Appendix A
Sources and Data

Stand-Alone Municipalities					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	NOTES
Andover	C	C	C	C	
Anoka	C	C	C	C	
Apple Valley	C	C	C	C	
Arden Hills	C	C	I	I	
Bayport	C	C	C	I	
Belle Plaine	C	C	C	I	
Blaine	C	C	C	C	
Bloomington	C	C	C	C	
Brooklyn Center	C	C	C	C	
Brooklyn Park	C	C	C	C	
Burnsville	C	C	C	C	
Carver	C	C	C	C	
Centerville	C	C	C	C	
Champlin	C	C	C	C	
Chanhassen	C	C	C	C	
Chaska	C	C	C	C	
Circle Pines	C	C	C	C	
Cologne	C	C	C	C	
Columbus	C	I	C	C	
Coon Rapids	C	C	C	C	
Corcoran	C	I	I	I	
Cottage Grove	C	C	C	I	
Dayton (pt-hennepin)	C	C	C	C	
Eagan	C	C	C	C	
East Bethel	C	C	P	I	Monthly Usage Analysis only includes MPARS data for 2014 and 2015
Eden Prairie	C	C	C	C	
Edina	C	C	C	C	
Elko New Market	C	C	C	C	
Empire Township	C	C	C	C	
Excelsior	C	C	C	C	
Farmington	C	C	C	C	
Forest Lake	C	C	C	C	
Fridley	C	C	C	C	
Greenfield	C	C	C	C	

Stand-Alone Municipalities					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	NOTES
Hamburg	C	C	C	C	
Hampton	C	C	C	I	
Hastings	C	C	C	C	
Hopkins	C	C	C	C	
Hugo	C	C	C	C	
Inver Grove Heights	C	C	C	C	
Jordan	C	C	C	C	
Lake Elmo	C	C	C	C	
Lakeville	C	C	C	C	
Lexington	C	C	I	C	
Lino Lakes	C	C	C	C	
Long Lake	C	C	C	C	
Loretto	C	C	C	C	
Maple Plain	C	C	C	C	
Marine on St. Croix	C	I	P	P	Monthly Usage Analysis only includes MPARS data from 2009-2015, Number of Connections and Volumes Analysis includes MPARS data for 2003, 2005, 2013-2015
Mayer	C	C	C	C	
Medina	C	C	C	C	
Minnetonka Beach	C	C	C	C	
Minnetrista	C	C	C	C	
Mound	C	C	C	C	
Mounds View	C	C	C	C	
New Brighton	C	C	C	C	
New Germany	C	C	C	C	
New Trier	C	C	C	I	
Norwood Young America	C	C	C	C	
Oak Grove	C	C	C	I	
Oak Park Heights	C	C	C	C	
Orono	C	C	C	C	
Plymouth	C	C	C	C	
Prior Lake	C	C	C	C	
Ramsey	C	C	C	C	

Stand-Alone Municipalities					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	NOTES
Randolph	C	C	C	C	
Richfield	C	C	C	C	
Robbinsdale	C	C	C	C	
Rogers	C	C	C	C	
Rosemount	C	C	C	C	
Savage	C	C	C	C	
Shakopee	C	C	C	C	
Shoreview	C	C	C	C	
Spring Lake Park	C	C	C	C	
Spring Park	C	C	C	C	
St. Anthony	C	C	C	C	
St. Bonifacius	C	C	C	C	
St. Francis	C	C	C	C	
St. Louis Park	C	C	C	C	
St. Paul Park	C	C	C	C	
Stillwater	C	C	C	C	
Tonka Bay	C	C	C	C	
Vadnais Heights	C	C	C	C	
Vermillion	C	C	C	C	
Victoria	C	C	C	C	
Waconia	C	C	C	C	
Watertown	C	C	C	C	
Wayzata	C	C	C	C	

No Municipal Water Supply					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	Notes
Afton	NA	NA	NA	NA	
Baytown Township	NA	NA	NA	NA	
Belle Plaine Township	NA	NA	NA	NA	
Benton Township	NA	NA	NA	NA	
Bethel	NA	NA	NA	NA	
Blakeley Township	NA	NA	NA	NA	

No Municipal Water Supply					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	Notes
Camden Township	NA	NA	NA	NA	
Castle Rock Township	NA	NA	NA	NA	
Cedar Lake Township	NA	NA	NA	NA	
Coates	NA	NA	NA	NA	
Credit River Township	NA	NA	NA	NA	
Dahlgren Township	NA	NA	NA	NA	
Dellwood	NA	NA	NA	NA	
Denmark Township	NA	NA	NA	NA	
Douglas Township	NA	NA	NA	NA	
Eureka Township	NA	NA	NA	NA	
Gem Lake	NA	NA	NA	NA	
Grant	NA	NA	NA	NA	
Greenvale Township	NA	NA	NA	NA	
Greenwood	NA	NA	NA	NA	
Grey Cloud Island Township	NA	NA	NA	NA	
Ham Lake	NA	NA	NA	NA	
Hampton Township	NA	NA	NA	NA	
Hancock Township	NA	NA	NA	NA	
Helena Township	NA	NA	NA	NA	
Hollywood Township	NA	NA	NA	NA	
Independence	NA	NA	NA	NA	
Jackson Township	NA	NA	NA	NA	
Laketown Township	NA	NA	NA	NA	
Linwood Township	NA	NA	NA	NA	
Louisville Township	NA	NA	NA	NA	

No Municipal Water Supply					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	Notes
Marshan Township	NA	NA	NA	NA	
May Township	NA	NA	NA	NA	
Medicine Lake	NA	NA	NA	NA	
Miesville	NA	NA	NA	NA	
New Market Township	NA	NA	NA	NA	
Nininger Township	NA	NA	NA	NA	
Nowthen	NA	NA	NA	NA	
Pine Springs	NA	NA	NA	NA	
Randolph Township	NA	NA	NA	NA	
Ravenna Township	NA	NA	NA	NA	
San Francisco Township	NA	NA	NA	NA	
Sand Creek Township	NA	NA	NA	NA	
Scandia	NA	NA	NA	NA	
Sciota Township	NA	NA	NA	NA	
Spring Lake Township	NA	NA	NA	NA	
St. Lawrence Township	NA	NA	NA	NA	
St. Marys Point	NA	NA	NA	NA	
Stillwater Township	NA	NA	NA	NA	
Vermillion Township	NA	NA	NA	NA	
Waconia Township	NA	NA	NA	NA	
Waterford Township	NA	NA	NA	NA	
Watertown Township	NA	NA	NA	NA	
West Lakeland Township	NA	NA	NA	NA	
Young America Township	NA	NA	NA	NA	

Purchases Water From Another Municipality					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	Notes
Birchwood Village	C	C	I	I	
Columbia Heights	C	C	I	I	
Crystal	C	C	I	I	
Deephaven (Minetonaka)	C	I	P	I	Monthly Usage Analysis MPARS data does not include 2013-2016
Deephaven (Shorewood)	C	--	--	--	Deephaven (Minnetonka) and Deephaven (Shorewood) were considered one municipality for the Water Treatment Plant Characteriestics Analysis, Monthly Usage Analysis, and Number of Connections and Volumes Analysis
Falcon Heights	C	I	I	I	
Fort Snelling	I	I	I	I	
Golden Valley	C	C	I	I	
Hilltop	C	C	I	I	
Lakeland Shores	C	I	I	I	
Lake St. Croix Beach	I	I	I	I	
Landfall	I	I	I	I	
Lauderdale	C	I	I	I	
Lilydale	C	I	I	I	
Little Canada	C	C	I	I	
Maplewood	C	I	I	I	
Mendota	C	I	I	I	
Mendota Heights	C	I	I	I	
New Hope	C	C	I	I	
Newport	C	C	C	C	
North Oaks	I	I	I	I	
Osseo	C	C	P	I	Monthly Usage Analysis MPARS data does not include 2013-2016
Roseville	C	C	I	I	
South St. Paul	C	C	C	C	
Sunfish Lake	C	I	I	I	
West St. Paul	C	I	I	I	

Purchases Water From Another Municipality					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	Notes
Willernie	I	C	I	I	
Woodland	C	I	I	I	

