

**Mayor's Water Solution Task Force
Mecklenburg County, North Carolina**

Honorable Jeffrey Tarte
Mayor of Cornelius
North Carolina

Dear Mayor Tarte,

As Chairman of the Water Solution Task Force, it is a pleasure to forward to you the results of the group's effort on behalf the citizens of Mecklenburg County. As you know, hundreds, if not thousands, of residents have lodged complaints through the Task Force, public media, and to the utility department directly regarding abnormally high water/sewer bills, unusual spikes in meter readings, and what is perceived as dismissive attitudes by the department's staff and 311 operators.

The Task Force restricted its inquiry solely to those issues related to customer dissatisfaction with the Charlotte Mecklenburg Utility Department (CMUD) practices as they relate to billing, measurement, and customer relations. No inquiry was made into commercial billings, storm water management, or contracting practices. Based upon the level of customer dissatisfaction and the extent of problems found with residential billing and services, the Task Force believes that further inquiries into these areas is also warranted.

The Task Force sought to conduct a fact-based inquiry into management practices that resulted in significant customer anger over excessively high water bills, anomalies in usage reporting, and concern regarding how complaints were addressed by CMUD. During its inquiry, the Task Force found serious flaws within the CMUD rate setting model prior to the drought of 2007-8 and in its response to revenue losses associated with the drought. The rate model places a disproportion share of system costs on heavier users who own single-family homes and those with large families. This practice is ultimately self defeating as customers can scale back usage resulting in reduced revenue.

The Task Force discovered that CMUD has experienced high error rates in its measurement apparatus and has worked quietly to repair and replace defective equipment on a case-by-case basis. While down playing equipment problems to its customers, CMUD failed to acknowledge the problem publicly and take timely corrective action. We believe that CMUD should have been open with its customers and should have dealt with the issue on a system-wide basis.

Lastly, the Task Force took serious issue with CMUD regarding its customer relations and dispute resolution process. CMUD uses the threat of service termination to coerce payment from its customers. It is this display of an attitude of arrogance that angered many of its customers.

The Task Force intent is that all of this information be shared with the utility, local government, the media, and the citizens of Mecklenburg County.

Water Solution Task Force

Jim Duke, Chair

*J. Patrick Bechdol, Bret Chapman, Ron Charbonneau, Susie Drake, Don Hawk,
Ron Kelley, Sam Marshall, Matt Thomas, Tony Tramontano, John Venzon,
Robert Watson, Robert Wenderlich*

Report to the Mayor



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Executive Summary

During the fall of 2009 a significant number of residents in Mecklenburg County began complaining about high water bills. In response to a myriad of complaints regarding high bills, unresponsive and dismissive behavior by the utility, and a large number of unexplained spikes in usually predictable billings, the Mayor of Cornelius appointed this Task Force in order to seek explanations and offer recommendations to the Mecklenburg County Utilities Department (CMUD) and the City Council of Charlotte.

The report that follows offers significant detail and fact-based analysis addressing the issues at the heart of customer dissatisfaction and the rising level of distrust of the utility's management. The report offers the following major findings:

- For many years CMUD has employed a questionable business model that provided very low water & sewer rates to its lower usage customers. It did so by passing costs through higher rates to those customers who use more heavily. This placed the utility in a vulnerable position as it became significantly more reliant upon those heavier users for reliable and adequate revenue.
- The drought of 2008 together with watering restrictions adversely affected revenue flow and required CMUD to find ways to increase revenues and maintain its credit rating.
- In reaction to revenue loss, CMUD's internal pricing decisions further weaken its revenue model by collapsing its tier structure thereby, shifting the financial burden to families with higher water usage. Relying upon higher users did little to secure a strong financial base and placed the utility in further jeopardy as higher level users could and did reduce usage.
- CMUD is aggressively seeking to expand its service base through a comprehensive Capital Improvement Plan that will add significant debt to its business model. Currently, debt service exceeds \$135 million on a total debt of \$ 1.1 billion. This debt cannot be sustained or future expenditures covered without continued rate increases.
- For a number of reasons, the utility is required to expend funds to support community development and public service projects for which it receives no reimbursement. This places the utility in a position of having to pay for projects that do not directly help existing customers.
- CMUD's customer service policies have created an adversarial environment with much of its customer base. Due to the threat of discontinued service, customers in many cases felt powerless to dispute or refuse to pay large bills.
- CMUD has long known that it was experiencing an excessive number of transmitter problems that resulted in billing discrepancies, yet it did little to address the problem in a comprehensive manner. The Task Force believes that these transmitters are a major contributing factor for spiked or high bills. These transmitters can under-report usage for months then catch up resulting in significantly spiked bills.
- CMUD lacks a comprehensive water audit program to investigate the causes of spikes and disputed water bills. Water audit procedures are proposed in this report. The Task Force believes that absent such an audit program a moratorium on water shut-offs should be in place into effect when water bills are contested and investigated.
- It is critical that the Charlotte City Council together with CMUD managers return its tier billing structure to pre-drought structure of just three tiers and address the issue of more fairly spreading the cost of water and sewer service to its entire customer base.

Report to the Mayor

The Mayor's Water Solution Task Force has determined that through a series of management decisions the Charlotte Mecklenburg Utilities Department (CMUD) has placed the City and itself in serious fiscal jeopardy and eroded public trust in its ability to meet the needs of its customers. The Task Force explored three principal areas of inquiry: financial management, technical measurement and reporting issues, and public relations. The Task Force found significant areas of concern in all three.

Immediately following the installation of electronic transmitter allowing remote meter reading, CMUD customers began to voice complaints about unusually large water/sewer bills, unexplained spikes in service costs, and a pattern of dismissive behavior by CMUD customer service staff. Dozens of initial complaints grew to hundreds then eventually to thousands as people learned that many others had similar high bills and that they may now have a voice that will be heard.

The Task Force believes that CMUD got into financial trouble through fiscal mismanagement that resulted in dramatically higher water rates on those customers who had higher consumption due to the size of their family and lawns that required watering. While not universal to all CMUD employees, management attitudes came across to its customer base as:

- Customers use more water and can afford to pay more;
- Raising rates of heavy users will resolve our financial problems;
- The drought caused CMUD's financial problems; and
- Customer Relations is unimportant to running a utility.

The Task Force addressed the issue of abnormally high bills or "spikes". It believes most of the spikes that are not due to leaks, etc, can most likely be traced to the transmitters. CMUD has known for some time that the installed transmitters (particularly the Itron 50W2), which allow remote meter reading, have a high failure rate. Those transmitters often underreport (and can also over report) usage for several months.

In many cases, CMUD, when prompted by a customer complaint or by examining an unusually high or a zero bill, CMUD sometimes, performs a Quick Check at a customer location to compare the meter "odometer" reading with that of the transmitter. The physical readings on the odometer are considered very accurate and, therefore, reflect actual usage. When the odometer is read and checked against the under-reporting transmitter, it is a CMUD practice to adjust bills to the odometer reading. CMUD has done a poor job in communicating why a "spike" in the bill has occurred.

The Customer reaction is often disbelief that they could have used so much water in a monthly period. The major issue is that the "spike", which often reflects actual accumulated usage based on the site odometer meter reading. This under-read followed by a catch up bill, places the customer in a higher payment tier giving the customer an unfair high bill. This needs to be corrected by CMUD by adjusting bill to lower tier levels.

There are some cases where unusually high bills cannot be credibly explained or justified by a faulty transmitter or other causes. CMUD needs to give the customer the benefit of the doubt in those cases and adjust bills to average previous twelve-month usage while continuing to investigate technical and administrative error sources.

Known less reliable transmitters and registers should immediately be replaced with known more reliable equipment. This would significantly reduce customer complaints, reduce the necessity for additional Customer Service personnel, and significantly improve customer perception of CMUD. This would also reduce operating expenses and management distractions while rebuilding the public's trust in CMUD. Utility customers want and deserve accurate billing for what they actually use on a monthly basis.

Given all of the issues found, CMUD needs to immediately institute an indefinite moratorium on denying water access while a customer billing dispute remains unresolved. As the Task Force effort continues, new information might become available that could alter and/or add to our Findings and Recommendations.

In reviewing the CMUD mission statement, the Task Force recognizes that the utility has been successful in providing safe and sufficient drinking water to the County and has been environmentally responsible. It should be noted that during interviews with CMUD management and task force members, Assistant Director Denise Foreman was both cordial and forthcoming during the entire inquiry.

Financial Management

CMUD's rate structure is flawed – most low level users pay too little, forcing a minority of heavier users to pay too much! Although prepared by a professional consulting firm, the pre-drought 2007 rate structure was guided by a CMUD management philosophy that relies upon an artificially high "conservation component" and an artificially low Tier One or sustaining level. Its skewed rate model rendered CMUD highly vulnerable to what is a variable component [charges paid by heavy users] within the rate structure. Revenue from the variable components, Tiers 3 and 4, can be adversely affected by weather and customer choices. When CMUD depended too heavily on higher tier revenue and that revenue didn't materialize, it adversely affected its business model and revenue.

In fact, when the drought occurred in 2008, the utility was not prepared to absorb the consequences of reduced revenue caused by mandatory water restrictions. Had CMUD more appropriately spread a greater share of the cost of its operations over its entire customer base, it would have been less likely to have been placed in such severe fiscal difficulty.

CMUD's response to drought has compounded its problems. The utility's response to an immediate need to raise funds was to adopt an even more aggressive reliance upon the variable component rate, without providing sufficient increases to the majority of its lower tier customer base, primarily those customers in Tier One. The result of its in-house generated post-drought rates increases was to add even more reliance upon its variable component. Post-drought, CMUD saw a significant reduction

in water usage and the emergence of customer outrage. Customers recoiled at the result of being re-classified from average users to heavy users through a CMUD-generated billing model that collapsed the tier structure, and added a punitive fourth tier. This Tier 4 would most adversely affect moderately sized households and customers who irrigate.

Post-drought increases in bills exceeded 60% - heavy users redefined. The financial sub-group made substantive inquiries into CMUD's rate setting methodology, management structure, and its capital investment program. Serious issues were uncovered relating to the utility's post drought rate increases and its effort to redefine the billing tier structure in such a way as to increase year-over-year billings for similar usage up to 60% for average users and significantly more for heavy users. It appeared to the Task Force that not only was the redefining of the definition of a heavy user an in-house decision, but the true impact upon customer bills was significantly down-played when presented to City Council decision makers.

Changes in Water Only Billings

	<i>Then Pre-Drought 2007</i>	<i>Now Post-Drought 2010</i>	<i>% Change</i>
4 Ccf	\$ 6.77 [Tier-1]	\$ 7.17 [Tier 1]	12%
9 Ccf	\$13.41 [Tier-1]	\$16.85 [Tier-3]	26%
16 Ccf	\$22.44 [Tier-2]	\$35.68 [Tier-3]	59%
20 Ccf	\$29.22 [Tier-2]	\$56.96 [Tier-4]	95%
30 Ccf	\$50.22 [Tier-3]	\$110.16 [Tier-4]	119%

Source: Raftelis Financial Consultants, Inc. Update to FY 2007 water and wastewater rate study, dated July 14, 2006.

CMUD appears to have not communicated the full impact of its proposed rate increases and modified tier structure to the City Council. Upon reviewing CMUD's presentation to the City Council for its post-drought rate increases, the Task Force observed a pattern of incomplete statements and obfuscation through the use of averages to veil the true impact of rate adjustments to consumer bills. This lack of full disclosure as to the effect of the proposed rates and tier adjustments upon heavy users is found to be troublesome. In its section on impact, the highest monthly bill increase shown was \$13.19 for a newly "adjusted" Tier 3 customer. CMUD also emphasized its position statewide as a utility with one of the lowest costs to average users, but failed to tell the complete story.

Impact of Rate Hikes Reported to City Council

<i>Usage</i>	<i>Monthly Increase</i>
4 Ccf	\$2.76
8 Ccf	\$6.36
12 Ccf	\$13.19

Source: Financial Impact of Drought, Briefing to City Council, April 7, 2008.

Capital Improvement Program questioned. CMUD's Capital Improvement Program (CIP) represents a significant challenge to its ability to sustain overall low rates for its bottom tier customers. Published in July of 2009, the program purports to spend \$1.116 billion over the next five years rising to \$1.533 billion over ten years. The Task Force renders no judgments regarding the relative merit of the over 100 projects in 2010 contained within the plan. There does, however, appear to be a significant number of projects that are directed or dictated by factors outside the realm of strictly utility-generated need. These projects include sewer repair and relocation work for municipal projects that could arguably be reimbursed from tax revenues and city or county-generated projects that support economic growth and development. In many localities such projects are funded from adequate impact fee revenue. It was noted by the task force that impact fee revenue is insufficient to reimburse the utility in any significant way.

FY 2010 Revenue Requirements

<i>Total Debt</i>	<i>\$ 1,594,426,000</i>
<i>Debt Service</i>	<i>\$ 135,200,296</i>
<i>Projects from Revenue</i>	<i>15,950,000</i>
<i>System Operating Costs</i>	<i>\$ 251,427,753</i>

Department Funding Statistics

<i>Item</i>	<i>Then 2007</i>	<i>Now 2010</i>	<i>Change</i>	
<i>Operating Budget</i>	<i>\$ 208M</i>	<i>\$ 251M</i>	<i>+\$ 43M</i>	<i>+ 21%</i>
<i>Water CIP</i>	<i>\$ 28M</i>	<i>\$ 111M</i>	<i>+\$ 83M</i>	<i>+ 293%</i>
<i>Wastewater CIP</i>	<i>\$ 49M</i>	<i>\$ 275M</i>	<i>+\$ 226M</i>	<i>+ 457%</i>

Source: Charlotte-Mecklenburg Utilities, "Fact and Figures" for 2007, 2008, & 2009.

Utility appears to lack funding discretion for of some projects. It appears that CMUD has limited control over the cost and frequency of many municipal and community development projects. These costly non-reimbursed projects drain utility resources and burden rate-payers. The Task Force understands that using utility funds for such projects is a long standing policy in Charlotte and in Mecklenburg County, however, it recommends that city officials revisit this policy and its negative impact upon the community of rate-payers. As many of these development projects positively affect the value of personal, corporate, and municipal properties, the use of property tax revenues to enhance their value appears a more appropriate policy.

It is acknowledged that a portion of the capital projects for which CMUD is expending funds are for projects directed by federal, state, and city mandates or policies. The amount of spending on such projects, especially city-generated spending, can only be controlled through appropriate negotiations with city officials.

