

# This presentation premiered at WaterSmart Innovations

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watersmart '09 Innovations



# Tracking Construction Water Consumption Using AMR in the City of North Las Vegas



**October 2009**





Presentation by:

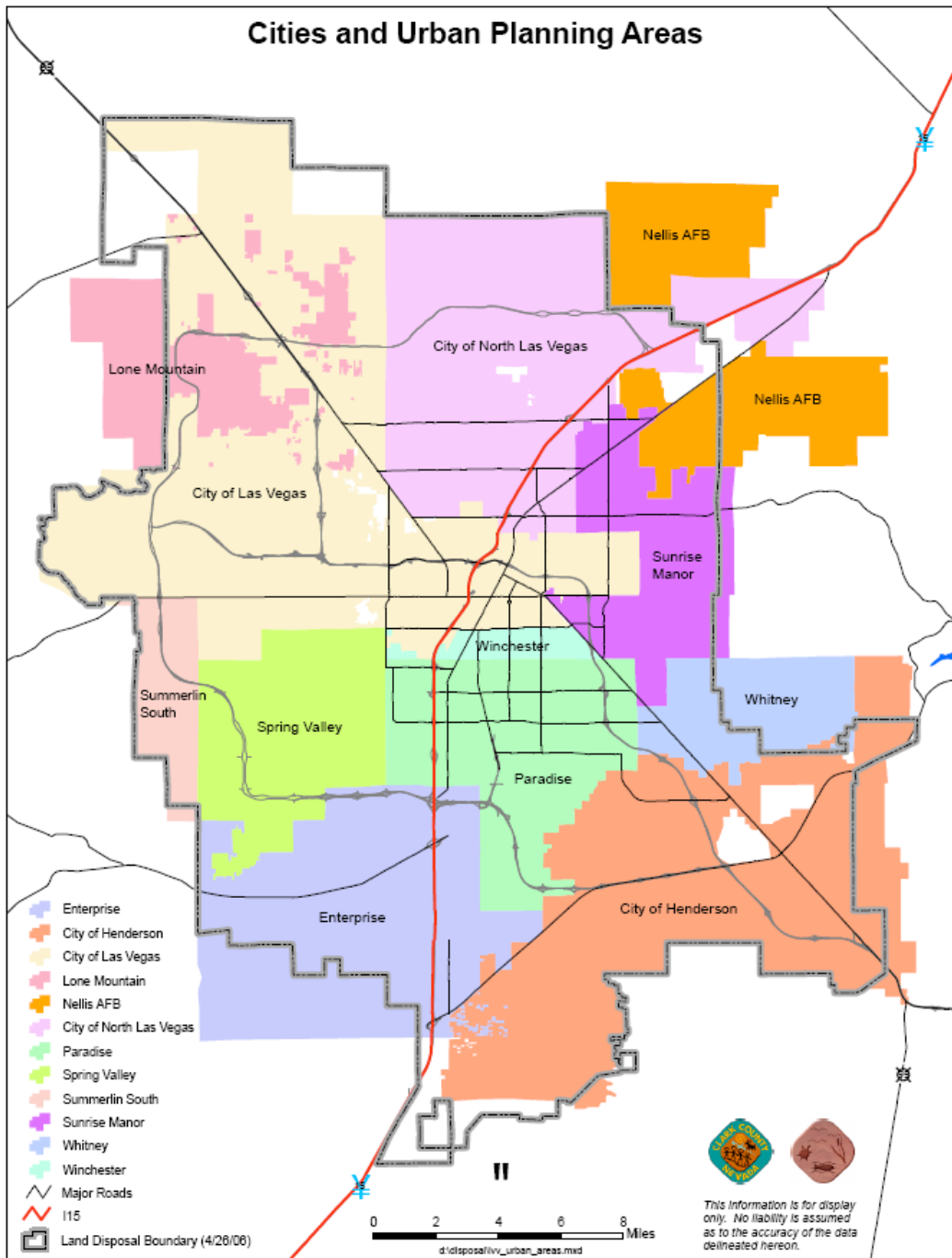
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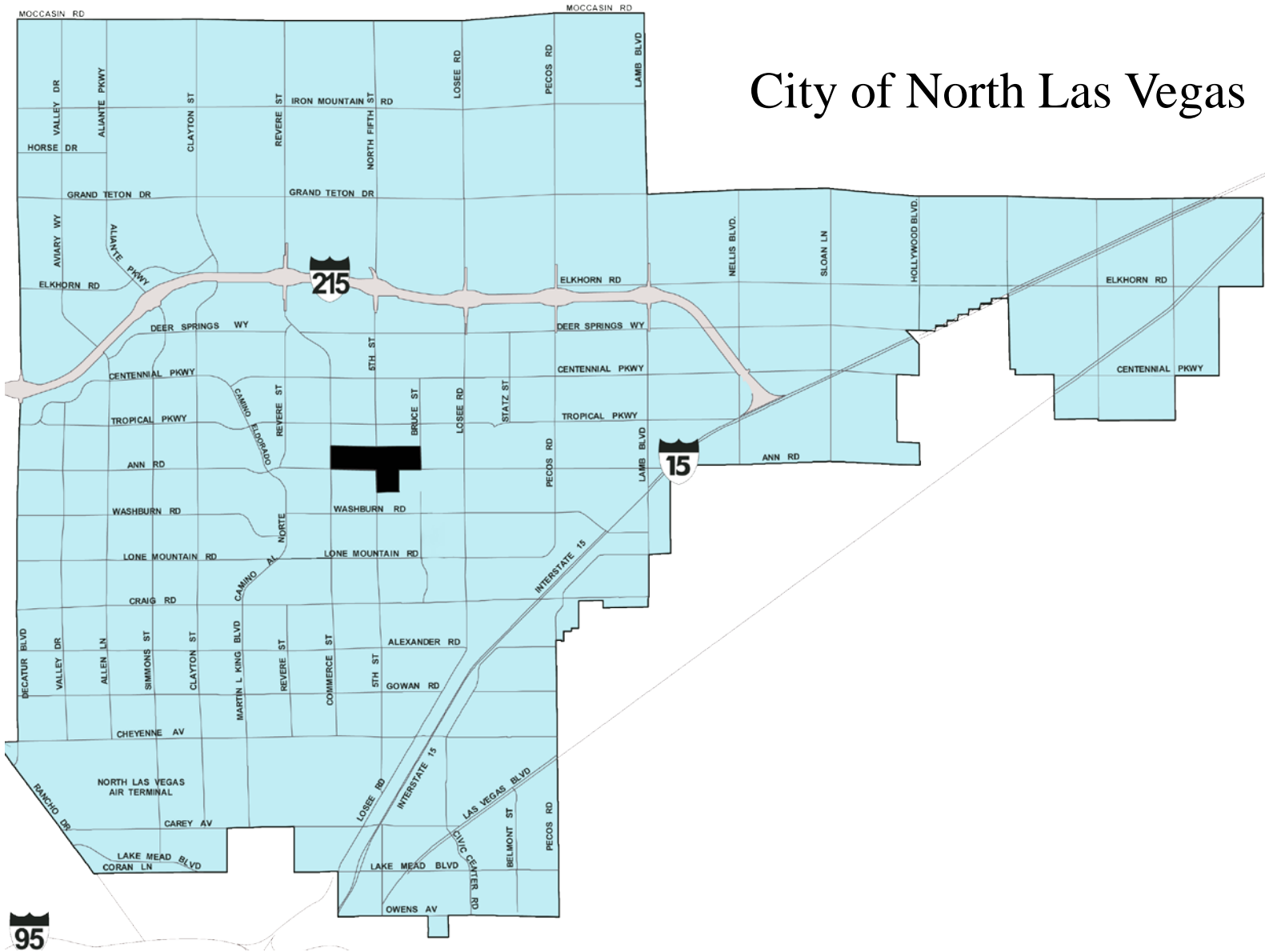
# Welcome to North Las Vegas



