243
Exhibit V-23	PAWC Maintenance Expenditures by Water District, 2003 to 2007	244
Exhibit V-24	PAWC Distribution of Capital and Maintenance Expenditures by District, 2003 - 2007.....	245
Exhibit V-25	PAWC Maintenance Services Organization, as of December 31, 2007	249
Exhibit V-26	Sample Condition-Based Maintenance Test, as of December 31, 2007.....	251
Exhibit V-27	PAWC Engineering Department Organization, as of December 31, 2007.....	253
Exhibit V-28	PAWC Inventory of Comprehensive Planning Studies and Other Studies, as of July 2007	255

**Table of Exhibits
(continued)**

Volume II

VI. CORPORATE GOVERNANCE.....	255
VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS	269
Exhibit VII-1 PAWC Positions Subject to Reorganization, as of April 2004.....	272
VIII. AFFILIATE INTERESTS	283
Exhibit VIII-1 American Water Works Company, Inc. Organization, as of December 31, 2007.....	286
Exhibit VIII-2 TWH, LLC Organization, as of December 31, 2007.....	287
Exhibit VIII-3 American Water Enterprise, Inc. Organization, as of December 31, 2007.....	288
Exhibit VIII-4 AWWSC Corporate Organization, as of December 31, 2007	289
Exhibit VIII-5 Affiliate Agreements involving PAWC and Other American Water Entities, as of December 31, 2007.....	293
Exhibit VIII-6 Summary of Charges Involving Affiliated Services Provided To/From PAWC, 2002 to 2007	294
Exhibit VIII-7 Summary of Charges Involving Affiliated Services Provided To/From PAWC by Affiliate/Type, 2002 to 2007	295
Exhibit VIII-8 PAWC's Share of AWWSC Expenses (\$ Thousands), 2002 to 2007.....	295
Exhibit VIII-9 Percentage of Direct Charges versus Allocations for AWWSC Charges to PAWC, 2005 to 2007	296
Exhibit VIII-10 Personnel Transfers From/To PAWC and its Affiliates, 2003 to 2007	297
Exhibit VIII-11 AWWSC Expense Categories, as of December 31, 2007	301
Exhibit VIII-12 PAWC Dividend Payments to American Water, 2002 to 2007	303
IX. DIVERSITY/EEO	315
Exhibit IX-1 Southeast Region HR Organization, as of December 31, 2007	318
Exhibit IX-2 AWWSC Supply Chain Organization, as of December 31, 2007	319
Exhibit IX-3 Diversity Composition of PAWC Employees, as of December 31, 2006.....	323
Exhibit IX-4 Diversity Composition of PAWC Employees, as of December 31, 2007	324
Exhibit IX-5 PAWC Consolidated AAP Data, 2004 to 2006 (as of August of Each Year)	325
Exhibit IX-6 Number of PAWC Agreements with Women and Minority Vendors, 2005 to 2007	326

**Table of Exhibits
(continued)**

Exhibit IX-7	Annual Spend Value and Percentage of Total Spend by PAWC with M/WBE Suppliers, 2002 to 2007	327
Exhibit IX-8	Location Validation Activities for AAP/EEO-1 Reporting by Area, as of December 31, 2007.....	330
Exhibit IX-9	Summary of American Water Progress against Diversity Plan, as of December 31, 2007, Page 1 of 3.....	332
Exhibit IX-9	Summary of American Water Progress against Diversity Plan, as of December 31, 2007, Page 2 of 3.....	333
Exhibit IX-9	Summary of American Water Progress Against Diversity Plan, as of December 31, 2007, Page 3 of 3.....	334
Exhibit IX-10	PAWC Women and Minority Utilization, as of December 31, 2006	336

X. CUSTOMER SERVICE 343

Exhibit X-1	American Water National Call Center, as of December 31, 2007.....	344
Exhibit X-2	Inside Alton Call Center, as of December 31, 2007.....	346
Exhibit X-3	Inside Pensacola Call Center, as of December 31, 2007	347
Exhibit X-4	Customer Service Center Organization, as of December 31, 2007	348
Exhibit X-5	AWWSC Eastern Division Organization, as of December 31, 2007	352
Exhibit X-6	AWWSC Southeast Region Customer Relations Organization, as of December 31, 2007.....	353
Exhibit X-7	PAWC Appointment Windows, as of December 31, 2007	356
Exhibit X-8	PAWC Met Appointments, 2005 to 2007	356
Exhibit X-9	Collection and Termination Practices, as of December 31, 2007	362
Exhibit X-10	PAWC Account Hold for Medical Condition, 2003 to 2008	362
Exhibit X-11	PAWC Customers Enrolled in Various Programs, as of December 31, 2007.....	363
Exhibit X-12	PAWC Accounts Receivable Aging Trends, 2002 to 2007	364
Exhibit X-13	PAWC Late Payment Revenues, 2002 to 2007	365
Exhibit X-14	PAWC Agency Collections, 2004 to 2007	365
Exhibit X-15	PAWC Allowance for Uncollectible Trends (\$ Thousands), 2004 to 2007.....	366
Exhibit X-16	Agreements Created/Broken, 2003 to 2007.....	366
Exhibit X-17	PAWC Full-time Meter Readers, 2004 to 2007	367
Exhibit X-18	Meter Age Histogram, as of December 31, 2007	368
Exhibit X-19	Meter Testing Rates, 2003 to 2007	369
Exhibit X-20	Theft of Service Statistics, as of December 31, 2007.....	370
Exhibit X-21	PAWC and American Water % of Calls Answered within 30 Seconds, 2002 to 2007.....	371
Exhibit X-22	PAWC Customers' Unanswered Calls (Alton and Pensacola) 2002 to 2007.....	372

**Table of Exhibits
(continued)**

Exhibit X-23	American Water and PAWC Call Abandoned Rates, 2002 to 2007	373
Exhibit X-24	PAWC Average Handle Time (Seconds), 2002 to 2007	374
Exhibit X-25	American Water CSR Turnover Rates By Call Center,2003 to 2007	374
Exhibit X-26	CSR Staffing Level Changes for American Water as a Whole, 2005 to 2007.....	377
Exhibit X-27	Number of PAWC Informal and Mediation Complaints, 2006.....	379
Exhibit X-28	PAWC Informal Complaints, 2003 to 2007.....	380
Exhibit X-29	PAWC Mediation Complaints, 2003 to 2007.....	381
Exhibit X-30	PAWC Average Turnaround Time for Complaints (Days), 2003 to 2007	381
Exhibit X-31	PAWC Formal Complaints, 2003 to 2007.....	382
Exhibit X-32	PAWC Executive Complaints, 2004 to 2007	382
Exhibit X-33	PAWC Dispute Trends, 2002 to 2007	383
Exhibit X-34	PAWC Billing Errors, 2003 to 2007.....	384
Exhibit X-35	Additional Costs From Over Estimates, as of December 31, 2006	385
Exhibit X-36	PAWC Consecutive No Read Progress, as of December 31, 2007	388

XI. OPERATIONAL PERFORMANCE 391

Exhibit XI-1	PAWC Emergency Response Exercises, as of December 31, 2006	397
Exhibit XI-2	Table Top Exercises Completed in 2007, as of December 31, 2007	398
Exhibit XI-3	PAWC Unaccounted-for Water, 2003 to 2007	403
Exhibit XI-4	PAWC Unaccounted-for-Water by Water District, 2005 to 2007	404
Exhibit XI-5	PAWC Unaccounted-for Water Reported to PaPUC, as of December 31, 2006	407
Exhibit XI-6	Analysis of PAWC Reported Unaccounted-For Water, 2005 to 2007.....	408
Exhibit XI-7	PAWC Unaccounted For Real Losses Calculation, as of December 31, 2007.....	409
Exhibit XI-8	System Pressure Impact on Report UFW, 2005 to 2007	410
Exhibit XI-9	PAWC Wilkes-Barre District Metering Areas, as of December 31, 2007.....	411
Exhibit XI-10	PAWC Capital Investment Program Expenditures, 2003 to 2007	413
Exhibit XI-11	PAWC Miles of Main Replacement by Water District, 2003 to 2007	414
Exhibit XI-12	PAWC Total Number of Employees, 1998 to 2007	416
Exhibit XI-13	PAWC Distribution Overtime Hours 2005 to 2007	417
Exhibit XI-14	Production Overtime Hours, 2005 to 2007	418
Exhibit XI-15	PAWC Maintenance Trends Pittsburgh, 2003 to 2007	419
Exhibit XI-16	PAWC Valve Operations, 2003 to 2007	420
Exhibit XI-17	PAWC Production Overtime, 2005 to 2007	421

**Table of Exhibits
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Exhibit XII-1	Distribution Business Processes, as of March 31, 2008.....	428
Exhibit XII-2	Valve and Hydrant Asset Performance Distribution Business Processes, as of March 31, 2008.....	431
Exhibit XII-3	Workforce Management and Parts and Inventory Distribution Business Processes, as of March 31, 2008.....	432
Exhibit XII-4	Leak Tracking and Reporting Distribution Business Processes, as of March 31, 2008.....	433
Exhibit XII-5	Recommended Distribution Business Processes Road Map as of March 31, 2008.....	435
Exhibit XII-6	Project Resource Estimates.....	442
Exhibit XII-7	Project Plan and Schedule.....	444
Exhibit XII-8	Project Cost Estimate, Page 1 of 2.....	445
Exhibit XII-8	Project Cost Estimate, Page 2 of 2.....	446

XIII. PHASE III HUMAN RESOURCES 447

Exhibit XIII-1	PAWC Human Capital Scorecard, as of March 31, 2008.....	450
Exhibit XIII-2	Percentage of Employees Eligible for Early Retirement in the Next Five Years by Selected Locations, as of April 1, 2008.....	454
Exhibit XIII-3	Strategy Matrix, April 1, 2008.....	457

XIV. APPENDIX A: DATA AND STATISTICS..... 461

Exhibit XIV-1	Total Net Plant in Service.....	465
Exhibit XIV-2	Total Water Sold.....	466
Exhibit XIV-3	Operating Revenue.....	468
Exhibit XIV-4	Residential Revenue.....	469
Exhibit XIV-5	Commercial Revenue.....	470
Exhibit XIV-6	Industrial Revenue.....	471
Exhibit XIV-7	Wholesale Revenue.....	472
Exhibit XIV-8	Governmental Authority Revenue.....	473
Exhibit XIV-9	Fire Service Revenue.....	474
Exhibit XIV-10	Other (Utility & Non-Utility) Revenue.....	475

**Table of Exhibits
(continued)**

Exhibit XIV-11	Total Average Number of Customer (year-end).....	476
Exhibit XIV-12	Total Employees (year-end).....	477
Exhibit XIV-13	Total Operation and Maintenance Expense.....	478
Exhibit XIV-14	Production Expense.....	479
Exhibit XIV-15	Purification Expense.....	480
Exhibit XIV-16	Transmission and Distribution Expense	480
Exhibit XIV-17	Customer Accounting Expense.....	481
Exhibit XIV-18	Administrative and General Expense.....	482
Exhibit XIV-19	Miles of Main in Service	483
Exhibit XIV-20	Performance Ratios	484
Exhibit XIV-21	Performance Ratios per Million Gallons	485
Exhibit XIV-22	Performance Ratios per One Thousand Customers	485
Exhibit XIV-23	Performance Ratios per Mile of Main	486
Exhibit XIV-24	Performance Ratios – Average Number of Customers per Employee	486
Exhibit XIV-25	Performance Ratios – Gross Utility Plant in Service per Average Number of Customers	487
Exhibit XIV-26	Utility Plant in Service Less Depreciation	490
Exhibit XIV-27	Total Water Sold (millions of gallons).....	491
Exhibit XIV-28	Residential Water Sold (millions of gallons).....	492
Exhibit XIV-29	Commercial Water Sold (millions of gallons).....	493
Exhibit XIV-30	Industrial Water Sold (millions of gallons).....	494
Exhibit XIV-31	Wholesale Water Sold (millions of gallons).....	495
Exhibit XIV-32	Governmental Authority Water Sold (millions of gallons)	496
Exhibit XIV-33	Fire Service Water Sold (millions of gallons)	497
Exhibit XIV-34	Other Water Sold (millions of gallons)	498
Exhibit XIV-35	Total Operating Revenue (\$'s).....	499
Exhibit XIV-36	Residential Revenue (\$'s).....	500
Exhibit XIV-37	Commercial Revenue (\$'s).....	501
Exhibit XIV-38	Industrial Revenue (\$'s).....	502
Exhibit XIV-39	Wholesale Revenue (\$'s).....	503
Exhibit XIV-40	Governmental Authority Revenue (\$'s)	504
Exhibit XIV-41	Fire Service Revenue (\$'s)	505
Exhibit XIV-42	Other Revenue (\$'s)	506
Exhibit XIV-43	Total Average Number of Customers (year-end).....	507
Exhibit XIV-44	Residential Average Number of Customer.....	508
Exhibit XIV-45	Commercial Average Number of Customers.....	509
Exhibit XIV-46	Industrial Average Number of Customers	510
Exhibit XIV-47	Wholesale Average Number of Customers	512
Exhibit XIV-48	Governmental Authority Average Number of Customers	513
Exhibit XIV-49	Fire Service Average Number of Customers	514

**Table of Exhibits
(continued)**

Exhibit XIV-50	Other Average Number of Customers.....	516
Exhibit XIV-51	Total Number of Employees (year-end)	517
Exhibit XIV-52	Total Operation & Maintenance Expense	518
Exhibit XIV-53	Production Expense.....	519
Exhibit XIV-54	Purification Expense.....	520
Exhibit XIV-55	Transmission & Distribution Expense.....	521
Exhibit XIV-56	Customer Accounting Expense.....	522
Exhibit XIV-57	Administrative & General Expense.....	523
Exhibit XIV-58	Miles of Main in Service	524
Exhibit XIV-59	Performance Ratio Expense Background Data Total Average Number of Customers per Employee Gross Utility Plant in Service per Total Average Number of Customers	525
Exhibit XIV-60	Expenses per Million Gallons.....	526
Exhibit XIV-61	Production Expenses per Million Gallons.....	527
Exhibit XIV-62	Purification Expenses per Million Gallons.....	527
Exhibit XIV-63	Transmission & Distribution Expenses per Million Gallons.....	528
Exhibit XIV-64	Customer Accounting Expenses per Million Gallons.....	528
Exhibit XIV-65	Administrative & General Expenses per Million Gallons	529
Exhibit XIV-66	Expenses per Thousand Customers	530
Exhibit XIV-67	Production Expenses per Thousand Customers	531
Exhibit XIV-68	Purification Expenses per Thousand Customers.....	531
Exhibit XIV-69	Transmission & Distribution Expenses per Thousand Customers	532
Exhibit XIV-70	Customer Accounting Expenses per Thousand Customers	532
Exhibit XIV-71	Administrative & General Expenses per Thousand Customers.....	533
Exhibit XIV-72	Expenses per Mile of Main	534
Exhibit XIV-73	Production Expenses per Mile of Main	535
Exhibit XIV-74	Purification Expenses per Mile of Main.....	535
Exhibit XIV-75	Transmission & Distribution Expenses per Mile of Main	536
Exhibit XIV-76	Customer Accounting per Mile of Main	536
Exhibit XIV-77	Administrative & General Expenses per Mile of Main.....	537

XV. APPENDIX B: GLOSSARY 539

Table of Findings

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19
Finding II-1	In general the American Water/PAWC organization adequately supports current ratepayer and corporate objectives.27
Finding II-2	Organizational planning and development at American Water/PAWC is largely informal and could be improved.....27
Finding II-3	Management communications and control are adequate.28
Finding II-4	Administrative procedures and controls are appropriate.28
Finding II-5	American Water and PAWC lack a formal, systematic strategic-planning process.29
Finding II-6	American Water’s external relations function has been recently strengthened and is well positioned to support corporate objectives and regional/state efforts; however, the role of the Southeast Regional Director should be better defined.34
Finding II-7	American Water has recently developed a number of strategic external-relations programs; however, these programs have not yet been rolled out, and there are no regional or state-specific operational plans.....35
Finding II-8	AWWSC Human Resources has no direct accountability to PAWC.44
Finding II-9	PAWC does not have a service level agreement with AWWSC that specifies the level of HR support to be provided.....45
Finding II-10	Human Resources does not have standard metrics and does not make regular reports of its contribution.45
Finding II-11	Data integrity problems in the JD Edwards human resources information system makes for additional manual effort, creates opportunity for errors, and limits PAWC HR’s ability to measure its effectiveness.46
Finding II-12	American Water Works Service Company and regional/local HR have extremely limited training and development capacity to support of the strategic HR needs of PAWC.....46
Finding II-13	Pennsylvania training and development is focused on technical training and has not aligned to the broader strategic HR needs of PAWC.....47
Finding II-14	PAWC’s Human Resources and executive management have recognized the loss of human capital and the potential for a large number of retirements in coming years but has not developed a plan to respond to these needs.49
Finding II-15	PAWC does not have effective position control.51

**Table of Findings
 (continued)**

Finding II-16	A lack of reliable information on employee capabilities (bench strength) hinders PAWC’s ability to respond effectively to current demands and plan for future growth.	52
Finding II-17	PAWC has not met its goal to reduce time-to-hire by 10%.....	53
Finding II-18	PAWC uses a time and attendance system with limited functionality that was developed in-house	53
Finding II-19	American Water/PAWC does not have a formal management development process.	54
Finding II-20	PAWC does not have a learning management system.....	55
III. FINANCIAL MANAGEMENT		59
Finding III-1	PAWC cash is managed in an efficient and cost-effective manner by corporate cash management functions.....	82
Finding III-2	Long-term debt is obtained at favorable rates.	83
Finding III-3	The consolidated managerial reporting, accounting, and control functions serving PAWC are efficient and closely monitored.....	83
Finding III-4	American Water’s general ledger system is not current and has not recently been updated to add needed functionality.	83
Finding III-5	The AWWSC’s Shared Services Center provides an extensive amount of employee training.	84
Finding III-6	The function of reporting actual financial results compared to budgets is managed and controlled effectively.	84
Finding III-7	Several key PAWC financial statistics have been deteriorating in recent years. .	85
Finding III-8	The Internal Audit Department is not sufficiently isolated from the Financial Management organization.	86
Finding III-9	The number of internal audits conducted has declined significantly during the past five years.....	86
IV. SUPPORT SERVICES.....		91
Finding IV-1	American Water’s long-range IT planning activities have been on hold since SOX compliance efforts began in 2006 following RWE’s December 2005 decision to divest of American Water.	118
Finding IV-2	ITS has made little progress in recent years with regard to addressing the technology needs of American Water’s business units, including those impacting PAWC operations.	118
Finding IV-3	The PMO has developed project-management documentation that is extensive in scope; however, materials to help employees effectively apply these standards has not yet been included as part of such documentation.	120

Table of Findings (continued)

Finding IV-4	The ITS organization is not placing adequate emphasis on certain staff's achievement and maintenance of project-management certifications.....121	121
Finding IV-5	The ability of the Client Services & Support group to electronically deploy software upgrades to workstations is hindered by American Water's network, which results in additional costs to ITS customers, such as PAWC.121	121
Finding IV-6	ITS management is not appropriately focusing its employee-training and development efforts through the use of a skills inventory for individual employees.121	121
Finding IV-7	The ITS organization does not have sufficient client-satisfaction information and data with which to evaluate its ability to serve AWWSC or PAWC departments.....122	122
Finding IV-8	The ITS organization has not developed service-level agreements with its client groups.....122	122
Finding IV-9	ITS' performance versus its targets show varying, and in some cases, poor results.123	123
Finding IV-10	Although ITS backup/restoration and security/protection plans and activities are generally reasonable, its disaster recovery plan is inadequate and appropriate testing activities are not being performed, despite its recent Chapter 101 self-certification reports that PAWC has met all required elements.124	124
Finding IV-11	The IT security function is not part of the ITS organization, which is atypical of industry practices.....126	126
Finding IV-12	The data center space has recently been expanded in large part as a result of American Water not effectively performing a consolidation of its servers.126	126
Finding IV-13	The current American Water employee vehicle assignment policy does not include a provision for an annual review of the requirements of employees for vehicles and, therefore, it does not address changes in employee job titles and positions.....148	148
Finding IV-14	A regularly scheduled physical inventory of vehicles leased from ARI is not performed.....149	149
Finding IV-15	There is an exception report for multiple fuel transactions in one day but not for apparently excessive fuel usage over a period of time (i.e., weekly or monthly).....149	149
Finding IV-16	Neither the ARI contract nor the resultant invoices have been audited by the AWWSC Internal Auditing group.149	149
Finding IV-17	Continued use of the two PAWC mechanics in the Pittsburgh District goes against the recommended policies of American Water and may not be cost-effective.149	149
Finding IV-18	The improper reporting of taxable benefits relating to employer-provided vehicles that was identified in the internal audit conducted in November 2005 has yet to be addressed in a satisfactory manner.150	150

Table of Findings (continued)

Finding IV-19	There are no standardized reports or data collected on the status of state inspections for vehicles in the PAWC fleet.....	150
Finding IV-20	There is no integrated Facilities and Property Management group at either American Water or at PAWC.....	157
Finding IV-21	There are no formal policies and procedures to guide the performance of the facilities and properties management function at PAWC or at American Water.....	157
Finding IV-22	The current procurement module of the ERP system is 12 years old and lacks significant amounts of capability that would be expected from a state-of-the-art current application.....	172
Finding IV-23	The use of preferred suppliers under national contracts is not mandated and likely is having a negative financial implications for the operating companies as a result of not maximizing the use of suppliers that have been subjected to a bidding and negotiation process.....	173
Finding IV-24	The lack of PAWC-specific data that is collected in relation to the procurement function renders it difficult for the PAWC management to evaluate and assess the effectiveness of that function’s performance at PAWC.	174
Finding IV-25	Based on the numerous inventory procedures and systems deficiencies that were identified during the course of this audit, it appears that the inventory data and calculations that are produced by PAWC are inaccurate to some extent.	183
Finding IV-26	The inventory management computer systems that are currently in use are very out of date and the data that is collected is by no means sufficient to maintain proper control of inventory.	187
Finding IV-27	There is no centralization or leadership in the materials management function at American Water operating companies, including PAWC.	188
Finding IV-28	No standardized, comprehensive inventory-management policies and procedures exist for either American Water in general or for PAWC.	189
Finding IV-29	Insufficient inventory-skills training is provided to storeroom personnel.....	189
Finding IV-30	There is currently no standardization of part numbers across the PAWC storerooms or American Water operating companies in general, although this situation is being reviewed at the current time.....	189
Finding IV-31	There are no inventory grid systems in the PAWC storerooms, making the location of parts difficult and time consuming for those who are not familiar with the inventory layout at that particular storeroom.	190

**Table of Findings
 (continued)**

Finding IV-32 There is no standardized, formal cycle-counting program in place.....190

Finding IV-33 PAWC does not have a mechanism to identify and report on material that is
 obsolete or held in excessive quantities.190

Finding IV-34 Maintenance items are not inventoried and therefore can only be reordered
 based on visual inspections.....191

Finding IV-35 The strategic parts inventory could be reduced for PAWC by consolidating
 them into a few strategic inventory locations.191

Finding IV-36 Inventory maintenance and control is inconsistent across the PAWC
 storerooms and the control of inventory was observed to cover the range from
 inadequate to sufficient.191

Finding IV-37 The vast majority of the storerooms that were visited by
 Schumaker & Company consultants did not have a computer terminal in the
 storeroom area; rather, data entry and lookup were the responsibility of an
 administrative person in the each of the service center front offices.....192

Finding IV-38 Under the current procedures, rolling stock (that being the inventory that is
 carried on the field operations trucks) is tracked as part of the on-hand balance
 of parts.192

Finding IV-39 A formal enterprise risk management program was established in 2003 when
 RWE acquired American Water, but this program must now evolve as
 American Water (and therefore PAWC) changes it focus to SEC/SOX
 compliance.....210

Finding IV-40 When looking to outside legal organizations for help in addressing PAWC’s
 legal needs, the Southeast Region Legal organization does not rely on
 competitive bidding to develop a master list of pre-qualified legal firms.219

Finding IV-41 The AWWSC Legal organization has not evaluated the use of standard legal
 management software across its various entities; therefore, the Southeast
 Region (and ultimately PAWC) may not be benefiting from processes
 associated with the use of a “best in class” system.220

V. WATER OPERATIONS..... 223

Finding V-1 PAWC production facilities are well operated.....228

Finding V-2 PAWC uses state-of-the-art, computerized supervisor control and data
 acquisition (SCADA) systems to continuously monitor critical pumping and
 treatment processes, as well as distribution system hydraulic conditions, at most
 of its treatment plants and associated remote facilities.....236

Finding V-3 Best practices are not necessarily shared or implemented by the various water
 districts.238

Table of Findings (continued)

Finding V-4	Although PAWC has built a good SCADA system for operating the plants and distribution network, its implementation of technology for managing the day-to-day monitoring and reporting on various aspects of the business processes within network needs significant improvement.	238
Finding V-5	The number of reported leaks/breaks by water district indicates that certain water districts are up to 10 times worse than others.	239
Finding V-6	Maintenance and capital budgets do not appear to consistently take an analysis of leak/break historical data into consideration shown in <i>Exhibit V-24</i>	243
Finding V-7	PAWC has implemented a good proactive production equipment maintenance program.	249
Finding V-8	Although PAWC has implemented a good proactive production equipment maintenance program, it has failed to implement a computerized maintenance management program at the production facilities.	252
Finding V-9	The Engineering Department generally conducts formal, comprehensive planning studies on a periodic basis for each water district.	254
Finding V-10	With the most recent budgeting process (2008 Budget Year), the Engineering Department has implemented a more analytical main replacement decision-making methodology.	256

**Table of Findings
(continued)**

Volume II

VI. CORPORATE GOVERNANCE..... XIII

Finding VI-1 The review, selection, and compensation of American Water’s Board are appropriate.258

Finding VI-2 American Water has adopted a substantive Code of Ethics document; however, the Code does not explicitly apply to all contractors and vendors who do business with American Water.260

Finding VI-3 Board compensation appears to be appropriate; however, American Water has not recently reviewed Board compensation and has delayed the recruitment of new independent directors.261

Finding VI-4 The American Water Board maintains adequate oversight and is taking further steps to increase its role in ensuring proper controls.262

Finding VI-5 American Water is taking steps to strengthen oversight through the Audit and Corporate Governance Committees.263

Finding VI-6 The Board exercises appropriate control over the external auditors; however, a process has not been established to ensure that cost comparisons for external audit services are performed on a periodic basis.264

Finding VI-7 The Internal Audit Department has adequate interaction with the American Water Board Audit Committee, but its reporting relationship to the American Water Board Audit Committee and American Water management is unclear.265

Finding VI-8 American Water is taking substantive steps to comply with SOX/NYSE requirements for internal controls.265

VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS 269

Finding VII-1 PAWC’s culture under RWE could best be defined as *insular*.274

Finding VII-2 PAWC, like American Water, operates various systems with substantial differences in how each entity is run with respect to certain fundamental business processes.274

Finding VII-3 Divestiture from RWE presents a significant opportunity to refocus American Water and to strengthen PAWC by leveraging best practices across the enterprise.275

Finding VII-4 PAWC has not surveyed its employees since 2003 and has no current data on employee attitudes, management practices, and other key elements of corporate culture.276

**Table of Findings
 (continued)**

Finding VII-5 PAWC does not have a management development process..... 276
 Finding VII-6 Human Resources does not have the capacity to support the change
 management requirements of PAWC..... 278
 Finding VII-7 PAWC does not have any enterprise-wide improvement initiatives that
 fully engage employees at all levels. 279
 Finding VII-8 PAWC has limited management succession planning and workforce
 management capability, thereby making it difficult to assess the adequacy
 of staffing levels..... 279
 Finding VII-9 American Water’s ethics policies and practices have been substantially
 communicated to all employees. 279
 Finding VII-10 Ethics allegations are properly recorded and promptly investigated. 281

VIII. AFFILIATE INTERESTS..... 283

Finding VIII-1 Cost allocation documentation was disjointed and poorly organized, which
 required Schumaker & Company auditors to meet with multiple individuals and
 to review multiple documents in order to understand how affiliate relationships
 and cost allocations are handled at American Water..... 304
 Finding VIII-2 The cost-allocation methodologies impacting PAWC are generally reasonable,
 although the use of number of customers for allocating AWWSC costs among
 regulated utilities is essentially a simplification mechanism that is not based on
 cost
 causative factors..... 305
 Finding VIII-3 Although American Water engaged an independent consultant in 2006 and
 2007 to perform cost-to-market comparisons for AWWSC charges to three of
 its regulated utilities, it does not perform these comparisons on a regular
 basis. 307
 Finding VIII-4 The AWWSC/PAWC affiliate agreement is not up to date and a new version
 has not been provided to the PaPUC for
 review and approval. 309
 Finding VIII-5 Ongoing training updates to AWWSC employees on timekeeping procedures,
 which could potentially impact affiliate charges, is not being provided..... 310
 Finding VIII-6 Affiliate charges from RWE/Thames have been appropriately handled..... 310
 Finding VIII-7 Most activities undertaken for monitoring and ensuring the appropriate
 implementation of cost-allocation processes are reasonable; however, internal
 audits of affiliate transactions and the systems that are used for creating affiliate
 charges are not regularly performed. 311

**Table of Findings
(continued)**

IX. DIVERSITY/EEO 315

Finding IX-1 The American Water/PAWC diversity program is primarily policy and affirmative-action-compliance oriented.327

Finding IX-2 Employee location data used for EEO-1 reporting from American Water’s JD Edwards human resources information system (HRIS) are often incorrect, thereby causing the company to conduct a manual verification process.329

Finding IX-3 PAWC and American Water do not have standard processes and use inconsistent methods for preparing affirmative action utilization and EEO-1 reports, which leads to reporting errors.329

Finding IX-4 No senior executive or officer of American Water reviews and approves the EEO-1 report prior to submittal to the federal government.331

Finding IX-5 American Water has developed a comprehensive diversity plan but has failed to effectively implement it.331

Finding IX-6 PAWC has a fully compliant affirmative action plan, but could be more aggressive in setting affirmative action hiring goals and attracting women and minority job candidates.335

Finding IX-7 The supplier diversity program is informally conducted.337

Finding IX-8 Over the 2003 to 2007 time period, PAWC has neither consistently submitted or fully complied with the filing guideline requirements for diversity reports submitted to the PaPUC.338

X. CUSTOMER SERVICE..... 343

Finding X-1 American Water call centers have failed to meet industry standard service levels. 370

Finding X-2 Customer service representatives are taking longer to complete calls and follow-up work.373

Finding X-3 The Pensacola CSC CSR turnover rate exceeds industry standards.374

Finding X-4 American Water has made no effort and has no plans to implement initiatives aimed at reducing employee turnover.375

Finding X-5 More than one in four newly hired CSRs leave prior to completing all initial training and close monitoring.376

Finding X-6 After several years of a decreasing number of CSRs, American Water now plans to hire additional CSRs.377

Finding X-7 Despite the company’s unfavorable service levels, PAWC customers appear to be generally satisfied with the contact they have with the company.377

**Table of Findings
(continued)**

Finding X-8	The Help Queue has proven effective in improving consistency of answers to customers and allowing supervisors to focus more of their time on CSR coaching and development.....	378
Finding X-9	Neither American Water nor PAWC have a customer accessible website to provide basic customer self assistance.....	378
Finding X-10	Neither American Water nor PAWC supports electronic billing at this time.	378
Finding X-11	American Water has very limited customer self-serve options available on its IVR system.	378
Finding X-12	The trends in various types of complaints (informal, mediation, executive, and formal) are generally increasing.	379
Finding X-13	The number of disputes has increased significantly since 2004.	383
Finding X-14	There is a significant amount of over estimating in the billing process.....	384
Finding X-15	A business case has been developed for an upgrade to the Advantex software used in FRCC operations.	385
XI. OPERATIONAL PERFORMANCE		391
Finding XI-1	PAWC is unable to provide a complete and extensive third-party line-hit damage history for the last five years because of lack of good business processes.....	392
Finding XI-2	PAWC’s recently developed third party line hit standardized reporting form has inherent deficiencies and is not integrated with other key business processes or systems to effectively manage this function.....	393
Finding XI-3	The latest Chapter 101 self-certifications indicate that PAWC has met all required elements.....	396
Finding XI-4	PAWC maintains a physical security plan for each of its operating plant facilities.	396
Finding XI-5	Business-continuity planning is less complete than our experience with other utilities.	396
Finding XI-6	Emergency-preparedness planning has been tested via tabletop exercises.....	397
Finding XI-7	The systems used for maintaining the operations and maintenance plans for each facility are labor intensive, subject to potential inaccuracies, and not as clearly defined as we have seen elsewhere in the utility industry.....	398
Finding XI-8	Unaccounted-for-water on a system-wide basis has improved as reported to the PaPUC since 2004; however, individual districts are experiencing high levels of unaccounted-for-water.	403

Table of Findings (continued)

Finding XI-9	PAWC has developed a fairly extensive spreadsheet for reporting and monitoring non-revenue water and unaccounted-for water.	405
Finding XI-10	The linked Excel spreadsheets are a good prototype for building an improved NRW and UFW reporting and monitoring program, but the database platform would be a better technology upon which to build the tool.	405
Finding XI-11	PAWC has implemented an allowance for unavoidable real losses using an AWWA methodology (still under development) in reporting its unaccounted-for-water numbers to the PaPUC on an annual basis.	406
Finding XI-12	PAWC was unable to provide an engineering justification for the 100 psi pressure used in its calculation at this time.	409
Finding XI-13	PAWC is in the process of metering water usage within various parts of a water district as another indicator of possible leakage.	410
Finding XI-14	The collection of complete operating statistical data on production and network operations is complicated by a lack of standard data-collection and reporting systems.	415
Finding XI-15	Production field force staffing levels appear to be inadequate as overtime hours are increasing.	415
Finding XI-16	Valve operations and maintenance programs are not completely implemented across the PAWC distribution network.	419

**Table of Findings
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Finding XII-1	There is no common leak tracking system used throughout PAWC.	423
Finding XII-2	None of the current Access databases are scalable for a state-wide or enterprise-wide application.	424
Finding XII-3	Distribution operations personnel are very knowledgeable of their current leak tracking database.....	424
Finding XII-4	PAWC’s current plans are to develop the leak tracking database as a part of CMMS; however, several key requirements may have been overlooked.	424
Finding XII-5	The main replacement prioritization process that PAWC implemented in 2008 is a reasonable algorithm for prioritization and is similar to methods used in the natural gas industry; however, it has not been developed to the point of having automatic interfaces to PAWC performance reporting systems.	425
Finding XII-6	The CMMS being implemented is a commercial product that allows significant user customization.	426
Finding XII-7	Valve operation tracking and reporting and hydrant flushing tracking and reporting are being appropriately integrated into CMMS.....	431
Finding XII-8	Based on Schumaker & Company’s review, it is not clear that CMMS will provide the work management capabilities needed for managing PAWC’s distribution workforce.	431
Finding XII-9	The parts and inventory portion of CMMS is not being fully implemented at this time.	432
Finding XII-10	Incorporating the leak tracking and reporting system into CMMS may not be the best approach.....	433
Finding XII-11	It may be more appropriate to integrate the leak tracking and reporting application with an enterprise GIS instead of CMMS.	434
Finding XII-12	There are currently no plans to integrate the NRW tracking and reporting with the leak tracking and reporting databases nor are there plans to integrate pavement tracking and reporting, permit tracking and reporting, or hit facilities tracking and reporting with a leak tracking and reporting system.	434

Table of Findings (continued)

XIII. PHASE III HUMAN RESOURCES	447
Finding XIII-1 The models and plans developed as part of this Phase III project provide clear direction for HR’s efforts to assist PAWC management in meeting its strategic priorities. Substantial work remains to implement these projects.	458
Finding XIII-2 PAWC HR does not have all the resources necessary to implement the projects defined in the Phase III effort.....	458
XIV. APPENDIX A: DATA AND STATISTICS	461
XV. APPENDIX B: GLOSSARY	539

Table of Recommendations

Volume I

I. INTRODUCTION AND REPORT SUMMARY	1	
II. EXECUTIVE MANAGEMENT, EXTERNAL RELATIONS, AND HUMAN RESOURCES	19	
Recommendation II-1	Develop a systematic organizational-planning and development process. (Refer to Finding II-2.)	29
Recommendation II-2	Develop a formal and integrated strategic-planning process. (Refer to Finding II-5.)	30
Recommendation II-3	Develop a regional/state operational external-communications plan. (Refer to Finding II-6 and Finding II-7.)	36
Recommendation II-4	Strengthen HR accountability to the PAWC President. (Refer to Finding II-8.)	55
Recommendation II-5	Assess PAWC’s HR needs and staff accordingly. (Refer to Finding II-8 and Finding II-10.)	55
Recommendation II-6	Develop an HR service level agreement with AWWSC. (Refer to Finding II-9.)	56
Recommendation II-7	Develop a Pennsylvania-specific HR scorecard. (Refer to Finding II-10.)	56
Recommendation II-8	Align HR services to the strategic priorities of PAWC. (Refer to Finding II-8 and Finding II-12.)	56
Recommendation II-9	Consider outsourcing technical training. (Refer to Finding II-13.)	56
Recommendation II-10	Implement a learning management system. (Refer to Finding II-20.)	57
Recommendation II-11	Conduct comprehensive workforce planning for all levels of the organization and provide necessary resources for implementation. (Refer to Finding II-12 and Exhibit II-12.)	57
Recommendation II-12	Complete the Organizational Capability Review for all levels of PAWC management. (Refer to Finding II-16.)	57
Recommendation II-13	Implement a leadership-development program and provide sufficient resources to sustain. (Refer to Finding II-19 .)	58
Recommendation II-14	Implement position control. (Refer to Finding II-15)	58
Recommendation II-15	Evaluate the costs and benefits associated with a more sophisticated time and attendance system. (Refer to Finding II-18.)	58

Table of Recommendations (continued)

Recommendation II-16 Analyze recruitment and selection process, implement process improvements, measure performance, and provide additional resources if necessary. (Refer to Finding II-16 and Finding II-17.) .58

III. FINANCIAL MANAGEMENT 59

Recommendation III-1 Research and develop plans for upgrading or replacing the current ERP system. (Refer to Finding III-4.) 88

Recommendation III-2 Investigate why key PAWC financial statistics have been deteriorating, develop and implement a plan for improving PAWC's financial health as appropriate. (Refer to Finding III-7.) 88

Recommendation III-3 Assess the need for internal audits of American-Water-regulated utility operations and develop and implement plans to meet the internal audit requirements. (Refer to Finding III-9.) 88

IV. SUPPORT SERVICES 91

Recommendation IV-1 Expedite efforts to develop a long-range IT plan, and subsequently perform yearly review and update activities. (Refer to Finding IV-1 and Finding IV-2.) 127

Recommendation IV-2 Update ITS documentation as part of an ongoing program to include all aspects of a well-managed technology organization, including (but not limited to) operational, governance, and project management/QA functions. (Refer to Finding IV-2 and Finding IV-3.) 128

Recommendation IV-3 Address organizational issues involving vacancy of director positions, the appropriateness of staffing size of the various ITS groups, and the reporting location of the information systems' security function within American Water's organization structure. (Refer to Finding IV-2 and Finding IV-11.) 128

Recommendation IV-4 Expand American Water's commitment to project-management principles by requiring all ITS employees who are actively involved in project work to achieve PMP certification and by closely monitoring related activities to ensure that timely progress is made. (Refer to Finding IV-4.) 129

Recommendation IV-5 Enhance the American Water network to enable electronic deployment of software updates to PAWC employees. (Refer to Finding IV-5.) 129

Recommendation IV-6 Improve training and development efforts for ITS employees. (Refer to Finding IV-6) 129

Table of Recommendations (continued)

Recommendation IV-7	Develop a plan to regularly conduct ITS client-satisfaction surveys and implement the first survey in a timely manner. (Refer to Finding IV-7.)	130
Recommendation IV-8	Establish ITS service-level agreements with major client groups. (Refer to Finding IV-8.)	130
Recommendation IV-9	Implement a relevant ITS scorecard. (Refer to Finding IV-9.)	130
Recommendation IV-10	Update the ITS disaster recovery plan and begin routinely reviewing and testing disaster-recovery plans and documenting results. (Refer to Finding IV-10.)	131
Recommendation IV-11	Perform a server consolidation study and implement study recommendations. (Refer to Finding IV-12.)	132
Recommendation IV-12	Initiate a formal procedure requiring an annual review of the requirements for each employee to have an assigned vehicle based on his or her current job assignment. (Refer to Finding IV-2.)	150
Recommendation IV-13	Develop a formal procedure that details a requirement for the performance of a regularly scheduled annual physical inventory of the vehicles that are leased from ARI. (Refer to Finding IV-14.) ..	150
Recommendation IV-14	Develop an exception report that would clearly identify excessive fuel usage by specific vehicles or employees on a weekly or monthly basis. (Refer to Finding IV-15.)	151
Recommendation IV-15	Perform an internal audit of the ARI contract and the resultant invoices using the AWWSC Internal Auditing group. (Refer to Finding IV-16.)	151
Recommendation IV-16	Perform a cost/benefit analysis to determine whether the (continued) use of the two PAWC mechanics in the Pittsburgh District is cost effective. (Refer to Finding IV-17.)	151
Recommendation IV-17	Perform a reassessment of the PAWC policy relating to the use of employer-provided vehicles that are used for personal purposes in order to be in compliance with IRS regulations. (Refer to Finding IV-18.)	151
Recommendation IV-18	Develop a computerized tracking system that is capable of monitoring the completion of the annual state-vehicle inspections for the individual vehicles in compliance with the established schedule. (Refer to Finding IV-19.)	152
Recommendation IV-19	Establish a single point of responsibility for the facilities and properties management function at PAWC. (Refer to Finding IV-2.)	157
Recommendation IV-20	Develop a set of formal policies and procedures to guide the performance of the facilities and properties management function at PAWC and American Water. (Refer to Finding IV-14.)	158

Table of Recommendations (continued)

Recommendation IV-21	Initiate a software identification, selection, and evaluation process for a new integrated procurement/materials management application. (Refer to Finding IV-22).....	174
Recommendation IV-22	Evaluate in detail the impacts of not mandating the use of national contracts with preferred vendors by the state-operating companies, especially in terms of the financial impacts, and determine whether mandating this practice would be beneficial to the operating companies. (Refer to Finding 0-2.).....	174
Recommendation IV-23	Initiate a study to determine how best to present the operational and performance data on a state company basis and to evaluate the potential benefits of such reporting changes. (Refer to Finding IV-24.).....	175
Recommendation IV-24	Perform an internal audit of the inventory data that is produced and used by PAWC to determine the accuracy thereof. (Refer to Finding IV-25.).....	193
Recommendation IV-25	Initiate an ERP materials management module evaluation and selection process with the intention of identifying a fully integrated ERP application that would serve the needs of the PAWC materials management function. (Refer to Finding IV-26.).....	193
Recommendation IV-26	Establish a central point of management and responsibility for the materials management function at both AWWSC and PAWC. (Refer to Finding 0-6.).....	194
Recommendation IV-27	Develop a comprehensive and detailed materials management procedures manual that is specific to PAWC. (Refer to Finding IV-14.).....	194
Recommendation IV-28	Establish a formalized training program at PAWC for the personnel who have been designated as being responsible for the materials management function at the various storerooms. (Refer to Finding IV-29.).....	195
Recommendation IV-29	Adopt and expeditiously implement at PAWC the standardized part-number format that is being developed by the Part Number Standardization Committee. (Refer to Finding IV-30.).....	195
Recommendation IV-30	Design and implement a standardized inventory-grid location system at all PAWC storerooms. (Refer to Finding IV-31.).....	195
Recommendation IV-31	Develop and implement a standardized procedure for performing cycle counting that is to be used at all storerooms. (Refer to Finding IV-32.).....	196
Recommendation IV-32	Develop an inventory management plan that addresses how to identify and handle obsolete and excess material. (Refer to Finding IV-33.).....	196

Table of Recommendations (continued)

Recommendation IV-33	Incorporate maintenance items into the current materials management application to gain better inventory control over these items. (Refer to Finding IV-34.).....	196
Recommendation IV-34	Establish a system of a few centralized storerooms that are to be used for strategic parts storage. (Refer to Finding IV-35.)	197
Recommendation IV-35	Implement a program at PAWC to standardize the inventory maintenance and control procedures across the PAWC storerooms. (Refer to Finding 0-15.).....	197
Recommendation IV-36	Install computer terminals in secure locations at all of the PAWC storerooms. (Refer to Finding IV-37.).....	197
Recommendation IV-37	Develop and implement a procedural modification that stipulates that material is decremented from the inventory at the time of issue from the storeroom, not at the time that it is used in the field. (Refer to Finding IV-38.)	198
Recommendation IV-38	Develop a formal implementation plan for changing the focus of the ERM process to include SEC/SOX compliance. (Refer to Finding IV-2.)	212
Recommendation IV-39	Establish a formal mechanism for developing a pre-qualified list of external legal firms by periodically reviewing proposals from potential candidates. (Refer to Finding IV-2.)	221
Recommendation IV-40	Perform a formal cost/benefit analysis regarding standardization of legal management software throughout the American Water system. (Refer to Finding IV-14.)	221

V. WATER OPERATIONS 223

Recommendation V-1	Aggressively pursue the identification and implementation of technology-based best practices among the water districts. (Refer to Finding V-4 and Finding V-3.).....	246
Recommendation V-2	Develop a business process for addressing aggressive identification of the most beneficial main segments for replacement based on an expectation of potential leak impact. (Refer to Finding V-4, Finding V-5, and Finding V-6.).....	247
Recommendation V-3	Implement a computerized maintenance management system in conjunction with the proactive production equipment maintenance program. (Refer to Finding V-8.).....	252
Recommendation V-4	Continue to develop a risk-assessment-based approach for identifying main replacement projects. (Refer to Finding V-9.).....	257
Recommendation V-5	Continue to periodically perform CPS studies. (Refer to Finding V-9.).....	257

Table of Recommendations (continued)

Volume II

VI. CORPORATE GOVERNANCE.....		255
Recommendation VI-1	Require contractors, vendors, and others doing business with American Water to conduct themselves ethically when dealing with American Water entities. (Refer to Finding VI-2.).....	267
Recommendation VI-2	Expand the American Water Board in anticipation of going public and review Board compensation as soon as possible. (Refer to Finding VI-3.)	267
Recommendation VI-3	Implement a process to periodically perform cost comparisons for external audit services. (Refer to Finding VI-6.)	268
Recommendation VI-4	Modify the Internal Audit Department reporting structure so that it no longer administratively reports to the American Water CFO. (Refer to Finding VI-7 and Finding III-8.)	268
VII. CORPORATE CULTURE, MANAGEMENT STRUCTURE, AND STAFFING LEVELS		269
Recommendation VII-1	Expedite efforts to define and support a high-performing organizational culture. (Refer to Finding VII-1, Finding VII-2, and Finding VII-3.)	281
Recommendation VII-2	Implement an employee survey process with appropriate feedback and action-planning components. (Refer to Finding VII-4.)	282
Recommendation VII-3	Implement a formal management development process. (Refer to Finding VII-5.)	282
Recommendation VII-4	Fill open Organization Development positions in American Water and assess the need for additional change management resources for PAWC. (Refer to Finding VII-5, Finding VII-6, and Finding VII-7.)	282
Recommendation VII-5	Implement workforce management processes at PAWC. (Refer to Finding VII-8.)	282
VIII. AFFILIATE INTERESTS		283
Recommendation VIII-1	Develop formal, comprehensive documentation for affiliate relationships and cost allocations, and assign the responsibility for affiliate transactions to the appropriate manager. (Refer to Finding VIII-1.).....	312

Table of Recommendations (continued)

Recommendation VIII-2	Perform a detailed analysis to verify that the use of the number of customers for allocating AWWSC costs among regulated utilities is reasonable and reasonably approximates the use of cost-causative factors; subsequently make modifications, as appropriate. (Refer to Finding VIII-2.).....	312
Recommendation VIII-3	Regularly evaluate the cost of services provided to PAWC by its affiliates so as to verify that PAWC ratepayers are not being harmed by charging these services at cost rather than market. (Refer to Finding VIII-3.).....	313
Recommendation VIII-4	Update the AWWSC/PAWC affiliate agreement, as necessary, and submit it to the PaPUC for review and approval. (Refer to Finding VIII-4.).....	313
Recommendation VIII-5	Provide ongoing training updates to AWWSC employees on proper use of billing numbers for charging affiliates when reporting time. (Refer to Finding VIII-5.).....	313
Recommendation VIII-6	Regularly conduct internal audits of affiliate transactions and associated cost allocations. (Refer to Finding VIII-7.).....	314
IX. DIVERSITY/EEO.....		315
Recommendation IX-1	Update the diversity action plan, provide resources, and implement the plan in a timely manner and give consideration to a Pennsylvania-specific initiative. (Refer to Finding IX-1 and Finding IX-5.).....	339
Recommendation IX-2	Complete efforts to assure data integrity in the JD Edwards human resources information system. (Refer to Finding IX-2.).....	339
Recommendation IX-3	Develop and implement a standard data-verification process for EEO-1 reporting. (Refer to Finding IX-3.).....	340
Recommendation IX-4	Require the AWWSC Human Resources Vice President to review and approve EEO-1 reports prior to submission. (Refer to Finding IX-4.).....	340
Recommendation IX-5	Define, document, and implement more aggressive hiring plans for women and minorities. (Refer to Finding IX-6.).....	340
Recommendation IX-6	Formalize the supplier diversity program and explore the use of spend targets in the Supply Chain performance objectives. (Refer to Finding IX-7.).....	341
Recommendation IX-7	Submit comprehensive diversity reports to the PaPUC annually. (Refer to Finding IX-8.).....	341

Table of Recommendations (continued)

X. CUSTOMER SERVICE.....		343
Recommendation X-1	Invest in new customer interfacing technology, including IVR, electronic billing, and web self-service capabilities. (Refer to Finding X-1, Finding X-2, Finding X-6, Finding X-7, Finding X-9, Finding X-10, and Finding X-11)	386
Recommendation X-2	Analyze employee turnover at the Pensacola Call Center and develop strategies to reduce turnover. (Refer Finding X-3 and Finding X-4)	386
Recommendation X-3	Strengthen recruitment, selection, and training practices to improve the quality of new CSR hires. (Refer to Finding X-1, Finding X-2, Finding X-3, Finding X-4, Finding X-5, Finding X-6, Finding X-7, and Finding X-8).....	386
Recommendation X-4	Develop a Pennsylvania-specific customer service scorecard and regularly report associated metrics to the PAWC President. (Refer to Finding X-1, Finding X-2, and Finding X-7).....	387
Recommendation X-5	Perform an analysis of the increase in complaint trends that PAWC is currently experiencing. (Refer to Finding X-12)	387
Recommendation X-6	Perform an analysis of the growth in PAWC disputes. (Refer to Finding X-13).....	387
Recommendation X-7	Initiate actions to lower the number of over estimates in meter reading. (Refer to Finding X-14)	387
Recommendation X-8	Complete the upgrade project for Advantex. (Refer to Finding X-15)	388
XI. OPERATIONAL PERFORMANCE.....		391
Recommendation XI-1	Develop a comprehensive damage prevention program. (Refer to Finding XI-1 and Finding XI-2.)	394
Recommendation XI-2	Improve business-continuity planning. (Refer to Finding XI-4). ...	399
Recommendation XI-3	Perform a review and incorporate better technologies for preparing, distributing, and updating the emergency and the operations and maintenance manuals including the intranet site. (Refer to Finding XI-7.).....	400
Recommendation XI-4	Continue to strengthen the unaccounted-for-water program. (Refer to Finding XI-8).....	412
Recommendation XI-5	Incorporate the methodologies in the currently evolving UFW spreadsheets into a more appropriate technology, specifically a backend database with a client server or web interface. (Refer to Finding XI-10.)	412

Table of Recommendations (continued)

Recommendation XI-6	Refine the reporting of unaccounted-for water to the PaPUC. (Refer to Finding XI-11 and Finding XI-12.)	412
Recommendation XI-7	Investigate the reasons for the increase in overtime that has occurred in the Production Department. (Refer to Finding XI-15)	420
Recommendation XI-8	Implement standard systems for monitoring and reporting key statistical information in network operations. (Refer to Finding XI-1, Finding XI-14, and Finding XI-16.)	421

**Table of Recommendations
(continued)**

Volume III

XII. PHASE III – WATER OPERATIONS – DISTRIBUTION BUSINESS SYSTEMS 421

Recommendation XII-1	Structure the design of business applications for the distribution operations function as shown in Exhibit XII-5. (Refer to Finding XII-1, Finding XII-2, Finding XII-3, Finding XII-4, and Finding XII-10)434
Recommendation XII-2	Develop the leak tracking and reporting database as a part of a larger, long-term effort to integrate with other supporting performance reporting business processes such as NRW, permits, pavement tracking, and hit facilities. (Refer to Finding XII-10 and Finding XII-12).....436
Recommendation XII-3	Adopt the multi-organizational reporting structure (upon which CMMS is being implemented) across both the workforce management business process and supporting performance business processes. (Refer to Finding XII-6).....436
Recommendation XII-4	Engage AWWSC ITS to assist in the development of the supporting performance reporting process systems identified in Exhibit XII-5. (Refer to Finding XII-6).....436
Recommendation XII-5	Address the deficiencies in the current plans regarding the incorporation of leak tracking and reporting into the design of CMMS. (Refer to Finding XII-4).....437
Recommendation XII-6	Consider integration of leak tracking and reporting with the eventual GIS system versus integration with CMMS. (Refer to Finding XII-5, Finding XII-10, and Finding XII-11).....437
Recommendation XII-7	Ensure that the leak history is migrated into the eventual leak tracking and reporting database from all existing databases with good data. (Refer to Finding XII-4)437
Recommendation XII-8	Electronically connect leak and other records to the main prioritization model. (Refer to Finding XII-4)438

Table of Recommendations (continued)

Recommendation XII-9	Allocate infrastructure improvement budgets on a state-wide basis not just district by district. (Refer to Finding XII-5)	438
Recommendation XII-10	Consider the eventual implementation of the parts and inventory component of CMMS. (Refer to Finding XII-9).....	438
Recommendation XII-11	Recognize that a more robust distribution workforce management application may eventually be required to support future business processes. (Refer to Finding XII-8).....	439
XIII. PHASE III HUMAN RESOURCES		447
Recommendation XIII-1	Provide resources and perform timely implementation of the six deliverables developed as part of this Phase III project. (Refer to Finding XIII-1 and Finding XIII-2).....	459
XIV. APPENDIX A: DATA AND STATISTICS.....		461
XV. APPENDIX B: GLOSSARY		539

XII. Phase III – Water Operations – Distribution Business Systems

This chapter addresses a *Phase III* project in the water operations area and its impact on Pennsylvania-American Water Company (PAWC) operations.