Sells Water From Another Municipality					
Municipal Utility	Billing Rates and Rates Structures Data	Water Treatment Plant Characteristics	MPARS Monthly Usage	MPARS - Number of Connections and Volumes	Notes
Lakeland	C	C	C	C	
Mahtomedi	C	C	C	C	
Maple Grove	C	C	C	C	
Minneapolis	C	C	C	C	
Minnetonka	C	C	C	C	
North St. Paul	C	C	C	C	
Oakdale	C	C	C	C	
Shorewood	C	C	C	C	
St. Paul	C	C	P	C	Monthly Usage Analysis does not include 2013-2016 data.
White Bear Lake	C	C	C	C	
White Bear Township	C	C	C	C	
Woodbury	C	C	C	C	

C = Complete Data

P = Partial Data

I = Incomplete Data

Appendix B
Water Conservation Programs

City Water Conservation Programs

City	2016 Municipal Residential Water Conservation Program (Y/N)	2016 Program Description	Link	Program Type	2014 Program (Y/N)	2014 Program Description
Andover	No				No	N/A
Anoka	Yes	Anoka is offering rebate programs for residential customers on Energy Star efficient appliances. Customers who purchase and install Energy Star rated clothes washers and dishwashers (and other energy saving appliances) may qualify for a $25 rebate.	http://www.anokaelectric.govoffice3.com/index.asp?Type=B_BASIC&SEC={016973E4-8F48-44F8-846C-C4EA4CA5C71D}	Rebate	No	N/A
Apple Valley	No		http://www.ci.apple-valley.mn.us/documentcenter/view/455	No	No	N/A
Arden Hills	No				No	N/A
Bayport	No				No	N/A
Belle Plaine	No				No	N/A
Birchwood Village	No		http://www.cityofbirchwood.com/index.asp?SEC=AC00C6B3-D19C-4BE3-A6AA-06E7482AFA0C&Type=B_BASIC		No	N/A
Blaine	No		http://www.ci.blaine.mn.us/index.cfm?id=900429#.V_PcavkrLRY		No	N/A
Bloomington	No		https://www.bloomingtonmn.gov/tips-conserving-water		No	N/A
Brooklyn Center	No		http://www.cityofbrooklyncenter.org/index.aspx?NID=572		No	N/A
Brooklyn Park	Yes	Certain residents who qualify can get a $50 rebate for installing a newer and more efficient Energy Star labeled clothes washer or WaterSense toilet and $25 for installing a newer and more efficient WaterSense irrigation system controller.	http://www.brooklynpark.org/city-government/public-works/water-efficiency-rebate/	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
Burnsville	No		http://www.ci.burnsville.mn.us/index.aspx?NID=403		No	N/A
Carver	No				No	N/A
Centerville	No				No	N/A
Champlin	No				No	N/A
Chanhassen	Yes	Chanhassen is offering many rebates and opportunities take action towards conserving their water. They are offering free irrigation audits for residents who qualify, up to $50 rebates on Energy Star certified clothes washer machines, and landscape rebates to any resident, organization or business who replaces a minimum of 200 square feet of irrigated/watered lawn or landscape with a WaterWise landscape. In addition to those programs, Chanhassen residents who replace existing irrigation controllers with WaterSense labeled, weather-based Irrigation Controllers qualify for rebates up to $250 and there are $5-off coupons for Rain Barrels available to residents.	http://www.ci.chanhassen.mn.us/index.aspx?NID=410	Irrigation Audit, Rebates Met Council Water Efficiency Grant Recipient	Yes	WaterWise Water conservation program, irrigation audit program
Chaska	No				No	N/A
Circle Pines	Yes	Qualified activities for rebates can include; toilet replacements, residential clothes washing machine replacements, irrigation system audits that result in irrigation system controller replacements, and irrigation system controller replacements only.	http://www.centennialutilities.com/index.asp?SEC=0DBF443D-192A-4568-B60F-00D2ADF7B1A3&Type=B_BASIC	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
Cologne	No				No	N/A
Columbia Heights	No				No	N/A
Columbus	No				No	N/A
Coon Rapids	Yes	Pilot program installed irrigation sensors for 10 households in 2016. Free water conservation kits available through Minnesota Energy Resources.	http://www.knowtheflow.us/category/cities/coon-rapids/		No	N/A
Cottage Grove	Yes	Qualified activities for rebates can include; toilet replacements, residential clothes washing machine replacements, irrigation system audits that result in irrigation system controller replacements, and irrigation system controller replacements only.	http://www.cottage-grove.org/environment/water-conservation	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
Crystal	No				No	N/A
Dayton (pt-hennepin)	No				No	N/A
Deephaven (Minnetonka)	No				No	N/A
Deephaven (Shorewood)	No				No	N/A
Eagan	Yes	The city of Eagan is offering $100 rebates to 625 residents who replace existing washing machines with new Energy Star certified washing machines. Free water conservation kits available through Minnesota Energy Resources.	http://www.ci.eagan.mn.us/index.php/public-works-department/utilities/washer-rebate	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
East Bethel	No				No	N/A
Eden Prairie	Yes	There are 6 rebate programs that give Eden Prairie residents opportunities to save money while being more efficient. Eden Prairie will cover 50% of the pre-tax cost, up to $100, of a new EnergyStar clothes washer, 50% of the pre-tax cost, up to $50, of WaterSense labeled faucets or showerheads, and up to 50% of the direct costs up to $1,500 for several different landscape rebates. Eden Prairie will also cover a portion of the costs on irrigation controllers, and on the replacement, repair or audits of irrigation systems. Lastly, they will cover 50% of the pre-tax costs, up to $1,500, on pervious payment projects and 50% of the pre-tax costs up to $50, on replacing old toilets with WaterSense labeled toilets.	http://www.edenprairie.org/community/living-green/water-conservation-rebate-programs	Irrigation Audit, Rebates Met Council Water Efficiency Grant Recipient	Yes	Rebates for toilets, clothes washers, faucets, showerheads, irrigation systems, landscaping, pervious pavement
Edina	No	Free water conservation kits available through Minnesota Energy Resources.	http://edinamn.gov/?section=protect_our_water		Yes	Financing for installation of energy and water efficient products
Elko New Market	No				No	N/A
Empire Township	No		http://www.township.empire.mn.us/index.asp?Type=B_BASIC&SEC=%7B79E1A849-DC17-4B52-9A42-9A90F5DC6FB8%7D		No	N/A
Excelsior	No		http://www.ci.excelsior.mn.us/index.aspx?NID=149		No	N/A
Falcon Heights	No				No	N/A
Farmington	No				No	N/A
Forest Lake	Yes	Forest Lake residents have the opportunity to qualify for a $150 rebate on washing machines and $100 rebate on toilets by replacing the current appliances with Energy Star and WaterSense labeled ones.	http://www.ci.forest-lake.mn.us/244/Water-Conservation-Rebate	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
Fort Snelling (unorg.)	No				No	N/A

