ORANGE WATER AND SEWER AUTHORITY

A public, non-profit agency providing water, sewer and reclaimed water services to the Carrboro-Chapel Hill community.

MEMORANDUM

TO: **Natural Resources and Technical Systems (NRTS) Committee**

Terri Buckner (Chair)
Stephen Dear
Michael Hughes
Heather Payne
Dana Raborn
Will Raymond
Amy Witsil
John Young
Alan Rimer (*ex officio*)

THROUGH: Ed Kerwin

FROM: Ruth Rouse

DATE: November 1, 2013

SUBJECT: November 6, 2013 NRTS Committee Meeting

The NRTS Committee will meet on Wednesday, November 6, 2013 from 5:30 to 7:00 PM in the OWASA Boardroom. The purpose of this meeting is to provide the Committee with additional information regarding advance metering infrastructure (AMI). This meeting builds on the discussion concerning AMI from the July 30, 2013 NRTS Committee meeting. That meeting summary can be found here and staff's PowerPoint presentation on AMI is Attachment 2.

Todd Taylor, General Manager of Operations, will make the presentation and address the following (Attachment 1):

- Advanced Meter Infrastructure (AMI) Implementation
  - Implementation Options
  - Comparison of Options
  - Staff Recommendation
  - Rationale for Recommendation
- Conservation Impacts of AMI
  - No case study conclusions from five utilities responding to OWASA survey
- Discussion

The attached documents outline the relative advantages of the AMI implementation options and advantages and disadvantages of AMI systems. We look forward to seeing you on November 6.

Ruth C. Rouse

Ruth Rouse, AICP
Planning and Development Manager

c: Robert Epting, OWASA General Counsel

Attachments:

Attachment 1 – AMI Implementation Options including Table 1and Option A-D Maps
Attachment 2 – PowerPoint presentation on AMI – July 30, 2013

Advanced Meter Infrastructure (AMI) Implementation Options

NRTS Committee Meeting
November 6, 2013

Purpose:

The OWASA NRTS Committee has requested staff evaluate options for the implementation of an Advanced Meter Infrastructure (AMI) system.

Background:

Staff has assessed several different options for a phased implementation approach centering on the UNC Campus as well as a one-time, complete system conversion. The relative advantages and disadvantages between these scenarios are presented in Table 1 (see attachment) as well as the financial implications of each option. Maps of the various coverage areas are also provided.

Discussion of Options:

Options A (AMI conversion of the UNC Campus meters) and Option B (AMI conversion of the UNC Campus meters plus 500 residential meters close to Campus) both were found to have negative net present values and returns on investment. Both Option C (AMI conversion of all of the meters in the Phase 1 service area) and Option D (one-time, complete system conversion to AMI) were found to have positive net present values, positive returns on investment and 10 year payback periods. Therefore, Options C and D appear to be sound financial investments. These higher investments also appear to lead to greater equity and a simpler billing process, but tend to increase the system's maintenance costs and "throw away" the investments already made in Automated (drive-by) Meter Reading (AMR).

Water Conservation Impacts:

A number of utilities with AMI systems were contacted by staff in an attempt to collect data on the water conservation benefits of the system. None of the utilities contacted had seen any measurable system-wide increases in water conservation as a result of AMI implementation. The conservation impact most cited in sales and professional publications comes from the benefits of early leak detection at the individual premise level.

Staff Recommendation:

Based on our analyses and assuming we were not constrained by cost considerations, Option D, a one-time, complete conversion to an AMI system, provides the greatest net present value and provides the best overall value and service for our customers. However, we must consider the large upfront cost to implement any of the options in context with all of our funding needs and our affordability objectives. Therefore, we recommend that the Board consider the cost/benefit and timing of the various AMI options with our other needs in the upcoming Fiscal Year 2015 budget process.

Additionally, should the Board decide early in 2014 to replace our billing system, we strongly recommend that our switch to AMI begin after the new billing system is in place and fully operational.

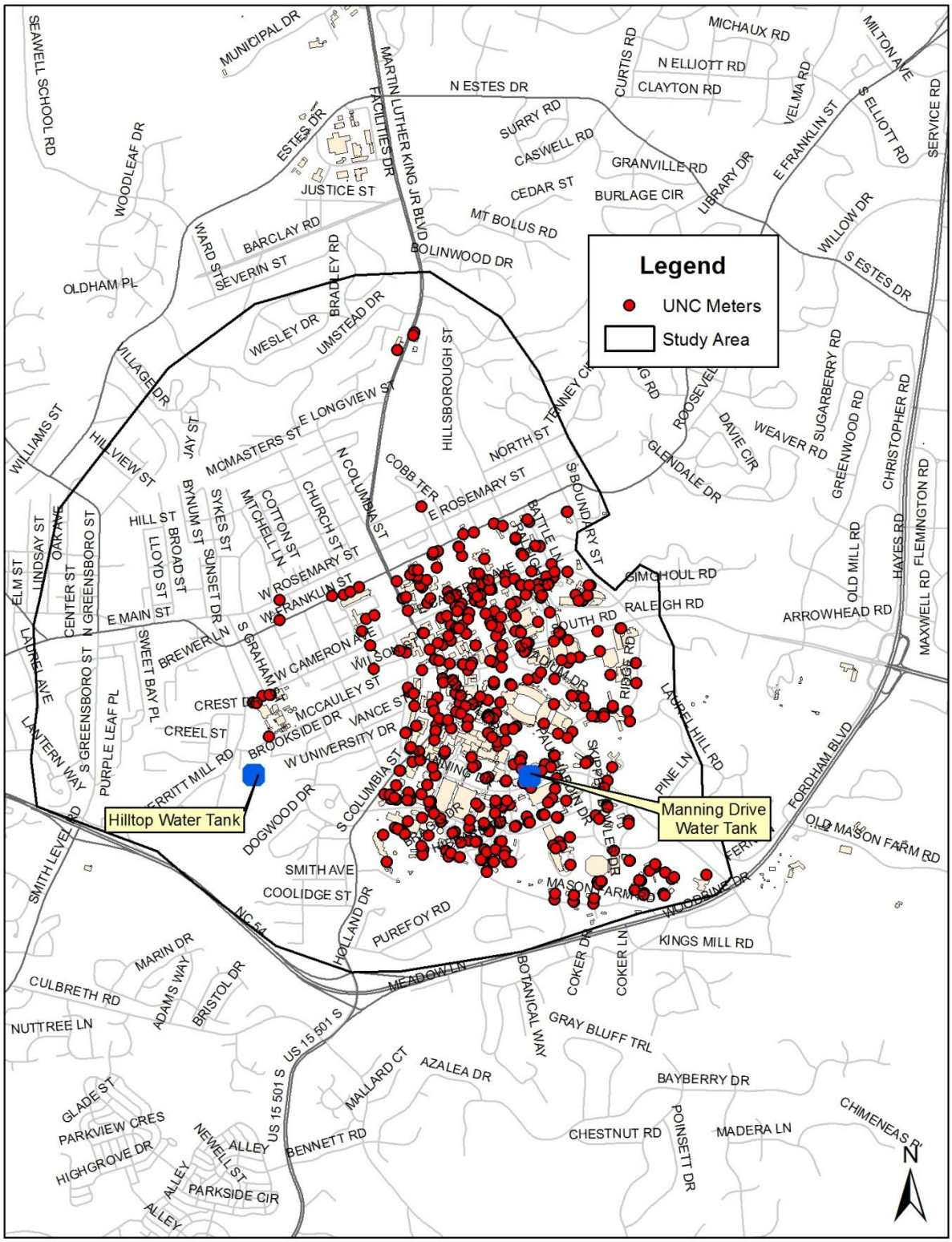
ADVANTAGES AND DISADVANTAGES OF AMI SYSTEMS APPROACH	
Advantages	**Disadvantages**
COST, EFFICIENCY, AND OPERATIONAL CONSIDERATIONS	
▪ Reduced operating costs (fewer staff, vehicles)	▪ Large upfront expenditure
▪ Potential for increased usage charge revenue recovery from improved meter accuracy	▪ Annual hosting, service and maintenance fees
▪ Improved accuracy; fewer re-reads	▪ Security risks associated with unauthorized access to data/network
▪ Availability of on-demand readings for new service and final bills	▪ Increased technical complexity with associated risks (battery life/performance, etc.)
▪ Improved worker safety	▪ Effect on current meter reading staff; reduced labor pool for emergencies
▪ Identify and follow-up on water theft, meter tampering, etc.	▪ Annual or bi-annual manual reading of AMR/AMI meters offsets some of the savings
▪ Identify potential reverse flow/backflow issues and situations where meter may not be proper size	▪ Data analytics and related services could require new staff with different skill-sets
	▪ Damaged meter boxes will not be identified & repaired as quickly
	▪ "Wasting" useful remaining life of meters now in service
CUSTOMER SERVICE CONSIDERATIONS	
▪ Improved billing and consumption analysis tools - On time readings - More uniform consumption periods - No estimates due to weather issues - Proactive notification to customers - Customers have on-line access to usage data	▪ Substantially reduced staff presence/visibility - Customer belief meters not being read - Customer interaction with Meter Reader - Less opportunity for staff detection of system problems in the field (leaks, overflows, valve box damage, etc.)
▪ Faster response to customer inquiries, service initiation and termination requests, water loss adjustments, etc.	▪ Customer "privacy" and "big brother" concerns
▪ Reduction in number of customer calls, high bill disputes, etc.	
▪ Improved overall customer "experience"	
ENVIRONMENTAL/NATURAL RESOURCE CONSIDERATIONS	
▪ Enhanced tool for conservation, drought response, etc. - Leak notification - Better target outreach & education efforts - Ability to bill in smaller increments - Data can be used for rate design, water resource management, system modeling, drought response, etc.	▪ Meter leaks on OWASA side not detected as quickly as with current process
▪ Reduced carbon emissions associated with meter reading and field service operations, water use, etc.	▪ Battery production and disposal concerns ▪ Concerns about microwave transmissions