Is the current rate of capacity expansion really needed? The Capital Improvement Program does contain projects that seek to expand the capacity of the water and sewer system. This aggressiveness appears misplaced in that the utility is currently operating at approximately 60% of its maximum required capacity and is facing

an environment of limited raw water availability. The Task Force recognizes that most utilities face peak days and peak hour issues. However, these availability issues are most appropriately addressed through storage projects where continuing modest operational loads are needed and adequate storage required. Modern water systems do not generally need a capacity to match peak times or peak days such as those required by electric utilities.

CMUD's FY 2010 to 2014 Capital Improvement Program (CIP) is an exceptionally well prepared document that outlines the utility's plan for expanding the system and improving its infrastructure. It is recognized that many of the projects are needed and this report does not discount the value of any project.

Department Production Statistics

<i>Item</i>	<i>Then 2007</i>	<i>2009</i>	<i>Change</i>	
<i>Capacity</i>	<i>242 mgd</i>	<i>242 mgd</i>	<i>None</i>	
<i>Average Daily % of Capacity</i>	<i>111 mgd 46%</i>	<i>99 mgd 41%</i>	<i>- 13 mgd</i>	<i>- 11%</i>
<i>Highest Daily Used % of Capacity</i>	<i>157 mgd 65%</i>	<i>146 mgd 60%</i>	<i>- 11 mgd</i>	<i>- 7%</i>
<i>Active Connections</i>	<i>232,545</i>	<i>242,631</i>	<i>+ 10,086</i>	<i>+ 4%</i>

mgd = million gallons per day

Source: Charlotte-Mecklenburg Utilities, "Fact and Figures" for 2007, 2008, & 2009.

CMUD steadfastly defends its post-drought rate strategy in spite of declining revenue and customer outrage. Unabashedly proclaiming that more increases are coming! When such issues as related above were discussed with CMUD staff, it became clear that they held fast to their belief in its failing policy and pointed with pride at future rates hikes as the cost of doing business. Staff held to the concept that suburban homes were driving up costs and that those customers should bear the load of higher water and sewer rates. Staff appeared not to grasp the concept that they were indeed vulnerable to reduced consumption by these very customers and the loss of revenue that a dependency upon a high variable rate component would bring.

In documents supporting a \$ 93.7 million revenue bond proposal, the utility offered the following statement:

"In order to accommodate projected expansion, it is anticipated that the total monthly residential water and sewer bills will have average increases of approximately 8.3% each year through Fiscal Year ending June 30, 2014."

Customer Relations Issues

The Customer Service Subcommittee found a number of areas that need to be addressed in order for CMUD to deliver appropriate Customer Service. Current policies and procedures are not customer driven. There appears to be a tendency to start the investigative process by with finding who is at fault rather than focusing on what is the problem. The public views CMUD culture as adversarial. Effective customer service should view the customer as an integral partner providing residents with high quality water at fair and equitable rates. The current mission statement should be fully implemented in all departments on a continuing basis and made an integral part of employee training.

Fundamentally, CMUD customers want accurate billings, which some customers are not getting now. CMUD needs to restore customer faith in its billing system, change policies and procedures to be more customer-driven, and improve ways to resolve disputes. Dispute resolution, using the ultimate action of shutting off water the customer's supply as the ultimate bargaining tool, forces compliance and generates distrust. In many cases, fear of disconnection, will coerce customers to pay disputed bills and view the process as un-winnable. While any dispute remains unresolved, CMUD must take equal ownership of the problem and partner with the customer to resolve the dispute. Below are our recommendations for helping to achieve that goal.

CMUD needs to review its water shut-off policy when disputes arise. Due to the uncertainty in what is causing a large number of spikes in billing, CMUD's coercive tactic of threatening water shut-off leads to pre-mature resolution of disputes without any real identification of the problem. Fearing shut-off, customers simply accept the view that it must be their problem and pay the bill. A moratorium should immediately be placed on all shut-offs until a solution to what the problem is has been found.

CMUD "Quick Check Inspections" are inadequate. Many customers report that the quick drive up checks together with the "tag on the door" does little to assure them that their complaint was actually addressed. This approach offers little to no help in assisting the homeowner discover the cause of their high billing. This cursory inspection generates a high level of resentment, distrust, and frustration on the part of the homeowner.

It appears that this CMUD procedure represents a mindset that the problem is overwhelmingly on the homeowner side. "They have a leak or they used too much water" appears to be the predetermined mindset and a standard answer. While it may be true that the majority of the problems are on the homeowner side of the meter (e.g. leaks, change in usage habits, etc), not all of them are related to customer problems. Simply put, a number problems to date, cannot be explained.

CMUD response to high bill complaints and spikes lacks a comprehensive approach to a resolution. Many high bills or spikes have their root causes in excessive usage, undiscovered leaks, or technical issues that can be identified. Many more, however, cannot be readily explained without a detailed investigation. It appears to the Task Force that CMUD lacks the resources to fully investigate serious billing errors and relies upon its power to disconnect to obtain a resolution that is not always in

the best interest of the customer. CMUD needs to do a corporate cultural shift when it comes to Customer Service and problem resolution with respect to "spikes/high bills".

Referring water billing problems to 311 appears to have made the customer relations problems worse. The Task Force has found that billing issues may at times be too complex for a 311 generalist. In many respects it has created a barrier to CMUDs understanding of what customers are reporting as well as generate unnecessary customer frustration with the process. The Task Force believes that such customer frustration can be ameliorated were CMUD to address the more serious "spike/high bill" complaints to a more highly trained group of specialists.

CMUD should adopt a "Customer Bill of Rights". It would be a significant step forward in restoring trust, were the utility adopt such a document whereby customers fully understands their rights in dispute resolution. Such a simple statement could be added to the back of the hang tag that CMUD currently leave at the door after a Quick Check and/or included with correspondence from the utility during a dispute. A suggested Bill of Rights is provided in an appendix to this report.

CMUD needs to improve its tracking of reported problems. The Task Force believes that better tracking of problem categories would help identify problems early and answers found ahead of time. Trends in technical, administrative, and usage should be maintained and regularly screened.

CMUD lacks independent oversight and control. While the utility does employ an advisory group, it is not clear what power and influence this group currently maintains. Proper oversight would include real power to amend or influence CMUD executives regarding management, rate setting, and customer relations. The work of such a group would help provide clear and detailed information to City Council decision makers and better represent all CMUD customers. Lacking such an "empowered" group the Task Force would be willing to maintain contact with CMUD executives and provide regular input into the City Council.

CMUD lacks a comprehensive water audit process. Lacking a comprehensive way to resolve billing disputes does not provide the utility with a method of getting to "what" is wrong. Such a process would then help determine "who" has the responsibility for repair or adjustment. Currently, the information that comes back from a CMUD Quick Check to the homeowner does little to get to what the problem is, rather it communicates that CMUD does not believe it is their equipment that is a problem. This response and attitude is at the heart of what has damaged the reputation of CMUD and to the rise of community resentment.

Technical Measurement and Reporting Issues

The Task Force focused upon the issue of water use measurement and billing with particular attention to the problem of spiking water bills. (See Appendix 2) The group was reminded of initial CMUD staff, statements that spiked bills could not be explained and that they would be looking into likely causes of the few cases of significantly high water bills. The task force discovered that CMUD had been experiencing problems with high water bills for quite some time and were aware that telemetry issues were likely at the heart of the misreads and spikes. CMUD has been

replacing failed telemetry devices for several years without public notice. Concurrently, CMUD was nevertheless maintaining that billings were accurate.

The technical sub-group has reviewed the metering and reading equipment use by CMUD, reviewed best practices employed by other utilities, researched available options and has provided a number of observations and recommendations. Products from the meter to when the reading data is collected by the mobile or hand-held RF devices were reviewed. No review was completed on the route management software or methods used by CMUD for data integrity, tamper detection, no-reads or additional billing analysis. The study divides the products into five segments for analysis.

The Meter: This device measures the water through mechanical action and represents long-standing technology. No change is recommended, as this device is widely used and is proven to be accurate in measuring residential flows.

The Mechanical Elements of the Register: The visual odometer, flow indicator and sweep hand visually indicates water consumption and flow. The Register has a specific gear ratio for each meter size. Possible over registration could occur if the wrong register (different gear ratio) was installed on the meter. This can be identified by markings on the register face for each meter size. No change is recommended, as this element is adequate. We do suggest training and quality assurance programs for service personnel to assist in spotting problems related to human error.

The Electronic Elements of the Register: These internal components convert the visual reading into a digital signal and send data to the RF transmitter for collection and storage. The Badger Meter Model RTR employs a piezo electric switch. This technology may fail which would cause under or over electronic pulses sent to the RF transmitter. While this device does not require programming, it does require that the RF Transmitter be program to match this device. Any programming or human intervention to match an electronic reading with a visual reading introduces possible inaccuracies.

Intermittent connection problems or bad/damaged wires may also cause increased or decreased switches, that result in misreads, for the RF devices. The register does not allow for reverse flow to be measured in any way.

The Task Force recommends replacing the Model RTR with the newer Badger Meter Model ADE, Absolute Digital Encoder. The ADE register does not require the RF transmitter reading to be programmed and eliminates human intervention.

Consideration should be given to replacing the quick disconnect wiring, as they are an error source and could improve reliability.

The RF Transmitter: The RF Transmitter collects and stores the digital signal from the Electronic Register and transmits the digital reading to a receiver. CMUD employs two types of RF transmitters -- The 50W2 and the 60WP. The 50W2 affords poor packaging for a water meter pit environment that allows in some cases water to migrate onto the electronic PCB causing a high failure rate. The 60WP device appears to have far better environmental packaging and is far less prone to failure

There are two types of the preferred 60WP RF transmitters. One type is used to count electronic switches and another used for absolute encoders.

The Task Force recommends that CMUD use only the 60WP for Absolute Encoder Registers. This will greatly assist in the elimination of errors when matching visual and transmitter readings.

The Task Force recommends that when an RF transmitter does not match the visual reading, that both the RTR register and the RF transmitter be replaced with an ADE register and an Absolute Encoder RF Transmitter. It is also recommended that CMUD not allow re-programming when the RF transmitter fails to match the visual reading.

The Mobile or Handheld Receiver: These devices receive the RF transmissions from storage and upload data to route management software.

The Task Force recommends that CMUD upgrade software to Itron Choice Connect Collection application so that system administrators and service representative can alert customers to potential leaks and reverse flow. Service technicians should not be allowed to re-program RF transmitter to match visual readings.

Common Measurement Problems:

Customer Leaks: It is believed that some of over usage by CMUD customers is related to leakage. It is likely that drought-related ground shifting may have damaged underground water lines on the customer side of the meter. Many of these leaks are difficult to find.

Transmission Errors: Electronic transmitters can fail or operate sporadically giving over, under and zero reads to data collectors. Among likely causes are: blocked signals when reading vehicles pass by transmitter; damaged wires or casing causing failures; electrical interference during or prior to readings, dead or failing batteries, and human collection errors.

Excessive Use: Infrequently, customers will inadvertently allow water to run due to damaged pipes, hoses, or appliances. Most commonly, slow leaking toilets can be the cause of significant water waste. In addition, customers often are not sensitive to change in usage habits cause by a change of seasons

Irrigation Leaks: While many customers turn off their irrigation systems at the control box during off seasons, unless they cut the water off at the source near the water meter, the irrigation system remains charged. If a leak is present within the irrigation system, water will be wasted all year round. This consistent and often unseen leakage can raise the base level of water consumption every month. The Water Audit recommended in this report would discover such leaks.

Comprehensive Water Audit Process

A Comprehensive Water Audit Process is needed to ensure both CMUD and the customer that the problem is being appropriately addressed. The Task Force believes that water audits should be performed systematically at three levels.

Level 1: Conduct CMUD's Quick Check at the meter. If this process does not resolve the issue to the customer's satisfaction or nothing can be found there, the investigation should go to the next level of inquiry.

Level 2: Customer is offered a no charge Water Audit investigation. The Water Audit inspection should start at the meter and continue on the other side of the meter.

If a model 50W-2 transmitter is found at the meter box (there are still about 150,000 of these less reliable units in service), it should be replaced by the Water Auditor with the new more reliable 60WP model even if the transmitter and register are in agreement. The register should also be changed to the ADE mode. A recheck of all the components should be conducted at the meter box (right meter with right register, etc.).

Testing should include a measurement of water quantity flowing. The Water Audit should also include an isolation of the feed line to the home for leaks, and a check of all toilet tanks with leak dyes and water faucets looking for leaks. In addition, the Audit should include an examination of any changes in usage habits or events that may have resulted in a higher bill. (e.g., left an outside faucet on, over watered a lawn, installed a pool, etc.).

These tests and reviews should be done by an independent CMUD Certified Water Auditor (similar to the existing certified back flow testers) so the results will be accepted by the homeowner and CMUD. If a leak is suspected the Water Auditor should have the necessary equipment to find the leak.

At the end of the Water Audit there should be a written report provided to CMUD and the homeowner. If the problem is found on the homeowner side of the meter, the homeowner is advised of the findings. The costs of making any repairs on the homeowner side should be paid by the homeowner.

To avoid conflicts of interest, the Certified Water Auditor should not be permitted to do repairs on a property that they inspect. If the Water Audit finds no problem with leaks or changes in usage habits, then it is recommended that the "spike/high bill" be resolved by the homeowner paying the average of the previous 12 months (not including the spike) and the matter be closed. If the problem is found in an area of CMUD's responsibility, then CMUD should make the repair and the bill should be adjusted to paying the average of the previous 12 months (not including the spike).

If that is not acceptable, then the matter should go to Level 3 for resolution.

Note: No doubt funding of the Certified Water Auditors will be raised as a barrier to implementation. The Customer Service Subcommittee has considered this and recommends funding should be the same as the way locating underground utilities is

now funded. The homeowner calls 611 and requests that they be marked before digging. They are marked at no charge, but funded by a small monthly charge on customer utility bills for this purpose. It is recommended that for the next two years (review amount and adjust to reflect need after two years) a fee of \$.25 should be added to each monthly bill for the training and costs of providing "Water Audit Inspections". This would raise about \$61,000 per month or enough to cover about 700 to 800 Water Audits per month.