A. Background & Perspective

In the 2000 management audit¹ of PAWC, several findings and recommendations were made in water operations that have yet to be fully implemented. They specifically include:

Prior Findings

1. A system-wide leak survey and repair database has not been developed.
2. A formal main replacement prioritization procedure needs to be developed.

Prior Recommendations

3. Develop an automated company-wide leak survey and repair database to be utilized with the recommended main replacement prioritization procedure.
4. Develop a formalized main replacement procedure based on weighted factors in order to systematically prioritize main replacement candidates on a state-wide basis.

It is Schumaker & Company's assessment that these findings and recommendations from the 2000 audit have not been completed. For whatever reason, each water district is responsible for implementing their own business processes for managing such common processes. The benefits of being a part of a larger organization that could provide the benefits of such common business processes have not been realized. Therefore, as part of Phase III of this audit, Schumaker & Company recommended that more investigation and guidance be provided in this area to ensure future implementation.

To their credit, PAWC has developed fairly detailed non-revenue water (NRW) and unaccounted-for-water (UFW) reporting processes that rely on an extensive set of spreadsheets. Although we are recommending that the technologies underlying that process be converted to a database in lieu of an Excel spreadsheet, that process does begin to provide some uniformity in the management and reporting of unaccounted-for-water. However, a leak tracking database is not part of that application.

¹ / Focused Management and Operations Audit of the Pennsylvania-American Water Company prepared by the Pennsylvania Utility Commission, Bureau of Audits, Management Audit Division, August 2000

The purpose of this work plan area was to:

- ◆ Perform an in-depth review of the existing leak tracking database, pavement cut database, and pump maintenance database, and the DataStream maintenance database envisioned to be used in production.
- ◆ Identify weighted factors to systematically prioritize main replacement candidates on a state-wide basis.
- ◆ Identify specific improvements to existing systems or new systems needed to implement a systematic main replacement program including, but not limited to:
 - Leak reporting, tracking, and repair
 - System mapping
 - Pipe tracking databases
 - Pavement resurfacing databases
 - Pipe pressure database – hydraulic modeling
- ◆ Compare the applicability of what the natural gas industry is using with regard to main replacement prioritization to the water industry.
- ◆ Develop a preliminary functional specification for potential computer systems needed to fulfill the requirements of the 2000 audit.
- ◆ Develop a report of findings and recommendations involving these best practices.
- ◆ Develop an implementation plan, in which activities, timeframes, resources, and responsible parties are identified.

B. Findings & Conclusions

This section discusses additional water operations findings, specifically distribution operations, based on a more detailed investigation into the status of the leak tracking and reporting database and also some recent PAWC changes since our earlier Phase I Diagnostic Review field work in September to November of 2007. It includes specific findings and conclusions developed during *Phase III* Focused Analysis of this audit. We have divided our findings into two groupings:

- ◆ *Current Status* – We have summarized our findings regarding the current state of leak tracking and reporting systems, computerized maintenance management systems (CMMS), and main replacement decision models that existed in the January to March 2008 timeframe.
- ◆ *Current Plans* – We developed a high-level overview of all the major business processes in distribution operations. Using that understanding, we developed findings regarding the course of action that PAWC should undertake in implementing a leak tracking and reporting system and other potential business systems that would improve PAWC internal business processes in distribution operations.

The list of business processes that were identified was restricted to the major business processes only in distribution operations and did not include field service technicians, meter reading personnel, and other field activities. Those areas have separate business processes that were beyond the scope of our Phase III investigations.

Current Status

Finding XII-1 There is no common leak tracking system used throughout PAWC.

There are currently three different Access databases in existence at PAWC, which are being used to varying degrees, for tracking leaks. These are three separate database “designs.” We stress the word “design” in that, although each database tracks leak information, each “design” is different and incorporates alternate attributes and features based on the needs of the water district at the time it was developed. Some of these features have nothing to do with leaks. These database designs are:

- ◆ A Microsoft Access leak tracking database, which was developed by Wilkes-Barre/Scranton distribution operations personnel, is used for tracking leaks in the Wilkes-Barre/Scranton area. It has been in existence for five to six years. It is used specifically for leak reporting and tracking.
- ◆ A Microsoft Access leak tracking database, which was developed by Pittsburgh distribution operations personnel, is used for tracking leaks in the several water districts in Western PA, including Brownsville, Pittsburgh, McMurray, and others. It has been in existence for four to five years. It is used for leak reporting and tracking in addition to valve operation and some other unique items. Each water district has its own database file, so for all practical purposes we are actually talking about four to five separate databases running over a very slow network infrastructure.
- ◆ A Microsoft Access leak tracking database, which was developed by the Best Operating Practices group in November of 2007, is currently not used by any water district, but was envisioned to be used by other water districts (those which currently do not have a leak tracking database) to begin collecting leak information. It is also currently being used for designing a leak tracking and reporting capability into CMMS, discussed in *Finding XII-4*. However, there are currently no plans to migrate all of the leak information from the old databases into CMMS, again discussed in *Finding XII-4*.

Each of these databases is slightly different in design. Furthermore, each is the creation of a distribution operations person, not necessarily a trained database developer. Although the databases somewhat “get certain aspects of the job done,” the databases are not well designed from an underlying technology standpoint (for instance, database naming conventions have not been consistently used in the designs) and would not be sufficiently flexible to integrate (electronically) with other current or future applications.

Finding XII-2 None of the current Access databases are scalable for a state-wide or enterprise-wide application.

Although Microsoft Access is a good application for developing small applications with a limited number of concurrent users, it is not a good application for building an enterprise-wide application. A more robust backend database product, such as Oracle or Microsoft SQL, needs to be deployed for such applications. Furthermore the use of Microsoft Access in the PAWC computer network environment is further degraded by the slow network infrastructure currently in place at PAWC, which we understand America Water is currently in the process of attempting to improve.

Finding XII-3 Distribution operations personnel are very knowledgeable of their current leak tracking database.

There is limited reporting from each of the leak tracking databases. Distribution operations personnel are knowledgeable regarding Microsoft Access and use it to write their own queries and develop reports, as needed, to pull and analyze the required information from their leak tracking databases. The fact that distribution operations personnel have the ability to query the Access database in various ways needs to be considered in any new design of a leak tracking database. If distribution operations personnel are not capable of writing their own queries against a new leak tracking database, it will require the development of a greater number of standard reports and the design of some form of query analysis capability into the new system. Furthermore, it will give rise to an even greater need for training of distribution operations personnel that might be involved in leak reporting and analysis.

Finding XII-4 PAWC's current plans are to develop the leak tracking database as a part of CMMS; however, several key requirements may have been overlooked.

PAWC has recently decided (March 2008) to incorporate the leak tracking database design put forth by the Best Operating Practices group into CMMS. Although CMMS appears to be a reasonable computerized maintenance management system, Schumaker & Company consultants have several reservations about the approach currently being undertaken, including:

- ◆ There is currently no consideration for uploading historical leak history from the various water districts into CMMS. In essence, PAWC will only have system-wide leak history information going forward after implementation of the CMMS database in 2008 (as prior historical information will only be available in Excel spreadsheets or Access databases). One of the primary purposes for developing a leak tracking and reporting database is to support various analyses of the condition of the distribution infrastructure. The more historical information that is available, the better the analyses.
- ◆ There has been insufficient consideration of “electronically” integrating the leak tracking databases with other leak-related business processes, as discussed in the analysis in subsequent findings contained in this report, specifically NRW tracking and reporting.

- ◆ There has been insufficient consideration of the underlying infrastructure requirements that might be required to integrate these business processes.
- ◆ There has been insufficient consideration of the distribution operations personnel efficiency and effectiveness improvements that might be possible from different approaches to the design – for instance the monthly unaccounted for water calculations could be automatically calculated and reported in the monthly NRW reports with little to no distribution operations personnel involvement.
- ◆ Up to this time, each leak tracking database has been separate and application security not necessarily given much thought as part of the design of any of the individual databases. Security was more a function of the file share (network security versus application security – i.e. there is no need to log into the current databases) on which the database was located. An enterprise-wide leak tracking and reporting system will require a more rigorous designed security plan. This has yet to be developed.

Finding XII-5 The main replacement prioritization process that PAWC implemented in 2008 is a reasonable algorithm for prioritization and is similar to methods used in the natural gas industry; however, it has not been developed to the point of having automatic interfaces to PAWC performance reporting systems.

America Water has recently developed for the 2008 budget year a main replacement prioritization model using Microsoft Excel that uses a pairwise (weighing various parameters against each other) comparison for prioritizing main replacement projects – once they have been identified as a project and the necessary information collected and loaded into the model.¹ The algorithm used is similar to the model that we have seen used in the natural gas industry. Various relevant attributes of a segment of pipe and its leak history is factored into the calculations that are made.

However, collecting the data necessary to load the model can be a labor intensive process, in that there are no automatic interfaces to PAWC data sources. As a result of the labor involved, PAWC currently only analyzes selected main segments that have been identified by field personnel versus being able to automatically analyze all main segments on an ongoing basis.²

Most natural gas companies are farther along in the implementation of main replacement and risk assessment programs in that they have built computer interfaces between their prioritization model and internal data sources, such as leak and pipe condition data to permit all pipe segments within their system to be analyzed and compared on an ongoing basis with minimal labor involved.

The U.S. Department of Transportation is promulgating regulations for the natural gas industry whereby all natural gas distribution companies have to be able to demonstrate the following:

- ◆ Know its infrastructure
- ◆ Identify system threats (leaks and breaks)



- ◆ Assess and quantify risk
- ◆ Proactively mitigate significant risk
- ◆ Measure, report, and improve performance

In fact, the gas distribution companies themselves came up with these basic elements for effective distribution system management. A water utility that is the size of PAWC and its parent company should actively strive to achieve similar objectives, as it makes good business sense without regulatory requirements.

PAWC uses the main replacement prioritization process to allocate capital on a district basis, not on a state-wide basis, which is suboptimal. PAWC's capital allocation for infrastructure improvements should be a system-wide process of comparative evaluation involving both risk and economic considerations. PAWC should monitor the entire state-wide network for changes in conditions (threats):

- ◆ New leaks, third-party locates, new buildings, constructions, etc.
- ◆ Constantly re-assess and monitor risk

A geographic information system (GIS) can be a very effective tool for accomplishing this objective, but it can also be done through a relational database.

Finding XII-6 The CMMS being implemented is a commercial product that allows significant user customization.

The CMMS currently being implemented by PAWC is a product called DataStream, which is owned by Infor. Infor acquired DataStream in early 2006. The CMMS is being hosted by Infor – i.e. it is not being run or supported on American Water computers or infrastructure, with the exception that the product is accessed over the American Water network facilities. The backend database is an Oracle database. The front end of CMMS permits users to perform a fair amount of customization of the interface and its capabilities without having to be a computer system developer or programmer. Users can create user defined fields for holding and reporting information and the CMMS application handles the necessary changes to the backend Oracle database to support the modified application.³

The implementation of CMMS, in addition to being a relational database, is based on a customizable multi-organizational structure. This multi-organizational structure permits the information to be grouped and reported at various levels of consolidation. Essentially, the lowest level is a piece of equipment, the next level is the assignment of that piece of equipment to a plant, the next level up is the assignment of that plant to a water district, etc.

Therefore, the CMMS application can be implemented with very little American Water Works Service Company (AWWSC) Information Technology Services (ITS) Department support (which in fact is the case at PAWC), especially because it is not being hosted on American Water computer hardware. CMMS

is currently being piloted in the Glen Alsace water district. It is expected to be operational across PAWC in all water districts within the next two years (by the middle of 2010).⁴

The DataStream CMMS has been implemented on the unregulated side of American Water for several years. Therefore, it is not an entirely new application to American Water. In addition, prior to the year 2000 (Y2k) issue, PAWC had an earlier version of DataStream implemented at many of its water production facilities. However, its use was discontinued at the time of Y2k.⁵ The DataStream software at that time was determined to not be compliant with issues associated with the date format change for the year 2000.

Planned Status

To provide a context in which to further investigate a leak tracking and reporting system, it was necessary as part of this work plan area to:

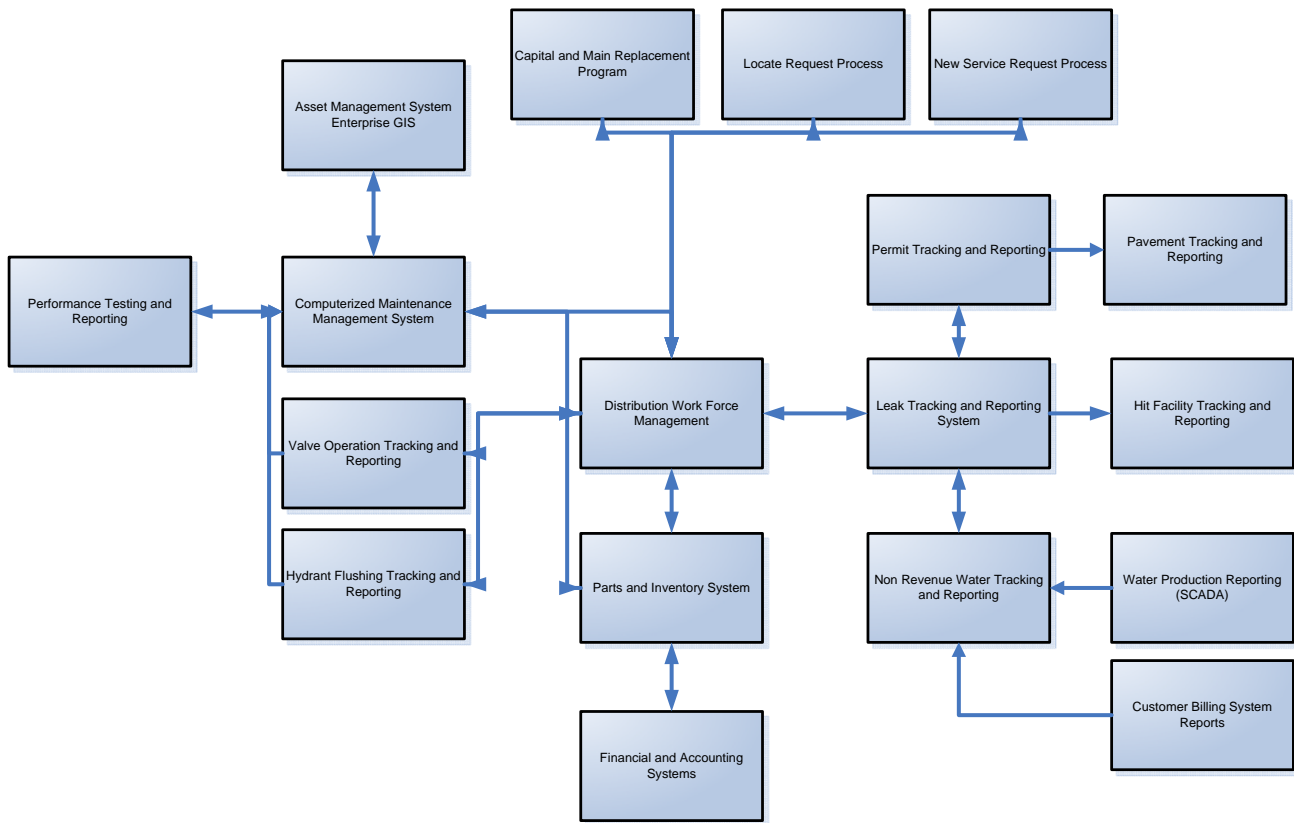
- ◆ Identify the major business processes that exist within distribution operations, which are provided at a high level in *Exhibit XII-1*.
- ◆ Identify the computer system(s) that might exist or could be developed to support these business processes, which are covered in the discussion of CMMS, enterprise GIS, and the proposed supporting performance reporting processes.
- ◆ Identify what interfaces might exist among these various business processes/computer systems, which are provided in the discussions of *Exhibit XII-2* through *Exhibit XII-5*.
- ◆ Identify the common data sources that might exist among these various business processes, which are discussed in the discussions of *Exhibit XII-2* through *Exhibit XII-5*.

A key factor of establishing the boundaries of a leak tracking and reporting system is the existence of common or related functionality and/or data sources that might dictate grouping more functionality into a larger and more comprehensive system rather than developing it as a standalone system.

The major business processes in distribution operations that were identified through our interviews are schematically illustrated in *Exhibit XII-1*. *Exhibit XII-1* provides a high-level representation of the major business processes that exist within the distribution (network) operations area of PAWC. In many cases, only manual systems exist to support these business processes and in other cases some form of computerized system has been developed (in several cases, each system being separately developed) to support the business processes. *Exhibit XII-1* is an attempt to identify all of the major operational business processes that exist at a high level, grouping them into related underlying information needs and identifying the interrelationships and boundaries that might exist that could be defined between each individual high-level business process.⁶



**Exhibit XII-1
Distribution Business Processes
as of March 31, 2008**



Source: Interviews 175, 183,184,185,186, 187, 195, 196, and 202

The following briefly describe the individual groupings portrayed in *Exhibit XII-1*.

- ◆ *Asset Management System* – This business process revolves around the identification and management of individual equipment and facilities (assets) that require some form of operational management or oversight. Operational management implies some form of ongoing management of the asset, such as maintenance and testing throughout the life of the asset. This differs from a financial perspective, where financial management might only be concerned with applying the proper depreciation to the asset. From a technology standpoint the business process would involve that implementation of some sort of database (relational and/or geo-coded database) as its underlying technology. Depending on the nature of business operations, a computerized maintenance management system might serve the basis of an asset management system. In the case of PAWC, assets would include such items as pumps, valves, piping, instrumentation, physical plant facilities, etc.
- ◆ *Computerized Maintenance Management System* – This business process implements certain business rules regarding the ongoing preventive maintenance and corrective maintenance of existing

assets. The business process maintains a record (history) of all activities regarding an individual asset (piece of equipment or facility). This history is used to forecast maintenance requirements. In many cases the system contains a link to inventory and other maintenance resources (including people). The business process creates individual work orders or lists of actions required based on imbedded business rules.

- ◆ *Performance Testing and Reporting* – Some assets can be better “managed” if they are assigned an ongoing monitoring and testing program, which is a more precise predictor of a preventive or corrective action requirement. Usually not all equipment in a computerized maintenance management system would require this type of ongoing monitoring and, therefore, it might be a separate system. In essence only a subset of the equipment might be addressed with such a system. Very specialized business rules would be used to generate work orders or lists of corrective actions required.
- ◆ *Valve Operation Tracking and Reporting* – This business process is more of a testing process to ensure that the various manual and automatic valves within the system operate as needed and required. The intent is to find out if there might be a problem with a valve’s operation before it is required to operate – such as in the event of the need to shut off supply due to a leak or some other need. In PAWC, Allegheny County has specific requirements relating to a valve testing program that PAWC must follow.
- ◆ *Hydrant Flushing Tracking and Reporting* – This business process is more of a testing process to ensure that the various hydrants within the system operate as needed and required. The intent is to find out if there might be a problem with a hydrant before it is required to operate. Robust tracking and reporting of hydrant inspections is very important from a liability standpoint. In the event of a malfunction during an emergency, a water utility needs to be able to back up claims of regular inspections and maintenance.
- ◆ *Locate Request Process* – This business process manages the assignment of locate requests to distribution field personnel. Because PAWC performs all of its own locate requests (as opposed to the use of outside contractors), there needs to be a business process for managing this effort.
- ◆ *New Service Request* – This business process manages the request for new services, specifically where a pre-existing service did not exist. PAWC has currently implemented a manual process for this business process.
- ◆ *Capital and Main Replacement Program* – This business process manages the identification and management of all distribution capital projects that are eventually implemented by distribution field operations.
- ◆ *Distribution Workforce Management (Jobs, Resources, Assignments)* – This is the business process for assigning and managing the work assigned to distribution field forces. It is currently primarily a paper system at PAWC. Other utilities have developed workforce management systems for assigning and managing distribution field forces. Much of a distribution field forces’ work can be planned in advance. Larger utilities have central groups and systems for

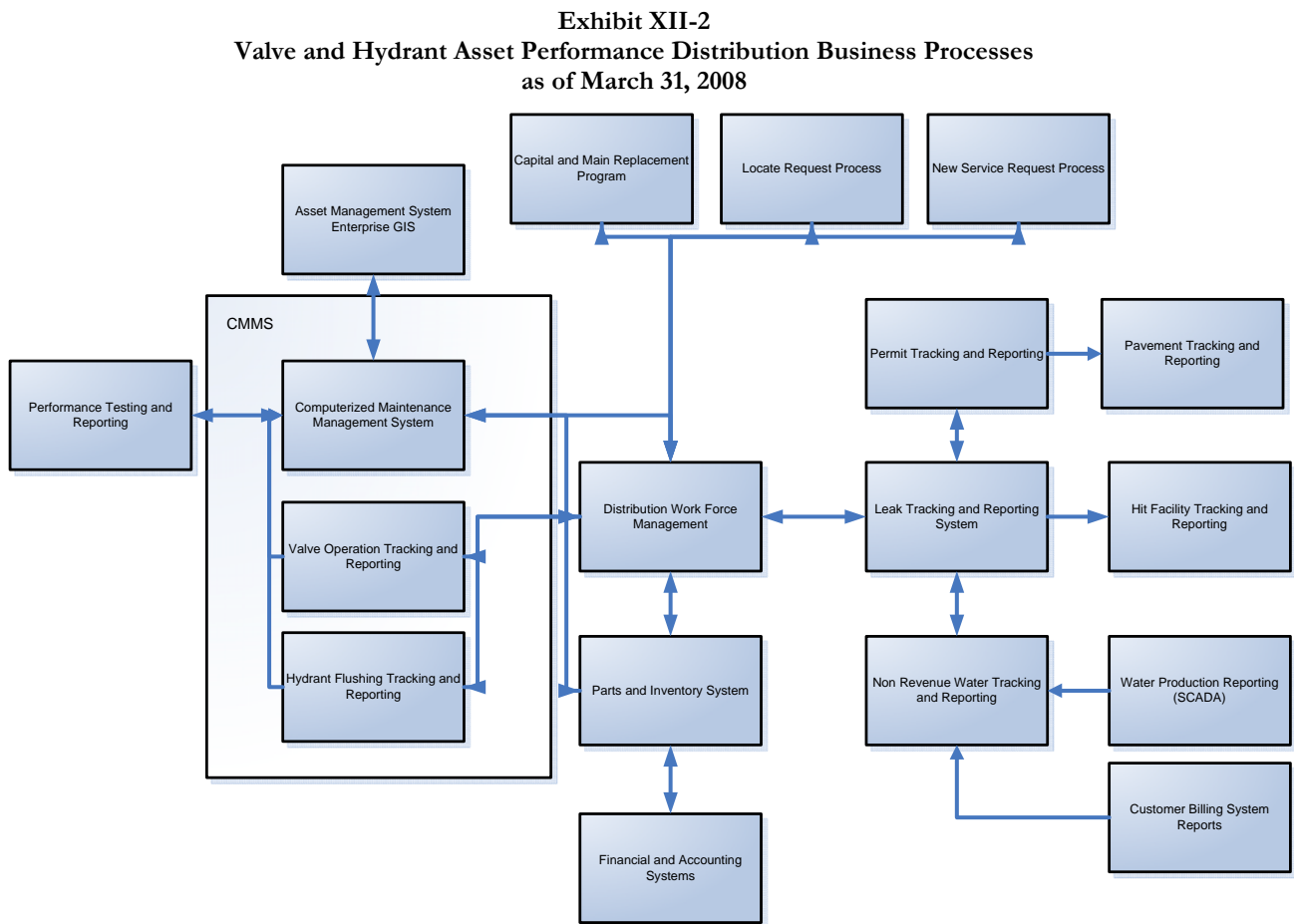


supporting this business process. Various other systems usually feed work orders into the system where various business rules are applied to schedule the work – such as different work orders being assigned priorities based on the nature of the work order. For instance, in distribution the type of work orders might be new main construction, new service installation, main replacement, leak investigation, leak repair, valve operations, hydrant flushing, leak detection, etc. Depending on the skills of the field forces and associated union rules, the field forces could be dispatched based on specific business rules.

- ◆ *Leak Tracking and Reporting System* – This business process collects and reports information on identified leaks in the system. There are two primary purposes for this information:
 - To provide historical information for making better decisions on future main replacement efforts
 - To take credit for “accounted for” leaks, such as leakage that occurs from the time a leak is identified until it is repaired, in the system that directly impact non-revenue water and unaccounted-for-water calculations.
- ◆ *Permit Tracking and Reporting* – This business process is related to construction and repair operations in the field where a permit is required for a particular activity – such as a pavement cut in a road. It manages the opening and closing of permits with various municipal and local governments.
- ◆ *Pavement Tracking and Reporting* – This business process is related to construction activities where the pavement needs to be removed, resulting in a temporary patch until a permanent patch can be performed. It also provides a historical record of all pavement cuts for liability purposes.
- ◆ *Hit Facility Tracking and Reporting* – In the event of a facility being damaged by a third-party, additional information needs to be collected for determining the party at fault and potentially assessing damages.
- ◆ *Non Revenue Water Tracking and Reporting* – The business process surrounding the calculation of non revenue water and unaccounted for water involves many different inputs. This information needs to be available on a periodic and geographic basis, and calculated uniformly.
- ◆ *Water Production Reporting (SCADA)* – This is an information source for calculating non revenue water. The information needs to be available on a periodic and geographic basis, including smaller water control zones.
- ◆ *Customer Billing System Reporting* – This is an information source for calculating non revenue water. The information needs to be available on a periodic and geographic basis, including smaller water control zones.
- ◆ *Parts and Inventory System* – This business process ensures that materials are available to perform identified maintenance and repair activities and to carry out new construction activities.
- ◆ *Financial and Accounting Systems* – These systems are of a more financial than operational nature, although some interfaces to these systems might be necessary.

Finding XII-7 Valve operation tracking and reporting and hydrant flushing tracking and reporting are being appropriately integrated into CMMS.

The business processes that are being addressed with CMMS are illustrated in the CMMS box shown in *Exhibit XII-2*. As shown in *Exhibit XII-2*, valve operations and hydrant flushing are being implemented into CMMS using inspection routes – valves, pumps, and hydrants being assigned to specific inspection routes to minimize travel time.⁷ The history for all of these inspections will be available from CMMS.⁸



Source: Interviews 175, 183,184,185,186, 187, 195, 196, and 202

Finding XII-8 Based on Schumaker & Company’s review, it is not clear that CMMS will provide the work management capabilities needed for managing PAWC’s distribution workforce.

The CMMS is anticipated to also support distribution work management activities in the field. As shown in *Exhibit XII-3* and based on interviews with PAWC personnel, CMMS is also anticipated to be the primary workforce management tool used in distribution operations. While this may be possible on

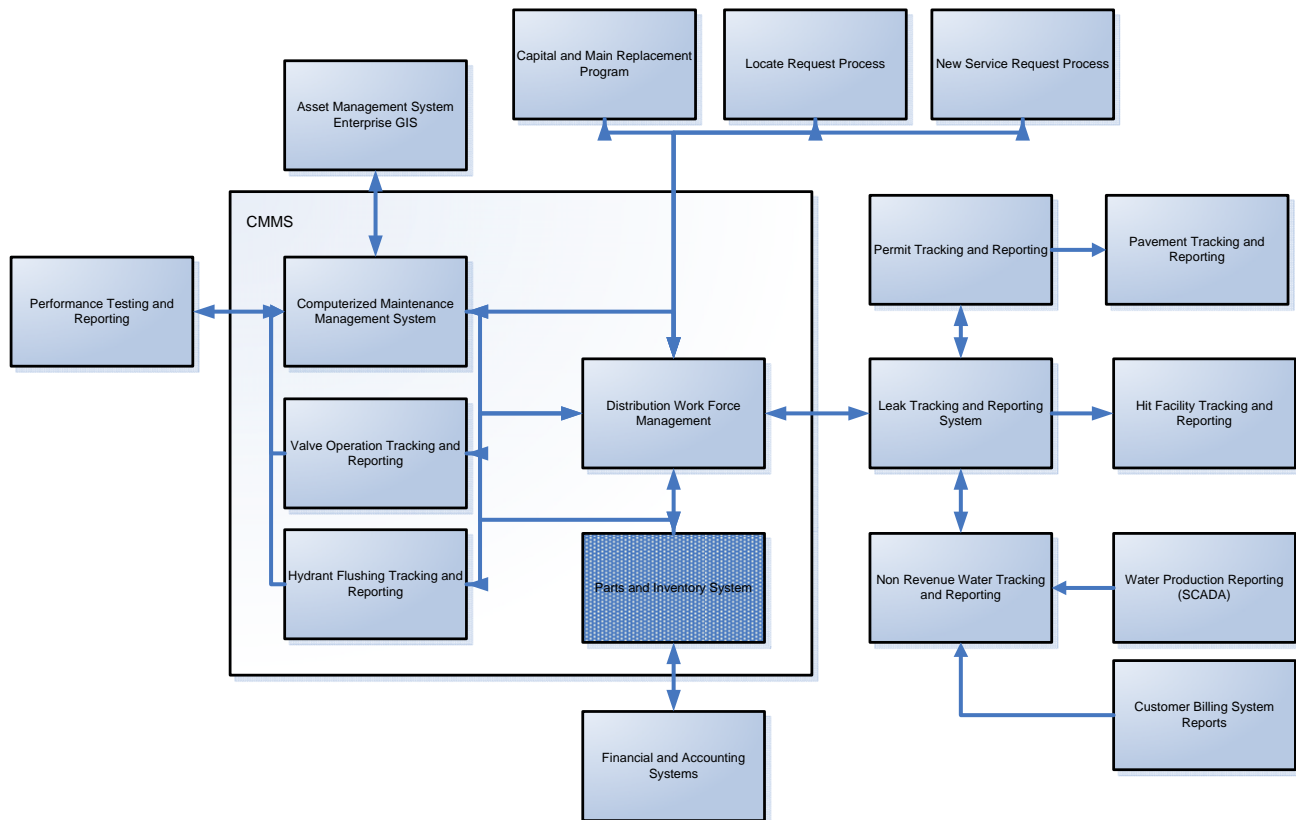
the production side, in our experience, more utilities have implemented separate work force management applications with interfaces to a CMMS-type application for managing distribution work. On the production side, most of the work is driven by the maintenance program, whereas on the distribution side there are a lot more drivers of the work such as new main construction, main replacement projects, locate requests, new service installations, etc.⁹

Finding XII-9 The parts and inventory portion of CMMS is not being fully implemented at this time.

As shown in *Exhibit XII-3*, CMMS includes a parts and inventory module, which is not being implemented at this time. However, American Water personnel do have experience with CMMS parts and inventory in that it has been implemented at several places on the unregulated side.

The CMMS parts and inventory module should be considered for possible implementation to address some of our findings in *Chapter IV – Procurement and Materials Management*.

**Exhibit XII-3
Workforce Management and Parts and Inventory Distribution Business Processes
as of March 31, 2008**

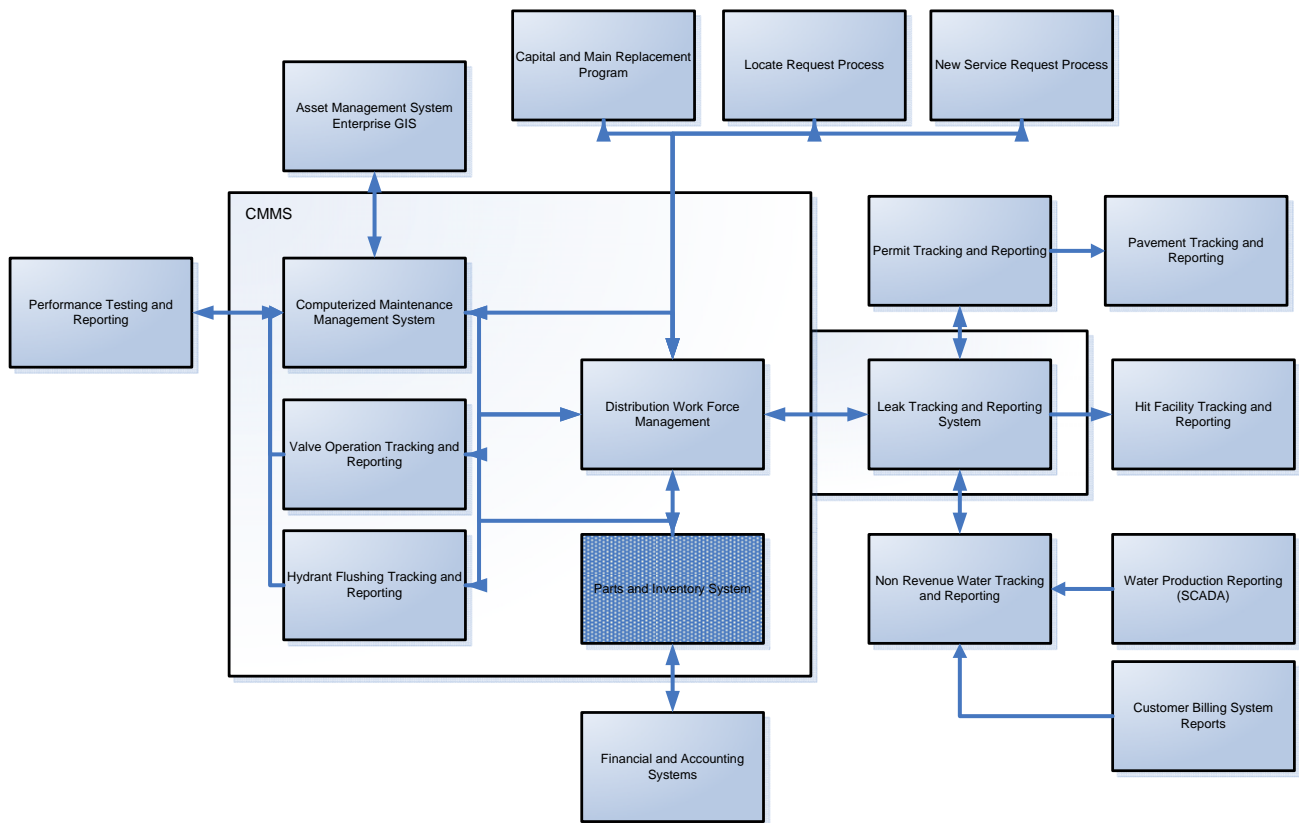


Source: Interviews 175, 183,184,185,186, 187, 195, 196, and 202

Finding XII-10 Incorporating the leak tracking and reporting system into CMMS may not be the best approach.

In addition to the concerns expressed in *Finding XII-4*, *Exhibit XII-4* illustrates that a leak tracking and reporting system would appear to tie into many other business processes that are not a part of CMMS. The leak tracking and reporting system is the repository for all of the leaks identified on a monthly basis that factor into the NRW and UAW calculations currently reported in the NRW tracking and reporting system. This system is currently a set of linked Excel spreadsheets, which need to be converted to a database, as discussed in *Chapter XI – Operational Performance*. In addition, leaks can be the drivers behind pavement cuts and hit facilities as well as the need for getting permits for cutting into streets and road facilities of the various jurisdictions in which PAWC operates.¹⁰

**Exhibit XII-4
 Leak Tracking and Reporting Distribution Business Processes
 as of March 31, 2008**



Source: Interviews 175, 183,184,185,186, 187, 195, 196, and 202

Finding XII-11 **It may be more appropriate to integrate the leak tracking and reporting application with an enterprise GIS instead of CMMS.**

Within the gas industry, many gas utilities are integrating information from a leak tracking application with their enterprise GIS. The integration essentially involves linking information from the leak-tracking application via geo-code locations to be able to display the information on GIS maps. In addition, these geo-code locations are also used to assign leaks to pipe segments for the purpose of performing main replacement analyses.

Schumaker & Company consultants recognize that one could tie the leak tracking information to a CMMS. However, that would necessitate uniquely identifying all the pipe segments in the system (developing a unique numbering scheme for pipe segments) and then assigning all identified leaks to the specific pipe segments.

Enterprise GIS is currently under consideration for adoption at PAWC, pending the results achieved by a pilot program in New Jersey. In our experience, those utilities that have implemented enterprise GIS have typically chosen to integrate leak tracking with enterprise GIS.

Finding XII-12 **There are currently no plans to integrate the NRW tracking and reporting with the leak tracking and reporting databases nor are there plans to integrate pavement tracking and reporting, permit tracking and reporting, or hit facilities tracking and reporting with a leak tracking and reporting system.**

Schumaker & Company consultants recognize some interconnection among the business processes involving NRW tracking, pavement tracking, permit tracking, and hit facilities. In almost all cases, a leak is the initiating event. Therefore, to design a leak tracking and reporting application that integrates many of these other business processes would appear to result in greater efficiencies in these business processes within PAWC.

C. Recommendations

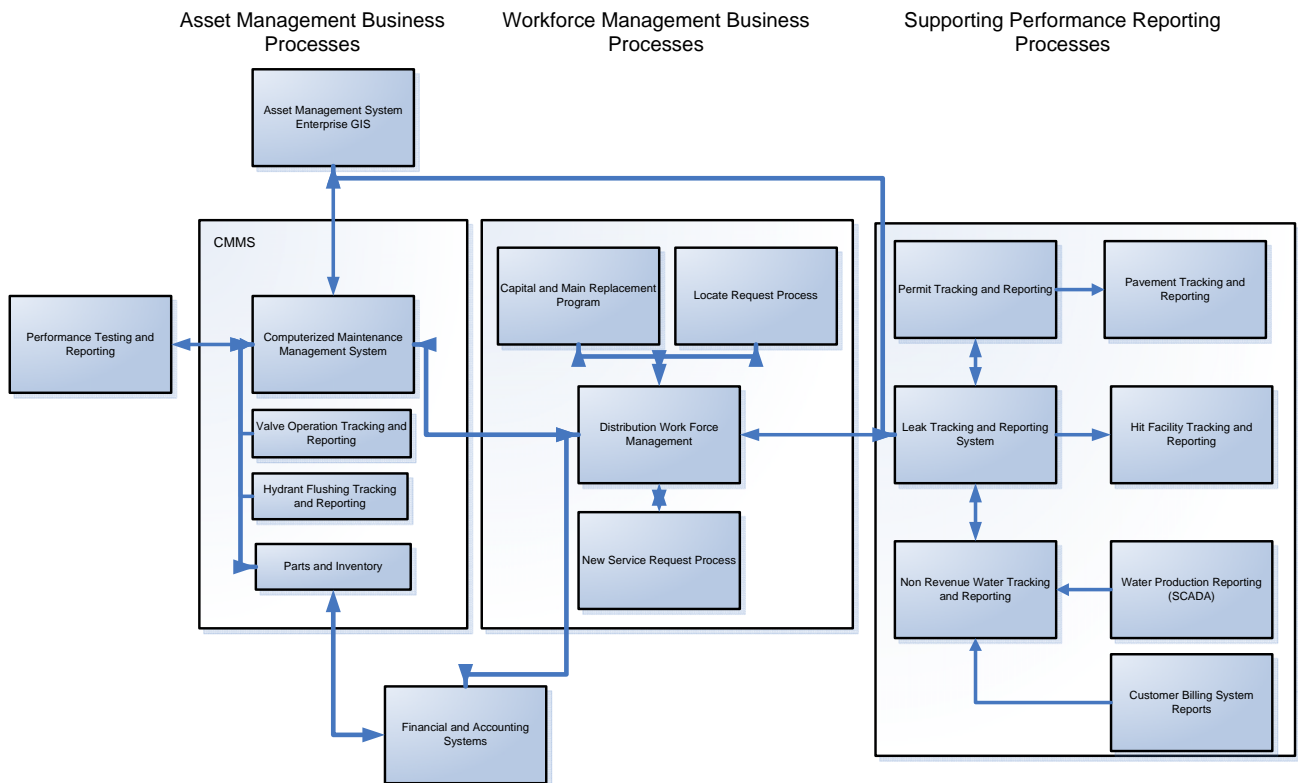
Recommendation XII-1 **Structure the design of business applications for the distribution operations function as shown in Exhibit XII-5. (Refer to Finding XII-1, Finding XII-2, Finding XII-3, Finding XII-4, and Finding XII-10)**

Having identified many of the major business processes within distribution operations and schematically displaying them on the exhibits contained in this report leads to the identification of three major groupings of related business processes. These groupings, which are shown in *Exhibit XII-5*, include:

- ◆ *Asset Management Business Processes* – Business processes associated with the operations, maintenance, testing, and inspections of equipment and facilities used in fulfilling PAWC’s mission of delivering water and waste water services.
- ◆ *Workforce Management Business Processes* – Business processes associated with the management of field forces used in fulfilling the PAWC mission of delivering water and waste water services.
- ◆ *Supporting Performance Reporting Business Processes* – Other business processes necessary for managing other aspects of the water business, which provide statistical and other specific information used in fulfilling the PAWC mission of delivering water and waste water services.

In addition, the financial and accounting systems would also be considered another grouping of information systems; however, these systems were beyond the scope of this work plan area.

**Exhibit XII-5
Recommended Distribution Business Processes Road Map
as of March 31, 2008**



Source: Schumaker & Company Analysis

This grouping of major business processes provides a logical grouping in which the interfaces among the major groupings are minimal. For instance, the following major interfaces would exist:

- ◆ *Financial and Accounting System – Asset Management Systems* – primary interface would be parts and

inventory with CMMS and labor costing to the extent it is used for managing the workforce labor costs.

- ◆ *Asset Management – Workforce Management* – primary interface is via work orders generated by the CMMS to be performed in the field.
- ◆ *Workforce Management – Supporting Performance Reporting* – primary interface is work orders involving leaks that are handled in the field.
- ◆ *Asset Management – Supporting Performance Reporting* – primary interface is leaks that would be mapped on GIS.

Recommendation XII-2 **Develop the leak tracking and reporting database as a part of a larger, long-term effort to integrate with other supporting performance reporting business processes such as NRW, permits, pavement tracking, and hit facilities. (Refer to Finding XII-10 and Finding XII-12)**

As shown in *Exhibit XII-5*, there is more commonality of leak tracking and reporting to NRW, permits, pavement tracking, and hit facilities than there is between leak tracking and reporting with CMMS.

Recommendation XII-3 **Adopt the multi-organizational reporting structure (upon which CMMS is being implemented) across both the workforce management business process and supporting performance business processes. (Refer to Finding XII-6)**

One of the strengths of CMMS is the multi-organizational structure on which it is built. It would be beneficial for all other business systems to be based on the same multi-organizational structure.

Recommendation XII-4 **Engage AWWSC ITS to assist in the development of the supporting performance reporting process systems identified in Exhibit XII-5. (Refer to Finding XII-6)**

The water operations area had been attempting to implement CMMS without much assistance from the AWWSC ITS organization. Schumaker & Company consultants recognize that there have been some issues with ITS support in the past, due primarily to resource and skills availability; however, these issues are purportedly being addressed by ITS. Water operations management needs to meet with ITS management to obtain an agreement on the development of the supporting performance reporting processes identified in *Exhibit XII-5*. Either ITS needs to obtain the required staffing/resource skills to adequately support water operations needs or external resources should be considered for this applications development effort.

Recommendation XII-5 Address the deficiencies in the current plans regarding the incorporation of leak tracking and reporting into the design of CMMS. (Refer to Finding XII-4)

Although CMMS appears to be a reasonable computerized maintenance management system, Schumaker & Company consultants have several reservations about the approach currently being undertaken. These reservations include:

- ◆ There is currently no consideration for uploading historical leak history from the various water districts into CMMS.
- ◆ There has been insufficient consideration of “electronically” integrating the leak tracking databases with other leak related business processes.
- ◆ There has been insufficient consideration of the underlying infrastructure requirements that might be required to integrate these business processes.
- ◆ There has been insufficient consideration of the distribution operations personnel efficiency and effectiveness improvements that might be possible from different approaches to the design – for instance the monthly accounted for water calculations could be automatically calculated and reported in the monthly NRW reports with little to no distribution operations personnel involvement.
- ◆ Up to this time, each leak tracking database has been separate and application security not necessarily given much thought into the design of any of the individual databases. Security was more a function of the file share (network security versus application security – i.e. there is no need to log into the current databases) on which the database was located. An enterprise-wide leak tracking and reporting system will require a more rigorous designed security plan. This has yet to be developed.

Recommendation XII-6 Consider integration of leak tracking and reporting with the eventual GIS system versus integration with CMMS. (Refer to Finding XII-5, Finding XII-10, and Finding XII-11)

Based on our experience, this is the route that most gas utilities are adopting and would be the most beneficial approach for PAWC’s implementation.

Recommendation XII-7 Ensure that the leak history is migrated into the eventual leak tracking and reporting database from all existing databases with good data. (Refer to Finding XII-4)

One of the primary purposes of a leak tracking and reporting system is to maintain a history of leak information that can be used for performing various analyses – the more history, the more information to consider in analyses.

Recommendation XII-8 Electronically connect leak and other records to the main prioritization model. (Refer to Finding XII-4)

Leaks and breaks in particular need to be associated to specific pipes in an automated manner. Two primary ways to accomplish this association are:

- ◆ As an interim process until a GIS is built and deployed, PAWC should use leak and break record data from databases to build pseudo mains to be maintained in the leak database by address range. Whenever a new leak comes in within the given address range, it should be added to the pseudo main project. Usually a leak record will have the following information:
 - Pipe material
 - Pipe size
 - Other attributes
- ◆ Implement a GIS with main attributes with geocoding of breaks and leaks to pipes.

The main prioritization model needs to be modified to be able to handle automated data acquisition. Other data sources besides leaks should also be considered, such as taste and odor complaints, non-revenue water data, etc.

Recommendation XII-9 Allocate infrastructure improvement budgets on a state-wide basis not just district by district. (Refer to Finding XII-5)

PAWC should begin using the main prioritization model to allocate infrastructure improvement capital dollars on a state-wide basis not just district by district. Key objectives should be:

- ◆ Provide an objective evaluation framework
 - Quantification and comparison between candidate projects
 - Improve organizational communication via a common understanding of high-priority projects and the underlying drivers
- ◆ Minimize risk and optimize resource allocations
 - Focus limited resources on riskiest pipes
 - Reduce operations and maintenance (O&M) dollars through economically justified investments

Recommendation XII-10 Consider the eventual implementation of the parts and inventory component of CMMS. (Refer to Finding XII-9)

The parts and inventory system that is a part of CMMS already has interfaces to the maintenance management capabilities that CMMS designed into it. Schumaker & Company recognizes that PAWC is currently using an enterprise resource planning (ERP) system from JD Edwards, which American Water

may upgrade or replace. Schumaker & Company consultants have made several recommendations regarding materials management in *Chapter IV – Support Services*. Because CMMS already contains an inventory module, there are two things that should be considered and evaluated.

- ◆ Adopt the CMMS inventory module and use it to generate requisitions to the ERP system, which results in purchase orders for replenishment based on business rules in CMMS.
- ◆ Adopt the CMMS inventory module and synchronize the inventories with the ERP system using the ERP business rules to generate purchase orders.

Recommendation XII-11 Recognize that a more robust distribution workforce management application may eventually be required to support future business processes. (Refer to Finding XII-8)

Many utilities have developed separate workforce management systems to support field operations. A CMMS-type application would be but one of the applications that would “feed” work orders into the workforce management system for field operations. Water operations management’s current plan is to use the existing CMMS to perform this business process. PAWC should continue to monitor how well CMMS helps it to manage its workforce. If CMMS is found to be inadequate, then PAWC should more fully develop the workforce management portion of CMMS.

Schumaker & Company consultants recognize that PAWC is convinced that the CMMS system has the capability to host a work order/workforce management system, and will continue to explore this possibility. Potentially, distribution operations work orders can be created in the CMMS and communicated and scheduled/managed through the Advantex system. The Company does not completely agree with the consultants assertion that “much of a distribution field forces’ work can be planned in advance,” particularly in the smaller districts. Poor weather, main breaks, emergency locate requests, water quality issues and collections efforts, for example, can all disrupt a planned work day. Some flexibility will always be required in whatever system the Company ultimately chooses. The Company currently views anything outside of CMMS and Advantex as potentially adding another layer of complexity to the process.

D. Overall Summary Conclusions

While Schumaker & Company consultants are impressed with the capabilities of the proposed CMMS and fully endorse its implementation for plant and facilities maintenance management and the scheduling and management of periodic inspections such as hydrant flushing, valve operations, etc.; we have real concerns if it is the appropriate tool for implementing leak tracking. Our concerns revolve around the following issues.