Table 1
Advanced Meter Infrastructure (AMI)
Implementation Options

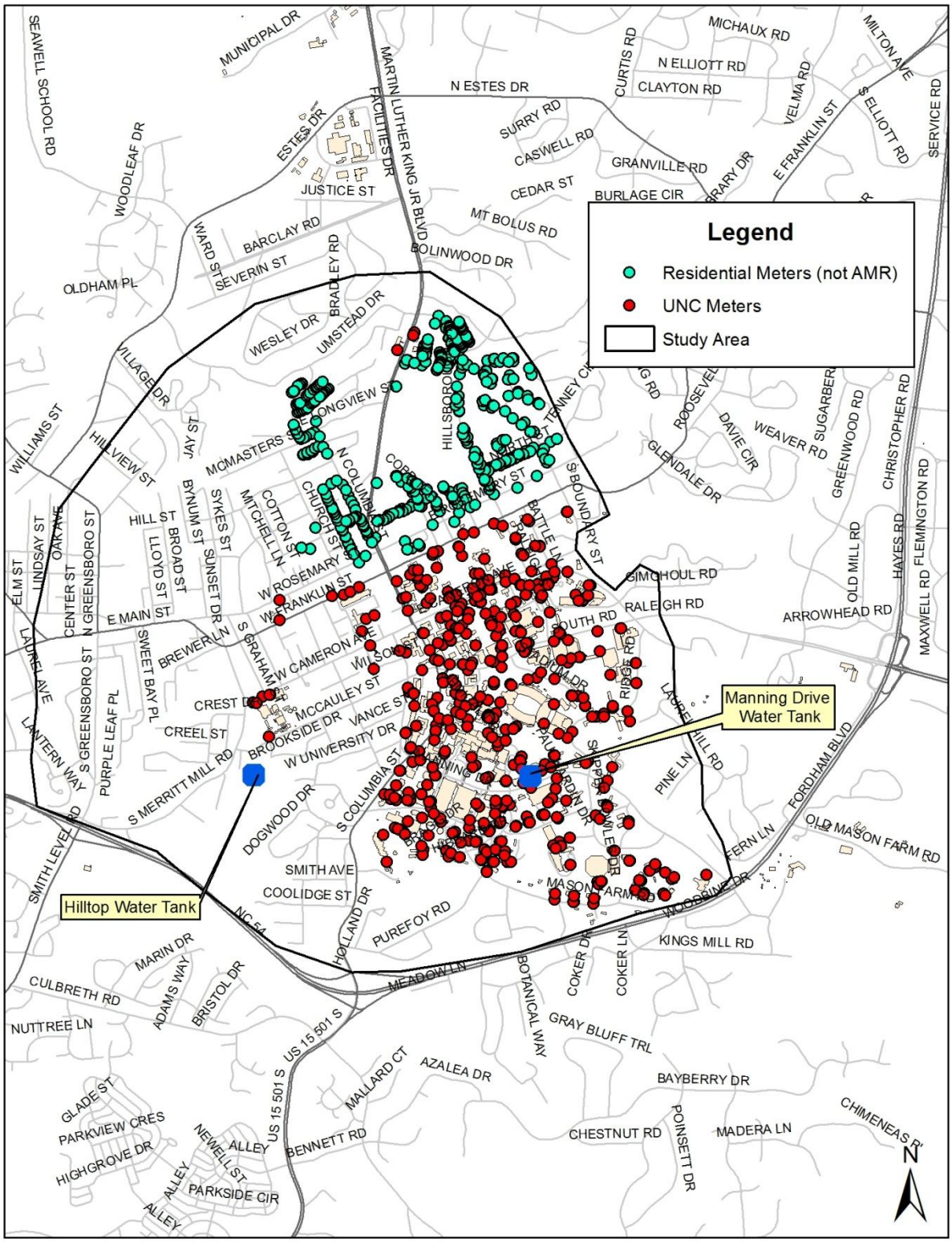
Option	A	B	C	D
Description	Replace and/or retrofit UNC Campus meters within the Phase 1 service area.	Replace and/or retrofit UNC Campus meters and 500 residential meters in the Phase 1 service area.	Replace and/or retrofit all UNC, commercial, irrigation and residential meters in Phase 1 service area.	Replace and/or retrofit all meters in the system.
Quantity of Meters	432	932	4,248	20,842
Installation Schedule	6 - 12 months	6 - 12 months	6 - 12 months	12-18 months
Total Investment	$385,000	$504,000	$1,336,000	$5,281,000
Net Present Value (NPV)	-$45,000	-$5,000	$556,000	$1,765,000
Return on Investment (ROI)	-12%	-1%	42%	33%
Payback Period (Years)	Payback exceeds useful life	Payback exceeds useful life	9	10
Relative Advantages	-Smallest initial investment -High acceptance & utilization by UNC	-Moderate initial investment -Some diversity of customer types	-Maximizes coverage area utilization -Highest ROI -High diversity of customer types -Shortest payback period	-Highest net present value -Most equitable to all customers -Streamlines billing process
Relative Disadvantages	-Low utilization of coverage area -High network infrastructure investment (30% of total cost) -Complicates billing process -Negative NPV & ROI -Least equitable	-Low utilization of coverage area -High network infrastructure investment (21% of total cost) -Complicates billing process -Negative NPV & ROI -Low equitability	-Large initial investment -"Throws away" some AMR investments (~$173,000) -Modest equitability -Complicates billing process	-Largest initial investment -"Throws away" all AMR investments (~$1,000,000) -Highest maintenance costs

Assumptions:
-20 year equipment life cycle
-3.3% discount rate
-1% revenue gain
-Elimination of labor costs equivalent to 5 full-time positions
-Unit prices provided by Mueller Systems on 9/10/2013 are still valid
-Meter information obtained from GIS is accurate.
-Growth rates and trends used in NPV calculations are accurate
-Current meter changeout program expenses are not accounted for (~$150,000-$200,000/year)
-Cash purchase

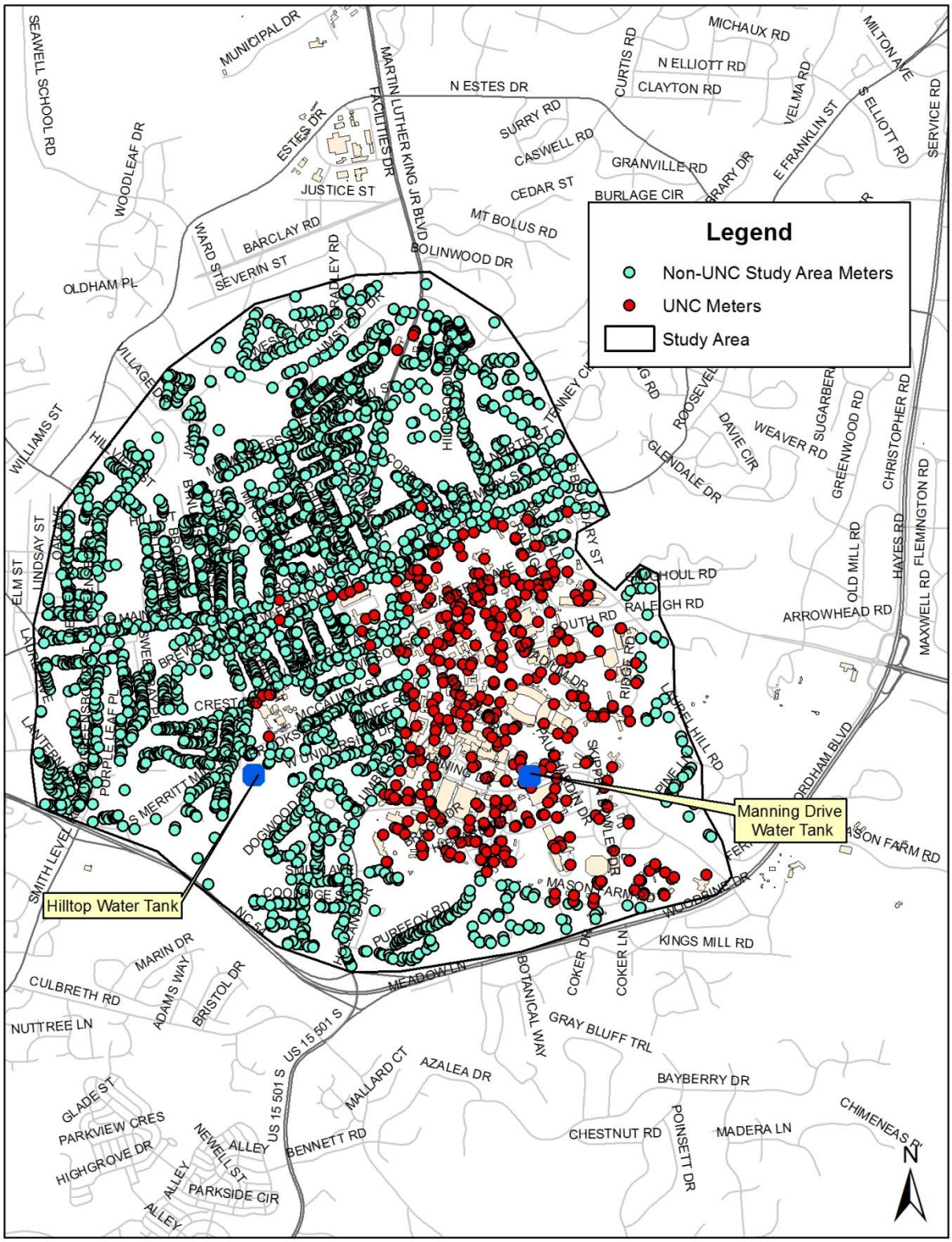
Option A – UNC Only (432 meters)



