Austin Water Utility
Cost of Service Rate Study 2008

APPENDIX

C

Wastewater Cost-of-Service Results

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

2908083 / POR

Table C-1
Austin Water Utility
Wastewater Cost of Service Model
Number of Wastewater Connections & Estimated Flows by Customer Class

Customer Class	Connections	Flows (Kgal)		
		Customer Contributed	I&I	Total Flows
Residential	177,229	9,942,419	1,166,429	11,108,848
Multi-Family	5,202	6,943,006	814,543	7,757,548
Commercial	11,455	6,436,992	755,178	7,192,170
(Industrial Classes Below)	0	0	0	0
(Combined Residential Above)	0	0	0	0
(Combined Multi-Family Above)	0	0	0	0
(Combined Commercial Above)	0	0	0	0
Comanche Canyon (WCID#17)	1	2,400	282	2,682
Manor, City of	1	60,000	7,039	67,039
North Austin MUD #1	1	295,792	34,702	330,494
Northtown MUD	1	167,867	19,694	187,561
Rollingwood, City of	1	37,800	4,435	42,235
Shady Hollow MUD	1	88,997	10,441	99,438
Sunset Valley, City of	1	71,485	8,387	79,872
Steiner Ranch (WCID#17)	1	480	56	536
Wells Branch MUD	1	388,534	45,582	434,117
Westlake Hills, City of	1	30,000	3,520	33,520
Hospira	1	149,494	17,538	167,033
Spansion	1	467,000	54,788	521,788
Applied Materials	1	50,000	5,866	55,866
Freescale	23	450,000	52,793	502,793
Samsung	1	710,000	83,296	793,296
Sematech	1	70,000	8,212	78,212
University of Texas	14	241,913	28,381	270,294
Extra-Strength Surcharges	0	0	0	0
Totals	193,918	26,604,181	3,121,161	29,725,342

Table C-2
Austin Water Utility
Wastewater Cost of Service Model
BOD and TSS Contributions by Customer Class

Customer Class	BOD lbs/day Totals	TSS lbs/day Totals
Residential	34,291	49,980
Multi-Family	23,946	34,902
Commercial	22,201	32,359
(Industrial Classes Below)	0	0
(Combined Residential Above)	0	0
(Combined Multi-Family Above)	0	0
(Combined Commercial Above)	0	0
Comanche Canyon (WCID#17)	1	1
Manor, City of	207	302
North Austin MUD #1	1,020	1,487
Northtown MUD	579	844
Rollingwood, City of	130	190
Shady Hollow MUD	307	447
Sunset Valley, City of	247	359
Steiner Ranch (WCID #17)	0	0
Wells Branch MUD	1,340	1,953
Westlake Hills, City of	103	151
Hospira	581	366
Spansion	299	267
Applied Materials	144	268
Freescale	1,266	632
Samsung	2,041	1,041
Schaetzli	79	69
University of Texas	693	1,083
Extra-Strength Surcharges	16,567	3,962
Total	106,042	130,664

Table C-3
Austin Water Utility
Wastewater Cost of Service Model
Summary of Customer Service Characteristics

Customer Class	Flow	BOD	TSS	Customer	Meter
Residential	37.32%	32.34%	38.25%	91.39%	91.35%
Multi-Family	26.10%	22.58%	26.71%	2.68%	2.68%
Commercial	24.20%	20.94%	24.76%	5.91%	5.90%
(Industrial Classes Below)	0.00%	0.00%	0.00%	0.00%	0.00%
(Combined Residential Above)	0.00%	0.00%	0.00%	0.00%	0.00%
(Combined Multi-Family Above)	0.00%	0.00%	0.00%	0.00%	0.00%
(Combined Commercial Above)	0.00%	0.00%	0.00%	0.00%	0.00%
Comanche Canyon (WCID#17)	0.01%	0.00%	0.00%	0.00%	0.00%
Manor, City of	0.23%	0.20%	0.25%	0.00%	0.00%
North Austin MUD #1	1.11%	0.96%	1.14%	0.00%	0.00%
Northtown MUD	0.63%	0.55%	0.65%	0.00%	0.00%
Rollingwood, City of	0.14%	0.12%	0.15%	0.00%	0.00%
Shady Hollow MUD	0.33%	0.29%	0.34%	0.00%	0.00%
Sunset Valley, City of	0.27%	0.23%	0.28%	0.00%	0.00%
Steiner Ranch (WCID #17)	0.00%	0.00%	0.00%	0.00%	0.00%
Wells Branch MUD	1.46%	1.26%	1.49%	0.00%	0.00%
Westlake Hills, City of	0.11%	0.10%	0.12%	0.00%	0.04%
Hospira	0.56%	0.55%	0.28%	0.00%	0.00%
Spansion	1.76%	0.28%	0.20%	0.00%	0.00%
Applied Materials	0.19%	0.14%	0.21%	0.00%	0.00%
Freescale	1.69%	1.19%	0.48%	0.00%	0.00%
Samsung	2.67%	1.93%	0.80%	0.00%	0.00%
Sematech	0.26%	0.07%	0.05%	0.00%	0.00%
University of Texas	0.91%	0.65%	0.83%	0.01%	0.01%
Extra-Strength Surcharges	0.00%	15.62%	3.03%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

Table C-4
Austin Water Utility
Wastewater Cost of Service Model
Assignment of Classes to Cost Pools

Customer Class	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers
Residential	100%	100%	0%	100%	0%	0%
Multi-Family	100%	100%	0%	100%	0%	0%
Commercial	100%	100%	0%	100%	100%	0%
(Industrial Classes Below)	100%	100%	0%	100%	57%	0%
(Combined Residential Above)	100%	100%	0%	100%	0%	0%
(Combined Multi-Family Above)	100%	100%	0%	100%	0%	0%
(Combined Commercial Above)	100%	100%	0%	100%	100%	0%
Comanche Canyon (WCID#17)	100%	0%	100%	100%	0%	0%
Manor, City of	100%	0%	100%	100%	0%	0%
North Austin MUD #1	100%	0%	100%	0%	0%	0%
Northtown MUD	100%	0%	100%	100%	0%	0%
Rollingwood, City of	100%	0%	100%	100%	0%	0%
Shady Hollow MUD	100%	0%	100%	100%	0%	0%
Sunset Valley, City of	100%	0%	100%	100%	0%	0%
Steiner Ranch (WCID #17)	100%	0%	100%	100%	0%	0%
Wells Branch MUD	100%	0%	100%	100%	0%	0%
Westlake Hills, City of	100%	0%	100%	100%	0%	0%
Hospira	100%	100%	0%	100%	57%	0%
Samsung	100%	100%	0%	100%	57%	0%
Applied Materials	100%	100%	0%	100%	57%	0%
Freescale	100%	100%	0%	100%	57%	0%
Samsung	100%	100%	0%	100%	57%	0%
Sematech	100%	100%	0%	100%	57%	0%
University of Texas	100%	100%	0%	100%	57%	0%
Extra-Strength Surcharges	100%	0%	0%	100%	0%	100%

Table C-5
Austin Water Utility
Water Cost of Service Model
Actual O&M Costs

Item	Class Code Description	Computed
WASTEWATER TREATMENT SUPPORT		
Environmental & Regulatory Support	Treatment	$527,956
WW Treatment Laboratory	Treatment	1,461,380
Process Engineering	Treatment	323,610
Facility Engineering - Plants	Treatment	701,174
WASTEWATER TREATMENT		
Hornsby Biosolids Plant		
Hornsby Operations		
Electrical	Treatment	376,250
Chemical	Treatment	852,514
Other	Treatment	1,270,901
Hornsby Maintenance	Treatment	1,824,807
Hornsby Bend Equipment Maintenance	Treatment	1,797,899
Wastewater Plant Maintenance		
South Austin Regional WWTP Maintenance	Treatment	1,672,615
Govalle WWTP Maintenance	Treatment	363,393
Walnut Creek WWTP Maintenance	Treatment	1,414,910
Electric Maintenance	Treatment	1,078,655
Instrumentation & Control Maintenance	Treatment	1,023,585
Systems Support - Wastewater--MBN	Treatment	105,869
Admin Support - Wastewater--MBN	Treatment	305,827
South Austin Regional Operations		
Electrical	Treatment	2,809,092
Chemical	Treatment	296,250
Other	Treatment	1,599,791
Govalle Operations - Govalle recently decommissioned		
Electrical	Treatment	98,750
Chemical	Treatment	0
Other	Treatment	261,600
Walnut Creek Operations		
Electrical	Treatment	2,678,489
Chemical	Treatment	335,750
Other	Treatment	1,804,198
COLLECTION SYSTEM OPERATIONS & MAINTENANCE		
Lift Stations		
Electrical	Conveyance	922,827
Other	Conveyance	3,227,446
Collection Pipeline Maintenance		
Management Services	Conveyance	563,534
Pipeline Operations	Conveyance	5,152,213
Sanitary Sewer Overflow (SSO) Prevention	Conveyance	1,359,312
Service (House) Connection	Conveyance	373,224
Construction - Lines) & Rehab	Conveyance	1,417,365
COLLECTION SYSTEM SUPPORT		
Asset Management	Conveyance	196,831
Dispatch	Conveyance	404,447
Pipeline Engineering	Conveyance	660,392
Facility Engineering - Dist/Coll	Conveyance	818,504
Engineering & Tech Support	Conveyance	1,018,850
Collection System Support Laboratory		0
Collection Technical Support		0
GIS Services	Conveyance	490,104
Line Locators - Collection	Conveyance	533,521
On-Site Sewage Facilities (OSSF)	Conveyance	310,649
Industrial Waste	Conveyance	1,173,063
Infrastructure Records--MBN	Conveyance	581,545
Systems Planning	Conveyance	861,814
Utility Development Services	Conveyance	364,241
Wastewater TV Inspection, Inflow & Infiltration		
TV Inspection	Conveyance	2,764,298
Inflow and Infiltration	Conveyance	1,155,033