- ◆ CMMS is a third-party product that permits a fair amount of user customization. While on the surface that may appear to be good, its very design makes it more difficult for a developer or

programmer interested in electronically integrating information contained in the system with other business processes or systems. We recognize that given enough money and time anything can be done, but is that the best route to take?

- ◆ With the exception of the multi-organizational structure of CMMS, there is little commonality in the underlying data between leak tracking and maintenance management. In fact, the review of the various business processes discussed above (shown above in *Exhibit XII-5*) builds a stronger case for building a separate group of computer technologies that support not only leak tracking but also:
 - NRW and UAW management and reporting
 - Pavement cut management and reporting
 - Permit tracking and reporting
- ◆ There are no plans to load historical information into CMMS. Although the argument has been made that the information in the Microsoft Access database will still be available, that would require operations personnel to consult two different systems when attempting to perform a 10-year analysis. Furthermore, if the leak tracking database is being developed to support all of American Water similar to the CMMS, the decision not to migrate historical data is putting the effort in the position of telling Kentucky-American Water Company, Tennessee-American Water Company, or other American Water systems that they have to agree to maintain their old data on their old system. We believe that this would be a serious impediment to state-wide adoption.
- ◆ The inability to accommodate historical information is due largely to the fact that CMMS apparently does not support loading historical data into the system.
- ◆ In the long run, PAWC will probably want to have the ability to show leaks on a GIS system map. Electronically linking leak information from CMMS into a GIS will be much a harder than in a more straight-forward database that was custom developed, primarily due to the underlying data structure.
- ◆ In the long run, PAWC will want to electronically pull leak information into its main replacement model. Electronically linking leak information from CMMS into a main replacement model will be much a harder than in a more straight-forward database that was custom developed, primarily due to the underlying data structure.
- ◆ A leak tracking database is not an overly complicated system. In fact the various Microsoft Access databases that are currently used were developed by non-technical personnel in operations who have the benefit of a Microsoft Access course and the desire to make leak tracking a better process. With a few significant exceptions, the rough database design could be used as a starting point for developing a new application. The significant exceptions include:
 - The main leak information table was not defined in the design.

- A security model was not developed as a part of the design – i.e. user rights etc.
- The multi-organizational structure proposed needs to be reviewed to make sure it is consistent with CMMS.
- ◆ A leak tracking database should be the type of application that could be developed internally by American Water. While we recognize that in the past the AWWSC ITS Department has not been able to provide the support requirements for water operations due to various reasons, it would be a good test of their capabilities.

In summary, this document should be shared with the AWWSC ITS Department, and the department should be solicited to support this effort.

E. Implementation Plan

This section provides a preliminary implementation plan for the development of a leak tracking database and also computerizing the NRW and UAW monitoring and reporting systems (linked spreadsheets as currently developed). Once these business applications are successfully implemented, they would provide a strong technology base for moving forward with the integration of pavement cut management and reporting, permit tracking and reporting, the integration of leaks with an eventual GIS and other future systems.

The implementation plan included in *Exhibit XII-6* (project resource estimates), *Exhibit XII-7* (project plan and schedule), and *Exhibit XII-8* (project cost estimates) was created in Microsoft Project. The entire Microsoft Project file is available as an attachment and viewable, if one has Microsoft Project available.

Assumptions

This implementation plan assumes that the leak tracking database would be developed with its systems architecture based on a Microsoft SQL Server back end and a .NET front end, such that it would operate in a web browser over the Internet or an Intranet. A Microsoft Access front end would be provided to operations personnel for querying (viewing and reporting only) the back-end SQL Server database. This type of systems architecture would minimize the need to develop specific reports as a part of this project. The initial design does not assume any mobile deployment. If deployed to mobile devices, Citrix would be the quickest and easiest platform. This architecture design is not necessarily the recommended design, but one that Schumaker & Company technology consultants are very familiar with from past projects and also the design used when creating the project plan.

Project Staffing

This implementation plan assumes the resources and costs (using assumed billing rates that estimate an average between in-house and outsourced resources) shown in *Exhibit XII-6*.

**Exhibit XII-6
Project Resource Estimates**

ID		Resource Name	Type	Initials	Max. Units	Std. Rate	Accrue At	Base Calendar
1		Project Manager	Work	PM	100%	\$125.00/hr	Prorated	Standard
2		Senior Developer	Work	SD	100%	\$105.00/hr	Prorated	Standard
3		Developer 1	Work	D1	100%	\$85.00/hr	Prorated	Standard
4		Developer 2	Work	D2	100%	\$85.00/hr	Prorated	Standard
5		Documentation Specialist	Work	DS	100%	\$55.00/hr	Prorated	Standard

Source: Schumaker & Company Analysis

Project Plan

The project plan is based on beginning the development of the leak tracking database followed by the development of the NRW reporting database, although these items could be worked concurrently. The major tasks are briefly discussed below:

- ◆ *System Design* – A method for adopting the multi-organization structure in CMMS would be designed and developed for the leak tracking database and other subsequent databases discussed below. The actual data tables required for the application would be created using proper naming conventions. A security model would be developed that would involve the development of a rights table, user list, groups, group rights etc. An initial entry and editing form would be prototyped.
- ◆ *System Development* – The system design would be developed into a prototype application for demonstration and testing.
- ◆ *Data Conversion* – This major task would involve the loading of the leak information already contained in the Wilkes-Barre and Pittsburgh databases into the new application for testing purposes. Operations personnel familiar with their current Access leak tracking database would test the data entry and editing interface that had been developed to date. We suggest that users be provided with an Access front end for querying the information in the back-end database to begin to provide them with an idea of what could be done and perhaps what reports might be beneficial.
- ◆ *System Pilot Testing* – The prototype would be tested by operations personnel using a copy of their current leak data.

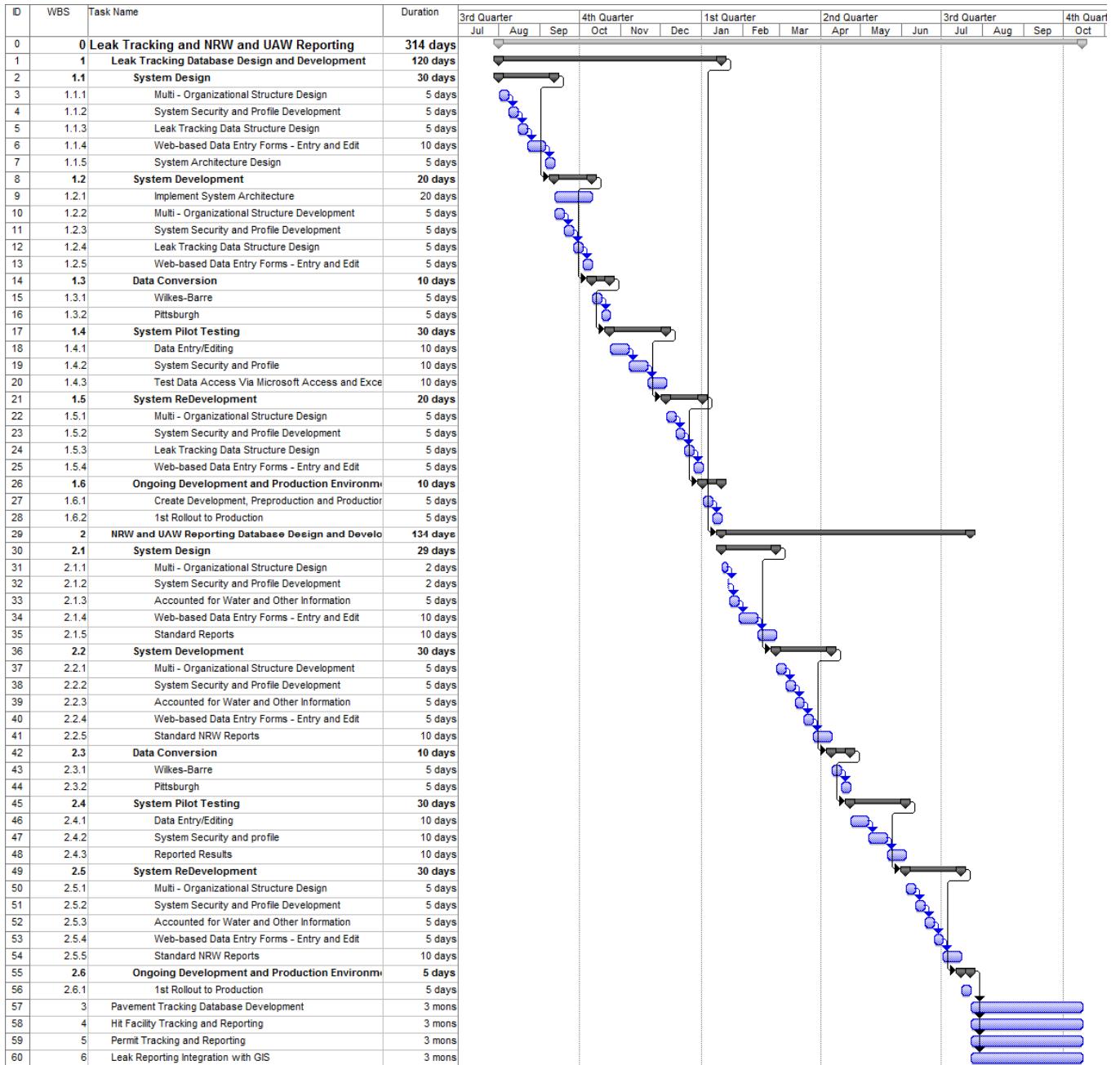
- ◆ *System Redevelopment* – Bug fixes resulting from the initial testing would be incorporated into the system and potential enhancements identified and prioritized. A decision would be made on the ability to put the application into the production environment.
- ◆ *Ongoing Development and Production* – Subsequently development, preproduction, and production environments would be created for continuing development of the leak tracking database and other applications, as necessary.

Project Schedule

This implementation plan includes the schedule shown in *Exhibit XII-7*



**Exhibit XII-7
Project Plan and Schedule**



Source: Schumaker & Company Analysis

Project Costs Estimates

The cost estimates are shown in *Exhibit XII-8*.

Exhibit XII-8
Project Cost Estimate
Page 1 of 2

ID	WBS	Task Name	Work	Cost	Details	2nd Half		1st Half		2nd Half	
						Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3
0	0	Leak Tracking and NRW and UAW Reporting	5,526.8 hrs	\$533,126.00	Work		1,144h	1,181.2h	1,771.2h	1,068.4h	362h
1	1	Leak Tracking Database Design and Development	2,587.2 hrs	\$249,032.00	Work		1,144h	1,181.2h	262h		
2	1.1	System Design	780 hrs	\$78,900.00	Work		780h				
		Project Manager	240 hrs	\$30,000.00	Work		240h				
		Senior Developer	240 hrs	\$25,200.00	Work		240h				
		Developer 1	240 hrs	\$20,400.00	Work		240h				
		Documentation Specialist	60 hrs	\$3,300.00	Work		60h				
3	1.1.1	Multi - Organizational Structure Design	0 hrs	\$0.00	Work						
4	1.1.2	System Security and Profile Development	0 hrs	\$0.00	Work						
5	1.1.3	Leak Tracking Data Structure Design	0 hrs	\$0.00	Work						
6	1.1.4	Web-based Data Entry Forms - Entry and Edit	0 hrs	\$0.00	Work						
7	1.1.5	System Architecture Design	0 hrs	\$0.00	Work						
8	1.2	System Development	560 hrs	\$54,400.00	Work		364h	196h			
		Project Manager	120 hrs	\$15,000.00	Work		78h	42h			
		Senior Developer	160 hrs	\$16,800.00	Work		104h	56h			
		Developer 1	80 hrs	\$6,800.00	Work		52h	28h			
		Developer 2	160 hrs	\$13,600.00	Work		104h	56h			
		Documentation Specialist	40 hrs	\$2,200.00	Work		26h	14h			
9	1.2.1	Implement System Architecture	0 hrs	\$0.00	Work						
10	1.2.2	Multi - Organizational Structure Development	0 hrs	\$0.00	Work						
11	1.2.3	System Security and Profile Development	0 hrs	\$0.00	Work						
12	1.2.4	Leak Tracking Data Structure Design	0 hrs	\$0.00	Work						
13	1.2.5	Web-based Data Entry Forms - Entry and Edit	0 hrs	\$0.00	Work						
14	1.3	Data Conversion	208 hrs	\$17,800.00	Work			208h			
		Project Manager	8 hrs	\$1,000.00	Work			8h			
		Senior Developer	20 hrs	\$2,100.00	Work			20h			
		Developer 1	80 hrs	\$6,800.00	Work			80h			
		Developer 2	80 hrs	\$6,800.00	Work			80h			
		Documentation Specialist	20 hrs	\$1,100.00	Work			20h			
15	1.3.1	Wilkes-Barre	0 hrs	\$0.00	Work						
16	1.3.2	Pittsburgh	0 hrs	\$0.00	Work						
17	1.4	System Pilot Testing	359.2 hrs	\$34,132.00	Work			359.2h			
		Project Manager	80 hrs	\$10,000.00	Work			80h			
		Senior Developer	80 hrs	\$8,400.00	Work			80h			
		Developer 1	80 hrs	\$6,800.00	Work			80h			
		Developer 2	79.2 hrs	\$6,732.00	Work			79.2h			
		Documentation Specialist	40 hrs	\$2,200.00	Work			40h			
18	1.4.1	Data Entry/Editing	0 hrs	\$0.00	Work						
19	1.4.2	System Security and Profile	0 hrs	\$0.00	Work						
20	1.4.3	Test Data Access Via Microsoft Access and Ex	0 hrs	\$0.00	Work						
21	1.5	System Redevelopment	440 hrs	\$42,600.00	Work			418h	22h		
		Project Manager	80 hrs	\$10,000.00	Work			76h	4h		
		Senior Developer	160 hrs	\$16,800.00	Work			152h	8h		
		Developer 1	80 hrs	\$6,800.00	Work			76h	4h		
		Developer 2	80 hrs	\$6,800.00	Work			76h	4h		
		Documentation Specialist	40 hrs	\$2,200.00	Work			38h	2h		
22	1.5.1	Multi - Organizational Structure Design	0 hrs	\$0.00	Work						
23	1.5.2	System Security and Profile Development	0 hrs	\$0.00	Work						
24	1.5.3	Leak Tracking Data Structure Design	0 hrs	\$0.00	Work						
25	1.5.4	Web-based Data Entry Forms - Entry and Edit	0 hrs	\$0.00	Work						
26	1.6	Ongoing Development and Production Environi	240 hrs	\$21,200.00	Work				240h		
		Project Manager	40 hrs	\$5,000.00	Work				40h		
		Senior Developer	80 hrs	\$8,400.00	Work				80h		
		Developer 1	20 hrs	\$1,700.00	Work				20h		
		Developer 2	20 hrs	\$1,700.00	Work				20h		
		Documentation Specialist	80 hrs	\$4,400.00	Work				80h		
27	1.6.1	Create Development, Preproduction and Product	0 hrs	\$0.00	Work						
28	1.6.2	1st Rollout to Production	0 hrs	\$0.00	Work						

Source: Schumaker & Company Analysis

**Exhibit XII-8
Project Cost Estimate
Page 2 of 2**

ID	WBS	Task Name	Work	Cost	Details	2nd Half		1st Half		2nd Half
						Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3
29	2	HRW and UAW Reporting Database Design and Deve	2,939.6 hrs	\$284,094.00	Work			1,509.2h	1,068.4h	362h
30	2.1	System Design	754 hrs	\$76,270.00	Work			754h		
		<i>Project Manager</i>	232 hrs	\$29,000.00	Work			232h		
		<i>Senior Developer</i>	232 hrs	\$24,360.00	Work			232h		
		<i>Developer 1</i>	232 hrs	\$19,720.00	Work			232h		
		<i>Documentation Specialist</i>	58 hrs	\$3,190.00	Work			58h		
31	2.1.1	Multi - Organizational Structure Design	0 hrs	\$0.00	Work					
32	2.1.2	System Security and Profile Development	0 hrs	\$0.00	Work					
33	2.1.3	Accounted for Water and Other Information	0 hrs	\$0.00	Work					
34	2.1.4	Web-based Data Entry Forms - Entry and Edit	0 hrs	\$0.00	Work					
35	2.1.5	Standard Reports	0 hrs	\$0.00	Work					
36	2.2	System Development	1,048 hrs	\$99,400.00	Work			755.2h	292.8h	
		<i>Project Manager</i>	180 hrs	\$22,500.00	Work			144h	36h	
		<i>Senior Developer</i>	240 hrs	\$25,200.00	Work			192h	48h	
		<i>Developer 1</i>	120 hrs	\$10,200.00	Work			96h	24h	
		<i>Developer 2</i>	240 hrs	\$20,400.00	Work			192h	48h	
		<i>Documentation Specialist</i>	60 hrs	\$3,300.00	Work			48h	12h	
37	2.2.1	Multi - Organizational Structure Development	0 hrs	\$0.00	Work					
38	2.2.2	System Security and Profile Development	0 hrs	\$0.00	Work					
39	2.2.3	Accounted for Water and Other Information	0 hrs	\$0.00	Work					
40	2.2.4	Web-based Data Entry Forms - Entry and Edit	0 hrs	\$0.00	Work					
41	2.2.5	Standard NRW Reports	208 hrs	\$17,800.00	Work			83.2h	124.8h	
		<i>Project Manager</i>	8 hrs	\$1,000.00	Work			3.2h	4.8h	
		<i>Senior Developer</i>	20 hrs	\$2,100.00	Work			8h	12h	
		<i>Developer 1</i>	80 hrs	\$6,800.00	Work			32h	48h	
		<i>Developer 2</i>	80 hrs	\$6,800.00	Work			32h	48h	
		<i>Documentation Specialist</i>	20 hrs	\$1,100.00	Work			8h	12h	
42	2.3	Data Conversion	0 hrs	\$0.00	Work					
43	2.3.1	Wilkes-Barre	0 hrs	\$0.00	Work					
44	2.3.2	Pittsburgh	0 hrs	\$0.00	Work					
45	2.4	System Pilot Testing	357.6 hrs	\$33,924.00	Work					357.6h
		<i>Project Manager</i>	79.2 hrs	\$9,900.00	Work					79.2h
		<i>Senior Developer</i>	79.2 hrs	\$8,316.00	Work					79.2h
		<i>Developer 1</i>	79.2 hrs	\$6,732.00	Work					79.2h
		<i>Developer 2</i>	79.2 hrs	\$6,732.00	Work					79.2h
		<i>Documentation Specialist</i>	40.8 hrs	\$2,244.00	Work					40.8h
46	2.4.1	Data Entry/Editing	0 hrs	\$0.00	Work					
47	2.4.2	System Security and profile	0 hrs	\$0.00	Work					
48	2.4.3	Reported Results	0 hrs	\$0.00	Work					
49	2.5	System ReDevelopment	660 hrs	\$63,900.00	Work					418h 242h
		<i>Project Manager</i>	120 hrs	\$15,000.00	Work					76h 44h
		<i>Senior Developer</i>	240 hrs	\$25,200.00	Work					152h 88h
		<i>Developer 1</i>	120 hrs	\$10,200.00	Work					76h 44h
		<i>Developer 2</i>	120 hrs	\$10,200.00	Work					76h 44h
		<i>Documentation Specialist</i>	60 hrs	\$3,300.00	Work					38h 22h
50	2.5.1	Multi - Organizational Structure Design	0 hrs	\$0.00	Work					
51	2.5.2	System Security and Profile Development	0 hrs	\$0.00	Work					
52	2.5.3	Accounted for Water and Other Information	0 hrs	\$0.00	Work					
53	2.5.4	Web-based Data Entry Forms - Entry and Edit	0 hrs	\$0.00	Work					
54	2.5.5	Standard NRW Reports	0 hrs	\$0.00	Work					
55	2.6	Ongoing Development and Production Environ	120 hrs	\$10,600.00	Work					120h
		<i>Project Manager</i>	20 hrs	\$2,500.00	Work					20h
		<i>Senior Developer</i>	40 hrs	\$4,200.00	Work					40h
		<i>Developer 1</i>	10 hrs	\$850.00	Work					10h
		<i>Developer 2</i>	10 hrs	\$850.00	Work					10h
		<i>Documentation Specialist</i>	40 hrs	\$2,200.00	Work					40h
56	2.6.1	1st Rollout to Production	0 hrs	\$0.00	Work					
57	3	Pavement Tracking Database Development	0 hrs	\$0.00	Work					
58	4	Hit Facility Tracking and Reporting	0 hrs	\$0.00	Work					
59	5	Permit Tracking and Reporting	0 hrs	\$0.00	Work					
60	6	Leak Reporting Integration with GIS	0 hrs	\$0.00	Work					

Source: Schumaker & Company Analysis

XIII. Phase III Human Resources

This chapter addresses a *Phase III* project in the Human Resources (HR) area and its impact on Pennsylvania-American Water Company (PAWC) operations.

A. Background & Perspective

Among the 13 Human Resources findings Schumaker & Company presented in *Chapter II – Executive Management, External Relations, & Human Resources* are three key findings that supported our need to conduct the *Phase III – Human Resources* project:

- ◆ *Finding II-10* Human Resources does not have standard metrics and does not make regular reports of its contribution.
- ◆ *Finding II-13* Pennsylvania (PA) training and development is focused on technical training and has not aligned to the broader strategic HR needs of PAWC.
- ◆ *Finding II-14* PAWC's Human Resources and executive management have recognized the loss of human capital and the potential for a large number of retirements in coming years but have not developed a plan to respond to these needs.

Consistent with our recommendations to take action in these areas, with the Pennsylvania Public Utility Commission's concurrence, Schumaker & Company presented a proposal to the President of Pennsylvania-American Water Company that offered our support in these areas. Following an initial meeting with the PAWC President, Schumaker & Company consultants met again with the President and her direct reports to review PAWC's strategic direction and to examine how Human Resources can best support the business strategy. During this session, two key strategic priorities emerged:¹¹

1. *External focus:* This priority seeks to reconnect PAWC and its employees with external stakeholders, including municipal officers, community representatives, customers, fire departments, regulators, and legislators.
2. *Growth of company:* This priority reaffirms PAWC's intention to expand its operations in Pennsylvania. It was emphasized during the meeting that it is every employee's job to grow the company and that all should have a growth-related objective.

With these priorities clarified, a project team was formed consisting of the Regional HR Director, the HR Manager for Pennsylvania, the Regional Training and Development Manager, and the Vice President of Operations for PAWC. A staff auditor from the Pennsylvania Public Utility Commission (PaPUC) and two Schumaker & Company consultants also participated in the effort. The team met 12 times with each meeting lasting four or more hours.¹²

B. Project Team Deliverables

The team first addressed the Human Resources scorecard and those results are presented in the following section of this chapter. The majority of the team's time was spent developing an approach to workforce planning. Implementation of this project by PAWC will continue through 2009. The results of the team's effort in this area are also discussed in a later section of this chapter. Finally, the team gave consideration to the need to more fully align Human Resources to the strategic priorities of PAWC. Brief discussion of this effort is provided as well in this chapter.

The project team produced the following six tangible deliverables that PAWC will use going forward:

1. Business Strategy Summary
2. Human Capital Scorecard
3. Workforce Planning and Replenishment Project Model
4. Workforce Planning and Replenishment Phase I Project Plan (Microsoft Project®)
5. Retirement data pivot table (for analysis of retirement eligibility by person, location, and job classification) (Microsoft Excel®)
6. HR/Organization Development (OD) Strategy Matrix

Items 1, 3, 4, and 5 are considered competitively sensitive, company-confidential documents and are not included in this report. However, the major elements of the *Phase III* HR project are discussed in this chapter.

Human Capital Scorecard

Schumaker & Company has strongly made the point that the HR function must be accountable to the business and be able to quantify its contribution. This recommendation reflects a broader trend in Human Resources to be a "business partner" and to play a greater role in achieving organizational success. The Human Capital scorecard, based on the format of the balanced scorecard, is a key management tool to strengthen HR's strategic influence within the organization.¹³ Through considerable deliberation, the project team set four objectives that would ultimately shape the scorecard.

1. The new scorecard should be constructed within the framework of the four balanced scorecard quadrants (finance, customer, process, and employee) used throughout American Water.
2. The scorecard should emphasize human capital measures over HR efficiency measures (time and cost). Human capital measures reflect the collective knowledge, skills, and abilities of people to contribute to organizational success. This assessment, like any other, is to be developed and utilized to PAWC's advantage.¹⁴

3. Consistent with the human capital perspective, the scorecard should emphasize leading rather than lagging indicators. Leading indicators describe outcomes that are considered key to future success. Lagging indicators report on events that have already occurred; that is, they reflect past performance.
4. Finally, the scorecard should reflect shared accountabilities between Human Resources and business leaders. Measures that reflect Human Resources' activity alone are most likely to be lagging indicators. If Human Resources is a strategic partner, then the success of managing human capital is the result of the partnership between HR and business leaders who deploy and manage these assets (employees).

Exhibit XIII-1 (on the following page) lists the 14 measures in the PAWC Human Capital scorecard and provides a brief explanation of what is being measured by each.

Financial Measures

The financial measures contain only one traditional HR financial measure: "budget to actual." The project team chose instead to focus on how HR can affect the financial performance of PAWC by assuring that the company is hiring and retaining top talent. These measures look at the number of new hires who remain with PAWC past the first year and the retention of top performers (as measured in the performance evaluation process).

A related measure, "human capital loss risk," looks at the number of job classifications that have current assessments of retirement loss risk and the associated loss of institutional knowledge. This measure directly relates to the workforce planning and replenishment discussed later.

Finally, the scorecard also measures unscheduled absence rate. Unscheduled absences are defined as any absence from work other than vacation and holidays. Such absences include sick, personal, injury, Family Medical Leave Act (FMLA), and short-time disability (STD)/long-term disability (LTD) time. Although there is no indication that unscheduled absence rates are high at PAWC, they are a potentially enormous cost driver and one that every company should be measuring and managing.

Customer Measures

The scorecard measures employee and manager satisfaction with HR. This measurement will be accomplished through periodic surveys that allow internal customers to provide general feedback on HR and specific feedback on services that were used. For example, hiring managers will be able to comment on their satisfaction with HR's management of the hiring process.

**Exhibit XIII-1
PAWC Human Capital Scorecard
as of March 31, 2008**

Perspective	Measure	What This Measures
Finance	HR budget/actual	Basic measure of financial performance.
	First 12 months' turnover rate	Measures staffing function performance. Reflects the quality of hires.
	Top performer retention rate	Reflects many aspects of HR performance and corporate culture. Top talent retention is a critical strategic objective. Reflects cost avoidance of turnover costs and organizational performance.
	Unscheduled absence rate	Measures a critical aspect of workforce availability. Reflects reduced absenteeism costs and OT avoidance. Also reflects organization culture (Do employees want to come to work?).
	Human capital loss risk	Measures the degree to which HR is managing workforce retention and replenishment. Reflects the degree to which PAWC is safeguarding the loss of institutional knowledge.
Customer	Satisfaction	Measures individual employee satisfaction with HR services (meeting personal needs not organizational needs).
		Measures manager's satisfaction with HR services (support of organizational needs).
		Measures supervisor's satisfaction with training.
		Measures hiring manager's satisfaction with hiring process (includes timeliness, communication, quality of advice, quality of job definition, quality of results, etc.).
		Measures new employee satisfaction with hiring process (includes timeliness, communication, realistic job preview, on boarding, etc.).
Process	Time to fill vacancies	Cycle time measure of staffing process. (The average length of time it takes to fill an open requisition.)
	Candidate quality	Measures the degree to which HR is successful in attracting a highly qualified candidate pool.
	Percentage of exempt and nonexempt positions filled by diverse (women & minorities) display as two measures	Measures the degree to which PAWC is successful in hiring diverse managers and professionals.
Employee (Learning & Growth)	Leadership competency score	Reflects HR's success in developing core competencies of PAWC managers. A key measure of leadership talent.
	Employee engagement	Measures employee attitudes related to many aspects of HR and PAWC as a whole. A key performance indicator (KPI) of organizational culture.
	Internal promotion rate	Reflects HR's success at developing talent. A KPI of bench strength.
	Discrimination charges (agency) filed per hundred employees	Measures organization culture.
	Grievances filed per hundred employees	Measures labor relations climate.

Process Measures

There are literally hundreds of measures of HR's process efficiency and effectiveness. Unfortunately, most are not particularly good measures of HR's contribution to organizational effectiveness. The challenge presented to the project team was to identify the critical few that are most relevant to the HR group in Pennsylvania. Diversity hiring is included here as an indicator of PAWC's success in executing its affirmative action plan and hiring goals.

Employee (Learning and Growth)

The employee measures selected for the scorecard reflect a range of factors. The "leadership competency" scores reflect the quality of leadership in PAWC and the success in developing leaders. The "employee engagement" measure is determined through multiple items on the employee survey. This measure reflects a commitment to undertaking the employee survey as recommended in *Chapter VII – Culture, Management Structure, and Staffing Levels*. The "internal promotion rate" measure is a further indication of the quality of people hired, the success of employee development efforts, and PAWC's commitment to creating career opportunities for its employees. The "grievance rate" and "discrimination charges" measures are key indicators of the climate of the organization.

A number of concerns remain regarding this scorecard. It contains a relatively large number of measures, and there are some challenges to collecting the data that have not been fully resolved. In addition to the scorecard, the project team worked on developing an implementation schedule and on identifying data collection methods. The scorecard itself may be modified based on actual experience.

Workforce Planning and Replenishment

Aging Workforce

Perhaps the most pressing issue facing nearly all utilities is the aging of its workforce. Today, the average American worker is over 40 years old. In the water and wastewater utility industry, the average worker's age is more than 44 years.¹⁵ The American Water Works Association Research Foundation (AWWARF) concluded in a 2005 study that more than 50% of the current workers will no longer be at their utility in 10 years.¹⁶

One key factor may moderate the effect of these trends. Older worker participation in the labor force is increasing. In the 1970s and 1980s, fewer than 30% of workers 55 and older were active in the labor force. By 2006, participation had grown to 38%. Older workers are more educated, are leading healthier lives, and are living longer. All of these factors increase the likelihood of remaining in the workforce in some capacity.¹⁷

Changing Demographics

At the same time that an unprecedented number of workers are exiting the workforce, the pool of technically skilled workers is shrinking.¹⁸ In addition, younger workers have different expectations about work, and increasingly, the employer/employee relationship is shorter and less stable. Women and minority participation in the workplace is likely to increase.

Growing Demand for Operators

Employment of water and wastewater treatment plant and system operators is expected to grow by 14% between 2006 and 2016, which is faster than the average for all occupations. An increasing population and the growth of the economy are expected to boost demand for water and wastewater treatment services. As new plants are constructed to meet this demand, new water and wastewater treatment plant and system operator jobs will arise.¹⁹

Implications

Given these employment and workforce challenges, the AWWRD identified the following implications for water utilities:

- ◆ Workforce expectations regarding work/life balance may change.
- ◆ Filling technical positions in engineering and treatment operations may become difficult and expensive. Wages for operators and engineers will likely rise.
- ◆ The workplace will need to be sensitive to the needs of working parents and older workers.
- ◆ Good communicators will be especially valued in utility organizations.
- ◆ Large numbers of technically skilled “baby boomer” staff will soon be retiring; drinking water utilities will have to manage the personnel “crunch.”
- ◆ The challenge of managing a multi-generational, multi-ethnic workforce will continue for water utilities across the nation.
- ◆ Drinking water treatment and ancillary (communications, database, etc.) technologies are becoming increasingly complex. Utility managers will have to exploit these new technologies.
- ◆ Water utility managers will need new tools to acquire and retain good employees who will be dedicated to protecting public health and the environment.
- ◆ Labor union issues may grow in importance as cost-cutting and automation reduce job opportunities (in existing classifications). Contract negotiations could become increasingly difficult.

The Harvard Business Review suggests that an aging workforce will compel businesses to change how they operate and could even threaten companies' viability.²⁰ Construction and utilities will be particularly hard hit.²¹

PAWC's Aging Workforce

These demographic and industry trends are evident at PAWC. At first glance, the level of employees who are eligible to retire seems relatively low. Over the next five years, about 7% of PAWC's workforce will reach age 65, the normal retirement age.²² Unfortunately, it is likely that many more will retire prior to their 65th birthday. Most PAWC employees are eligible for early retirement when their age added to years of service equals 70. In fact, using the "rule of 70," nearly one-third of PAWC employees will be eligible for retirement over the next five years.²³

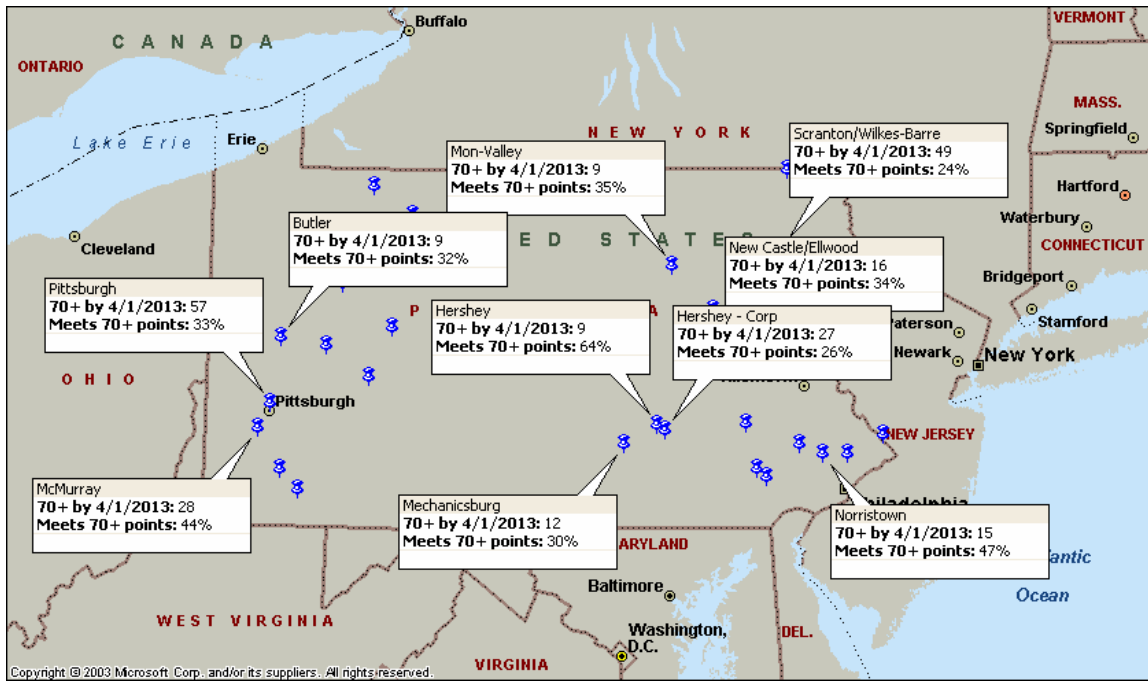
Different employee groups have slightly different pension-payout and benefit-eligibility rules. These differences may affect early retirement decisions, but in general, those employees who have been with PAWC the longest have the most generous pension and benefit plans.²⁴ As such, the effect of differences is likely to be slight.

In certain job categories, the size of the retirement-eligible group is even greater than the overall average. For example, 46% of the field services utility persons will be eligible for retirement in the next five years. Given the physical nature of the work, it is reasonable to assume that many will exercise their retirement options. Almost 51% of the supervisors and superintendents in field services are eligible for early retirement in the next five years.²⁵ These positions are particularly difficult to fill.²⁶

Our analysis of person-specific detail identified significant risk areas. For example, five of the 16 meter servicemen in Bethel are 55+ with an average "rule of 70" score of 77. Eight network supervisors in western Pennsylvania are 55+ with an average "rule of 70" score of 88. These individuals possess unique critical knowledge of both the system and the industry as a whole.²⁷

Some locations have an older workforce than others. *Exhibit XIII-2* shows the percentage of employees who are eligible to retire over the next five years by locations where PAWC has operations. For example, the workforce at Coatesville is relatively young, with only five of 27 employees eligible for early retirement in the next five years. Hershey (not including PAWC corporate staff), on the other hand, has nine of 14 eligible for early retirement in the next five years. In fact, seven of those nine are eligible this year.²⁸ A further breakdown of the data beyond what we can display in the map shows the more critical situations. For example, 45% of all staff at the Pittsburgh – Hayes plant and 56% of all staff at the Pittsburgh – Aldrich plant will be eligible for retirement in the next five years. Fully 100% of the seven staff members in the administrative group at McMurray are eligible for retirement this year.

Exhibit XIII-2
Percentage of Employees Eligible for Early Retirement in the Next Five Years by Selected Locations as of April 1, 2008



Source: Information Response 850

It is not the point of this report to do an exhaustive analysis of the retirement data. We have chosen to highlight certain points to demonstrate the criticality of the situation. Further analysis will, of course, be required.

Of course, the number of employees who are eligible to retire does not tell us how many will actually retire. What is known is that defined benefit pension plans with generous health benefits, such as that offered by PAWC, encourage early retirement.²⁹

Workforce Planning and Replenishment

Given the potentially serious consequences of a large number of employees retiring in the foreseeable future, the project team spent the majority of its time on clarifying PAWC’s approach to workforce planning and replenishment and on developing a project plan for implementation.

The project team’s effort expands on a workforce replenishment whitepaper prepared by the Regional Human Resources Director that lays out potential strategies.³⁰ The team also expanded on existing plans for a pilot knowledge-loss risk assessment that was planned for western PA locations.³¹ After considerable discussion regarding the definition of this project, the project team identified three key objectives that would guide workforce planning and replenishment:

1. Ensure continuity in critical institutional knowledge
2. Ensure next-generation employees meet the future requirements of PAWC
3. Moderate the impact of high levels of attrition

Based on this clarification, the project team developed a model of the effort. This project model is considered competitively sensitive and, therefore, is not included in this report. However, generally the model identifies the significant objectives and desired outcomes, and lays out various steps necessary to achieve these outcomes in two phases. *Phase I* is primarily focused on the assessment elements of the project. *Phase II* focuses on identifying and implementing strategies that meet the needs identified in the assessment phase. As such, the specifics of *Phase II* are not yet defined. The *Phase I* elements of the project are discussed below.

Critical Knowledge Risk Management

This component of the project is a recommitment of PAWC HR to complete a previously planned pilot of a knowledge-loss risk assessment and retention process developed by Tennessee Valley Authority (TVA). This approach differs from most workforce planning in that it does not focus on general replacement of retiring workers or filling of labor gaps. The TVA approach allows a company to identify critical positions where knowledge loss is the greatest threat. It also helps prioritize the specific knowledge and skills risk through the calculation of a position risk factor. Finally, the process helps a company develop actionable response to mitigate this loss.³²

Risk mitigation strategies include codification, education training, process reengineering (primarily technology implementation), and the use of alternative resources, including contractors, part-time employment, and retiree programs.³³

Phase I of this effort is aimed at completing the pilot risk assessment and at identifying the appropriate response. Implementation of these responses and expansion of the process to other PAWC locations are to be included in *Phase II* of this effort. The work plan developed by the project team lays out the specific steps and timetable for implementation.

Workforce of the Future

This component of the project is aimed at assuring that newly-hired workers meet the future requirements of PAWC. The *Phase I* deliverable is a competency model that defines the knowledge, skills, abilities, and attributes of the future workforce. This competency model will likely drive changes in job descriptions and potentially the redesign to entire classifications. It will certainly drive the recruitment plans of PAWC.

Job changes and recruitment plans will be defined and implemented in *Phase II* of the workforce planning and replenishment project. Critical to any recruitment plan will be a strong relationship to PAWC's diversity initiative.

Retiree Retention

Another component of the workforce planning and replenishment project aims to create opportunities to retain retirees in some form of alternative employment with PAWC. Employees who take early retirement often do not wish to fully exit the workforce, but pension plan restrictions limit their opportunities to remain involved. Although legal and policy barriers exist to returning retirees to the PAWC workforce, PAWC HR has already begun to identify and address these issues. This work will continue in *Phase I* of the workforce planning and replenishment project.

Recognizing the value of the human capital that is walking out the door will certainly lead to alternative work arrangements for retirees. Such alternatives will allow retirees to continue some level of involvement with PAWC without jeopardizing their retirement benefits. These individuals are especially valuable as mentors to new and existing employees, and they can make a substantial contribution to reducing the risk associated with the loss of institutional knowledge. The specifics of these alternative work arrangements are to be defined in *Phase II* of the project.

Project Plan

A highly-detailed project plan was developed by the project team and is considered competitively sensitive and is not included in this report. The project plan details *Phase I* aspects of the workforce planning and replenishment project and goes through 2009. The work plan also specifies the steps to define key elements of *Phase II* of the project.

Strategic Alignment

A concern raised in *Chapter II – Executive Management, External Relations, & Human Resources* is that PAWC Human Resources in general and the Organization Development function in particular were not sufficiently aligned to PAWC's strategic directions. This report comes at a time of transition for PAWC with the appointment of a new President and the divestiture of PAWC from its European parent.

This element of the *Phase III* project was aimed at clarifying PAWC's strategic direction, strengthening the dialogue between HR and the business leaders of PAWC, fine-tuning existing HR/OD efforts, and looking at additional ways that HR/OD can support PAWC on a strategic level. This is a complex effort that cannot be fully accomplished within the brief time span of this *Phase III* project.”

As a result of the work performed so far, we have achieved greater clarity regarding PAWC's strategic priorities: *external focus* and *growth*. Considerable work remains on bringing further definition to these priorities and on translating strategy into action. After a somewhat difficult start, substantial progress has been made on improving the strategic partnership between HR and business leadership. The participation of the Vice President of Operations for PAWC on this project team was certainly a contributing factor.

The HR leaders continue to develop a detailed strategy matrix that aligns HR activities to the strategic priorities of PAWC. *Exhibit XIII-3* presents a high-level overview of how HR will support these priorities. The HR objectives on the top row are drawn from a document developed by the American Water Human Resources organization in March 2008 for use by the entire company. *Managing Our People Together: Shared Accountabilities* lays out HR objectives, a high-level description of HR programs, and the activities and leadership team accountabilities that are necessary to achieve them.³⁴

**Exhibit XIII-3
Strategy Matrix
April 1, 2008**

PAWC Strategic Priorities	PAWC Human Resources Objectives		
	Assure skilled and diverse workforce availability.	Support a high-performing organizational culture.	Support effective leadership and business strategy.
External Focus	Develop external partnerships that support skilled and diverse employee availability.	Develop external focus competency at all levels of PAWC.	Integrate external focus in performance management and development.
Growth	Implement comprehensive workforce planning and replenishment that assures a skilled and diverse workforce of the future.	Effectively assimilate new, transferred, or newly promoted employees into PAWC.	Partner with PAWC business leaders to support mergers and acquisition.

Source: Project team deliverables

External Focus

PAWC HR/OD is already engaged in several key external partnerships, including the PA Utilities Industry Partnership (facilitated by the Keystone Development Partnership), which are aimed at supporting job training and developing interest in careers in water. In addition, the PAWC OD Director has played a major role in the PAWC Labor-Management Training Committee to address the training needs of the company.³⁵ HR will continue to look for external partnerships that support PAWC's success.

In our initial discussion with PAWC business leaders, several spoke of how many managers were not sufficiently skilled in identifying and developing key external relationships. As a result of this identified need, HR plans to recommend the addition of an external focus competency for managers into the existing American Water competency dictionary, which determines the competencies that are used for performance evaluation and development. If incorporated, this competency would be integrated into existing and future management development plans and programs.

Growth

Perhaps no other issue affects future growth than the availability of highly-skilled employees. The workforce planning and replenishment effort, as described in this report, is essential to the long-term growth and viability of PAWC.

In addition, HR will continue to assure that new employees (new hires and employees who join PAWC through acquisitions) will be effectively assimilated into the company. Such efforts include existing programs, such as Basic *Water Business*, as well as new initiatives aimed at the specific needs of new employees.

Moreover, HR will continue to support mergers and acquisitions from due diligence through post-merger integration. Existing approaches and protocols will need to be formalized to assure that HR has the necessary resources and is ready to respond as growth opportunities emerge.

C. Findings & Conclusions

Finding XIII-1 The models and plans developed as part of this Phase III project provide clear direction for HR's efforts to assist PAWC management in meeting its strategic priorities. Substantial work remains to implement these projects.

The six deliverables developed as part of this *Phase III* project provide a basis for implementation projects. HR must continue its implementation efforts and report regularly on its progress.

Finding XIII-2 PAWC HR does not have all the resources necessary to implement the projects defined in the Phase III effort

Considerable discussion with PAWC HR management has occurred regarding the need for additional resources to fully implement these projects (Human Capital scorecard, Phase I and II of workforce planning and replenishment, and yet to be specified projects associated with supporting PAWC's business strategy). HR must complete a more detailed resource request and provide it to PAWC management for funding and hiring approval, as necessary.

D. Recommendations

Recommendation XIII-1 Provide resources and perform timely implementation of the six deliverables developed as part of this Phase III project. (Refer to Finding XIII-1 and Finding XIII-2)

During the course of this project, PAWC Human Resources has made substantial progress in addressing the findings discussed by Schumaker & Company earlier in this chapter. Considerable work remains and it is certain that additional resources will be required to implement the models and plans developed as part of this *Phase III* project, specifically those in the following areas:

- ◆ Human capital scorecard
- ◆ Workforce planning and replenishment
- ◆ Strategic alignment

Timely implementation of the tasks identified in these three areas is essential to HR aligning its activities to those of PAWC's strategic priorities.

PAWC leadership must provide resources to assure that this work is completed on schedule. In addition, operational management plays a key role in the implementation. HR cannot implement these initiatives without line management's direct involvement and participation.

American Water has been working to define shared accountabilities within the company³⁶ and this project reflects the necessity of all parties to deliver on these accountabilities. Continuing to develop the partnership between Human Resources and the PAWC business leadership will contribute substantially to the success of this effort.

XIV. Appendix A: Data and Statistics

Pennsylvania-American Water Company (PAWC) is a public utility under the Pennsylvania Public Utility Code subject to regulation by the Pennsylvania Public Utility Commission (PaPUC). Incorporated in July 1904, it is the largest investor-owned water utility in the state, providing water and/or wastewater services to over 630,144 water customers and over 14,576 wastewater customers in 35 of Pennsylvania's 67 counties. The population in its service territory is more than two million. PAWC has nearly 1,000 employees. PAWC operates under rules and regulations established by the PaPUC, Department of Environmental Protection (DEP), and U.S. Environmental Protection Agency (EPA). It operates some 36 water treatment plants, four wastewater facilities, 100+ well stations, and a distribution system of more than 9,200 miles. Its source of supply is approximately 92% surface, 6% wells, and 2% purchases.³⁷ (Refer to *Chapter V – Water Operations* for a more detailed discussion of PAWC's operations.)

PAWC is headquartered in Hershey, Pennsylvania and is a wholly owned subsidiary of American Water Works Company founded in 1886 as the American Water Works & Guarantee Company and reorganized in 1947 as American Water Works Company, Inc. With a history of over 100 years, American Water provides water, wastewater, and other water-related services to approximately 15.6 million people in 32 states and Canada and has partnered with many municipalities within their non-regulated products and services group to maintain and operate municipal systems. American Water has revenues of approximately \$2.2 billion and employs approximately 7,000 professionals. In addition to its regulated operations in Pennsylvania, American Water manages the Meadville Area Water Authority, serving an additional 16,000 people. American Water is an integrated part of RWE AG (Essen, Germany), a leading Germany utility company. In fiscal 2005, RWE reported 41.8 billion Euros in revenue and employees of approximately 86,000.³⁸

This appendix details PAWC's operations and financial performance. It is divided into two sections:

- ◆ *Section I:* PAWC's annual data and compound growth percentage by category over a ten-year period (1997 to 2006)
- ◆ *Section II:* Comparative analysis of PAWC to a select group of water utilities over a five-year period (2002 to 2006), including:
 - Non-American Water companies (individually and subtotaled)
 - Aqua Pennsylvania (Aqua PA)
 - Aquarian Connecticut (Aquarian CT)
 - San Jose Water Corporation
 - American Water companies (individually and subtotaled)
 - Elizabethtown Water
 - Missouri-American Water Company
 - New Jersey-American Company

Schumaker & Company has reviewed the *National Association of Water Companies (NAWC) Financial and Operating Data for Investor-owned Water Utilities* covering years 1997 through 2006 and other documents furnished by the PaPUC, regulated water utility companies operating in Pennsylvania, and a few select non-Pennsylvania based companies. NAWC publishes relevant information on financial and physical operations. Collected data include all line items from balance sheet, income statement, cash flows, plant in service, depreciation, depletion and amortization, taxes, salaries, operating revenue, sales, number of customers, operation and maintenance expenses, environmental facilities and expenses, and much more.

For many years, water utilities have been referred to as “silent servants.” This was an appropriate descriptor. The operation of water utilities 15 years ago was characterized by consistently low rates, availability of generally inexpensive water supplies, infrequent contact with the public and the regulatory community (at least in comparison with today), relatively unchanging drinking water regulations, only gradual introduction of computerization, and an infrastructure that was for the most part “out of sight, out of mind.” There was little innovation because it was not perceived to be needed.

Today, new challenges are making water operations a dynamic and rapidly changing environment, requiring increased interaction between the functional areas, new technologies, expanded capabilities from staff personnel, and for some utilities, re-evaluation of utility philosophies. Utilities have had to increase staff and obtain new technical skills. Many utilities have had to re-assess the extent to which analytical laboratory functions should remain in-house. New regulations, such as those pertaining to the disposal of sludge and the protection of aquatic wildlife, have also had important implications on water utility operations. One effect of these regulations has been to decrease the accessibility of water supplies and/or increase the cost of developing new supplies. In addition, many utilities have had to deal with the possibility that their current raw water sources may be inadequate over the long-term. Because of the combination of these factors, techniques used to determine “least-cost” long-term supply planning alternatives have become more rigorous for many utilities. Demand management, conservation, and other non-conventional solutions have become important elements in long-term planning. The implications on water rates have resulted in greater interaction between the engineering design, finance and rates, and customer relations departments of many utilities throughout the long-term planning process.