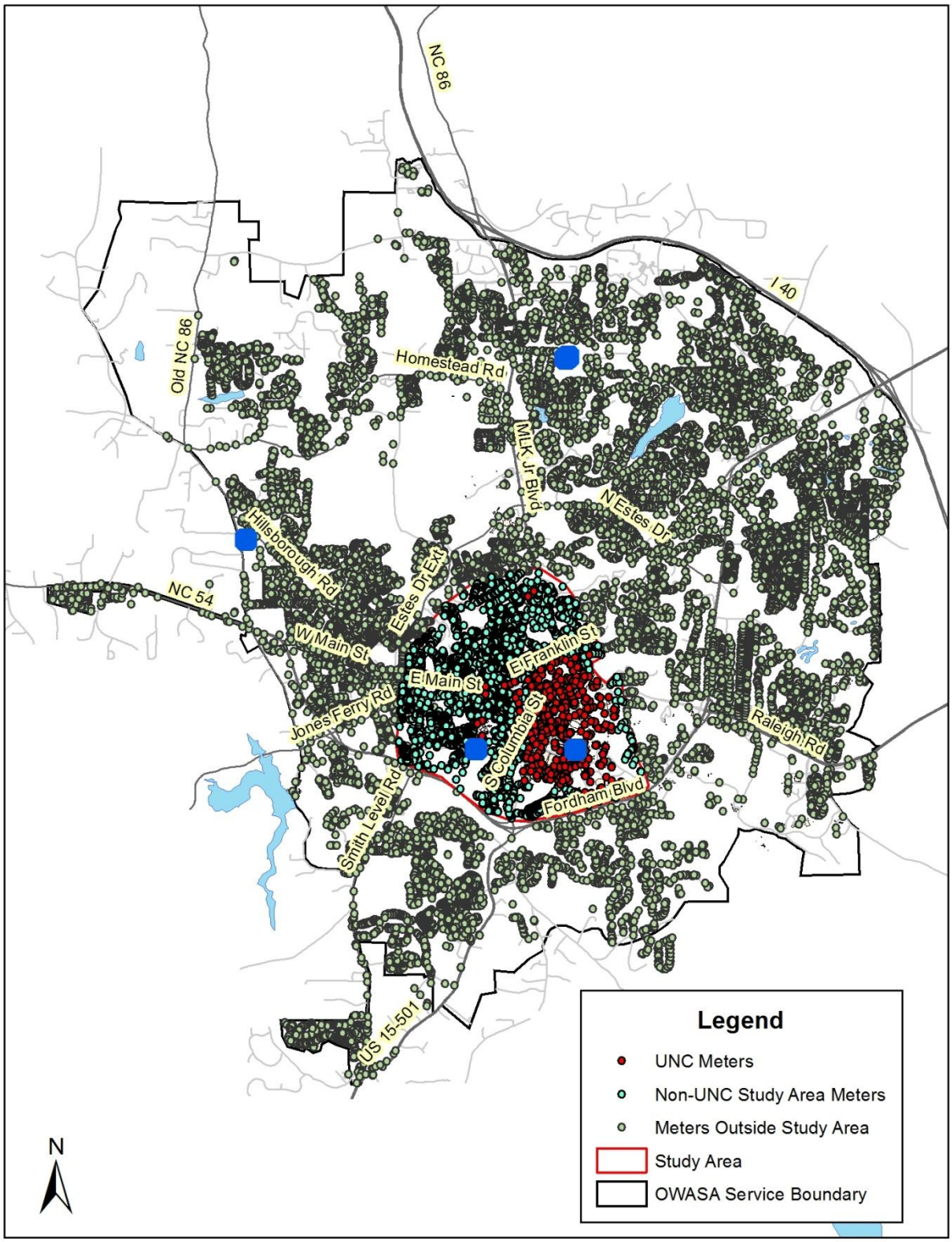
Option B – UNC & 500 residential (932 meters)



Option C – UNC Coverage Area (4,248 meters)



Option D – Full Conversion (20,842 meters)



Automatic Meter Reading

ORANGE WATER AND SEWER AUTHORITY
NRTS COMMITTEE MEETING
July 30, 2013

A public, non-profit agency providing water, sewer and reclaimed water services to the Carrboro-Chapel Hill community

Agenda

- Evolution of Meter Reading
- AMR vs. AMI
- Why Invest in AMR/AMI?
  - Advantages/Disadvantages of AMI
- AMR/AMI Metering Features
- OWASA's Current Meter Program
- Projected Cost of AMI Conversion

Evolution of Meter Reading

Manual Read

- Water flows through meter chamber and documented by register
- Requires visual inspection of each register
- Meter readings recorded in field book (paper)
- Process still used by some utilities
- Average reading rate of 250-275 meters per day



Touch Read (2000-2002)

- An early step toward automated readings
- Improved access and reading speed
- Helps reduce "human" error
- Adds a third component to metering
  - Meter case
  - Meter Register
  - "TOUCH PAD" – interface with register



Hand Held Computer (1987 - Present)

- Meters are still read manually
- Readings are manually entered into handheld computer
- Readings are uploaded directly to billing system
- Still opportunity for "human" error
- Consumption alerts provided during field reading
- Process used by a majority of utilities
- Average reading rate of 250-275 meters per day



Mobile Data Collection (2004-Present)

- Interface with register transmits data short distances by radio frequency
- Relatively low cost ($150 for residential meter)
- Flexible deployment strategies
- Some units can store profile data ("smart meters")
- Average reading rate of 250-300 meters per hour



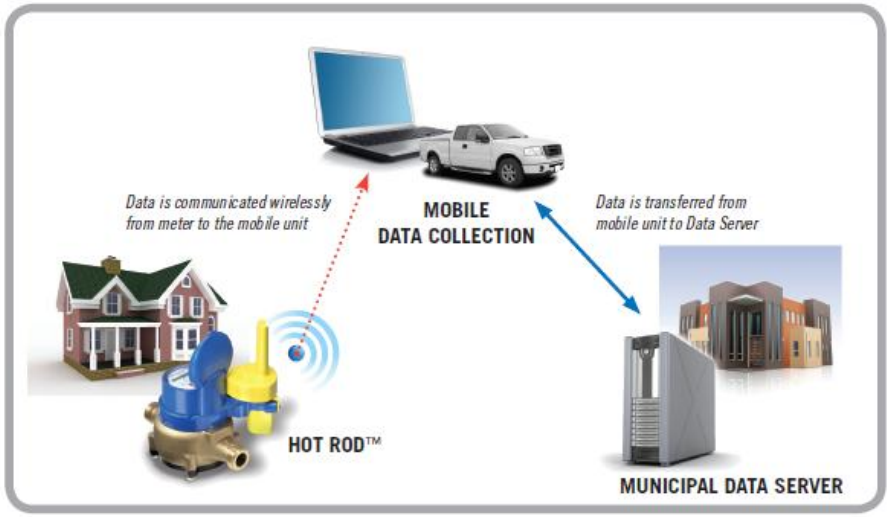
AMR vs. AMI

AMR stands for Automatic Meter Reading. It is an older technology that only collects the meter reading and transfers data from the water meter to the utility (one-way communication).

AMI stands for Advanced Metering Infrastructure. AMI meters, also known as "smart meters" are updated versions of the traditional water meter. These smart meters not only measure how much water was used, but also at what times during the day, and can provide alerts on leaks, stopped meters, tampering, etc. (two-way communication).

*Although AMR and AMI have different definitions they are still used interchangeably.

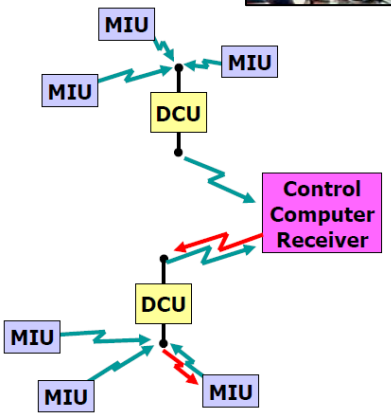
Typical AMR System



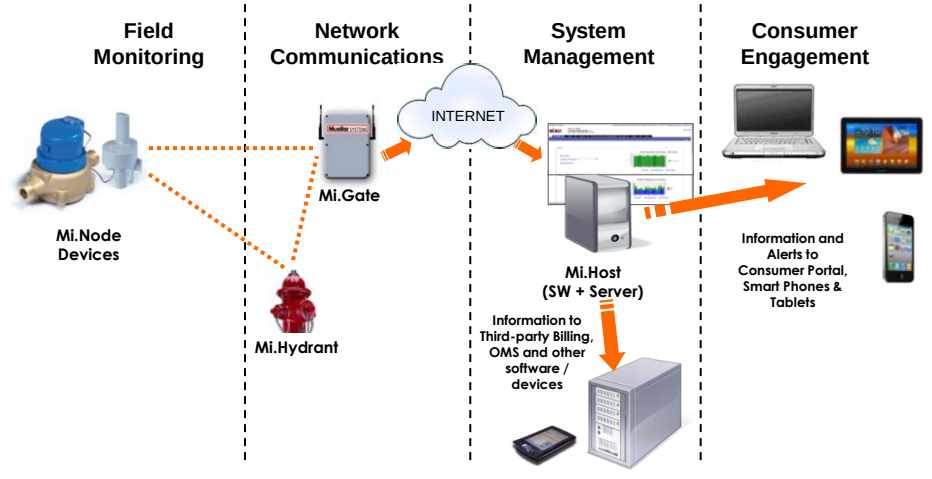
Fixed Network System

- Meter interface units (MIU) with stronger signal.
- Data Collector Units (DCU) introduced to collect and send data to a central data receiver.
- Can perform multiple readings per day.
- Customer consumption profiling capabilities
- Requires more data management
- Easy aggregation of meter readings
- Tamper, leaks, etc. detected quickly
- Collector sighting issues, repeaters may be needed





Typical AMI System



Why Invest in AMR/AMI?