City Water Conservation Programs

City	2016 Municipal Residential Water Conservation Program (Y/N)	2016 Program Description	Link	Program Type	2014 Program (Y/N)	2014 Program Description
Fridley	Yes	Rebates on toilets, washing machines and irrigation controllers or audits are available to Fridley residents. The city will cover 50% of the replacement costs up to $200, $150 and $200 respectively.	https://fridleymn.gov/watergrant	Irrigation Audit, Rebates Met Council Water Efficiency Grant Recipient	No	N/A
Golden Valley	No				No	N/A
Greenfield	No				No	N/A
Hamburg	No				No	N/A
Hampton	No				No	N/A
Hastings	No				No	N/A
Hilltop	No				No	N/A
Hopkins	No		http://www.hopkinsmn.com/residents/environment/savewater.php		No	N/A
Hugo	Yes	Qualified residents in Hugo can receive rebates up to 100% of the costs of replacing old toilets, washers, and irrigation systems with WaterSense or Energy Star labeled appliances and systems, up to a maximum of $100, $150, and $200 respectively. Rebates on the irrigation systems include audits, irrigation controllers and/or replacement irrigation heads.	http://www.ci.hugo.mn.us/index.asp?SEC=28A1A24C-74D4-4804-AC84-8B801A741125&Type=B_BASIC	Irrigation Audit, Rebates Met Council Water Efficiency Grant Recipient	Yes	Irrigation inspections, landscape allowances, water audits of city property, rebate program for replacing old fixtures
Inver Grove Heights	No				No	N/A
Jordan	No		http://jordanmn.gov/notices/water-conservation/		No	N/A
Lake Elmo	No		http://www.lakeelmo.org/protect-irrigation-system-reduce-water.html		No	N/A
Lake St. Croix Beach	No				No	N/A
Lakeland	Yes	Free evaluation of landscape and irrigation systems. Includes water conservation kit, rain sensor, and assistance with irrigation timer.	http://www.lakelandgov.net/water/conservation/irrigation-systems		No	N/A
Lakeland Shores	No				No	N/A
Lakeville	No		http://www.ci.lakeville.mn.us/274/Water-Conservation		No	N/A
Landfall	No				No	N/A
Lauderdale	No				No	N/A
Lexington	No				Yes	Provides educational materials, and replacement incentives
Lilydale	No				No	N/A
Lino Lakes	No				No	N/A
Little Canada	No				No	N/A
Long Lake	No				No	N/A
Loretto	No				No	N/A
Mahtomedi	Yes	Mahtomedi is offering $50 rebates for residents who replace washing machines and toilets. All new washing machines need to be Energy Star labeled, while all toilets need to be WaterSense labeled and use 1.28 gallons per flush.	http://www.ci.mahtomedi.mn.us/index.asp?Type=B_PR&SEC={6B0E4A8E-F89C-458E-B0DD-92FD947086C9}&DE={2A245409-77F0-4382-8589-D8A40EF9CAB7}	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
Maple Grove	Yes	Maple Grove is offering water conservation kits to all residents at no charge. Kits allow residents to install items to help make faucets and toilets more efficient and conserve water.	http://www.maplegrovemn.gov/departments/public-works/watersewer-utilities/water-conservation-kits	Assistance	Yes	Free conservation kits
Maplewood	No				No	N/A
Maple Plain	No				Yes	Provides educational materials
Marine on St. Croix	No				No	N/A
Mayer	No				No	N/A
Medina	No				No	N/A
Mendota	No				No	N/A
Mendota Heights	No				No	N/A
Minneapolis	No		http://www.minneapolismn.gov/utilitybilling/utility-billing_saving		No	N/A
Minnetonka	No	Free water conservation kits available through Minnesota Energy Resources.			Yes	Fall open house and eco fair events
Minnetonka Beach	No				No	N/A
Minnetrista	No				No	N/A
Mound	No				No	N/A
Mounds View	No				No	N/A
New Brighton	Yes	Qualified activities for rebates can include; toilet replacements, residential clothes washing machine replacements, irrigation system audits that result in irrigation system controller replacements, and irrigation system controller replacements only.	http://www.ci.new-brighton.mn.us/index.asp?SEC=48B1E2BA-2368-4024-8FC1-BF4A9A4809DA&DE=81A9F231-7BD5-4C2C-8A49-1C791E902E67&Type=B_BASIC	Rebates Met Council Water Efficiency Grant Recipient	No	N/A
New Germany	No				No	N/A
New Hope	No				No	N/A
New Trier	No				No	N/A
Newport	Yes	Rebates on toilets, washing machines and irrigation controllers are available to Newport residents. The city will cover 50% of the costs up to $100, $50 and $100 respectively on replacing old appliances and systems with Energy Star and WaterSense labeled ones.	http://www.ci.newport.mn.us/WaterConservationRebate.php	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
North Oaks	No				No	N/A
North St. Paul	Yes	North St. Paul's 2016 Appliance & Recycling Bonus Rebate program allows residential customers receiving electric service from a local municipal electric utility that is a participating member of the MMPA to apply for a $25 rebate on Energy Star certified Dish and clothes washers.	http://www.northstpaul.org/vertical/sites/%7B5F63881B-2F96-4032-818C-7F4AD3529485%7D/uploads/2016_Appliance_and_Recycle.pdf	Rebate	No	N/A
Norwood Young America	No		http://www.cityofnya.com/city-departments/public-utilities/		No	N/A
Oak Grove	No				No	N/A
Oak Park Heights	No		http://www.cityofoakparkheights.com/index.asp?SEC=55E630E3-5B17-4E4F-B420-D0386E52BB46		No	N/A
Oakdale	No		http://www.ci.oakdale.mn.us/vertical/Sites/%7B9D2ABE6F-4847-480E-9780-B9885C59543F%7D/uploads/Flyer-conservewater.pdf		No	N/A
Orono	No				No	N/A
Osseo	No				No	N/A

City Water Conservation Programs

City	2016 Municipal Residential Water Conservation Program (Y/N)	2016 Program Description	Link	Program Type	2014 Program (Y/N)	2014 Program Description
Plymouth	Yes	Residents and commercial property owners in Plymouth may qualify for a rebate on replacing old, inefficient toilets, washing machines and irrigation controllers. The city may cover 75% of the costs of a new Energy Star or WaterSense labeled device, up to $50, $100 and $200 respectively. Free water conservation kits available through Minnesota Energy Resources.	http://www.ci.plymouth.mn.us/index.aspx?page=850	Rebate Met Council Water Efficiency Grant Recipient	No	Grant program for native lawns, rain gardens, moisture sensors
Prior Lake	No		http://www.cityofpriorlake.com/documents/sprinkingtips.pdf		No	N/A
Ramsey	No				No	N/A
Randolph	No				No	N/A
Richfield	No		http://www.cityofrichfield.org/departments/public-works/utilities/water-conservation		No	N/A
Robbinsdale	No		http://www.robbinsdalemn.com/home/showdocument?id=362		No	N/A
Rogers	No				No	N/A
Rosemount	Yes	Rebates on toilets, washing machines and irrigation controllers are available to residential water customers in Rosemount. The city will cover 50% of the costs on replacing old appliances with Energy Star or WaterSense labeled ones up to $50, $150 and $150 respectively.	http://www.ci.rosemount.mn.us/index.aspx?nid=272	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
Roseville	No		http://www.cityofroseville.com/2021/Water-Conservation		No	N/A
Savage	Yes	Free water conservation kits available through Minnesota Energy Resources.	http://www.cityofsavage.com/wise-water-use#other-tips		No	N/A
Shakopee	Yes	Qualified activities for rebates can include; toilet replacements, residential clothes washing machine replacements, irrigation system audits that result in irrigation system controller replacements, and irrigation system controller replacements only.	http://spucweb.com/	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
Shoreview	Yes	Shoreview is offering Home Water Reports to all residents free of charge. Customers can receive paper or e-mail reports that deliver individualized water consumption information and water saving tips to each resident. Studies show that households who receive reports reduce their water consumption by 3-5% because they know directly where they are being the least efficient.	http://www.shoreviewmn.gov/services/shoreview-water-conservation-program	Audit	No	N/A
Shorewood	No				No	N/A
South St. Paul	No				No	N/A
Spring Lake Park	No				No	N/A
Spring Park	No				No	N/A
St. Anthony	No		http://www.ci.saint-anthony.mn.us/index.asp?Type=B_BASIC&SEC=%7BA9B27699-41F5-4766-BDAB-8E30D574B77B%7D		No	N/A
St. Bonifacius	No				No	N/A
St. Francis	No		http://stfrancismn.org/public-works/water/		No	N/A
St. Louis Park	No		https://www.stlouispark.org/public-works-programs-services/water-information.html		No	N/A
St. Paul	No		https://www.stpaul.gov/departments/water-services/water-conservation		No	N/A
St. Paul Park	No		http://www.stpaulpark.govoffice.com/index.asp?SEC=BF35FD21-12D8-4FD2-83FB-461CAB752EF8&Type=B_BASIC		No	N/A
Stillwater	No				No	N/A
Sunfish Lake	No				No	N/A
Tonka Bay	No				No	N/A
Vadnais Heights	No				No	N/A
Vermillion	No				No	N/A
Victoria	Yes	Victoria is offering rebates on dish and clothes washers, toilet, showerheads and faucets for residents. The rebates are $100 for Energy Star certified dish and clothes washers and $50 for WaterSense labeled toilets, showerheads and faucets.	http://www.ci.victoria.mn.us/index.aspx?nid=146	Rebate Met Council Water Efficiency Grant Recipient	Yes	Rebates for energy efficient appliances
Waconia	No		http://www.waconia.org/221/Utility-Billing		No	N/A
Watertown	No				No	N/A
Wayzata	No		http://www.wayzata.org/338/Water-Conservation		No	N/A
West St. Paul	No				No	N/A
White Bear Lake	Yes	Qualified activities for rebates can include; toilet replacements, residential clothes washing machine replacements, irrigation system audits that result in irrigation system controller replacements, and irrigation system controller replacements only.	http://www.whitebearlake.org/index.asp?Type=B_PR&SEC={56C10AAB-AABE-4396-9B9E-4B7D756033D6}&DE={17363B5F-3593-465E-8FA3-1C7C69C3E244}	Irrigation Audits, Rebates Met Council Water Efficiency Grant Recipient	No	N/A
White Bear Township	Yes	Rebates on toilets, washing machines and irrigation controllers are available to residential water customers in White Bear Township. The township will cover 100% of the pre-tax costs on replacing old appliances with Energy Star or WaterSense labeled ones up to $200, $150 and $200 respectively.	http://www.ci.white-bear-township.mn.us/165/Water-Efficiency-Rebate-Program	Rebate Met Council Water Efficiency Grant Recipient	No	N/A
Willernie	No				No	N/A
Woodbury	Yes	Woodbury is a community who received intern help through the MnTAP program. Interns, at no cost to the city, helped perform irrigation audits in order to help come up with specific solutions like replacing clock-based irrigation controllers with evapotranspiration controllers or installing pressure regulators. Qualified activities for rebates can include; toilet replacements, residential clothes washing machine replacements, irrigation system audits that result in irrigation system controller replacements, and irrigation system controller replacements only.	http://mntap.umn.edu/intern/pdf/City%20of%20Woodbury%20Executive%20Summary.pdf	Irrigation Audits, Rebates Met Council Water Efficiency Grant Recipient MNTAP Grant Recipient	No	N/A
Woodland	No				No	N/A