# Cities and Urban Planning Areas

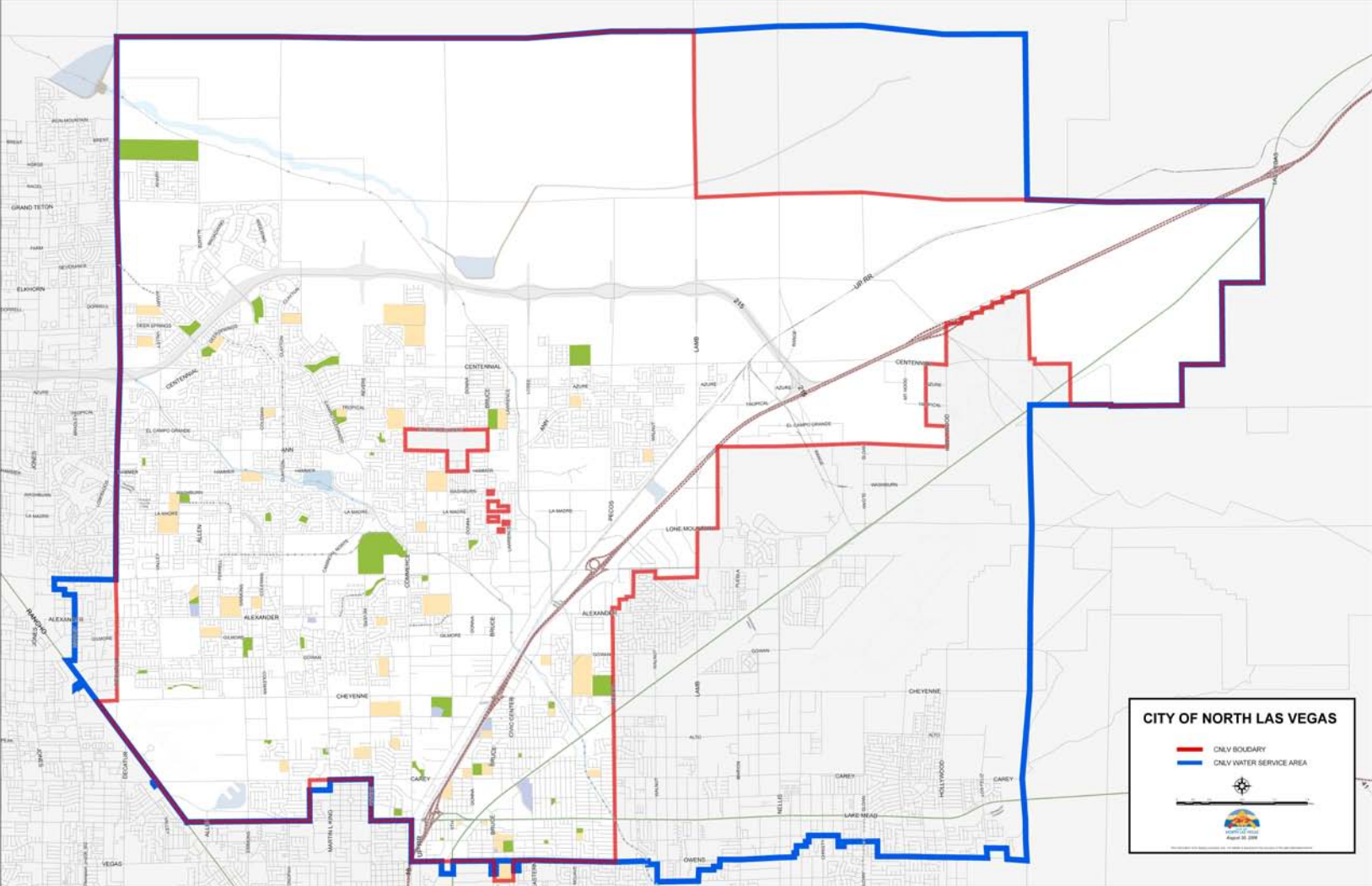


# City of North Las Vegas





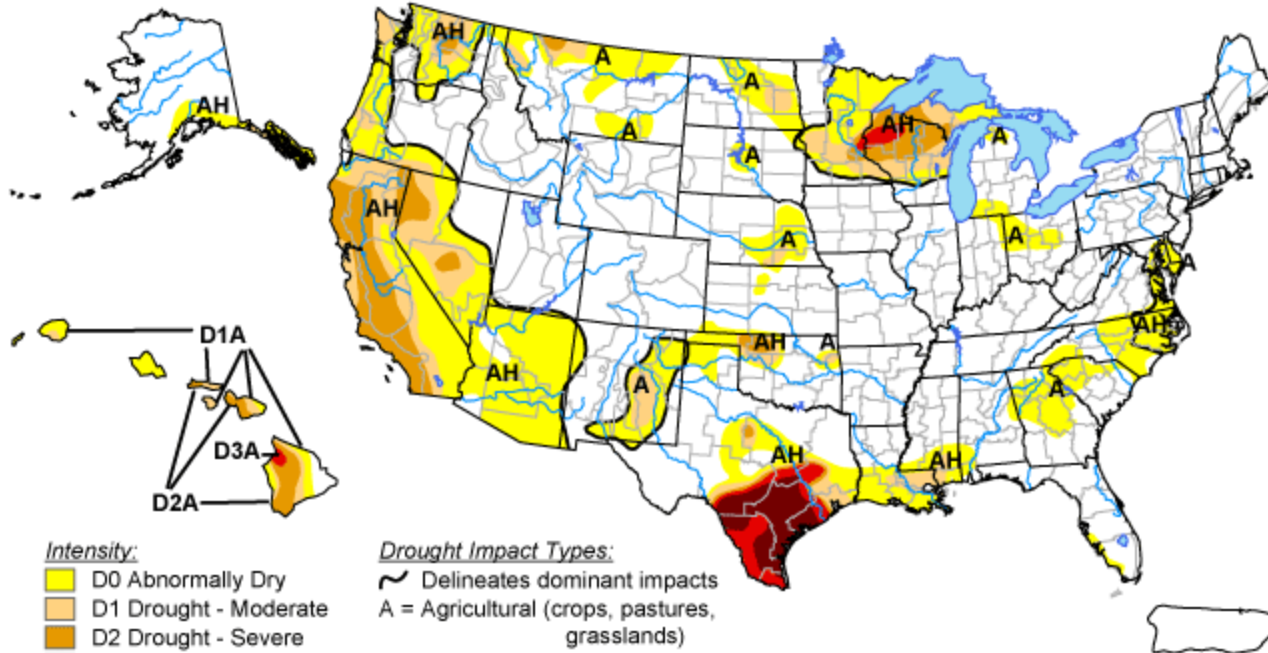
# Water Service Area



# Drought

## U.S. Drought Monitor

August 4, 2009  
Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, August 6, 2009