Typical Drivers for Water Utility AMI/AMR

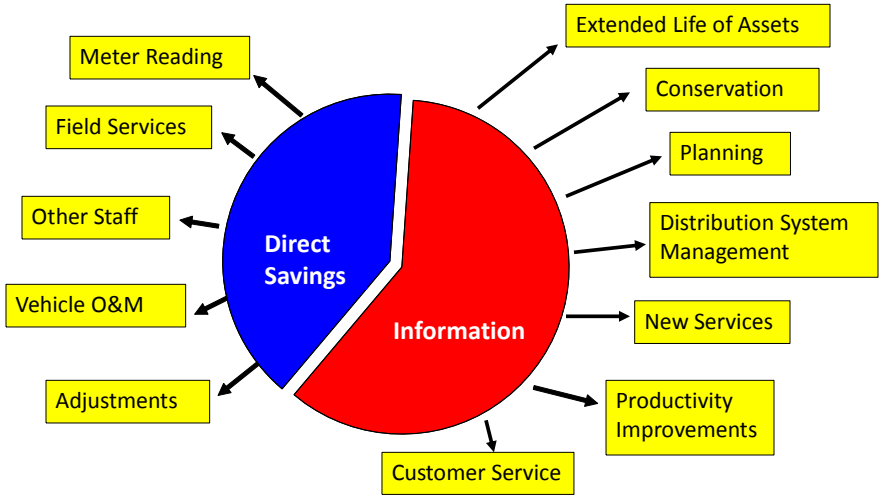
- Cost control
- Water loss reduction and revenue recovery
- Customer service issues
- Conservation
- Reading frequency
- Labor or management issues
- Technophilia



Advantages of Fixed Network AMI System

- Reduced Operating Costs
  - Reduced labor, vehicles, etc.
  - Fewer re-reads
  - On-demand readings for new service and final bills
- Improved Accuracy/On-time billing
- Safety & Environmental Benefits
- Enhanced Customer Service Level
- Leak, theft and tamper detection and notification

Potential Benefits from AMI



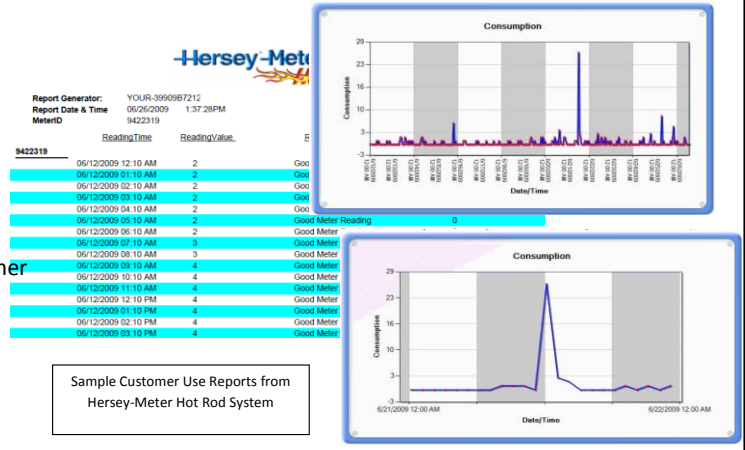
Why Invest in AMI?

Disadvantages of Fixed Network AMI System:

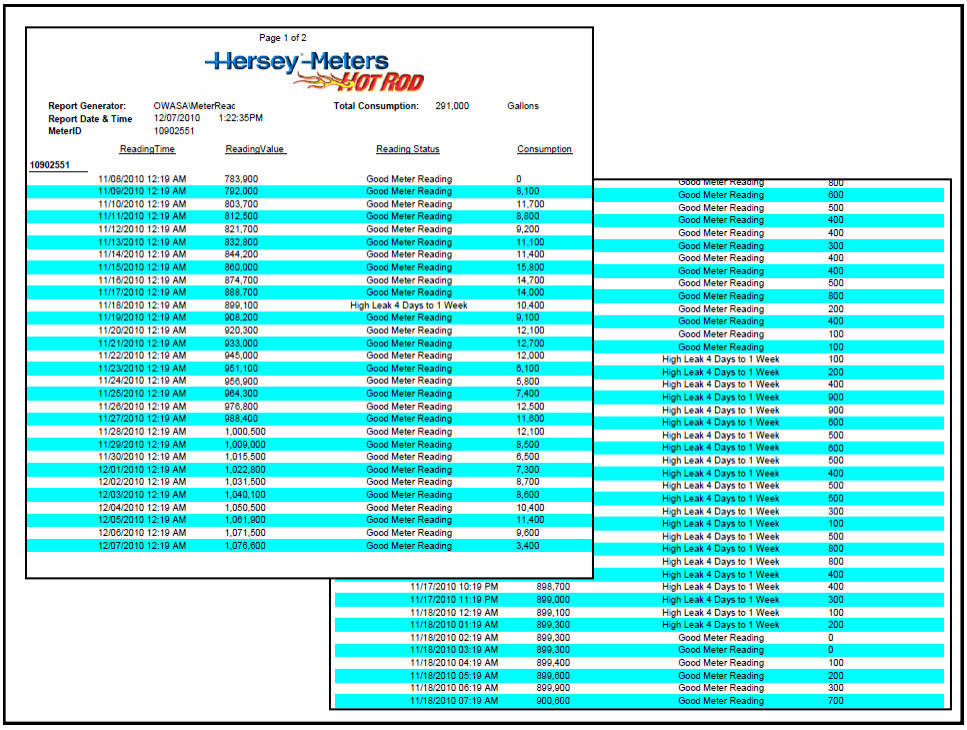
- Large upfront expenditure
- Annual hosting, service and maintenance fees
- Loss of visibility
  - Customer belief meters not being read
  - Customer interaction with Meter Reader
  - Staff detection of system problems
- Meter leaks on OWASA side may not be detected
- Potential loss of meter location and repair to damaged meter boxes
- Annual or bi-annual manual reading of AMI meters recommended
- Customer "privacy" concerns

AMR/AMI Features

- Customer Leak Detection
- Data Profiling
- System Balancing
- Conservation Enforcement
- Enhanced Customer Service
- Reduced Service Calls



Sample Customer Use Reports from Hersey-Meter Hot Rod System



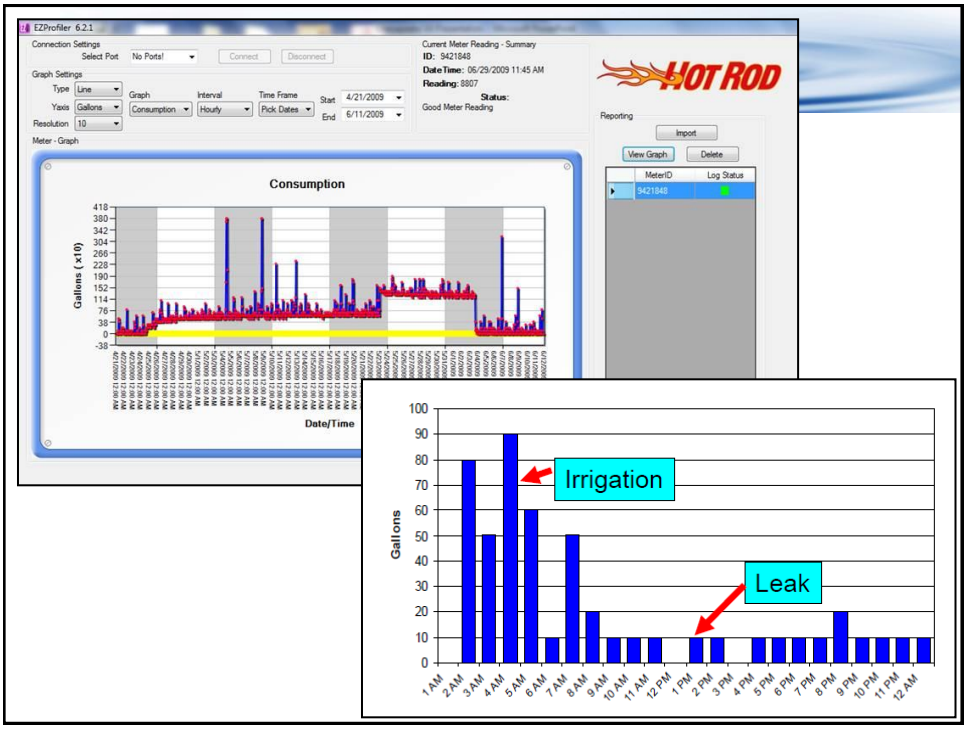
Page 1 of 2

Hersey Meters HOT ROD

Report Generator: OWASA\MeterReac
Report Date & Time 12/07/2010 1:22:35PM
MeterID 10902551
Total Consumption: 291,000 Gallons

	ReadingTime	ReadingValue	Reading Status	Consumption
10902551				
	11/08/2010 12:19 AM	783,900	Good Meter Reading	0
	11/09/2010 12:19 AM	792,000	Good Meter Reading	8,100
	11/10/2010 12:19 AM	803,700	Good Meter Reading	11,700
	11/11/2010 12:19 AM	812,500	Good Meter Reading	8,800
	11/12/2010 12:19 AM	821,700	Good Meter Reading	9,200
	11/13/2010 12:19 AM	832,800	Good Meter Reading	11,100
	11/14/2010 12:19 AM	844,200	Good Meter Reading	11,400
	11/15/2010 12:19 AM	860,000	Good Meter Reading	15,800
	11/16/2010 12:19 AM	874,700	Good Meter Reading	14,700
	11/17/2010 12:19 AM	888,700	Good Meter Reading	14,000
	11/18/2010 12:19 AM	899,100	High Leak 4 Days to 1 Week	10,400
	11/19/2010 12:19 AM	908,200	Good Meter Reading	9,100
	11/20/2010 12:19 AM	920,300	Good Meter Reading	12,100
	11/21/2010 12:19 AM	933,000	Good Meter Reading	12,700
	11/22/2010 12:19 AM	945,000	Good Meter Reading	12,000
	11/23/2010 12:19 AM	951,100	Good Meter Reading	6,100
	11/24/2010 12:19 AM	956,900	Good Meter Reading	5,800
	11/25/2010 12:19 AM	964,300	Good Meter Reading	7,400
	11/26/2010 12:19 AM	976,800	Good Meter Reading	12,500
	11/27/2010 12:19 AM	988,400	Good Meter Reading	11,600
	11/28/2010 12:19 AM	1,000,500	Good Meter Reading	12,100
	11/29/2010 12:19 AM	1,009,000	Good Meter Reading	8,500
	11/30/2010 12:19 AM	1,015,500	Good Meter Reading	6,500
	12/01/2010 12:19 AM	1,022,800	Good Meter Reading	7,300
	12/02/2010 12:19 AM	1,031,500	Good Meter Reading	8,700
	12/03/2010 12:19 AM	1,040,100	Good Meter Reading	8,600
	12/04/2010 12:19 AM	1,050,500	Good Meter Reading	10,400
	12/05/2010 12:19 AM	1,061,900	Good Meter Reading	11,400
	12/06/2010 12:19 AM	1,071,500	Good Meter Reading	9,600
	12/07/2010 12:19 AM	1,076,800	Good Meter Reading	3,400