Infrastructure rehabilitation, establishment of new rate structures that encourage (as oppose to discourage) water conservation, and computerizing the system wherever possible to achieve greater efficiencies of operation are just some of the pressing needs facing water utilities. The now successful water utility is one that seeks to cope with the demands of the following:

- ◆ *Maintaining Compliance with the Safe Drinking Water Act (SDWA) Amendments and Other Regulations* – Much of the initial challenges of SDWA are behind the largest utilities. Nonetheless, cost and compliance issues with regard to the disinfection byproducts rule, the lead and copper rule, radionuclide rule, groundwater contamination, and others are still important concerns. Some regulations impacting (or potentially impacting) water utilities include:

- Interim Enhanced Surface Water Treatment Rule
 - Long-term 1 Enhanced Surface Water Treatment Rule
 - Long-term 2 Enhanced Surface Water Treatment Rule
 - Stage 1 Disinfectants/Disinfection Byproducts Rule
 - Stage 2 Disinfectants/Disinfection Byproducts Rule
 - Filter Backwash Recycling Rule
- ◆ *Convincing the Public That Dramatic Increases in Water Rates are Justified* – Economists speak of the consumer’s “ability to pay” and “willingness to pay.” Environmental groups and other interest groups can force utilities, through public pressure, to become public relations experts.
 - ◆ *Addressing Accumulated “Deferred Maintenance” Problems* – Many water utilities have “unaccounted-for-water” percentages ranging from 15% to 40%. This is often tolerated because of the expense and disruption resulting from digging up and replacing old, leaky mains. This is an inefficient practice that must be corrected. If a utility is faced with constructing a filtration plant, the savings that can be realized in reduced design capacity as a result of reducing “unaccounted-for-water” percentages to 10% to 12%, more than justifies costs to replace aging mains.
 - ◆ *Dealing with Inadequate Quantities of Water* – Water shortages used to be a purely “west of the Mississippi” phenomenon. Water was plentiful in the East where the mean annual rainfall amounts to about 40 inches. This is no longer the case. Many utilities, east and west, face water shortages. Water conservation is a reality. This will manifest itself in a number of forms: peak period pricing, use of demand management techniques, 100% metering, reduction of leakage, adoption of rate structures which penalize excessive use, and public appeals to conserve.
 - ◆ *Attracting, Training, and Retaining Skilled Human Resources* – Water supply, though not often viewed as an environmental function, is nevertheless forced to compete with environmental firms, other utilities, and other governmental entities for skilled individuals. Implementing the Clean Water Act, the Clean Air Act, a reauthorized Resource Conservation and Recovery Act, Superfund, and other environmental laws requires huge amounts of money and many trained people. The growth of environmental engineering firms is constrained primarily by the lack of skilled people; thus, they look to water utilities, state government, and other related sectors for skilled individuals. Human Resource departments face other pressures, such as demands for higher skills, requirements for higher wages, and the need for detailed training (e.g., in water systems engineering, management, use of computers, etc.).
 - ◆ *Obtaining Capital* – Financing is always a major challenge for utilities. The limitations on tax-exempt financing posed by the Tax Reform Act of 1986, competition for capital make it difficult for water utilities to obtain the funding needed to make capital improvements, rehabilitate their systems, and obtain new sources of supply.



- ◆ *Moving to an Age of Automation* – Computerization is essential to increase productivity, achieve efficiency, and reduce costs. Many water utilities have installed Supervisory Control and Data Acquisition (SCADA) systems, others have computerized their billing systems, while still others have moved toward installation of automatic or central meter reading systems (AMR or CMR). As these technologies are demonstrated effective, more utilities will purchase and use automated systems.

In short, although it has become more difficult to develop solid conclusions from just looking at these numbers, this analysis is useful in providing some insights into the changes taking place at PAWC – recognizing the above issues.

A. Section 1 – PAWC

This section of the report uses NAWC as its major source of data and presents the annual statistics of Pennsylvania-American Water Company for the years 1997 through 2006.

- ◆ Total net plant in service
- ◆ Water sales by volume (millions of gallons)
- ◆ Operating revenue
- ◆ Total average number of customers (year-end)
- ◆ Total employees (year-end)
- ◆ Total operation and maintenance expense
- ◆ Miles of main in service
- ◆ Performance ratio expense

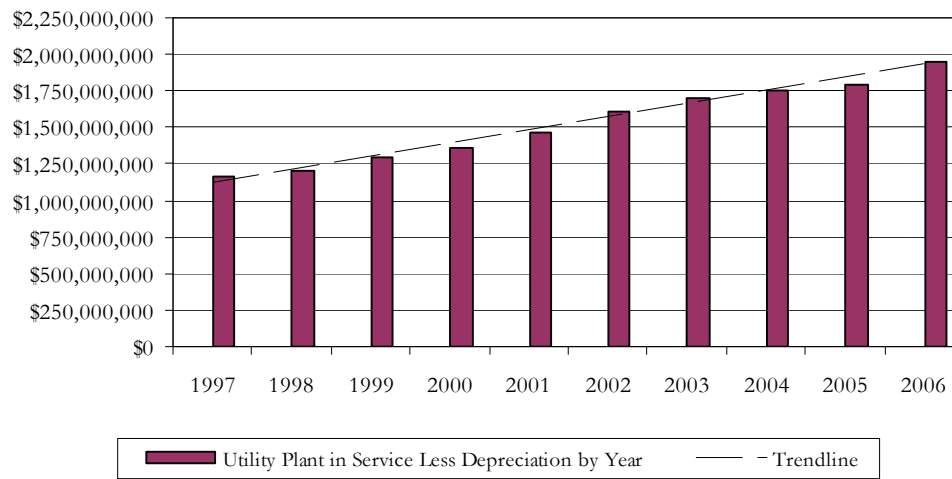
(PAWC 1997-2005 data is based on annual PaPUC reports under NARUC guidelines. The source information is not based on audited financial statements and, therefore, may not reflect audit adjustments (e.g., 2005 and 2006)).

Total Net Plant in Service

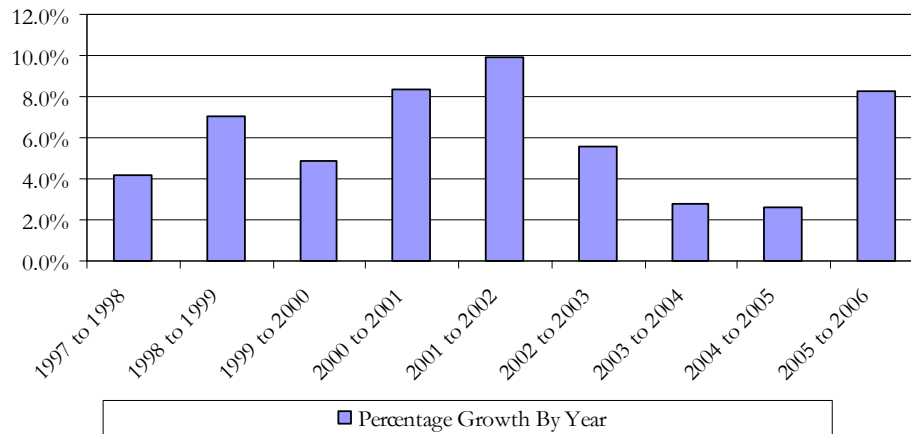
Exhibit XIV-1
Total Net Plant in Service

Financial & Operating Data	1997 Penn American (PAWC)	1998 Penn American (PAWC)	1999 Penn American (PAWC)	2000 Penn American (PAWC)	2001 Penn American (PAWC)	2002 Penn American (PAWC)	2003 Penn American (PAWC)	2004 Penn American (PAWC)	2005 Penn American (PAWC)	2006 Penn American (PAWC)	1997-2006 Compound Growth/Loss
Utility Plant in Service Less Depreciation	\$1,158,650,999	\$1,207,026,112	\$1,291,675,886	\$1,355,047,587	\$1,468,116,457	\$1,613,648,666	\$1,703,422,931	\$1,751,300,272	\$1,796,735,724	\$1,944,628,000	5.86%
Dollar Growth by Year		\$48,375,113 1997 to 1998	\$84,649,774 1998 to 1999	\$63,371,701 1999 to 2000	\$113,068,870 2000 to 2001	\$145,532,209 2001 to 2002	\$89,774,265 2002 to 2003	\$47,877,341 2003 to 2004	\$45,435,452 2004 to 2005	\$147,892,276 2005 to 2006	
Percentage Growth by Year		4.2%	7.0%	4.9%	8.3%	9.9%	5.6%	2.8%	2.6%	8.2%	

Net Plant by Year



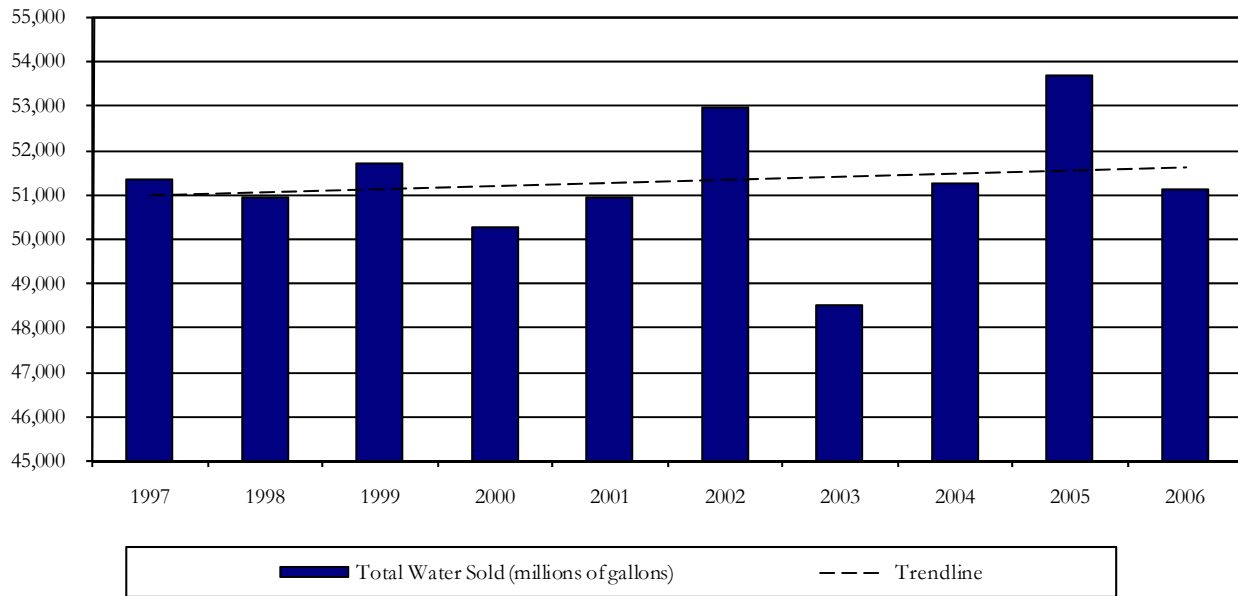
Percentage Growth by Year

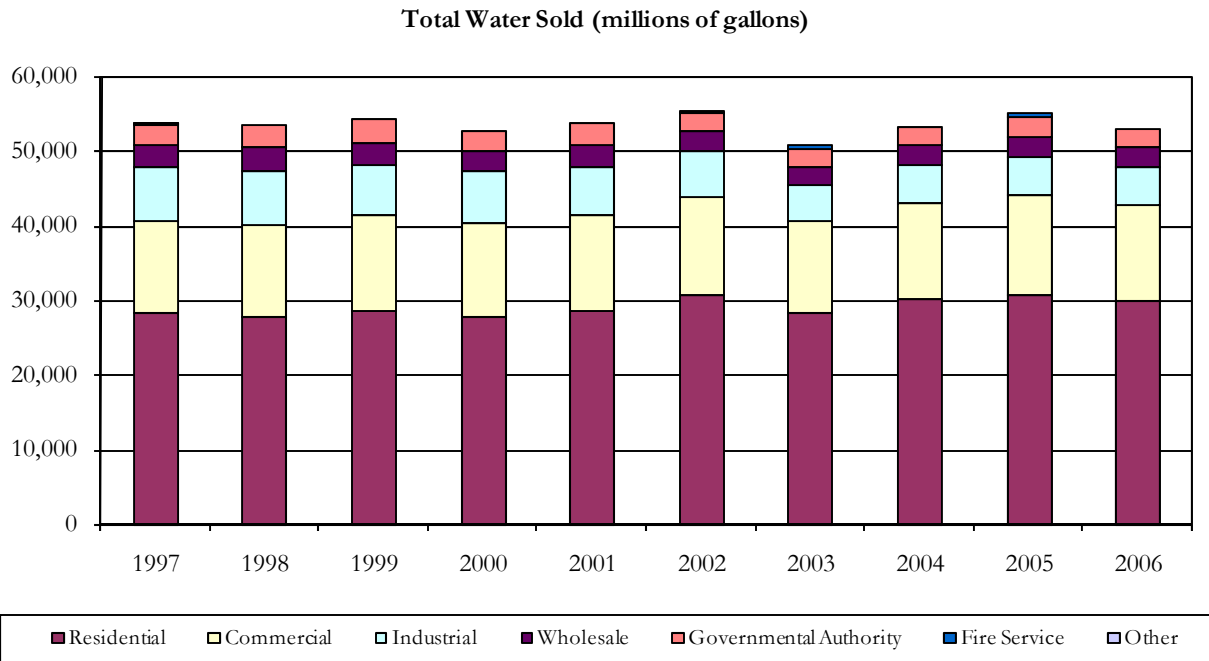


Water Sales by Volume (millions of gallons)

**Exhibit XIV-2
Total Water Sold**

Financial & Operating Data	1997 Penn American (PAWC)	1998 Penn American (PAWC)	1999 Penn American (PAWC)	2000 Penn American (PAWC)	2001 Penn American (PAWC)	2002 Penn American (PAWC)	2003 Penn American (PAWC)	2004 Penn American (PAWC)	2005 Penn American (PAWC)	2006 Penn American (PAWC)	1997-2006 Compound Growth/Loss
Water Sold (millions of gallons)											
Residential	28,200	27,769	28,452	27,728	28,595	30,559	28,268	30,137	30,769	29,949	0.66%
Commercial	12,471	12,375	12,889	12,684	12,786	13,351	12,316	12,917	13,236	12,856	0.34%
Industrial	7,012	7,251	6,781	6,788	6,456	6,031	4,890	5,096	5,157	4,966	-3.72%
Wholesale	718	574	586	354	257	308	238	555	783	713	-0.08%
Governmental Authority	2,949	2,982	3,004	2,727	2,874	2,600	2,393	2,552	2,659	2,625	-1.27%
Fire Service	2	0	0	0	0	116	426	0	536	0	-100.00%
Other (Utility & Non-Utility)	0	0	0	0	0	0	0	0	0	0	N/A
Total Water Sold	51,352	50,951	51,712	50,281	50,968	52,965	48,531	51,257	53,716	51,109	-0.05%



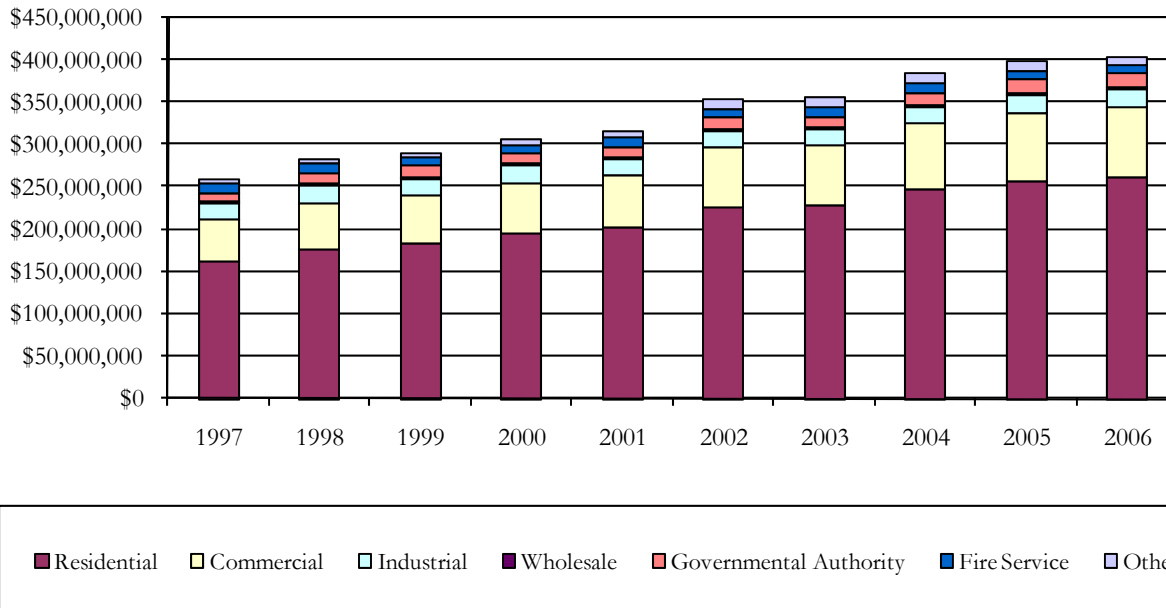
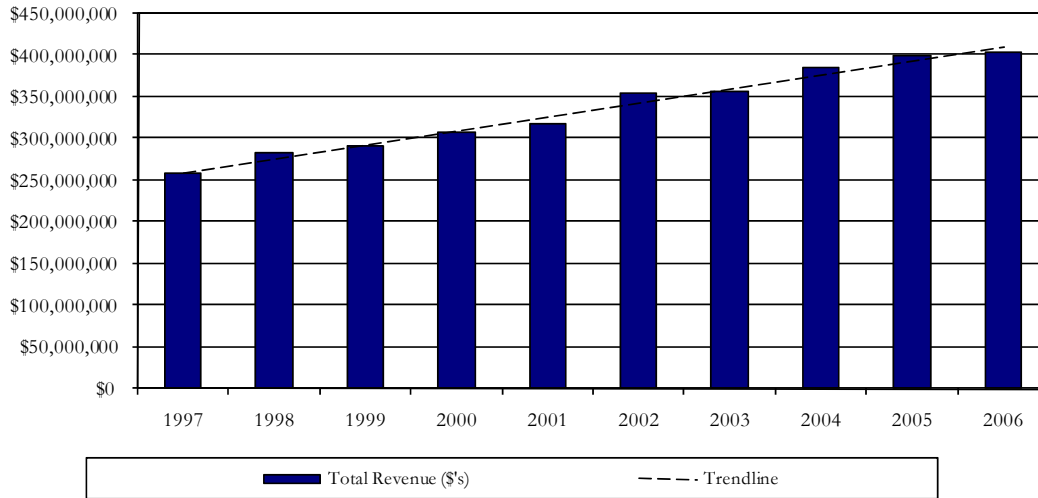


Water sold in 2003 was substantially down, although revenues were not (as shown in next *Operating Revenue* section). According to American Water management, the reclassification of industrial customers into the commercial bill class was partially responsible for the reduction in water sold. Also, for the years 2003 to 2005, under RWE ownership, PAWC was required to close its books for the calendar year in early December. Therefore, PAWC financial data (revenues and expenses) were accrued to December 31 of each year, while statistical data (such as water sold, which is based on billed usage) was not.³⁹

Operating Revenue

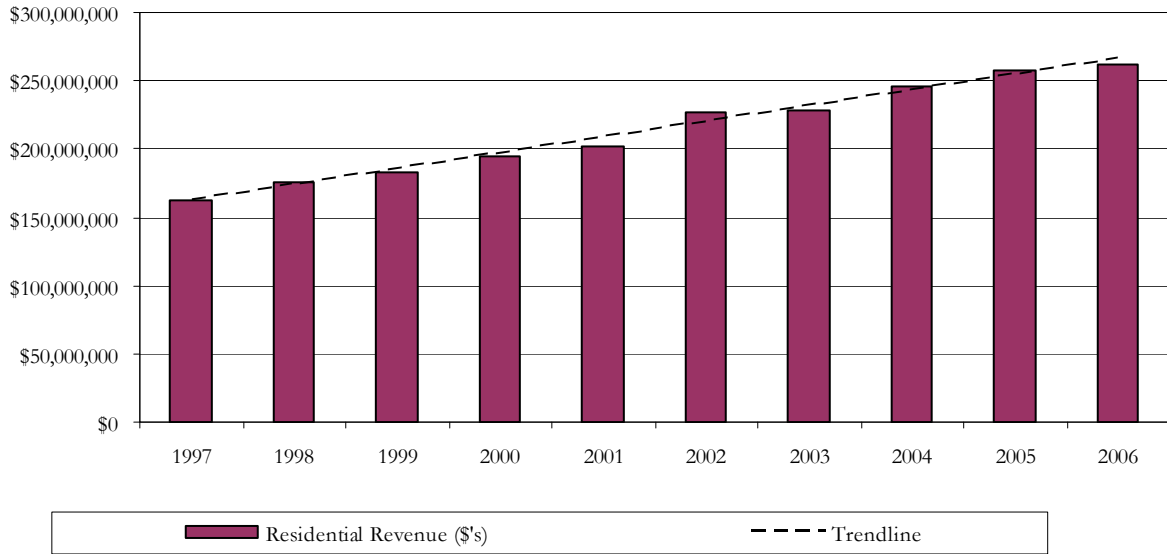
**Exhibit XIV-3
Operating Revenue**

Financial & Operating Data	1997 Penn American (PAWC)	1998 Penn American (PAWC)	1999 Penn American (PAWC)	2000 Penn American (PAWC)	2001 Penn American (PAWC)	2002 Penn American (PAWC)	2003 Penn American (PAWC)	2004 Penn American (PAWC)	2005 Penn American (PAWC)	2006 Penn American (PAWC)	1997-2006 Compound Growth/Loss
Revenue (\$'s)											
Residential	162,974,256	176,135,034	183,482,822	194,398,406	202,446,808	226,575,152	228,809,241	246,333,788	257,225,435	261,751,000	5.35%
Commercial	48,456,873	53,959,875	56,523,268	60,325,509	61,755,608	69,568,695	71,054,559	78,722,592	81,202,972	82,799,000	6.07%
Industrial	19,459,801	21,852,820	20,681,327	21,199,760	21,127,271	21,311,584	19,563,868	20,684,995	21,232,096	21,417,000	1.06%
Wholesale	2,267,765	2,196,295	2,194,829	1,393,405	901,488	1,757,631	1,249,264	1,535,296	2,085,539	1,972,000	-1.53%
Governmental Authority	9,754,747	12,006,358	11,928,989	12,110,987	11,826,235	12,728,972	12,960,136	14,133,775	15,574,261	16,115,000	5.68%
Fire Service	10,997,892	11,088,005	11,349,827	10,824,367	10,877,460	10,910,570	11,294,979	11,160,570	10,274,507	10,803,000	-0.20%
Other (Utility & Non-Utility)	4,602,021	4,800,832	4,867,528	5,558,053	8,406,324	10,669,900	10,574,997	11,831,175	12,200,929	7,893,000	6.11%
Total Revenue	258,512,855	282,059,219	291,028,590	305,810,487	317,341,194	353,522,504	355,507,044	384,402,191	399,795,739	402,750,000	5.00%



Residential Revenue versus Water Sold

**Exhibit XIV-4
 Residential Revenue**

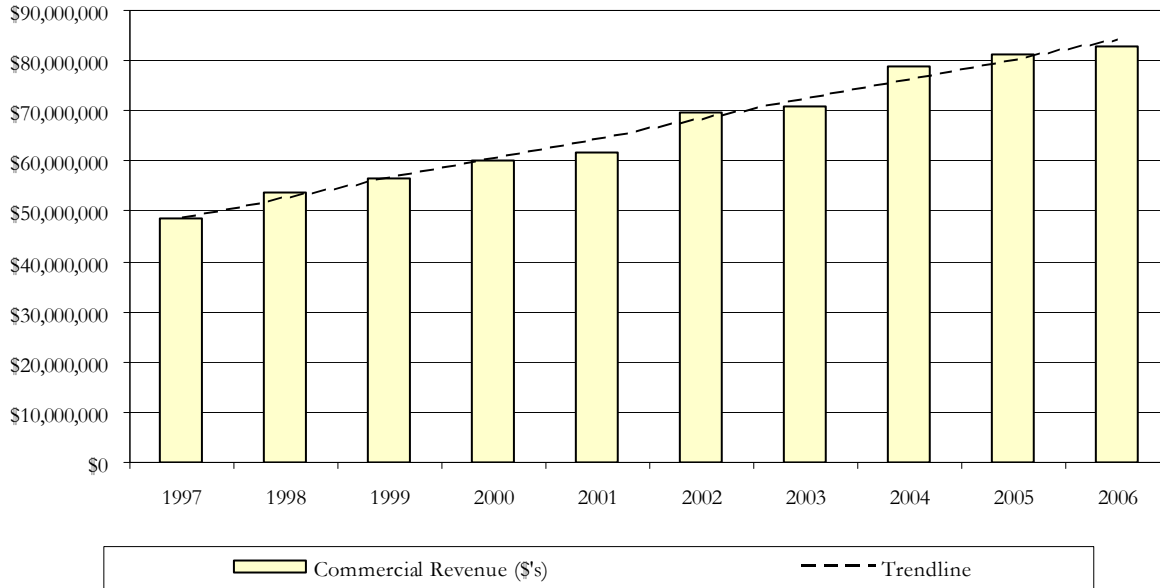


Residential Water Sold

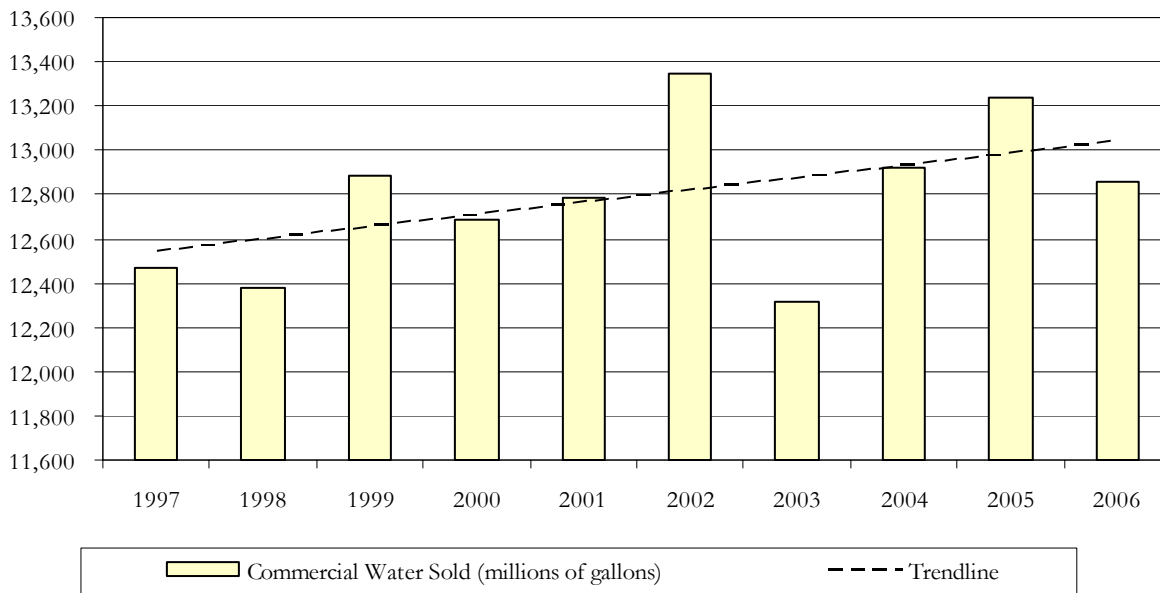


Commercial Revenue versus Water Sold

**Exhibit XIV-5
 Commercial Revenue**

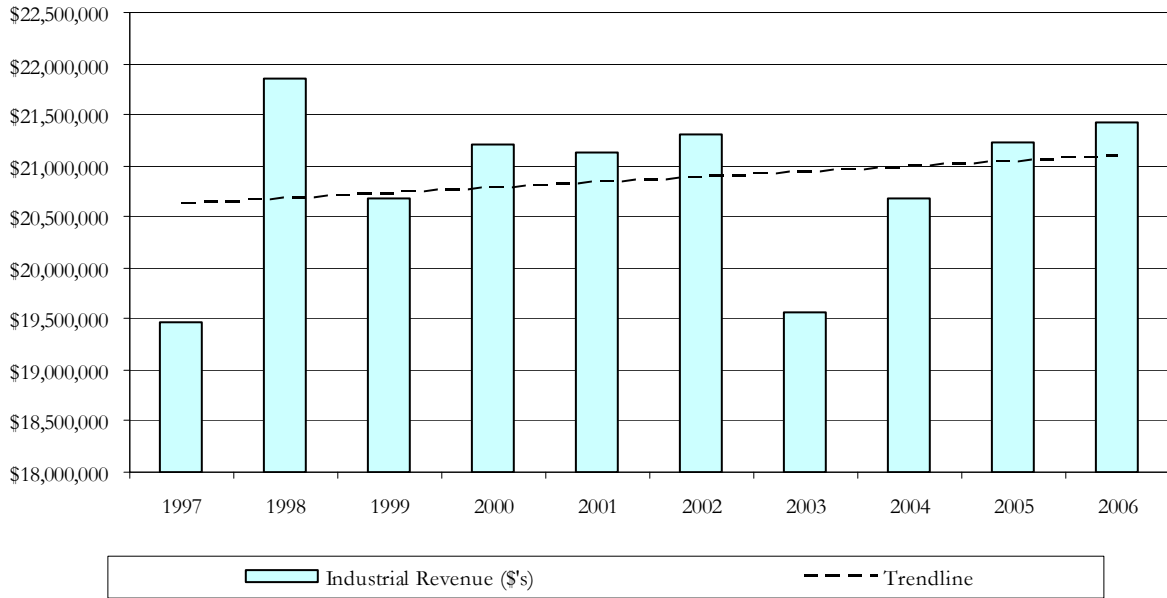


Commercial Water Sold

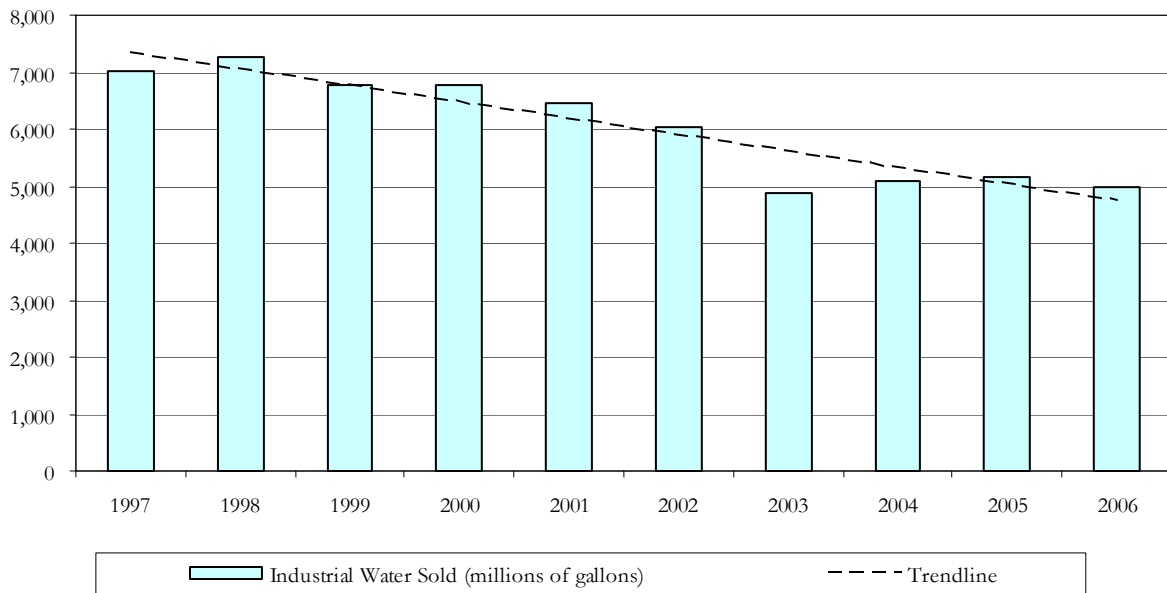


Industrial Revenue versus Water Sold

**Exhibit XIV-6
Industrial Revenue**



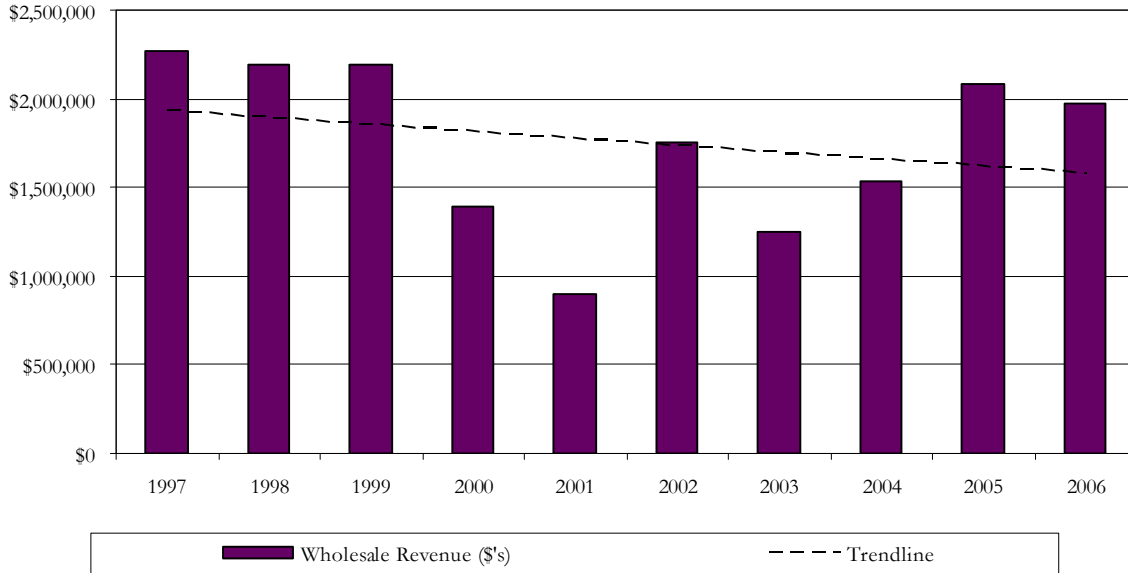
Industrial Water Sold



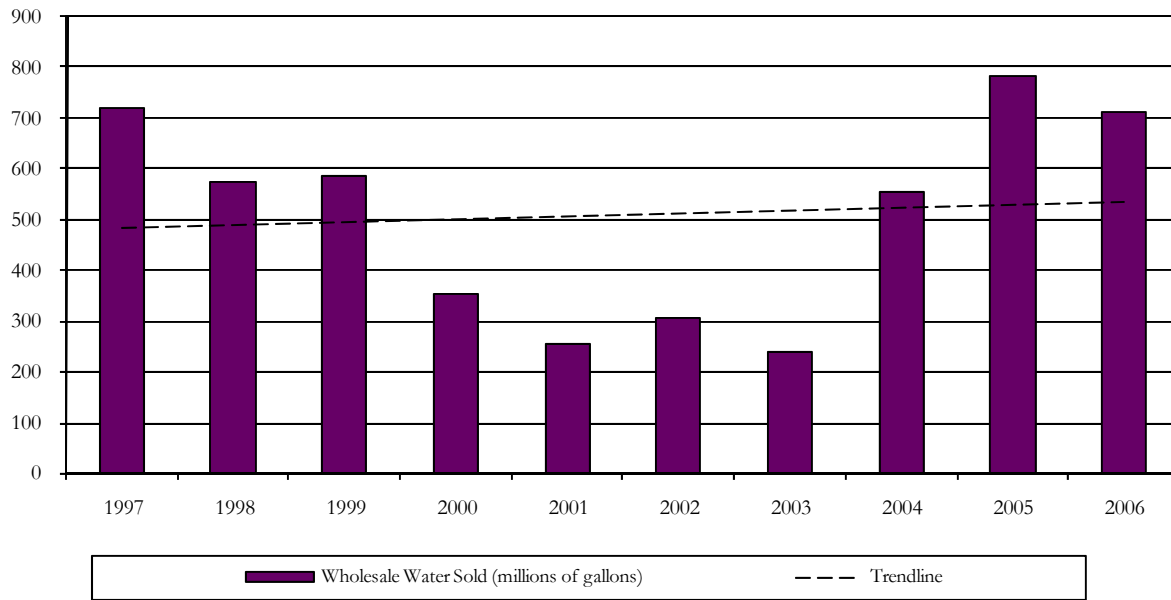
As discussed previously, water sold is based on billed usage and the year-end close in 2003 was December 12, while revenue was based on both billed and unbilled usage.⁴⁰

Wholesale Revenue versus Water Sold

**Exhibit XIV-7
 Wholesale Revenue**

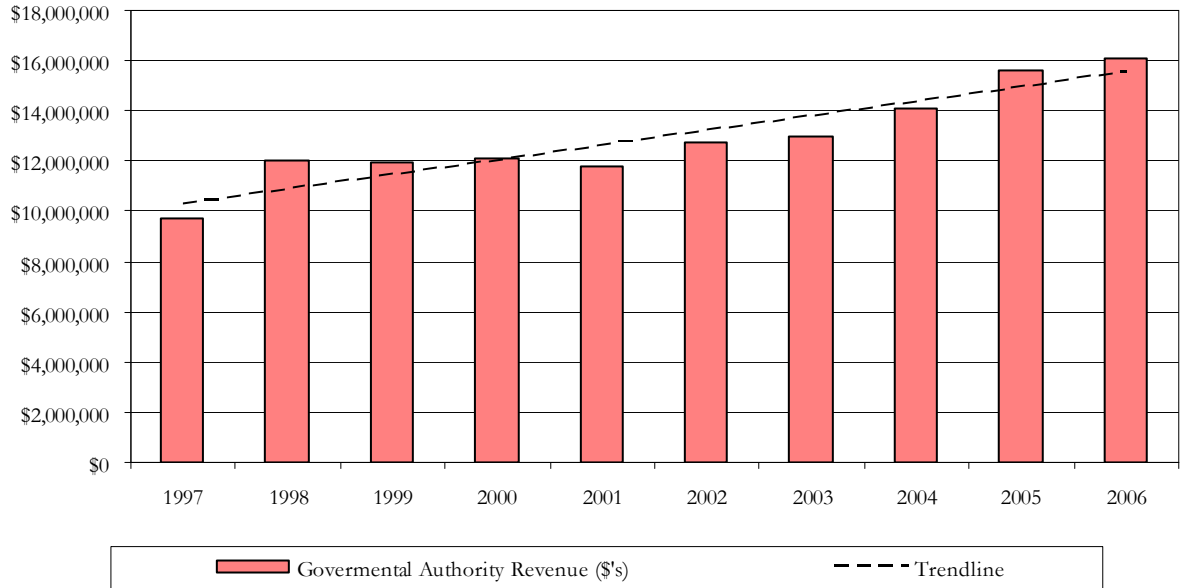


Wholesale Water Sold

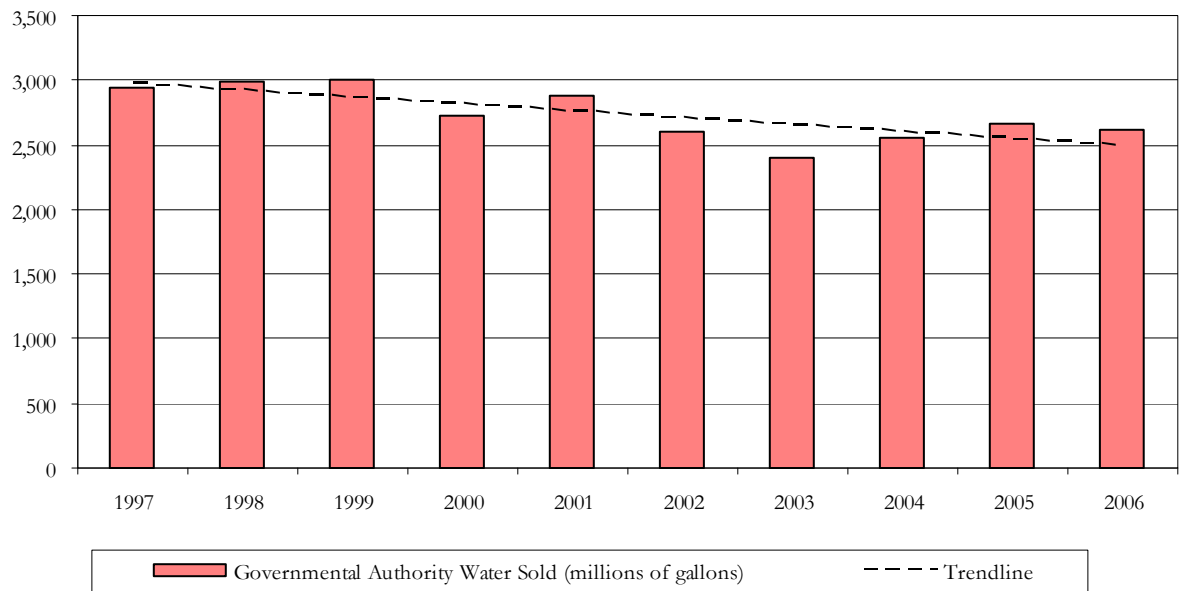


Governmental Authority Revenue versus Water Sold

**Exhibit XIV-8
 Governmental Authority Revenue**

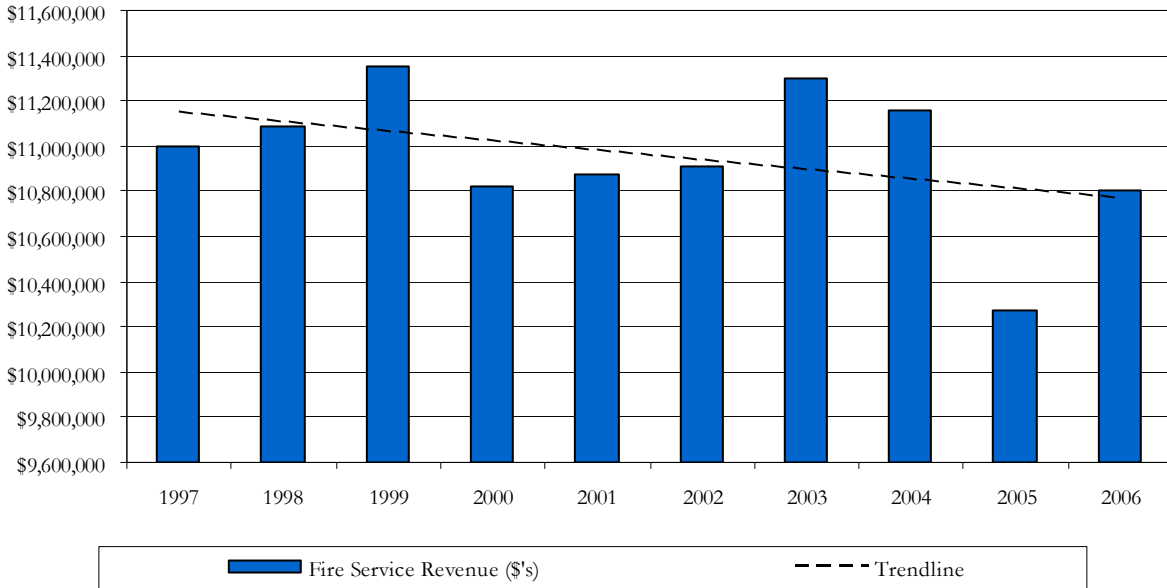


Governmental Authority Water Sold

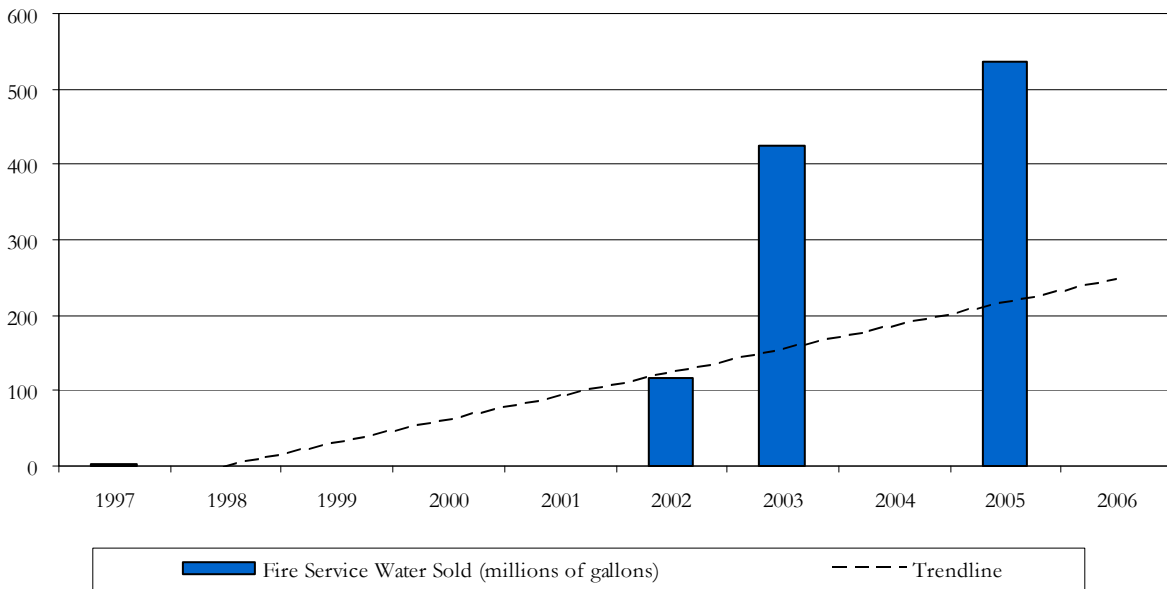


Fire Service Revenue versus Water Sold

**Exhibit XIV-9
 Fire Service Revenue**



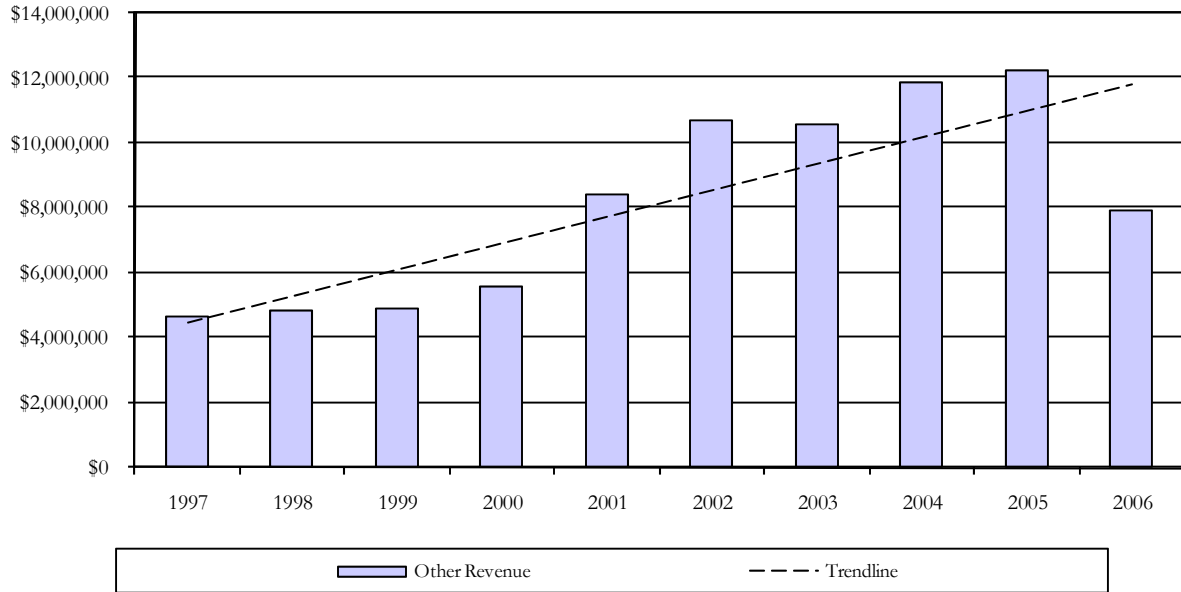
Fire Service Water Sold



As fire service is a flat rate, PAWC does not typically report usage for this bill class, although figures were provided for 2002, 2003, and 2005.⁴¹

Other (Utility & Non-Utility) Revenue

Exhibit XIV-10
Other (Utility & Non-Utility) Revenue

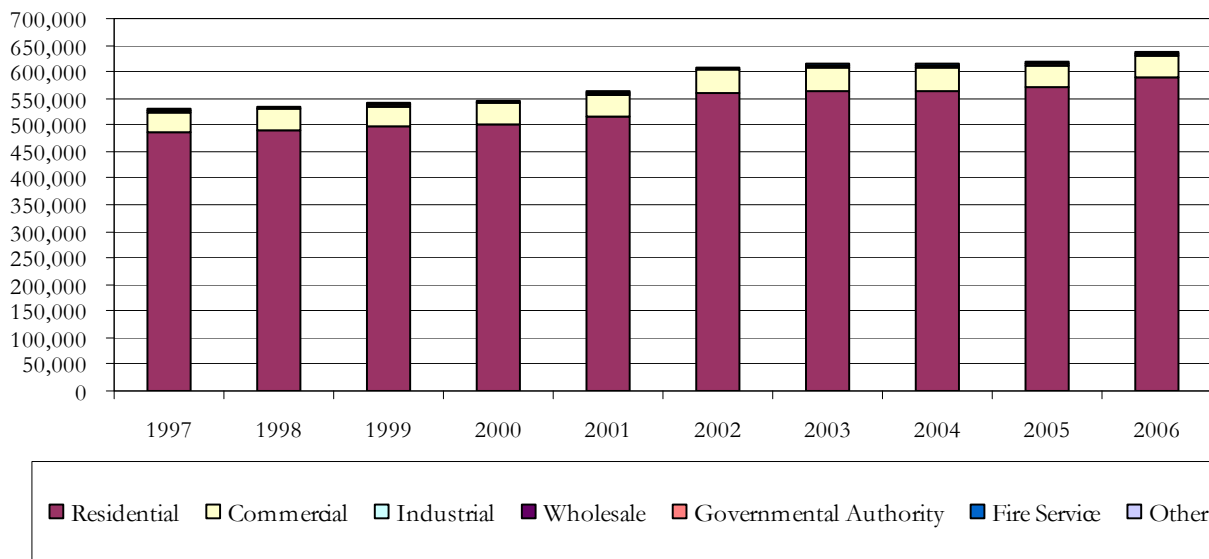
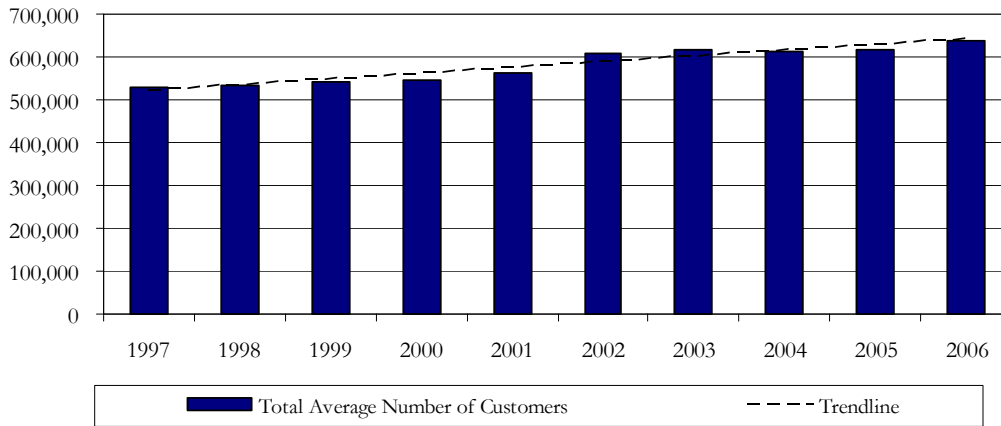


Total Average Number of Customers (year-end)

Exhibit XIV-11
Total Average Number of Customer (year-end)

Financial & Operating Data	1997 Penn American (PAWC)	1998 Penn American (PAWC)	1999 Penn American (PAWC)	2000 Penn American (PAWC)	2001 Penn American (PAWC)	2002 Penn American (PAWC)	2003 Penn American (PAWC)	2004 Penn American (PAWC)	2005 Penn American (PAWC)	2006 Penn American (PAWC)	1997-2006 Compound Growth/ Loss
Average Number of Customers											
Residential	486,299	490,475	495,917	500,922	516,558	559,570	565,301	565,290	569,432	588,133	2.11%
Commercial	38,599	38,587	38,783	39,029	40,590	43,040	43,229	42,560	42,475	42,996	1.19%
Industrial	877	811	811	803	852	976	959	899	883	873	-0.05%
Wholesale	32	30	28	25	29	26	24	23	24	28	-1.46%
Governmental Authority	2,266	2,162	2,153	2,178	2,234	2,258	2,294	2,301	2,298	2,421	0.73%
Fire Service	2,784	2,815	2,833	2,794	2,818	3,240	3,262	3,235	3,223	3,209	1.58%
Other	0	0	0	0	0	0	0	0	5	0	N/A
Total Customers	530,857	534,880	540,525	545,751	563,081	609,110	615,069	614,308	618,340	637,660	2.04%

Total Average Number of Customers



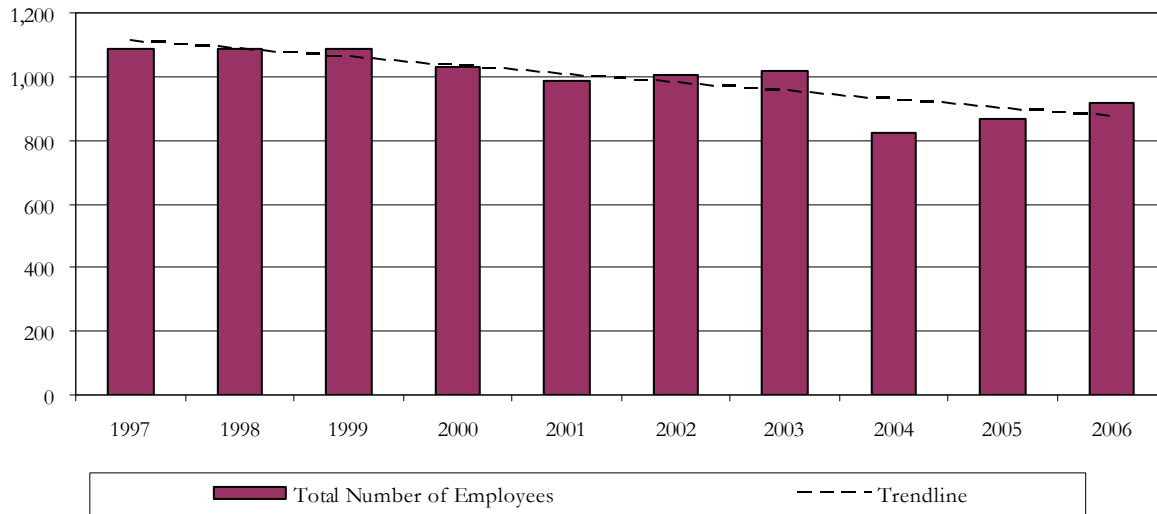
Total Employees (year-end)

The counts in *Exhibit XIV-12* represent end-of-year totals and include active, full-time and part-time employees.