Author: Mark Svoboda, National Drought Mitigation Center



# Drought Future

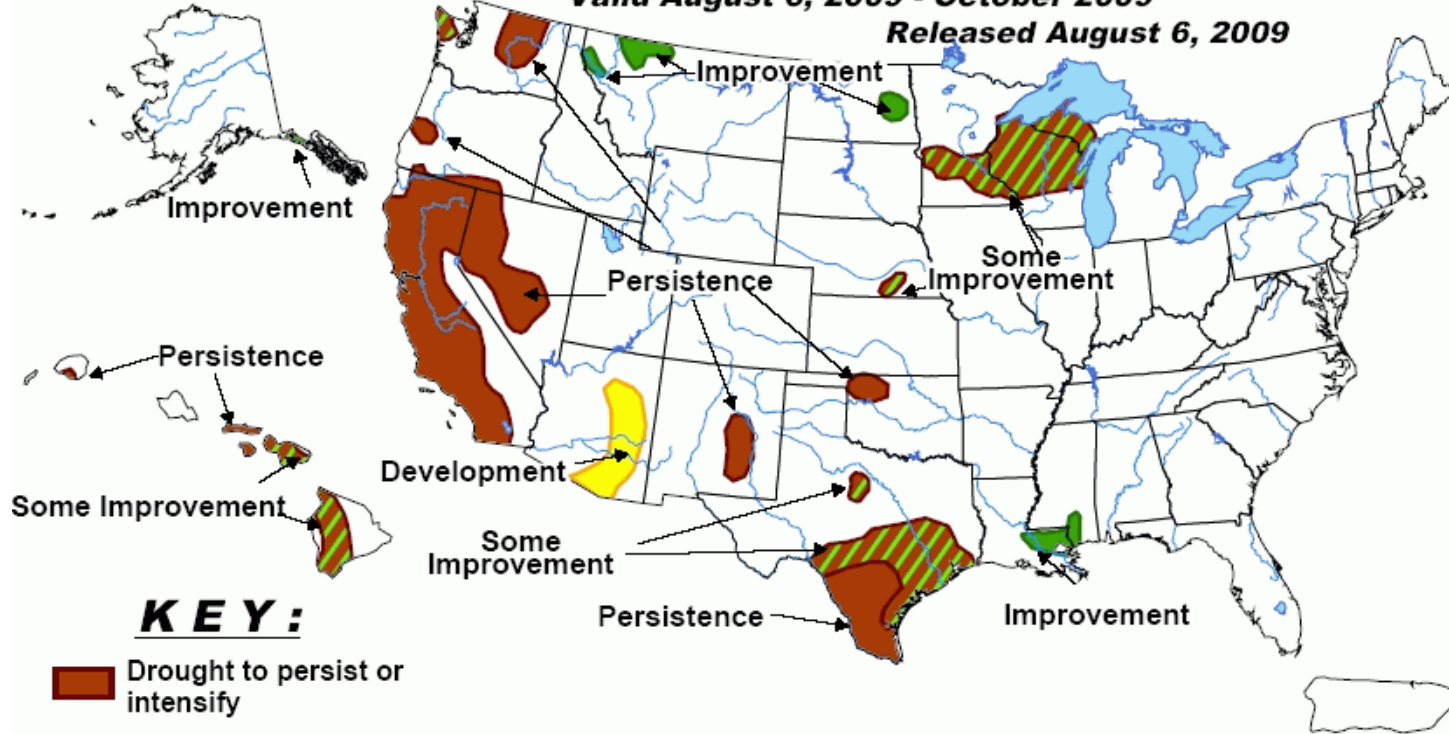


## U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid August 6, 2009 - October 2009

Released August 6, 2009

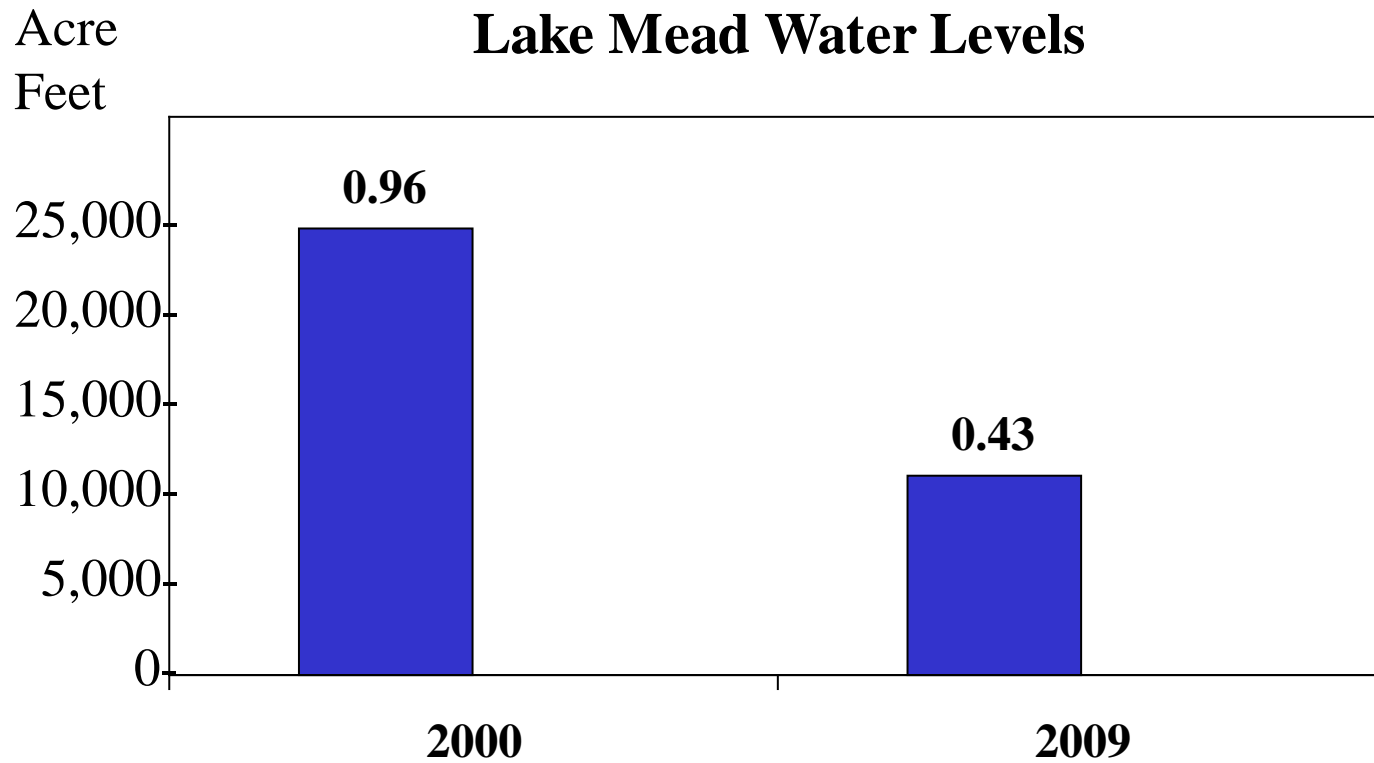


### KEY:

-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

# Drought - Lake Mead CNLV Primary Water Supply

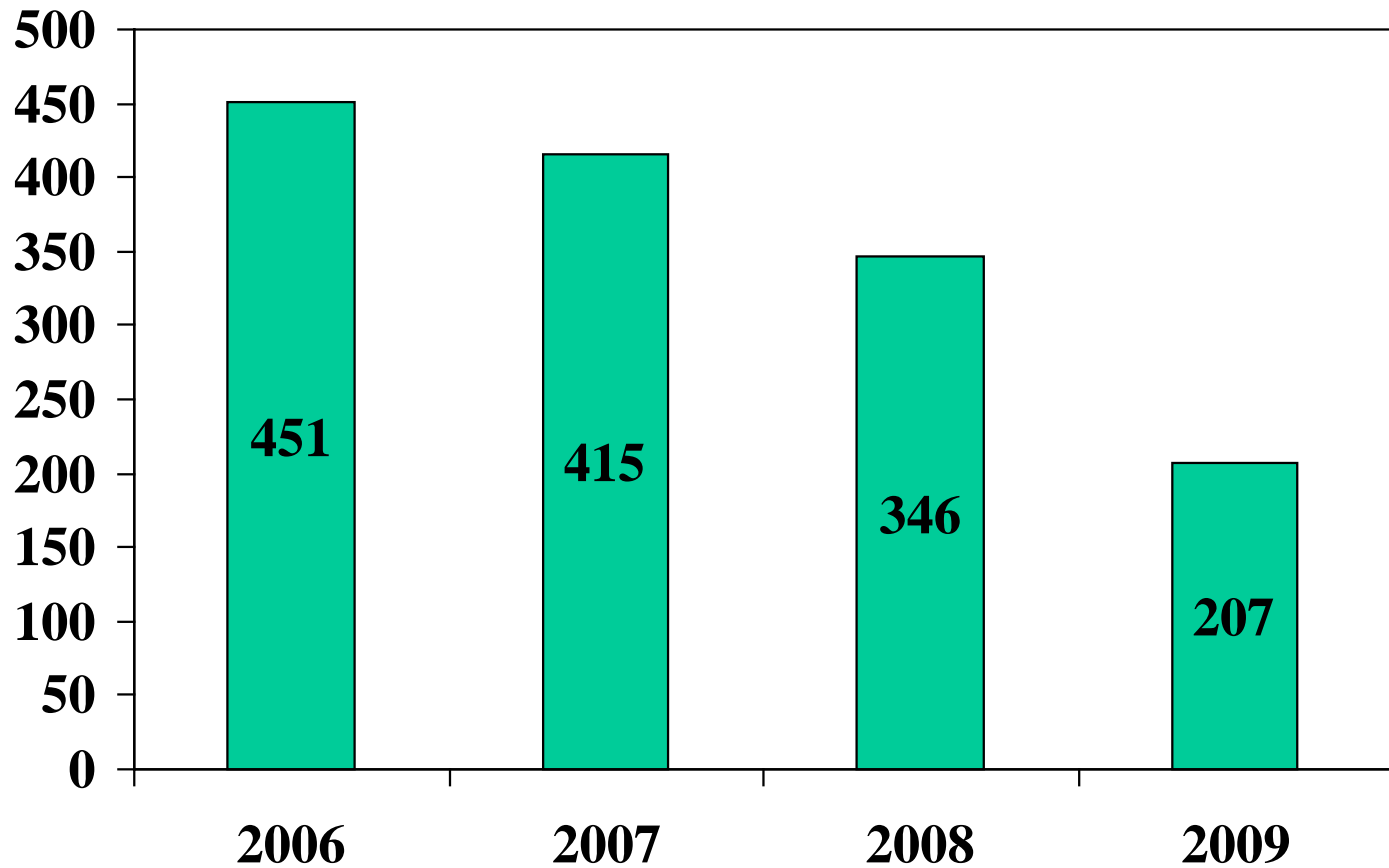


# Construction Water

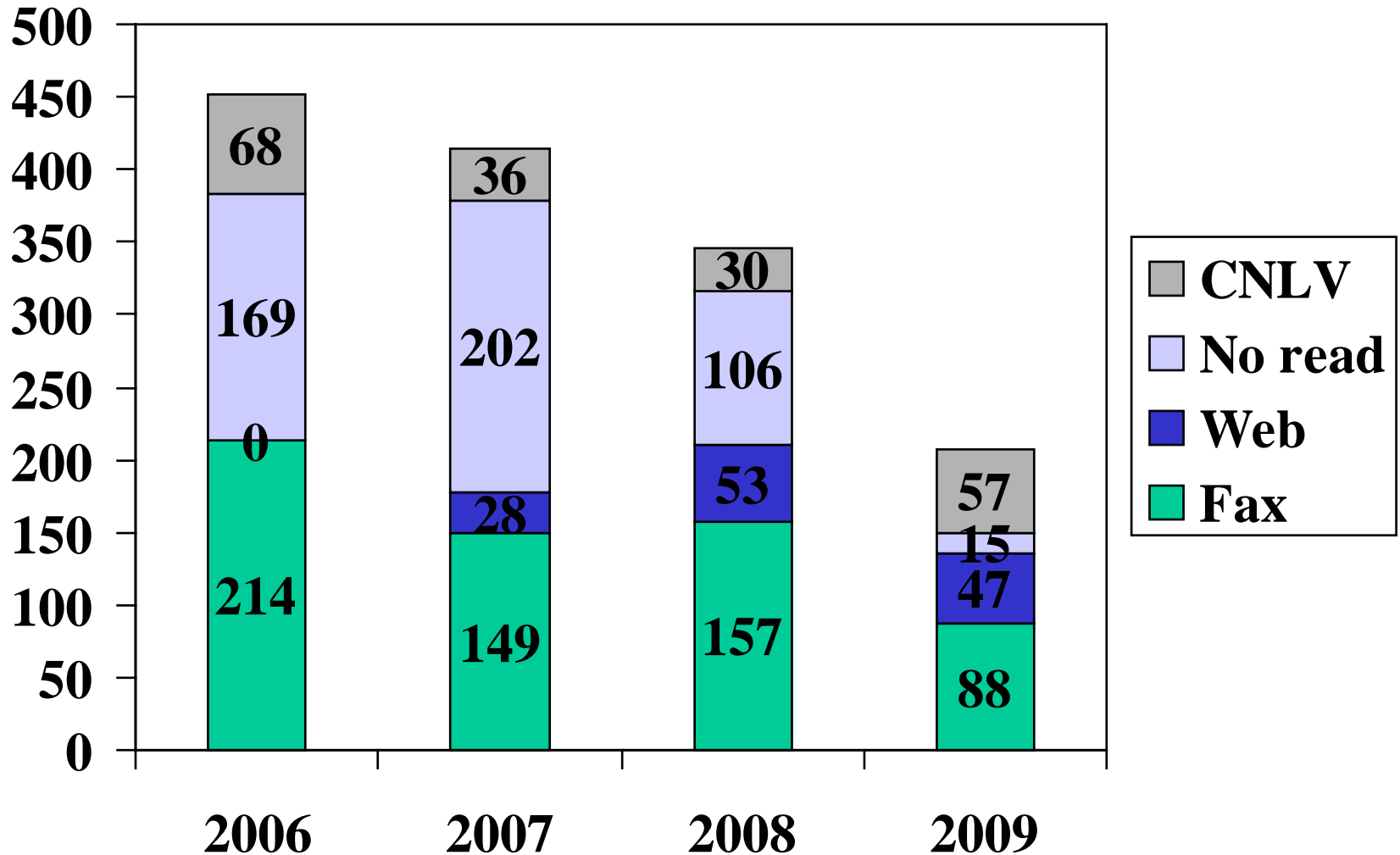
- Hydrant Meter (Jones Valve)
  - Construction Company Administered
    - \$950 deposit
    - Application
    - Identification
    - Location
    - Monthly Readings on Honor System
      - Fax
      - Internet



# Construction – Hydrant Meters



# Monthly Reads – Honor System



# Honor System

- **Problem – Missing Reads Each Month**
- **Solution – Added Web Submission in 2007**