	Good Meter Reading	800
	Good Meter Reading	600
	Good Meter Reading	500
	Good Meter Reading	400
	Good Meter Reading	400
	Good Meter Reading	300
	Good Meter Reading	400
	Good Meter Reading	400
	Good Meter Reading	500
	Good Meter Reading	800
	Good Meter Reading	200
	Good Meter Reading	400
	Good Meter Reading	100
	Good Meter Reading	100
	High Leak 4 Days to 1 Week	100
	High Leak 4 Days to 1 Week	200
	High Leak 4 Days to 1 Week	400
	High Leak 4 Days to 1 Week	900
	High Leak 4 Days to 1 Week	900
	High Leak 4 Days to 1 Week	600
	High Leak 4 Days to 1 Week	500
	High Leak 4 Days to 1 Week	600
	High Leak 4 Days to 1 Week	500
	High Leak 4 Days to 1 Week	400
	High Leak 4 Days to 1 Week	500
	High Leak 4 Days to 1 Week	500
	High Leak 4 Days to 1 Week	300
	High Leak 4 Days to 1 Week	100
	High Leak 4 Days to 1 Week	500
	High Leak 4 Days to 1 Week	800
	High Leak 4 Days to 1 Week	800
	High Leak 4 Days to 1 Week	400
11/17/2010 10:19 PM	898,700	High Leak 4 Days to 1 Week	400
11/17/2010 11:19 PM	899,000	High Leak 4 Days to 1 Week	300
11/18/2010 12:19 AM	899,100	High Leak 4 Days to 1 Week	100
11/18/2010 01:19 AM	899,300	High Leak 4 Days to 1 Week	200
11/18/2010 02:19 AM	899,300	Good Meter Reading	0
11/18/2010 03:19 AM	899,300	Good Meter Reading	0
11/18/2010 04:19 AM	899,400	Good Meter Reading	100
11/18/2010 05:19 AM	899,600	Good Meter Reading	200
11/18/2010 06:19 AM	899,900	Good Meter Reading	300
11/18/2010 07:19 AM	900,600	Good Meter Reading	700



Implementation Considerations

Meter Interface Units (MIU)
- Mounting options
- Meter pit issues
- MIUs as repeaters
- Battery life (20 yrs. ??)
- Warranties



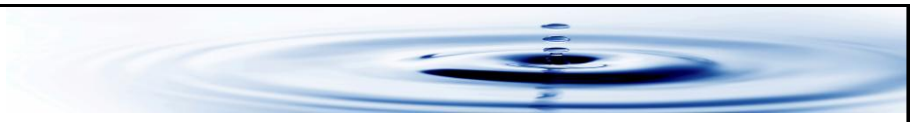
Data Collector Units (DCU)
- Propagation study
- Collector sighting issues
- Number of repeaters needed



Backhaul Modes
- Cellular
- Ethernet
- Wi-Fi
- Fiber

Current Meter Program

- Currently read 21,000 meters (5/8" through 8") monthly
- Currently employ 6 Meter Readers reading 16 working days per month
- Approximately 6,000 "smart" meters have been installed since 2006
- Priority for AMR/AMI meter placement has been:
  - Safety concerns (traffic, vaults, etc.)
  - Difficult to read (large lots, non-uniform location, etc.)
  - New construction/developments /reclaimed water
  - Reduce number of reading days
- Currently replace about 1,000 meters a year with AMR/AMI meters
- Annual meter replacement budget approximately $150,000
- At current replacement rate it would take approximately 15 years to have complete mobile "drive-by" AMR/AMI system



Estimated Cost & Payback

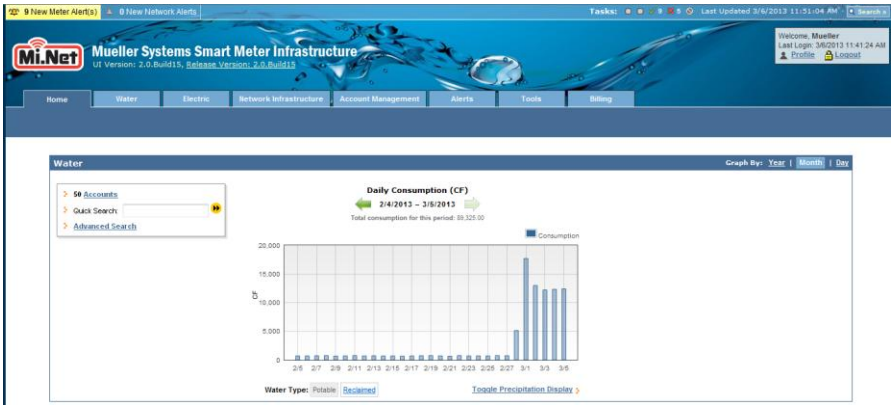
- Purchase & Install approximately
  15,000 AMI meters - $4,500,000
- Purchase & install collectors and repeaters - $250,000
- Annual Hosting Fee & O&M Cost (20 yrs.)- $800,000
  Total based on 20 year life - $5,550,000

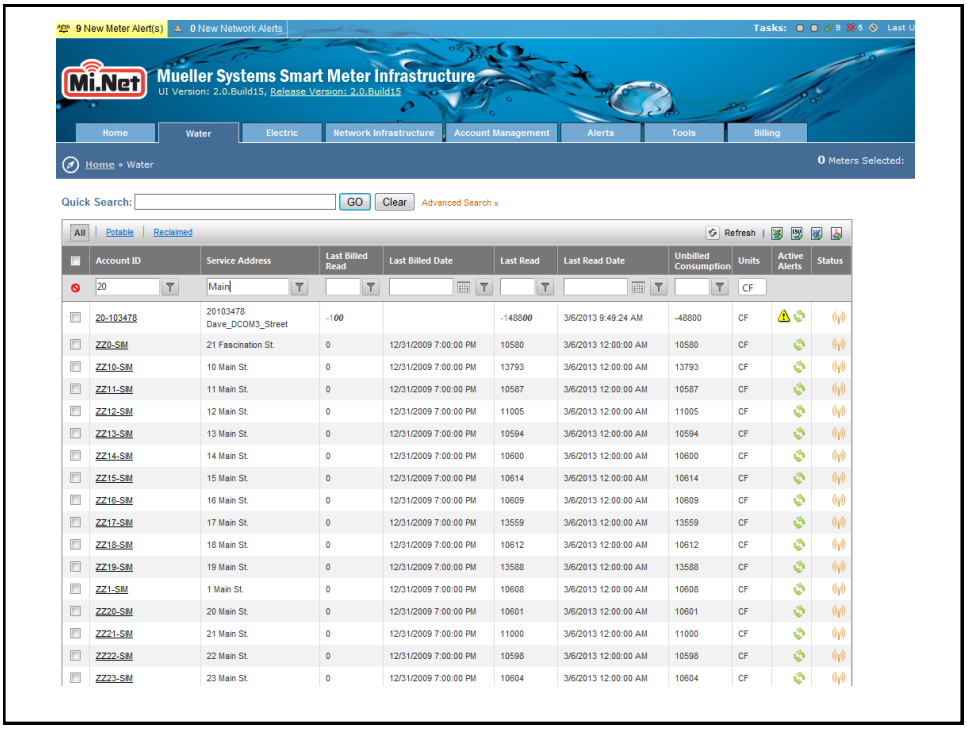
- Estimated annual savings on meter reading cost
  (personnel, fringes, equipment, O&M)- $260,000
- Estimated annual increase in revenues (1%) - $265,000 ???
  Total O&M Savings & Revenue Gain - $525,000