Energy Company Programs

Organization	Program Type	Program Description	Link
Xcel Energy	Assistance	HomeSmart Appliance Repair & Replacement program is available through Xcel Energy to anyone in Minnesota. They have the opportunity to sign up for a plan that will give them the access to have quick and efficient repairs and replacement plan opportunities to help offset costs to many of their appliances including kitchen and laundry appliances. This will help keep appliances like dish and clothes washers more efficient and not wasting as much water.	https://www.xcelenergy.com/programs_and_rebates/residential_programs_and_rebates/equipment_and_appliances/homesmart_appliance_repair_and_replacement
Neighborhood Energy Connections	Rebate	Home Performance with Energy Star allows Xcel Energy customers who pay for Audit and make at least five energy improvements (two of the options are replacing clothes and dish washing machines) capable to schedule a free NEC inspection and then they will submit rebate paperwork to Xcel for the customer. Rebates for replacing appliance with Energy Star dishwasher is $15 and Energy Star clothes washer is $50.	http://thenec.org/rebates/home-performance-with-energy-star
Center Point Energy	Assistance	Center Point Energy is offering up to 3 free low flow showerheads and 3 free faucet aerators to all of their residential customers.	http://www.centerpointenergy.com/en-us/residential/save-energy-money/efficiency-programs-rebates/low-flow-showerheads-faucet-aerators?sa=mn
Minnesota Energy Resources	Rebate, Assistance	All Minnesota Energy Resources customers whose water heater is fueled by natural gas qualify for an appliance rebate for their dish and clothes washer. Replacing older dish and clothes washers with Energy Star certified ones can qualify customers for a $30 or $45 rebate respectively. Also available to those same customers is free water conservation kits which can include low-flow showerheads, kitchen and bathroom faucet aerators. Minnesota Energy Resources' coverage is throughout the state but covers metropolitan area south of Minneapolis, including Rosemount.	http://www.minnesotaenergyresources.com/home/appliance_rebates.aspx http://www.minnesotaenergyresources.com/home/water_conservation.aspx

MNTAP Recipients

Company	Location	Year	Actions
CSM Bakery Products	Eagan	2013	Implement water conservation program Replace had washing faucet with low flow model Replace hose nozzles with low flow model Change operational procedures in kettle room
Federal Cartridge Company	Anoka	2013	Installed timed rinse faucets Installed wash tub spray nozzles Implemented recycling of effluent for sand filter cleaning Installed automatic shut-off valves Installed chiller to recycle water from environmental test chamber condenser unit
Gedney Foods Company	Chaska	2013	Implemented reuse of excess water from steam pasteurizer Implemented reuse of fermentation tank brine Reduced fermentation and salt storage levels Reduced salt storage Fixed water leaks
Northern Star Company	Chaska	2013	Lowered water level and potato washer Replaced float in basket washer Reduced peeler exhaust spray time Replaced leaking solenoid Implemented reuse of reverse osmosis reject water Implemented reuse of scrubber water Installed auto-fill valves on pump tanks Optimized water levels in surge bin
Tennant Company	Golden Valley	2013	Improve efficiency of Reverse Osmosis water treatment.
ECO Finishing	Fridley	2014 and 2015	Install conductivey control on water rinse systems Recycle water from final rinse cycle
GE Power and Water Technologies	Minnetonka	2014	Installed metering valves and flow meters Installed solenoid valve with interlock mechanism Installed thermocouple on gear box
Gerdau	St. Paul	2014	Change water as coolant for compressors to air as coolant.
TEL FSI			
City of Woodbury	Woodbury	2015 and 2016	Conducted irrigation system water audits Installed pressure regulators and evapotranspiration controllers
Lloyd's BBQ	Mendota Heights	2015	Optimized lawn irrigation Installed wash tank temperature regulator Optimized hot water pump Implemented employee training on solid waste management
Sanimax	South St. Paul	2015	Installed coolers on condensate pumps Installed radiators on coolers Repaired process leaks and compressed air leaks Optimized cooker cooling water Installed water shut-off valves and nozzles Repaired compressed air leaks
Xcel Energy Riverside	Minneapolis	2105 and 2016	Recovered condensate from heating systems Increased recovery from reverse osmosis systems Recovered water from sampling system Optimized air intake evaporative cooling
Anoka Hennepin Independent School District	Fridley	2016	Researched irrigation system water conservation Identified non-essential irrigation areas Located areas that were over-watered Recommended aeration Trained employees to manually control irrigation after rainfall
Cemstone	Mendota Heights	2016	Reduced water usage in production, truck washout, and water reuse systems Performed water balance on system Identified areas to reduce water use in the filling of the tank and cleaning of the truck Recommended a best practices document and incentives for proper site cleaning of trucks Recommended automatic shut-off on tank filling hose Evaluated the potential to re-use weir water in concrete production
Hennepin County Medical Center	Minneapolis	2016	Investigated water reductions in distribution, washing, sterilizing, and building processes Documented water use by building Determined highest areas of water consumption Recommended the hospital update sinks and toilets to low flow Recommended replacing aging structures Evaluated the discharge temperature requirements Evaluated re-use of reverse osmosis reject water
R&D Systems	Minneapolis	2016	Identified water reductions for water system and water cooled freeze dryers Reduced purge stream flow to conserve water while maintaining function Increased reverse osmosis membrane life before replacement Recommended increasing freezer temperatures to reduce energy use and increase freezer lifetime
TEL FSI	Chaska	2014 and 2016	Researched water conservation and reuse Decommissioned one piece of equipment to reduce water usage Recommended installing water flow monitors Checked system for gas leakages Sorted and classified trash Recommended composting, additional recycling of plastic, and garment recycling

Appendix C
Twin Cities Water Utility Database Structure

Twin Cities Water Utility Database Structure

Monthly Usage Field	Monthly Usage Data Type
CTU ID	Number
ID	Number
COUNTY_ID	Number
Permit Number	Number
PERMITTEE	Short Text
RESOURCETYPE_ID	Number
Year	Short Text
January	Number
February	Number
March	Number
April	Number
May	Number
June	Number
July	Number
August	Number
September	Number
October	Number
November	Number
December	Number
INSTALLATION_TOTAL	Number
USE_ID	Number
Number of Connections Field Name	Number of Connections Data Type
CTU ID	Number
ID	Number
PERMIT_NUM	Short Text
Permittee Name	Short Text
YEAR	Number
POP	Number
RES	Number
RES_CONN	Number
RES_MET	Number
F10	Short Text
F11	Short Text
COMM	Number
COMM_CONN	Number
COMM_MET	Number
IND	Number
IND_CONN	Number
IND_MET	Number
AG	Number
AG_CONN	Number
AG_MET	Number
OTH	Number
OTH_CONN	Number
OTH_MET	Number
TOT_SOLD	Number