Exhibit XIV-12
Total Employees (year-end)

Financial & Operating Data	1997 Penn American (PAWC)	1998 Penn American (PAWC)	1999 Penn American (PAWC)	2000 Penn American (PAWC)	2001 Penn American (PAWC)	2002 Penn American (PAWC)	2003 Penn American (PAWC)	2004 Penn American (PAWC)	2005 Penn American (PAWC)	2006 Penn American (PAWC)	1997-2006 Compound Growth/Loss
Total Number of Employees	1,089	1,085	1,088	1,032	989	1,004	1,018	824	868	917	-1.87%

Total Employees (year-end)



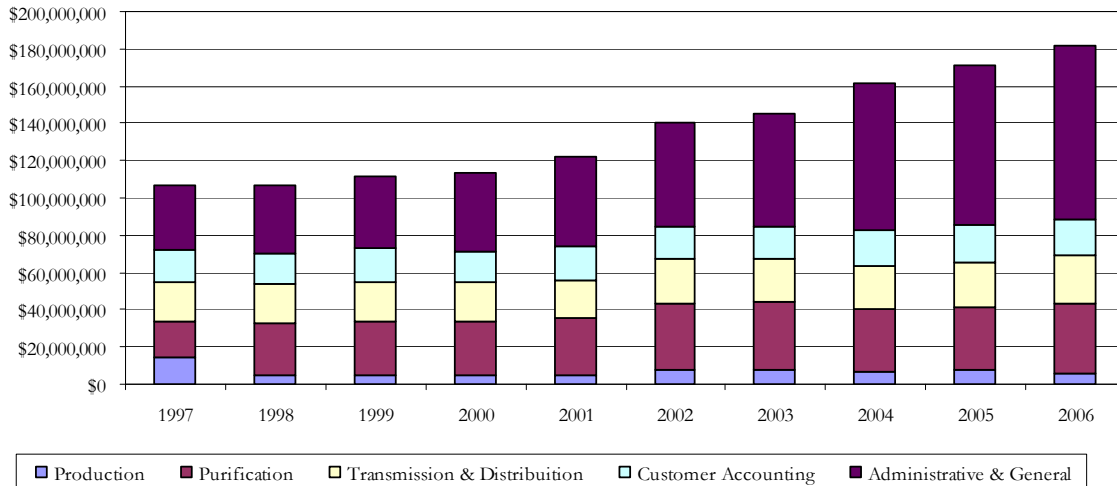
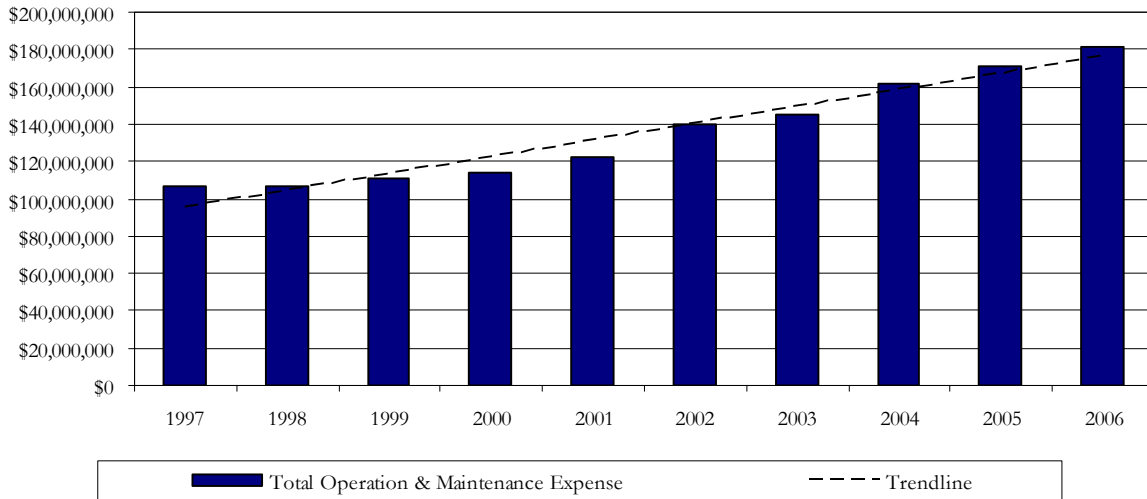
The reorganization that created the regional American Water Works Service Company, Inc. (AWWSC) organization was primarily implemented during 2004 and the transfer of personnel from PAWC to AWWSC is the primary reason for the reduction in PAWC staff.

Total Operation and Maintenance Expense

Exhibit XIV-13
Total Operation and Maintenance Expense

Financial & Operating Data	1997 Penn American (PAWC)	1998 Penn American (PAWC)	1999 Penn American (PAWC)	2000 Penn American (PAWC)	2001 Penn American (PAWC)	2002 Penn American (PAWC)	2003 Penn American (PAWC)	2004 Penn American (PAWC)	2005 Penn American (PAWC)	2006 Penn American (PAWC)	1997-2006 Compound Growth/Loss
Production Expense	14,453,856	4,812,315	4,908,655	4,676,801	4,460,017	7,752,285	7,689,097	6,793,175	7,381,507	5,733,244	-9.67%
Purification Expense	18,788,159	28,099,591	28,784,318	29,040,717	30,811,544	35,073,349	36,209,603	33,221,018	34,241,715	37,841,759	8.01%
Transmission & Distribution Expense	21,211,501	20,956,664	21,582,654	20,765,738	20,289,497	24,055,511	23,267,164	23,573,589	24,014,129	25,866,804	2.21%
Customer Accounting Expense	17,674,295	16,405,695	17,513,011	16,796,376	18,457,471	17,675,097	17,382,430	19,517,836	20,119,161	18,892,361	0.74%
Administrative & General Expense	34,407,817	36,247,597	38,418,676	42,589,031	47,847,408	55,843,120	60,391,914	78,121,997	85,683,241	93,101,420	11.57%
Total Operation & Maintenance Expense	106,535,628	106,521,862	111,207,314	113,868,663	121,865,937	140,399,362	144,940,208	161,227,615	171,439,753	181,475,588	6.03%

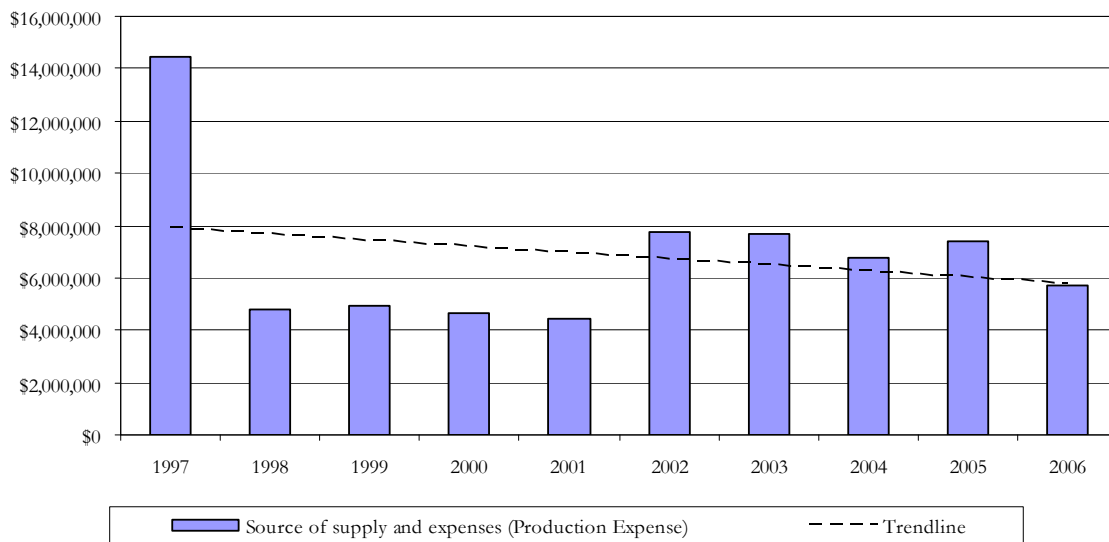
Total Operation and Maintenance Expense



Since 2003 substantial changes in PAWC O&M expense have occurred. According to American Water management, the regional component of American Water Works Service Company (AWWSC) was implemented at the end of 2003. AWWSC management fee increases of approximately \$15.4 million have been partially offset by reduced PAWC labor costs of approximately \$5 million. Other categories of costs that have caused this increase in O&M expense include: insurance (\$1 million), software licenses (\$800,000), transportation-related fuel costs (\$600,000), and contract services for temporary employees (\$600,000). Also, the classification of amortization of net negative salvage as O&M expense beginning in 2005 also unfavorably impacted expenses by \$1.3 million. In addition to these increases, security services reflected a \$7.3 million increased due to a \$5.6 million deferral credit in 2003. General office expenses in 2005 included expenses of \$5 million of previously deferred project initiative costs.⁴²

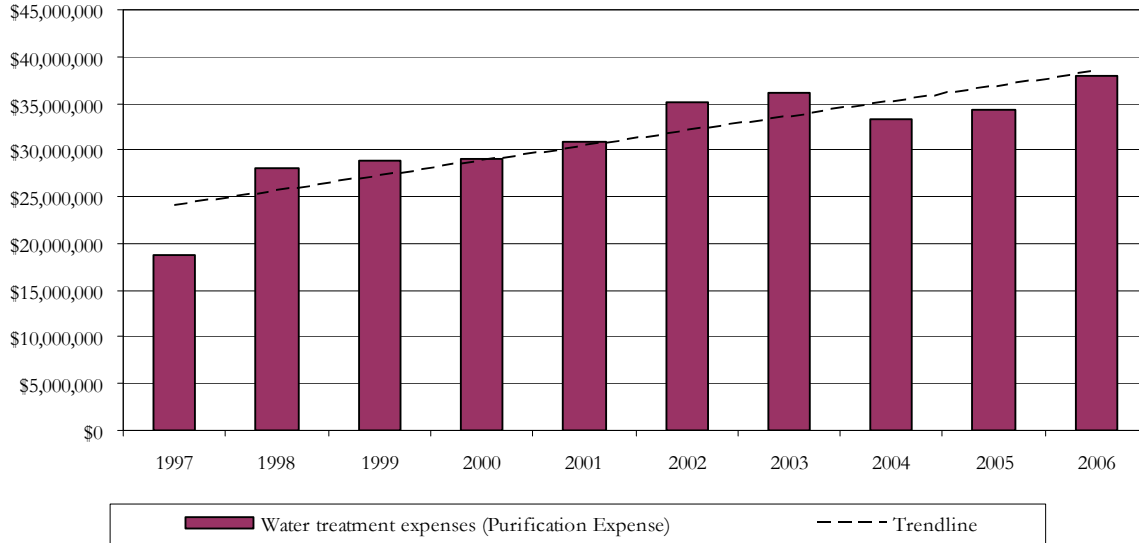
Production Expense

**Exhibit XIV-14
 Production Expense**



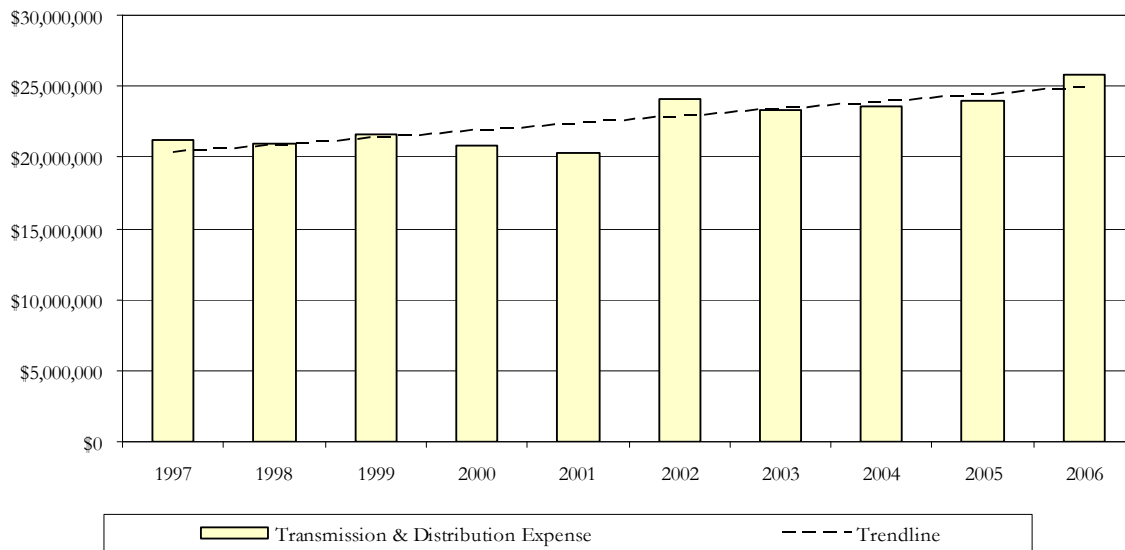
Purification Expense

**Exhibit XIV-15
Purification Expense**

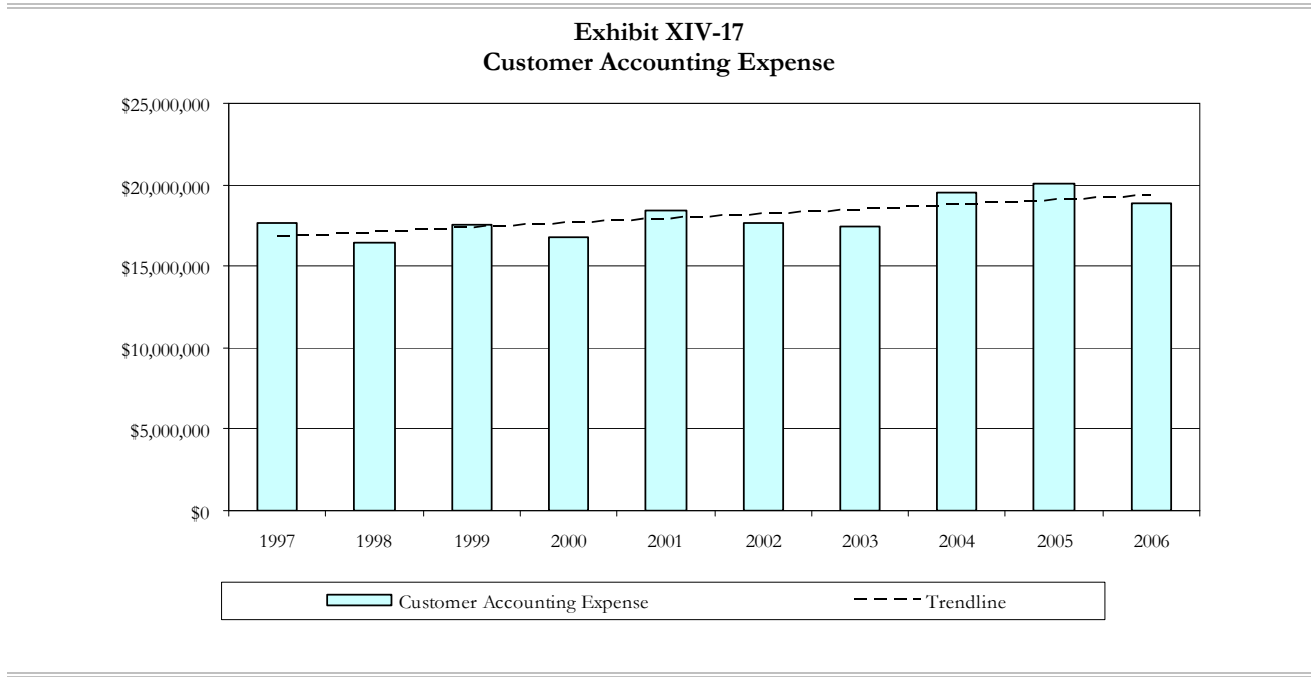


Transmission and Distribution Expense

**Exhibit XIV-16
Transmission and Distribution Expense**



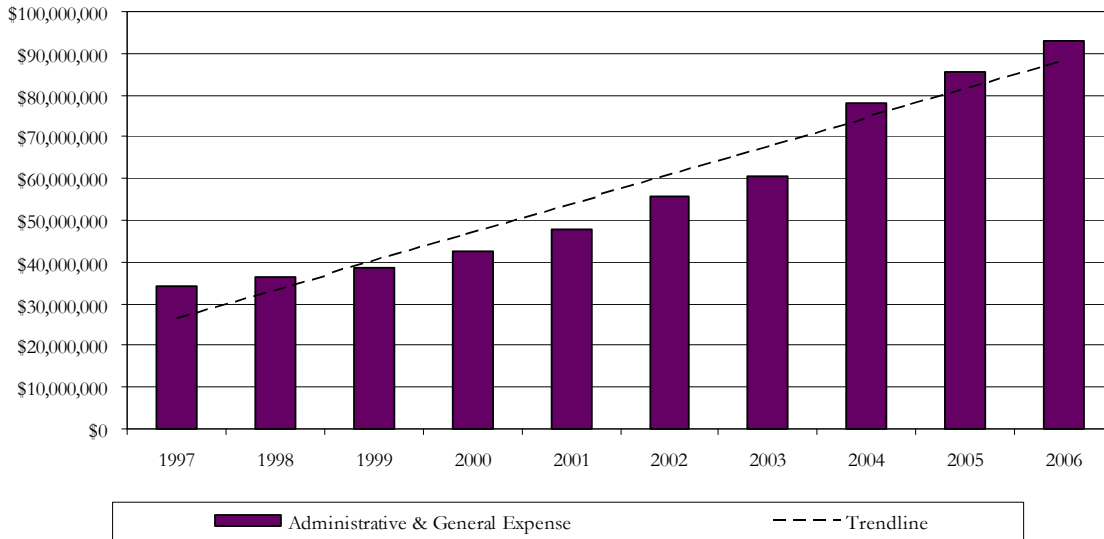
Customer Accounting Expense



According to American Water management, increases in uncollectible expenses, associated with increased revenue and slightly higher uncollectible rate, and postage expenses account for most of the increase in PAWC customer accounting expense from 2003 to 2005.⁴³

Administrative and General Expense

Exhibit XIV-18
Administrative and General Expense



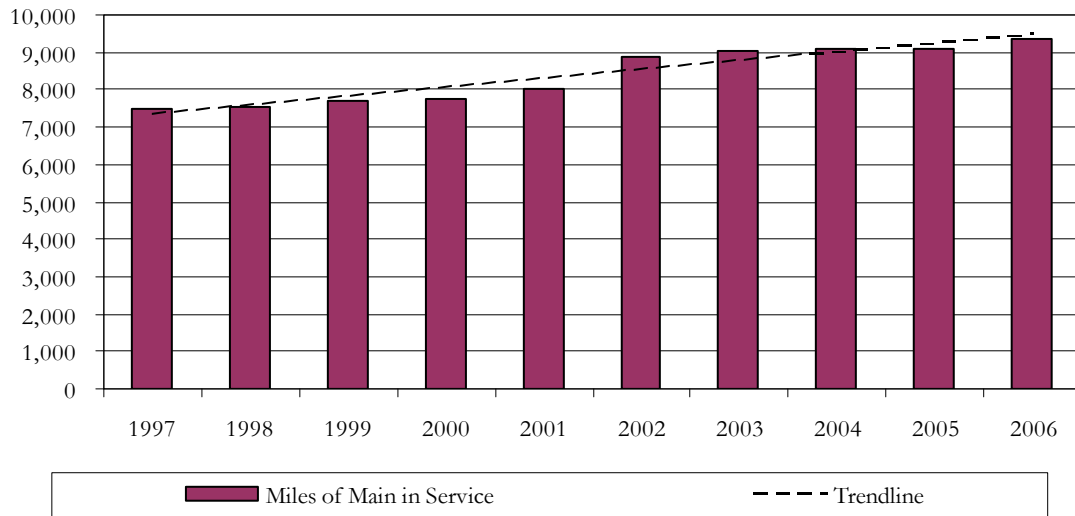
According to American Water management, increases to O&M expenses are also relevant to A&G expenses. The increase in O&M expenses is slightly more than increases to the A&G component of total O&M expenses, as production cost increases are included in O&M expenses, but not A&G expenses.⁴⁴

Miles of Main in Service

**Exhibit XIV-19
Miles of Main in Service**

Financial & Operating Data	1997 Penn American (PAWC)	1998 Penn American (PAWC)	1999 Penn American (PAWC)	2000 Penn American (PAWC)	2001 Penn American (PAWC)	2002 Penn American (PAWC)	2003 Penn American (PAWC)	2004 Penn American (PAWC)	2005 Penn American (PAWC)	2006 Penn American (PAWC)	1997-2006 Compound Growth/Loss
Miles of Main in service	7,466	7,560	7,714	7,758	8,040	8,891	9,037	9,108	9,108	9,370	2.53%

Miles of Main in Service



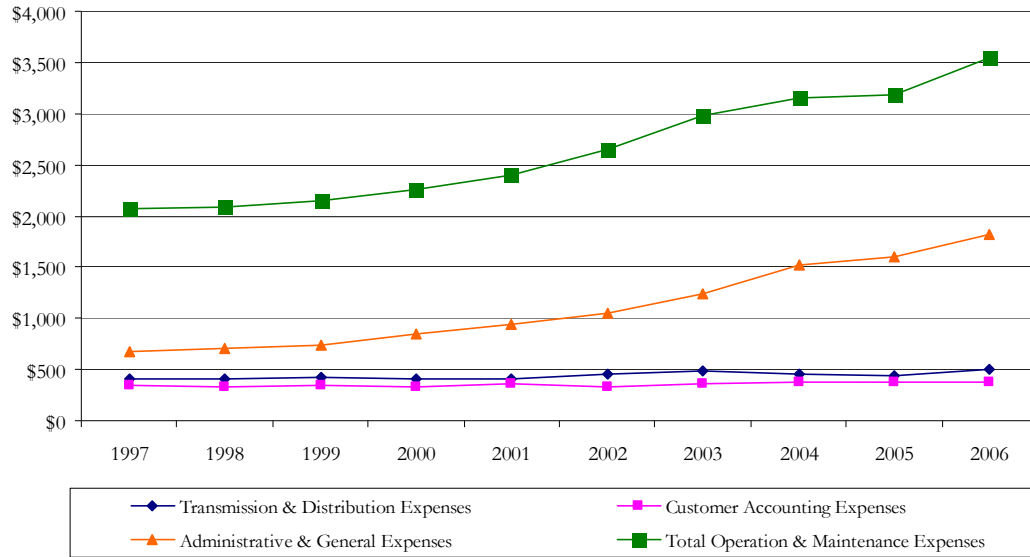
Performance Ratios

Exhibit XIV-20 Performance Ratios

Financial & Operating Data	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006 Compound Growth/Loss
	Penn American (PAWC)	Penn American (PAWC)	Penn American (PAWC)	Penn American (PAWC)	Penn American (PAWC)	Penn American (PAWC)	Penn American (PAWC)	Penn American (PAWC)	Penn American (PAWC)	Penn American (PAWC)	
Production Expense	\$14,453,856	\$4,812,315	\$4,908,655	\$4,676,801	\$4,460,017	\$7,752,285	\$7,689,097	\$6,793,175	\$7,381,507	5,733,244	-9.67%
Purification Expense	\$18,788,159	\$28,099,591	\$28,784,318	\$29,040,717	\$30,811,544	\$35,073,349	\$36,209,603	\$33,221,018	\$34,241,715	37,841,759	8.01%
Transmission & Distribution Expense	\$21,211,501	\$20,956,664	\$21,582,654	\$20,765,738	\$20,289,497	\$24,055,511	\$23,267,164	\$23,573,589	\$24,014,129	25,866,804	2.21%
Customer Accounting Expense	\$17,674,295	\$16,405,695	\$17,513,011	\$16,796,376	\$18,457,471	\$17,675,097	\$17,382,430	\$19,517,836	\$20,119,161	18,892,361	0.74%
Administrative & General Expense	\$34,407,817	\$36,247,597	\$38,418,676	\$42,589,031	\$47,847,408	\$55,843,120	\$60,391,914	\$78,121,997	\$85,683,241	93,101,420	11.57%
Total Operation & Maintenance Expense	\$106,535,628	\$106,521,862	\$111,207,314	\$113,868,663	\$121,865,937	\$140,399,362	\$144,940,208	\$161,227,615	\$171,439,753	181,475,588	6.03%
Gross Utility Plant in Service	\$1,338,075,968	\$1,415,981,133	\$1,522,773,057	\$1,608,020,754	\$1,766,649,298	\$1,970,710,145	\$2,108,923,582	\$2,201,791,081	\$2,301,664,989	\$2,513,927,000	7.18%
Utility Plant in Service Less Depreciation	\$1,158,650,999	\$1,207,026,112	\$1,291,675,886	\$1,355,047,587	\$1,468,116,457	\$1,613,648,666	\$1,703,422,931	\$1,751,300,272	\$1,796,735,724	1,944,628,000	5.86%
Total Average Number of Customers	530,857	534,880	540,525	545,751	563,081	609,110	615,069	614,308	618,340	637,660	2.04%
Total Water Sold (millions of gallons)	51,352	50,951	51,712	50,281	50,711	52,965	48,531	51,257	53,716	51,109	-0.05%
Total Revenue	\$258,512,855	\$282,059,219	\$291,028,590	\$305,810,487	\$317,341,194	\$353,522,504	\$355,507,044	\$384,402,191	\$399,795,739	402,750,000	5.00%
Total Number of Employees	1,089	1,085	1,088	1,032	989	1,004	1,018	824	868	917	-1.87%
Miles of Main in service	7,466	7,560	7,714	7,758	8,040	8,891	9,037	9,108	9,108	9,370	2.53%
Production Expenses per Million Gallons	\$281	\$94	\$95	\$93	\$88	\$146	\$158	\$133	\$137	\$112	-9.62%
Purification Expenses per Million Gallons	\$366	\$552	\$557	\$578	\$608	\$662	\$746	\$648	\$637	\$740	8.06%
Transmission & Distribution Expenses per Million Gallons	\$413	\$411	\$417	\$413	\$400	\$454	\$479	\$460	\$447	\$506	2.26%
Customer Accounting Expenses per Million Gallons	\$344	\$322	\$339	\$334	\$364	\$334	\$358	\$381	\$375	\$370	0.79%
Administrative & General Expenses per Million Gallons	\$670	\$711	\$743	\$847	\$944	\$1,054	\$1,244	\$1,524	\$1,595	\$1,822	11.63%
Total Operation & Maintenance Expenses per Million Gallons	\$2,075	\$2,091	\$2,151	\$2,265	\$2,403	\$2,651	\$2,987	\$3,145	\$3,192	\$3,551	6.09%
Production Expenses per Thousand Customers	\$27,227	\$8,997	\$9,081	\$8,569	\$7,921	\$12,727	\$12,501	\$11,058	\$11,938	\$8,991	-11.47%
Purification Expenses per Thousand Customers	\$35,392	\$52,534	\$53,253	\$53,212	\$54,720	\$57,581	\$58,871	\$54,079	\$55,377	\$59,345	5.85%
Transmission & Distribution Expenses per Thousand Customers	\$39,957	\$39,180	\$39,929	\$38,050	\$36,033	\$39,493	\$37,829	\$38,374	\$38,836	\$40,565	0.17%
Customer Accounting Expenses per Thousand Customers	\$33,294	\$30,672	\$32,400	\$30,777	\$32,779	\$29,018	\$28,261	\$31,772	\$32,537	\$29,628	-1.28%
Administrative & General Expenses per Thousand Customers	\$64,816	\$67,768	\$71,077	\$78,037	\$84,974	\$91,680	\$98,187	\$127,171	\$138,570	\$146,005	9.34%
Total Operation & Maintenance Expenses per Thousand Customers	\$200,686	\$199,151	\$205,739	\$208,646	\$216,427	\$230,499	\$235,649	\$262,454	\$277,258	\$284,596	3.92%
Production Expenses per Mile of Main	\$1,936	\$637	\$636	\$603	\$555	\$872	\$851	\$746	\$810	\$612	-11.90%
Purification Expenses per Mile of Main	\$2,516	\$3,717	\$3,731	\$3,743	\$3,832	\$3,945	\$4,007	\$3,647	\$3,760	\$4,039	5.34%
Transmission & Distribution Expenses per Mile of Main	\$2,841	\$2,772	\$2,798	\$2,677	\$2,524	\$2,706	\$2,575	\$2,588	\$2,637	\$2,761	-0.32%
Customer Accounting Expenses per Mile of Main	\$2,367	\$2,170	\$2,270	\$2,165	\$2,296	\$1,988	\$1,923	\$2,143	\$2,209	\$2,016	-1.75%
Administration & General Expenses per Mile of Main	\$4,609	\$4,795	\$4,980	\$5,490	\$5,951	\$6,281	\$6,683	\$8,577	\$9,407	\$9,936	8.82%
Total Operation & Maintenance Expenses per Mile of Main	\$14,269	\$14,090	\$14,416	\$14,678	\$15,157	\$15,791	\$16,039	\$17,702	\$18,823	\$19,368	3.42%
Total Average Number of Customers per Employee	487	493	497	529	569	607	604	746	712	695	3.98%
Gross Utility Plant in Service per Total Average Number of Customers	\$2,521	\$2,647	\$2,817	\$2,946	\$3,137	\$3,235	\$3,429	\$3,584	\$3,722	\$3,942	5.04%

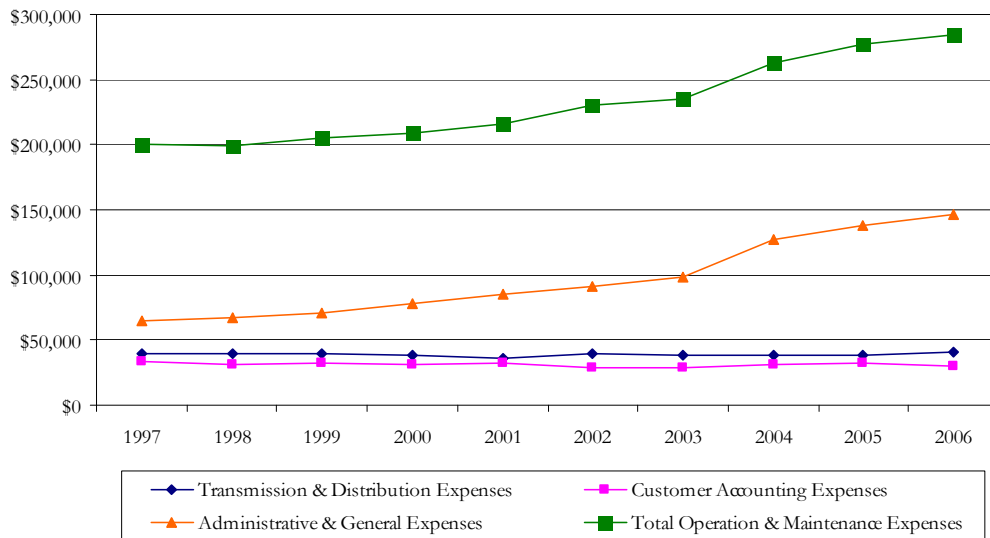
Performance Ratios per Million Gallons

**Exhibit XIV-21
Performance Ratios per Million Gallons**



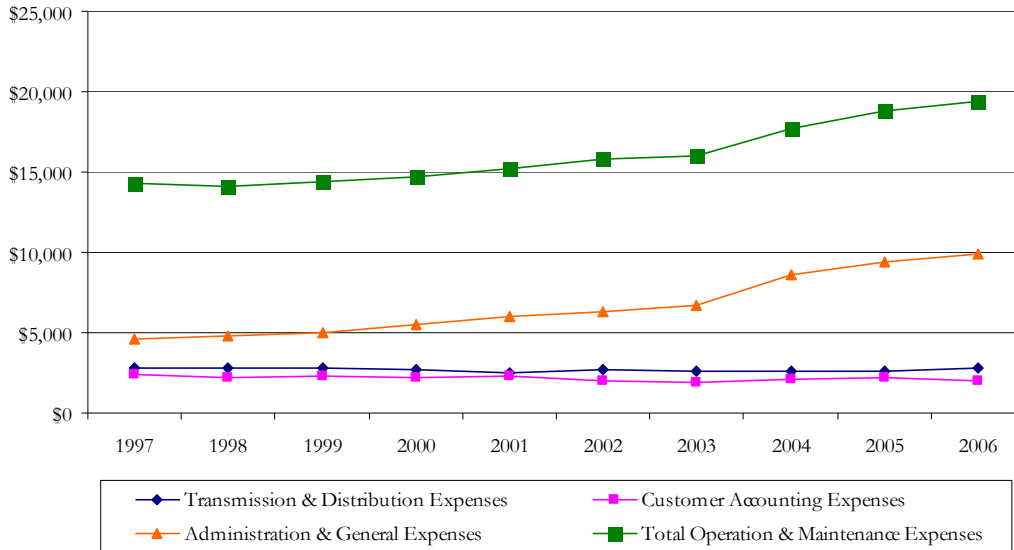
Performance Ratios per One Thousand Customers

**Exhibit XIV-22
Performance Ratios per One Thousand Customers**



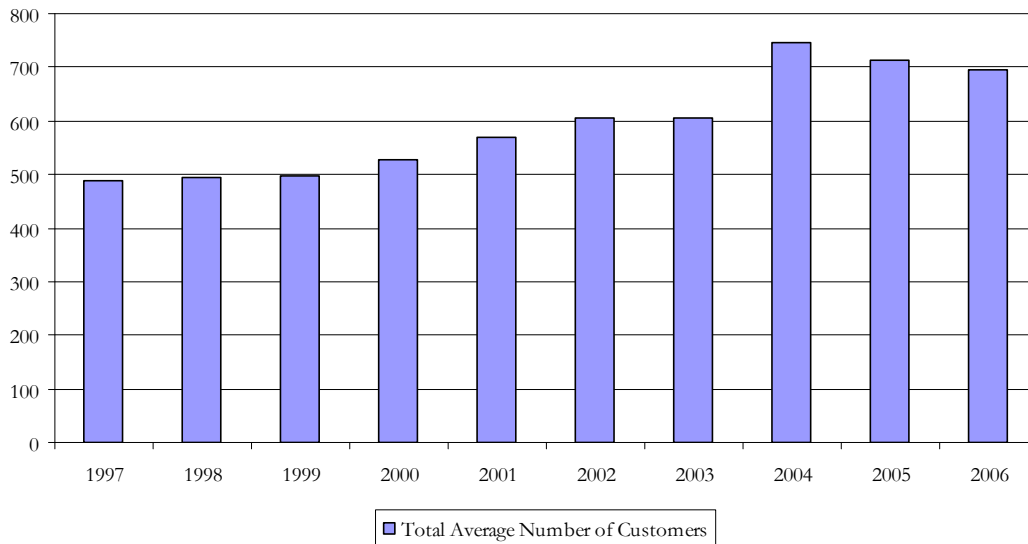
Performance Ratios per Mile of Main

Exhibit XIV-23
Performance Ratios per Mile of Main



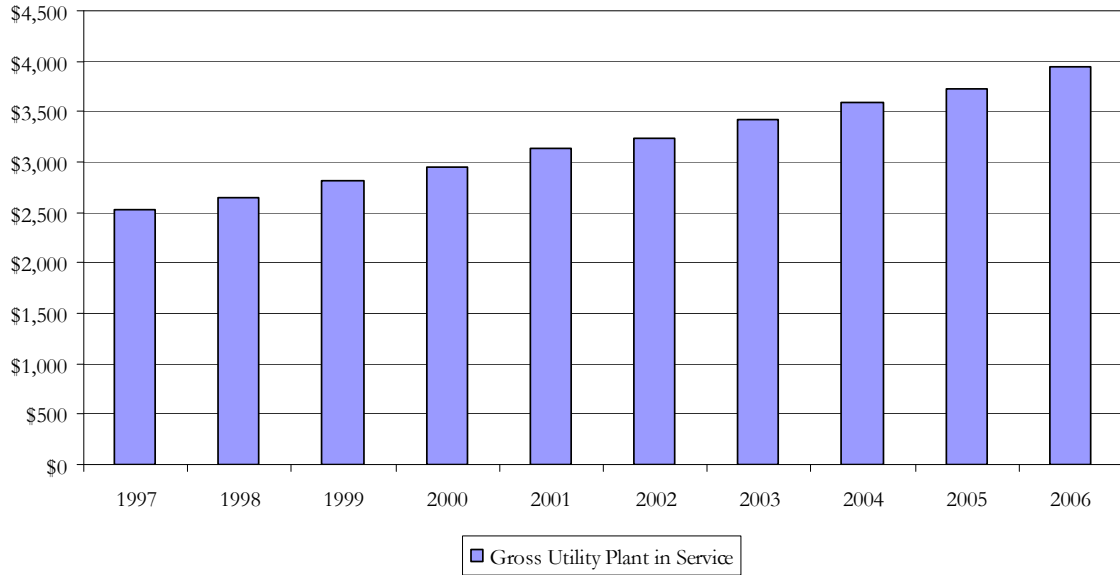
Performance Ratios - Average Number of Customers per Employee

Exhibit XIV-24
Performance Ratios – Average Number of Customers per Employee



Performance Ratios - Gross Utility Plant in Service per Average Number of Customers

Exhibit XIV-25
Performance Ratios – Gross Utility Plant in Service per Average Number of Customers



B. Section 2 – Comparative

This section provides a comparative analysis of Pennsylvania-American Water Company (PAWC) to a select group of appropriate water utilities over a five-year period (2002 to 2006). These comparators include:

- ◆ Non-American Water companies (individually and subtotaled)
 - Aqua Pennsylvania (Aqua PA)
 - Aquarian Connecticut (Aquarian CT)
 - San Jose Water Corporation
- ◆ American Water companies (individually and subtotaled)
 - Elizabethtown Water
 - Missouri-American Water Company
 - New Jersey-American Company

This section of the report uses NAWC as its major source of data and presents the following statistics for the years 2002 through 2006.

- ◆ Total net plant in service
- ◆ Water sales by volume (millions of gallons)
- ◆ Operating revenue
- ◆ Total average number of customers (year-end)
- ◆ Total employees (year-end)
- ◆ Total operation and maintenance expense
- ◆ Miles of main in service
- ◆ Performance ratio expense

Total Net Plant in Service

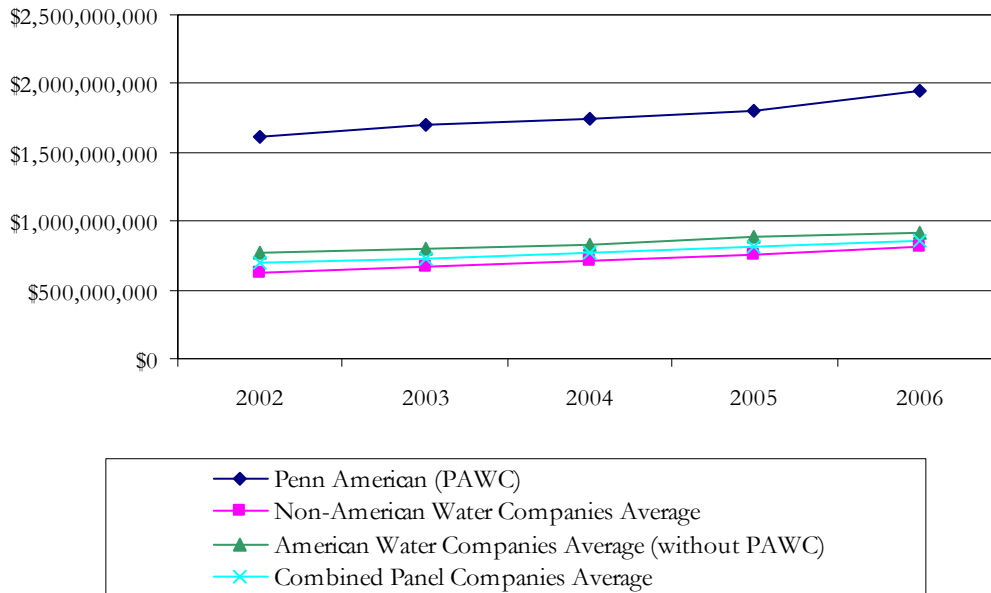
**Exhibit XIV-26
Utility Plant in Service Less Depreciation**

Utility Plant in Service Less Depreciation	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)**	\$1,613,648,666	\$1,703,422,931	\$1,751,300,272	\$1,796,735,724	\$1,944,628,000	4.77%
Aqua Penn/Philadelphia Suburban	\$1,038,525,245	\$1,109,141,275	\$1,183,592,362	\$1,279,583,788	\$1,398,446,192	7.72%
Aquarion Connecticut	\$448,599,816	\$473,764,056	\$508,357,118	\$527,708,953	\$547,521,421	5.11%
San Jose Water Corp	\$374,623,025	\$404,723,802	\$425,773,766	\$449,597,107	\$479,947,705	6.39%
Non-American Water Companies Average	\$620,582,695	\$662,543,044	\$705,907,749	\$752,296,616	\$808,638,439	6.84%
Elizabethtown Water**	\$698,290,304	\$715,733,304	\$707,210,682	\$785,216,750	\$801,922,000	3.52%
Missouri American*	\$683,132,066	\$691,813,490	\$732,899,739	\$776,284,568	\$862,399,000	6.00%
New Jersey American	\$941,448,916	\$995,536,752	\$1,030,349,593	\$1,098,607,693	\$1,098,350,995	3.93%
American Water Companies Average (without PAWC)	\$774,290,429	\$801,027,849	\$823,486,671	\$886,703,004	\$920,890,665	4.43%
Combined Panel Companies Average	\$697,436,562	\$731,785,447	\$764,697,210	\$819,499,810	\$864,764,552	5.52%

* 2002 data from filed MO PSC Annual Report, not NAWC

** 2006 Elizabethtown Water and PAWC data from Data Request 620 response, not NAWC

Utility Plant in Service Less Depreciation



Water Sales by Volume (millions of gallons)

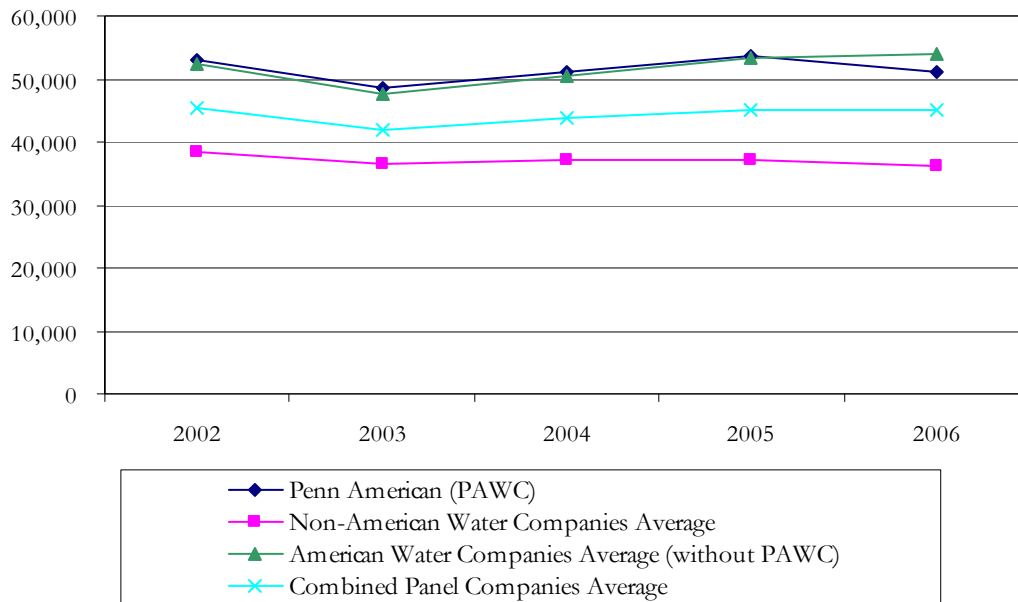
**Exhibit XIV-27
Total Water Sold (millions of gallons)**

Total Water Sold (millions of gallons)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	52,965	48,531	51,257	53,716	51,109	-0.89%
Aqua Penn/Philadelphia Suburban	39,861	39,077	38,465	39,933	38,659	-0.76%
Aquarion Connecticut	26,287	23,953	24,473	26,129	24,493	-1.75%
San Jose Water Corp	48,861	46,632	48,186	45,318	45,592	-1.72%
Non-American Water Companies Average	38,336	36,554	37,041	37,127	36,248	-1.39%
Elizabethtown Water*	46,785	42,735	42,839	44,870	42,430	-2.41%
Missouri American**	64,840	57,811	62,646	67,253	72,180	2.72%
New Jersey American*	45,629	42,123	45,886	47,923	47,664	1.10%
American Water Companies Average (without PAWC)	52,418	47,556	50,457	53,349	54,091	0.79%
Combined Panel Companies Average	45,377	42,055	43,749	45,238	45,170	-0.11%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Total Water Sold (millions of gallons)



Residential Water Sold

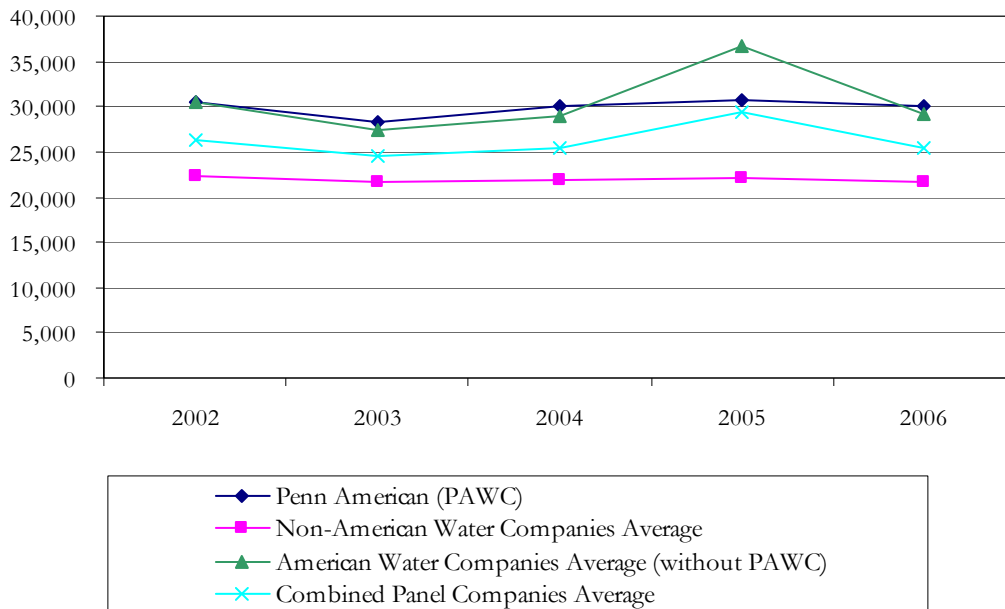
**Exhibit XIV-28
Residential Water Sold (millions of gallons)**

Residential Water Sold (millions of gallons)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	30,559	28,268	30,137	30,769	29,949	-0.50%
Aqua Penn/Philadelphia Suburban	22,651	22,497	22,025	23,209	21,946	-0.79%
Aquarion Connecticut	15,222	14,706	15,069	16,499	15,990	1.24%
San Jose Water Corp	29,173	27,754	28,824	26,701	26,892	-2.01%
Non-American Water Companies Average	22,349	21,652	21,973	22,136	21,609	-0.84%
Elizabethtown Water*	26,087	23,855	24,114	29,460	17,812	-9.10%
Missouri American**	38,999	34,548	36,673	38,960	41,851	1.78%
New Jersey American*	26,126	23,817	26,181	41,477	27,553	1.34%
American Water Companies Average (without PAWC)	30,404	27,407	28,989	36,632	29,072	-1.11%
Combined Panel Companies Average	26,376	24,530	25,481	29,384	25,341	-1.00%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Residential Water Sold (millions of gallons)



Commercial Water Sold

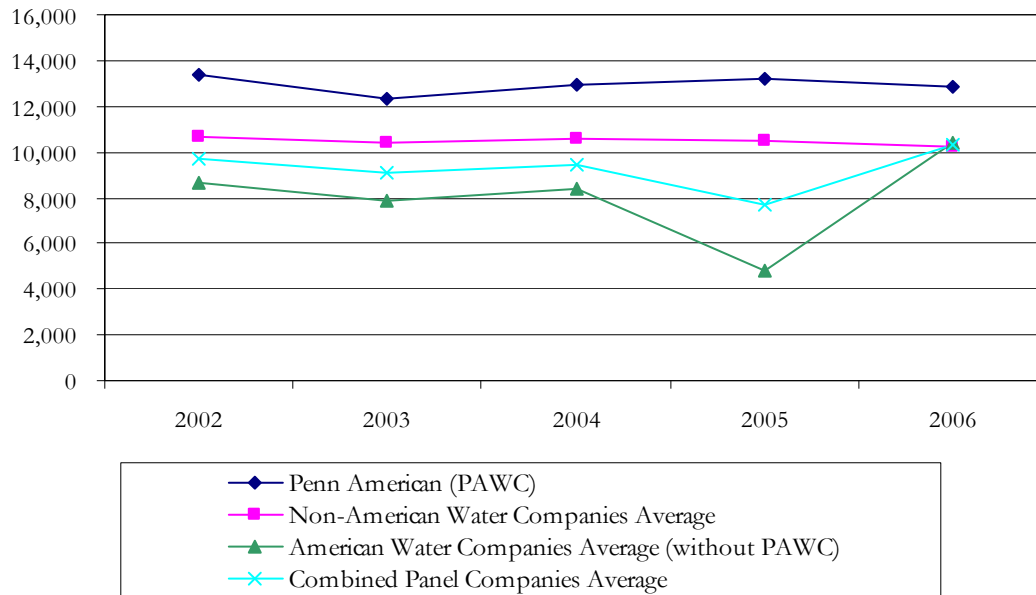
**Exhibit XIV-29
Commercial Water Sold (millions of gallons)**

Commercial Water Sold (millions of gallons)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	13,351	12,316	12,917	13,236	12,856	-0.94%
Aqua Penn/Philadelphia Suburban	11,145	10,754	10,692	10,973	10,802	-0.78%
Aquarion Connecticut	5,364	5,401	5,635	5,706	4,904	-2.22%
San Jose Water Corp	15,532	15,013	15,385	14,890	14,976	-0.91%
Non-American Water Companies Average	10,680	10,389	10,571	10,523	10,227	-1.08%
Elizabethtown Water*	0	0	0	0	4,166	N/A
Missouri American**	12,875	11,787	12,533	14,474	14,488	2.99%
New Jersey American*	13,059	11,702	12,631	0	12,504	-1.08%
American Water Companies Average (without PAWC)	8,645	7,830	8,388	4,825	10,386	4.69%
Combined Panel Companies Average	9,663	9,110	9,479	7,674	10,307	1.63%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Commercial Water Sold (millions of gallons)



Industrial Water Sold

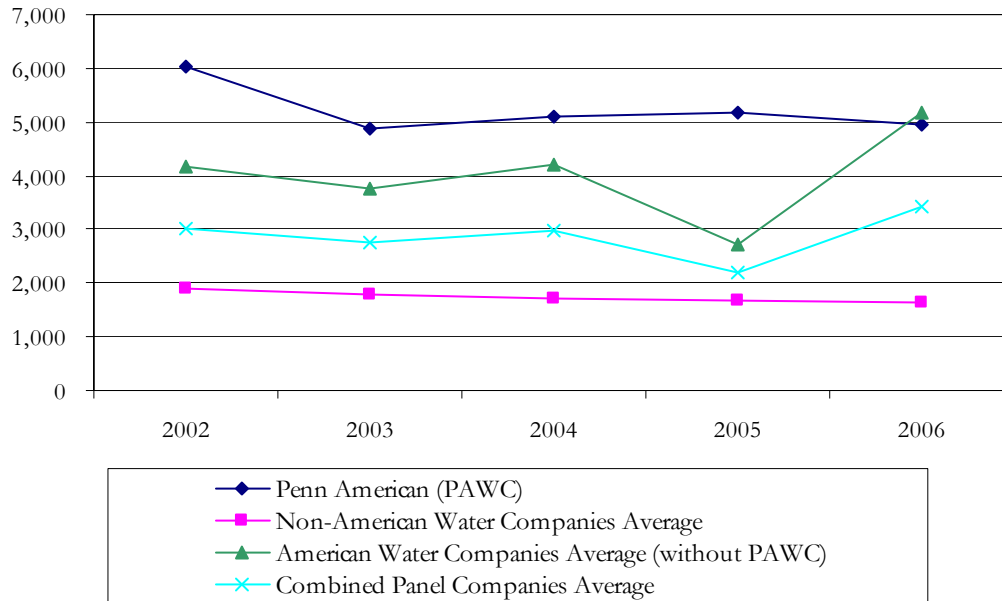
Exhibit XIV-30
Industrial Water Sold (millions of gallons)

Industrial Water Sold (millions of gallons)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	6,031	4,890	5,096	5,157	4,966	-4.74%
Aqua Penn/Philadelphia Suburban	3,853	3,702	3,594	3,407	3,546	-2.05%
Aquarion Connecticut	1,384	1,266	1,191	1,265	1,061	-6.43%
San Jose Water Corp	412	366	375	320	340	-4.69%
Non-American Water Companies Average	1,883	1,778	1,720	1,664	1,649	-3.26%
Elizabethtown Water*	3,668	3,843	3,906	0	5,311	9.69%
Missouri American**	8,229	6,885	8,250	8,160	9,799	4.46%
New Jersey American*	603	547	516	0	429	-8.16%
American Water Companies Average (without PAWC)	4,167	3,758	4,224	2,720	5,180	5.59%
Combined Panel Companies Average	3,025	2,768	2,972	2,192	3,414	3.07%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Industrial Water Sold (millions of gallons)



Wholesale Water Sold

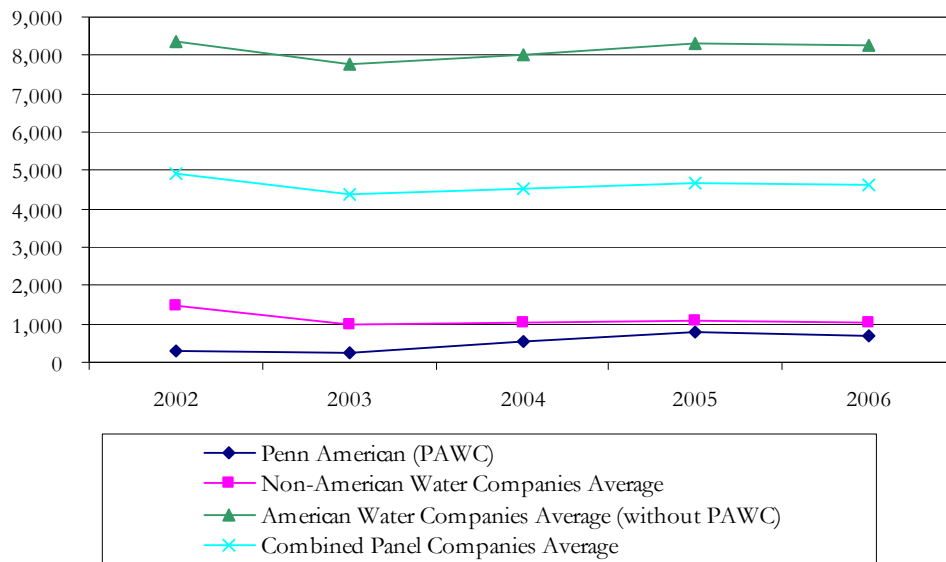
**Exhibit XIV-31
Wholesale Water Sold (millions of gallons)**

Wholesale Water Sold (millions of gallons)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	308	238	555	783	713	23.35%
Aqua Penn/Philadelphia Suburban	935	1,027	991	1,088	1,126	4.76%
Aquarion Connecticut	3,259	1,734	1,800	1,875	1,704	-14.97%
San Jose Water Corp	293	250	250	232	230	-5.87%
Non-American Water Companies Average	1,496	1,004	1,014	1,065	1,020	-9.13%
Elizabethtown Water*	17,030	15,037	14,819	15,410	14,731	-3.56%
Missouri American**	3,634	3,589	4,024	4,409	4,677	6.51%
New Jersey American*	4,476	4,754	5,193	5,132	5,381	4.71%
American Water Companies Average (without PAWC)	8,380	7,793	8,012	8,317	8,263	-0.35%
Combined Panel Companies Average	4,938	4,399	4,513	4,691	4,642	-1.54%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Wholesale Water Sold (millions of gallons)



PAWC’s wholesale water sold increased at a compound growth rate over 23%, primarily due to the fact that in 2004 PAWC entered into an agreement with West Allegheny County Municipal Authority (WACMA) for the purchase of water to resell. In 2005, a full year of revenue and usage was recorded according to the terms of the agreement.