At the end of the Water Audit process, more information will be known by both CMUD and the homeowner and it is likely responsibility will be clearer and resolution will follow. The Customer Service Subcommittee believes this both sides of the meter type of Audit will resolve most disputes by identifying root causes plus the Audit will have a side benefit of eliminating leaks thus promoting water conservation. However, this will not always define responsibility as CMUD acknowledges that some "spikes/high bills" cannot be explained. If CMUD and the customer cannot reach resolution as suggested above, then there needs to be a final Dispute Resolution Board as outlined in Level 3 below.

Level 3: Customers are offered the opportunity to appeal to a Water Dispute Resolution Board for resolution. CMUD does not have this now. CMUD makes the determination of what is right and the customer either pays or faces water shut off. That is not reasonable, fair or sustainable. The North Carolina Utilities Commission (CMUD is not subject to this) requires just such an appeal Board for this purpose.

Recommendations

The Task Force offers the following recommendations to the Charlotte City Council regarding how best to resolve customer dissatisfaction and restore trust in the management of CMUD.

Financial Management

Recommendation # 1: Restore billing tier structure to pre-drought model containing only three tiers with rates at the current level for tiers one through three.

Recommendation # 2: Establish incremental increases to Tier One pricing with a target of bringing the rate closer to the North Carolina state average rate for subsistence level users.

Recommendation # 3: Re-examine expenditures planned for the Capital Improvement Program (CIP) and base decisions regarding contracting for projects that require the use of operating funds. Such expenditures should be based upon the availability of funds and decisions made more toward the end of each fiscal year.

Recommendation # 4: Employ an outside consultant to examine the CMUD rate structure and its CIP. Emphasis should be given to establishing an equitable "conservation" component and a common sense approach to building capacity at an appropriate rate.

Recommendation # 5: When hiring a new Director for CMUD, look for strong leadership skills as well as extensive experience in successfully managing a large utility.

Recommendation # 6: Establish an effective oversight mechanism employing people with expertise in utility management and operations. Such experts would independently advise the City Council on budgets, rates, and management issues.

Recommendation # 7: Explore ways to increase the amount of money charged for Water and Sewer connection and capacity fees [as well as impact fees] for projects that benefit developers, rather than placing the burden on current CMUD customers.

Recommendation # 8: Reexamine the use of utility funds for city generated repair and relocation projects that are outside the scope of the utility's role. Looks for ways to reimburse the utility for tax supported projects.

Customer Service

Recommendation # 9 : Place a moratorium on water cut-offs related to spiking bills until and full investigation has taken place and both CMUD and the customer have a full understanding of what caused the billing spike. In the interim, customers should be charged the average usage for the previous twelve months not counting the spike months. This policy change should be a high priority given the current circumstances.

Recommendation # 10: Enhance the "Quick Check Inspection" to include direct contact with the customer, a simple demonstration of the "slow flow dial" together with the provision of literature to the customer regarding methods of finding and resolving leaks if they are indeed identified.

Recommendation # 11: City Council should direct CMUD to adequately fund its Customer Service function by considering moving money from other functions to inspections staffing and increased customer service. Because of the complexity of many high bills, these should be referred directly to CMUD and not 311.

Recommendation # 12: Adopt a comprehensive model for addressing high bills and spikes that focuses on what is causing a billing issue and how can the problem be resolved to the satisfaction of both CMUD and the customer. A "straw man" model of such an approach is provided at the end of this report.

Recommendation # 13: CMUD needs to improve its tracking of reported problems and how they are resolved. The Customer Service Subcommittee recommends that CMUD develop better tracking of problem categories so trends can be identified early and answers found. We recommend that these be reviewed on a monthly basis. Trends in technical, administrative and usage should be maintained and screened.

Recommendation # 14: An oversight board should be appointed to advise City Council on CMUD management practices. This oversight Board should be appointed to monitor CMUD operations and report directly to City Council. The current responsibility of the oversight group, in tracking issues, is basically very narrow. This would help with Budgeting issues as well as giving the City Council a "heads up" notice on other issues.

Recommendation # 15: Members of the Task Force should continue to meet with CMUD every 90 days or as appropriate for the remainder of 2010 to see what progress has been made and report its Findings to the Mayors of Cornelius and Charlotte. It is imperative with all that has happened and the current level of disillusionment with CMUD that Customer Service at CMUD must change. Routine follow up by the Task Force members could provide feedback on what changes have been made or are in progress.

Recommendation # 16: It is recommended that when a permanent Director is appointed, that the Task Force meet with him/her to outline the history of the situation and our recommendations. Whoever is appointed should have the benefit of learning what we found and why we have recommended what we recommended.

Recommendation # 17: Fully implement and make available to all customers a Comprehensive Water Audit as outlined in this report.

Recommendation # 18: Implement an Appeal Board to hear disputes and resolve them. This should include a standard policy of resolution for "unexplainable" high bills that uses the previous 12 months average usage as a resolution model for the months in dispute. This should include a standard policy of resolution for "unexplainable" high bills, such as, a system that allows for the prior average billing for dispute resolution. Part of any resolution process should be criteria and process by which customers who paid excessively high bills due to faulty equipment be offered appropriate credit based upon the lowest effective tier at the time of usage.

Technical Measurement and Reporting

Recommendation # 19: CMUD should continue working with meter and telecommunication vendors to determine root cause of the spike issue. The transmitters and registers should be thoroughly tested not only for functionality, but also for how faults may occur through performing fault induced testing. If the billing software is suspect, it too should be evaluated.

Recommendation # 20: Since there remains a number of unexplained irregular meter/transmitter readings that have resulted in inaccurate billings, it is recommended that UNCC Department of Electrical Engineering be approached as a potential resource for evaluating this matter with a fresh perspective. With such of high caliber talent at the schools disposal, this topic might be a perfect case study that could provide answers.

Recommendation # 21: CMUD should accelerate the installation of the Itron 60WP Endpoint transmitter [or its equivalent] throughout the system. This newer technology especially if it is fitted with leak detection and reverse flow capabilities would greatly reduce water measurement issues.

Recommendation # 22: The Task Force recommends that when an RF transmitter does not match the visual reading, that both the RTR register and the RF transmitter be replaced with an ADE register and an Absolute Encoder RF Transmitter. It is also recommended that CMUD not allow re-programming when the RF transmitter fails to match the visual reading.

Recommendation # 23: For new installations or replacements, the Task Force recommends the newer Badger Meter Model ADE, Absolute Digital Encoder. The ADE register does not require the RF transmitter reading to be programmed and eliminates human intervention.

Recommendation # 24: The Task Force recommends CMUD change the Invitation to bid specifications for Water Meters to exclude meter registers that employ Pulse or Switch Closure register technology. Absolute encoder technology that identifies the odometer wheel position should be specified.

Resources

Charlotte-Mecklenburg Utilities FY '10 – '14 Capital Improvement Program, dated July 1, 2009.

Briefing to Charlotte City Council; "Financial Impact of Drought" dated March 5, 2008; CMUD PowerPoint Presentation.

Briefing to Charlotte City Council; "Financial Impact of Drought" dated April 7, 2008; CMUD PowerPoint Presentation.

Charlotte-Mecklenburg Utilities, FY 2007 Year End Report; dated July 2007.

Charlotte-Mecklenburg Utilities FY 2008 Year End Report; Strategic Planning; Measuring Performance; dated July 2008.

Charlotte-Mecklenburg Utilities FY 2009 Year End Report; Strategic Planning; Measuring Performance; dated July 2009.

Utilities Financial Policies and Operations Review; Charlotte-Mecklenburg Utilities; Prepared by Budget and Evaluation, City of Charlotte, dated May 21, 2008.

Charlotte-Mecklenburg Utility Department; CMUD Water and Sewer Extension Policy, dated May 26, 1992.

Raftelis Financial Consultants, Inc., Rate Study, dated July 14, 2006.

Official Statement; Water and Sewer Revenue Refunding Bonds, Series 2009. relating to \$ 93,765,000; dated July 30, 2009.

Itron White Paper, 60 Series Endpoints, "Detecting Leaks and Reverse Flow with 60 Series Endpoints, 2008.

Technical Brief, Recordall® Cold Water Bronze Disc Meter, BadgerMeter, Inc.

Technical Brief, Model ADE, Absolute Digital Encoder, BadgerMeter, Inc.

Charlotte-Mecklenburg Utilities, Water and Sewer Connection and Capacity Costs, Effective 7/01/09 through 6/30/10.

North Carolina League of Municipalities, "Water and Wastewater Rate Structures in North Carolina, March 2009.

Appendix One:

The Utility Customer Bill of Rights

1. *The right to be treated with respect and dignity at all times by utility staff.*
2. *The right to an accurate billing with complete and detailed responses to billing or service inquiries.*
3. *The right to fair and equitable rates associated with services received.*
4. *The right to pay only for the cost of providing service to existing customers.*
5. *The right to continued service when a billing dispute is under investigation.*
6. *The right to appeal a billing dispute to an independent authority.*
7. *The right for all communities in Mecklenburg County to be represented by an independent oversight board.*

Appendix Two:

Water Use History Charts

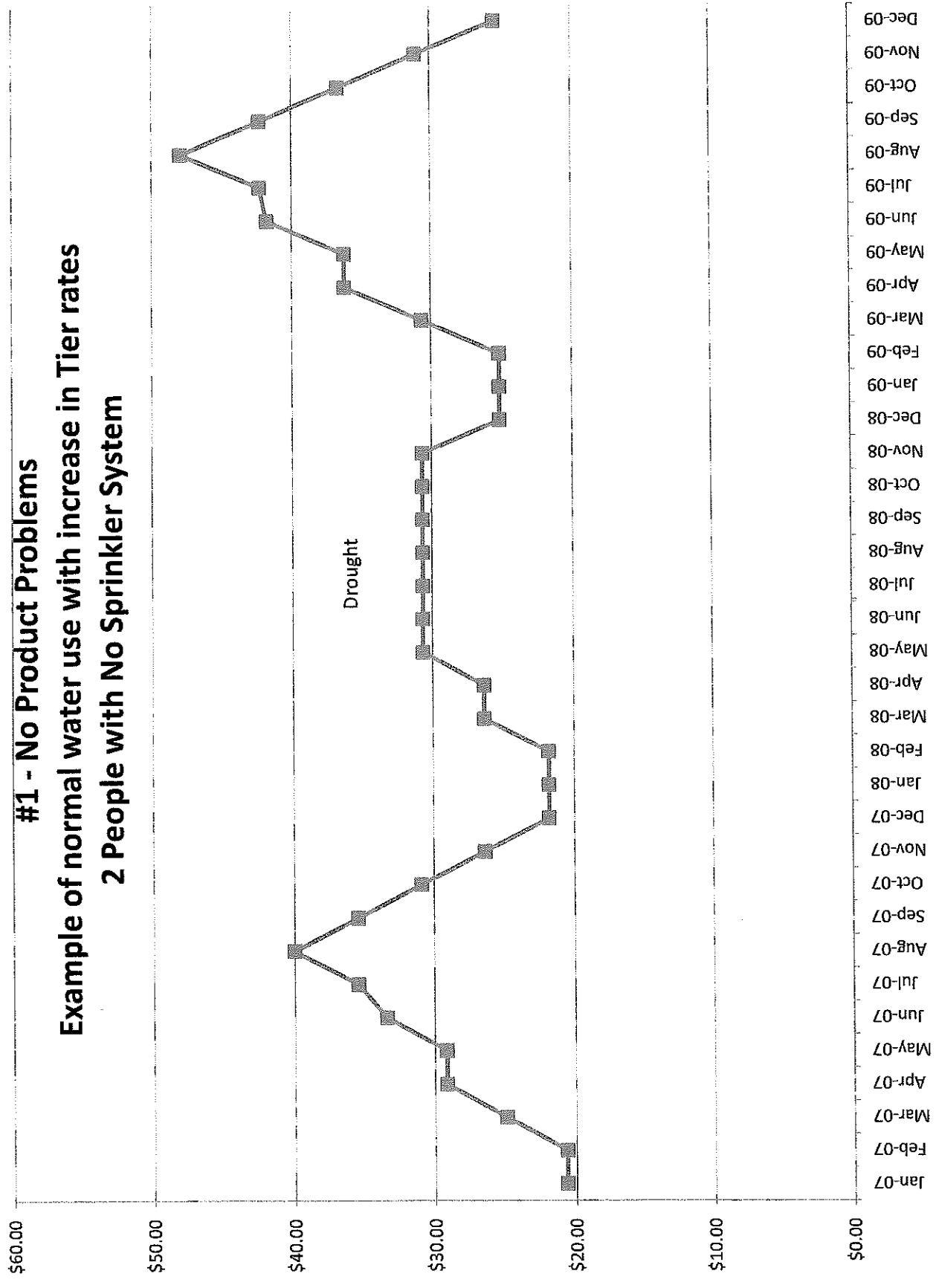
This appendix contains six charts that display the effects of CMUD rate structure changes upon different classes of customers. These charts were developed to represent examples of monthly bills when the visual read [actual consumption] and the RF transmitter do not accurately match. Three charts were done for each of the two primary examples: 1) two residents without an irrigation system; and 2) four residents with an irrigation system. The use of the term "product" in each chart refers to the measuring and reporting devices installed by the utility.

- Chart #1 is an example an example of normal usage by two people with no meter/transmitter problem, some moderate outdoor watering during the warm months, but without an irrigation system. This base line chart represents usage that corresponds month over month for the three year period, thus showing the effect of the changes to the tier structure.
- Chart #2 is an example of a "high RF reading", using the base line data in Chart #1. It shows that the RTR register or RF Transmitter over records the electronic switches at 25% of one billing unit rate per month, but this could also happen in a one month period. Given a customer dispute; the meter is verified and re-set with the visual read. This chart indicates that the visual read was one in July 2009 and the customer would be provided a credit on his bill.
- Chart #3 is an example of a "low RF reading", again using the base line data of Chart #1. It shows that the RTF register or RF Transmitter under records the electronic switches at 25% of one billing unit rate per month, this could also happen in a one month period. This error is corrected when the utility identifies zero usage; the meter is verified and re-set using the visual reading. The chart shows the visual read in July 2009 which results in the customer being billed for the water used, but previously not reported. In this case, the customer did use the water, but not during the month for which he was billed. More importantly, this customer is billed for water at the newly established higher tier, despite having used the water under a lower billing structure.
- Chart #4 is an example of normal usage by four people with no meter/transmitter problem, but with an irrigation system. This base line chart represents usage that corresponds month over month for the three year period, thus showing the effect of the changes to the tier structure. *Note: The billings for similar year-over-year usage are substantially higher due to the rate increase and the dramatic increase related to the change in the tier structure.*
- Chart #5 is an example of a "high RF reading", using the base line data in Chart #4. It shows that the RTR register or RF Transmitter over records the electronic switches at 25% of one billing unit rate per month, but this could also happen in a one month period. Given a customer dispute; the meter is verified and re-set with the visual read. This chart indicates that the visual read was one in July 2009 and the customer would be provided a credit on his bill.