- **Problem Continues – Missing Reads**
- **Solution – A \$250 fee each month in 2008**
- **Problem Continues – Missing Reads**
- **Final Solution – City Administered Program**



# Construction Company Administration

- **Problem – Meter Damage and Misuse**
  - Register not working
    - Excuse – I don't know how they work
    - Customer won't accept estimated use
  - Meter read less than the previous month
    - Excuse – wind caused meter to go backwards
    - Customer won't accept estimated use
- **Solution – City Administered Program**

# Construction Company Administration

- **Problem – Lost or Stolen Meter**
  - Usage lost from billing and from reports
  - Customer won't accept estimated use
  - City recovers only \$950 deposit
  - Meter found
- **Solution – A \$2,500 fee**
  - Customer dispute
  - Meter found sometimes
- **Final Solution – City Administered Program**

# Construction Company Administration

- **Problem – Customer goes out of business**
  - Where are the hydrant meters?
  - What was the last usage?
- **Solution – City hopes they reappear on another customer's work site**
  - City staff periodically check worksites for hydrant meters and report findings
  - Problem – lack of staff due to number of projects and small number of staff
- **Final Solution – City Administered Program**

# City Administered Program

- City requires customer to provide:
  - Application
  - Identification
  - \$950 deposit
  - Location
- City installs within 24 hours (next work day) for free or on the same day for \$60

# City Administered Program

- City moves hydrant meter to requested location within 24 hours (next work day) for free or on the same day for \$60
- City is responsible for the readings
- City is not responsible for damage or loss