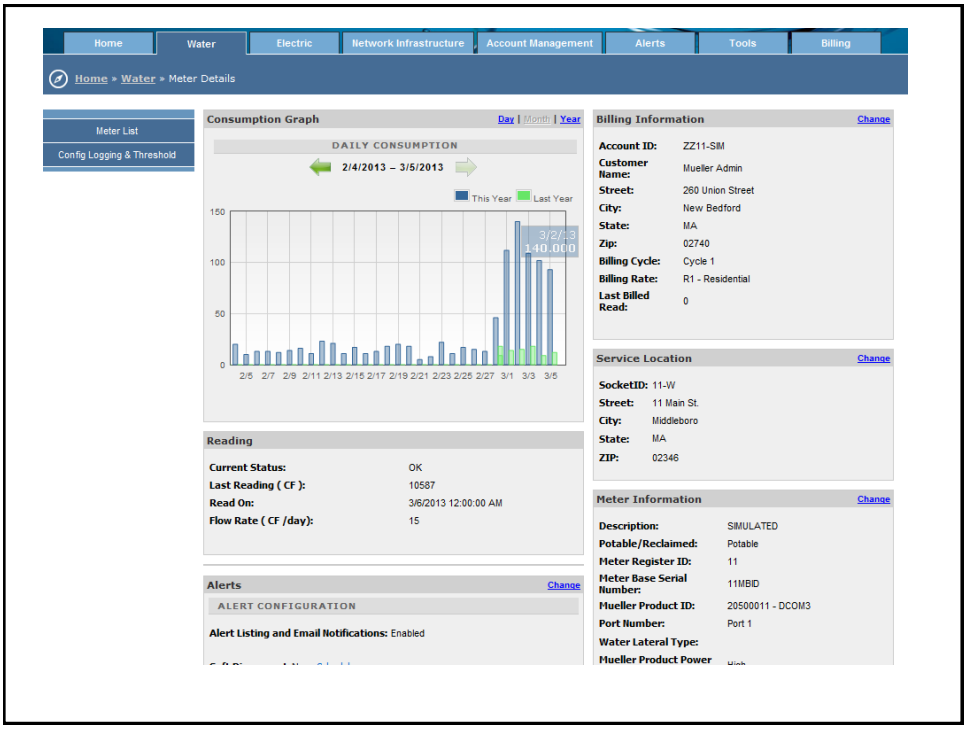
SIMPLE PAYBACK – APPROX. 10 YEARS

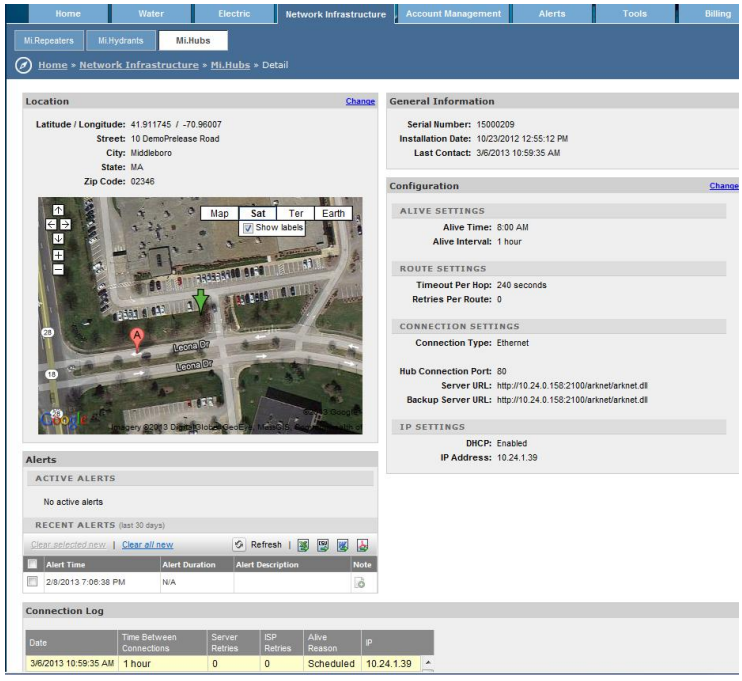
Utility Interface

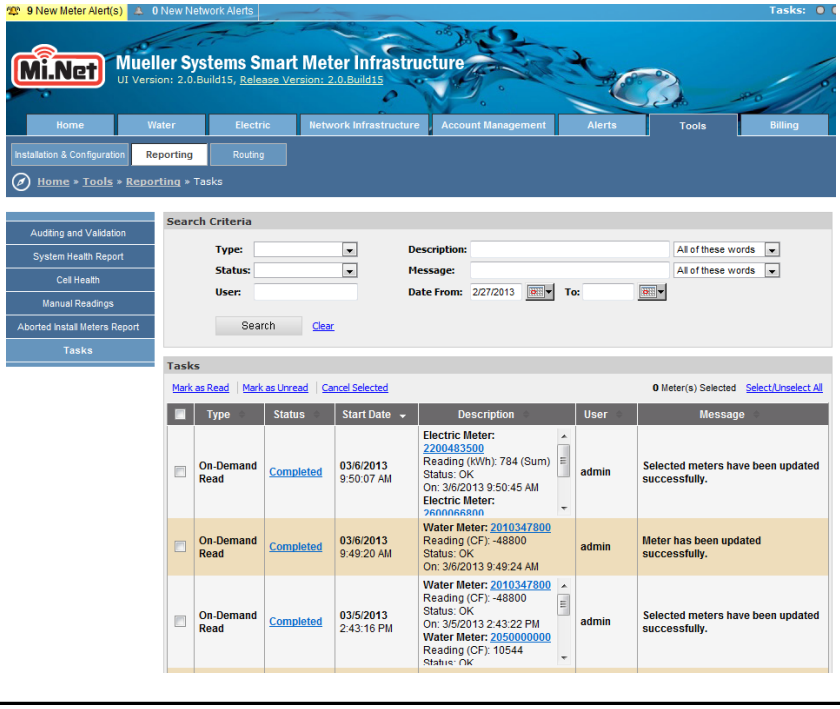

UI Version: 2.0.Build15, Release Version: 2.0.Build15
Mi.Net
Mueller Infrastructure Network
Please Login
Username:
Remember my Username on this Computer
Password:
Login
Forgot Your Password?
Bookmark this Page
Contact Customer Support


9 New Meter Alert(s)
0 New Network Alerts
Tasks:
Last Updated 3/6/2013 11:51:04 AM
Search
Mi.Net
Mueller Systems Smart Meter Infrastructure
UI Version: 2.0.Build15, Release Version: 2.0.Build15
Welcome, Mueller
Last Login: 3/6/2013 11:41:24 AM
Profile
Logout
Home
Water
Electric
Network Infrastructure
Account Management
Alerts
Tools
Billing
Water
Graph By: Year | Month | Day
50 Accounts
Quick Search
Advanced Search
Daily Consumption (CF)
2/4/2013 – 3/5/2013
Total consumption for this period: 89,325.00
Consumption
20,000
15,000
10,000
5,000
0
CF
2/6 2/7 2/9 2/11 2/13 2/15 2/17 2/19 2/21 2/23 2/25 2/27 3/1 3/3 3/5
Water Type: Potable Reclaimed
Toggle Precipitation Display

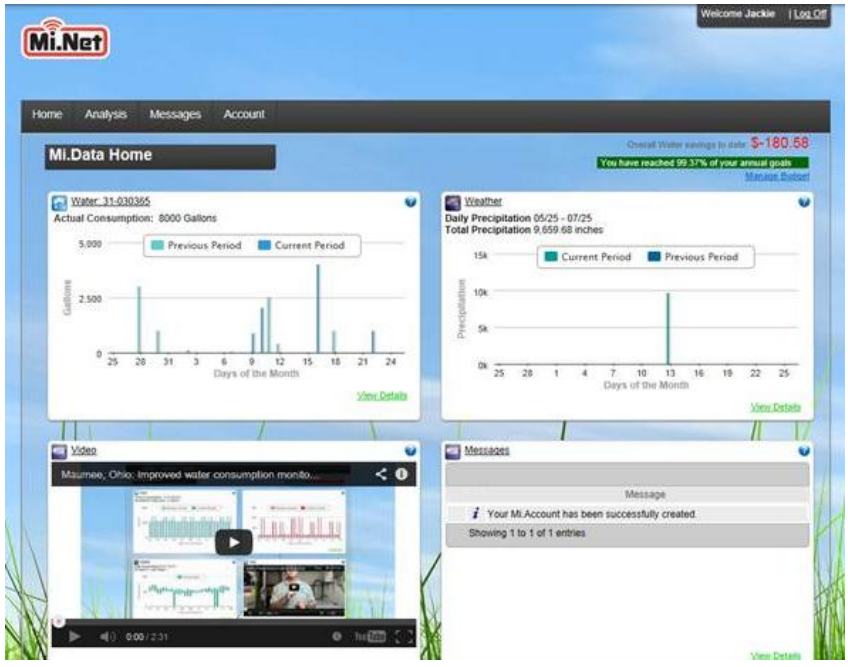

9 New Meter Alert(s)
0 New Network Alerts
Tasks:
Mi.Net
Mueller Systems Smart Meter Infrastructure
UI Version: 2.0.Build15, Release Version: 2.0.Build15
Home
Water
Electric
Network Infrastructure
Account Management
Alerts
Tools
Billing
Home » Water
0 Meters Selected:
Quick Search:
GO
Clear
Advanced Search »
All
Potable
Reclaimed
Refresh
Account ID
Service Address
Last Billed Read
Last Billed Date
Last Read
Last Read Date
Unbilled Consumption
Units
Active Alerts
Status
20-103478 20103478 Dave_DCOM3_Street -100 -148800 3/6/2013 9:49:24 AM -48800 CF
ZZ0-SIM 21 Fascination St. 0 12/31/2009 7:00:00 PM 10580 3/6/2013 12:00:00 AM 10580 CF
ZZ10-SIM 10 Main St. 0 12/31/2009 7:00:00 PM 13793 3/6/2013 12:00:00 AM 13793 CF
ZZ11-SIM 11 Main St. 0 12/31/2009 7:00:00 PM 10587 3/6/2013 12:00:00 AM 10587 CF
ZZ12-SIM 12 Main St. 0 12/31/2009 7:00:00 PM 11005 3/6/2013 12:00:00 AM 11005 CF
ZZ13-SIM 13 Main St. 0 12/31/2009 7:00:00 PM 10594 3/6/2013 12:00:00 AM 10594 CF
ZZ14-SIM 14 Main St. 0 12/31/2009 7:00:00 PM 10600 3/6/2013 12:00:00 AM 10600 CF
ZZ15-SIM 15 Main St. 0 12/31/2009 7:00:00 PM 10614 3/6/2013 12:00:00 AM 10614 CF
ZZ16-SIM 16 Main St. 0 12/31/2009 7:00:00 PM 10609 3/6/2013 12:00:00 AM 10609 CF
ZZ17-SIM 17 Main St. 0 12/31/2009 7:00:00 PM 13559 3/6/2013 12:00:00 AM 13559 CF
ZZ18-SIM 18 Main St. 0 12/31/2009 7:00:00 PM 10612 3/6/2013 12:00:00 AM 10612 CF
ZZ19-SIM 19 Main St. 0 12/31/2009 7:00:00 PM 13588 3/6/2013 12:00:00 AM 13588 CF
ZZ1-SIM 1 Main St. 0 12/31/2009 7:00:00 PM 10608 3/6/2013 12:00:00 AM 10608 CF
ZZ20-SIM 20 Main St. 0 12/31/2009 7:00:00 PM 10601 3/6/2013 12:00:00 AM 10601 CF
ZZ21-SIM 21 Main St. 0 12/31/2009 7:00:00 PM 11000 3/6/2013 12:00:00 AM 11000 CF
ZZ22-SIM 22 Main St. 0 12/31/2009 7:00:00 PM 10598 3/6/2013 12:00:00 AM 10598 CF
ZZ23-SIM 23 Main St. 0 12/31/2009 7:00:00 PM 10604 3/6/2013 12:00:00 AM 10604 CF