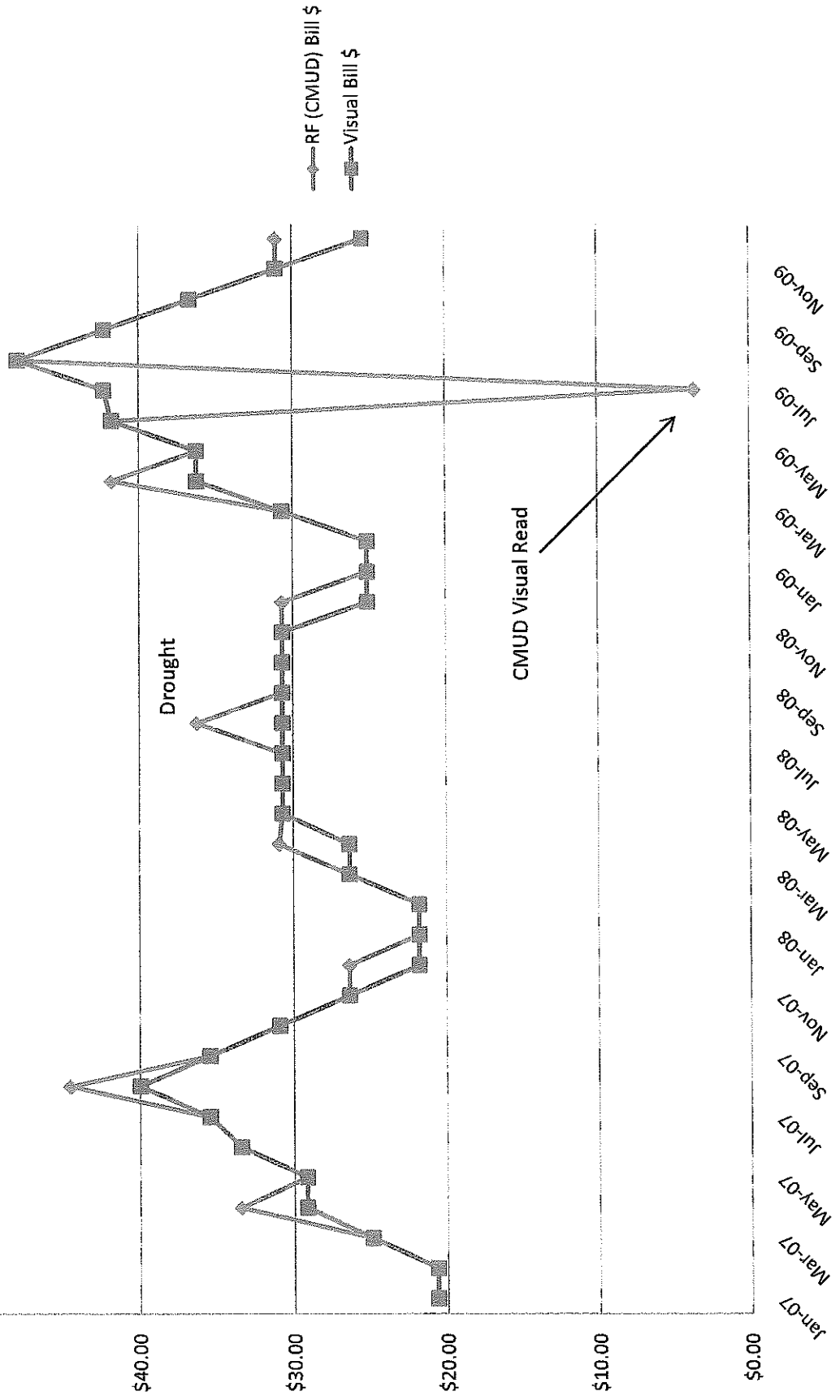
- Chart #6 is an example of a "low RF reading", again using the base line data of Chart #4. It shows that the RTF register or RF Transmitter under records the electronic switches at 25% of one billing unit rate per month, this could also happen in a one month period. This error is corrected when the utility identifies zero usage; the meter is verified and re-set using the visual reading. The chart shows the visual read in July 2009 which results in the customer being billed for the water used, but previously not reported. In this case, the customer did use the water, but not during the month for which he was billed. More importantly, this customer is billed for water at the newly established higher tier, despite having used the water under a lower billing structure.

Conclusion: These charts show two principal causes for customer discontent: 1) paying a significantly higher price for same level usage; and 2) having to pay a higher price for water actually used under a lower billing structure. Billing errors due to over and under reads can be dealt with to a customer's satisfaction, if errors are recognized and appropriate adjustments made.

#1 - No Product Problems Example of normal water use with increase in Tier rates 2 People with No Sprinkler System



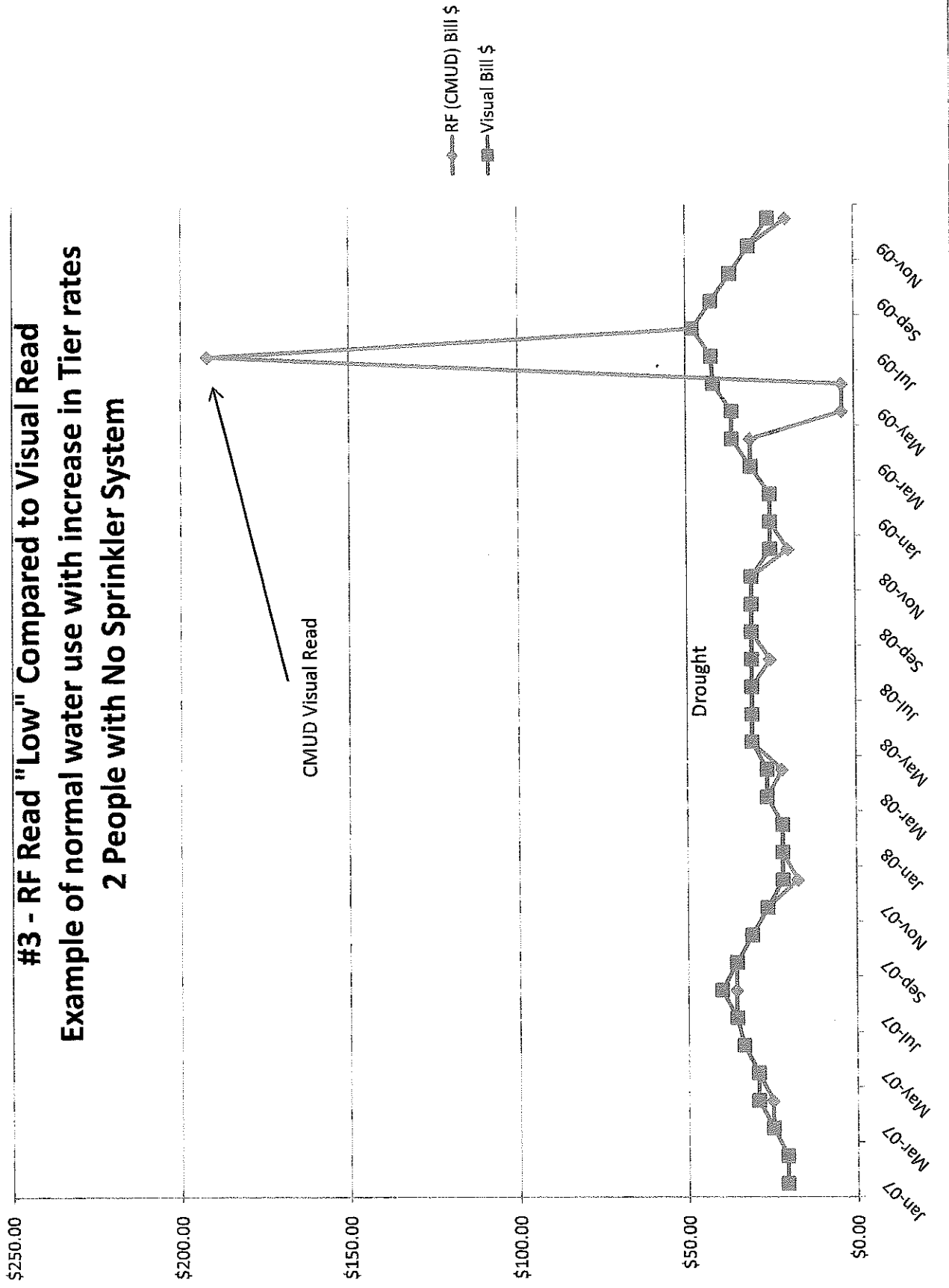
#2 - RF Read "High" Compared to Visual Read Example of normal water use with increase in Tier rates 2 People with No Sprinkler System



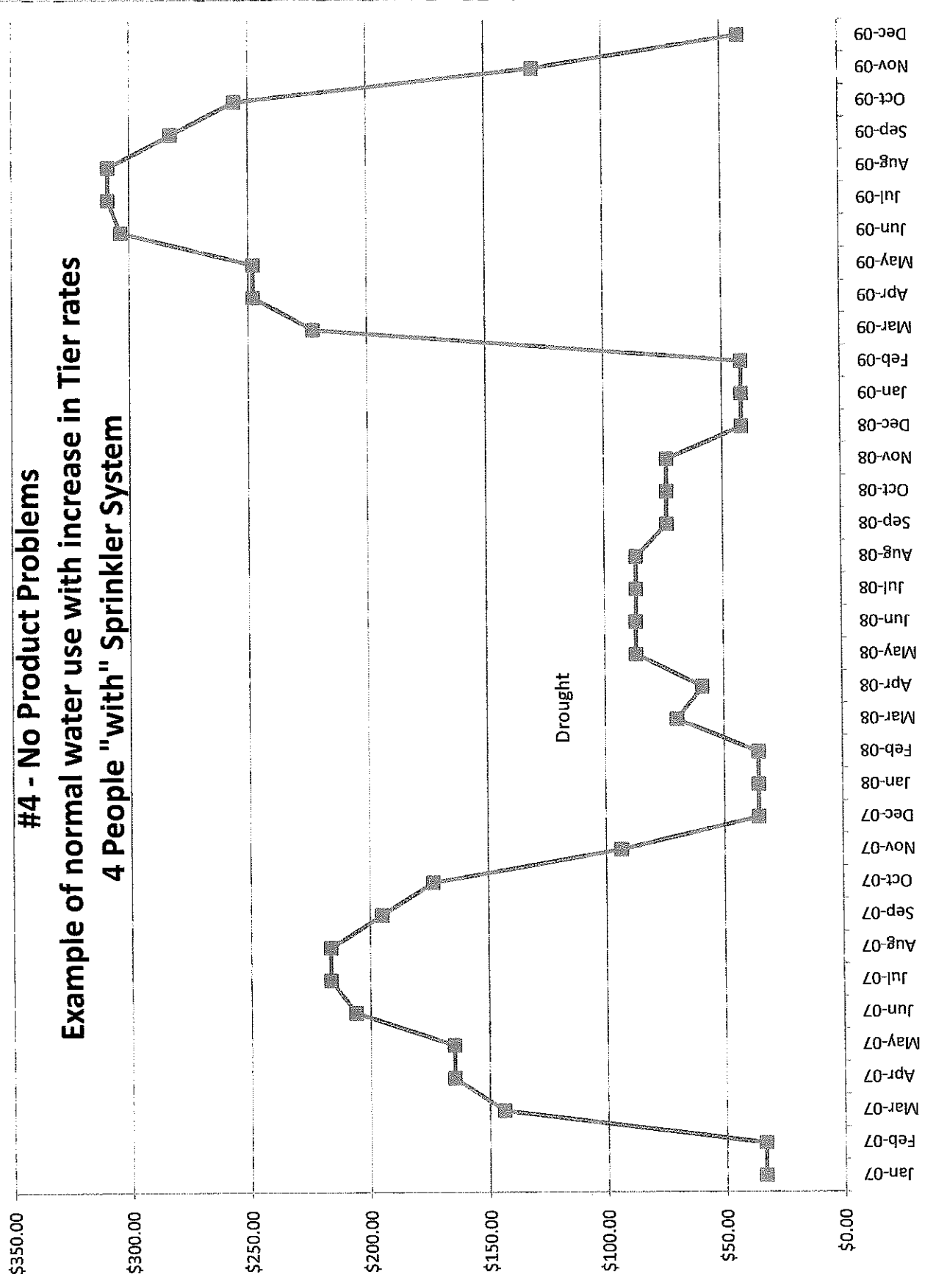
#3 - RF Read "Low" Compared to Visual Read