Governmental Authority Water Sold

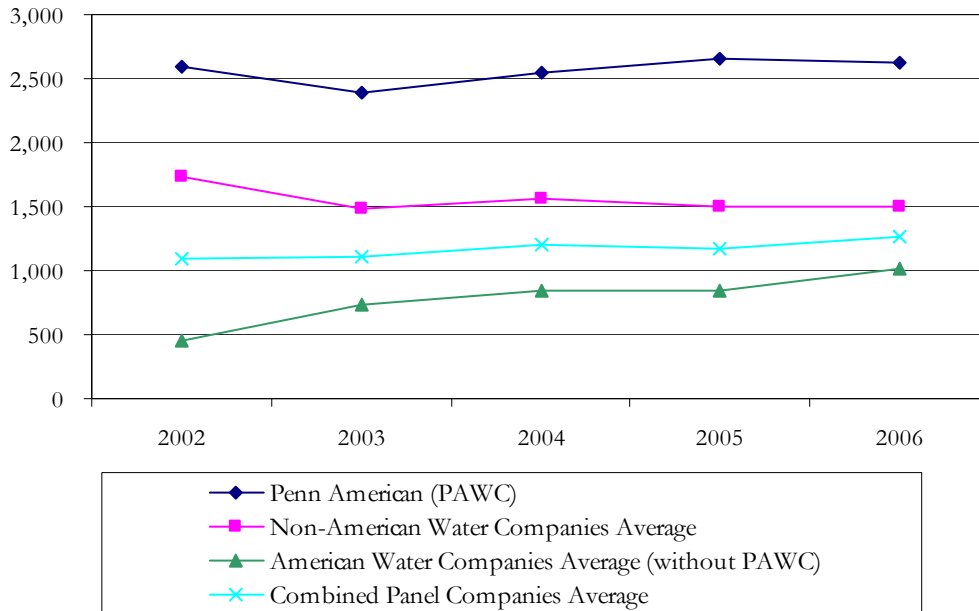
**Exhibit XIV-32
Governmental Authority Water Sold (millions of gallons)**

Governmental Authority Water Sold (millions of gallons)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	2,600	2,393	2,552	2,659	2,625	0.24%
Aqua Penn/Philladelphia Suburban	1,187	979	1,080	1,185	1,186	-0.02%
Aquarion Connecticut	1,058	846	778	784	834	-5.77%
San Jose Water Corp	2,959	2,613	2,810	2,530	2,467	-4.44%
Non-American Water Companies Average	1,735	1,479	1,556	1,500	1,496	-3.64%
Elizabethtown Water*	0	0	0	0	379	N/A
Missouri American**	0	989	1,166	1,239	1,349	10.79%
New Jersey American*	1,365	1,202	1,365	1,314	1,337	-0.52%
American Water Companies Average (without PAWC)	455	730	844	851	1,022	22.41%
Combined Panel Companies Average	1,095	1,105	1,200	1,175	1,259	3.55%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC and Compound Growth/Loss calculated only on 2003-2006

Governmental Authority Water Sold (millions of gallons)



Fire Service Water Sold

**Exhibit XIV-33
Fire Service Water Sold (millions of gallons)**

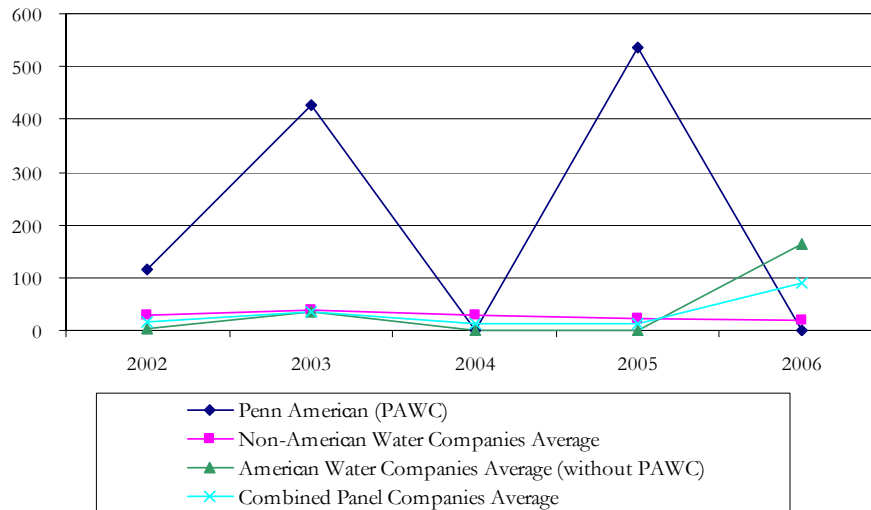
Fire Service Water Sold (millions of gallons)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	116	426	0	536	0	-100.00%
Aqua Penn/Philadelphia Suburban	90	118	83	71	53	-12.40%
Aquarion Connecticut	0	0	0	0	0	0.00%
San Jose Water Corp	0	0	0	0	0	0.00%
Non-American Water Companies Average	30	39	28	24	18	-12.40%
Elizabethtown Water*	0	0	0	0	31	N/A
Missouri American***	5	1	0	0	0	-100.00%
New Jersey American**	0	101	0	0	460	64.92%
American Water Companies Average (without PAWC)	2	34	0	0	164	214.80%
Combined Panel Companies Average	16	37	14	12	91	54.69%

* 2006 Elizabethtown Water and PAWC data from Data Request 620 response, not NAWC

** 2006 New Jersey American data from Data Request 620 response, not NAWC and Compound Growth/Loss calculated only on 2003-2006

*** 2002 data from filed MO PSC Annual Report, not NAWC

Fire Service Water Sold (millions of gallons)



As fire service is a flat rate, PAWC does not typically report usage for this bill class, although figures were provided for 2002, 2003, and 2005.⁴⁵

Other Water Sold

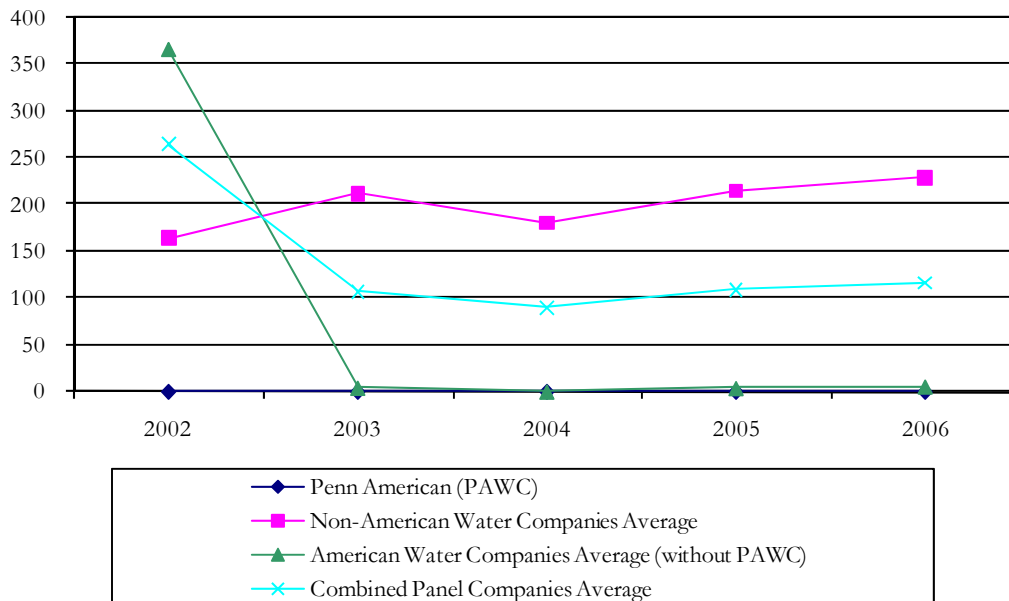
Exhibit XIV-34
Other Water Sold (millions of gallons)

Other Water Sold (millions of gallons)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	0	0	0	0	0	0.00%
Aqua Penn/Philadelphia Suburban	0	0	0	0	0	0.00%
Aquarion Connecticut	0	0	0	0	0	0.00%
San Jose Water Corp	492	636	542	645	687	8.70%
Non-American Water Companies Average	164	212	181	215	229	8.70%
Elizabethtown Water*	0	0	0	0	0	0.00%
Missouri American**	1,098	12	0	11	16	-65.26%
New Jersey American*	0	0	0	0	0	0.00%
PAWC)	366	4	0	4	5	-65.26%
Combined Panel Companies Average	265	108	90	109	117	-18.46%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Other Water Sold (millions of gallons)



Operating Revenue

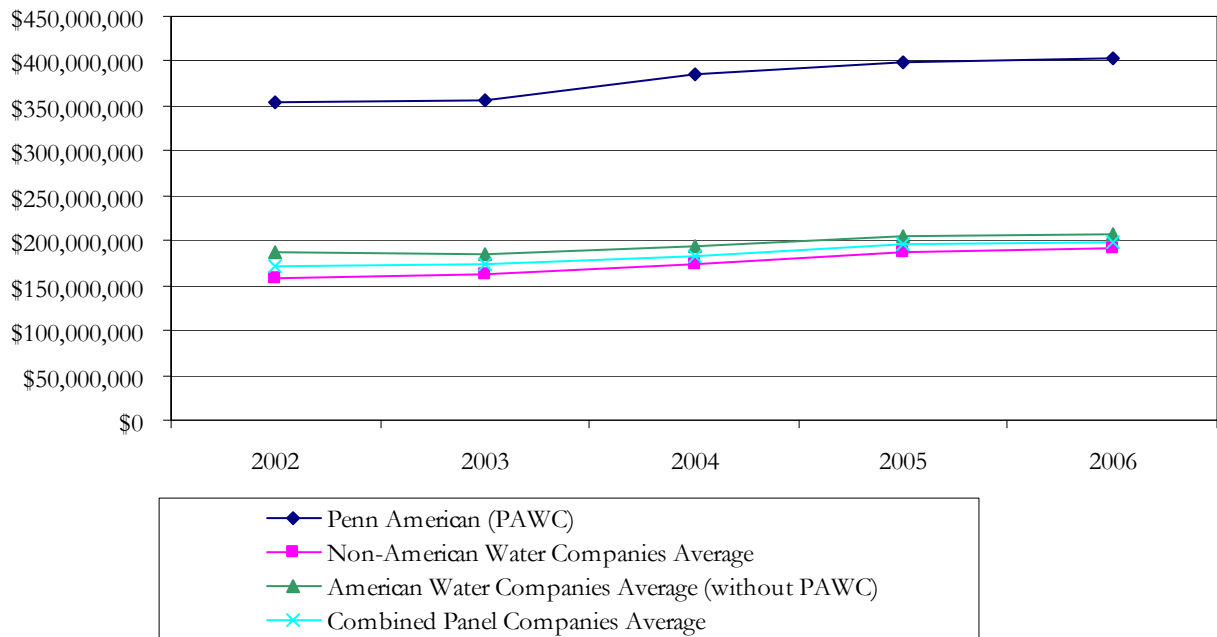
Exhibit XIV-35
Total Operating Revenue (\$'s)

Total Revenue (\$'s)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	353,522,504	355,507,044	384,402,191	399,795,739	402,750,000	3.31%
Aqua Penn/Philadelphia Suburban	218,240,778	234,582,061	247,680,460	269,039,760	282,947,426	6.71%
Aquarion Connecticut	110,034,624	109,862,116	110,915,907	116,235,620	113,173,791	0.71%
San Jose Water Corp	143,092,488	146,131,296	161,757,237	175,524,319	180,619,665	6.00%
Non-American Water Companies Average	157,122,630	163,525,158	173,451,201	186,933,233	192,246,961	5.17%
Elizabethtown Water*	155,066,981	155,329,841	158,017,899	165,203,157	166,592,000	0.00%
Missouri American**	161,986,367	156,996,994	154,968,916	164,047,256	170,853,331	1.34%
New Jersey American*	244,347,075	241,543,126	266,661,506	282,658,077	281,305,000	3.58%
American Water Companies Average (without PAWC)	187,133,474	184,623,320	193,216,107	203,969,497	206,250,110	2.46%
Combined Panel Companies Average	172,128,052	174,074,239	183,333,654	195,451,365	199,248,536	3.73%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Total Revenue (\$'s)



Residential Revenue

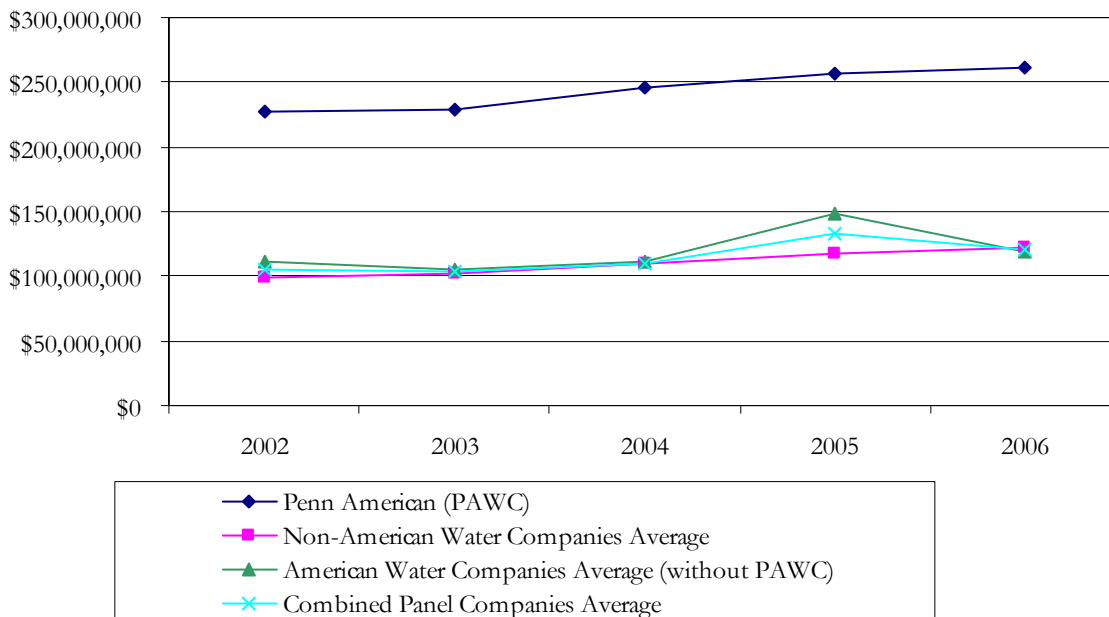
**Exhibit XIV-36
Residential Revenue (\$'s)**

Residential Revenue (\$'s)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	226,575,152	228,809,241	246,333,788	257,225,435	261,751,000	3.67%
Aqua Penn/Philadelphia Suburban	138,149,783	145,717,993	156,854,891	166,959,090	179,192,387	6.72%
Aquarion Connecticut	70,954,552	69,608,508	70,275,687	75,346,027	72,340,512	0.48%
San Jose Water Corp	87,801,429	89,805,202	99,981,981	109,732,604	113,280,900	6.58%
Non-American Water Companies Average	98,968,588	101,710,568	109,037,520	117,345,907	121,604,600	5.28%
Elizabethtown Water*	100,780,604	87,616,431	87,347,322	116,175,270	78,616,000	-6.02%
Missouri American**	102,272,550	96,570,086	98,165,040	103,366,532	106,299,676	0.97%
New Jersey American*	132,905,402	131,475,571	147,667,230	226,629,471	170,452,000	6.42%
American Water Companies Average (without PAWC)	111,986,185	105,220,696	111,059,864	148,723,758	118,455,892	1.41%
Combined Panel Companies Average	105,477,387	103,465,632	110,048,692	133,034,832	120,030,246	3.28%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Residential Revenue (\$'s)



Commercial Revenue

**Exhibit XIV-37
Commercial Revenue (\$'s)**

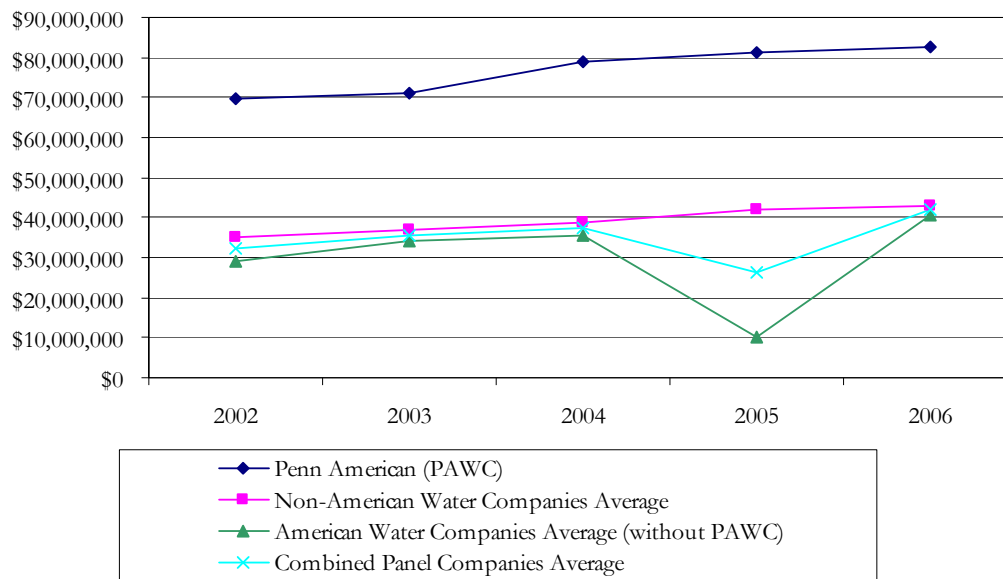
Commercial Revenue (\$'s)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	69,568,695	71,054,559	78,722,592	81,202,972	82,799,000	4.45%
Aqua Penn/Philadelphia Suburban	45,010,812	49,475,672	50,839,751	57,257,270	58,935,102	6.97%
Aquarion Connecticut	17,307,059	17,494,575	17,398,458	17,414,498	17,007,953	-0.43%
San Jose Water Corp	42,982,977	44,315,153	48,343,235	51,886,818	53,132,415	5.44%
Non-American Water Companies Average	35,100,283	37,095,133	38,860,481	42,186,195	43,025,157	5.22%
Elizabethtown Water**	0	15,178,440	17,150,554	0	19,118,000	7.91%
Missouri American***	28,978,736	30,163,477	27,012,598	29,940,877	32,850,402	3.18%
New Jersey American*	58,700,389	57,123,111	63,126,506	0	69,589,000	4.35%
American Water Companies Average (without PAWC)	29,226,375	34,155,009	35,763,219	9,980,292	40,519,134	8.51%
Combined Panel Companies Average	32,163,329	35,625,071	37,311,850	26,083,244	41,772,145	6.75%

* 2006 New Jersey American and PAWC data from Data Request 620 response, not NAWC

** 2006 Elizabethtown Water data from Data Request 620 response, not NAWC and Compound Growth/Loss calculated only on 2003-2006

*** 2002 data from filed MO PSC Annual Report, not NAWC

Commercial Revenue (\$'s)



Industrial Revenue

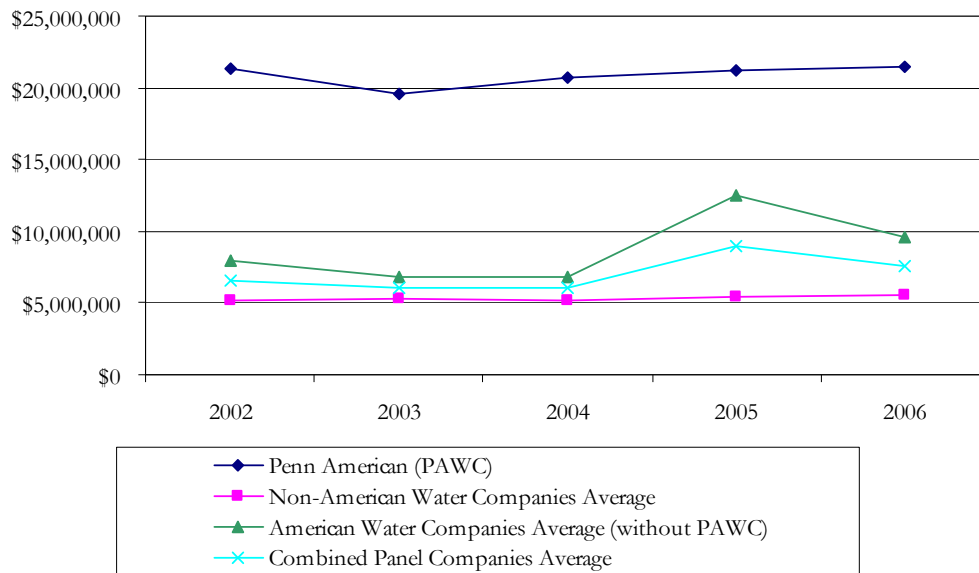
**Exhibit XIV-38
Industrial Revenue (\$'s)**

Industrial Revenue (\$'s)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	21,311,584	19,563,868	20,684,995	21,232,096	21,417,000	0.12%
Aqua Penn/Philadelphia Suburban	11,980,382	12,644,717	12,227,340	12,922,921	13,539,623	3.11%
Aquarion Connecticut	2,584,270	2,426,645	2,391,047	2,269,054	2,145,675	-4.54%
San Jose Water Corp	1,059,658	979,392	1,082,661	1,041,561	1,114,548	1.27%
Non-American Water Companies Average	5,208,103	5,350,251	5,233,683	5,411,179	5,599,949	1.83%
Elizabethtown Water*	9,387,200	6,975,157	7,573,325	26,979,047	16,272,000	14.74%
Missouri American**	11,672,626	10,911,841	10,551,463	10,383,853	10,432,773	-2.77%
New Jersey American*	2,622,102	2,588,938	2,352,845	0	2,108,000	-5.31%
American Water Companies Average (without PAWC)	7,893,976	6,825,312	6,825,878	12,454,300	9,604,258	5.02%
Combined Panel Companies Average	6,551,040	6,087,782	6,029,780	8,932,739	7,602,103	3.79%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Industrial Revenue (\$'s)



PAWC experienced only a 0.12% compound growth over the time period 2002 to 2006, as it has not added any large industrial customers, plus it has seen a decrease in usage as well as the loss of several large industrial customers.

Wholesale Revenue

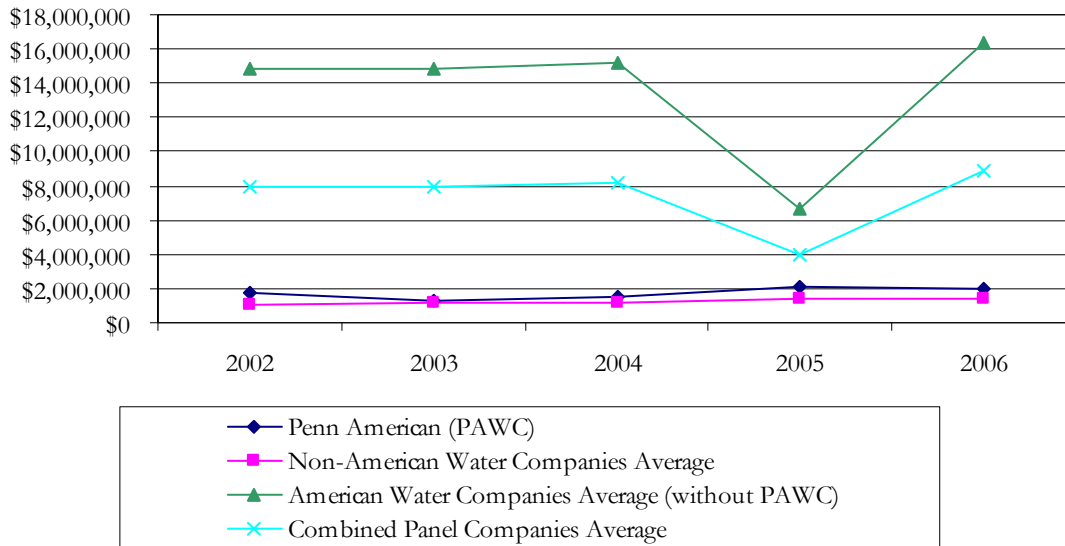
**Exhibit XIV-39
Wholesale Revenue (\$'s)**

Wholesale Revenue (\$'s)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	1,757,631	1,249,264	1,535,296	2,085,539	1,972,000	2.92%
Aqua Penn/Philadelphia Suburban	620,473	509,652	403,382	589,372	679,978	2.32%
Aquarion Connecticut	1,896,526	2,293,835	2,444,049	2,920,422	2,775,900	9.99%
San Jose Water Corp	505,977	536,889	607,947	784,479	887,572	15.08%
Non-American Water Companies Average	1,007,659	1,113,459	1,151,793	1,431,424	1,447,817	9.48%
Elizabethtown Water*	25,635,466	25,647,650	25,442,775	0	26,368,000	0.71%
Missouri American**	6,745,287	6,653,166	6,968,543	6,716,118	6,891,797	0.54%
New Jersey American*	12,079,236	12,313,726	13,237,484	13,113,566	15,721,000	6.81%
American Water Companies Average (without PAWC)	14,819,996	14,871,514	15,216,267	6,609,895	16,326,932	2.45%
Combined Panel Companies Average	7,913,828	7,992,486	8,184,030	4,020,660	8,887,375	2.94%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Wholesale Revenue (\$'s)



Governmental Authority Revenue

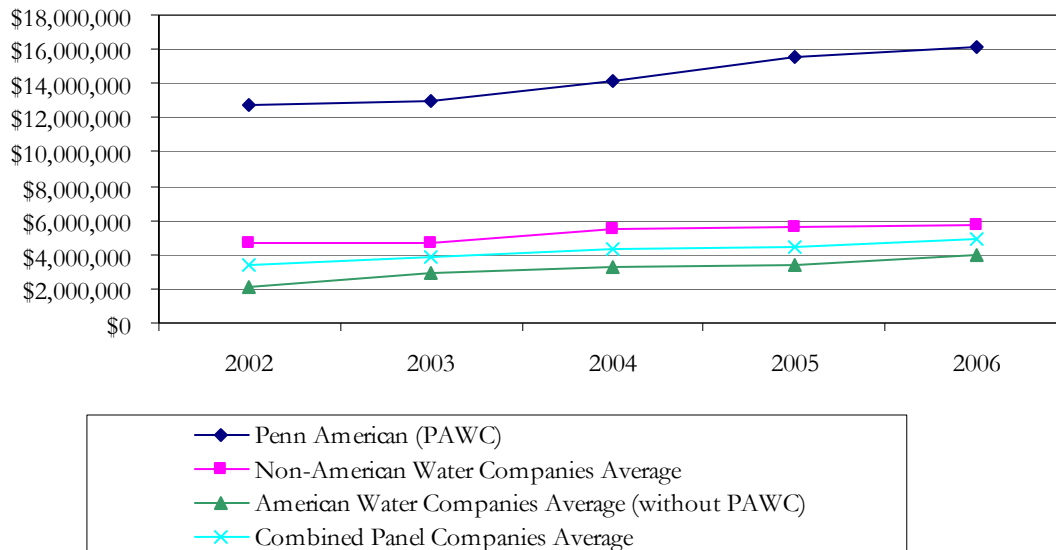
**Exhibit XIV-40
Governmental Authority Revenue (\$'s)**

Governmental Authority Revenue (\$'s)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	12,728,972	12,960,136	14,133,775	15,574,261	16,115,000	6.07%
Aqua Penn/Philadelphia Suburban	2,792,419	3,419,390	4,643,443	5,082,333	5,382,712	17.83%
Aquarion Connecticut	2,983,764	2,906,646	2,963,352	2,940,655	2,907,154	-0.65%
San Jose Water Corp	8,173,522	7,856,318	8,832,308	8,903,231	8,903,340	2.16%
Non-American Water Companies Average	4,649,902	4,727,451	5,479,701	5,642,073	5,731,069	5.37%
Elizabethtown Water*	0	0	0	0	1,929,000	0.00%
Missouri American**	0	2,680,872	2,717,984	2,850,402	3,107,759	5.00%
New Jersey American*	6,414,923	6,155,438	6,949,236	7,167,160	6,889,000	1.80%
American Water Companies Average (without PAWC)	2,138,308	2,945,437	3,222,407	3,339,187	3,975,253	16.77%
Combined Panel Companies Average	3,394,105	3,836,444	4,351,054	4,490,630	4,853,161	9.35%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC and Compound Growth/Loss calculated only on 2003-2006

Governmental Authority Revenue (\$'s)



Fire Service Revenue

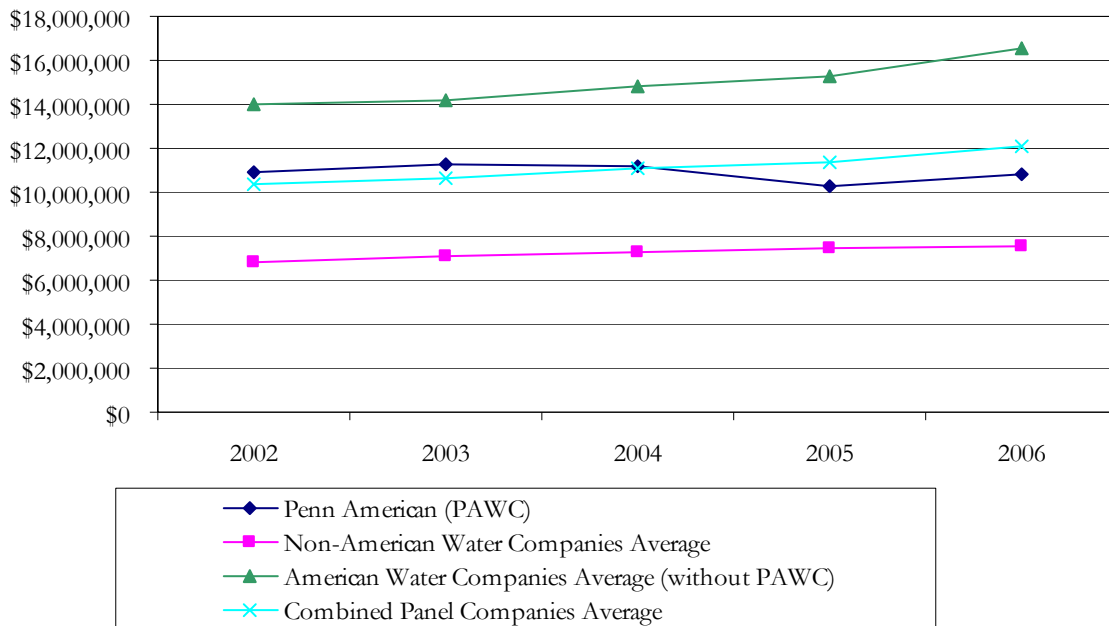
**Exhibit XIV-41
Fire Service Revenue (\$'s)**

Fire Service Revenue (\$'s)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	10,910,570	11,294,979	11,160,570	10,274,507	10,803,000	-0.25%
Aqua Penn/Philadelphia Suburban	5,471,009	5,593,844	5,680,321	5,786,109	5,912,558	1.96%
Aquarion Connecticut	13,742,012	14,361,761	14,644,326	14,658,226	14,752,079	1.79%
San Jose Water Corp	1,267,226	1,306,705	1,521,510	1,961,253	2,046,274	12.73%
Non-American Water Companies Average	6,826,749	7,087,437	7,282,052	7,468,529	7,570,304	2.62%
Elizabethtown Water*	19,197,200	19,842,508	20,438,920	20,968,166	23,662,000	5.37%
Missouri American**	7,800,435	7,857,952	7,588,461	7,936,945	8,403,144	1.88%
New Jersey American*	14,875,054	14,803,801	16,507,013	16,916,808	17,497,000	4.14%
American Water Companies Average (without PAWC)	13,957,563	14,168,087	14,844,798	15,273,973	16,520,715	4.30%
Combined Panel Companies Average	10,392,156	10,627,762	11,063,425	11,371,251	12,045,509	3.76%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Fire Service Revenue (\$'s)



Other Revenue

Exhibit XIV-42
Other Revenue (\$'s)

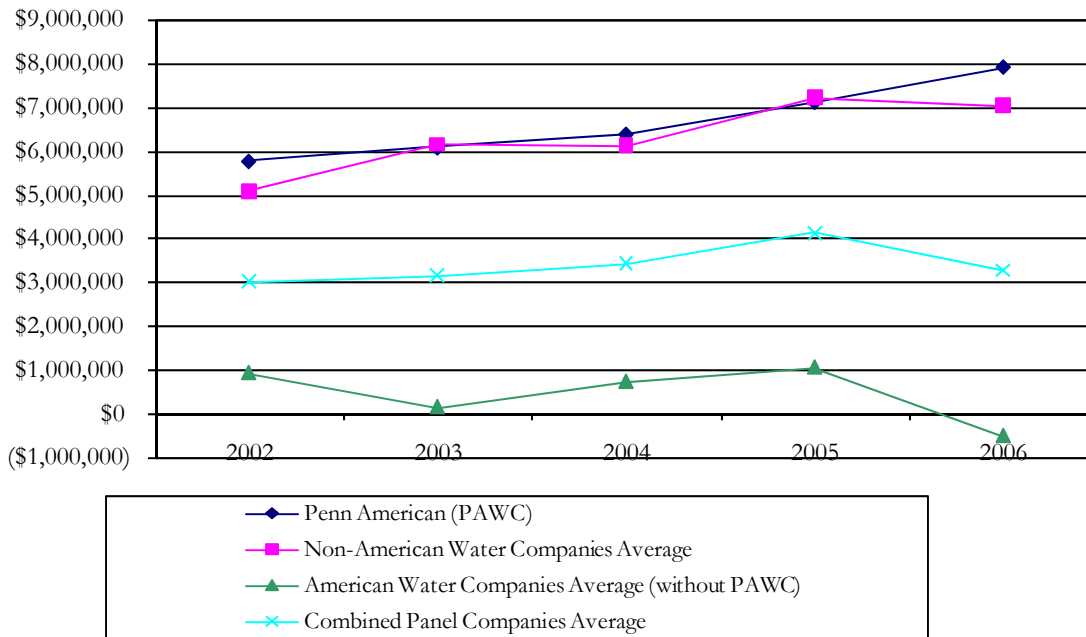
Other Revenue (\$'s)	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	5,770,793	6,076,508	6,380,528	7,101,623	7,893,000	8.14%
Aqua Penn/Philadelphia Suburban	14,215,900	17,220,793	17,031,332	20,442,665	19,305,066	7.95%
Aquarion Connecticut	566,441	770,146	798,988	686,738	1,244,518	21.75%
San Jose Water Corp	438,552	426,139	520,062	491,581	520,433	4.37%
Non-American Water Companies Average	5,073,631	6,139,026	6,116,794	7,206,995	7,023,339	8.47%
Elizabethtown Water**	66,511	69,655	65,004	1,080,674	(515,000)	150.94%
Missouri American***	2,691,528	211,374	1,897,157	2,556,833	183,279	-48.92%
New Jersey American*	(4,757)	165,465	197,754	(511,585)	(1,176,000)	N/A
American Water Companies Average (without PAWC)	917,761	148,831	719,972	1,041,974	(502,574)	4.28%
Combined Panel Companies Average	2,995,696	3,143,929	3,418,383	4,124,484	3,260,383	2.14%

* 2006 New Jersey American and PAWC data from Data Request 620 response, not NAWC

** 2006 Elizabethtown Water data from Data Request 620 response, not NAWC, and Compound Growth/Loss calculated only on 2002-2005

*** 2002 data from filed MO PSC Annual Report, not NAWC

Other Revenue (\$'s)



Total Average Number of Customers (year-end)

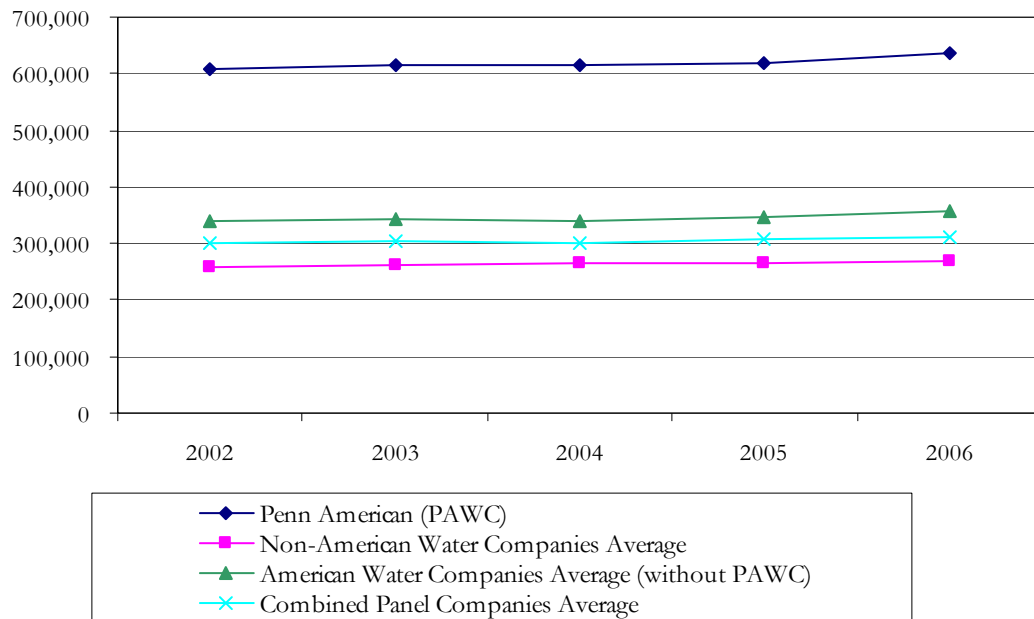
**Exhibit XIV-43
Total Average Number of Customers (year-end)**

Total Average Number of Customers	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	609,110	615,069	614,308	618,340	637,660	2.33%
Aqua Penn/Philadelphia Suburban	387,634	390,019	395,935	399,456	403,860	1.03%
Aquarion Connecticut	172,328	174,033	176,101	177,911	179,004	0.95%
San Jose Water Corp	219,041	219,670	220,370	223,198	223,184	0.47%
Non-American Water Companies Average	259,668	261,241	264,135	266,855	268,683	0.86%
Elizabethtown Water*	203,138	204,735	206,559	207,690	208,211	0.62%
Missouri American**	432,029	444,557	450,547	459,564	464,365	1.82%
New Jersey American*	378,957	383,222	360,601	368,181	395,561	1.08%
American Water Companies Average (without PAWC)	338,041	344,171	339,236	345,145	356,046	1.31%
Combined Panel Companies Average	298,855	302,706	301,686	306,000	312,364	1.11%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Total Average Number of Customers



Residential Average Number of Customers

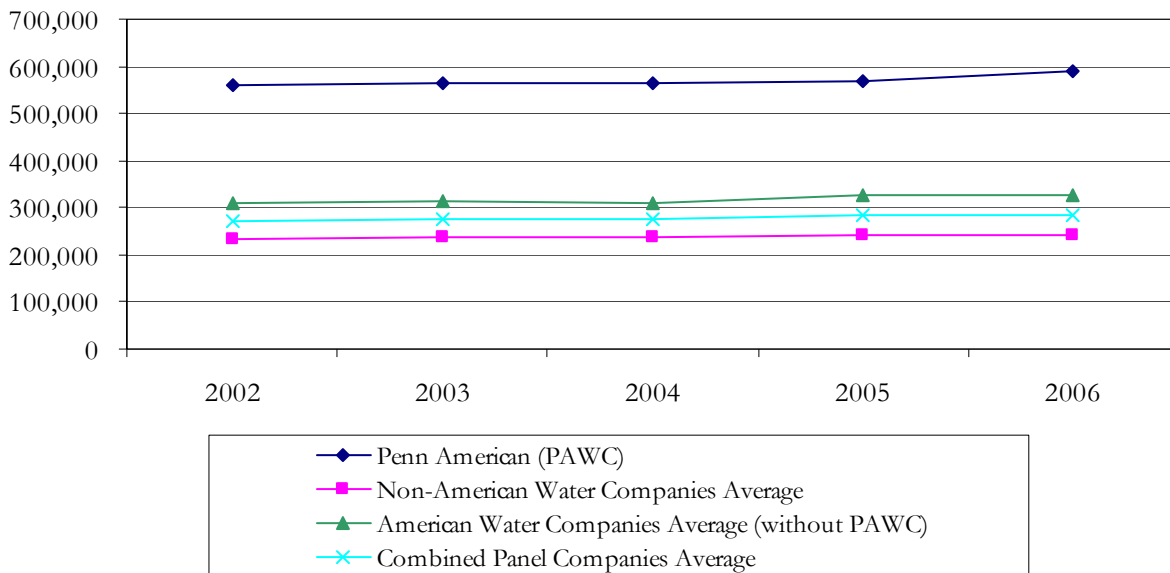
**Exhibit XIV-44
Residential Average Number of Customer**

Residential Average Number of Customers	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	559,570	565,301	565,290	569,432	588,133	1.25%
Aqua Penn/Philadelphia Suburban	353,321	358,333	364,010	367,851	371,959	1.29%
Aquarion Connecticut	155,765	157,359	158,765	160,522	162,026	0.99%
San Jose Water Corp	193,975	193,540	195,307	195,749	196,510	0.33%
Non-American Water Companies Average	234,354	236,411	239,361	241,374	243,498	0.96%
Elizabethtown Water*	200,084	191,167	192,686	203,988	192,044	-1.02%
Missouri American**	397,238	409,840	412,983	418,977	424,185	1.65%
New Jersey American*	337,551	342,412	323,635	361,768	359,346	1.58%
American Water Companies Average (without PAWC)	311,624	314,473	309,768	328,244	325,192	1.07%
Combined Panel Companies Average	272,989	275,442	274,564	284,809	284,345	1.02%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Residential Average Number of Customers



Commercial Average Number of Customers

**Exhibit XIV-45
Commercial Average Number of Customers**

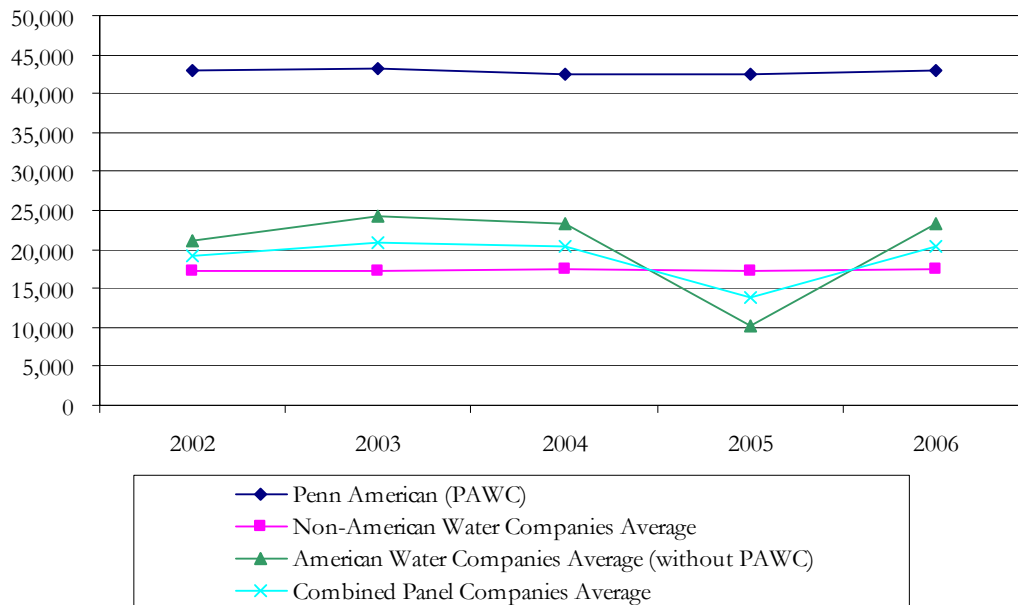
Commercial Average Number of Customers	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	43,040	43,229	42,560	42,475	42,996	-0.03%
Aqua Penn/Philadelphia Suburban	19,655	19,962	20,065	20,078	20,210	0.70%
Aquarion Connecticut	11,770	11,820	12,208	12,210	11,907	0.29%
San Jose Water Corp	20,123	20,246	19,902	19,544	20,210	0.11%
Non-American Water Companies Average	17,183	17,343	17,392	17,277	17,442	0.38%
Elizabethtown Water**	0	10,208	10,330	0	10,561	1.13%
Missouri American***	28,799	28,668	29,587	30,902	30,216	1.21%
New Jersey American*	34,731	33,972	30,149	0	29,396	-4.08%
American Water Companies Average (without PAWC)	21,177	24,283	23,355	10,301	23,391	2.52%
Combined Panel Companies Average	19,180	20,813	20,374	13,789	20,417	1.57%