Twin Cities Water Utility Database Structure

F25	Short Text
F26	Short Text
TOT_APPR	Number
F28	Short Text
RATES	Number
NOTES	Short Text
MAX_DAY_VOL	Short Text
MAX_VOL_DATE	Short Text
F33	Short Text
F34	Short Text
Utility Rates Field Name	Utility Rates Data Type
ID1	AutoNumber
Utility	Short Text
ID	Number
Permit Number	Short Text
Permit Number – 2	Short Text
CTU ID	Number
Effective Date – Month	Short Text
Effective Date – Year	Short Text
Customer Sector	Short Text
resGPD	Number
CalcBillFor	Short Text
Frequency	Short Text
FreqN	Number
Rate Structure	Short Text
Seasonal Rate Structure	Short Text
Number of Blocks	Number
Units	Short Text
¾" Base Charge	Short Text
Service Fee (Tier 0)	Currency
Service Volume (Tier Zero)	Short Text
Service Volume for ¾"	Short Text
Service Fee for ¾"	Short Text
1st Block	Short Text
Units in 1st Block	Short Text
1st Block Lower Vol	Short Text
1st Block Upper Vol	Number
Auxiliary Rate (1st Block)	Number
Auxiliary 1st Block Units	Short Text
Aux 1st Block Lower Vol	Short Text
Aux 1st Block Upper Vol	Short Text
2nd Block	Number
Units in 2nd Block	Short Text
2nd Block Lower Vol	Number
2nd Block Upper Vol	Number
Auxiliary 2nd Block Units	Number

Twin Cities Water Utility Database Structure

Aux 2nd Block Lower Vol	Short Text
Aux 2nd Block Upper Vol	Short Text
3rd Block	Short Text
Units in 3rd Block	Short Text
3rd Block Lower Vol	Number
3rd Block Upper Vol	Number
Auxiliary 3rd Block Units	Short Text
Aux 3nd Block Lower Vol	Short Text
Aux 3nd Block Upper Vol	Short Text
4th Block	Short Text
Units in 4th Block	Short Text
4th Block Lower Vol	Number
4th Block Upper Vol	Number
5th Block	Number
Units in 5th Block	Short Text
5th Block Lower Vol	Short Text
5th Block Upper Vol	Short Text
6th Block	Short Text
Units in 6th Block	Short Text
6th Block Lower Vol	Short Text
6th Block Upper Vol	Short Text
7th Block	Short Text
Units in 7th Block	Short Text
7th Block Lower Vol	Short Text
7th Block Upper Vol	Short Text
8th Block	Short Text
Units in 8th Block	Short Text
8th Block Lower Vol	Short Text
8th Block Upper Vol	Short Text
9th Block	Short Text
Units in 9th Block	Short Text
9th Block Lower Vol	Short Text
9th Block Upper Vol	Short Text
10th Block	Short Text
Units in 10th Block	Short Text
10th Block Lower Vol	Short Text
10th Block Upper Vol	Short Text
Surcharge	Short Text
Senior Rates (Y/N)	Short Text
Water Treatment Characteristics Field Name	Water Treatment Characteristics Data Type
Utility	Short Text
CTU ID	Number
Treatment Plant (Y/N) (from facility file)	Short Text

Twin Cities Water Utility Database Structure

Treatment Plant Begin Date_(from facility treatment file)	Short Text
Most Recent Treatment Plant Begin Date_(from facility treatment	Short Text
Groundwater or Surface Water_(from facility file)	Short Text
PWS Design Capacity (from pws file)	Short Text
PWS Design Capacity Units_(from pws file)	Short Text
PWS Design Capacity (g/d)_(from pws)	Number
PWS Average Daily Production_(from pws)	Number
PWS Average Daily Production Units (gal)	Short Text
# Treatment Plants (from facility file)	Number
#Wells_(from facility file)	Number
Well Entry Point_(Earliest Date)_(from facility file)	Date/Time
Well Entry Point_(Latest Date)_(from facility file)	Date/Time
Other Infrastructure Facility Date (Earliest Date)_(from facili	Date/Time
Other Infrastructure Facility Date (Latest Date)_(from facility)	Date/Time
Type of "Other Infrastructure Facility"_(from facility file)	Short Text
General Notes_(from facility file)	Short Text
# Residential Service Connections in 2015 (from MPARS_Inventory	Number
F21	Short Text
FACILITY_SEQ_NO	Number
PWS_SEQ_NO	Number
F24	Short Text
begin date	Date/Time
latest date	Date/Time
F27	Number

Appendix D
Bill Assessment Tool

BILL ASSESSMENT TOOL

November 2016

The Council's mission is to foster efficient and economic growth for a prosperous metropolitan region

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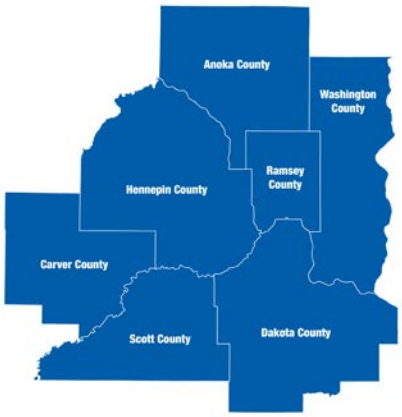

The Metropolitan Council is the regional planning organization for the seven-county Twin Cities area. The Council operates the regional bus and rail system, collects and treats wastewater, coordinates regional water resources, plans and helps fund regional parks, and administers federal funds that provide housing opportunities for low- and moderate-income individuals and families. The 17-member Council board is appointed by and serves at the pleasure of the governor.

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Introduction

Creating Water Conservation Tiers for Residential Customers to Encourage Efficiency

To send appropriate price signals, the rate structure must be set for each group of customers (e.g., residential, commercial, industrial) with similar water use patterns. Water conservation tiers won't work if commercial and industrial customers have the same rates as residential customers. The higher rates in the upper tiers of a tiered rate structure will penalize commercial and industrial customers who may have the majority of their water use in the upper tiers. At the same time, residential customers may not be penalized if these upper rates are set too low to accommodate commercial and industrial users.

Water conservation rate structures typically focus on the residential customer-class since summer peak use is most often due to non-essential water use like lawn irrigation that can be curtailed. For example, the ratio of peak month water consumption to average winter month consumption in the Twin Cities region ranges from a low of 1.4 to a high of 5.0. The metro average ratio is 2.7, meaning that, on average, the typical residential water customer uses 2.7 times more water in one summer month than is used in one winter month. Residential water conservation rate structures established to discourage peak summer water use are typically either a 3-tiered or 4-tiered structure. They could also be set up as seasonal rates with higher rates applied during the summer season. Seasonal rates may be tiered or a combination of uniform rates for the winter period and tiered rates for the summer period.

For 3 or 4-tiered residential water conservation rate structures, the first tier, termed "essential," captures what would be considered use associated with essential water use (e.g., washing hands, flushing toilets, bathing, drinking water, cooking). The second tier, termed "basic," represents the typical use of water in a single-family dwelling. The third tier, termed "discretionary," relates to discretionary use such as lawn irrigation, which can be easily curtailed during system peak demand periods or could be considered price sensitive. If a fourth tier is used, it is typically considered a penalty tier and is priced at a high rate that would be expected to result in less water use.

In setting the volume for each tier, the first step is to determine how much water sold should be included in the upper tiers (e.g., Tier 3 or Tier 4). To target a considerable amount of conservation, the upper tier(s) would include about 20 percent of the water sold, as a general rule. For example, assign 20 percent to Tier 3 or split the 20 percent between Tier 3 and Tier 4. To send a price signal to encourage more efficient use of water, a 3-tier structure may be best, with the third tier including about 10 percent of the water sold. If you want to promote water conservation and include a penalty tier, then you might include a fourth tier. To set Tier 1 and Tier 2, industry practice is to either divide the remaining water sold roughly equally between those two tiers. You may also want to calculate your average winter consumption and make sure that it does not fall into either Tier 3 or Tier 4.

The other element in rate design is setting the price. The price for the upper 10 percent or 20 percent of use should be considerably higher than the price for water in the other tiers. The more aggressive you want to be in encouraging water efficiency, the higher the price of Tier 3 or Tier 4 needs to be. Penalty levels should be considered if the utility has a limited amount of water to sell and must achieve conservation. Pricing 10 percent of water sold at the upper tier is an inducement for customers to be more efficient. Pricing 20 percent of the water sold at a much higher price will typically result in use reductions for those customers that are price sensitive.

Additional increases in efficiencies can be achieved by a change from a quarterly billing cycle to a monthly billing cycle. Longer billing cycles disconnect customers from their water use practices. The more immediate feedback of a monthly bill has a greater chance to influence efficiency.

Using this Tool to Explore Revenue Impacts of Residential Water Conservation Tiers

The purpose of this tool is to allow water utility managers to test the rate and revenue impacts of a proposed change in their residential tiered rate structures. This tool is not a substitute for an in-depth financial analysis. Instead, it is intended to provide preliminary "what-if" computations that help a manager understand if a more in-depth financial analysis should be initiated. This tool walks through five steps aimed at establishing the purpose and assessing impact of implementing or changing a tiered water utility rate structure.