Example of normal water use with increase in Tier rates

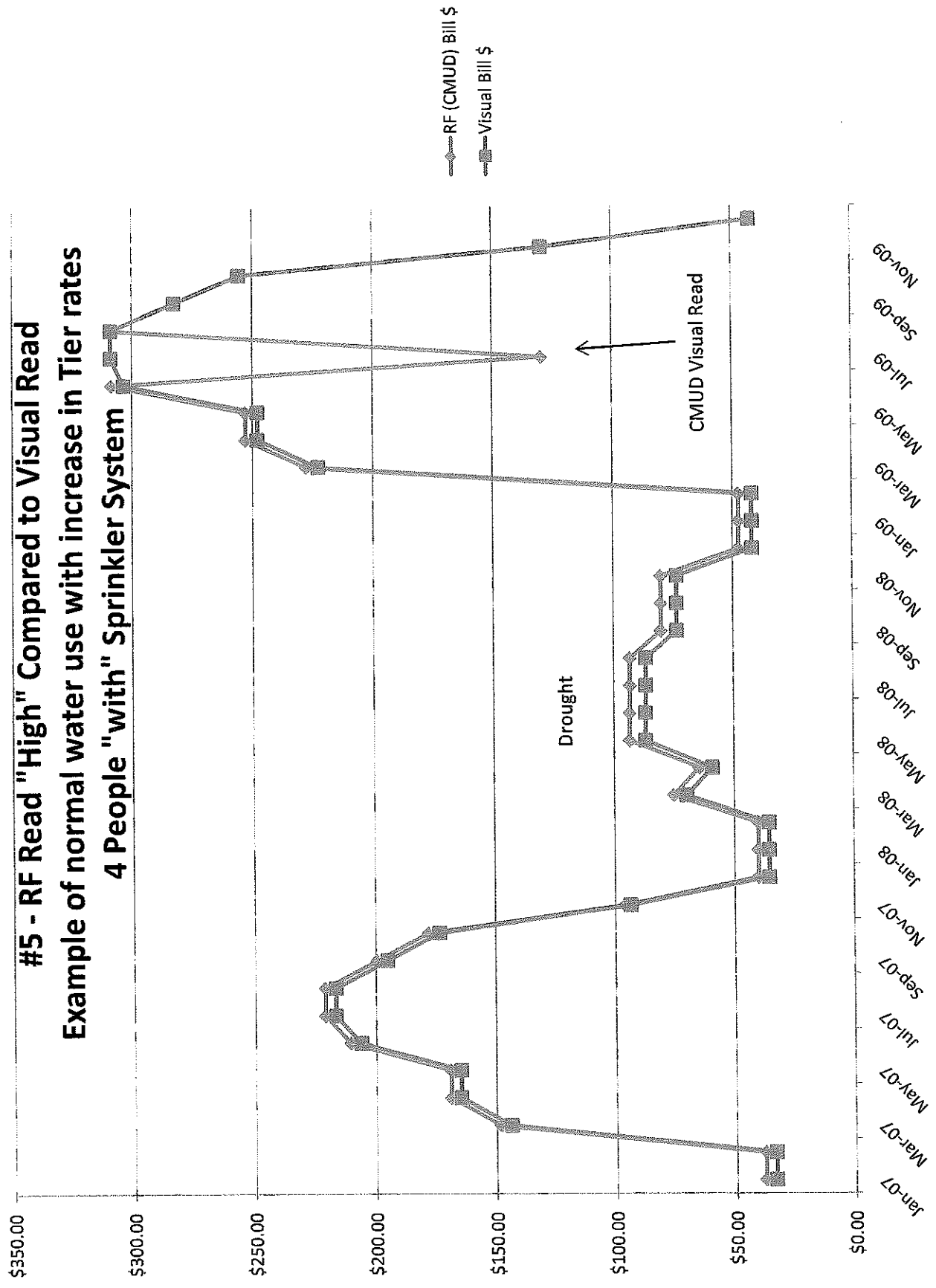
2 People with No Sprinkler System



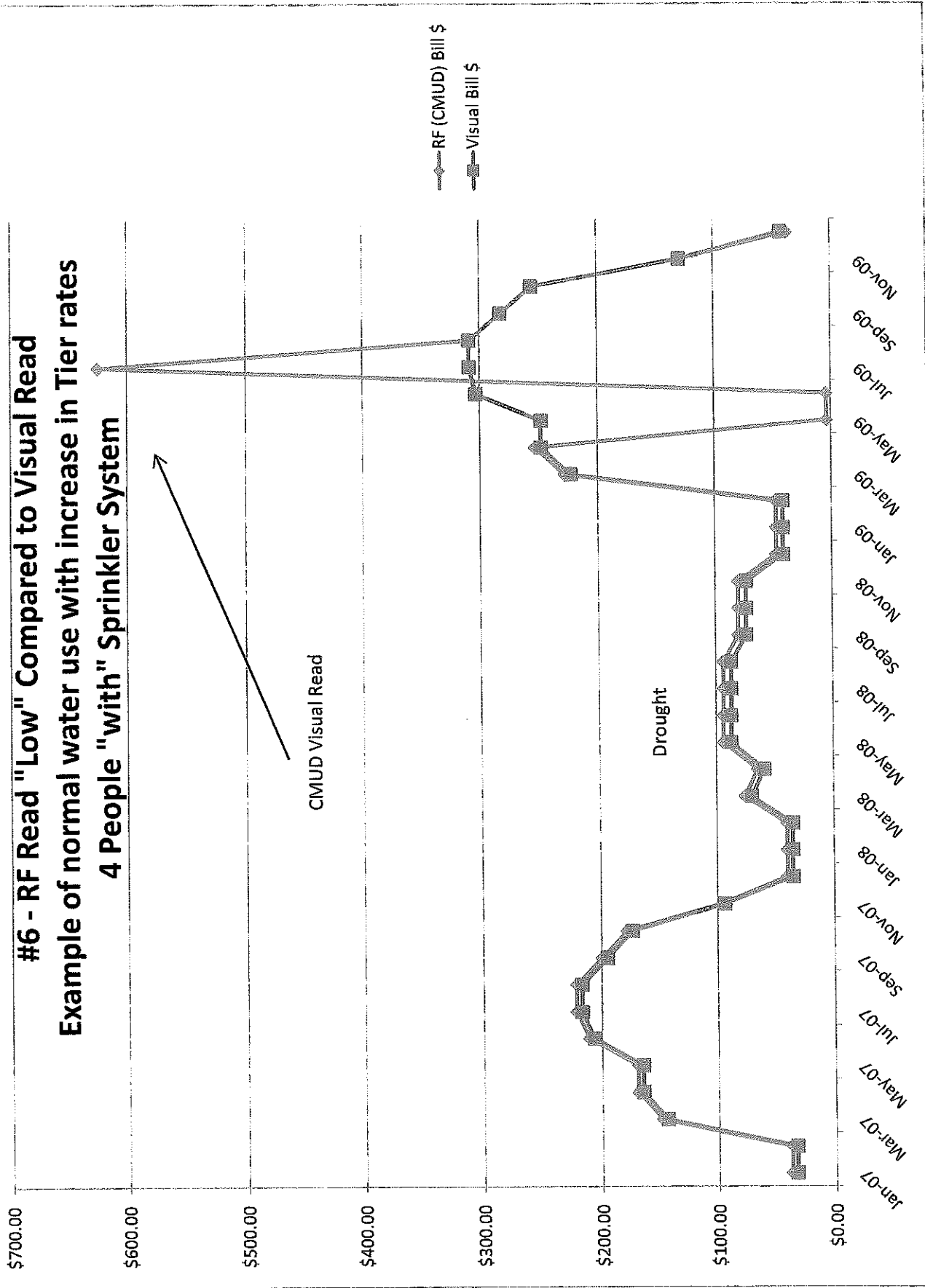
#4 - No Product Problems Example of normal water use with increase in Tier rates 4 People "with" Sprinkler System



#5 - RF Read "High" Compared to Visual Read Example of normal water use with increase in Tier rates 4 People "with" Sprinkler System



#6 - RF Read "Low" Compared to Visual Read Example of normal water use with increase in Tier rates 4 People "with" Sprinkler System



Charlotte Mecklenburg Utilities Department
Summary of Water Charge Increases 2001 to 2010

ccf	10 Year Inc										3 Year Inc			Post Drought Summary*			Inc
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Inc	Inc	Inc	2007	2008	2009	2010
1	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.38	\$ 1.45	38%	13%	13%	\$ 6.77	\$ 6.97	\$ 7.17	\$ 7.60
2	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.38	\$ 1.45	38%	13%	13%	\$ 5.46	\$ 4.28	\$ 5.22	\$ 7.45
3	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.38	\$ 1.45	38%	13%	13%				
4	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.38	\$ 1.45	38%	13%	13%	\$ 12.23	\$ 11.25	\$ 12.39	\$ 15.05
5	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.56	\$ 1.64	56%	28%	28%	Nominal Users - 9ccf or 6732 Gal.			
6	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.56	\$ 1.64	56%	28%	28%				
7	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.56	\$ 1.64	56%	28%	28%				
8	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.56	\$ 1.64	56%	28%	28%	\$ 13.41	\$ 11.97	\$ 14.32	\$ 16.85
9	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 1.56	\$ 1.64	56%	110%	110%	\$ 26.82	\$ 28.98	\$ 34.02	\$ 37.80
10	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 2.56	\$ 2.89	156%	110%	110%				
11	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 1.25	\$ 1.28	\$ 1.33	\$ 2.56	\$ 2.89	156%	110%	110%	\$ 40.23	\$ 40.95	\$ 48.34	\$ 54.65
12	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 2.04	\$ 2.10	\$ 2.18	\$ 2.56	\$ 2.89	156%	28%	28%	Average Users - 16 ccf or 11,968 Gal.			
13	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 2.04	\$ 2.10	\$ 2.18	\$ 2.56	\$ 2.89	156%	28%	28%				
14	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 2.04	\$ 2.10	\$ 2.18	\$ 2.56	\$ 2.89	156%	28%	28%				
15	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 2.04	\$ 2.10	\$ 2.18	\$ 2.56	\$ 2.89	156%	28%	28%	\$ 22.44	\$ 25.53	\$ 34.04	\$ 35.68
16	\$ 1.05	\$ 1.05	\$ 1.09	\$ 1.09	\$ 1.17	\$ 2.04	\$ 2.10	\$ 2.18	\$ 2.56	\$ 2.89	156%	28%	28%	\$ 49.32	\$ 51.52	\$ 60.48	\$ 67.60
17	\$ 1.05	\$ 1.50	\$ 1.56	\$ 1.82	\$ 1.91	\$ 2.04	\$ 2.10	\$ 2.18	\$ 5.05	\$ 5.32	407%	153%	153%				
18	\$ 1.05	\$ 1.50	\$ 1.56	\$ 1.82	\$ 1.91	\$ 2.04	\$ 2.10	\$ 2.18	\$ 5.05	\$ 5.32	407%	153%	153%	\$ 71.76	\$ 77.05	\$ 94.52	\$ 103.28
19	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 1.91	\$ 2.04	\$ 2.10	\$ 2.18	\$ 5.05	\$ 5.32	322%	153%	153%	Above Average Users - 20 ccf or 14,960 Gal.			
20	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 1.91	\$ 2.04	\$ 2.10	\$ 2.18	\$ 5.05	\$ 5.32	322%	153%	153%				
21	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 1.91	\$ 2.04	\$ 2.10	\$ 2.18	\$ 5.05	\$ 5.32	322%	153%	153%				
22	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 1.91	\$ 2.04	\$ 2.10	\$ 2.18	\$ 5.05	\$ 5.32	322%	153%	153%				
23	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%	\$ 29.22	\$ 47.23	\$ 54.04	\$ 56.96
24	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%	\$ 59.60	\$ 64.40	\$ 75.60	\$ 81.80
25	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
26	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%	\$ 88.82	\$ 111.63	\$ 129.64	\$ 138.76
27	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%	High Users - 30 ccf or 22,440 Gal.			
28	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
29	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
30	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
31	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%	\$ 50.22	\$ 73.09	\$ 104.74	\$ 110.16
32	\$ 1.26	\$ 1.50	\$ 1.56	\$ 1.82	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%	\$ 89.40	\$ 96.60	\$ 96.00	\$ 96.00
33	\$ 1.26	\$ 2.34	\$ 3.00	\$ 3.70	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%	* Includes Monthly Charge			
34	\$ 1.26	\$ 2.34	\$ 3.00	\$ 3.70	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%	\$ 139.62	\$ 169.69	\$ 200.74	\$ 206.16
35	\$ 1.26	\$ 2.34	\$ 3.00	\$ 3.70	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
36	\$ 1.26	\$ 2.34	\$ 3.00	\$ 3.70	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
37	\$ 1.26	\$ 2.34	\$ 3.00	\$ 3.70	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
38	\$ 1.26	\$ 2.34	\$ 3.00	\$ 3.70	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
39	\$ 1.26	\$ 2.34	\$ 3.00	\$ 3.70	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				
40	\$ 1.26	\$ 2.34	\$ 3.00	\$ 3.70	\$ 3.70	\$ 3.96	\$ 4.14	\$ 4.31	\$ 5.05	\$ 5.32	322%	29%	29%				

Wastewater Rates \$ 2.98 \$ 3.22 \$ 3.78 \$ 4.00

Tier 1 Tier 2 Tier 3 Tier 4

Source: CMUD Rate Report

Water and Wastewater Rates and Rate Structures in North Carolina

March 2009

This report details the results of a survey of FY 08-09 water, irrigation and wastewater rates and rate structures conducted by the North Carolina League of Municipalities and the Environmental Finance Center at the UNC School of Government¹. Rates and rate structures are analyzed for 498 local government and not-for-profit utilities throughout the State. For more information, or to download tables of every rate structure and its computed bills, use interactive Rates Dashboards designed to allow you to compare rates using multiple selection criteria, and to view rate sheets of individual utilities, please visit www.ncm.org or www.efc.unc.edu/projects/NCWATERates.htm.

Any reference to tables, figures or subheadings, whether in the table of contents or within the text, are hyperlinked. Click on them to jump to the corresponding page.

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¹ Partial funding for this activity was provided by the Public Water Supply Section of the North Carolina Department of Environment and Natural Resources.

What Utilities Charge their Customers

Residential Water and Wastewater Bills

Figure 12 and Figure 13 show the median amount utilities that bill their residential water and wastewater customers, respectively, for a range of consumption/disposal amounts on a monthly basis³. These calculations include base charges and consumption allowances. The colored bars highlight what the middle 80 percent of utilities charge (between the 10th and 90th percentile) across the consumption spectrum. Utilities that charge below or above the colored bars are charging less than or more than 90 percent of all other utilities in the sample, respectively.

Figure 12: Monthly-Equivalent Residential Water Bills by Consumption (n=521)

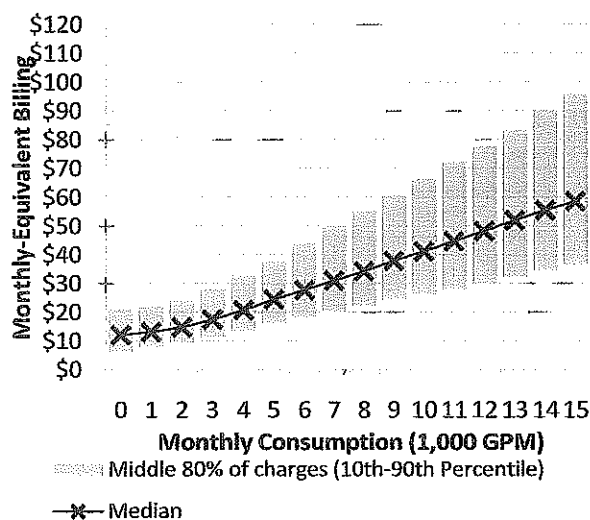
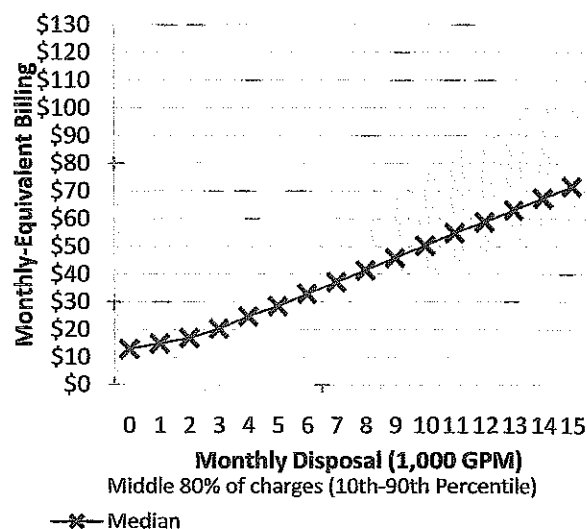


Figure 13: Monthly-Equivalent Residential Wastewater Bills by Disposal (n=412)



The median monthly amount charged for zero gallons of water is \$12.17, \$24.50 for 5,000 gallons, \$27.75 for 6,000 gallons, and \$41.25 for 10,000 gallons. As a point of comparison, a gallon of potable water at a major grocery retailer is approximately \$1.00 while the median bill for 6,000 gallons is approximately \$0.0046 per gallon, which is 216 times cheaper.