Table C-5
Austin Water Utility
Water Cost of Service Model
Actual O&M Costs

Item		Class Code Description		Computed
Collection Engineering		Conveyance		2,876,743
ONE STOP SHOP				
Commercial Building Plan Review				
Building Plan Review		Administrative		2,603
Building Plan Review - IW		Administrative		90,717
Land Use Review		Administrative		39,126
One-Time Inspection		Administrative		39,126
Refund Center				
Permit and License Center		Administrative		96,622
Permit and Licens. Center OSSF		Administrative		39,126
Site Inspections		Administrative		274,517
SUPPORT SERVICES				
Administration & Management				
Internal Audit		Administrative		213,924
Business Support		Administrative		890,455
Strategic Resources Services - Wholesale		Administrative		137,043
Business Improvement Services		Administrative		193,840
CIP Budget/Acct & FinReporting - MDN		Administrative		311,592
Rates, Analysis & Asset Mngt		Administrative		269,455
Stores		Administrative		1,805,597
Budget & Accounting		Administrative		995,610
Information Technology Support		Administrative		1,620,626
Facility Expenses				
Facility Management - GBSC - Webberville		Administrative		523,440
Facility Management - WGC, NSC		Administrative		583,620
Purchasing / MDE / WBE				
Purchasing		Administrative		177,625
Accounts Payable		Administrative		245,968
Public Involvement - Community Involvement		Administrative		337,579
Personnel / Training				
Organizational Development		Administrative		114,440
Employment, Compensation & Sys		Administrative		148,589
Employee Relations & Wkrs Comp		Administrative		157,146
Safety & Training		Administrative		416,152
Equipment Repairs		Administrative		494,076
CONSERVATION & REUSE				
Facility Engineering - Conservation		Treatment		32,430
Environmental Lab - Conserv & Reuse Support		Treatment		109,511
Water Reuse / WW Reuse		Treatment		177,178
BILLING/CUSTOMER SERVICES				
Tap Sales		Administrative		170,797
Taps Investigation & Admin		Administrative		90,519
Retail Customer Service		Administrative		461,570
Utility Customer Services Office - AB		Administrative		4,810,574
Bad Debt		Administrative		982,500
TRANSFERS & OTHER REQUIREMENTS				
Commission on Debt		Administrative		30,347
Special Support		Administrative		8,768,658
TRANSFERS & OTHER REQUIREMENTS				
Operating Transfers		0		931,350
Other Transfers		0		214,209
Funding of low-income subsidy		0		0
Total O&M Cost:				78,158,195

Table C-6 Austin Water Utility Wastewater Cost of Service Model Cash Basis Capital Costs	
Item	Computed
Debt Service Requirements (Includes CRB)	$82,812,283
Transfer to City General Fund	13,107,647
Transfer to Sustainability Fund	1,964,817
Transfer to Wastewater Construction Fund/Capital Outlay	35,465,114
Operating Transfers	0
Other Transfers	214,210
Total	$133,564,071

Table C-7 Austin Water Utility Water Cost of Service Model Non-Rate Revenue	
Item	**Computed**
Industrial Waste Permits	$397,595
Reconnection Fee	14,827
Permit Liquid Waste Hauler	11,616
Restitution Criminal Acts	1
Xerox Copies & Utilities	458
Late Payment Penalties	982,759
Building Rental Income	165,810
Damage Charges	1
Process Assessment	1
Compost/ Sludge Sales	410,672
Agricultural Bi-products	31,985
Wastewater Special Billings	16,924
Commission Agenda Packets	14
Property Sales- Motorized Vehicles	68,889
After Hours Turn On	201,116
Special Bill - Wtr Fin Mgmt	61,088
Septic Tank Haulers Fee	837,751
Wholesale Penalities & Fees	78,347
Service Installation	344,086
A/R Adjustment - Leak Adjustment	(63,278)
NWA MUD 1 Surcharge Credit	(277,656)
WW Meter Application Fee	1,957
OSSF Reviews	38,258
Lab Testing Fee	11,530
Reuse Water Service	7,364
A/R Adjustment - Conservation Rebate	1
Southland Oaks Surcharge	68,251
A/R Adjustment	1
Miscellaneous Revenues	125,000
Returned Check Fee	11,455
Junk/ Metal Sales	10,273
Cash Over/Short	1
Sales Tax Penalty	1
New Service Connections	381,940
Transfer In from CIP	1,000,000
Transfers In (from CRFs & Public Works)	3,700,292
Interest Income (O&M Portion)	577,575
Decrease (Increase) in Operating Reserves	6,599,196
Interest Income (Capital Portion)	967,133
Decrease (Increase) in Operating Reserves	3,941,058
Total	$20,312,304

Table C-8
Austin Water Utility
Wastewater Cost of Service Model
Summary of User Charge Revenue Requirements by Customer Class

Customer Class	O&M	Special Costs	Revenue-Based Allocations	Depreciation	Return	Total
Residential	$28,511,258	$202,573	$35,944,665	$10,358,780	$29,576,228	$74,594,002
Multi-Family	15,835,428	141,322	3,791,730	7,233,760	20,654,207	47,656,447
Commercial	15,529,090	131,022	3,741,686	6,706,556	19,128,906	45,257,260
(Industrial Classes Below)	0	0	0	0	0	0
(Combined Residential Above)	0	0	0	0	0	0
(Combined Multi-Family Above)	0	0	0	0	0	0
(Combined Commercial Above)	0	0	0	0	0	0
Comanche Canyon (WCID#17)	2,786	49	605	1,447	3,907	8,795
Manor, City of	104,570	1,221	21,641	46,849	122,078	296,360
North Austin MUD #1	515,387	0	117,235	230,959	601,826	1,465,407
Northtown MUD	292,507	3,417	61,452	131,074	341,537	829,997
Rollingwood, City of	65,893	769	14,855	29,515	76,909	187,941
Shady Hollow MUD	155,093	1,811	31,997	69,491	181,076	439,468
Sunset Valley, City of	124,581	1,455	24,249	55,817	145,445	351,548
Steiner Ranch (WCID #17)	585	10	161	289	78	1,926
Wells Branch MUD	676,971	7,908	161,507	303,374	790,522	1,940,283
Westlake Hills, City of	52,308	611	12,088	23,425	61,039	149,468
Hospira	336,294	3,043	76,749	150,842	433,332	1,000,260
Spansion	827,085	9,506	265,380	410,798	1,215,885	2,728,653
Applied Materials	112,745	1,018	34,109	51,539	147,491	346,902
Freescale	932,712	9,160	285,219	431,414	1,252,671	2,881,175
Samsung	1,478,835	14,452	349,618	682,771	1,981,224	4,506,899
Sematech	129,436	1,425	40,792	65,095	185,723	420,471
University of Texas	536,188	4,924	126,727	245,508	704,720	1,618,067
Extra-Strength Surcharges	2,892,762	0	0	560,343	1,275,628	4,728,734
Total	$69,112,512	$535,495	$15,072,464	$27,787,646	$78,901,845	$191,409,961

Table C-9
Austin Water Utility
Wastewater Cost of Service Model
Distribution of O&M Costs to Cost Pools

Item	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers	Total
Collection	$0	$16,405,047	$0	$0	$0	$0	$16,405,047
Interceptors	10,014,142	0	0	0	0	0	10,014,142
Lift Stations (Conveyance)	6,221,582	0	0	0	0	0	6,221,582
Plant Raw WW Pumping	2,182,381	0	0	0	0	0	2,182,381
Preliminary Treatment	894,210	0	0	0	0	0	894,210
Industrial Waste Control	0	0	0	0	699,229	699,229	1,398,457
Bar Screens	0	0	0	0	0	0	0
Grit Removal	0	0	0	0	0	0	0
Primary Clarifiers	1,098,143	0	0	0	0	0	1,098,143
Flow Equalization Basins	1,535,476	0	0	0	0	0	1,535,476
Aeration Basins	5,107,146	0	0	0	0	0	5,107,146
Secondary Clarifiers	2,163,540	0	0	0	0	0	2,163,540
Return Sludge Pumping	151,055	0	0	0	0	0	151,055
Waste Sludge Pumping	105,719	0	0	0	0	0	105,719
Filters	3,364,960	0	0	0	0	0	3,364,960
Disinfection and Outfall	1,769,466	0	0	0	0	0	1,769,466
Revenue Allocated Costs	0	0	0	0	0	0	0
Sludge Thickening	659,075	0	0	0	0	0	659,075
Biosolids Management	9,224,396	0	0	0	0	0	9,224,396
Wholesale & Industrial Services	0	0	150,445	0	37,611	0	188,056
Customer Services	6,664,936	0	0	0	0	0	6,664,936
Indirect Treatment	265,070	0	0	0	0	0	265,070
Indirect	0	0	0	0	0	0	0
Totals	$51,120,951	$16,405,047	$150,445	$0	$736,840	$699,229	$69,112,512