Step 1 – Establish Residential Water Efficiency Goals

Step 2 – Establish the Need for Water Conservation Tiers

Step 3 – Assess Whether Residential Tier Rates Can Be Implemented

Step 4 – Prepare Residential Billing Data

Step 5 – Conduct Tier Use Analysis

Step 1 – Establish Residential Water Efficiency Goals

To help establish goals for water efficiency within the residential customer class, prioritize the list below using a 7-point system with 1 being the most important and 7 being the least important.

- Administrative Ease
- Ability to Pay
- Economic Competition
- Efficient Water Use
- Fair and Equitable / Public Acceptance
- Revenue Stability / Cost Recovery
- Simplicity

If encouragement of Efficient Water Use within your residential customer class is a high priority, then consider to what extent you want to encourage the efficient use of water among your residential customers.

- Mild to Moderate encouragement of efficient use – consider a three-tier residential structure with a moderate price for the third tier.
- Strong encouragement of efficient use – consider a four-tier residential structure with the top 10 percent of use in the top tier at a high rate.

Some example goals for creating a residential customer rate structure include:

1. A structure that encourages efficient use of water while recovering the cost of serving the residential customer class.
2. A structure that encourages efficient use of water while maintaining relatively stable revenues from that customer class.

Step 2 – Establish the Need for Water Conservation Tiers

If the answer to any of the questions below is Yes, then proceed to Step 3 – Process Flow Diagram.

1. Does revenue need to be stabilized?

   Yes – decreased water use caused by efficient appliances and other water efficiency changes have decreased demand (proceed to Step 3).

   Yes – rate structure does not generate sufficient revenue (proceed to Step 3).

   No – continue to next question.

2. Has the Minnesota Department of Natural Resources required implementation of a water conservation rate structure as a condition of a new municipal well installation?

   Yes – need to establish stable rate structure that preserves revenue as water demand decreases (proceed to Step 3).

   No – continue to next question.

3. Does your typical residential customer use more than 2 times more water each summer month than they use each winter month?

   Yes – there is a high discretionary water use for lawn irrigation and other outdoor uses (proceed to Step 3).

   No – continue to next question.

4. Do water use patterns vary significantly between different types of customers (residential, commercial, agricultural)?

   Yes – establish separate rate structure for each customer class (proceed to Step 3).

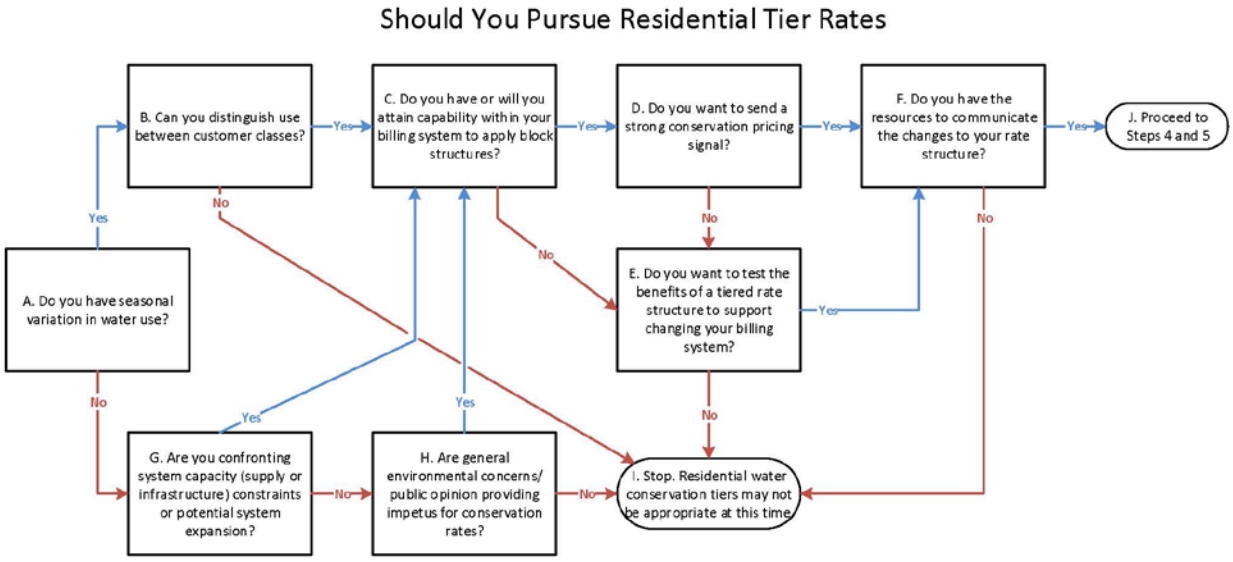
   No – continue to next question.

5. Is the billing period longer than monthly?

   Yes – customers receiving quarterly or bi-monthly bills do not see the effects of monthly use on their water bill (proceed to Step 3).

   No – monthly billing is best for efficiency pricing.

Step 3 – Process Flow Diagram



The above graphic is a step-by-step decision-making process that asks eight questions and leads to two decisions. The questions are labeled A through H. The decisions are labeled I and J. The questions and answers are as follows:

Question A – Do you have seasonal variation in water use? If yes, then proceed to Question B. If no, then proceed to Question G.

Question B – Can you distinguish use between customer classes? If yes, then proceed to Question C. If no, then proceed to Decision I.

Question C – Do you have or will you attain capability within your billing system to apply block structures? If yes, then proceed to Question D. If no, then proceed to Question E.

Question D – Do you want to send a strong conservation pricing signal? If yes, then proceed to Question F. If no, then proceed to Question E.

Question E – Do you want to test the benefits of a tiered rate structure to support changing your billing system? If yes, then proceed to Question G. If no, then proceed to Question F.

Question F – Do you have the resources to communicate the changes to your rate structure? If yes, then proceed to Decision J. If no, then proceed to Decision I.

Question G – Are you confronting system capacity (supply or infrastructure) constraints or potential system expansion? If yes, then proceed to Question C. If no, then proceed to Question H.

Question H – Are general environmental concerns and/or public opinion providing impetus for conservation rates? If yes, then proceed to Question C. If no, then proceed to Decision I.

Decision I – Stop. Residential water conservation tiers may not be appropriate at this time.

Decision J – Proceed to Steps 4 and 5 of this Residential Tier Analysis Tool.

Step 4 – Prepare Residential Billing Data

The following steps will prepare your residential customer billing data for use in Step 5, the Residential Tier Use Analysis. The analysis allows you to experiment with different tiers to see how much water use falls within each tier. It also lets your set different rates ($ per unit) for each of the tiers to see what volume-based revenue could be generated.

Step 4A – Preparing Residential Billing Data for Use in Step 5 – Residential Tier Use Analysis

The analysis requires that residential billing data be separated from other customer class data. If your billing system does not identify the customer class, you can separate out billing data that is likely residential by choosing customers with 5/8-inch, ¾-inch, and 1-inch meters. A few other customer types (such as very small commercial) may be inadvertently captured here, but the billing data will be fairly representative of the residential customer class.

Once you have your residential billing data for an entire 12 consecutive months, then summarize the data into two columns. Column 1 is the Billing Demand Level, which is a list of every positive use level that was billed. Column 2 is the Number of Bills issued at that billed level (Number of Bills at Level). Sort these two columns based on the Billing Demand Level from smallest to largest. Delete any negative billed amounts and associated number of bills. (See example below.)

Example

Billing Demand Level	Number of Bills at Level
0	100
1	1500
1.5	750
2	623
10	50
12	6
50	1

Note: Do not include any negative bills

Notes:

- The Tier Use Analysis is on a unit per billing period basis. Therefore, your billing data does not need to be converted to a specific volume unit (e.g., ccf or kgal) nor to a specific billing period (e.g., monthly).
- If you have many billing demand levels that are fractions of whole amounts, such as 0.2, 0.3, 1.2, 1.6, you may want to round the billing demand levels to the nearest 0.5 before creating your columns of Billing Demand Level and associated Number of Bills and Level.
- If you want to examine multi-family residential data, you need to perform an additional step with the data. The Billing Demand Level requires that the use on a multi-family utility bill be divided by the number of dwelling units. For example, if use on the bill equals 10 volume units and the dwelling units for the account equal two, then the Billing Demand Level equals five.

Step 4B – Instructions for Entering Inputs in the Residential Tier Use Analysis

Copy your Billing Demand Level and Number of Bills at Level data into the corresponding columns on the Step 5 – Residential Tier Use Analysis tab, starting in cell A5. Exclude any negative bill demand levels and associated number of bills. (Note: Overwrite the sample data that is in cells A5 through B7.)