Wastewater bills are generally higher than water bills. The median monthly wastewater bill for customers disposing zero gallons of water is \$13.00, \$28.50 for 5,000 gallons, \$32.99 for 6,000 gallons, and \$50.44 for 10,000 gallons.

The range of combined water and wastewater bills for various levels of consumption is shown on Figure 14. The median monthly combined bill for zero gallons is \$24.50, \$52.52 for 5,000 gallons, \$60.20 for 6,000 gallons and \$91.25 for 10,000 gallons.

³ For utilities that bill on a non-monthly basis (bi-monthly or quarterly), charges have been calculated and presented on a monthly basis to allow for accurate comparison.

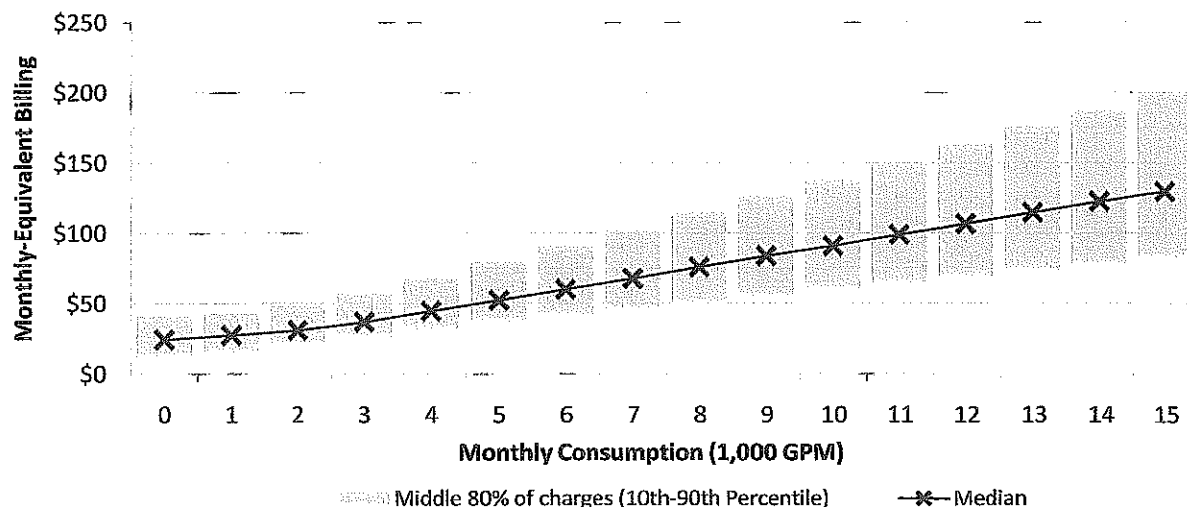
Figure 14: Monthly-Equivalent Residential Combined Water and Wastewater Bills by Consumption (n=384)

Table 4 shows that the median water bills among the largest utilities generally are lower than those of smaller utilities. This trend is not as evident for wastewater bills. Table 5 shows that municipal utilities generally have lower water and wastewater bills than other service providers, possibly because the population density is highest for municipal utilities, which translates into lower per customer costs (and therefore bills) for distribution and collection. Conversely, county utilities, which are typically more spread out, have the highest water bills.

Table 4: Median Water and Wastewater Monthly Bills at 6,000 GPM, by Utility Size

Size of Utility (Service Population)	Water Rate Structures		Wastewater Rate Structures	
	Total Number of Structures	Median Monthly Bill at 6,000 GPM	Total Number of Structures	Median Monthly Bill at 6,000 GPM
1 – 999	114	\$27.00	91	\$33.50
1,000 – 2,499	89	\$29.54	80	\$31.50
2,500 – 4,999	87	\$27.18	75	\$35.25
5,000 – 9,999	86	\$27.95	55	\$32.40
10,000 – 24,999	75	\$29.24	56	\$31.88
25,000+	68	\$26.32	51	\$32.12
All Rate Structures	521	\$27.75	412	\$32.99

Table 5: Median Water and Wastewater Monthly Bills at 6,000 GPM, by Utility Type

Utility Type	Water Rate Structures		Wastewater Rate Structures	
	Total Number of Structures	Median Monthly Bill at 6,000 GPM	Total Number of Structures	Median Monthly Bill at 6,000 GPM
Municipality	377	\$25.84	356	\$32.11
County/District	82	\$35.89	37	\$40.00
Sanitary District	19	\$31.00	9	\$37.00
Authority/Metropolitan District	8	\$34.33	8	\$38.07
Not-for-Profit	35	\$29.79	2	\$37.52
All Rate Structures	521	\$27.75	412	\$32.99

What Utilities Charge by River Basin

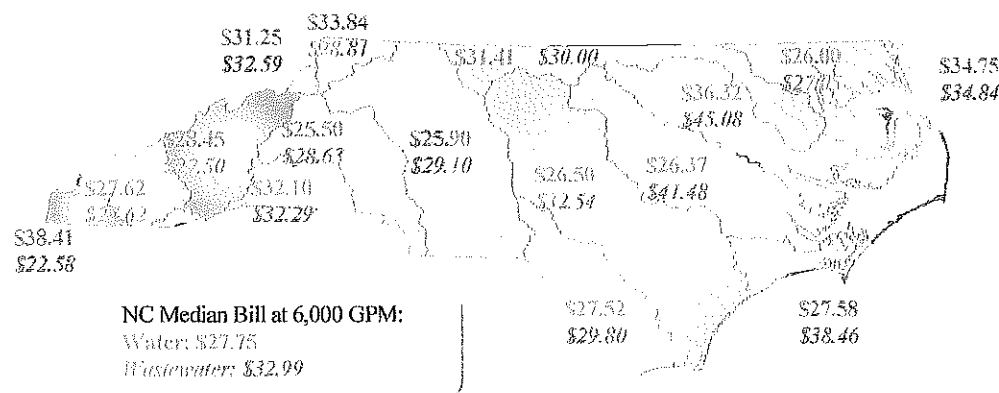
It is important to consider the operating environment when comparing rates among utilities. Source water quality and quantity can have a significant impact on the cost to produce water. Likewise, receiving water quality can have a major impact on the cost of wastewater treatment. In an attempt to consider these impacts, median water and wastewater bills for 6,000 GPM were calculated for each of North Carolina's 17 major river basins; they are displayed in Table 6 and Figure 23.

The highest median water charges in river basins with a sample of more than 10 rate structures can be found in the Tar-Pamlico River Basin. The lowest median water charges, by contrast, are found in the Catawba River Basin. The highest median wastewater charges can be found in the Tar-Pamlico and the Neuse River Basins, both of which are under stringent discharge regulations. The lowest median wastewater charges can be found in the Chowan River Basin.

Table 6: Median Water and Wastewater Monthly Bills at 6,000 GPM, by River Basin

River Basin	Water Rate Structures		Wastewater Rate Structures	
	Total Number of Structures	Median Monthly Bill at 6,000 GPM	Total Number of Structures	Median Monthly Bill at 6,000 GPM
Broad	17	\$32.10	12	\$32.29
Cape Fear	101	\$26.50	76	\$32.54
Catawba	42	\$25.50	40	\$28.63
Chowan	19	\$26.00	12	\$27.05
French Broad	25	\$28.45	17	\$27.50
Hiwassee	3	\$38.41	3	\$22.58
Little Tennessee	7	\$27.62	5	\$27.62
Lumber	39	\$27.52	27	\$29.80
Neuse	74	\$26.37	60	\$41.48
New	6	\$33.84	6	\$28.81
Pasquotank	20	\$34.75	12	\$34.84
Roanoke	32	\$31.41	25	\$30.00
Savannah	0	—	0	—
Tar-Pamlico	49	\$36.32	32	\$45.08
Watauga	4	\$31.25	3	\$32.59
White Oak	10	\$27.58	5	\$38.46
Yadkin-PeeDee	69	\$25.90	60	\$29.10

Figure 23: Median Water and Wastewater Monthly Bills at 6,000 GPM, by River Basin



Affordability of Residential Rates

What the Average North Carolinian Pays for 6,000 Gallons

The above figures and tables are useful in determining the range of rates that utilities across the state are currently charging. As mentioned above, the median price for 6,000 GPM across all the utilities is \$27.75 for water and \$32.99 for wastewater, using “inside” residential rates. This indicates that half of the 521 water rate structures in this sample charge more than \$27.75 for water for 6,000 GPM, and half of 412 wastewater rate structures charge more than \$32.99 for wastewater. However, as shown in Table 4, larger utilities may be charging lower rates because they are able to spread their costs across a large customer base. The utilities in this study serve over 7.1 million North Carolinians. If we assume that everyone in this sample pays “inside” rates only, the average North Carolinian in this sample would be paying a weighted average⁸ of \$26.07 for water, \$32.03 for wastewater or \$55.30 for combined water and wastewater for 6,000 GPM. These numbers represent a good estimate of average bills across the population of the state. The actual average bill for a North Carolinian for 6,000 gallons is likely to be higher however, since a substantial portion of the citizens are paying “outside” rates that are greater than “inside” rates as shown in Figure 24. Furthermore, some citizens may be paying a portion of their water bill through irrigation rates, making it impossible to accurately estimate what the average North Carolinian actually pays for 6,000 gallons.

Annual Bills as a Percent of Household Income

Is the weighted average bill of \$55.30 per month for combined water and wastewater for 6,000 gallons too high for most North Carolinians? Compared to monthly electric bills, gas bills, grocery bills, and even discretionary bills such as cable TV bills or high-speed internet bills, water and wastewater bills oftentimes make up a smaller portion of a household budget. Nevertheless, because citizens may not have an alternative to the water service they are currently receiving, and water service is necessary for public health, the issue of affordability of water and wastewater rates remains vital.

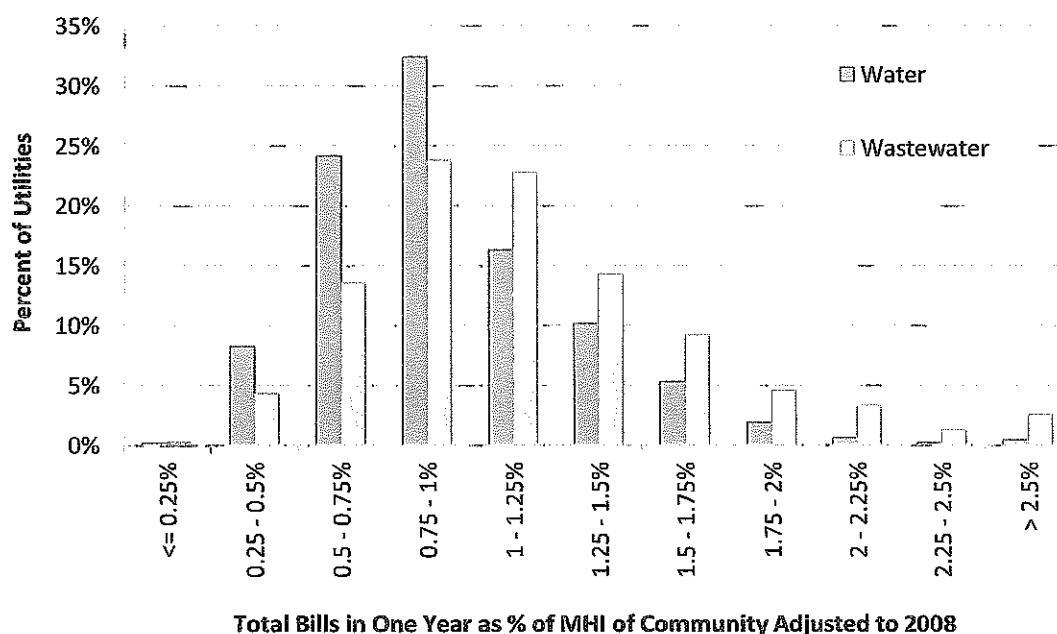
Affordability is very difficult to assess, and there is no one true, accurate measure for affordability. The most commonly used and most cited measure in the water industry is “percent MHI” – that is, calculating what a year’s worth of water and wastewater bills for an average level of consumption (e.g.: 6,000 GPM) is compared to the median household income (MHI) in the community served by the utility. This indicator is easy to calculate by simply using the calculated bill amount and the U.S. Census Bureau’s median household income data, available at <http://www.census.gov>. Since the nationwide Census is only administered every 10 years, an adjustment factor may be applied to adjust the household income data from year to year⁹.

Compared to the 2008-adjusted median household incomes of the communities served by 472 water and 391 wastewater utilities, annual bills for 6,000 GPM range from 0.5% MHI to over 2.5% MHI for each service, as shown in Figure 26. The majority of water rates fall between 0.5% and 1.25% MHI, with a median of 0.88% MHI across all utilities. Wastewater rates are higher, with the majority of wastewater rates falling between 0.75% and 1.5% MHI, and a median of 1.1% MHI across the utilities. For combined water and wastewater bills at 6,000 GPM, half of the utilities charge more than 1.98% MHI.

⁸ The “weighted average bill” is the average bill being paid by customers, taking into account the different utility’s rates and service populations, assuming that all of the customers are paying their utility’s bill for 6,000 GPM.

⁹ The U.S. Department of Housing and Urban Development (HUD) publishes income adjustment factors yearly at <http://www.huduser.org/datasets/il.html>.