# City Administered Solution

- Hydrant Meter locked to hydrant using AMR radio





# Original Hydrant Meter



# Components added for AMR

- Anti-theft mounting plate

- Information Sheet

- Electronic Register

- T2 Radio



# Components added for AMR on Hydrant Meter





# Locking Devices



Collar with Master Lock

Collar with Barrel Lock

# Locks



Master Lock & Key

Barrel Lock & Key

# Hydrant Meter Set



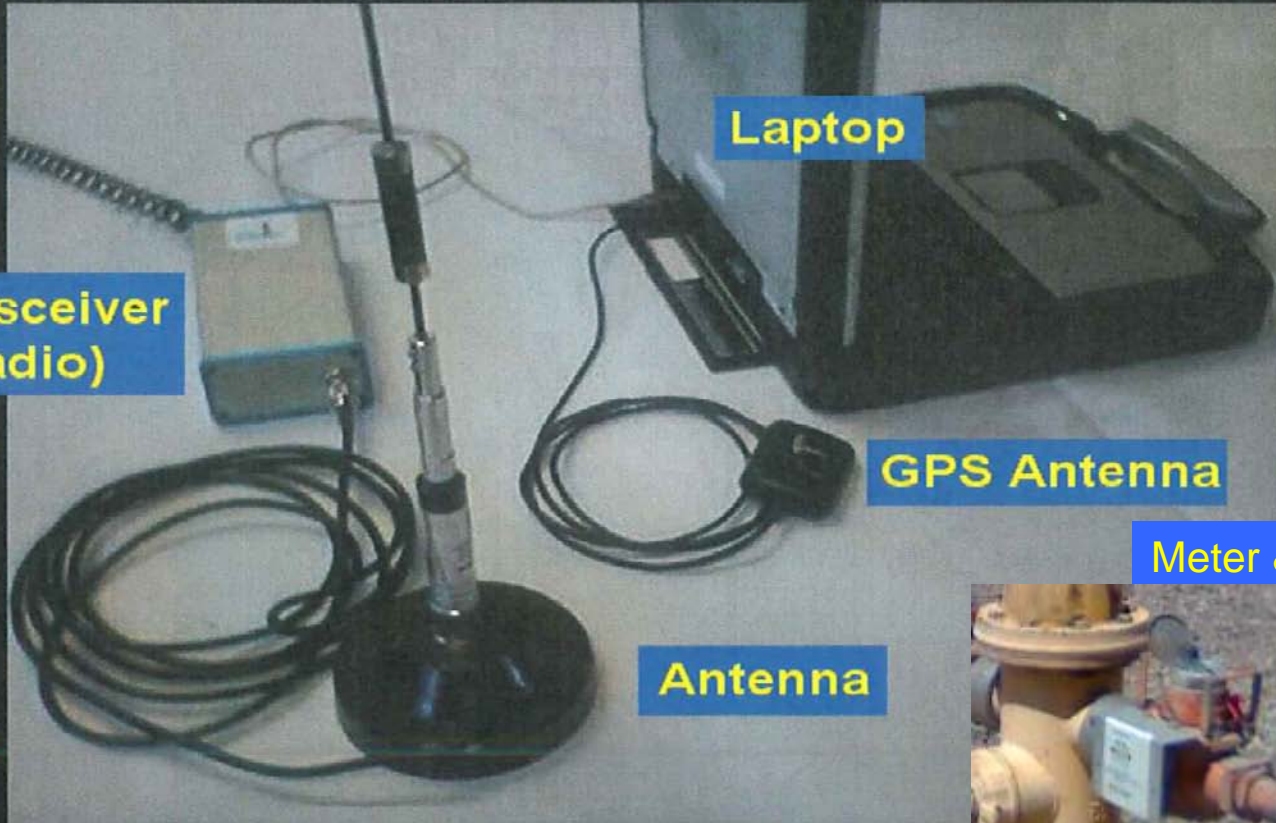


# Locating GPS Points



# AMR Components

## System Components



Transceiver  
(Radio)

Laptop

GPS Antenna

Meter & Radio

Antenna





# AMR Route Screen

Route database: C:\T2 G2 MOBILE\Database\cy2June.mdb

File View Configuration Utilities Options Help

Microsoft MapPoint

**T2** TRANSPARENT TECHNOLOGIES. BEYOND AMR **G2** MOBILE

**Activity Window**  
Receiver serial port.

RF1  RF2  GPS

**Account Information**  
Account:  
MeterID: 114374  
Address: 4127 PROSPEROUS CT  
Location:

**Meter Reading Status**  
Total Meters in Database = 3220  
Total Meters Read = 0 %  
Total Meters Remaining = 3220

- Unread Meter      - Comm Error  
 - M1 Read OK      - High Usage  
 - M2 Read OK      - Conservation  
 - M2 OK Log Avail.      - Backflow  
 - Leak      - Zero-Use

Lat: 36.2032?     Lon: -115.1608?

RF1 Sens: ON / OFF     RF1 BW: HIGH / LOW     Meter Filter: ON / OFF

Zoom IN (F5)     Zoom OUT (F6)

Map View     Data View     Log View     EXIT

G2 AMR Profile: Default     Zoom is 1X     Filters: Unread + Comm Error + Encoder Fail

start     Route database: C:\...     1:53 PM

# AMR Reading Screen

The screenshot shows the AMR Reading Screen software interface. The title bar indicates the database path: "Route database: C:\T2 G2 MOBILE\Database\1 G2 dec18 Template Edited for 200K and up.mdb". The menu bar includes "File", "View", "Configuration", "Utilities", "Options", and "Help".