Table C-10
Austin Water Utility
Wastewater Cost of Service Model
Distribution of Specially Allocated Items to Cost Pools

Item	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers	Total
Collection	$0	$0	$0	$0	$0	$0	$0
Interceptors	0	0	0	535,495	0	0	535,495
Lift Stations (Conveyance)	0	0	0	0	0	0	0
Plant Raw WW Pumping	0	0	0	0	0	0	0
Preliminary Treatment	0	0	0	0	0	0	0
Industrial Waste Control	0	0	0	0	0	0	0
Bar Screens	0	0	0	0	0	0	0
Grit Removal	0	0	0	0	0	0	0
Primary Clarifiers	0	0	0	0	0	0	0
Flow Equalization Basins	0	0	0	0	0	0	0
Aeration Basins	0	0	0	0	0	0	0
Secondary Clarifiers	0	0	0	0	0	0	0
Return Sludge Pumping	0	0	0	0	0	0	0
Waste Sludge Pumping	0	0	0	0	0	0	0
Filters	0	0	0	0	0	0	0
Disinfection and Outfall	0	0	0	0	0	0	0
Revenue Allocated Costs	0	0	0	0	0	0	0
Sludge Thickening	0	0	0	0	0	0	0
Biosolids Management	0	0	0	0	0	0	0
Wholesale & Industrial Services	0	0	0	0	0	0	0
Customer Service	0	0	0	0	0	0	0
Indirect Treatment	0	0	0	0	0	0	0
Indirect	0	0	0	0	0	0	0
Totals	$0	$0	$0	$535,495	$0	$0	$535,495

Table C-11
Austin Water Utility
Wastewater Cost of Service Model
Distribution of Revenue Allocated Costs to Cost Pools

Item	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers	Total
Collection	$0	$0	$0	$0	$0	$0	$0
Interceptors	0	0	0	0	0	0	0
Lift Stations (Conveyance)	0	0	0	0	0	0	0
Plant Raw WW Pumping	0	0	0	0	0	0	0
Preliminary Treatment	0	0	0	0	0	0	0
Industrial Waste Control	0	0	0	0	0	0	0
Bar Screens	0	0	0	0	0	0	0
Grit Removal	0	0	0	0	0	0	0
Primary Clarifiers	0	0	0	0	0	0	0
Flow Equalization Basins	0	0	0	0	0	0	0
Aeration Basins	0	0	0	0	0	0	0
Secondary Clarifiers	0	0	0	0	0	0	0
Return Sludge Pumping	0	0	0	0	0	0	0
Waste Sludge Pumping	0	0	0	0	0	0	0
Filters	0	0	0	0	0	0	0
Disinfection and Outfall	0	0	0	0	0	0	0
Revenue Allocated Costs	15,072,464	0	0	0	0	0	$15,072,464
Sludge Thickening	0	0	0	0	0	0	0
Biosolids Management	0	0	0	0	0	0	0
Wholesale & Industrial Services	0	0	0	0	0	0	0
Customer Service	0	0	0	0	0	0	0
Indirect Treatment	0	0	0	0	0	0	0
Indirect	0	0	0	0	0	0	0
Totals	$15,072,464	$0	$0	$0	$0	$0	$15,072,464

Table C-12
Austin Water Utility
Wastewater Cost of Service Model
Distribution of Net Plant in Service to Cost Pools

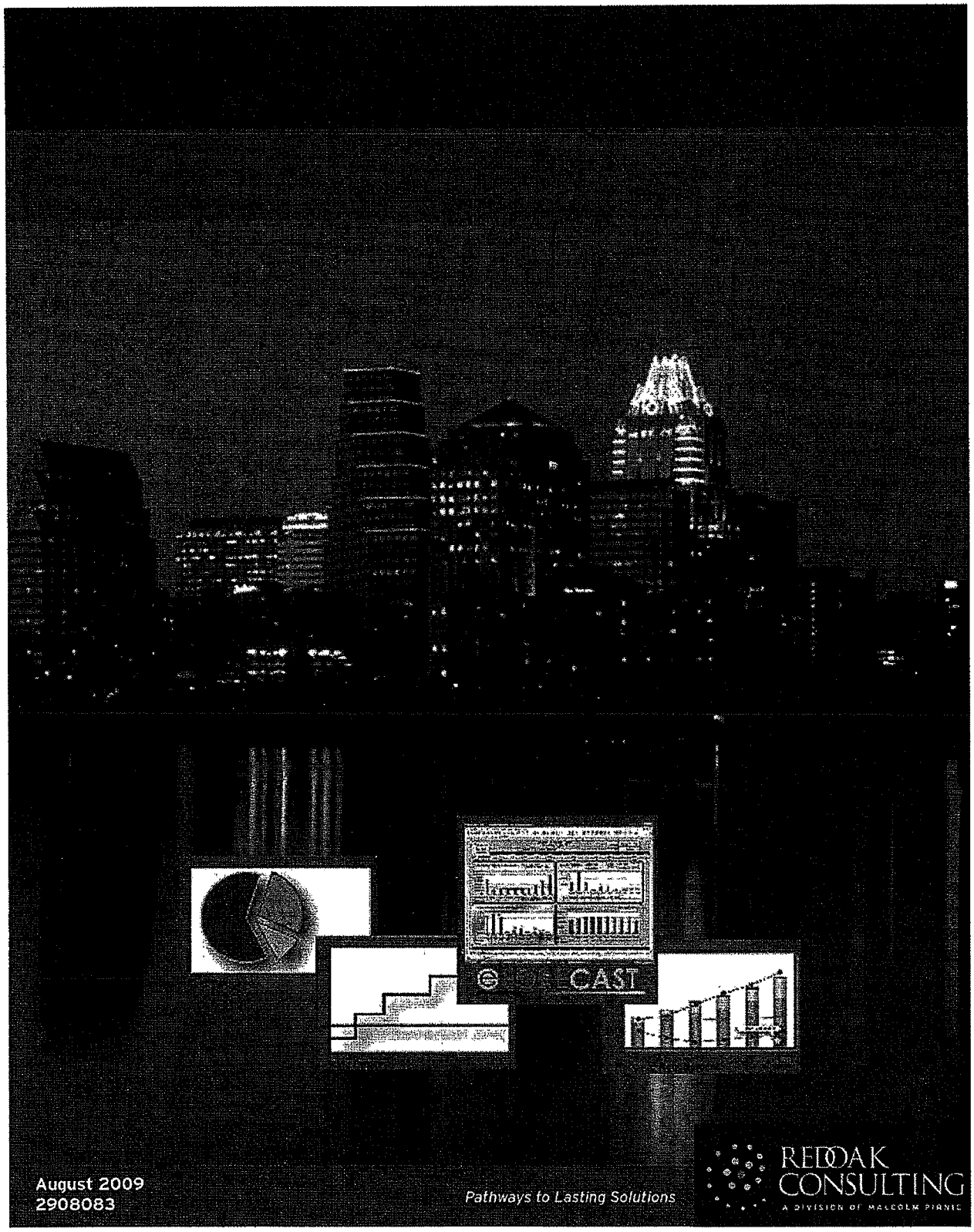
Item	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers	Total
Collection	$0	$181,654,613	$0	$0	$0	$0	$181,654,613
Interceptors	119,081,666	0	0	0	0	0	119,081,666
Lift Stations (Conveyance)	34,280,935	0	0	0	0	0	34,280,935
Plant Raw WW Pumping	24,999,544	0	0	0	0	0	24,999,544
Preliminary Treatment	0	0	0	0	0	0	0
Industrial Waste Control	0	0	0	0	0	0	0
Bar Screens	4,304,000	0	0	0	0	0	4,304,000
Grit Removal	2,255,188	0	0	0	0	0	2,255,188
Primary Clarifiers	13,185,190	0	0	0	0	0	13,185,190
Flow Equalization Basins	8,990,410	0	0	0	0	0	8,990,410
Aeration Basins	53,892,925	0	0	0	0	0	53,892,925
Secondary Clarifiers	17,779,611	0	0	0	0	0	17,779,611
Return Sludge Pumping	10,758,442	0	0	0	0	0	10,758,442
Waste Sludge Pumping	0	0	0	0	0	0	0
Filters	0	0	0	0	0	0	0
Disinfection and Outfall	46,350,184	0	0	0	0	0	46,350,184
Revenue Allocated Costs	0	0	0	0	0	0	0
Sludge Thickening	14,180,193	0	0	0	0	0	14,180,193
Biosolids Management	67,032,966	0	0	0	0	0	67,032,966
Wholesale & Industrial Services	0	0	0	0	0	0	0
Customer Service	0	0	0	0	0	0	0
Indirect Treatment	0	0	0	0	0	0	0
Indirect	0	0	0	0	0	0	0
Total	$417,091,255	$181,654,613	$0	$0	$0	$0	$598,745,868