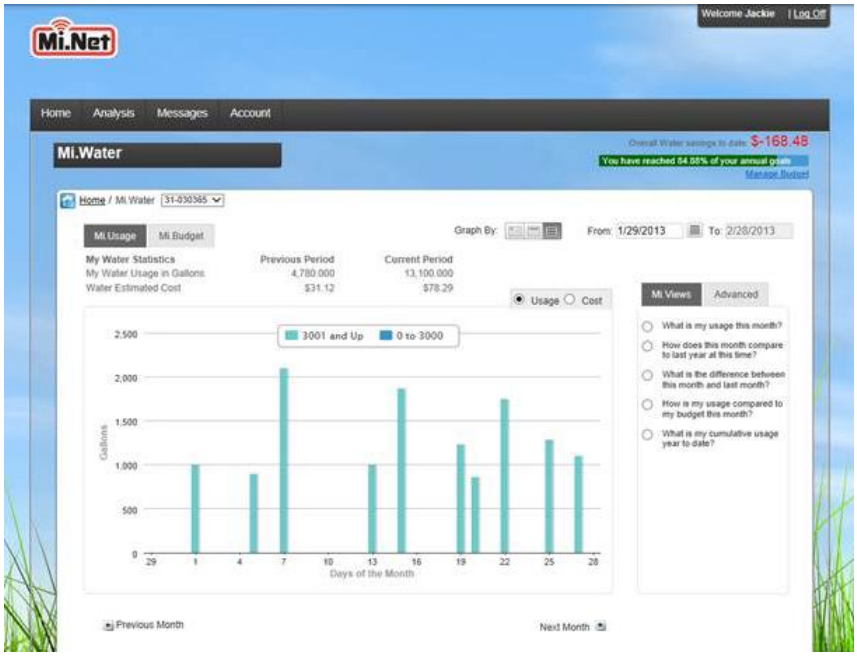

Home
Water
Electric
Network Infrastructure
Account Management
Alerts
Tools
Billing
Home » Water » Meter Details
Meter List
Config Logging & Threshold
Consumption Graph
Day | Month | Year
DAILY CONSUMPTION
2/4/2013 – 3/5/2013
This Year
Last Year
150
100
50
0
3/2/13
140.000
2/5 2/7 2/9 2/11 2/13 2/15 2/17 2/19 2/21 2/23 2/25 2/27 3/1 3/3 3/5
Billing Information
Change
Account ID: ZZ11-SIM
Customer Name: Mueller Admin
Street: 260 Union Street
City: New Bedford
State: MA
Zip: 02740
Billing Cycle: Cycle 1
Billing Rate: R1 - Residential
Last Billed Read: 0
Service Location
Change
SocketID: 11-W
Street: 11 Main St.
City: Middleboro
State: MA
ZIP: 02346
Reading
Current Status: OK
Last Reading (CF): 10587
Read On: 3/6/2013 12:00:00 AM
Flow Rate (CF /day): 15
Meter Information
Change
Description: SIMULATED
Potable/Reclaimed: Potable
Meter Register ID: 11
Meter Base Serial Number: 11MBID
Mueller Product ID: 20500011 - DCOM3
Port Number: Port 1
Water Lateral Type:
Mueller Product Power
Alerts
Change
ALERT CONFIGURATION
Alert Listing and Email Notifications: Enabled

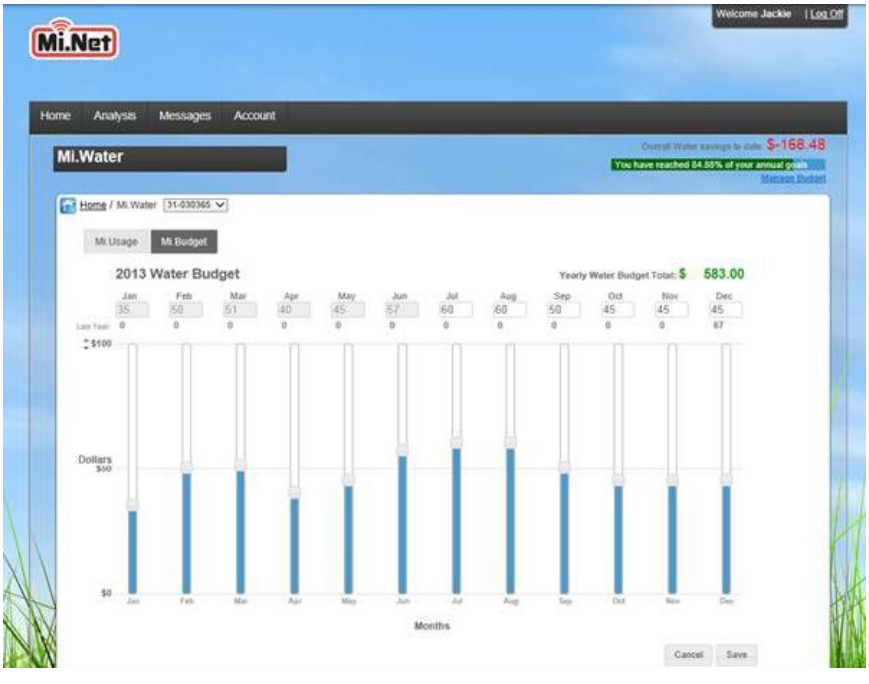

Home
Water
Electric
Network Infrastructure
Account Management
Alerts
Tools
Billing
Mi.Repeaters
Mi.Hydrants
Mi.Hubs
Home » Network Infrastructure » Mi.Hubs » Detail
Location
Change
Latitude / Longitude: 41.911745 / -70.96007
Street: 10 DemoPrelease Road
City: Middleboro
State: MA
Zip Code: 02346
Map
Sat
Ter
Earth
Show labels
Leona Dr
General Information
Serial Number: 15000209
Installation Date: 10/23/2012 12:55:12 PM
Last Contact: 3/6/2013 10:59:35 AM
Configuration
Change
ALIVE SETTINGS
Alive Time: 8:00 AM
Alive Interval: 1 hour
ROUTE SETTINGS
Timeout Per Hop: 240 seconds
Retries Per Route: 0
CONNECTION SETTINGS
Connection Type: Ethernet
Hub Connection Port: 80
Server URL: http://10.24.0.158:2100/arknet/arknet.dll
Backup Server URL: http://10.24.0.158:2100/arknet/arknet.dll
IP SETTINGS
DHCP: Enabled
IP Address: 10.24.1.39
Alerts
ACTIVE ALERTS
No active alerts
RECENT ALERTS (last 30 days)
Clear selected new | Clear all new
Refresh
Alert Time
Alert Duration
Alert Description
Note
2/8/2013 7:06:38 PM
N/A
Connection Log
Date
Time Between Connections
Server Retries
ISP Retries
Alive Reason
IP
3/6/2013 10:59:35 AM
1 hour
0
0
Scheduled
10.24.1.39

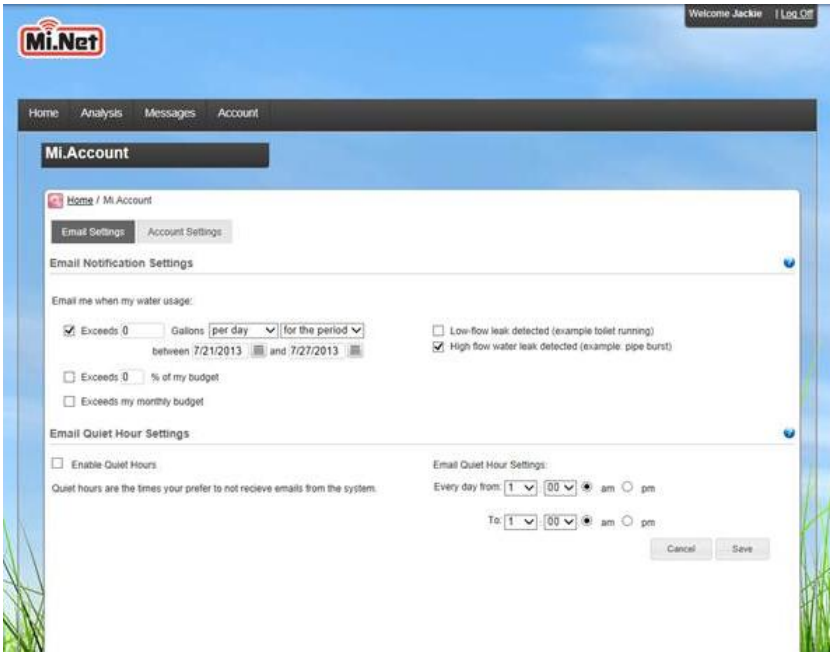

9 New Meter Alert(s)
0 New Network Alerts
Tasks:
Mi.Net
Mueller Systems Smart Meter Infrastructure
UI Version: 2.0.Build15, Release Version: 2.0.Build15
Home
Water
Electric
Network Infrastructure
Account Management
Alerts
Tools
Billing
Installation & Configuration
Reporting
Routing
Home » Tools » Reporting » Tasks
Auditing and Validation
System Health Report
Cell Health
Manual Readings
Aborted Install Meters Report
Tasks
Search Criteria
Type:
Status:
User:
Description:
Message:
Date From: 2/27/2013
To:
All of these words
Search
Clear
Tasks
Mark as Read | Mark as Unread | Cancel Selected
0 Meter(s) Selected Select/Unselect All
Type
Status
Start Date
Description
User
Message
On-Demand Read
Completed
03/6/2013 9:50:07 AM
Electric Meter: 2200483500
Reading (kWh): 784 (Sum)
Status: OK
On: 3/6/2013 9:50:45 AM
Electric Meter:
admin
Selected meters have been updated successfully.
On-Demand Read
Completed
03/6/2013 9:49:20 AM
Water Meter: 2010347800
Reading (CF): -48800
Status: OK
On: 3/6/2013 9:49:24 AM
admin
Meter has been updated successfully.
On-Demand Read
Completed
03/5/2013 2:43:16 PM
Water Meter: 2010347800
Reading (CF): -48800
Status: OK
On: 3/5/2013 2:43:22 PM
Water Meter: 2050000000
Reading (CF): 10544
admin
Selected meters have been updated successfully.