Figure 26: Annual Bills for 6,000 GPM as a Percent of the Served Community's 2008-Adjusted Median Household Income (n=472 water, n=391 wastewater)



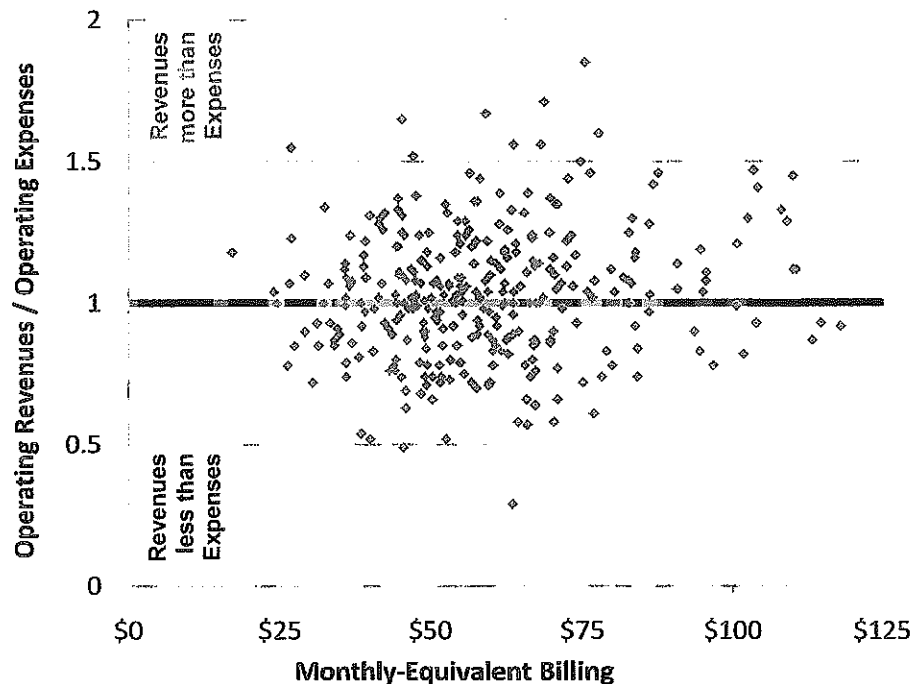
There is no single target for affordability, even in terms of percent MHI. Early reports within the Environmental Protection Agency, as well as by some agencies in the State of North Carolina, suggest that rates that exceed a point somewhere between 0.75% and 1.25% MHI, for either water or wastewater service, may be difficult to afford.

Do Prices Reflect the True Cost of Water Services in North Carolina?

Comparing rates across the State or among specific utilities is further complicated by the variation in the extent to which utilities charge the full cost of providing service. Rates that provide enough revenue to balance an annual budget do not necessarily provide enough revenue to cover long term capital and maintenance needs and many utilities charge much less than the full cost of service provision. Figure 27 shows rates from FY 2007-08 in terms of combined water and wastewater charges for customers using 6,000 GPM plotted against the ratio of operating revenue over operating expenses (including depreciation) from the same fiscal year. This measure, often referred to as an operating ratio, helps identify if an entity is operating at a financial loss, financial gain, or is breaking even. Financial data were provided by the Local Government Commission in the Department of the State Treasurer. The figure shows that many utilities are not covering their operating expenses, making it difficult or impossible to rehabilitate aging infrastructure, save for operating emergencies, finance system improvements and expansion, and engage in proactive asset management. It is interesting to note that the utilities that did not recover their operating expenses (operating at a financial loss) are not always charging low rates – even some utilities with high rates can be operating at a financial loss. Nevertheless, there are several utilities that charged low rates in FY 2007-08 (to the left of the graph), which resulted in operating at a financial loss (below the horizontal line on the graph) in that fiscal year.

Operating ratio as calculated here may be a flawed measure, however, due to the distorting effects of book value depreciation. Due to inflation, older plants' assets that were purchased long ago have nominally cheaper prices than assets of plants that are newer. This makes older plants' depreciation expense smaller in comparison to the depreciation of a newer plant with the same types of assets. In turn, this means that the operating ratio seems higher (better) for older plants than for newer plants, due to the effect of inflation. Despite this, the measure maintains a level of intuitive power which makes it a useful tool for examining the ongoing capacity for the utility to bring in enough revenue to cover its operating costs.

Figure 27: Combined Residential Bill in FY2007-08 for 6,000 GPM for Utilities with Reported LGC Data on Total Operating Revenues and Total Operating Expenses in FY2007-08 (n=324)



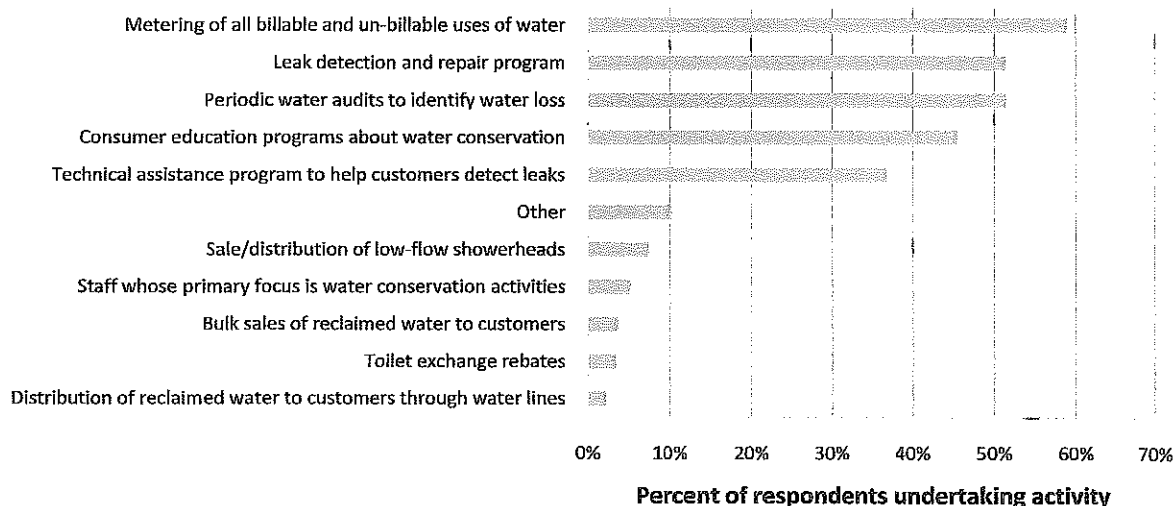
How Utilities Can Respond to Drought Conditions by Changing Rates, Rate Structures or Billing Periods, or Through Non-Price Strategies

Due to the recent (and ongoing) drought conditions, utilities under severe supply constraints are considering different options to manage demand as part of their water drought plans. These options may include a combination of pricing strategies as well as more structural or operational practices strategies.

As part of this year's survey, NCLM and EFC asked water utilities around the state to report on their non-price water conservation activities. Responses from 320 water utilities serving more than 5.6 million North Carolinians indicate that local utilities are making concerted efforts to reduce their customers' water consumption. The variety of strategies that have already been employed by utilities are shown in Figure 28.

Over 90 percent of survey respondents indicated that they had employed at least one of the non-price water conservation strategies in 2008. As shown in the figure, the most popular strategies were 1) metering of all billable and un-billable uses of water; 2) periodic water audits to identify water loss; 3) leak detection and repair programs; 4) consumer education programs about water conservation; and 5) technical assistance programs to help customers detect leaks. More than 85 percent of respondents had undertaken at least one of these five activities, and 70 percent were engaged in at least two of the five top activities to encourage water conservation.

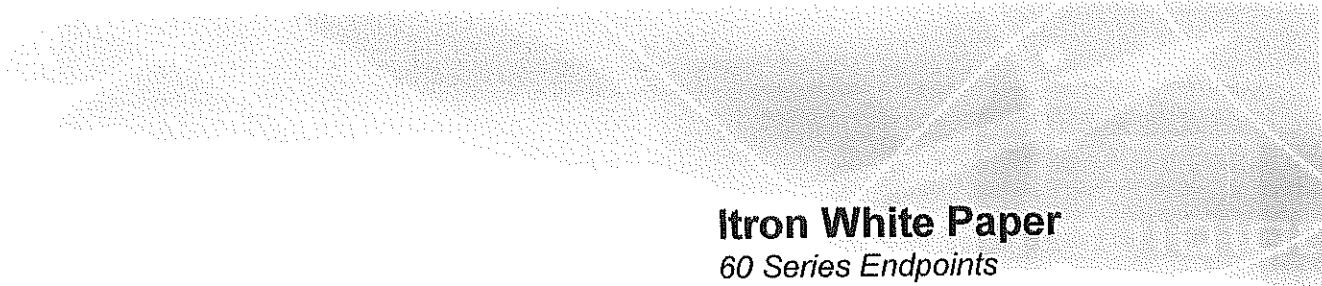
Figure 28: Non-Price Conservation Strategies Employed by Water Utilities in North Carolina in 2008



In addition to these operational strategies, utilities also may choose to employ pricing strategies to encourage conservation. Some options include changing the billing periods, changing the rate structure, raising the rates, or employing the use of drought surcharges.

Few utilities with bi-monthly or quarterly billing are considering switching to monthly billing cycles. Although this switch would increase meter reading, billing and accounting costs, customers who receive bills monthly receive quicker (and more frequent) feedback on their usage and conservation efforts. Additionally, utilities that include news and statements as inserts with the water/wastewater bills would be able to communicate with their customers more frequently under a monthly billing cycle.

Some utilities have considered switching their rate structures to ones that provide stronger price signals at higher ends of consumption, or using separate rate structures for irrigation meters charging rates that are higher than the residential water rates. Increasing block structures typically are assumed to provide a stronger conservation incentive than uniform rates or decreasing block structures — however, the Environmental Finance Center has shown that many utilities with uniform rates provide a price signal as strong as that of utilities with increasing block rate structures. This is a result of how the rate structure is designed. Careful selection of the base charge, consumption allowance with the base, the block endpoints, the rates and the difference in the rates between blocks are essential to designing a conservation-oriented rate structure. For advice on rate setting or more information on making appropriate rate comparisons, please contact Jeff Hughes (jhughes@sog.unc.edu) or Shadi Eskaf (eskaf@sog.unc.edu) at the Environmental Finance Center.



Itron White Paper

60 Series Endpoints

Continuing Itron's
commitment to innovation
and performance, the
60 Series endpoints
are designed to

Peter Sanburn / Allen Rogers
Itron Product Marketing

Itron



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Introduction

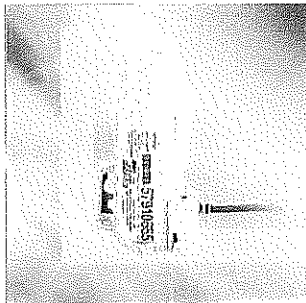
As demand on water distribution systems continues to grow, more and more utilities are striving to improve the quality of service they provide, reduce water loss, prevent theft or misuse, and educate customers on conservation strategies. Utilities seek to proactively create a smarter, more satisfied consumer, and ensure that Earth's most precious natural resource is used as efficiently as possible.

Itron's 60 Series water endpoints feature robust leak and reverse flow detection capabilities to help utilities realize these goals.

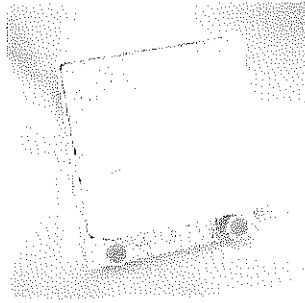
About 60 Series Water Endpoints

The intent of this white paper is to discuss the leak and reverse flow detection capabilities of Itron 60 Series endpoints (60W, 60W-R, 60WP and 60WP-R).

Designed for the water market, 60 Series endpoints are part of Itron's ChoiceConnect™ suite of data collection solutions. Created with simplicity and reliability in mind, these compact endpoints provide superior performance in harsh pit environments and all manner of remote applications.



60WP Endpoint



60W-R Endpoint

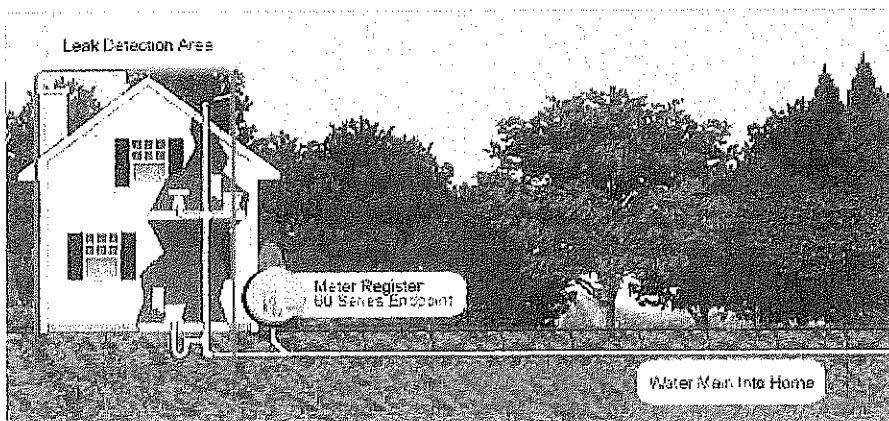
With features such as advanced leak, reverse flow and cut-cable tamper detection, as well as a 20-year battery life, utilities can deploy these endpoints to reduce operations and maintenance (O&M) expenses and improve customer satisfaction.

The 60 Series water endpoints utilize 50 radio channels randomly, selecting one channel for each data message. This multi-channel approach delivers improved reading performance over competing products by reducing the effect of interfering radio signals. Itron has also increased the 60 Series water endpoint's radio frequency (RF) output power and employed an advanced antenna to further improve meter reading performance.

These water endpoints work with Itron ChoiceConnect radio-based handheld computers and mobile collection systems.

Detecting Leaks with 60 Series Endpoints

The 60 Series endpoint provides system leak detection for any leaks occurring *after* the meter register.