Table C-13
Austin Water Utility
Wastewater Cost of Service Model
User Charge Revenue Requirements by Customer Service Characteristic

Customer Class	Flow	BOD	TSS	Customer	Meter	Totals
Residential	$55,866,770	$7,497,279	$3,139,116	$6,690,838	$0	$74,394,002
Multi-Family	38,653,414	5,235,512	3,588,755	178,766	0	47,656,447
Commercial	36,682,433	4,853,942	3,327,203	392,682	0	45,257,260
(Industrial Classes Below)	0	0	0	0	0	0
(Combined Residential Above)	0	0	0	0	0	0
(Combined Multi-Family Above)	0	0	0	0	0	0
(Combined Commercial Above)	0	0	0	0	0	0
Comanche Canyon (WCID#17)	8,542	137	82	34	0	8,795
Manor, City of	220,068	45,244	31,013	34	0	296,360
North Austin MUD #1	1,089,434	223,048	152,891	34	0	1,465,407
Northtown MUD	616,611	126,584	86,769	34	0	829,997
Rollingwood, City of	139,864	28,504	19,538	34	0	187,941
Shady Hollow MUD	326,322	67,010	46,002	34	0	439,468
Sunset Valley, City of	260,659	53,905	36,950	34	0	351,548
Siebert Ranch (WCID #17)	1,748	27	16	34	0	1,826
Wells Branch MUD	1,446,438	292,982	200,829	34	0	1,940,283
Westlake Hills, City of	111,302	22,622	15,507	34	0	149,465
Hospira	835,559	126,985	37,681	34	0	1,000,260
Spansion	2,635,800	65,340	27,478	34	0	2,728,653
Applied Materials	287,902	31,386	27,579	34	0	346,902
Freescale	2,539,350	276,783	64,985	103	0	2,881,175
Samsung	3,953,468	446,333	107,063	34	0	4,506,899
Sematech	396,101	17,286	7,050	32	0	420,471
University of Texas	1,354,643	151,603	111,341	481	0	1,618,067
Extra-Strength Surcharges	0	4,186,427	542,307	0	0	4,728,734
Totals	$147,426,429	$23,748,993	$13,570,154	$6,664,386	$0	$191,409,961

Table C-14
Austin Water Utility
Wastewater Cost of Service Model
Revenue Summary

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$74,392,186	$74,692,011	0.4%
Multi-Family	46,253,768	47,729,253	3.2%
Commercial	47,639,158	45,285,030	(4.9%)
Comanche Canyon (WCID#17)	8,496	8,795	3.5%
Manor, City of	277,296	296,195	6.8%
North Austin MUD #1	1,473,619	1,466,614	(0.5%)
Northtown MUD	839,721	829,885	(1.2%)
Rollingwood, City of	178,512	188,051	5.3%
Shady Hollow MUD	411,264	439,208	6.8%
Sunset Valley, City of	330,645	351,229	6.2%
Steiner Ranch (WCID #17)	1,718	1,824	6.1%
Wells Branch MUD	1,919,935	1,938,903	1.0%
Westlake Hills, City of	141,900	149,433	5.3%
Hospira	992,737	1,002,277	1.0%
Spansion	3,100,976	2,733,719	(11.8%)
Applied Materials	332,097	347,172	4.5%
Freescale	2,988,288	2,885,391	(3.4%)
Samsung	4,714,496	4,513,542	(4.3%)
Sematech	464,896	421,414	(9.4%)
University of Texas	1,607,649	1,620,537	0.8%
Extra Strength Surcharges	0	4,728,734	0.0%
Totals	$188,069,357	$191,629,215	1.9%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Austin Water City of Austin

Report Vol. II

Austin Water Utility Cost of Service Rate Study 2008

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SECTION

1

Issue Papers

REDOAK CONSULTING
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Issue Paper# 1
Revenue Requirements

Subject: Determination of System Revenue Requirements

Date: December 12, 2007

Introduction

Setting rates for water and wastewater utilities requires a method of determining the amount of revenue the utility is allowed to recover from its customers. This amount is referred to as the utility's revenue requirements. This issue paper examines the alternative methods available to determine revenue requirements for Austin Water Utility (AWU).

Over time industry standards have evolved to guide practitioners in the development of revenue requirements.[1] The body of industry standards originated to provide the following:

1. Protection of consumers. Utilities are normally considered natural monopolies.[2] As such, utilities may have the ability to charge rates that exceed costs.[3]

2. Ensuring utilities have sufficient revenue to maintain the utility's value. This concern originated with investor-owned utilities that were subject to the regulation of the rates they charge their customers. If the revenue requirements are insufficient to generate profits, the value of the utility would decline and its owners would suffer a loss in wealth.

Review of Alternative Revenue Requirement Methodologies

In the water and wastewater industry there are generally accepted methods of determining a utility's revenue requirements. These methods are:

- Cash Basis

[1] See for example, Phillips, C.F., *The Regulation of Public Utilities,* (Arlington, Virginia: Public Utilities Reports, Inc., 1984) or Bonbright, J.C., and A.L. Danielsen and D.R. Kamerschen, *Principles of Public Utility Rates,* Second Edition, (Arlington, Virginia: Public Utilities Reports, Inc., 1988)

[2] A natural monopoly is a business in an industry where the marginal costs of producing additional output is lower than the average cost over the relevant range of demands. This results in the natural selection of one enterprise to dominate the industry eventually gathering large economies of scale that undercut its competition. Utilities are generally considered natural monopolies.

[3] The definition of economic costs includes a *normal profit* that is required to attract and maintain investment in the enterprise. In competitive markets, profits above normal profits attract competition and serve to return profits to a normal level. The opposite is also true. Profits below normal profits will encourage firms to exit from the industry. The exit of these firms will reduce supply and increase profits to more normal levels. This market function serves to allocate investments efficiently throughout the economy. Natural monopolies distort this market function since competition is ineffective.

- Utility Basis

A third method of determining revenue requirements exists that combine elements of the cash and utility basis. This method is referred to as the *Utility Basis with Cash Residual.* Each method is described below.

Cash Basis

Most municipally owned utilities are required to maintain a municipal-like budget where their revenue and expenses balance each year. Unlike an investor-owned utility, municipally owned utilities do not normally have access to sources of capital other than retained earnings and formally issued debt. Normally in these circumstances the total revenue from all customers must equal its budgeted expenses. This is the cash basis. The cash basis revenue requirements include:

- O&M expenses
- Debt service
- Capital expenditures (not debt financed)
- Increase in fund balances
- Taxes and other requirements

O&M Expenses

O&M expenses are the costs necessary to operate and maintain the utility's facilities and costs related to customer service and the administration of the utility. These expenses include expenditures for salaries, benefits, chemicals, power, maintenance, postage, and other typical operating expenses. O&M expenses exclude depreciation expense, taxes, and other expenditures that are capitalized rather than expensed. In some cases, capitalized overheads are included as an O&M expense, but generally these are capitalized and included in the costs of an improvement.

Debt Service

Debt service equals the principal and interest on outstanding debt.

Capital Expenditures

Utilities often make some capital expenditures from their operating funds without the use of long-term debt. Some utilities limit this to rolling stock and other minor capital expenditures. Others use capital expenditures as a way to manage the overall financial health of the utility by maintaining certain financial policies[4] on the utility's capital structure (e.g., debt/equity ratios, bond debt service coverage, etc.)

[4] AWU's financial policies require a debt service coverage ratio of 1.50 and 20 percent equity financing of capital improvements.

Increase in Fund Balances

Utilities may maintain financial policies on capital structure by varying the amount of reserves maintained. In this context, reserves are the cash balances available to the utility from one year to the next. An example of changes in fund balances might include:

- Establishing a capital reserve fund to cash finance future capital projects, thereby reducing future borrowing needs.
- Increasing operating reserves to enhance the utility's ability to maintain programs during periods of lower than expected revenue or higher than expected expenses.
- Establishing debt service reserves as required by certain bond covenants or to maintain debt service coverage ratios.
- Other similar purposes.

These increases in fund balances either offset or increase the revenue required from the utility's customers.

Taxes and Other Requirements

Like other business, taxes and other requirements are assessed to utilities for multiple purposes. To ensure the utility's total costs are recovered, these taxes are generally included in the revenue requirements. Taxes and other requirements may include gross receipts taxes, franchise fees, transfers to municipal general funds, payments in lieu of taxes, etc.

Utility Basis

The utility basis is a method of determining revenue requirements that is similar to the methods used by investor-owned utilities. Under the utility basis, a utility's revenue requires include:

- O&M expenses
- Return on rate base (i.e., return on investment for the assets used by the utility's customers),
- Depreciation expense
- Taxes and other requirements

O&M Expenses

O&M expenses under the utility basis are the same as those under the cash basis.

