

# Board of Supervisors Meeting



Carson City  
Public Works Department

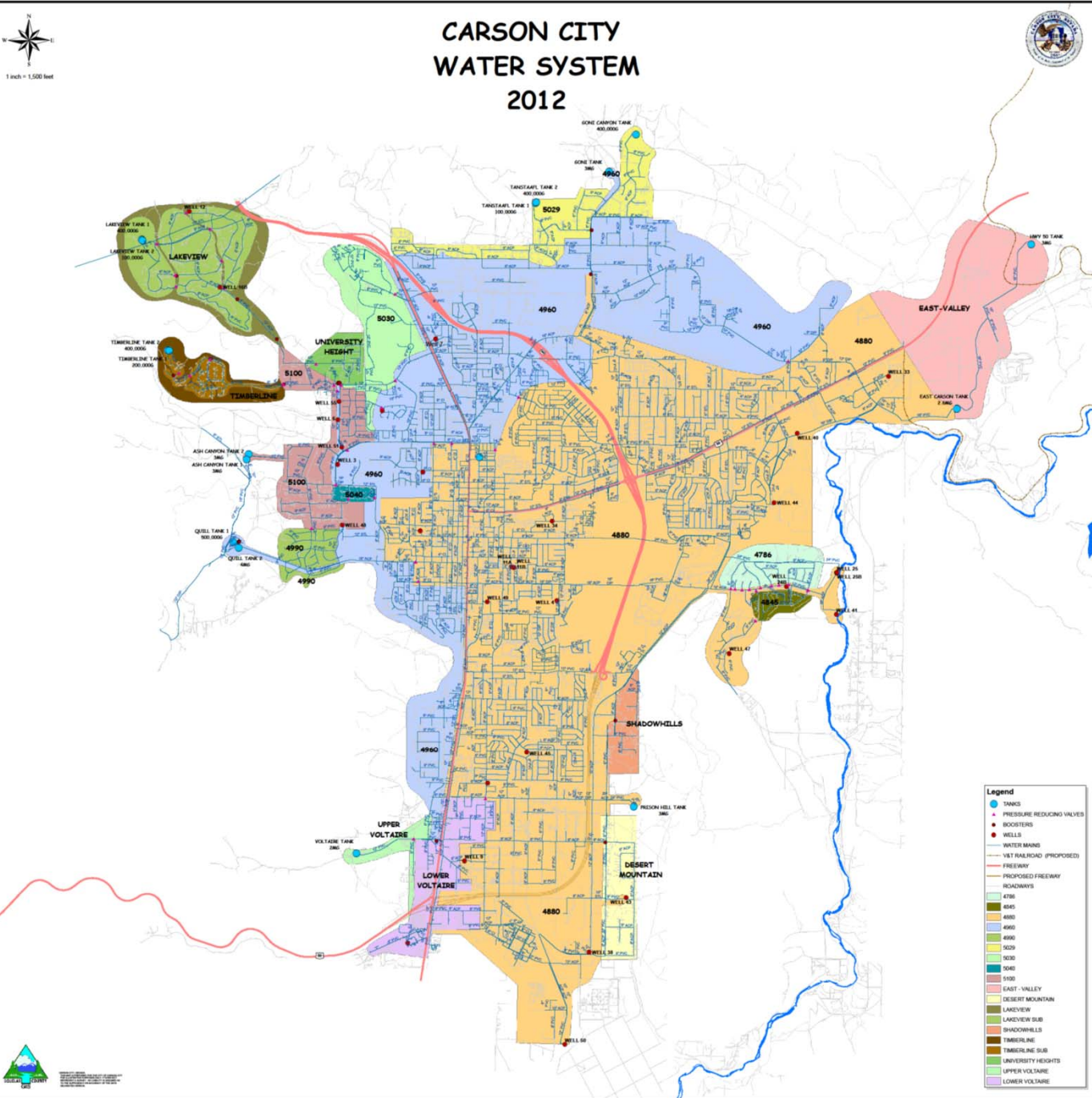
# Water System Capital Improvement Plan Update

March 14, 2013

# Water Facility Inventory

## Components:

- 23 – Pressure Zones
- 14 – Booster Pumping Stations
- 10 – Water Storage Tanks (26 MG Total Storage)
- 33 – Groundwater/Induction Wells (22 MGD Production)
- Quill Ranch Water Treatment Plant (4 MGD Capacity)
- Arsenic Treatment Plant (2 MDG)
- 43 – Pressure Regulating Stations
- 329 Miles – Water Distribution/Transmission Line
  - 6 Miles (Built in 1950's)
  - 42 Miles (Built in 1960's)
  - 89 Miles (Built in 1970's)
  - 54 Miles (Built in 1980's)
  - 65 Miles (Built in 1990's)
  - 73 Miles (Built in 2000's)



# Issues Which Drove Revisions to Water Plan

- State Engineer request for increased reserves for water supply
- Arsenic and Uranium Levels in Several Ground water wells
- System Operational Issues during Dry and Drought Conditions-Difficult to meet peak summer demands

# Water System Goals

- Provide Reliable and Sustainable Water **Quality** Throughout City Distribution System.
- Provide Reliable and Sustainable Water **Supply** for Build out Population.
- Provide above with Least Overall Cost to City Water System.

# Objectives – Water Supply

- Develop City Owned Groundwater within the Carson Valley Basin
- Maximize delivery of State Marlette raw water to City System.
- Optimize delivery of Ash and Kings Canyons raw water to Quill including alluvial fan storage by recharge.