The specific leak detection operating range is controlled by three parameters. These parameters determine:

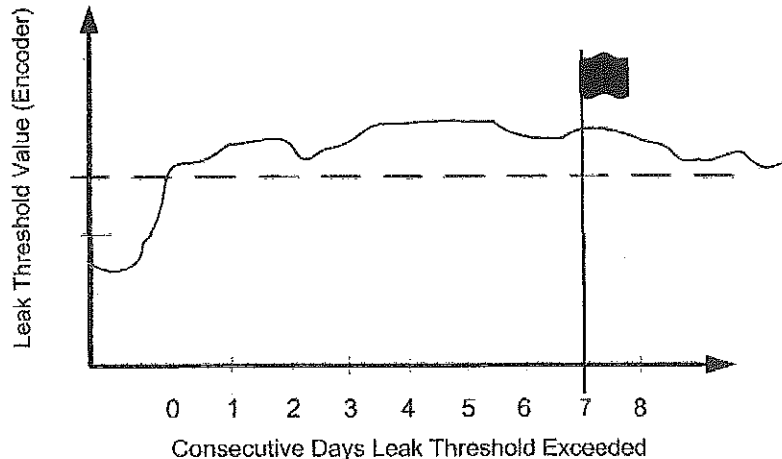
- 1) **Frequency** How often the endpoint checks for a leak.
- 2) **Time Period** How many consecutive non-zero flow periods have occurred and been reported by the endpoint.
- 3) **Threshold** How much water must flow during a presumed quiet period (period of time when little to no flow is typically registered) to be considered a leak.

Detection Methodology for Encoder-Style Registers

For encoder-style meters, the least significant digit reported by the register determines the smallest amount of water loss that can be considered a leak. Ittron sets the value for this parameter during the initial endpoint programming phase of the manufacturing process.

Detecting Leaks and Reverse Flow with 60 Series Endpoints

Once the lowest metered amount is repeatedly detected every hour over a monitoring period of seven (7) days, these defined parameters trigger the leak detection flag in the endpoint to activate.



The leak detection flag is then passed to the ChoiceConnect collection application so that system administrators or service representatives can alert customers to a potential leak.

Endpoint ID	Market	Reading	Tamper	Address
0203045	W		Leak	23 E. Main Street, Anytown, WA USA
0206626	W		Leak	36 E. First Avenue, Anytown, WA USA
0206942	W			39 E. Lincoln Blvd, Anytown, WA USA
0306213	W		Reverse	307 S. Brown, Anytown, WA USA

Tamper Change Properties

Route ID: Tamper Type:

Segment ID: Time:

Endpoint ID: Message Count:

Meter ID:

Reading:

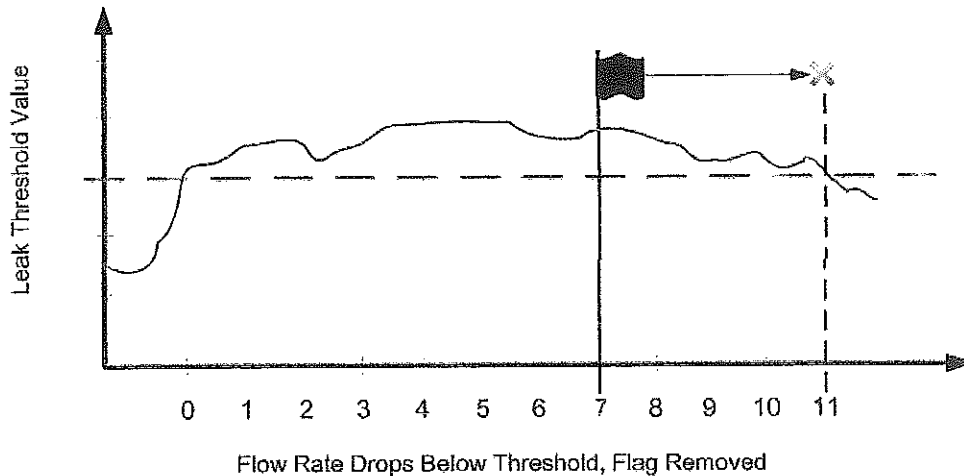
Address:

Mobile Interface PWR: On RCVR: On EXHIBIT: On

Tamper flag indicator in the MC3 Mobile Interface software application (part of ChoiceConnect)

Since this leak occurs after the meter register, utilities receive compensation for any lost water. To help educate customers and be proactive on stemming the tide of lost water, utilities can utilize the 60 Series endpoints to monitor for leaks and notify customers in a timely fashion. Potential issues can be addressed and action taken to correct the problem and prevent the customer from receiving a higher-than-normal bill—and the utility from receiving a potential bill complaint—during the next cycle.

The leak detection flag remains set until the metered flow drops below the least significant encoder register value. Once this occurs, the leak detection flag will be removed and the seven day period will reset.

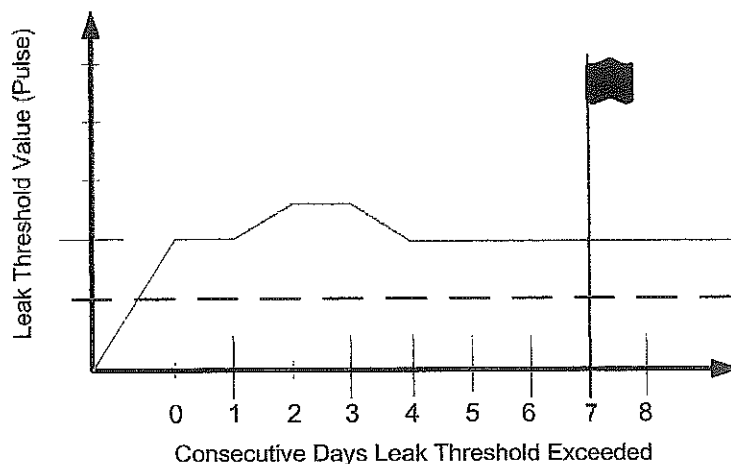


The ChoiceConnect collection system reflects the cleared tamper flag once a data packet is transmitted indicating the leak threshold is no longer being exceeded.

Detection Methodology for Pulser-Style Registers

The detection methodology for pulser-style registers is very similar to that for encoder registers. The metered flow that generates one pulse determines the smallest amount of water loss that can be considered a leak. Itron sets the value for this parameter during the endpoint programming phase of the manufacturing process.

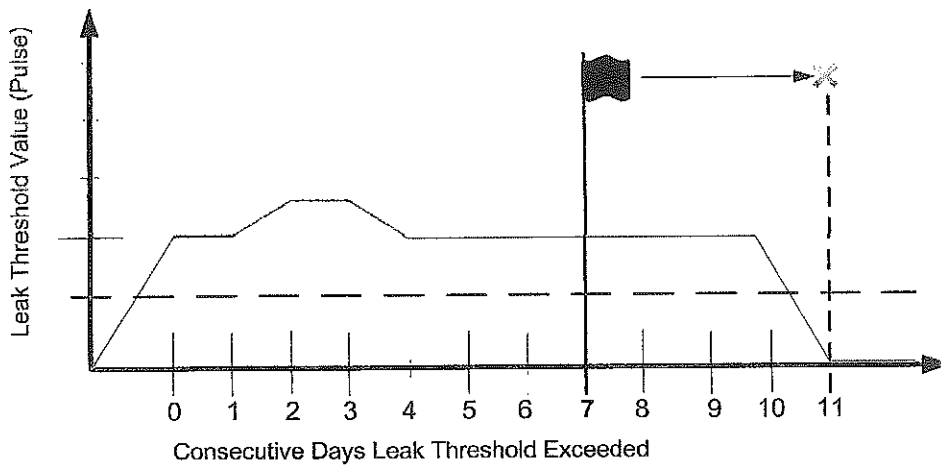
The leak detection flag in the endpoint is activated once the minimum pulse value is repeatedly detected every hour over a monitoring period of seven (7) days.



Detecting Leaks and Reverse Flow with 60 Series Endpoints

Similar to encoder registers, this flag is then passed to the ChoiceConnect collection application so that system administrators or service representatives can alert customers to a potential leak.

The leak detection flag remains set until the metered flow no longer produces a single pulse from the register. Once this occurs, the leak detection flag is cleared and the seven day period is reset. The ChoiceConnect collection system reflects the cleared tamper flag once a data packet is transmitted indicating the leak threshold is no longer being exceeded.



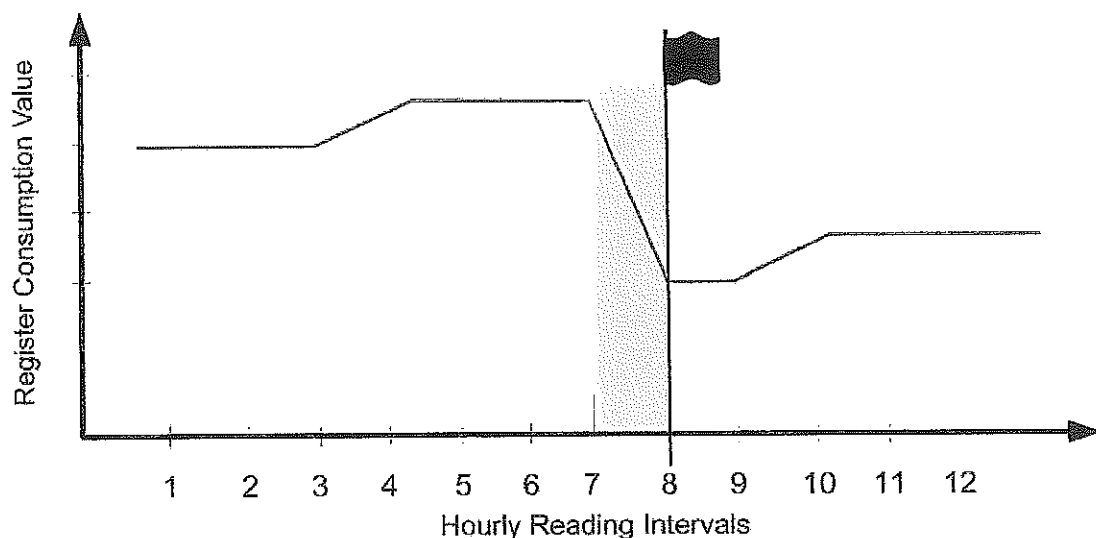
Detecting Reverse Water Flow with Encoder-Style Endpoints

Reverse flow (also referred to as backflow) can occur for a variety of reasons:

- Water main breaks can produce a significant loss of system pressure down stream and cause water to flow in the opposite direction to equalize pressure.
- In order to reduce their bills and “outsmart” the utility, unscrupulous customers may tamper with or invert a meter.
- During new construction, an untrained or inattentive contractor may inadvertently install the water meter incorrectly.
- Water pumps (for both residential and large-scale commercial and industrial customers, as well as water utility pumping stations) may malfunction and lose the ability to distribute water through the system in the proper direction.
- A meter register may report an inaccurate consumption value. The register wheels may record accurate consumption but electronics in the register may not read those properly and return a lower consumption value than the previous reading. Even though a reverse flow event has not occurred, this error in the data indicates a problem with the meter or endpoint that may need to be addressed.

The 60 Series encoder-style endpoints (60W and 60W-R) feature reverse flow detection that is based upon a simplified approach to determine revenue loss as a result of meter reversal.

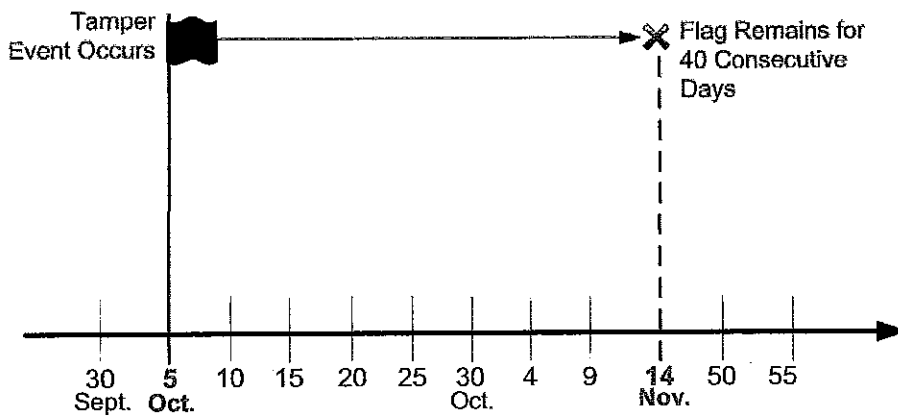
Reverse flow and theft detection are achieved by comparing differences in the register consumption value recorded by the endpoint. If the current register reading is less than the previous reading, then it is assumed that either some external pressure source caused water to flow backward through the meter or the meter was reversed in an attempt to lower the future reported consumption value, or the register reported an incorrect consumption value.



When the endpoint detects a reversal condition, an alarm flag is set, which is then reported to the utility by means of the meter reading equipment and associated ChoiceConnect collection software.

Detecting Leaks and Reverse Flow with 60 Series Endpoints

The alarm remains set for a period of 40 days to ensure it is reported within a typical monthly reading cycle. The alarm is disabled at the conclusion of the required 40 day period—provided no additional reverse flow events occur in that timeframe. Each reversal event will immediately initialize a new 40 day period.



Summary

In addition to their low-cost of ownership, ease of installation, superior performance and reliability, 60 Series water endpoints provide robust leak and reverse flow detection capabilities. By utilizing these devices in their system, utilities can help reduce the number of high bill customers receive; help educate customers on conservation efforts and potential problems within their residence; and more effectively identify and address potential theft or service quality issues.



Electric | Gas | Water
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To know more, start here: www.itron.com

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Nineteen years as Head of Engineering, Construction, and Capital Projects for International Paper. Ron was President of the River Run Property Owners Association and has experience dealing with CMUD on River Run water billing issues.

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Twenty two years as Chair of the Stafford County Utility Commission in Virginia. Jim has extensive experience with rate setting and utility operations oversight. He served as Senior Analyst with the White House Office of Management and Budget and has a Masters Degree in Financial Management from Syracuse University. Jim is currently President of the Peninsula Property Owners Association.

Ron Kelley

Ron is retired from Medical Device Industry with experience with electronic medical pumps. He has significant experience dealing with CMUD on water bill problems.

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Thirty five years experience as owner and operator of a wholesale and retail garden center on Long Island New York. Tony is currently a volunteer working with small businesses in the Charlotte area.

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A former executive with IBM and Bank of America, Jon is currently President of JNV Financials, providing consulting and financial solutions to businesses. He has a background in engineering and a degree in Mechanical Engineering from Carnegie Mellon University.

Robert Watson

Bob is owner of Cornelius Self Storage and is actively involved in numerous businesses in the area. He is active politically and is involved in local and national political organizing.

Robert Wenderlich

Bob is a retired Manager of Technical Service and Managing Director for Ingersoll-Rand in Davidson. He has been assisting River Run with water consumption and billing problems for some time.

Suzie Drake

Resident of Mecklenburg County

Bret Chapman, Don Hawk, & Sam Marshall

Opinion

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