Return on Rate Base

When a municipally owned utility provides service, it (and, by extension, its customers) undertakes financial and other risks similar to that of investor-owned utilities. To

compensate for these risks, the utility charges its customers a fair rate of return on its investment to serve customers. A fair rate of return is assumed to be a return that could be earned by investing the owner's money[5] in a comparable investment which has similar risk. The rate of return is often referred to as the cost of capital. It is often calculated using a weighted average of the utility's cost of debt and equity.

The rate base itself is not a user charge revenue requirement under the utility basis. The rate base is simply the value of the assets that are used and useful to a particular customer class or group of customer classes. Adjustments to the rate base may be made for construction-work-in-progress (CWIP) and/or an allowance for working capital. To determine the revenue requirement under the utility basis, a rate of return is applied to the rate base.

Depreciation Expense

Depreciation expense is the annual depreciation on fixed assets that are used to provide services to the utility's customers. These expenses are included in the revenue requirements to allow the utility to recover its initial capital investment.

Generally depreciation expense is calculated using the straight-line method assuming the accounting definitions of useful lives. If contributed capital is amortized, the amortization expenses are often subtracted from the depreciation expense for ratemaking purposes[6].

Taxes and Other Requirements

Taxes and other requirements under the utility basis are the same as those under the cash basis.

Utility Basis with Cash Residual

The *Utility Basis with Cash Residual* is a modification of the utility basis for municipally owned utility that must meet a balanced budget requirement. This approach is essentially a hybrid of the cash and utility basis. Under this approach, the overall revenue requirements are set to recover the cash basis requirements. The utility basis is used to determine the revenue requirements for the non-owner customers using a fair rate of return determined by external factors (e.g., weighted average cost of capital).

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[5] For a municipally owned utility like AWU, the owners are typically the customers who live within the City's corporate boundaries.

[6] When capital is contributed by a customer class, the utility normally treats this as *cost-free capital.* No return is earned on the contributed capital and the amortization expense is not included in the revenue requirements. If the contributed capital is amortized, and the assets acquired by the contribution are also depreciated, an adjustment to the depreciation expense is required to ensure the utility does not over recover its investment. With contributed capital, the utility did not make the initial investment (it was contributed), and therefore no capital recovery (i.e., deprecation expense) is required.

The residual revenue requirement (i.e., the difference between the total cash basis revenue requirements and the utility basis revenue requirements for non-owner customers) is recovered from owner customers using the cash basis[7].

Table 1 presents a hypothetical comparison of revenue requirements for AWU using each of the three approaches described above.

Table 1
City of Austin - Water Utility
Hypothetical Revenue Requirements
FY2007-08 Preliminary Budget

Item	Cash Basis	Utility Basis	Utility Basis with Cash Residual
Operation & Maintenance Expense	$79,127,008	$79,127,008	$79,127,008
Principal & Interest on Debt	76,636,711		
Annual Replacements, Extensions, and Improvements from Revenue	23,525,000		
Depreciation Expense		30,242,924	30,242,924
Return - Operating Income[1, 2, 3]		81,362,654	69,918,787
Other Revenue	(3,747,291)	(3,747,291)	(3,747,291)
Total Revenue Requirements	$175,541,428	$186,985,295	$175,541,428

[1]Assumed allowance for working capital as percent of recurring O&M	12.5%
[2]Assumed rate of return for utility basis:	9.0%
[3]Calculated rate of return for utility basis with cash residual:	7.7%

Methodological Options Under Review

When considering the issue of revenue requirements, the following methodological options are important to consider:

1. Which is the most appropriate overall method for determining revenue requirements?

2. How should future O&M expenses be projected?

3. How should the rate of return be determined?

[7] In practice, the cash basis revenue requirements are generally recovered by determining a separate rate of return for owner customers that fully recovers the residual revenue requirements.

4. How should the rate base be valued?

5. How should construction work in progress be treated in determining rate base?

Each of these issues is explored further in the following section. The discussion for each issue includes:

- Overview of the issue
- Description of the alternatives
- Evaluation of the alternatives using the executive team's evaluation criteria
- Consultant's preliminary findings and recommendations

After presentation to the executive team and public involvement committee, the consulting team will finalize its recommendations.

Issue 1: Which method of determining revenue requirements is most appropriate?

Overview of the Issue

The first revenue requirement policy issue to resolve is which industry standard approach to determining revenue requirements is best for AWU and its customers. The alternative selected will determine the method of setting the total revenue recovered from the cost-of-service analyses.

Description of Alternatives

The three available alternative methodologies are:

1. Cash basis
2. Utility basis
3. Utility basis with cash residual

These methods are fully described in the earlier section of this issue paper.

The primary difference among the alternatives is the concept of ownership and the method of consumer protection. Under the cash basis, consumer protection is provided by the budgeting oversight of the elected officials. These officials act both as a representative of the customers and the utility. Most often, the elected officials are elected by the citizens that act as the owners of the utility. Under this approach, ownership and consumer protection are combined into one elected body.

Under the utility basis, the consumer protection is often provided by public utility commissions or public service commissions. These regulatory bodies establish rates of return that provide consumer protection.

In situations where municipally owned utilities provide services to customers outside their corporate jurisdictions, consumer protection is often provided by explicit contractual agreements that specify the conditions under which utility rates are determined. This is the situation most commonly found when the *Utility Basis with Cash Residual* method is used.

Evaluation of Alternatives

Attachment A presents the weighted evaluations of the alternatives.[8]

When considering implementation, the cash basis alternative is generally preferred over the utility basis or utility basis with cash residual. Both techniques that use a rate base (i.e., the utility basis and the utility basis with cash residual) require administrative efforts to develop and maintain a detailed rate base. An additional burden is placed on the utility basis with cash residual to track the rate base with greater precision to properly categorize assets as inside or outside the City. These data requirements also impact the risk of implementation.

From an equity standpoint, the three alternative methods are similar with the exception of inter-generational equity. The utility basis is somewhat better at matching the cost of providing facilities with those who use them. The utility basis approaches spread the cost of an asset appropriately into the future by charging future customers their share of depreciation expense.

Like the equity criteria, the customer criteria were not influenced greatly by the method of determining revenue requirements. Those criteria depending on the total cost of utility services (i.e., affordability and economic development) did not vary since the total cost of utility services, in the long run, will be quite similar. The costs will depend on the external factors like future regulations and operating expenses.

For similar reasons, long-term conservation impacts are likely immune to changes in the method of determining revenue requirements.

The financial criteria offered more variation in evaluations. Revenue sufficiency was lower for the utility basis since the use of an externally generated rate of return may not necessarily generate the cash needs of the utility.

[8] The weights for the criteria used in these evaluations are those of the consultant and have not been adjusted to reflect the executive team's weights. The executive team's weights will be incorporated into the analysis after the weights have been determined.

Revenue stability is largely a measure of the impact of weather on utility revenue and is therefore less important to evaluating methods of determining revenue requirements.

Rate stability and rate predictability are correlated in this evaluation. In both cases, the utility basis generated the more stable and predicable rates. That outcome is a direct result of the requirement that the utility recover its investment over time using a rate of return and depreciation. This result may be mitigated by the use of predictive financial planning tools that allows the utility to gradually increase rates in anticipation of future capital requirements. In the case where rates are gradually increased, the cash basis may actually be more stable and predictable.

The cash basis reduces financial risks to the utility. This reduction in financial risk is primarily accomplished by ensuring revenue are sufficient to meet the cash needs of the utility. Unlike investor-owned utilities, municipal utilities do not have access to equity markets to allocate risks and accommodate financial shortfalls.

Preliminary Findings and Recommendations

The consulting team recommends AWU use the cash basis for determining revenue requirements. This method is consistent with current practices and requires data that are readily available and dependable.

Issue 2: How should future O&M expenses be projected?

Overview of the Issue

All three methods of determining revenue requirements include an amount to recover O&M expenses. The method of projecting the O&M expenses will influence the total revenue requirements.

Description of Alternatives

Two alternatives are generally considered in projecting O&M expenses. These are:

- Historical test year with adjustments for known and measurable changes
- Future budgeted O&M expenses

Under the first alternative, the allowance for O&M expenses is determined by using actual expenditures during a recent 12-month period for which detailed expenditure records are available. Because of the intricacies of municipal budgeting requirements, the 12-month period is generally the most recently completed fiscal year. The expenditures during the historical test year are then adjusted for what are called *known and measurable changes.* These adjustments to historical costs typically include allowances for changes in labor agreements, changes in utility rates, etc.

The alternative approach is to project future O&M expenses based on the utility's adopted annual budget. This approach depends on the municipal budgeting process to evaluate the reasonableness of projections of future O&M expenditures.

The compatibility of the methods used to project future O&M expenses may vary depending on the overall approach used to determine revenue requirements (i.e., cash basis, utility basis, and utility basis with cash residual.) One potential criticism of using the budget to project future O&M expenses is that municipal utilities generally cannot exceed their budget authorization. This restriction would indicate that budgeted O&M would exceed actual O&M. When the utility is on the cash basis, however, unspent O&M expenses would result in additional ending fund cash balances which would be available to offset future O&M expenses or capital expenditures.