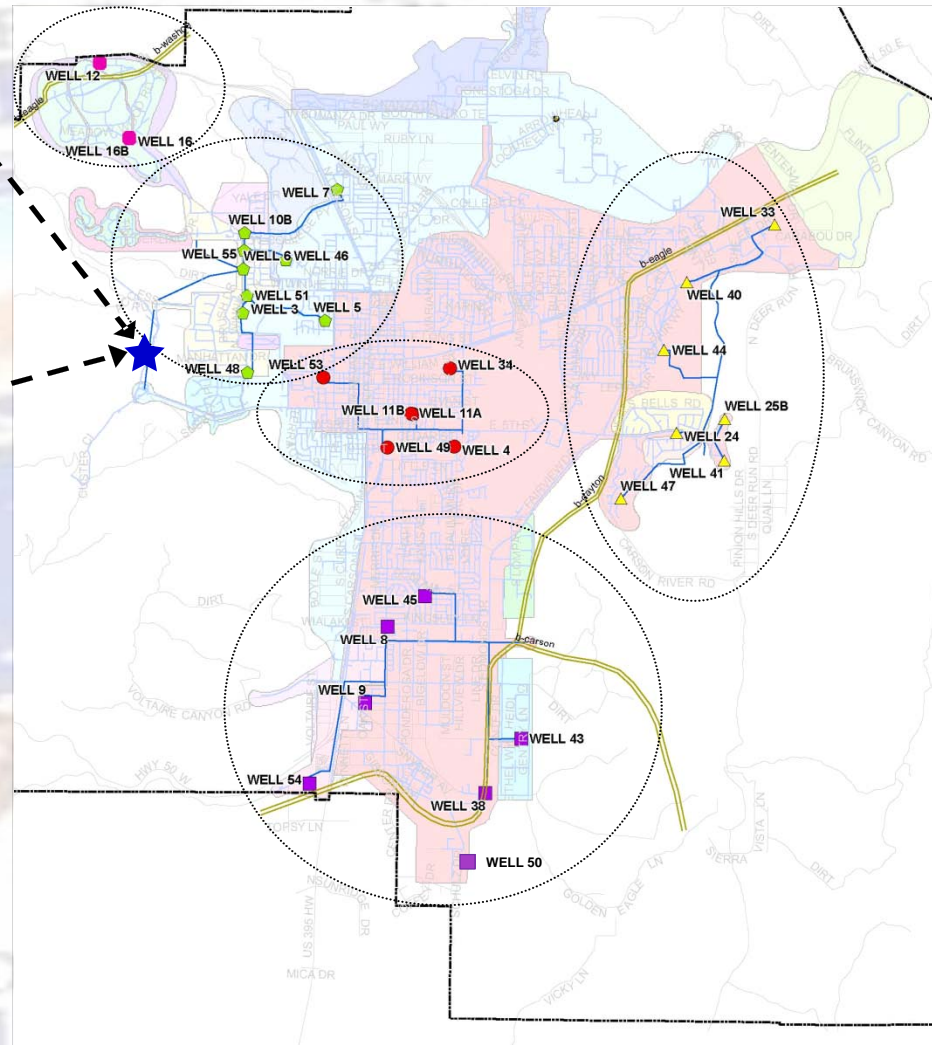
# Water Production Plan

- Maximum Month and Maximum Day Demands by Zone
- New Water required for Normal and Drought Conditions
- Address Water Transit and Aging Issues
- Distribution System Improvements
- System Efficiencies and Energy Savings