Then move over to the Rate Structure Test Table. This table allows you to experiment with different tier points (block amounts) and/or unit rates.

Enter the water use level you want to allow in each tier in cells L28 through L31. You may create up to five tiers in this tool, but keep in mind that residential tier structures designed to promote efficient use of water typically have three tiers. If you want to promote water conservation and include a penalty tier, then you might include a fourth tier. The "Top Tier" represents your highest tier, and all remaining use is captured in this tier. For example, if you want to try a three-tier structure, enter your first tier's water use in level L28 (Tier 1) and your second tier's water use in level L29 (Tier 2). The use in the third tier is captured in the Top Tier.

Enter the corresponding unit rates for those tiers in cells Q28 through Q32.

In cell Q34, enter your volume-based revenue goal for your residential customers. This goal may be the cost of serving your residential customers less the revenue you receive from any billing charges to those residential customers.

In cell O36, enter the number of billing periods per year (e.g., 6 for bi-monthly, 4 for quarterly, 12 for monthly) for the residential billing data.

Outputs

A graphical representation of the Billing Demand Curve is automatically calculated on a logarithmic scale. This graph can be used to help set initial tier points in the Rate Structure Test Table. The graph shows how much usage occurs at various billing demand levels.

The mean use per bill and median use per bill are displayed below the graph for reference. The percent of total use that falls into each tier, the estimated revenue based on the amount of use in each tier, and the rates for each tier are presented in the Rate Structure Test Table below the graph. The associated volume-based revenues are calculated and presented in Column R – Volume-Based Estimated Revenue.

The differential between the estimated Volume-Based Estimated Revenue and a goal revenue, if entered, is presented in cell R35. A positive value indicates that you are generating more than your goal.

Automated feedback on the tier points with respect to efficient use of water is presented in the feedback box.

Possible Alternatives

Existing Rate Structure

If you'd like to model your current rate structure and residential billing data, follow the steps above. Adjustments are necessary if you have a minimum bill charge that includes a base amount of use and/or if you have more than five tiers.

If you use a minimum bill that includes a base amount of use, then enter that use level in cell L28 and the corresponding unit rate in cell Q28. Calculate the corresponding rate by dividing the minimum bill by the use level. For example, if the minimum bill is $6 and includes 2 units of use, the corresponding unit rate would be $3 per unit ($6 divided by 2 units).

If you have more than five tiers in your current rate structure, enter the block amounts for the first four tiers in cells L28 through L31. The Top Tier will capture the remaining use. In cells Q28 through Q31, enter the unit rates for your first four tiers. In cell Q32, enter the weighted average unit rate for your tiers above Tier 4.

Seasonal Residential Rate Structure

If you want to examine a seasonal rate structure, the residential billing data will have to be split between summer and winter bills. Those periods are determined by the utility based on the timing of peak use (typically in the summer related to landscape irrigation and lawn watering). Once you have the summer and winter bills separated, enter the Billing Demand Level and Number of Bills at Level for the summer period into the corresponding columns on the Step 5 – Residential Tier Use Analysis tab. We suggest using the average winter use as a starting point for the Tier 1 use block. The remaining use will be captured in the Top Tier. (Seasonal rates often have a uniform rate in the winter and a two-tier structure in the summer.)

Different Tiers and Unit Rates

To see the impact on the amount of residential use that falls within a tier and on the volume-based revenues, change the inputs in cells L28 through L31 and cells Q28 through Q32.

Scenario Manager

Excel's Scenario Manager has been set up so that you may save any of the different Alternatives (aka Scenarios) that you try, as well as create a report of the results. The only caveat is that any price elasticity of demand alternatives will not automatically update the values in Column C as the Scenario Manager is limited to 32 inputs.

The inputs linked to the Scenario Manager are the tier blocks in cells L28 through L31, the unit rates in cells Q28 through Q32, and the number of billing periods in cell O36.

To use Scenario Manager, navigate to the Data tab in the Excel ribbon. Click on "What-If Analysis?" then click on Scenario Manager. The Scenario Manager dialog box will appear.

A sample Base Case and Alt1 are pre-loaded.

To Edit a Scenario – Click on an existing scenario, then click Edit. On the first screen, you may change the name. Click OK. Update the values and click OK.

To Add a Scenario – Click on Add, enter a name for the scenario, then click OK. Enter values in the dialog box or confirm that the values entered in cells L28 through L31, cells Q28 through Q32, and cell O36 match what you entered into the table directly and click OK. (You can either update the inputs within Scenario Manager or update the inputs in the Excel table and then open up Scenario Manager to add a new scenario.)

To View a Scenario – Click on a scenario name, then click Show.

To Create a Summary Report (like the one to the right) – Click on Scenario Summary, then click OK (without changing anything!!) and the summary report will be created in a new tab called “Scenario Summary.”

Step 5 – Bill Tabulation Assessment Tool

The Bill Tabulation Assessment Tool is an Excel spreadsheet that can be accessed at the Metropolitan Council website:

https://metrocouncil.org/Wastewater-Water/Planning/Water-Supply-Planning/Studies-Projects-Workgroups-(1)/Completed-Studies-Projects/Twin-Cities-Water-Rates-Database-and-Tool-Developm.aspx

Additional Resources

The American Water Works Association (AWWA) website has numerous resources for water rate setting, including Manuals M1 (*Principles of Water Rates, Fees, and Charges*), and M54 *(Developing Rates for Small Systems*).

The link below takes you directly to the AWWA water rates page, as well as additional resources:

http://www.awwa.org/resources-tools/water-and-wastewater-utility-management/water-wastewater-rates.aspx

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Appendix E
Case Studies

CASE STUDY

Conservation Rate Structures for Water Utilities

Owner: Denver Water
Implementation: April 1, 2016

Reason for the Change in the Rate Structure

Prior to 2016, Denver Water's water rate structure comprised of a monthly fixed charge plus a 4-tier structure for residential customers, and a seasonal rate for non-residential customers. Denver Water (DW) had three main reasons for evaluating a change to this water rate structure.

- The rate structure was based on demand patterns from 20 years ago and did not reflect current water consumption patterns or characteristics.
- The rate structure contributed to revenue volatility.
- The unit price ratios for single families created inequities between high volume and low volume residential water users.

DW places high importance on a defensible rate structure that meets interclass equity and sought to correct the high volume vs. low volume pricing inequities. Other very important objectives of the rate change included a rate structure that provided financial sufficiency and revenue stability, encouraged conservation, and addressed essential use/affordability.

Cost to Implement

Total cost information was not developed. The total effort involved approximately one dozen staff working for 18 months, plus consultant support.

Rate Structures Considered

Single family structure alternatives:

- Block Zero for low volume customers
- Fixed Block with similar tier thresholds for each service level
- Fixed Block with different tier thresholds for each service level
- Average Winter Consumption (AWC)
- AWC-Fixed

Rate Structure Selected

DW also chose to change the monthly fixed charge from a flat rate per bill to a flat rate based on the customer's meter size. The 4-tier structure was reduced to a 3-tier structure that is based on percentages of AWC. To reflect the different water use levels between single-family and multi-family/non-residential customers, separate 3-tier structures were created for those two customer classes.

The structure was chosen for several reasons:

- Balances most interests
- Best structure for affordability of essential water use
- Individualizes conservation pricing signal
- Ensures affordability of essential (indoor) water use
- Allows for the largest amount of essential water use for at-risk customers
- Promotes revenue stability and affordability of essential water use

- Applies easily to all customer types while providing recognition of individual use patterns

Major Hurdles/Issues

- As the new billing structure is very different from the previous one, DW held focus groups to get feedback on the best way to represent this on billing statements, as well as how to describe it on their website.
- DW received a large amount of calls. Managers spent a lot of time developing messaging for customer care people to help explain the changes to customers. In addition, they had to increase staffing temporarily to handle the increase in call volumes.

Lessons Learned

- Solid and very comprehensive outreach policy is imperative
- Anticipate high demand placed on the call center
- Develop messaging for staff to help explain the changes to customers
- Consider a temporary increase in staffing to handle the increase in calls right after the new bills are issued

CASE STUDY

Conservation Rate Structures for Water Utilities

Owner: Louisville Water Company
Implementation: January 1, 2016

Reason for the Change in the Rate Structure

Prior to 2011, the Louisville Water Company (LWC) maintained a 7-tier water rate structure that had been in place since the mid-1970s with only minor modifications. LWC wanted to examine changing the structure as part of a sustainable business strategy. Their goals were to make sure that any new structure helps stabilize revenues, maintains an economic incentive for commercial, industrial, and wholesale customers, and is easily adaptable to residential conservation pricing.