Evaluation of Alternatives

Using the future budget has fewer implementation issues than the historical test year. Regardless of the findings of this study, AWU will still be required to comply with the City's overall budgeting procedures. Using this procedure for setting rates requires little to no additional administrative effort.

There is no discernable difference between the alternatives in terms of criteria for equity, customer, and conservation.

Also, because of the requirement to maintain a balanced budget, the future budget approach is more certain to meet the revenue sufficiency criterion. Using a historical test year is less flexible than future budget in addressing prior years that have unusually high or low water sales. For the same reasons, the future budget approach presents less financial risk to the utility.

The historical test year may result in more predictable rates in the very short run. However, this advantage is mitigated if the City incorporates financial planning efforts to reduce the future impacts of O&M cost increases.

Preliminary Findings and Recommendations

The consulting team recommends the utility use the future budget to project O&M expenses. This recommendation should be reconsidered if AWU uses something other than the cash basis to determine revenue requirements.

The future budget approach is more consistent with the municipal nature of AWU's operations than the historical test year.

Issue 3: How should the rate of return be determined?

Overview of the Issue

When using either the utility basis or utility basis with cash residual method of determining revenue requirements, the utility must determine its rate of return. This process can be extremely controversial since the impact on non-owner customers and the utility can be significant.

Regulated utilities generally are required to determine the rate of return based on their weighted average cost of capital. This approach is designed to meet the unique needs of regulated utilities that are subject to economic regulation.[9] If economic or market conditions change, the rates charged by the utility may need adjustment to maintain an equitable value of the company's shares.

This issue is relevant only if the utility basis or utility basis with cash residual is chosen. If AWU uses the cash basis there is no need to determine a rate of return and this issue is irrelevant.

Description of Alternatives

Three alternatives are evaluated for determining the revenue requirements. These are:

- Weighted average cost of capital
- Indexed return
- Fixed return

The weighted average cost of capital is the typical approach used by regulated utilities. Under the weighted average cost of capital, the rate of return has two components. The first component is an allowance for debt. The return allowed for the allowance for debt is based on the effective interest rate on debt.[10] The second component is the return ascribed to equity. This return is calculated using sophisticated financial models that evaluate the relative risks associated with investing in an enterprise with comparable risks. The two components are weighted based on the percentage of the value of the utility provided by debt versus equity.

[9] Economic regulation is the approach used to ensure that investor-owned utilities earn a fair return but do not exploit their position as a natural monopolist. The standards for a fair rate of return commonly include the requirement that the utility earn profits at a rate comparable to other investors with similar risks and that the utility will attract sufficient capital to maintain its economic viability and value. These standards are less important to municipal utilities since municipal utilities do not have a requirement to maintain the price of their traded shares. Changing market and economic conditions can adversely affect consumers and/or shareholders and are generally reviewed when a regulated utility presents its rates for adjustment to its economic regulator.

[10] The effective interest rate on debt normally includes adjustments for the amortization of issuance costs and other similar expenses.

The indexed return is a simpler method commonly used by municipal utilities that do not have easily evaluated costs for equity. Under this simple approach, the utility adopts an index with an allowance for equity. For example, the utility may tie its rate of return to the return on a municipal bond index with an allowance of 200 basis points[11] to account for additional risk associated with equity. If the bond index had an effective return of 4.5 percent, the rate of return would be set at 6.5 percent (i.e., 4.5 percent plus 2.0 percent equals 6.5 percent.) If the return for the bond index dropped to 4.0 percent, the rate of return used by the utility would be reduced to 6.0 percent. Similarly, if the return for the bond index rose to 5.0 percent, the rate of return used by the utility would increase to 7 percent.

The last alternative is a fixed rate of return. A fixed rate of return is generally used when a utility provides service on a wholesale basis to another utility. Under a fixed rate of return, the utility sets its return when it establishes its agreement with its wholesale customer. This return is fixed for the term of the agreement.

Evaluation of Alternatives

This issue is only relevant if the utility uses a method of determining revenue requirements that relies on a rate of return. If the utility uses the cash basis, this issue is irrelevant.

The fixed return is most easily implemented and administered. This approach requires agreement at the time of contracting with a wholesale customer. The weighted average cost of capital tends to be complex and not well understood by the public. Also, both the weighted average cost of capital and the indexed return can present political acceptance problems if retail rates rise because of a general decline in interest rates or the cost of equity in the economy. Similarly, increases in interest rates or the cost of equity can result in increases in rates to wholesale customers that can appear to the public to be unrelated to the costs of providing the utility service. For these reasons, those approaches can seem unacceptable.

Equity concerns are not generally impacted by the approach to determining the rate of return. However, the use of the weighted average cost of capital and the indexed return are more commonly found in the industry than the fixed return. For that reason, we have rated those approaches more highly for industry standard.

For the customer category, only the rate shock/volatility differs for the alternatives. Because the fixed return is fixed, it provides less rate shock and volatility. Both the weighted average cost of capital and the indexed return change as market conditions change. This volatility in the rate of return will impact the rate of return, and therefore, the rates charged customers.

[11] A *basis point* is one one-hundredth of a percentage point. Therefore, 100 basis points equal 1 percent point.

The conservation criteria do not vary based on the alternative.

Because the fixed return has less volatility, it generally meets the financial criteria better than the other options. Depending on the index chosen, the volatility could be more or less than the weighted average cost of capital. Generally the weighted average cost of capital is less volatile than the indexed return because most utilities effective interest rate on debt does not vary much from year to year. But this general observation is not absolute. Given the assumptions on volatility, the indexed return fairs more poorly for the revenue stability, rate stability, rate predictability, and financial risk criteria.

Preliminary Findings and Recommendations

If the utility uses a revenue requirement method that includes a rate of return, the consultants recommend establishing a fixed rate of return. A fixed rate of return minimizes the volatility in revenue requirements and reduces the overall uncertainty for both owner and non-owner customers.

Issue 4: How should the rate base be valued?

Overview of the Issue

When using the utility basis or utility basis with cash residual, the utility must establish an approach to valuing the assets that serve its customers. During periods of high inflation, some utilities adopted an approach to value their fixed assets at reproduction costs rather than original costs. Under both alternatives, the value of the accumulated depreciation (at reproduction cost or original cost, as appropriate) is subtracted to provide the rate base.

These utilities restate their rate bases at reproduction costs to account for the impact that inflation has on the cost of replacing infrastructure. Generally as inflation rates declined during the 1980s, the interest in using reproduction costs for rate base also declined. Recent increases in the price for construction materials may prompt interest in this issue.

When the reproduction cost approach is used, the rate of return is generally reduced to exclude an inflationary component. This ensures the utility does not over collect as the cost of its rate base is restated due to inflation.

Description of Alternatives

Two alternatives are examined here. The first is the traditional original cost approach. Under the original cost approach, the rate base is set at the net book value of the assets that are used and useful in providing utility services. The net book value is determined by subtracting the accumulated depreciation from the original cost.[12]

[12] Other adjustments for contributed capital and construction work in progress are also included.

The second approach is to use the reproduction costs to determine the value of rate base. Under this approach, the reproduction costs would be net of accumulated depreciation (calculated at reproduction costs.) Also, the rate of return would be reduced to exclude an allowance for inflation. In other words, the rate of return would be a *real rate of return.*

Evaluation of Alternatives

For the implementation criteria, the original cost is preferred to the reproduction costs. The original cost approach is consistent with standard accounting techniques and does not require the estimation of the reproduction cost of the utility's fixed assets.

The original cost is likely more equitable to inside/outside customers since it more closely matches the utilities actual cost of service. Also, original cost more closely follows industry standards.

When considering the impact on customers, the reproduction cost may be more volatile and have greater rate shock if we experience periods of higher inflation. Otherwise we would not expect differences for the other customer criteria.

The conservation criteria do not vary based on these alternatives.

When considering the financial criteria, reproduction costs may provide greater revenue than original cost during periods of higher inflation. This greater revenue during periods of higher inflation would likely improve revenue sufficiency. The other financial criteria favor original cost since it is likely to be less volatile than the reproduction costs.

Preliminary Findings and Recommendations

If a determination of rate base is required, the consultants recommend the use of original cost to determine rate base.

Issue 5: How should construction work in progress be treated?

Overview of the Issue

Construction work in progress (CWIP) is the value of expenditures the utility has made in construction projects that have not been completed, and therefore, are not included as a fixed asset on the utility's books. Regardless of the status of booking the assets, the utility has carrying costs for these expenditures and the treatment of those carrying costs is the issue examined here.

Generally the carrying cost for CWIP is the interest expense (or interest earnings forgone) by having spent money on the project under construction. The longer the

construction period is the greater the carrying costs will be, and the more important this issue will be.

This issue is only important if the utility uses either the utility basis or the utility basis with cash residual method of determining revenue requirements.