# Existing Water Supply Sources

Supply From State MHWS to Quill

Ash and Kings Canyon Supply Through Quill



**Figure 13**  
**Water Distribution System Utilities**  
**Regional Blending Cluster Map**  
 City of Carson City, NV

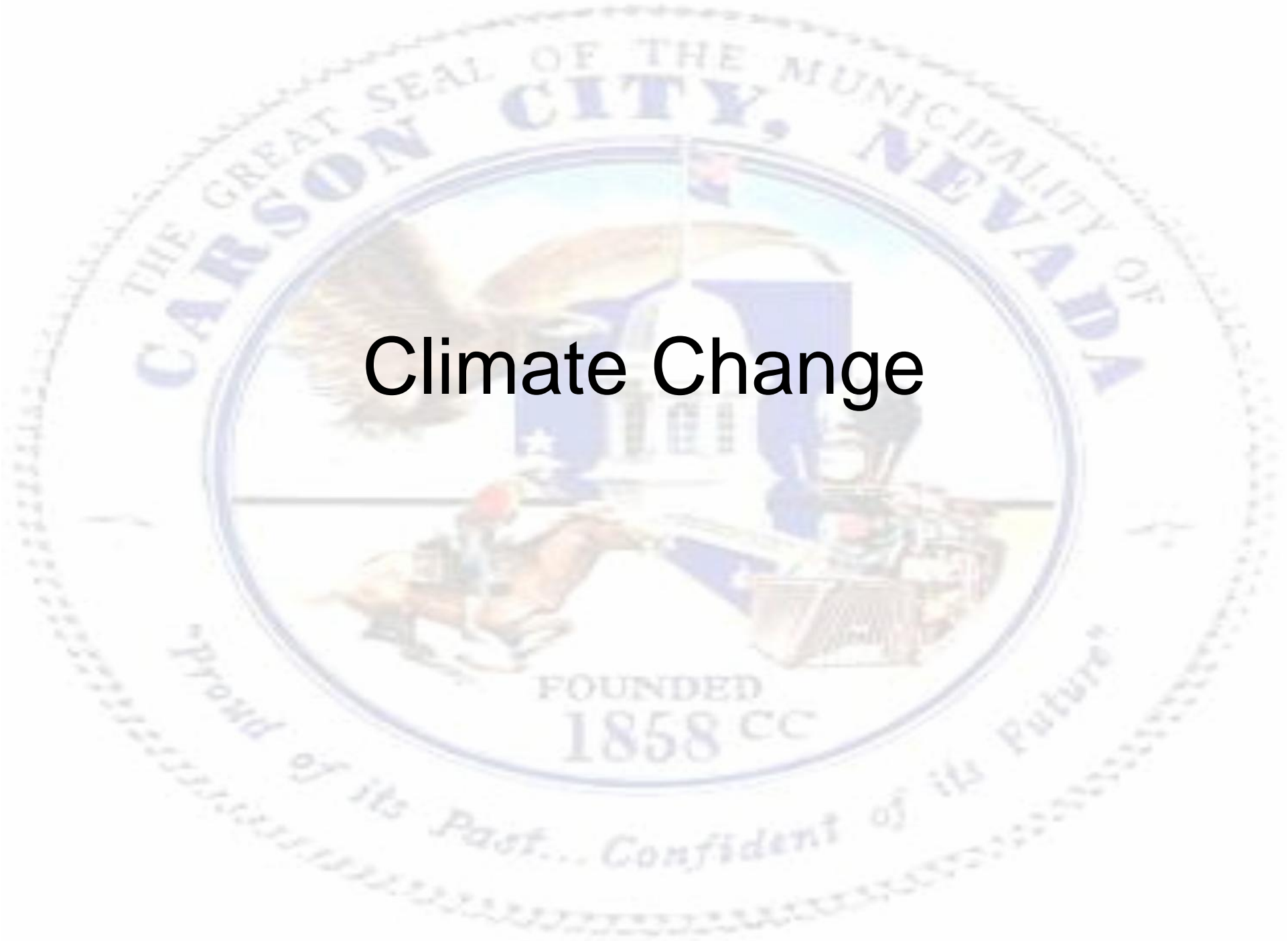
**LEGEND**

- ▲ Well Group 1
- Well Group 2
- Well Group 3
- ◆ Well Group 4
- Well Group 5
- Well Mains

0 4,500 9,000  
 Feet  
 1 inch equals 4,500 feet  
 Data source: City of Carson City GIS