Cost to Implement

Not available.

Rate Structures Considered

- Allocate more distribution costs to the fixed charge component of the rate
- Create an irrigation customer class with uniform rates
- Create a high-water use customer class with uniform rates
- Eliminate elevation surcharge
- Create a 3-tier residential class
- Create separate customer classes for commercial and industrial users: either uniform or tiered rate

Rate Structure Selected

LWC moved from a 7-tier inclining/declining block structure that applied to all customers to a structure that establishes specific rates for each customer class. Residential customers now have a 3-tier inclining block rate structure. This residential structure allows for enabling conservation pricing on residential use if ever needed. Non-residential customers now have a uniform rate structure that eliminates the complication of stepping through 7 unit rates to calculate the water bill on non-residential customers. These changes make it much easier for all customers to understand and estimate their bills.

Major Hurdles/Issues

None.

Lessons Learned

Have a lay person (i.e., someone who was not involved in the process and is not familiar with water rates) read the pamphlets and other materials presented to customers prior to the bill change to make sure that customers will understand what is changing. While LWC did a great job of creating bill inserts and other materials for communicating the change, the language used ended up being confusing to the average customer and resulted in the LWC staff fielding a lot of phone calls.

Appendix F
Workshop Materials

Water Utility Rate Assessment Workshop

Wednesday, December 7, 2016 from 12:30 PM to 4:30 PM

Instructor: Ann Casey – Ms. Casey has 23 years of experience working with management, administrative, and financial aspects of utilities and municipalities, including water, wastewater, electric, and gas utilities. Her comprehensive experience includes business process review, performance management development, financial planning, asset management, due diligence, feasibility studies, policy studies, capital improvement financing projects, rate studies, policy studies, and operation and staffing studies. Ann received her BSBA in Finance from Loyola University and her MBA in Finance from Rockhurst University.

Water Utility Rates Overview

1. Utility Governance Structures in the U.S.

   Discussion: Review different governance structures of the audience
2. Most Common Methods to Fund Utilities

   Discussion: Why do you think this is important to your ratepayers, even if it means they pay more?
3. Three Basic Elements of a Cost of Service Study

   Exercise: Walk through development of revenue requirements
4. Revenue Requirements

   Discussion: How do attendees complete their own financial plan development?
5. Cost of Service Allocation

   Discussion: Walk through development of Cost Allocation, Units of Service, Units Cost of Service, Rate Design

Anatomy of Utility Costs

1. Common Reasons to Want Direct Usage Behavior

   Discussion: Review goals of Any City and Any Town
2. Availability and Quality of Data
3. Customer Diversity
4. Seasonality of Revenues and Costs
5. Rate Structure Considerations
6. What Do You Think of Your Communities?
7. Weather Risks
8. Implementing and Alternative

Bill Tabulation – Displays the Distribution of Accounts and Usage Levels Under Current Conditions

Exercise: Bill Tabulation Evaluation Activity

Developed with participation from
Metropolitan Council
Clean Water, Land and Legacy Funds
CDM Smith

CLIENT CERTIFICATE REQUEST FORM

(For Non-CDM Smith Staff)

Please provide the following information to request a Certificate of Completion from CDM Smith University indicating your successful completion of training.

COURSE INFORMATION:

Course Title	
Location	
Date(s) of Training	

ATTENDEE INFORMATION:

Name (to be printed on certificate)	
PE Number/State or Country of Issuance	
Company	
Street Address	
Street Address	
City, State, Zip	
Daytime Phone Number	
Email Address	

☐ I prefer to receive my certificate by mail.

To receive a certificate of completion, your attendance must be verified on the Training Certification form. Certificates will be issued within 4 weeks of receipt of this Certificate Request form and Training Certification form.

*CDM Smith employees should not complete this form as they can obtain their certificate from the LMS.

CDM Smith University
Course Evaluation

Instructions: Please submit the completed form to the class coordinator who will forward it in a sealed envelope to the CDM Smith University Registrar in the Orlando, FL office.

Course Title: Location:
Course Date(s): Instructor(s):

Participant Name (optional): _____

Course Code:

Use this scale to rate the course content, applicability, materials, and instructor.
5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, 1 = strongly disagree or NA = Not Applicable

Course content, applicability and materials:	Please circle					
1. The learning objectives were stated and achieved.	5	4	3	2	1	NA
Comments:						
2. The activities and exercises added to my understanding of the course. If the activities and exercises did not add to your understanding, please	5	4	3	2	2	NA
Comment:						
3. The activities and exercises were relevant to the work I do	5	4	3	2	1	NA

4. List 2 or 3 things you plan to do to retain the knowledge from this course and practice the skills/tools you learned.

-MORE ON BACK PAGE-

5. What prerequisite knowledge do you think was necessary for your successful understanding of this material? Please list work experience and/or proficiency in specific applications.

6. What suggestions do you have for improving this course? Circle all that apply:

   - Shorter duration
   - Longer duration
   - More interactivity
   - Less interactivity
   - Pre-work
   - E-Learning component

7. Please provide additional suggestions for improving the course that were not listed above.

8. Please share feedback about the instructor(s), be specific.

9. Please provide any additional comments regarding this course.

Thank you for your input!

Water Utility Rate Assessment Workshop Discussion Notes

Wednesday, December 7, 2016

Why is cost of service approach common?

- Equitable and fair

What are other factors affecting rate development?

- Conservation
- Quality
- Reliability

Characteristics of the attendees' current rates?

- Flat or blocked
- Other fees include: trip charges, late charges, interest, and meter reading
- Political considerations are primarily the DNR's requirements

Individual Community Strategies

- Andover
  - The rate structure is an inclining structure. The community just switched from six tiers to four.
  - Andover is a young community and there are politics of revenue versus conservation.
- Apple Valley
  - The rate structure is an inclining structure where the upper rate is twice that of the lower rate.
  - Apple Valley is currently performing a rate study.
- Bloomington
  - The rate structure is an inclining structure consisting of two blocks.
  - Bloomington's tiers were lowered this year and the community has seen a decline in use.
- Dayton
  - Dayton charges a flat fee for usage less than 4,000 gallons and a flat rate for usage over 4,001 gallons. Dayton also incorporates development fees.
  - Dayton has four different water sources.
  - The community is currently performing a fee evaluation study.
- Edina

- The rate structure is an inclining structure where the upper rate is twice that of the lower rate.

- Lakeville
  - The rate structure is an inclining structure where the baseline is a fixed percentage.
  - Lakeville has seen declines in water usage this year but it is unclear whether this is because of rates or because it was a wet year.
- Mounds View
  - The rate structure is an inclining block structure with different rates for residential versus commercial water users.
  - Mounds View reduced their tiers in 2016 and has seen a decline in water use since making this adjustment.
- New Brighton
  - The rate structure is a uniform structure with a minimum of 8,000 gallons.
  - The community is considering that low water users, such as senior citizens, could drive an inclining rate.
- Northfield
  - The rate structure consists of a base fee and an inclining structure.
  - Northfield has seen a decline in use, but it is difficult to determine whether this is a result of newly installed efficient appliances or as a result of rates.
- North Oaks
  - The water rates used to be based upon individual neighborhoods, but now the municipality is consolidating the rate structure.
- Shoreview
  - The rate structure is an inclining structure.
  - It is easy to "sell" conservation.
  - Operations and Maintenance book is located online to explain rates to the customers.
- St. Louis Park
  - The rate structure is an inclining structure consisting of three tiers. Tier 1 captures the average water user and Tier 3 captures commercial water users.
  - The community is currently performing a rate study for capital improvement projects.
- Waite Park

    - The community has a significant senior citizen population and as such, they are considering an inclining rate structure.

- Woodbury
    - The residential rate structure is an inclining structure consisting of five tiers.
    - The commercial rate structure is flat.
    - Woodbury is currently evaluating the residential tiers.
    - The community has a Green Corps grant for conservation with a goal of reducing water demand.

Do your customers understand their rates?

Some communities think that the public and city council do not understand the rate process. Some communities receive feedback to rate changes, such as an increase in phone calls, while others do not see much reaction to rate changes. Those who do not receive a reaction from their customers speculate that the reasons may be because water is cheap, residents don't notice the increase when they are billed quarterly, or because residents feel guilty about their high levels of usage. Many municipalities reported receiving more phone calls related to metering than rate changes.