Description of Alternatives

Two alternatives are available for treating CWIP in the utility's rate base. The first option is to capitalize the interest during construction and include the capitalized interest in the asset value. Under this approach, the utility recovers the carrying cost of the CWIP over the life of the asset and earns a return on the outstanding investment in the carrying costs.

The second approach is to include CWIP in the rate base and allow the utility to earn a rate of return on CWIP during the construction itself.

The difference between the two approaches is primarily one of timing of receipt of the carrying costs and the impact that timing has on inter-generational equity. Generally, capitalizing the carrying costs spreads the carrying costs to those future users that benefit from the asset but delays the recovery of the investment by the utility.

Evaluation of Alternatives

Of the two options in treating CWIP, the capitalized interest normally presents the least administrative burden since it normally conforms more closely with typical accounting practices that use *Allowance for Funds Used During Construction (AFUDC)* to add the carrying costs of CWIP to the asset value.[13] If CWIP is included in rate base, the utility may be required to maintain separate values of the assets net of the capitalized interest. This requirement may add to the administrative burden of including CWIP in rate base as compared to capitalizing the interest.

Public understanding and public and political acceptance may be enhanced by including CWIP in the rate base. This allows the utility to more quickly earn a return on the project and may help offset the cash flow requirements during construction. This is particularly important for complex construction projects that span significant amounts of time.

Because capitalized interest is a more common approach it is likely to have less risk of implementation. Both approaches are legally defensible.

From an equity perspective, the capitalized interest approach is better at meeting the inter-generational, inside/outside city, and industry standards criteria. It better addresses

[13] Typically when capitalizing an asset, utilities add the AFUDC and other costs (such as capitalized overhead) to the value of the asset being capitalized. This results in a value more closely related to the actual cost of placing the asset in service.

the intergenerational criterion since it allocates the carrying cost of the construction project over time to those that benefit from the project. Also, it generally protects the interest of non-owner customers better since the rates charged to them only include charges for assets that are used by them. This is especially important if the non-owner customer may terminate its relationship with the utility before the asset in question is fully depreciated. Capitalized interest is also more common in the industry than including CWIP in rate base.

The only customer criteria relevant to the issue of CWIP is the rate shock/volatility criterion. Including CWIP in rate base tends to increase the rate base more gradually than waiting until the project is complete before adding it to rate base. This more gradual introduction of the asset value into the rate base tends to reduce rate shock and volatility.

The conservation criteria do not vary based on these alternatives.

The financial criteria all tend to favor including CWIP in the utility's rate base. Including CWIP in rate base increases the cash flow during the construction phase of the project. This additional cash flow improves revenue sufficiency and stability. It also reduces financial risks.

Also, adding CWIP to the rate base as the construction progresses reduces the impact that completing the project has on rate base. This easing of the impact helps improve rate stability and rate predictability.

Preliminary Findings and Recommendations

The consultants recommend using the capitalize interest approach to treat CWIP in the rate base. This approach follows industry standards, provides greater inter-generational equity, and is consistent with most utility's fixed asset accounting policies.

A2908-080

City of Austin
Issue Paper# 1: Revenue Requirements

Attachment

A

Evaluations of Alternatives

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

2908-080 / POR

Evaluations Based on Average Ratings
Selection of Revenue Requirement Methodology

	Implementation				
Alternatives	Administrative Burden	Public Understanding	Political Acceptance	Risk of Implementation	Legal Defensibility
Cash Basis	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Utility Basis	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Utility Basis with Cash Residual	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Equity				
Alternatives	Interclass	Intraclass	Inter-generational	Inside/ Outside City	Industry Standards
Cash Basis	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Utility Basis	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Utility Basis with Cash Residual	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Customer				
Alternatives	Affordability	Economic Development	Rate Shock/ Volatility	Understand Bill	
Cash Basis	[redacted]	[redacted]	[redacted]	[redacted]	
Utility Basis	[redacted]	[redacted]	[redacted]	[redacted]	
Utility Basis with Cash Residual	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Conservation				
Alternatives	Average-Day Savings	Peak-Season Savings	Peak-Day Savings	Sustainability	
Cash Basis	[redacted]	[redacted]	[redacted]	[redacted]	
Utility Basis	[redacted]	[redacted]	[redacted]	[redacted]	
Utility Basis with Cash Residual	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Financial				
Alternatives	Revenue Sufficiency	Revenue Stability	Rate Stability	Rate Predictability	Financial Risk
Cash Basis	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Utility Basis	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Utility Basis with Cash Residual	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Alternatives	Weighted Average Score
Cash Basis	[redacted]
Utility Basis	[redacted]
Utility Basis with Cash Residual	[redacted]

Average Ratings
Selection of Revenue Requirement Methodology

	Implementation				
Alternatives	**Administrative Burden**	**Public Understanding**	**Public and Political Acceptance**	**Risk of Implementation**	**Legal Defensibility**
Cash Basis	9.3	8.0	8.0	9.3	8.0
Utility Basis	6.7	5.3	8.0	4.0	8.0
Utility Basis with Cash Residual	4.0	4.0	8.0	4.0	8.0
Rate from 0 to 10 (10 most preferred)	5.6	7.0	8.4	8.4	9.8

	Equity				
Alternatives	**Interclass**	**Intraclass**	**Inter-generational**	**Inside/ Outside City**	**Industry Standards**
Cash Basis	8.0	8.0	4.0	8.0	8.0
Utility Basis	8.0	8.0	6.7	8.0	8.0
Utility Basis with Cash Residual	8.0	8.0	5.3	8.0	8.0
Rate from 0 to 10 (10 most preferred)	8.4	8.4	5.6	8.4	5.6

	Customer				
Alternatives	**Affordability**	**Economic Development**	**Rate Shock/ Volatility**	**Understand Bill**	
Cash Basis	8.0	8.0	5.3	8.0	
Utility Basis	8.0	8.0	8.0	8.0	
Utility Basis with Cash Residual	8.0	8.0	6.7	8.0	
Rate from 0 to 10 (10 most preferred)	7.0	7.0	7.0	7.0	

	Conservation				
Alternatives	**Average-Day Savings**	**Peak-Season Savings**	**Peak-Day Savings**	**Sustainability**	
Cash Basis	8.0	8.0	8.0	8.0	
Utility Basis	8.0	8.0	8.0	8.0	
Utility Basis with Cash Residual	8.0	8.0	8.0	8.0	
Rate from 0 to 10 (10 most preferred)	5.6	7.0	9.8	7.0	

	Financial				
Alternatives	**Revenue Sufficiency**	**Revenue Stability**	**Rate Stability**	**Rate Predictability**	**Financial Risk**
Cash Basis	9.3	8.0	5.3	5.3	9.3
Utility Basis	5.3	8.0	8.0	8.0	5.3
Utility Basis with Cash Residual	8.0	8.0	6.7	6.7	6.7
Rate from 0 to 10 (10 most preferred)	5.6	8.4	7.0	7.0	9.8

Alternatives	**Weighted Average Score**
Cash Basis	1,319
Utility Basis	1,251
Utility Basis with Cash Residual	1,219

Evaluations Based on Average Ratings
Method of Projecting O&M Expenses

	Implementation				
Alternatives	Administrative Burden	Public Understanding	Political Acceptance	Risk of Implementation	Legal Defensibility
Historical Test Year	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Future Budget	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Equity				
Alternatives	Interclass	Intraclass	Inter-generational	Inside/ Outside City	Industry Standards
Historical Test Year	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Future Budget	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Customer				
Alternatives	Affordability	Economic Development	Rate Shock/ Volatility	Understand Bill	
Historical Test Year	[redacted]	[redacted]	[redacted]	[redacted]	
Future Budget	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Conservation				
Alternatives	Average-Day Savings	Peak-Season Savings	Peak-Day Savings	Sustainability	
Historical Test Year	[redacted]	[redacted]	[redacted]	[redacted]	
Future Budget	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Financial				
Alternatives	Revenue Sufficiency	Revenue Stability	Rate Stability	Rate Predictability	Financial Risk
Historical Test Year	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Future Budget	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Alternatives	Weighted Average Score
Historical Test Year	[redacted]
Future Budget	[redacted]

Average Ratings
Method of Projecting O&M Expenses

	Implementation				
Alternatives	**Administrative Burden**	**Public Understanding**	**Public and Political Acceptance**	**Risk of Implementation**	**Legal Defensibility**
Historical Test Year	5.9	5.9	7.4	5.9	7.4
Future Budget	8.8	8.8	7.4	8.8	7.4
Rate from 0 to 10 (10 most preferred)	5.6	7.0	8.4	8.4	9.8

	Equity				
Alternatives	**Interclass**	**Intraclass**	**Inter-generational**	**Inside/ Outside City**	**Industry Standards**
Historical Test Year	7.4	7.4	7.4	7.4	7.4
Future Budget	7.4	7.4	7.4	7.4	7.4
Rate from 0 to 10 (10 most preferred)	8.4	8.4	5.6	8.4	5.6