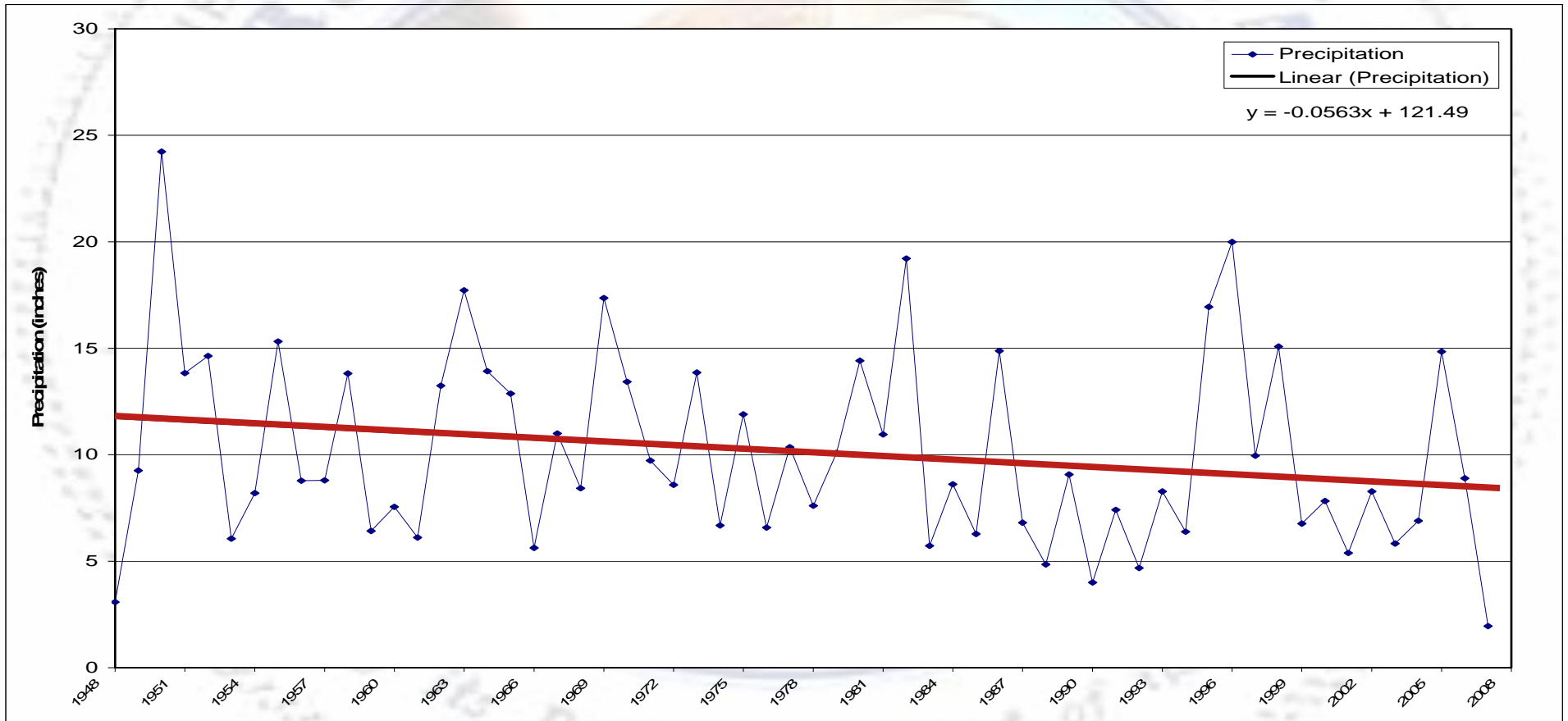
 



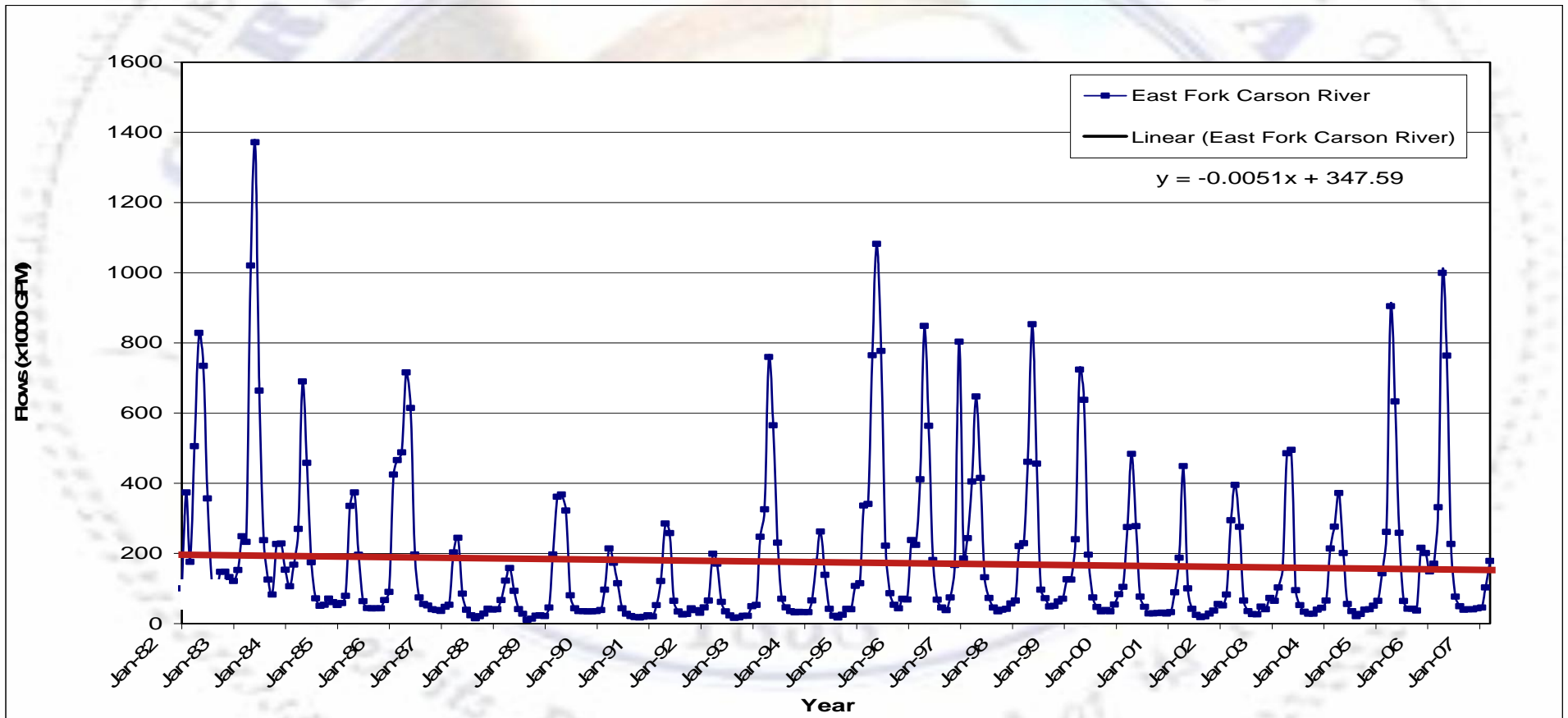


# Climate Change

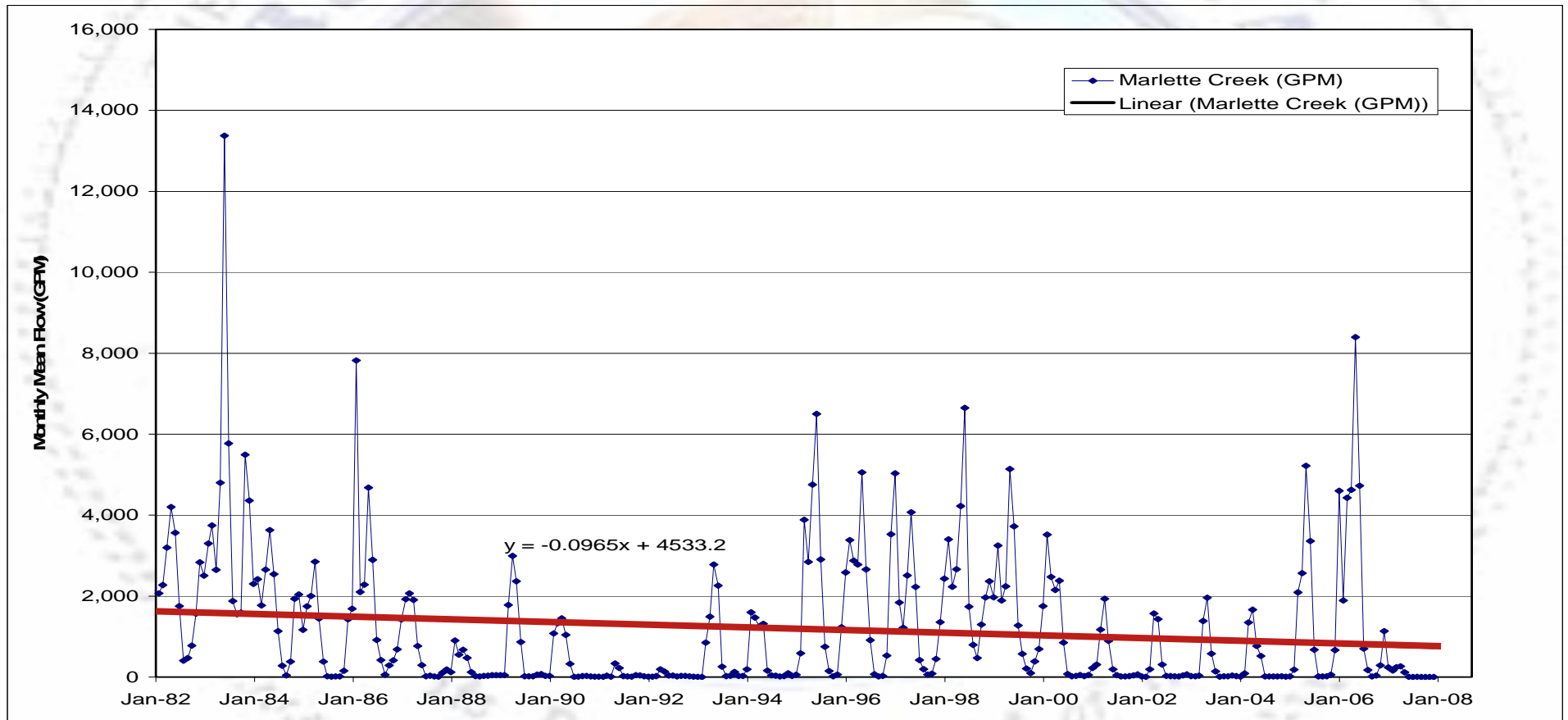
# Annual Precipitation for Carson City



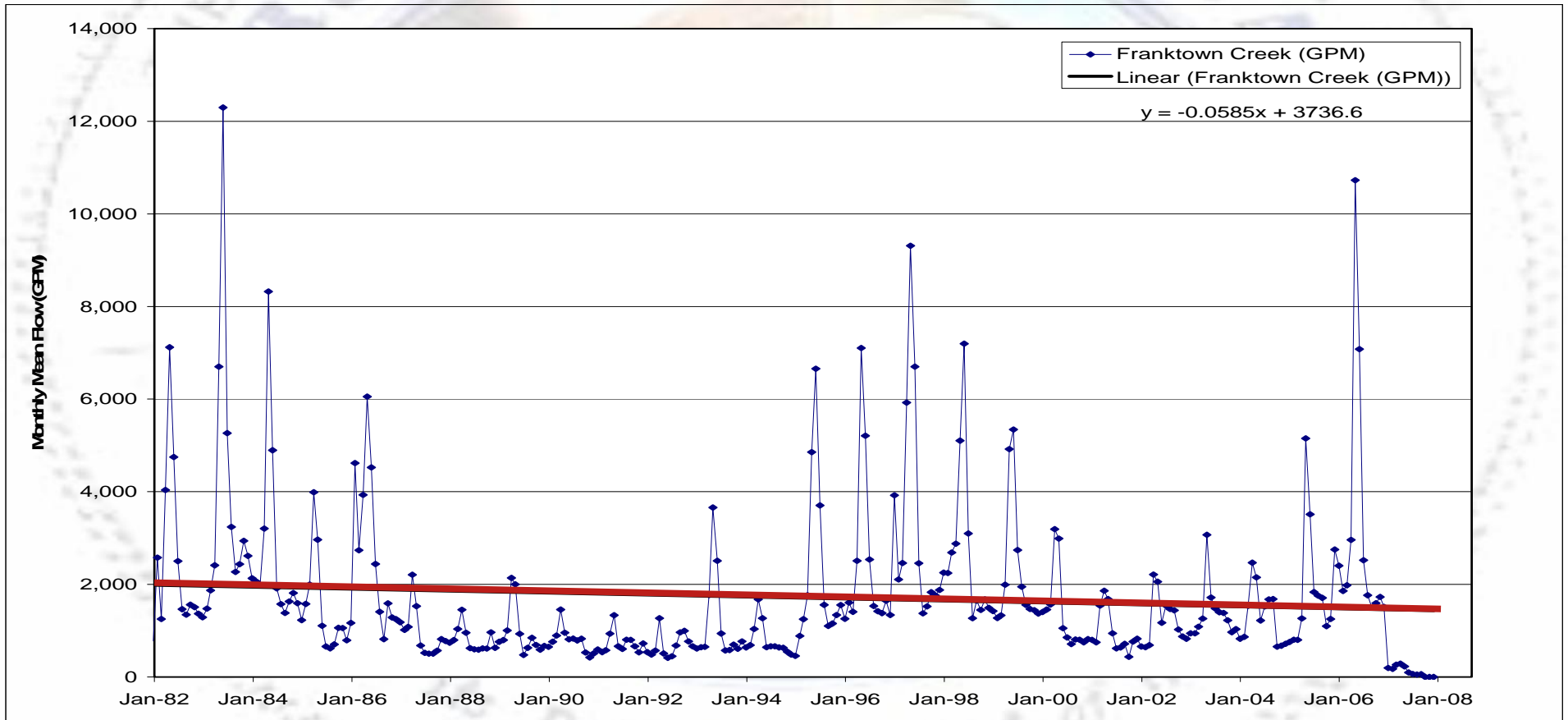