**Radio Activity Info** (Red box):  
ID: 236392 [236392]  
Reading: ??  
Status Byte: 0  
Node Strength: 3

**Radio and G.P.S. status** (Green box):  
RF1  GPS

**Account information** (Yellow box):  
AutoLog is Complete  
Response: FATIGAH, LISA  
MeterID: 236393  
Reading: 221  
Address: 1705 BENT ARROW DR  
Location:  
Meter Type:  
Meter Size:  
Code: 81  
Communications Error: False  
Leak Detect: True  
High Usage Flag: False  
Backflow Detect: False  
Zero Use Detect: False  
Low Battery: False  
Shoulder Fail: False  
Conservation Flag: False

**Meter Reading Status** (Purple box):  
Total Rte Stats  
Total Meters in Database = 5357  
Total Meters Read = 227 4%  
Total Meters Remaining = 5130

**Symbol Legend** (Grey box):  
● - Unread Meter      / - Comm Error  
● - M1 Read OK      / - High Usage  
▲ - M2 Read OK      / - Conservation  
■ - M2 OK Log Avail.      / - Backflow  
● - Leak      / - Zero-Use

**Control Panel** (Bottom):  
Lat: 36.2654 Lon: -115.1638  
RF1 Sens: ON/OFF      RF1 BW: HIGH/LOW      Meter Filter: ON/OFF  
Zoom IN (F5)      Zoom OUT (F6)  
Map View      Data View      Log View      EXIT

**Annotations:**  
- "Click on icon and this menu will popup" points to a context menu with options: Move Meter, Enter Manual Reading, Delete Reading, Edit Account Note, Edit Configuration, Get Log, View Log (highlighted), Close Menu.  
- "This box contains the Account Information for the selected icon." points to the yellow Account information box.  
- "to change screen Views" points to the Map View, Data View, Log View, and EXIT buttons.



# Data Log Sample

Transparent Technologies

File Export View



## Account Description

Single Family Residential House  
Had High Consumption of app 2400 Gals/Day  
Repaired Feb 18th

Meter ID

Meter Type

Meter Units

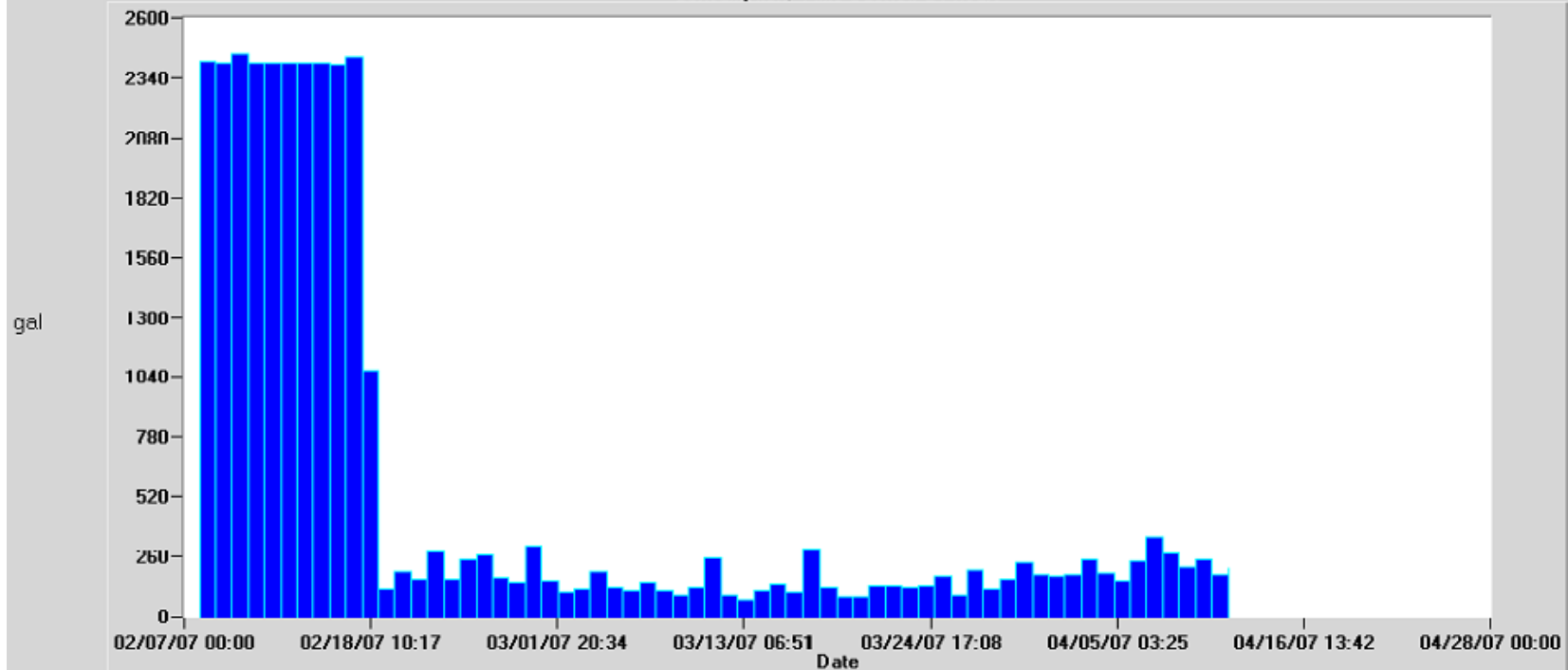
Meter Reading

Total Consumption

Meter Size

Read Date and Time

Consumption, Time Bucket: 24 hours



# Data Log

- Uploaded to Customer Service Computer System
- Useful for Customer Disputes & Questions



# City Solution – Progress

- Accurate Readings
- Accurate Billing
- Accurate Construction Water Reports
- Only 150 to Convert –  
57 Converted since 1-1-09
- Fewer Billing & Customer Problems
- Improved Customer Service

# Questions???