	Customer				
Alternatives	**Affordability**	**Economic Development**	**Rate Shock/ Volatility**	**Understand Bill**	
Historical Test Year	7.4	7.4	7.4	7.4	
Future Budget	7.4	7.4	7.4	7.4	
Rate from 0 to 10 (10 most preferred)	7.0	7.0	7.0	7.0	

	Conservation				
Alternatives	**Average-Day Savings**	**Peak-Season Savings**	**Peak-Day Savings**	**Sustainability**	
Historical Test Year	7.4	7.4	7.4	7.4	
Future Budget	7.4	7.4	7.4	7.4	
Rate from 0 to 10 (10 most preferred)	5.6	7.0	9.8	7.0	

	Financial				
Alternatives	**Revenue Sufficiency**	**Revenue Stability**	**Rate Stability**	**Rate Predictability**	**Financial Risk**
Historical Test Year	5.9	7.4	7.4	8.8	5.9
Future Budget	8.8	7.4	7.4	7.4	8.8
Rate from 0 to 10 (10 most preferred)	5.6	8.4	7.0	7.0	9.8

Alternatives	**Weighted Average Score**
Historical Test Year	1,208
Future Budget	1,304

Evaluations Based on Average Ratings
Determination of Rate of Return

	Implementation				
Alternatives	Administrative Burden	Public Understanding	Political Acceptance	Risk of Implementation	Legal Defensibility
Weighted Average Cost of Capital	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Indexed Return	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fixed Return	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Equity				
Alternatives	Interclass	Intraclass	Inter-generational	Inside/ Outside City	Industry Standards
Weighted Average Cost of Capital	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Indexed Return	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fixed Return	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Customer				
Alternatives	Affordability	Economic Development	Rate Shock/ Volatility	Understand Bill	
Weighted Average Cost of Capital	[redacted]	[redacted]	[redacted]	[redacted]	
Indexed Return	[redacted]	[redacted]	[redacted]	[redacted]	
Fixed Return	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Conservation				
Alternatives	Average-Day Savings	Peak-Season Savings	Peak-Day Savings	Sustainability	
Weighted Average Cost of Capital	[redacted]	[redacted]	[redacted]	[redacted]	
Indexed Return	[redacted]	[redacted]	[redacted]	[redacted]	
Fixed Return	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Financial				
Alternatives	Revenue Sufficiency	Revenue Stability	Rate Stability	Rate Predictability	Financial Risk
Weighted Average Cost of Capital	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Indexed Return	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Fixed Return	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Alternatives	Weighted Average Score
Weighted Average Cost of Capital	[redacted]
Indexed Return	[redacted]
Fixed Return	[redacted]

Average Ratings
Determination of Rate of Return

	Implementation				
Alternatives	Administrative Burden	Public Understanding	Public and Political Acceptance	Risk of Implementation	Legal Defensibility
Weighted Average Cost of Capital	4.4	5.9	7.4	7.4	7.4
Indexed Return	7.4	8.8	5.9	7.4	7.4
Fixed Return	8.8	8.8	8.8	7.4	7.4
Rate from 0 to 10 (10 most preferred)	5.6	7.0	8.4	8.4	9.8

	Equity				
Alternatives	Interclass	Intraclass	Inter-generational	Inside/ Outside City	Industry Standards
Weighted Average Cost of Capital	7.4	7.4	7.4	7.4	8.8
Indexed Return	7.4	7.4	7.4	7.4	8.8
Fixed Return	7.4	7.4	7.4	7.4	5.9
Rate from 0 to 10 (10 most preferred)	8.4	8.4	5.6	8.4	5.6

	Customer				
Alternatives	Affordability	Economic Development	Rate Shock/ Volatility	Understand Bill	
Weighted Average Cost of Capital	7.4	7.4	7.4	7.4	
Indexed Return	7.4	7.4	5.9	7.4	
Fixed Return	7.4	7.4	8.8	7.4	
Rate from 0 to 10 (10 most preferred)	7.0	7.0	7.0	7.0	

	Conservation				
Alternatives	Average-Day Savings	Peak-Season Savings	Peak-Day Savings	Sustainability	
Weighted Average Cost of Capital	7.4	7.4	7.4	7.4	
Indexed Return	7.4	7.4	7.4	7.4	
Fixed Return	7.4	7.4	7.4	7.4	
Rate from 0 to 10 (10 most preferred)	5.6	7.0	9.8	7.0	

	Financial				
Alternatives	Revenue Sufficiency	Revenue Stability	Rate Stability	Rate Predictability	Financial Risk
Weighted Average Cost of Capital	7.4	7.4	7.4	7.4	7.4
Indexed Return	7.4	5.9	5.9	5.9	5.9
Fixed Return	7.4	8.8	8.8	8.8	8.8
Rate from 0 to 10 (10 most preferred)	5.6	8.4	7.0	7.0	9.8

Alternatives	Weighted Average Score
Weighted Average Cost of Capital	1,234
Indexed Return	1,202
Fixed Return	1,333

Evaluations Based on Average Ratings
Approach to Value Rate Base

	Implementation				
Alternatives	Administrative Burden	Public Understanding	Political Acceptance	Risk of Implementation	Legal Defensibility
Original Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Reproduction Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Equity				
Alternatives	Interclass	Intraclass	Inter-generational	Inside/ Outside City	Industry Standards
Original Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Reproduction Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Customer				
Alternatives	Affordability	Economic Development	Rate Shock/ Volatility	Understand Bill	
Original Cost	[redacted]	[redacted]	[redacted]	[redacted]	
Reproduction Cost	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Conservation				
Alternatives	Average-Day Savings	Peak-Season Savings	Peak-Day Savings	Sustainability	
Original Cost	[redacted]	[redacted]	[redacted]	[redacted]	
Reproduction Cost	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Financial				
Alternatives	Revenue Sufficiency	Revenue Stability	Rate Stability	Rate Predictability	Financial Risk
Original Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Reproduction Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Alternatives	Weighted Average Score
Original Cost	[redacted]
Reproduction Cost	[redacted]

Average Ratings
Approach to Value Rate Base

	Implementation				
Alternatives	**Administrative Burden**	**Public Understanding**	**Public and Political Acceptance**	**Risk of Implementation**	**Legal Defensibility**
Original Cost	9.3	9.3	9.3	9.3	8.5
Reproduction Cost	4.6	4.6	4.6	4.6	6.2
Rate from 0 to 10 (10 most preferred)	5.6	7.0	8.4	8.4	9.8

	Equity				
Alternatives	**Interclass**	**Intraclass**	**Inter-generational**	**Inside/ Outside City**	**Industry Standards**
Original Cost	7.7	7.7	7.7	9.3	9.3
Reproduction Cost	7.7	7.7	7.7	4.6	4.6
Rate from 0 to 10 (10 most preferred)	8.4	8.4	5.6	8.4	5.6

	Customer				
Alternatives	**Affordability**	**Economic Development**	**Rate Shock/ Volatility**	**Understand Bill**	
Original Cost	7.7	7.7	7.7	7.7	
Reproduction Cost	7.7	7.7	6.2	7.7	
Rate from 0 to 10 (10 most preferred)	7.0	7.0	7.0	7.0	

	Conservation				
Alternatives	**Average-Day Savings**	**Peak-Season Savings**	**Peak-Day Savings**	**Sustainability**	
Original Cost	7.7	7.7	7.7	7.7	
Reproduction Cost	7.7	7.7	7.7	7.7	
Rate from 0 to 10 (10 most preferred)	5.6	7.0	9.8	7.0	

	Financial				
Alternatives	**Revenue Sufficiency**	**Revenue Stability**	**Rate Stability**	**Rate Predictability**	**Financial Risk**
Original Cost	7.7	7.7	7.7	7.7	7.7
Reproduction Cost	9.3	6.2	6.2	6.2	6.2
Rate from 0 to 10 (10 most preferred)	5.6	8.4	7.0	7.0	9.8

Alternatives	**Weighted Average Score**
Original Cost	1,391
Reproduction Cost	1,116

Evaluations Based on Average Ratings
Treatment of Construction Work In Progress

	Implementation				
Alternatives	Administrative Burden	Public Understanding	Political Acceptance	Risk of Implementation	Legal Defensibility
Capitalize Interest	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Include in Rate Base	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Equity				
Alternatives	Interclass	Intraclass	Inter-generational	Inside/ Outside City	Industry Standards
Capitalize Interest	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Include in Rate Base	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	Customer				
Alternatives	Affordability	Economic Development	Rate Shock/ Volatility	Understand Bill	
Capitalize Interest	[redacted]	[redacted]	[redacted]	[redacted]	
Include in Rate Base	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Conservation				
Alternatives	Average-Day Savings	Peak-Season Savings	Peak-Day Savings	Sustainability	
Capitalize Interest	[redacted]	[redacted]	[redacted]	[redacted]	
Include in Rate Base	[redacted]	[redacted]	[redacted]	[redacted]	
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	

	Financial				
Alternatives	Revenue Sufficiency	Revenue Stability	Rate Stability	Rate Predictability	Financial Risk
Capitalize Interest	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Include in Rate Base	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ratings	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Alternatives	Weighted Average Score
Capitalize Interest	[redacted]
Include in Rate Base	[redacted]