# Trending for East Fork Carson River



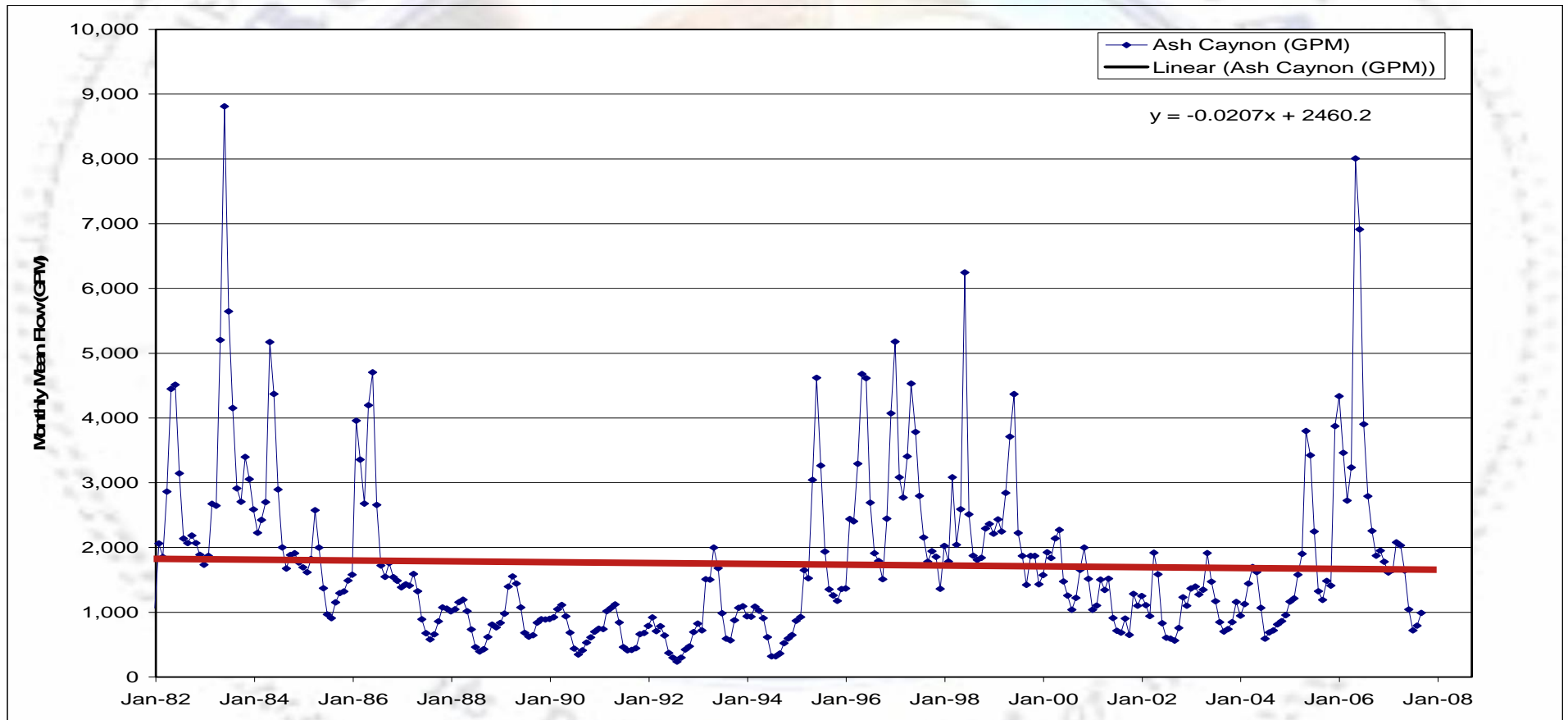
# Trending for Marlette Creek



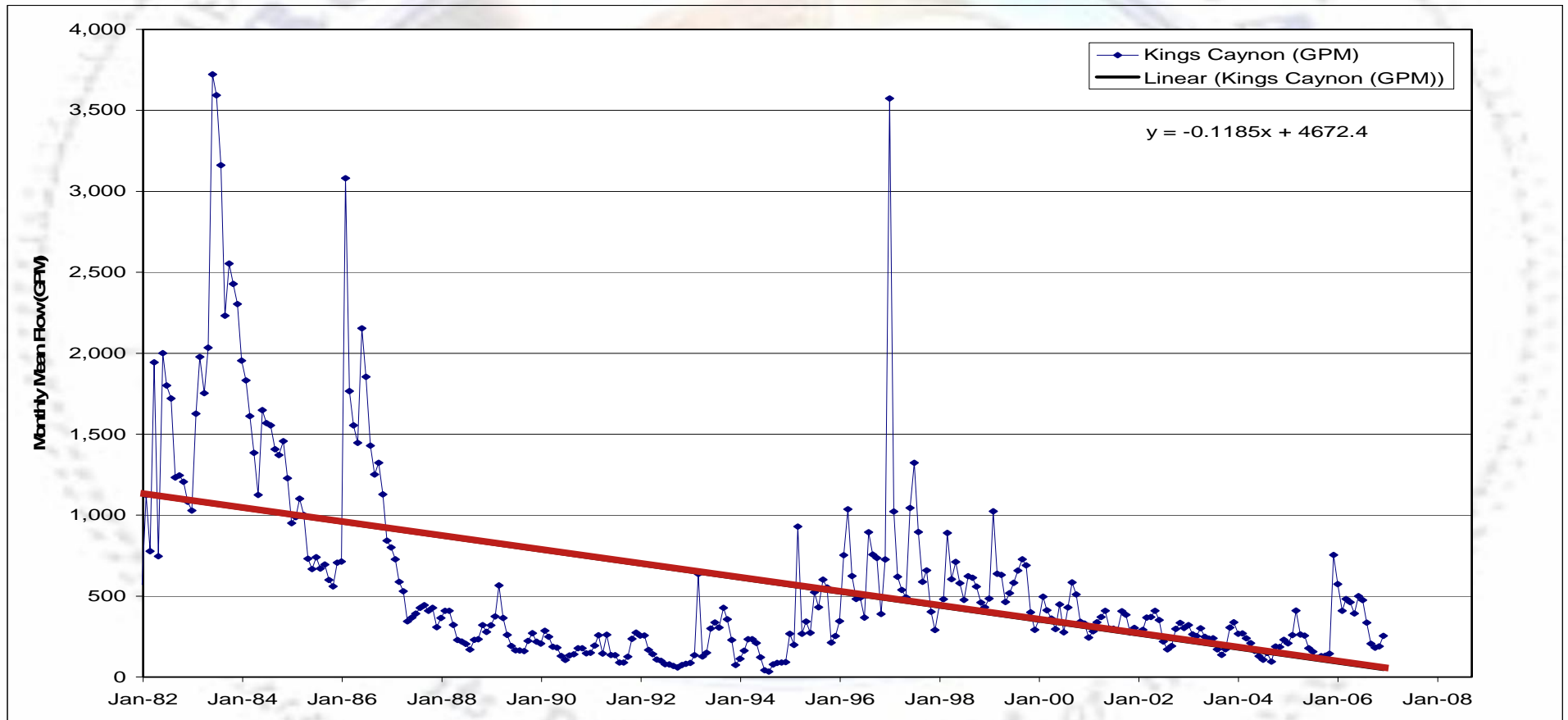
# Trending for Franktown Creek



# Trending for Ash Canyon



# Trending for Kings Canyon



# Impacts of Climate Change

- A reduction in future water resources of 14 percent has been applied to the Resource Assessment