* 2006 New Jersey American and PAWC data from Data Request 620 response, not NAWC

** 2006 Elizabethtown Water data from Data Request 620 response, not NAWC and Compound Growth/Loss calculated only on 2003-2006

*** 2002 data from filed MO PSC Annual Report, not NAWC

Commercial Average Number of Customers



Industrial Average Number of Customers

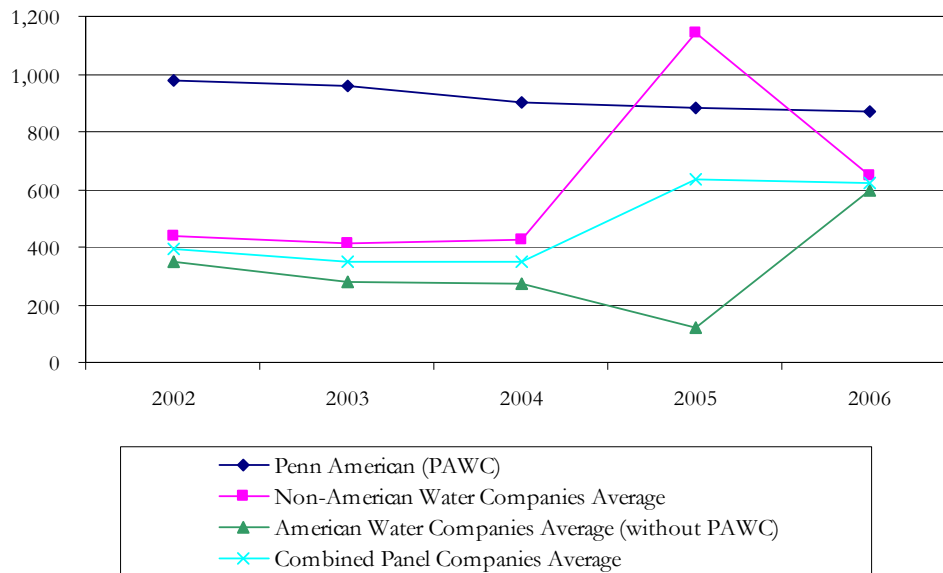
**Exhibit XIV-46
Industrial Average Number of Customers**

Industrial Average Number of Customers	2002	2003	2004	2005	2006	Compound Growth/Loss
Penn American (PAWC)*	976	959	899	883	873	-2.75%
Aqua Penn/Philadelphia Suburban	923	917	903	894	886	-1.02%
Aquarion Connecticut	296	237	279	810	225	-6.63%
San Jose Water Corp	95	91	90	1,722	835	72.18%
Non-American Water Companies Average	438	415	424	1,142	649	10.32%
Elizabethtown Water*	9	8	8	0	1,049	228.57%
Missouri American**	608	419	412	365	355	-12.59%
New Jersey American*	426	418	402	0	388	-2.31%
American Water Companies Average (without PAWC)	348	282	274	122	597	14.49%
Combined Panel Companies Average	393	348	349	632	623	12.22%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Industrial Average Number of Customers



PAWC experienced a slight decrease over the 2002-2006 time period, as it reclassified certain industrial customers to the commercial bill class as defined by its tariff. Furthermore, data anomalies seemed to occur for other companies in 2005 and 2006.⁴⁶



Wholesale Average Number of Customers

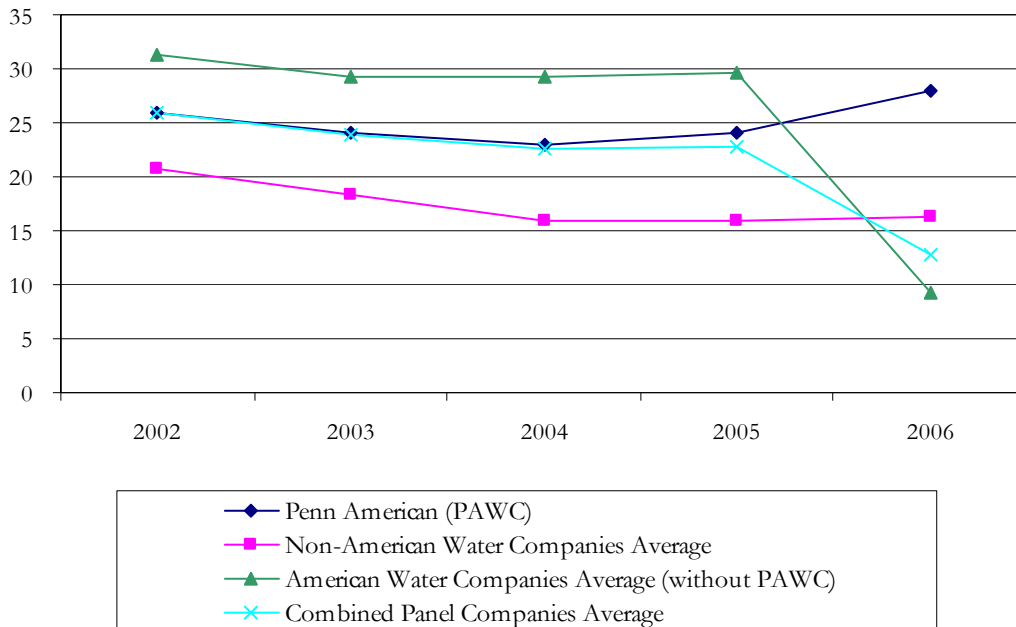
Exhibit XIV-47
Wholesale Average Number of Customers

Wholesale Average Number of Customers	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	26	24	23	24	28	1.87%
Aqua Penn/Philadelphia Suburban	15	12	12	12	13	-3.51%
Aquarion Connecticut	8	8	1	1	1	-40.54%
San Jose Water Corp	39	35	35	35	35	-2.67%
Non-American Water Companies Average	21	18	16	16	16	-5.71%
Elizabethtown Water*	13	13	15	16	0	-100.00%
Missouri American**	42	33	31	29	28	-9.64%
New Jersey American*	39	42	42	44	0	-100.00%
American Water Companies Average (without PAWC)	31	29	29	30	9	-26.12%
Combined Panel Companies Average	26	24	23	23	13	-16.18%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Wholesale Average Number of Customers



Governmental Authority Average Number of Customers

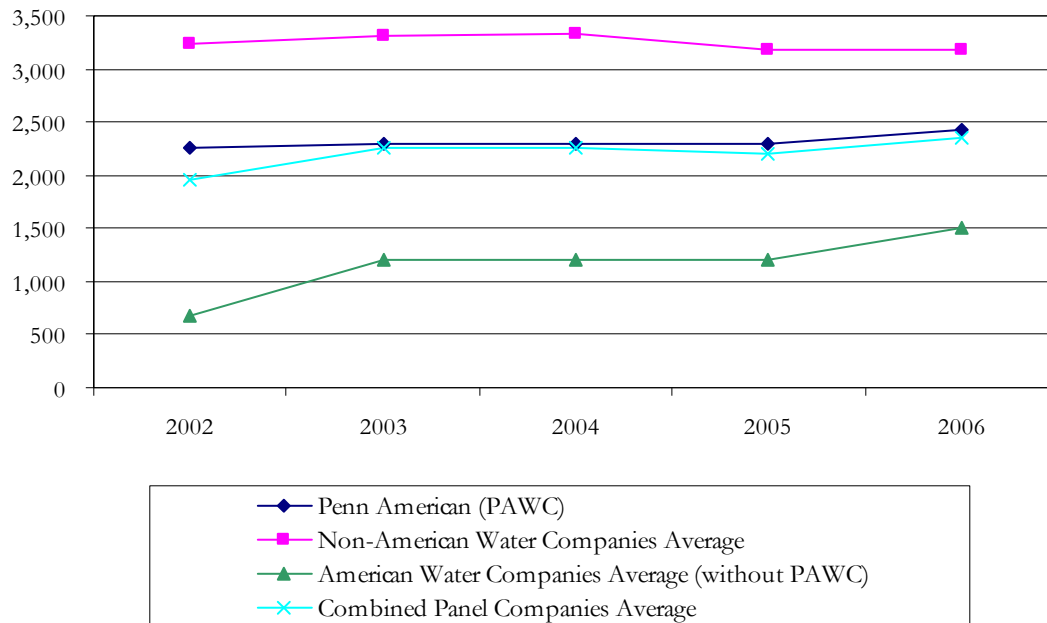
**Exhibit XIV-48
Governmental Authority Average Number of Customers**

Governmental Authority Average Number of Customers	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	2,258	2,294	2,301	2,298	2,421	1.76%
Aqua Penn/Philadelphia Suburban	6,711	6,751	6,750	6,272	6,280	-1.65%
Aquarion Connecticut	1,366	1,495	1,538	1,554	1,542	3.08%
San Jose Water Corp	1,658	1,681	1,700	1,720	1,720	0.92%
Non-American Water Companies Average	3,245	3,309	3,329	3,182	3,181	-0.50%
Elizabethtown Water*	0	0	0	0	790	N/A
Missouri American**	0	1,544	1,572	1,615	1,652	2.26%
New Jersey American*	2,025	2,079	2,042	2,008	2,086	0.74%
American Water Companies Average (without PAWC)	675	1,208	1,205	1,208	1,509	22.28%
Combined Panel Companies Average	1,960	2,258	2,267	2,195	2,345	4.59%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC and Compound Growth/Loss calculation 2003-2006 only

Governmental Authority Average Number of Customers



Fire Service Average Number of Customers

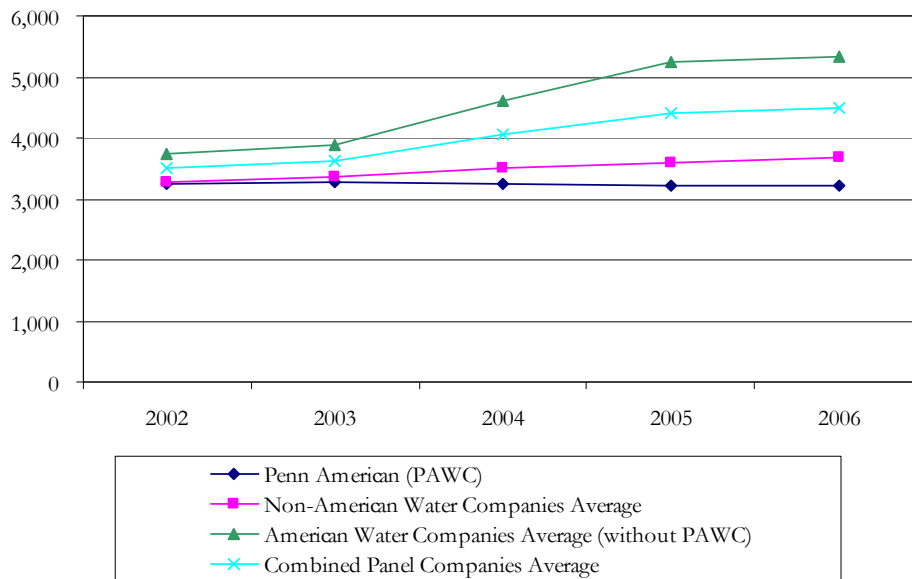
Exhibit XIV-49
Fire Service Average Number of Customers

Fire Service Average Number of Customers	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	3,240	3,262	3,235	3,223	3,209	-0.24%
Aqua Penn/Philadelphia Suburban	3,864	4,044	4,195	4,349	4,512	3.95%
Aquarion Connecticut	3,123	3,114	3,310	3,354	3,303	1.41%
San Jose Water Corp	2,851	2,945	3,028	3,083	3,195	2.89%
Non-American Water Companies Average	3,279	3,368	3,511	3,595	3,670	2.85%
Elizabethtown Water*	3,032	3,339	3,520	3,686	3,738	5.37%
Missouri American**	4,022	4,053	5,962	7,670	7,923	18.47%
New Jersey American*	4,185	4,299	4,331	4,361	4,345	0.94%
American Water Companies Average (without PAWC)	3,746	3,897	4,604	5,239	5,335	9.24%
Combined Panel Companies Average	3,513	3,632	4,058	4,417	4,503	6.40%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Fire Service Average Number of Customers



PAWC experienced a slight decrease over the 2002-2006 time period. Company management indicates that due to PaPUC regulations on metering all customers, PAWC no longer adds private fire-service

customers, unless through acquisition of other system. Instead, all such new customers are set up as general water service customers.⁴⁷

Other Average Number of Customers

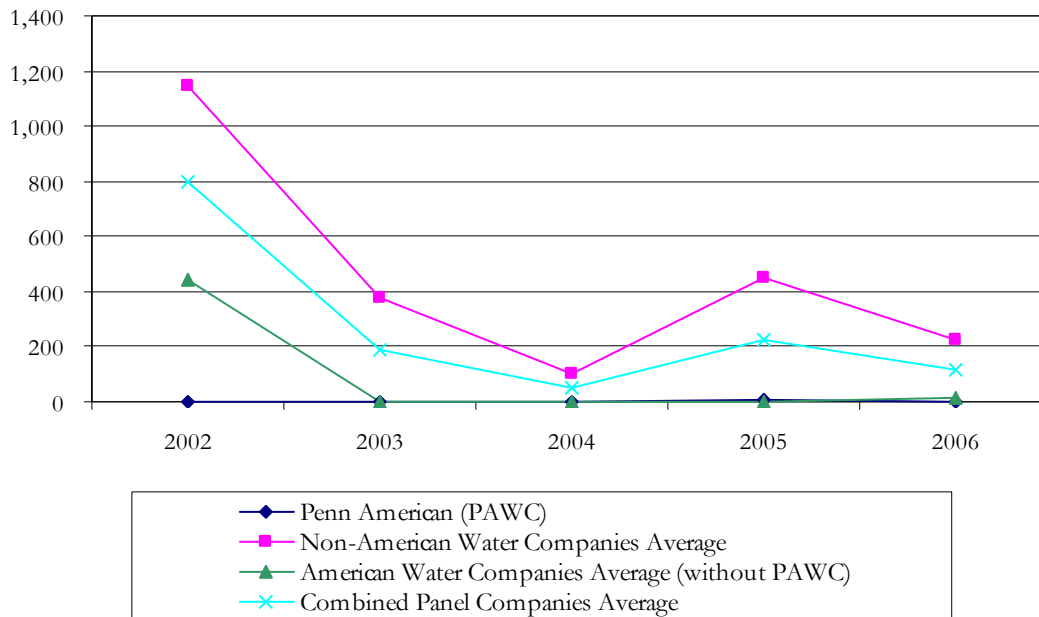
Exhibit XIV-50
Other Average Number of Customers

Other Average Number of Customers	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	0	0	0	5	0	0.00%
Aqua Penn/Philadelphia Suburban	3,145	0	0	0	0	-100.00%
Aquarion Connecticut	0	0	0	0	0	0.00%
San Jose Water Corp	300	1,131	308	1,345	679	22.66%
Non-American Water Companies Average	1,148	377	103	448	226	-33.37%
Elizabethtown Water*	0	0	0	0	29	N/A
Missouri American**	1,321	0	0	6	6	-74.04%
New Jersey American*	0	0	0	0	0	0.00%
American Water Companies Average (without PAWC)	440	0	0	2	12	-59.65%
Combined Panel Companies Average	794	189	51	225	119	-37.79%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Other Average Number of Customers



Total Employees (year-end)

The counts in *Exhibit XIV-51* represent end-of-year totals and include active, full-time and part-time employees.

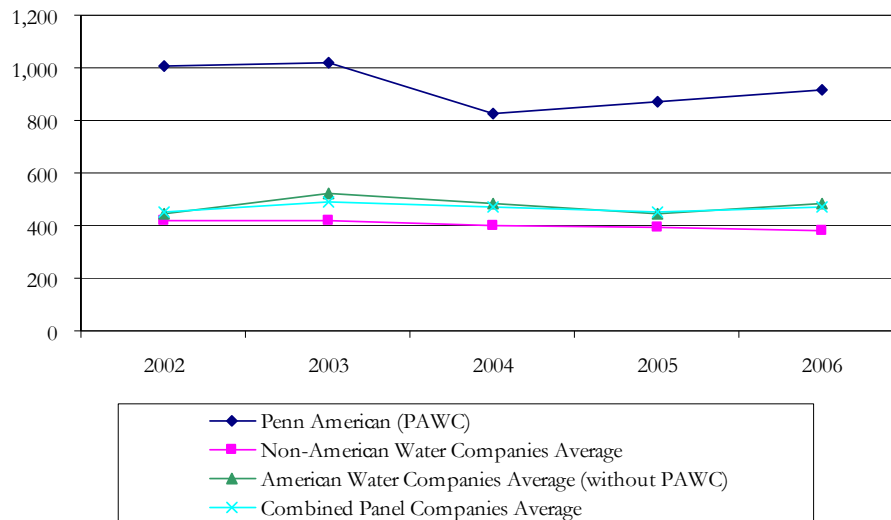
Exhibit XIV-51
Total Number of Employees (year-end)

Total Number of Employees	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	1,004	1,018	824	868	917	-2.24%
Aqua Penn/Philadelphia Suburban	621	628	583	596	541	-3.39%
Aquarion Connecticut	340	328	310	270	269	-5.69%
San Jose Water Corp	296	301	302	309	323	2.21%
Non-American Water Companies Average	419	419	398	392	378	-2.56%
Elizabethtown Water*	426	447	433	312	312	-7.49%
Missouri American**	N/A	661	563	559	672	0.55%
New Jersey American	459	462	459	459	459	0.00%
American Water Companies Average (without PAWC)	443	523	485	443	481	2.11%
Combined Panel Companies Average	451	493	472	451	470	1.05%

* 2006 Elizabethtown Water and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC and Compound Growth/Loss calculated 2003-2006 only

Total Number of Employees



Total Operation and Maintenance Expense

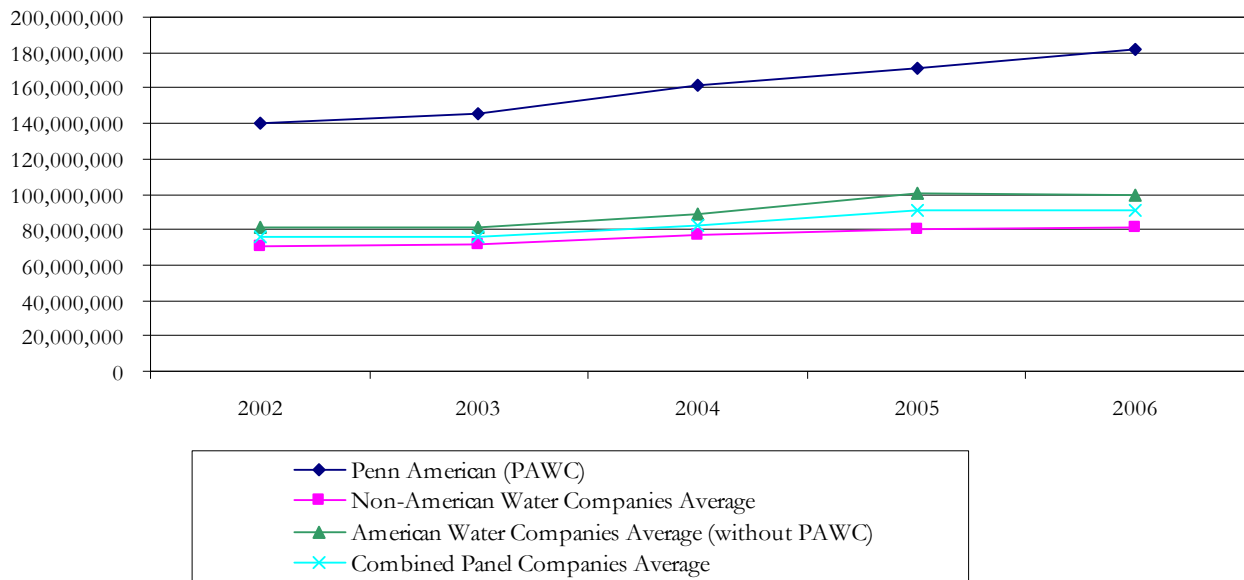
Exhibit XIV-52
Total Operation & Maintenance Expense

Total Operation & Maintenance Expense	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	140,399,362	144,940,208	161,227,615	171,439,753	181,475,588	6.63%
Aqua Penn/Philadelphia Suburban	76,444,185	78,802,313	81,983,126	88,721,951	94,599,605	5.47%
Aquarion Connecticut	39,197,702	41,298,518	45,163,941	42,857,314	40,552,926	0.85%
San Jose Water Corp	94,986,979	93,656,685	104,481,178	108,024,555	110,200,296	3.78%
Non-American Water Companies Average	70,209,622	71,252,505	77,209,415	79,867,940	81,784,276	3.89%
Elizabethtown Water*	60,925,576	63,998,543	64,554,515	72,378,041	71,082,952	3.93%
Missouri American**	75,338,685	73,898,153	77,902,552	95,624,673	92,203,987	5.18%
New Jersey American*	108,697,766	105,424,935	122,708,800	134,917,990	136,089,126	5.78%
American Water Companies Average (without PAWC)	81,654,009	81,107,210	88,388,622	100,973,568	99,792,022	5.14%
Combined Panel Companies Average	75,931,816	76,179,858	82,799,019	90,420,754	90,788,149	4.57%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Total Operation & Maintenance Expense



Production Expense

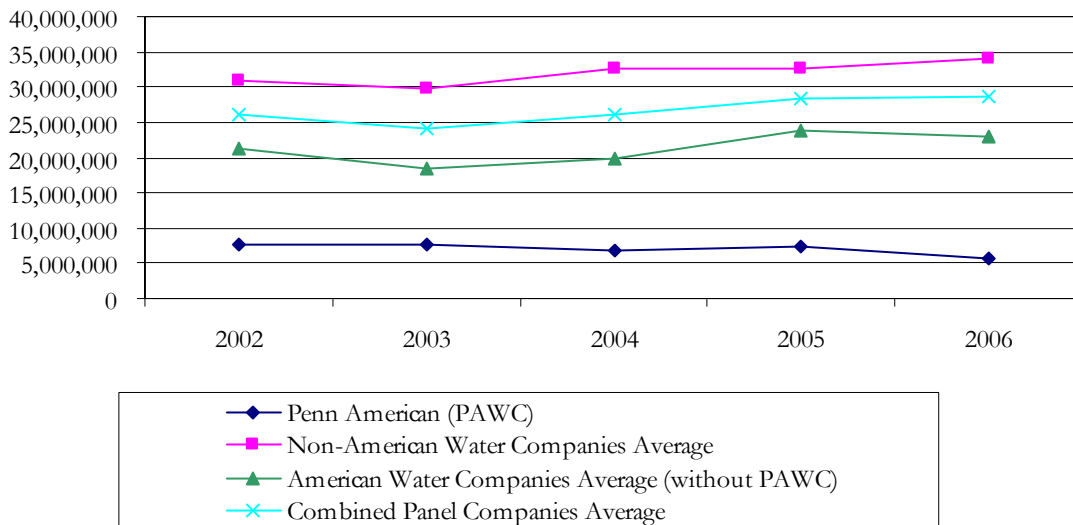
**Exhibit XIV-53
Production Expense**

Production Expense	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	7,752,285	7,689,097	6,793,175	7,381,507	5,773,244	-7.10%
Aqua Penn/Philadelphia Suburban	18,090,069	19,055,475	18,648,604	19,977,447	21,435,660	4.33%
Aquarion Connecticut	7,349,785	7,243,250	6,938,601	7,539,411	8,144,443	2.60%
San Jose Water Corp	67,061,678	62,995,814	71,925,820	70,548,730	72,843,100	2.09%
Non-American Water Companies Average	30,833,844	29,764,846	32,504,342	32,688,529	34,141,068	2.58%
Elizabethtown Water*	21,118,571	21,248,814	20,432,119	26,273,229	22,742,952	1.87%
Missouri American**	12,838,387	11,625,043	11,604,195	11,955,595	12,521,618	-0.62%
New Jersey American*	30,185,549	22,806,944	27,297,169	33,239,420	33,488,396	2.63%
American Water Companies Average (without PAWC)	21,380,836	18,560,267	19,777,828	23,822,748	22,917,655	1.75%
Combined Panel Companies Average	26,107,340	24,162,557	26,141,085	28,255,639	28,529,362	2.24%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Production Expense



Purification Expense

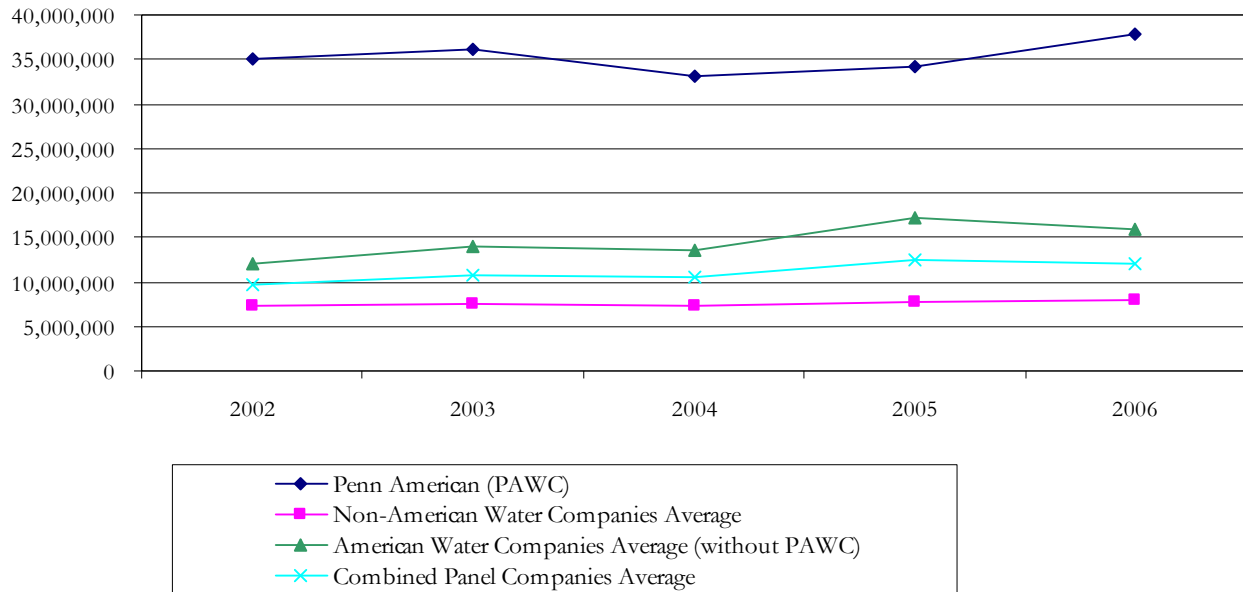
**Exhibit XIV-54
Purification Expense**

Purification Expense	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	35,073,349	36,209,603	33,221,018	34,241,715	37,841,759	1.92%
Aqua Penn/Philadelphia Suburban	12,908,807	12,927,372	13,020,736	13,775,246	13,975,013	2.00%
Aquarion Connecticut	7,203,038	8,176,316	7,306,861	7,386,838	7,342,871	0.48%
San Jose Water Corp	1,921,049	1,761,467	1,671,824	2,355,766	2,415,556	5.89%
Non-American Water Companies Average	7,344,298	7,621,718	7,333,140	7,839,283	7,911,147	1.88%
Elizabethtown Water*	5,890,628	5,846,758	5,345,246	7,165,426	8,016,372	8.01%
Missouri American**	10,369,057	10,152,043	10,127,146	11,092,540	11,638,949	2.93%
New Jersey American*	19,955,422	25,965,693	25,219,373	33,159,606	28,274,918	9.10%
American Water Companies Average (without PAWC)	12,071,702	13,988,165	13,563,922	17,139,191	15,976,746	7.26%
Combined Panel Companies Average	9,708,000	10,804,942	10,448,531	12,489,237	11,943,947	5.32%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Purification Expense



Transmission and Distribution Expense

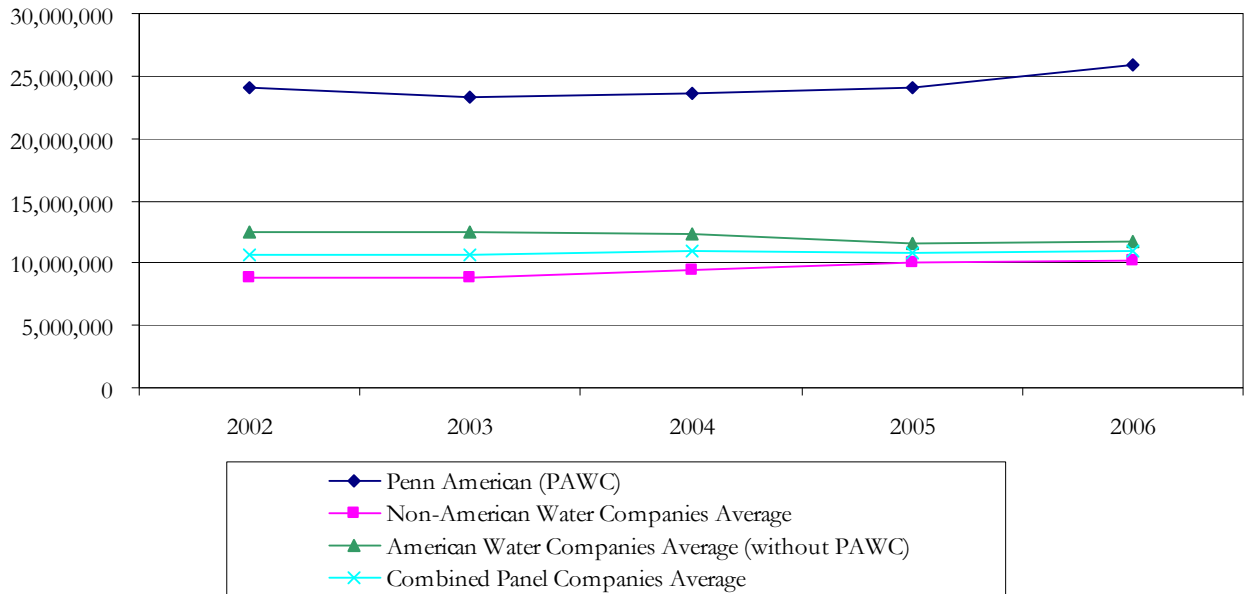
Exhibit XIV-55
Transmission & Distribution Expense

Transmission & Distribution Expense	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	24,055,511	23,267,164	23,573,589	24,014,129	25,866,804	1.83%
Aqua Penn/Philadelphia Suburban	9,829,785	9,670,519	11,255,043	11,597,366	11,626,718	4.29%
Aquarion Connecticut	7,240,265	7,168,826	6,738,015	7,137,160	7,159,026	-0.28%
San Jose Water Corp	9,404,358	9,507,480	10,408,940	11,191,914	11,628,936	5.45%
Non-American Water Companies Average	8,824,803	8,782,275	9,467,333	9,975,480	10,138,227	3.53%
Elizabethtown Water*	9,186,598	9,798,022	11,184,265	8,757,742	6,673,220	-7.68%
Missouri American**	15,044,078	14,514,333	12,640,611	13,949,457	15,397,097	0.58%
New Jersey American*	13,354,845	13,320,888	13,315,399	11,908,808	13,120,148	-0.44%
American Water Companies Average (without PAWC)	12,528,507	12,544,414	12,380,092	11,538,669	11,730,155	-1.63%
Combined Panel Companies Average	10,676,655	10,663,345	10,923,712	10,757,075	10,934,191	0.60%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Transmission & Distribution Expense



Customer Accounting Expense

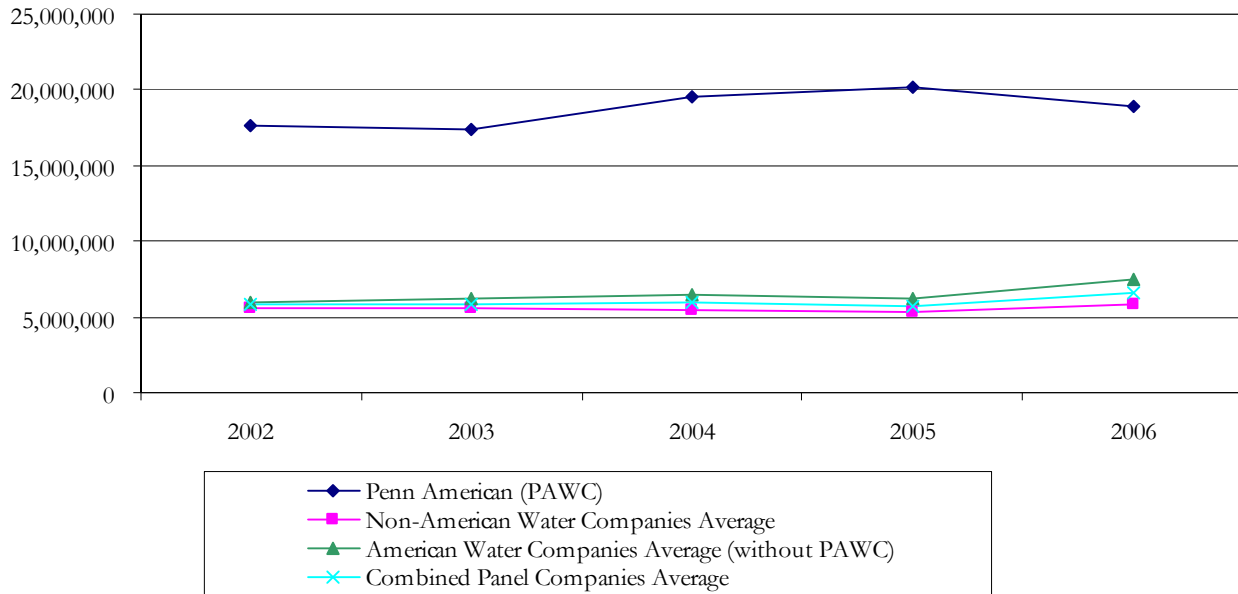
Exhibit XIV-56
Customer Accounting Expense

Customer Accounting Expense	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	17,675,097	17,382,430	19,517,836	20,119,161	18,892,361	1.68%
Aqua Penn/Philadelphia Suburban	8,944,622	8,472,758	7,940,738	7,274,091	8,504,329	-1.25%
Aquarion Connecticut	3,760,960	3,713,819	3,910,816	3,781,851	4,099,160	2.18%
San Jose Water Corp	4,186,325	4,403,424	4,589,995	4,823,892	4,819,801	3.59%
Non-American Water Companies Average	5,630,636	5,530,000	5,480,516	5,293,278	5,807,763	0.78%
Elizabethtown Water*	5,128,178	7,147,074	5,790,879	2,677,987	6,081,439	4.35%
Missouri American**	4,906,868	4,942,797	5,689,269	5,910,226	7,116,140	9.74%
New Jersey American*	7,870,638	6,701,074	7,958,610	9,959,593	9,197,571	3.97%
American Water Companies Average (without PAWC)	5,968,561	6,263,648	6,479,586	6,182,602	7,465,050	5.75%
Combined Panel Companies Average	5,799,599	5,896,824	5,980,051	5,737,940	6,636,407	3.43%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Customer Accounting Expense



Administrative and General Expense

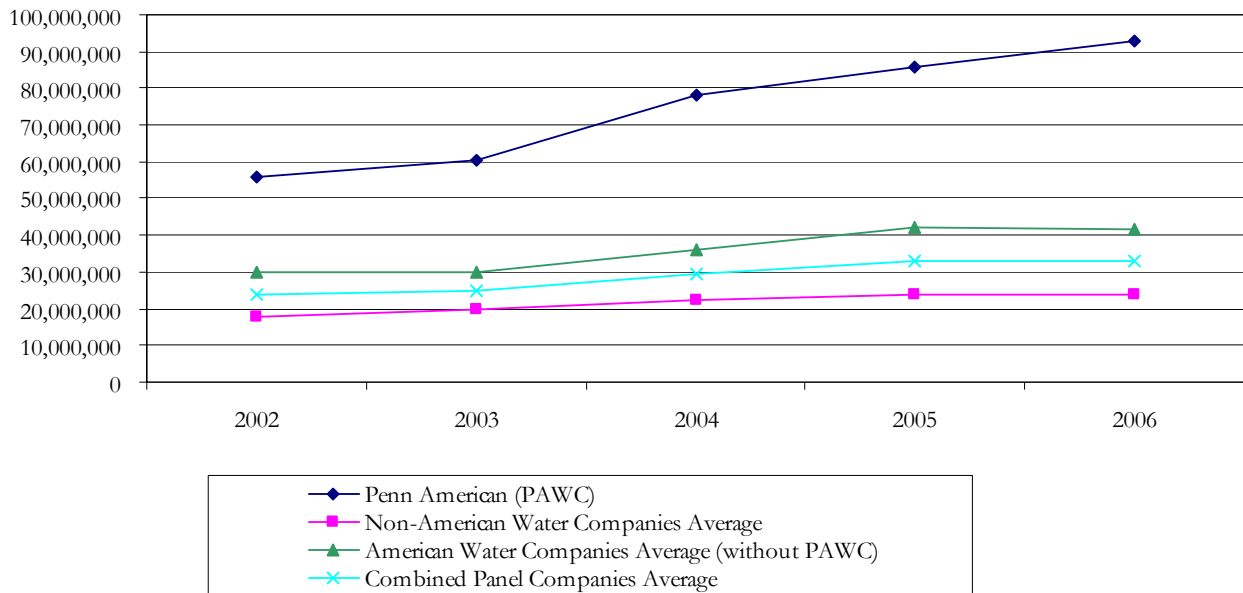
Exhibit XIV-57
Administrative & General Expense

Administrative & General Expense	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	55,843,120	60,391,914	78,121,997	85,683,241	93,101,420	13.63%
Aqua Penn/Philadelphia Suburban	26,670,902	28,676,189	31,118,005	36,097,801	39,057,885	10.01%
Aquarion Connecticut	13,643,654	14,996,107	20,269,648	17,012,054	13,807,426	0.30%
San Jose Water Corp	12,413,569	14,988,500	15,881,599	19,104,253	18,492,903	10.48%
Non-American Water Companies Average	17,576,042	19,553,599	22,423,084	24,071,369	23,786,071	7.86%
Elizabethtown Water*	19,601,601	19,957,875	21,802,006	27,503,657	27,568,969	8.90%
Missouri American**	32,180,295	32,663,681	37,841,331	52,716,855	45,530,183	9.06%
New Jersey American*	37,331,312	36,630,336	48,918,249	46,650,563	52,008,093	8.64%
American Water Companies Average (without PAWC)	29,704,403	29,750,631	36,187,195	42,290,358	41,702,415	8.85%
Combined Panel Companies Average	23,640,222	24,652,115	29,305,140	33,180,864	32,744,243	8.49%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Administrative & General Expense



Miles of Main in Service

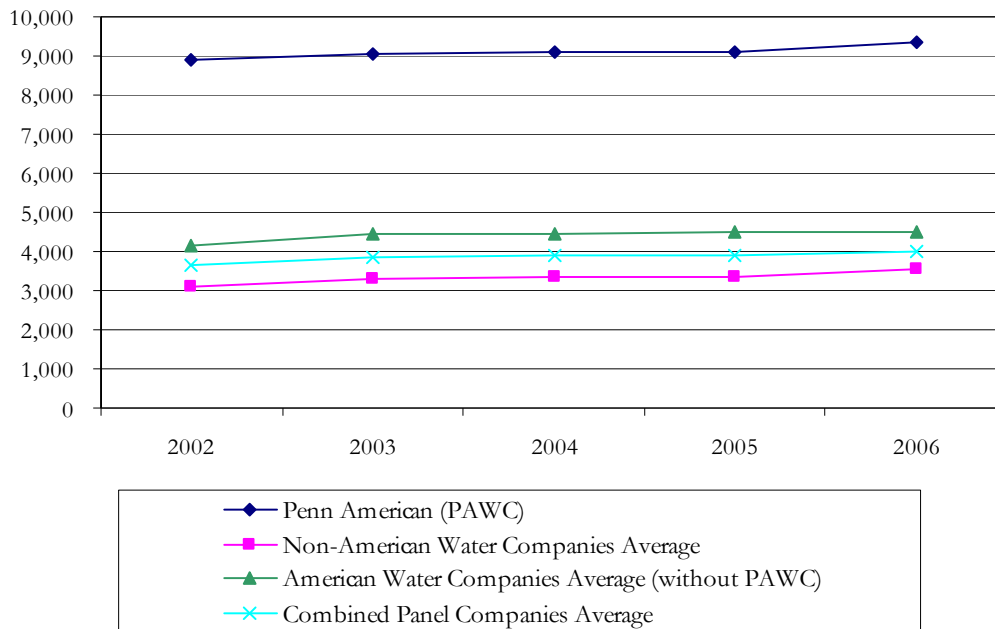
Exhibit XIV-58
Miles of Main in Service

Miles of Main in Service	2002	2003	2004	2005	2006	Compound Growth/Loss 2002-2006
Penn American (PAWC)*	8,891	9,037	9,108	9,108	9,370	1.32%
Aqua Penn/Philadelphia Suburban	4,173	4,754	4,784	4,784	5,100	5.14%
Aquarion Connecticut*	2,724	2,687	2,773	2,786	2,799	0.68%
San Jose Water Corp	2,422	2,430	2,434	2,447	2,739	3.12%
Non-American Water Companies Average	3,106	3,290	3,330	3,339	3,546	3.36%
Elizabethtown Water*	2,905	2,924	2,924	2,936	2,974	0.59%
Missouri American**	4,840	5,616	5,610	5,610	5,545	3.46%
New Jersey American	4,760	4,833	4,865	4,898	4,926	0.86%
American Water Companies Average (without PAWC)	4,168	4,458	4,466	4,481	4,482	1.83%
Combined Panel Companies Average	3,637	3,874	3,898	3,910	4,014	2.49%

* 2006 Elizabethtown Water and PAWC data from Data Request 620 response, not NAWC

** 2002 data from filed MO PSC Annual Report, not NAWC

Total Miles of Main in Service



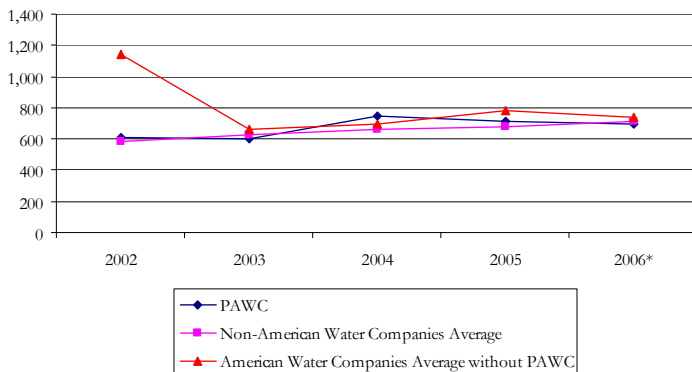
Performance Ratio Expense

Exhibit XIV-59 Performance Ratio Expense Background Data Total Average Number of Customers per Employee Gross Utility Plant in Service per Total Average Number of Customers

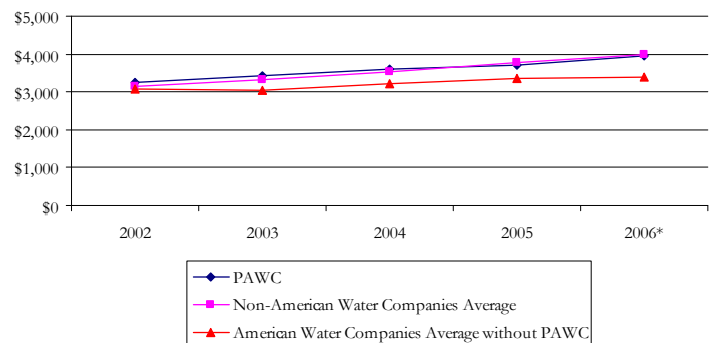
Performance Ratios	2002	2003	2004	2005	2006*	Compound Growth/Loss 2002-2006
Production Expense (PAWC)	7,752,285	7,689,097	6,793,175	7,381,507	5,773,244	-7.10%
Production Expense (Non-American Water Companies Average)	30,833,844	29,764,846	32,504,342	32,688,529	34,141,068	2.58%
Production Expense (American Water Companies Average without PAWC)	21,380,836	18,560,267	19,777,828	23,822,748	22,917,655	1.75%
Purification Expense (PAWC)	35,073,349	36,209,603	33,221,018	34,241,715	37,841,759	1.92%
Purification Expense (Non-American Water Companies Average)	7,344,298	7,621,718	7,333,140	7,839,283	7,911,147	1.88%
Purification Expense (American Water Companies Average without PAWC)	12,071,702	13,988,165	13,563,922	17,139,191	15,976,746	7.26%
Transmission & Distribution Expense (PAWC)	24,055,511	23,267,164	23,573,589	24,014,129	25,866,804	1.83%
Transmission & Distribution Expense (Non-American Water Companies Average)	8,824,803	8,782,275	9,467,333	9,975,480	10,138,227	3.53%
Transmission & Distribution Expense (American Water Companies Average without PAWC)	12,528,507	12,544,414	12,380,082	11,538,669	11,730,155	-1.63%
Customer Accounting Expense (PAWC)	17,675,097	17,382,430	19,517,836	20,119,161	18,892,361	1.68%
Customer Accounting Expense (Non-American Water Companies Average)	5,630,636	5,530,000	5,480,516	5,293,278	5,807,763	0.78%
Customer Accounting Expense (American Water Companies Average without PAWC)	5,968,561	6,263,648	6,179,586	6,182,602	7,465,050	5.75%
Administrative & General Expense (PAWC)	55,843,120	60,391,914	78,121,997	85,683,241	93,101,420	13.63%
Administrative & General Expense (Non-American Water Companies Average)	17,576,042	19,553,599	22,423,084	24,071,369	23,786,071	7.86%
Administrative & General Expense (American Water Companies Average without PAWC)	29,701,103	29,750,631	36,187,195	42,290,358	41,702,415	8.85%
Total Operation & Maintenance Expense (PAWC)	140,399,362	144,940,208	161,227,615	171,439,753	181,475,588	6.63%
Total Operation & Maintenance Expense (Non-American Water Companies Average)	70,209,622	71,252,505	77,209,415	79,867,940	81,784,276	3.89%
Total Operation & Maintenance Expense (American Water Companies Average without PAWC)	81,654,009	81,107,210	88,388,622	100,973,568	99,792,022	5.14%
Total Average Number of Customers per Employee (PAWC)	607	604	746	712	695	3.47%
Total Average Number of Customers per Employee (Non-American Water Companies Average)	586	623	664	681	711	4.94%
Total Average Number of Customers per Employee (American Water Companies Average without PAWC)	1,146	658	699	779	740	-10.35%
Gross Utility Plant in Service per Total Average Number of Customers (PAWC)	\$3,235	\$3,429	\$3,584	\$3,722	\$3,942	5.07%
Gross Utility Plant in Service per Total Average Number of Customers (Non-American Water Companies Average)	\$3,138	\$3,336	\$3,536	\$3,759	\$3,999	6.25%
Gross Utility Plant in Service per Total Average Number of Customers (American Water Companies Average without PAWC)	\$3,087	\$3,051	\$3,217	\$3,358	\$3,406	2.49%

* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

Total Average Number of Customers per Employee



Gross Utility Plant in Service per Total Average Number of Customers



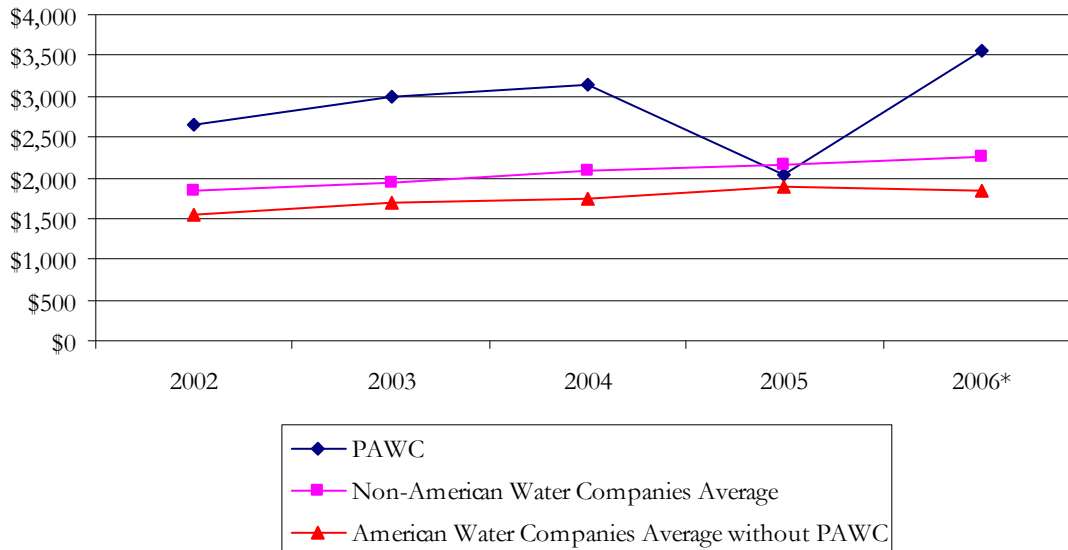
Operation and Maintenance Expenses per Million Gallons

**Exhibit XIV-60
Expenses per Million Gallons**

Performance Ratios	2002	2003	2004	2005	2006*	Compound Growth/Loss 2002-2006
Production Expenses per Million Gallons (PAWC)	\$146	\$158	\$133	\$88	\$113	-6.27%
Production Expenses per Million Gallons (Non-American Water Companies Average)	\$804	\$814	\$878	\$880	\$942	4.03%
Production Expenses per Million Gallons (American Water Companies Average without PAWC)	\$408	\$390	\$392	\$447	\$424	0.95%
Purification Expenses per Million Gallons (PAWC)	\$662	\$746	\$648	\$409	\$740	2.83%
Purification Expenses per Million Gallons (Non-American Water Companies Average)	\$192	\$209	\$198	\$211	\$218	3.31%
Purification Expenses per Million Gallons (American Water Companies Average without PAWC)	\$230	\$294	\$269	\$321	\$295	6.42%
Transmission & Distribution Expenses per Million Gallons (PAWC)	\$454	\$479	\$460	\$287	\$506	2.74%
Transmission & Distribution Expenses per Million Gallons (Non-American Water Companies Average)	\$230	\$240	\$256	\$269	\$280	4.99%
Transmission & Distribution Expenses per Million Gallons (American Water Companies Average without PAWC)	\$239	\$264	\$245	\$216	\$217	-2.40%
Customer Accounting Expenses per Million Gallons (PAWC)	\$334	\$358	\$381	\$240	\$370	2.59%
Customer Accounting Expenses per Million Gallons (Non-American Water Companies Average)	\$147	\$151	\$148	\$143	\$160	2.20%
Customer Accounting Expenses per Million Gallons (American Water Companies Average without PAWC)	\$114	\$132	\$122	\$116	\$138	4.93%
Administrative & General Expenses per Million Gallons (PAWC)	\$1,054	\$1,244	\$1,524	\$1,023	\$1,822	14.65%
Administrative & General Expenses per Million Gallons (Non-American Water Companies Average)	\$458	\$535	\$605	\$648	\$656	9.38%
Administrative & General Expenses per Million Gallons (American Water Companies Average without PAWC)	\$567	\$626	\$717	\$793	\$771	8.00%
Total Operation & Maintenance Expenses per Million Gallons (PAWC)	\$2,651	\$2,987	\$3,145	\$2,048	\$3,551	7.58%
Total Operation & Maintenance Expenses per Million Gallons (Non-American Water Companies Average)	\$1,831	\$1,949	\$2,084	\$2,151	\$2,256	5.35%
Total Operation & Maintenance Expenses per Million Gallons (American Water Companies Average without PAWC)	\$1,558	\$1,706	\$1,752	\$1,893	\$1,845	4.32%