Customer Interface

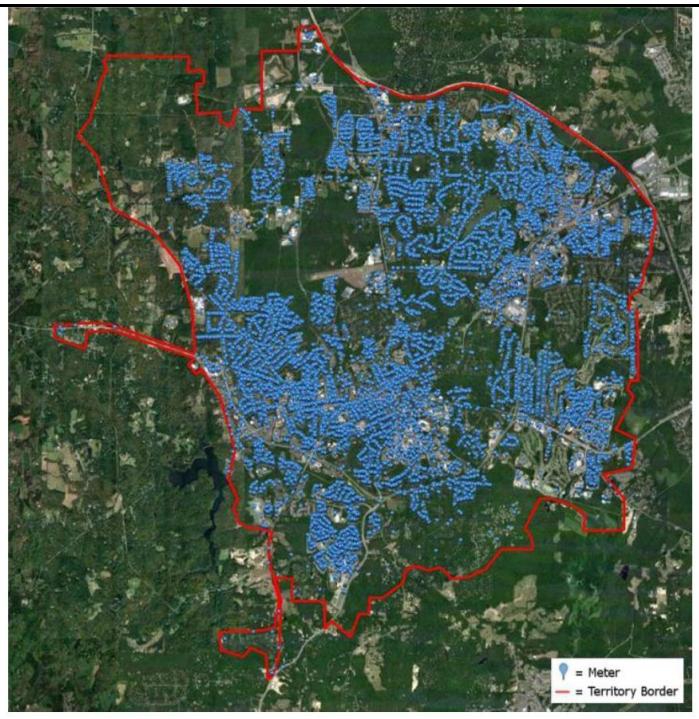


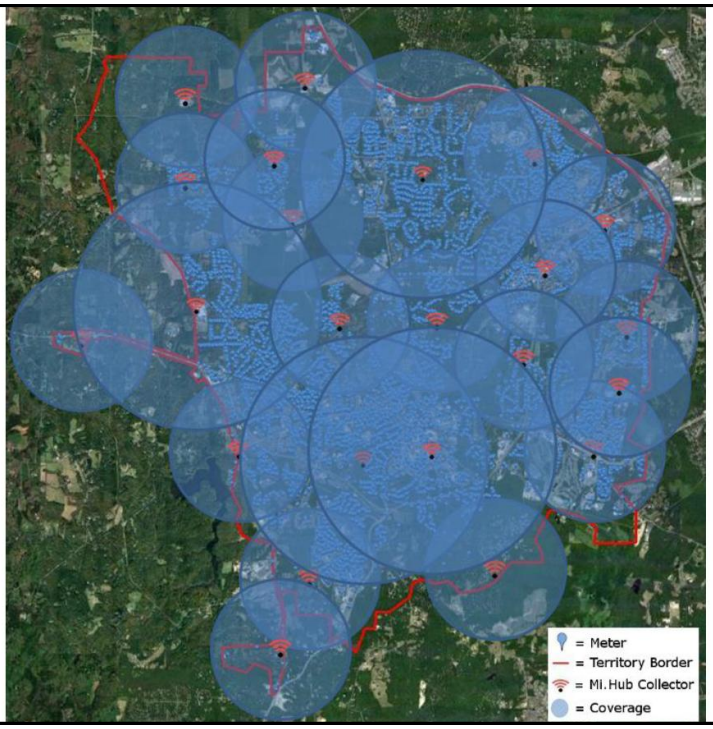

Mi.Net
Welcome Jackie | Log Off
Home
Analysis
Messages
Account
Mi.Water
Overall Water savings to date: $-168.48
You have reached 84.85% of your annual goals
Manage Budget
Home / Mi.Water 31-030365
Mi.Usage
Mi.Budget
Graph By:
From: 1/29/2013
To: 2/28/2013
My Water Statistics
Previous Period
Current Period
My Water Usage in Gallons 4,780.000 13,100.000
Water Estimated Cost $31.12 $78.29
Usage
Cost
Mi.Views
Advanced
What is my usage this month?
How does this month compare to last year at this time?
What is the difference between this month and last month?
How is my usage compared to my budget this month?
What is my cumulative usage year to date?
3001 and Up
0 to 3000
Gallons
Days of the Month
Previous Month
Next Month


Mi.Net
Welcome Jackie | Log Off
Home
Analysis
Messages
Account
Mi.Water
Overall Water savings to date: $-168.48
You have reached 84.85% of your annual goals
Manage Budget
Home / Mi.Water 31-030365
Mi.Usage
Mi.Budget
2013 Water Budget
Yearly Water Budget Total: $ 583.00
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
35 50 61 40 45 57 60 60 50 45 45 45
Last Year 0 0 0 0 0 0 0 0 0 0 0 67
$100
Dollars
$50
$0
Months
Cancel
Save

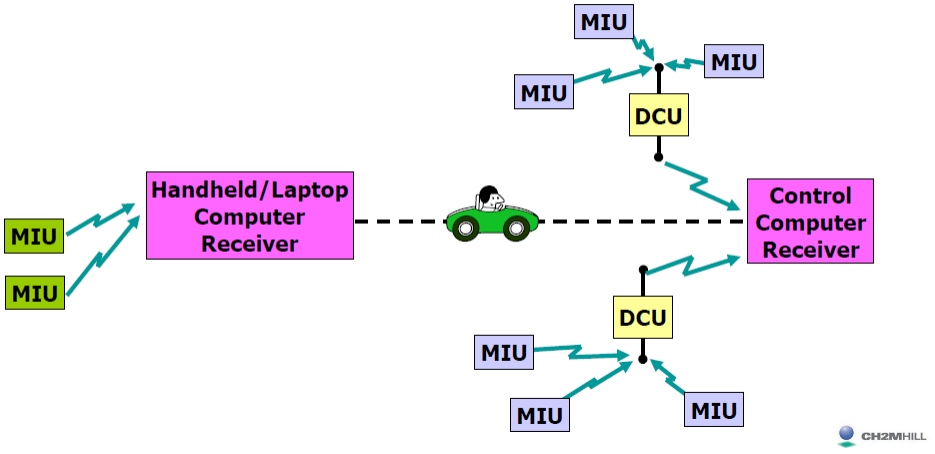


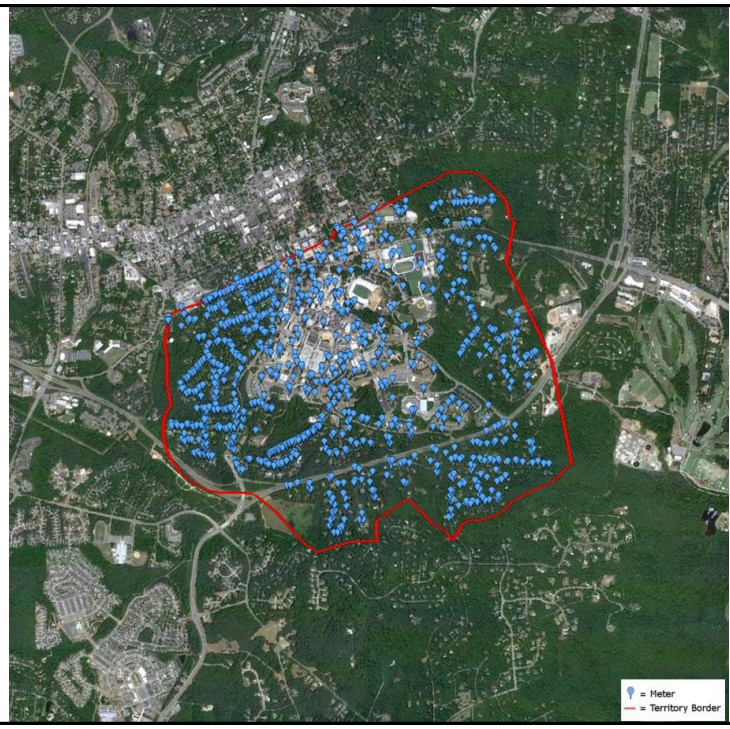
Propagation Study

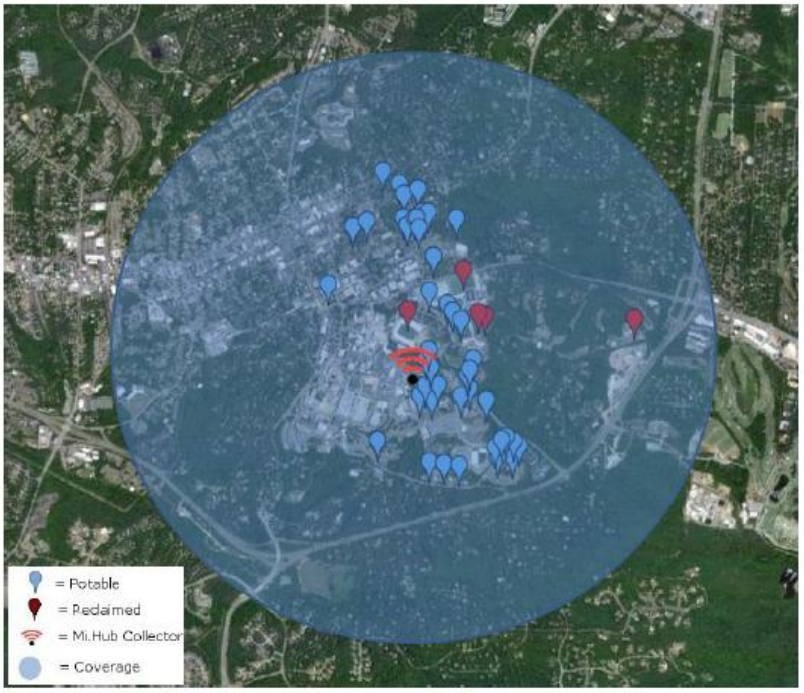

= Meter
= Territory Border


= Meter
= Territory Border
= MI.Hub Collector
= Coverage

Phased Implementation







Comments/Questions