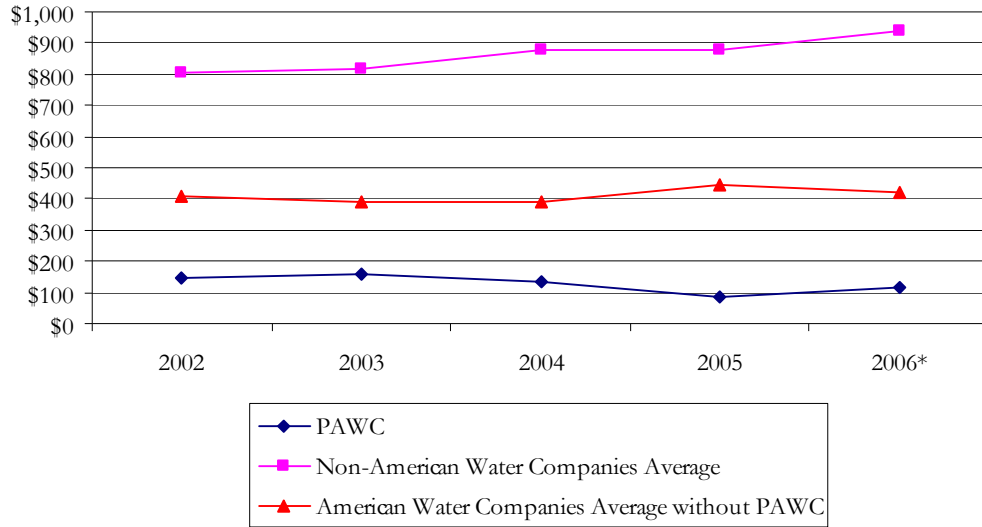
* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

Total Operation & Maintenance Expenses per Million Gallons



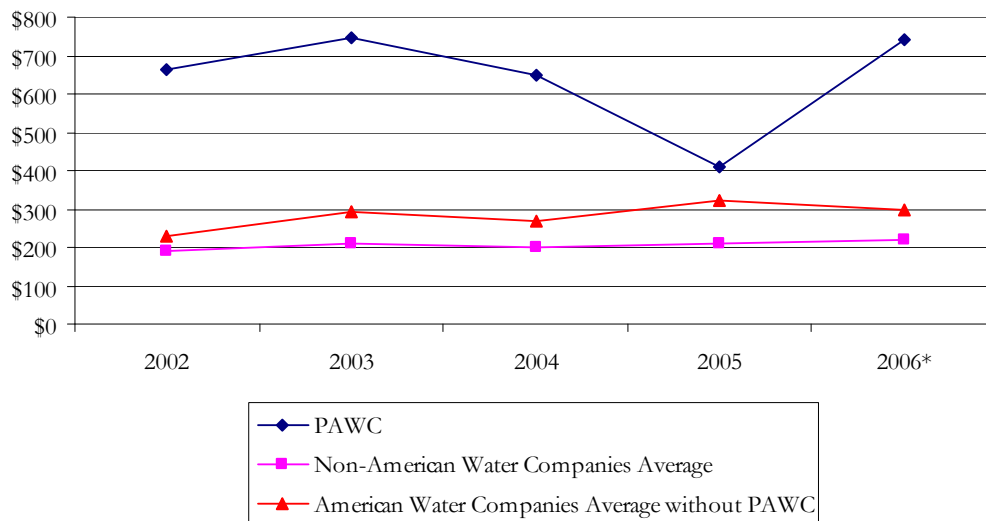
Production Expenses per Million Gallons

**Exhibit XIV-61
 Production Expenses per Million Gallons**



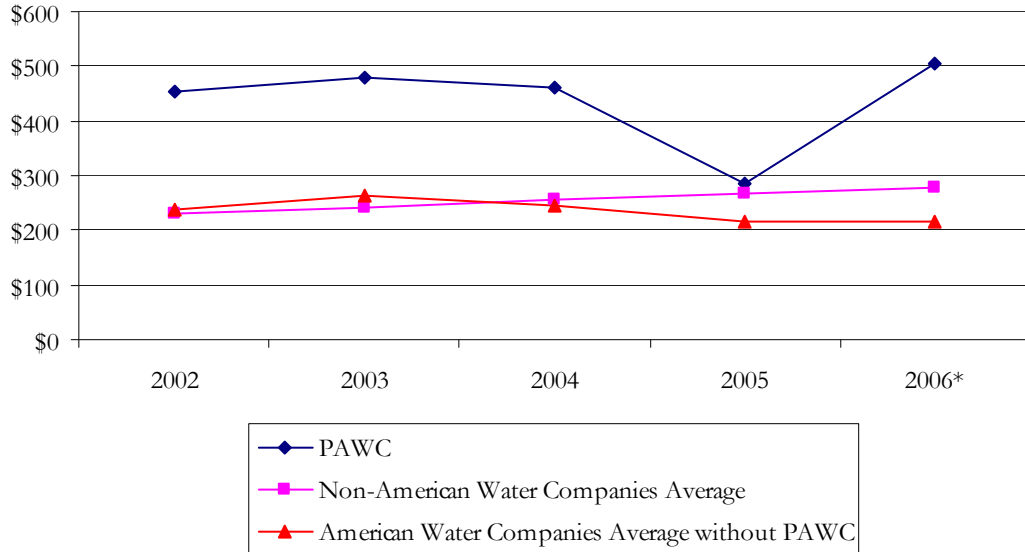
Purification Expenses per Million Gallons

**Exhibit XIV-62
 Purification Expenses per Million Gallons**



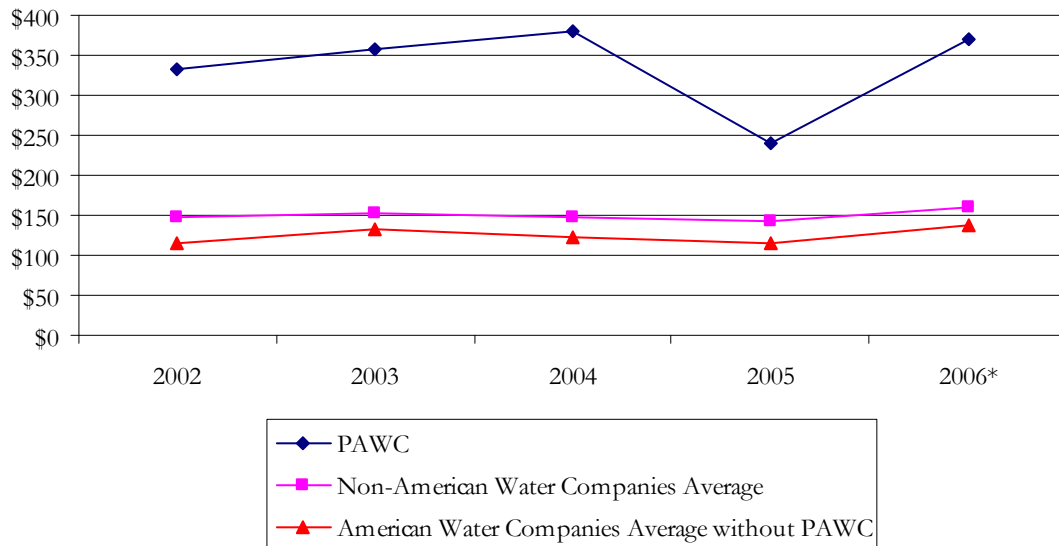
Transmission & Distribution Expenses per Million Gallons

Exhibit XIV-63
Transmission & Distribution Expenses per Million Gallons



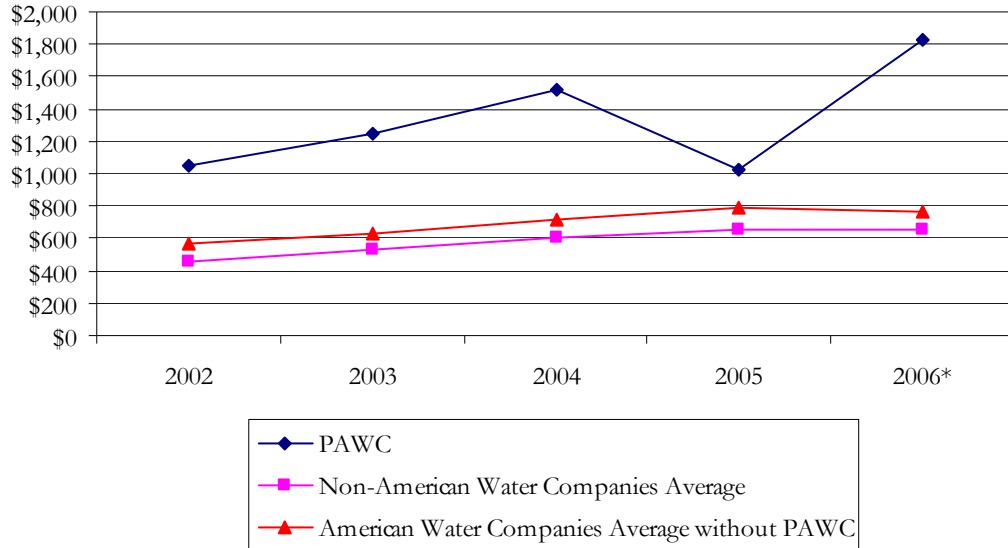
Customer Accounting Expenses per Million Gallons

Exhibit XIV-64
Customer Accounting Expenses per Million Gallons



Administrative & General Expenses per Million Gallons

Exhibit XIV-65
Administrative & General Expenses per Million Gallons



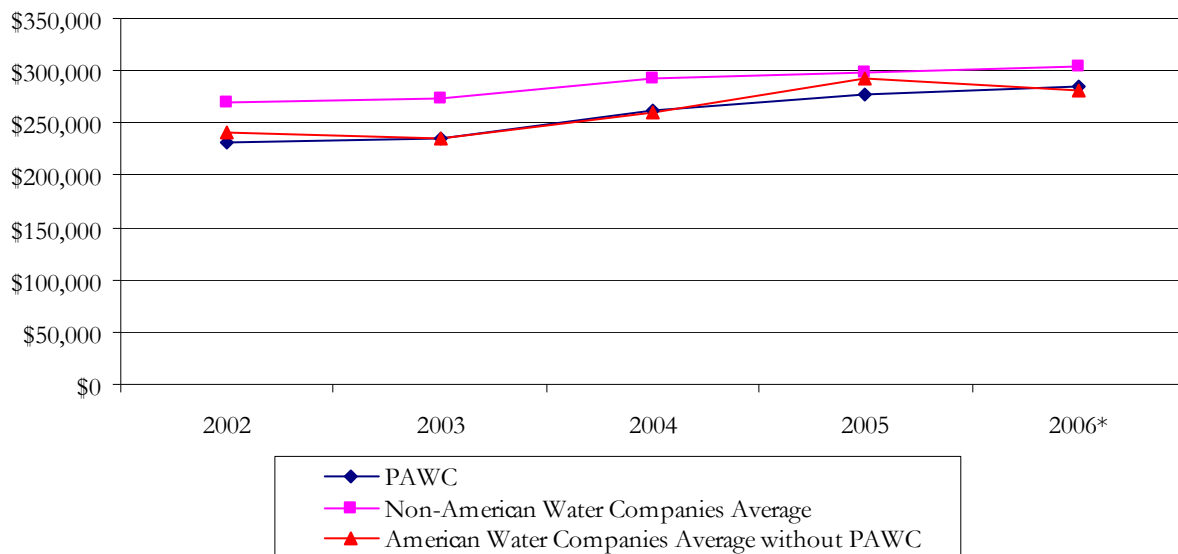
Operation and Maintenance Expenses per Thousand Customers

**Exhibit XIV-66
Expenses per Thousand Customers**

Performance Ratios	2002	2003	2004	2005	2006*	Compound Growth/Loss 2002-2006
Production Expenses per Thousand Customers (PAWC)	\$12,727	\$12,501	\$11,058	\$11,938	\$9,054	-8.16%
Production Expenses per Thousand Customers (Non-American Water Companies Average)	\$118,743	\$113,936	\$123,060	\$122,495	\$127,068	1.71%
Production Expenses per Thousand Customers (American Water Companies Average without PAWC)	\$63,249	\$53,927	\$58,301	\$69,022	\$64,367	0.44%
Purification Expenses per Thousand Customers (PAWC)	\$57,581	\$58,871	\$54,079	\$55,377	\$59,345	0.76%
Purification Expenses per Thousand Customers (Non-American Water Companies Average)	\$28,283	\$29,175	\$27,763	\$29,377	\$29,444	1.01%
Purification Expenses per Thousand Customers (American Water Companies Average without PAWC)	\$35,711	\$40,643	\$39,984	\$49,658	\$44,873	5.88%
Transmission & Distribution Expenses per Thousand Customers (PAWC)	\$39,493	\$37,829	\$38,374	\$38,836	\$40,565	0.67%
Transmission & Distribution Expenses per Thousand Customers (Non-American Water Companies Average)	\$33,985	\$33,618	\$35,843	\$37,382	\$37,733	2.65%
Transmission & Distribution Expenses per Thousand Customers (American Water Companies Average without PAWC)	\$37,062	\$36,448	\$36,494	\$33,431	\$32,946	-2.90%
Customer Accounting Expenses per Thousand Customers (PAWC)	\$29,018	\$28,261	\$31,772	\$32,537	\$29,628	0.52%
Customer Accounting Expenses per Thousand Customers (Non-American Water Companies Average)	\$21,684	\$21,168	\$20,749	\$19,836	\$21,616	-0.08%
Customer Accounting Expenses per Thousand Customers (American Water Companies Average without PAWC)	\$17,656	\$18,199	\$18,216	\$17,913	\$20,967	4.39%
Administrative & General Expenses per Thousand Customers (PAWC)	\$91,680	\$98,187	\$127,171	\$138,570	\$146,005	12.34%
Administrative & General Expenses per Thousand Customers (Non-American Water Companies Average)	\$67,687	\$74,849	\$84,893	\$90,204	\$88,528	6.94%
Administrative & General Expenses per Thousand Customers (American Water Companies Average without PAWC)	\$87,862	\$86,441	\$106,673	\$122,529	\$117,126	7.45%
Total Operation & Maintenance Expenses per Thousand Customers (PAWC)	\$230,499	\$235,649	\$262,454	\$277,258	\$284,596	5.41%
Total Operation & Maintenance Expenses per Thousand Customers (Non-American Water Companies Average)	\$270,382	\$272,746	\$292,310	\$299,293	\$304,389	3.01%
Total Operation & Maintenance Expenses per Thousand Customers (American Water Companies Average without PAW)	\$241,551	\$235,660	\$260,552	\$292,554	\$280,278	3.79%

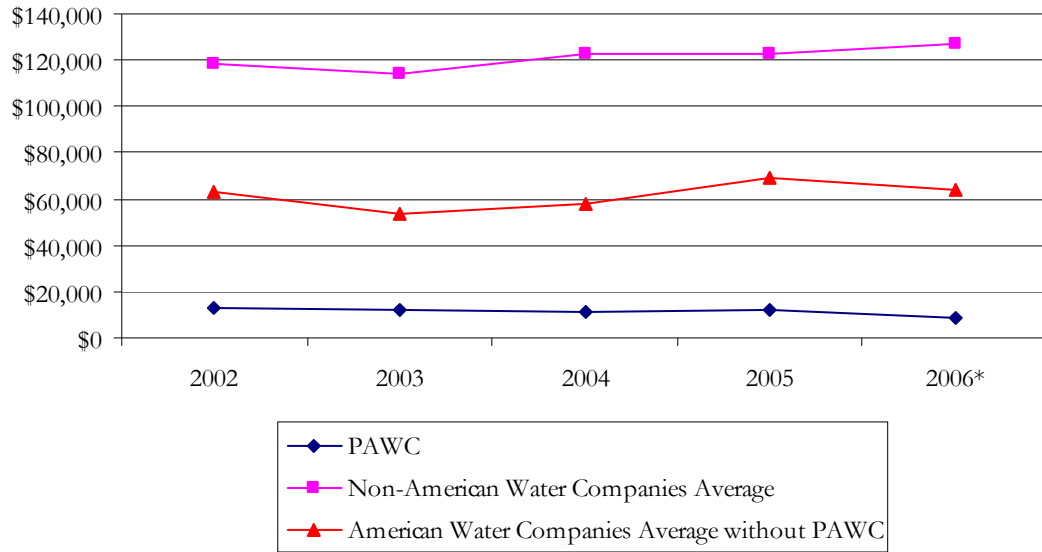
* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

Total Operation & Maintenance Expenses per Thousand Customers



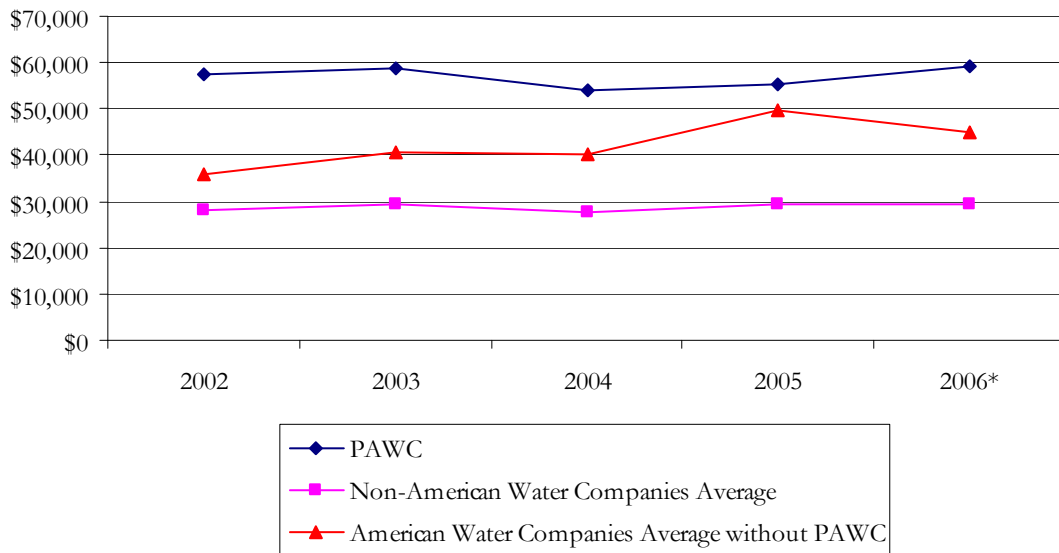
Production Expenses per Thousand Customers

**Exhibit XIV-67
 Production Expenses per Thousand Customers**



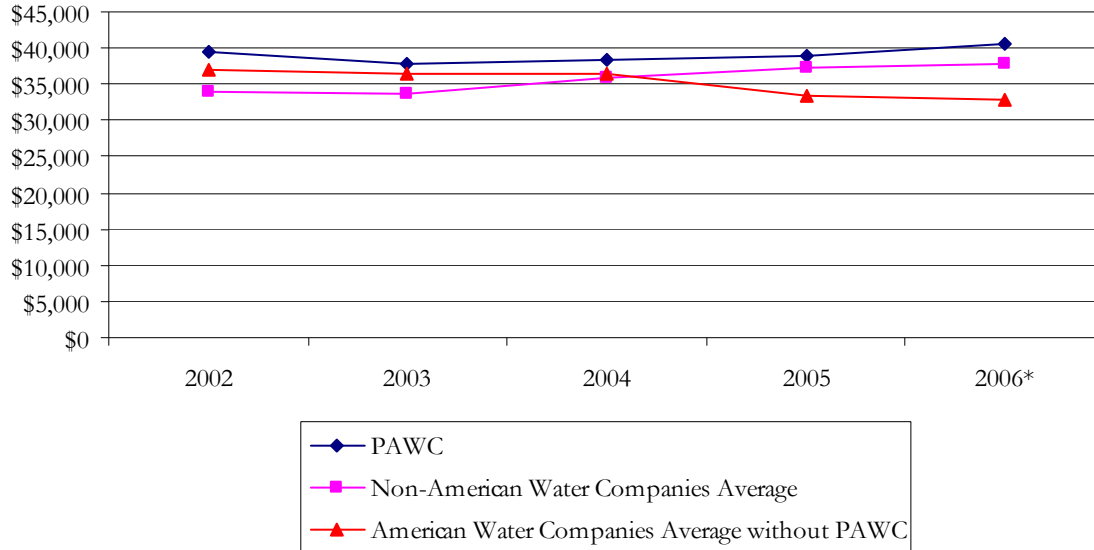
Purification Expenses per Thousand Customers

**Exhibit XIV-68
 Purification Expenses per Thousand Customers**



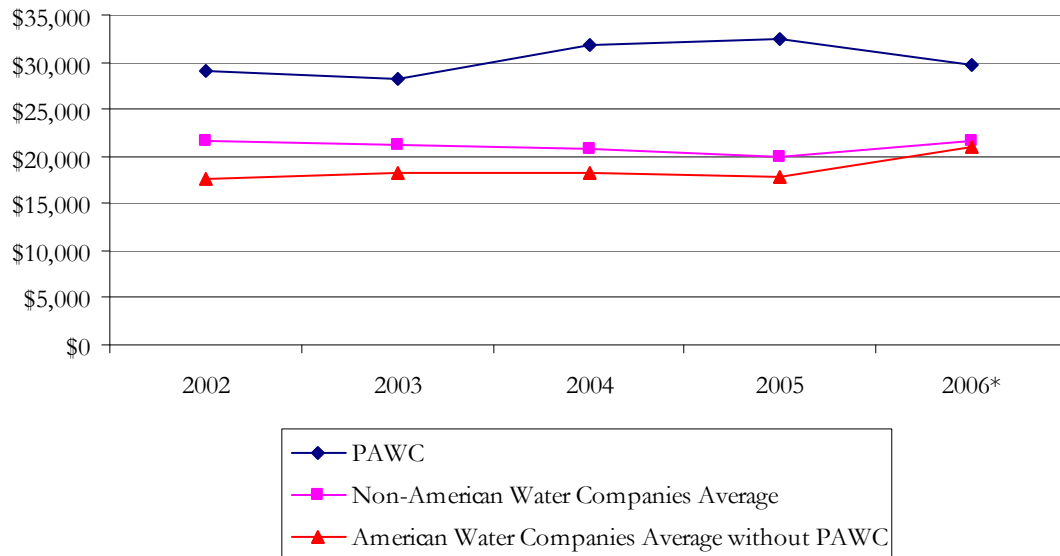
Transmission & Distribution Expenses per Thousand Customers

Exhibit XIV-69
Transmission & Distribution Expenses per Thousand Customers



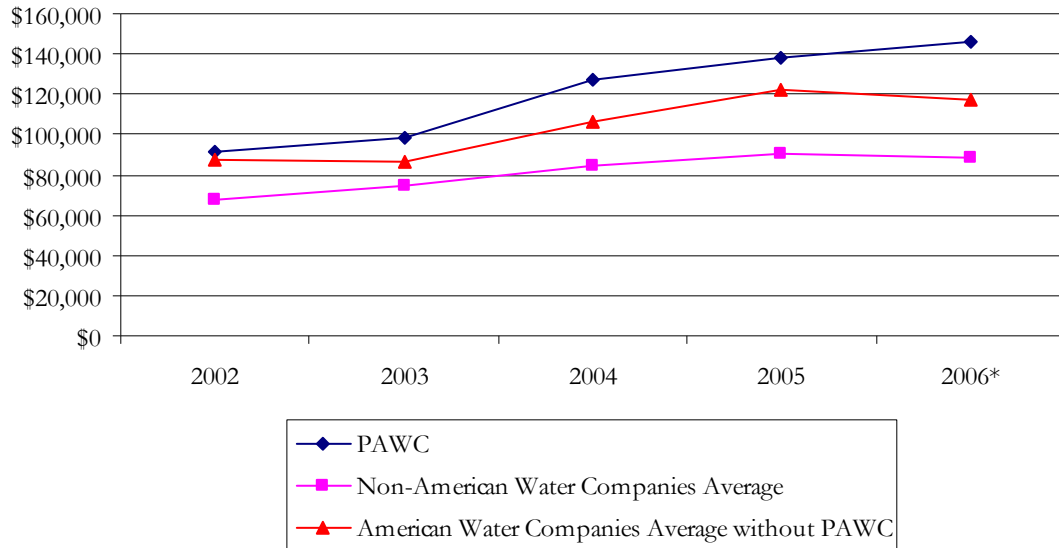
Customer Accounting Expenses per Thousand Customers

Exhibit XIV-70
Customer Accounting Expenses per Thousand Customers



Administrative & General Expenses per Thousand Customers

Exhibit XIV-71
Administrative & General Expenses per Thousand Customers



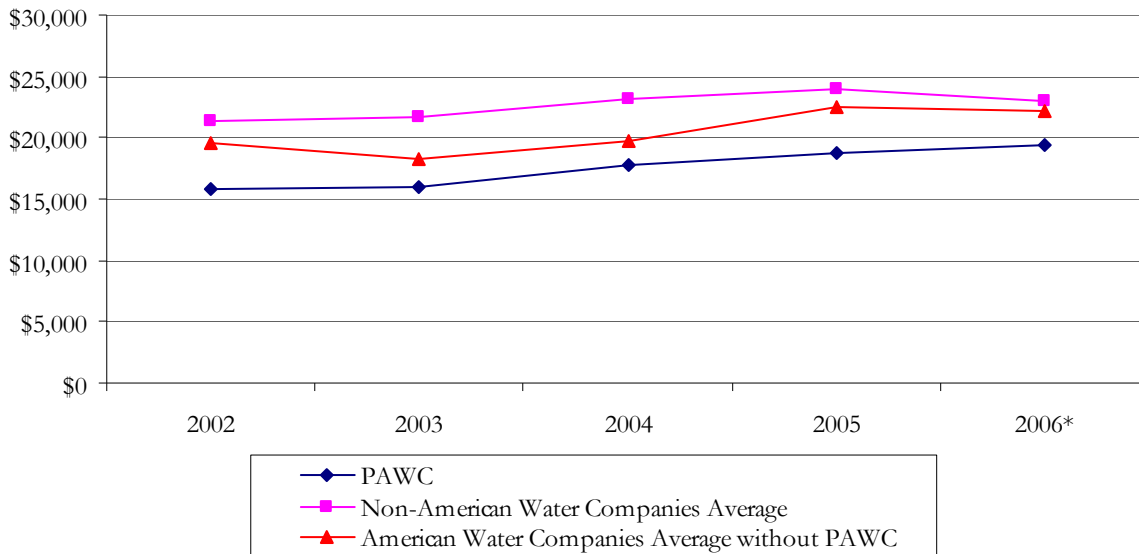
Operation and Maintenance Expenses per Mile of Main

**Exhibit XIV-72
Expenses per Mile of Main**

Performance Ratios	2002	2003	2004	2005	2006*	Compound Growth/Loss 2002-2006
Production Expenses per Mile of Main (PAWC)	\$872	\$851	\$746	\$810	\$616	-8.31%
Production Expenses per Mile of Main (Non-American Water Companies Average)	\$9,383	\$9,047	\$9,761	\$9,790	\$9,628	0.65%
Production Expenses per Mile of Main (American Water Companies Average without PAWC)	\$5,130	\$4,163	\$4,429	\$5,316	\$5,106	-0.11%
Purification Expenses per Mile of Main (PAWC)	\$3,945	\$4,007	\$3,647	\$3,760	\$4,039	0.59%
Purification Expenses per Mile of Main (Non-American Water Companies Average)	\$2,235	\$2,317	\$2,202	\$2,348	\$2,231	-0.05%
Purification Expenses per Mile of Main (American Water Companies Average without PAWC)	\$2,896	\$3,138	\$3,037	\$3,825	\$3,560	5.29%
Transmission & Distribution Expenses per Mile of Main (PAWC)	\$2,706	\$2,575	\$2,588	\$2,637	\$2,761	0.50%
Transmission & Distribution Expenses per Mile of Main (Non-American Water Companies Average)	\$2,686	\$2,669	\$2,843	\$2,988	\$2,859	1.58%
Transmission & Distribution Expenses per Mile of Main (American Water Companies Average without PAWC)	\$3,006	\$2,814	\$2,772	\$2,575	\$2,614	-3.43%
Customer Accounting Expenses per Mile of Main (PAWC)	\$1,988	\$1,923	\$2,143	\$2,209	\$2,016	0.35%
Customer Accounting Expenses per Mile of Main (Non-American Water Companies Average)	\$1,714	\$1,681	\$1,646	\$1,585	\$1,638	-1.12%
Customer Accounting Expenses per Mile of Main (American Water Companies Average without PAWC)	\$1,432	\$1,405	\$1,384	\$1,380	\$1,663	3.81%
Administration & General Expenses per Mile of Main (PAWC)	\$6,281	\$6,683	\$8,577	\$9,407	\$9,936	12.15%
Administration & General Expenses per Mile of Main (Non-American Water Companies Average)	\$5,349	\$5,943	\$6,734	\$7,209	\$6,708	5.82%
Administration & General Expenses per Mile of Main (American Water Companies Average without PAWC)	\$7,126	\$6,674	\$8,103	\$9,438	\$9,292	6.86%
Total Operation & Maintenance Expenses per Mile of Main (PAWC)	\$15,791	\$16,039	\$17,702	\$18,823	\$19,368	5.24%
Total Operation & Maintenance Expenses per Mile of Main (Non-American Water Companies Average)	\$21,366	\$21,657	\$23,186	\$23,920	\$23,064	1.93%
Total Operation & Maintenance Expenses per Mile of Main (American Water Companies Average without PAWC)	\$19,591	\$18,194	\$19,791	\$22,534	\$22,235	3.22%

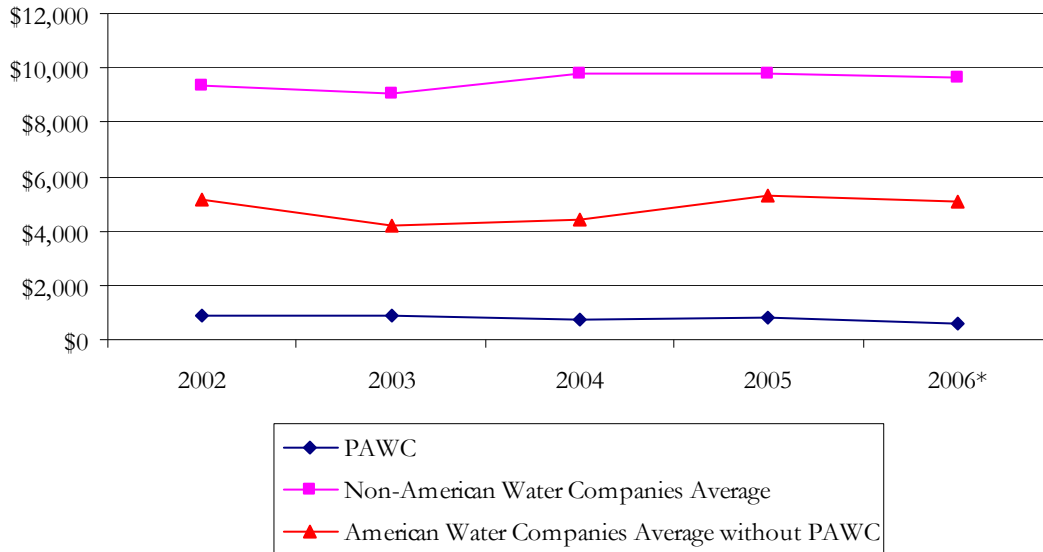
* 2006 Elizabethtown Water, New Jersey American, and PAWC data from Data Request 620 response, not NAWC

Total Operation & Maintenance Expenses per Mile of Main



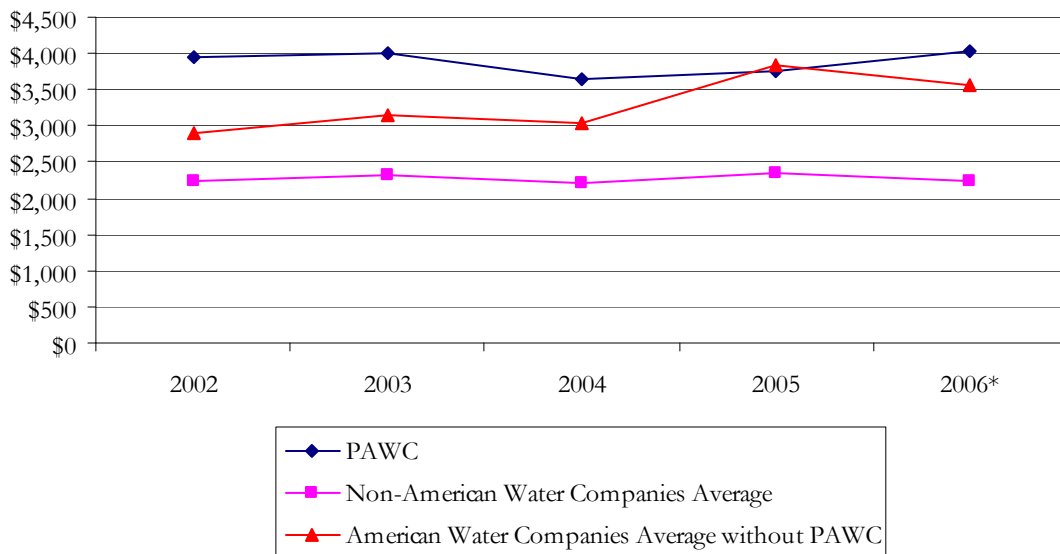
Production Expenses per Mile of Main

**Exhibit XIV-73
 Production Expenses per Mile of Main**



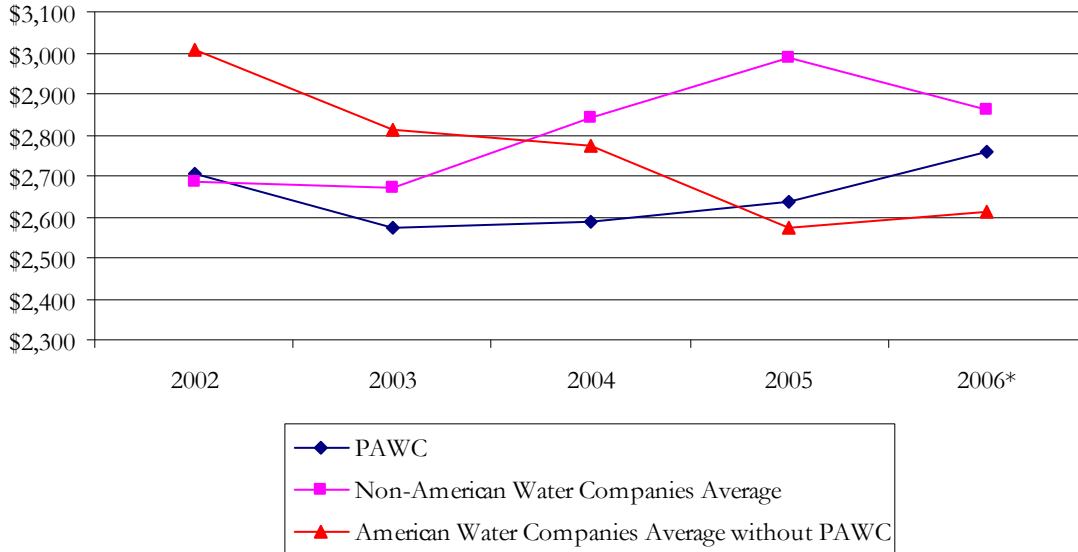
Purification Expenses per Mile of Main

**Exhibit XIV-74
 Purification Expenses per Mile of Main**



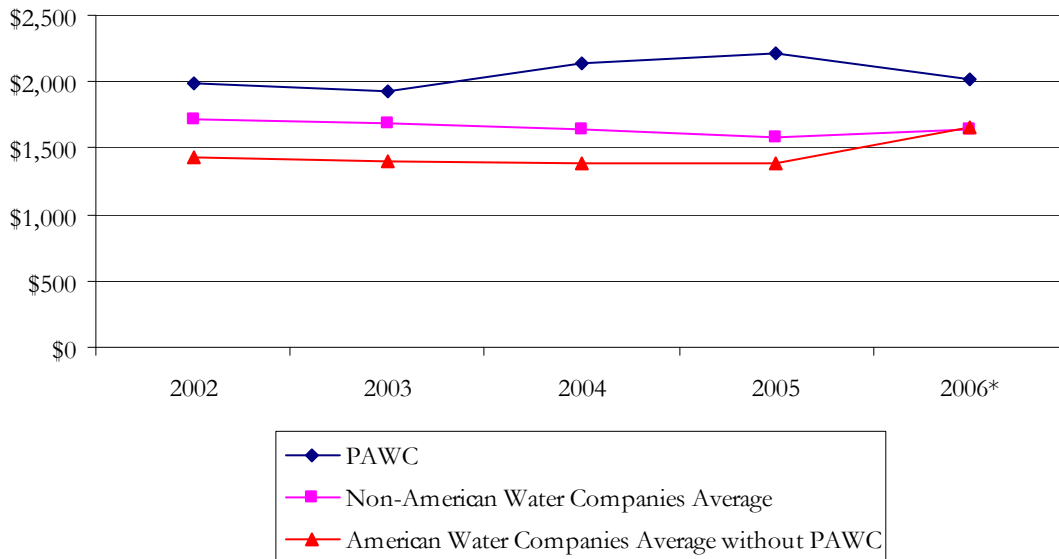
Transmission & Distribution Expenses per Mile of Main

**Exhibit XIV-75
 Transmission & Distribution Expenses per Mile of Main**



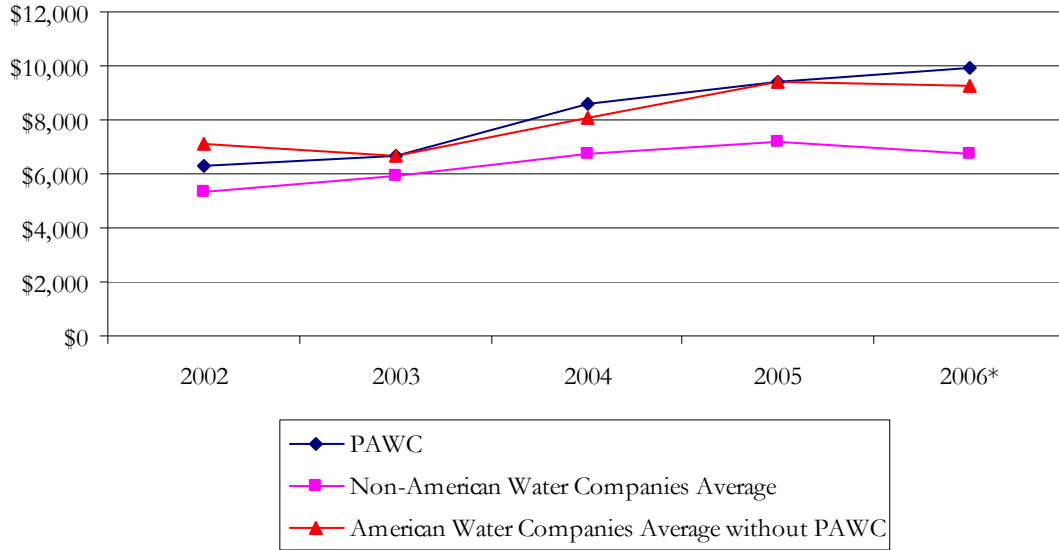
Customer Accounting Expenses per Mile of Main

**Exhibit XIV-76
 Customer Accounting per Mile of Main**



Administrative & General Expenses per Mile of Main

Exhibit XIV-77
Administrative & General Expenses per Mile of Main



XV. Appendix B: Glossary

A.

Item	Acronym	Description
accounts receivable aging	ARA	
Account Resolution Team	ART	
active directory	AD	
active leak control	ALC	
Activity Report	AR	
advanced metering system	AMS	
affirmative action plan	AAP	
American Bankers Association	ABA	
American Carbon Services	ACS	
American Water Capital Corporation	AWCC	
American Water Commercial Development Committee	AWCDC	
American Water Enterprises	AWE	
American Water Resources	AWR	
American Water Works Association	AWWA	
American Water Works Company	AWWC	
American Water Works Association Research Foundation	AWWARF	
American Water Works Service Company	AWWSC	
application service provider	ASP	
Applied Water Management	AWM	
automatic call distributor	ACD	
automatic meter reading	AMR	
automobile liability	AL	
Automotive Resources International	ARI	



B.

Item	Acronym	Description
best operating practice	BOP	
Bureau of Labor Statistics	BLS	
Business Application Support Specialist	BASS	
business continuity plan	BCP	
business opportunity form	BOF	
Business Performance Package	BPP	
business process reengineering	BPR	
business unit	BU	

C.

Item	Acronym	Description
Call Management Systems	CMS	
capital expenditures	CAPEX	
Capital Investment Management	CIM	
Capital Investment Management Committee	CIMC	
central meter reading	CMR	
central processing unit	CPU	
central standard time	CST	
Certified Fraud Examiner	CFE	
Certified Information System Auditor	CISA	
Certified Internal Auditor	CIA	
Certified Management Accountant	CMA	
Certified Public Accountant	CPA	
Change Approval Board	CAB	
Change Partner Network	CPN	
Chief Diversity Officer	CDO	
Chief Executive Offi	CEO	
Chief Financial Officer	CFO	
Chief Growth Officer	CGO	
Chief Information Officer	CIO	

Item	Acronym	Description
Chief Operating Officer	COO	
Client Services & Support	CS&S	
Code of Ethics	COE	
Collision Experts, Inc	CEI	
Commercial Development Committee	CDC	
commercially off-the-shelf	COTS	
Committee of Sponsoring Organizations	COSO	
computer maintenance management system	CMMS	
Computer Sciences Corporation	CSC	
construction work in progress	CWIP	
consumer price index	CPI	
Corporate Counsel	CC	
Customer Assistance Program	CAP	
Customer Contract Council	CCC	
Customer Service Center	CSC	
customer service representative	CSR	

D.

Item	Acronym	Description
days payable outstanding	DPO	
Department of Environmental Protection	DEP	
direct access storage device	DASD	
directors and officers	D&O	
disabled veteran business enterprise	DVBE	
disaster recovery plan	DRP	same acronym as distribution resources planning
distribution resources planning	DRP	same acronym as disaster recovery plan
district metering area	DMA	

E.

Item	Acronym	Description
earnings before interest and taxes	EBIT	
earnings before interest, taxes, depreciation, and amortization	EBITDA	
Electronic Customer Information System	E-CIS	
electronic funds transfer	EFT	
Employment Opportunity & Training Center	EOTC	
end of year	EOY	
enterprise resource planning	ERP	
enterprise risk management	ERM	
Environmental Protection Agency	EPA	
equal employment opportunity	EEO	
Equal Employment Opportunity Commission	EEOC	
Executive Management Team	EMT	
Executive Resolution Team	ERT	
Executive Vice President	EVP	

F.

Item	Acronym	Description
Family Medical Leave Act	FMLA	
fiber to the premise	FTTP	
Field Resource Coordination Center	FRCC	
Financial Planning & Analysis	FP&A	
Financial Reporting Package	FRP	
fiscal year	FY	
fixed assets	FA	
Fixed Utility Services	FUS	
full time equivalent	FTE	

G.

Item	Acronym	Description
General Counsel	GC	
General Electric	GE	
general liability	GL	
Generally Accepted Auditing Standards	GAAS	
geographic information system	GIS	
global positioning system	GPS	
granular activated carbon	GAC	
gross vehicle weight	GVW	

H.

Item	Acronym	Description
heating/venting/air conditioning	HVAC	
Human Resources	HR	
Human Resources Information System	HRIS	

I.

Item	Acronym	Description
identity access management	IAM	
independent auxiliary storage pod	IASP	
information technology	IT	
Information Technical Review Board	ITRB	
Information Technology Services	ITS	
infrastructure leakage index	ILI	
initial public offering	IPO	
Institute of Internal Auditors	IIA	
integrated cash management system	ICMS	
integrated file system	IFS	
interactive voice response	IVR	



Item	Acronym	Description
Internal Audit	IA	
International Association for Continuing Education & Training	IACET	
International Customer Management Institute	ICMI	
International Water Association	IWA	
IT Steering Committee	ITSC	

J.

Item	Acronym	Description
JD Edwards	JDE	

K.

Item	Acronym	Description
key performance indicator	KPI	

L.

Item	Acronym	Description
Letter Generation System	LGS	
long term disability	LTD	
Loss Control Manager	LCM	
lost work-day case	LWDC	

M.

Item	Acronym	Description
Master of Business Administration	MBA	
Michigan-American Water Company	MAWC	
minority business enterprise	MBE	
mobile automatic meter reading	M-AMR	

N.

Item	Acronym	Description
National Association for the Advancement of Colored People	NAACP	
National Association of Securities Dealers	NASD	
National Association of Water Companies	NAWC	
National Minority Supplier Development Council	NMSDC	
New York Stock Exchange	NYSE	
non-revenue water	NRW	
non-sufficient fund	NSF	

O.

Item	Acronym	Description
Occupational Safety & Health Administration	OSHA	
Office of Risk Management	ORM	same acronym as Operations Risk Management
operations and maintenance	O&M	same acronym as operations and management
operations and management	O&M	same acronym as operations and maintenance
Operations Risk Management	ORM	same acronym as Office of Risk Management
Opinion Research Corporation	ORC	
organization capability review	OCR	

Item	Acronym	Description
organization development	OD	
other post-employment benefits	OPEB	

P.

Item	Acronym	Description
Pennsylvania-American Water Company	PAWC	
Pennsylvania Infrastructure Investment Authority	PENNVest	
Pennsylvania Public Utility Commission	PaPUC	
personal computer	PC	
Personnel Decisions International	PDI	
point of presence	POP	
portable document format	PDF	
PowerPlant	PP	
pressure relief valve	PRV	
preventive maintenance	PM	
PricewaterhouseCoopers	PwC	
profit and loss	P&L	
Project Management Body of Knowledge	PMBOK	
Project Management Institute	PMI	
project management office	PMO	
Project Management Professional	PMP	
Project Steering Committee	PSC	
property	PR	
property damage	PD	
Public Company Accounting Oversight Board	PCAOB	
public utility commission	PUC	
Public Utility Realty Tax Act	PURTA	
public water system identified	PWSID	
purchase order	PO	

Q.

Item	Acronym	Description
quality assurance	QA	

R.

Item	Acronym	Description
Real View Imaging	RVI	
Regional Associate Counsel	RAC	
Regional General Counsel	RGC	
Regional Investment Management Committee	RIMC	
request for proposal	RFP	
request for quote	RFQ	
return on investment	ROI	
Risk Management Committee	RMC	
Risk Operations Management Committee	ROMC	
RWE AG	RWE	

S.

Item	Acronym	Description
Safe Drinking Water Act	SDWA	
Sarbanes-Oxley	SOX	
Securities and Exchange Commission	SEC	
Senior Vice President	SVP	
service level agreement	SLA	
Shared Services Center	SSC	
short term disability	STD	
Southeast Region	SER	
Strategic Capital Expenditure Plan	SCEP	
subject matter experts	SME	
supervisor control and data acquisition	SCADA	



Item	Acronym	Description
Supply Chain	SC	
Supplier Complaint Report	SCR	

T.

Item	Acronym	Description
Tennessee Valley Authority	TVA	
third-party administrator	TPA	
training and development	T&D	
turn-around-time	TAT	

U.

Item	Acronym	Description
unaccounted-for-water	UFW	
unavoidable leakage	UL	
unavoidable real losses	UARL	
uniform system of accounts	USOA	
user acceptance testing	UAT	
user access request	UAR	

V.

Item	Acronym	Description
vector directory number	VDN	
Vice President	VP	
virtual machine	VM	
voice over Internet protocol	VoIP	

W.

Item	Acronym	Description
Water Loss Control Committee	WLCC	
West Allegheny County Municipal Authority	WACMA	
women business enterprise	WBE	
women minority and disabled veterans business enterprise	WMDVBE	
work experience questionnaire	WEQ	
Workers' compensation	WC	
work order	WO	

X.

Item	Acronym	Description

Y.

Item	Acronym	Description
Year 2000	Y2k	
year-to-date	YTD	

Z.

Item	Acronym	Description

¹ / Interview 182

² / Interview 182

³ / Interview 202

⁴ / Interview 202 and Company Comments

-
- ⁵ / Interview 202
 - ⁶ / Interviews 175, 183,184,185,186, 187, 195, 196, and 202
 - ⁷ / Interviews 175, 183,184,185,186, 187, 195, 196, and 202
 - ⁸ / Interview 202
 - ⁹ / Interviews 175, 183,184,185,186, 187, 195, 196, and 202
 - ¹⁰ / Interviews 175, 183,184,185,186, 187, 195, 196, and 202
 - ¹¹ / Interview 173
 - ¹² / Interviews 174, 178, 179, 180, 191, 192, 193, 198, 199, 200, and 201
 - ¹³ / Lockwood, Nancy R., “Maximizing human capital: Demonstrating HR value with key performance indicators.” Society of Human Resource Managers research whitepaper, 2006.
 - ¹⁴ / Green, Robert J. “Sustaining Workforce Effectiveness.” Whitepaper, 2007.
 - ¹⁵ / A strategic assessment of the future of water utilities. American Water Works Association Research Foundation, 2006.
 - ¹⁶ / Lockwood, Nancy R., “Maximizing human capital: Demonstrating HR value with key performance indicators.” Society of Human Resource Managers research whitepaper, 2006.
 - ¹⁷ / Toosi, Mitra. “Labor force projections to 2016: more workers in their golden years.” Monthly Labor Review. November, 2007.
 - ¹⁸ / A strategic assessment of the future of water utilities. American Water Works Association Research Foundation, 2006.
 - ¹⁹ / Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2008-09 Edition, Water and Liquid Waste Treatment Plant and System Operators.
 - ²⁰ / Strack, Rainer, Baier, Jens, Fahlander, Anders. “Managing Demographic Risk.” Harvard Business Review. February, 2008.
 - ²¹ / “Planning strategically for the workforce of the future.” Edison Electric Institute Strategic Issues Roundtable. ScotMadden Management Consultants. February 7–9, 2007.
 - ²² / Information Response 850
 - ²³ / Information Response 850
 - ²⁴ / Information Response 878
 - ²⁵ / Information Response 850
 - ²⁶ / Information Response 806
 - ²⁷ / Information Response 806
 - ²⁸ / Information Response 850
 - ²⁹ / Toosi, Mitra. “Labor force projections to 2016: more workers in their golden years.” Monthly Labor Review. November, 2007.
 - ³⁰ / Information Response 624
 - ³¹ / Information Response 806
 - ³² / Information Response 806
 - ³³ / Information Response 806
 - ³⁴ / Information Response 832
 - ³⁵ / Information Response 879
 - ³⁶ / Information Response 832
 - ³⁷ / Kick-off presentation slides (Pre-Bid Conference Company Materials.pdf), http://hoovers.com/pennsylvania-american-water/--ID_111726--/free-co-factsheet.xhtml, and Company Comments
 - ³⁸ / Kick-off presentation slides (Pre-Bid Conference Company Materials.pdf)
 - ³⁹ / Company Comments
 - ⁴⁰ / Company Comments
 - ⁴¹ / Company Comments
 - ⁴² / Company Comments
 - ⁴³ / Company Comments
 - ⁴⁴ / Company Comments
 - ⁴⁵ / Company Comments
 - ⁴⁶ / Company Comments

⁴⁷ / Company Comments