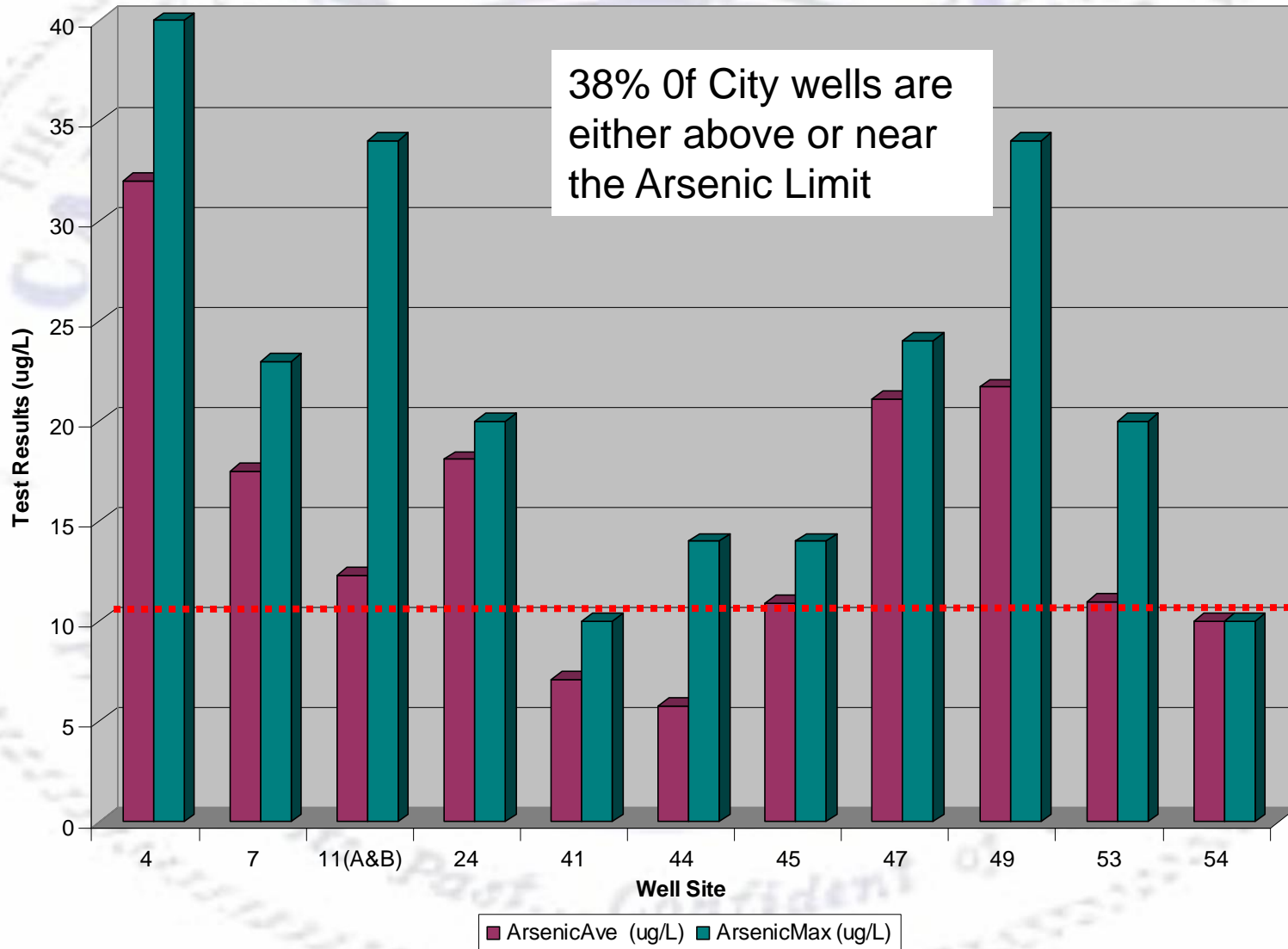


# Water Quality

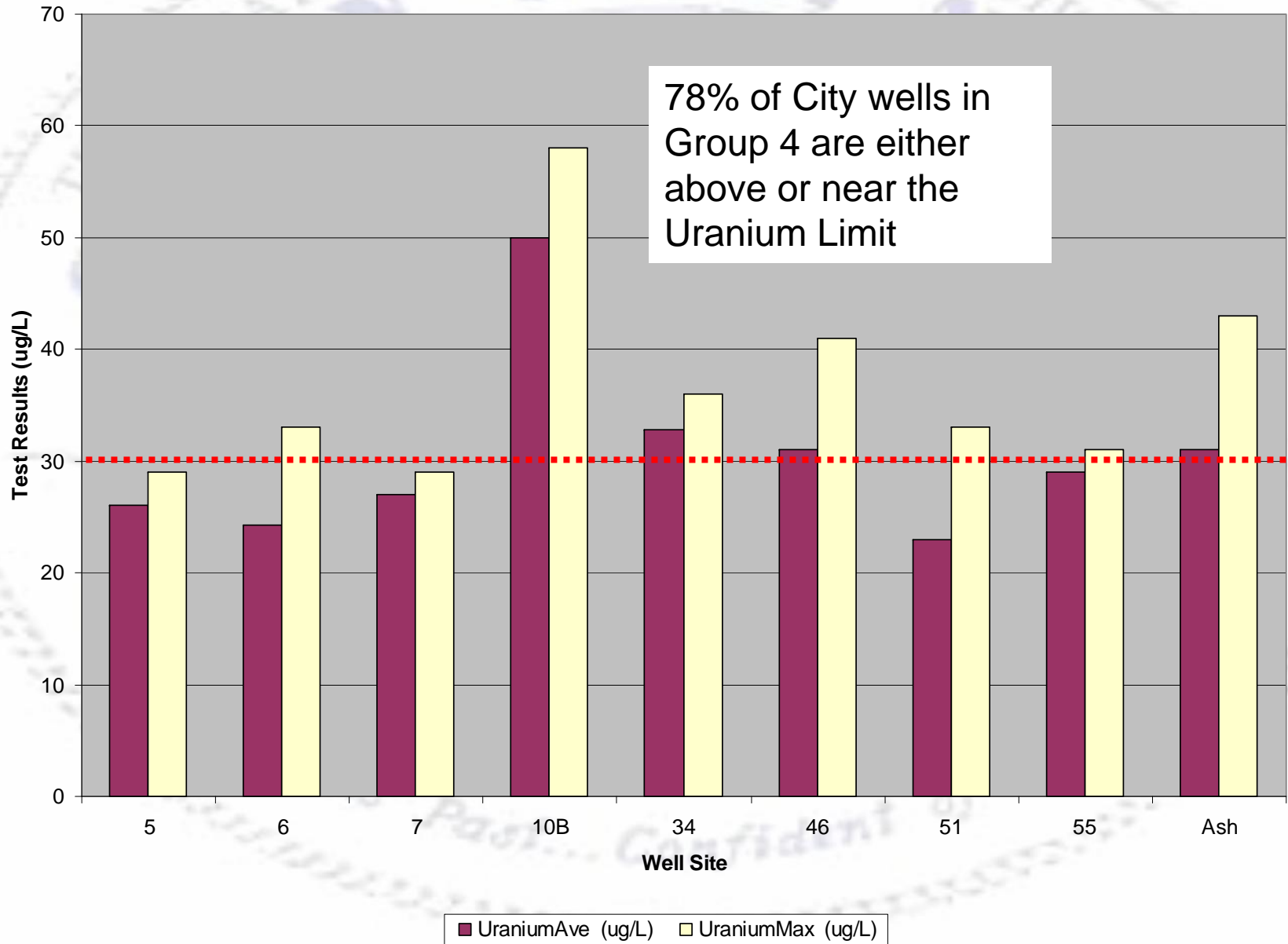


"Proud of its Past... Confident of its Future"

### Arsenic Test Results



### Uranium Test Results



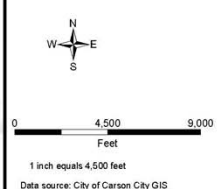
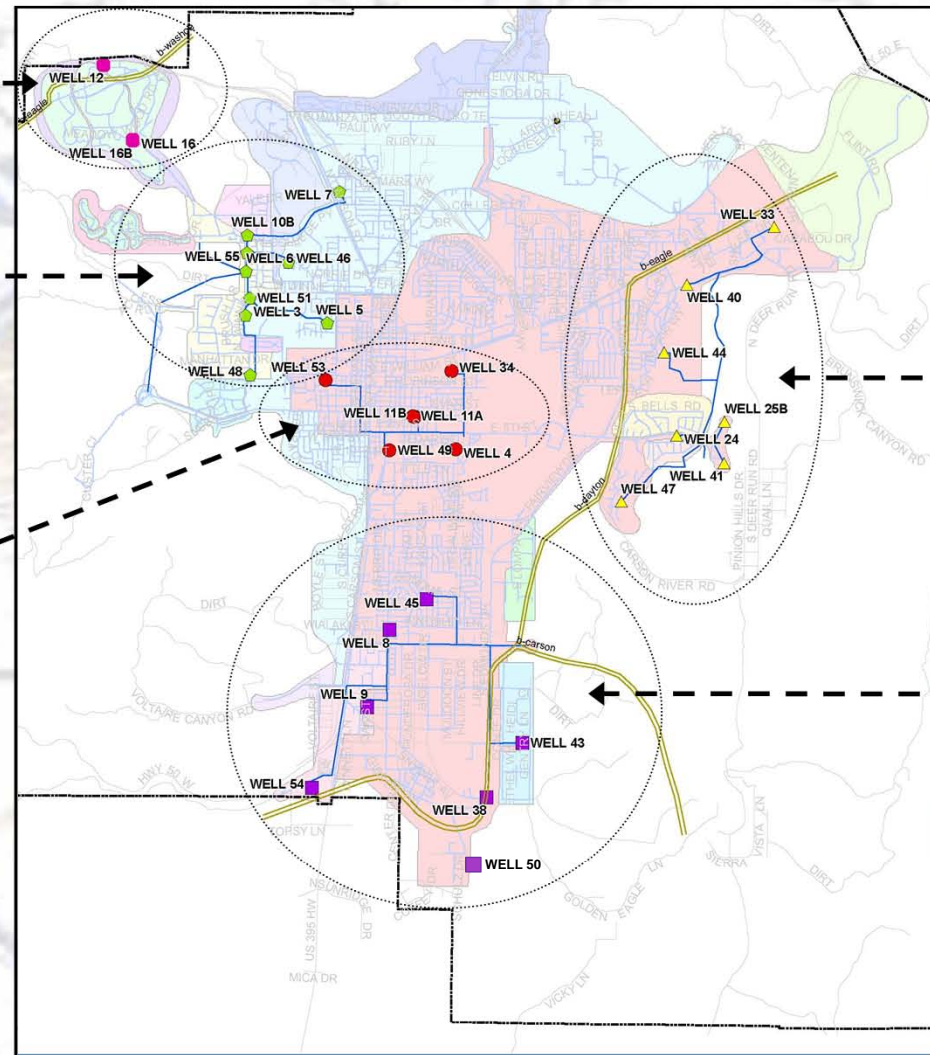
**WELL GROUP 5**  
No Action Required

**WELL GROUP 4**  
Blend in High Uranium Levels

**WELL GROUP 3**  
Treat/Blend for Arsenic and/or Uranium

**WELL GROUP 1**  
Blend for Arsenic and Fluoride

**WELL GROUP 2**  
No Action Required



**LEGEND**

- ▲ Well Group 1
- Well Group 2
- Well Group 3
- ◆ Well Group 4
- Well Group 5
- Well Mains

**Figure 13**

**Water Distribution System Utilities  
Regional Blending Cluster Map**

City of Carson City, NV



# Town of Minden, North Douglas County, Indian Hills GID & Carson City Water Line Intertie Project

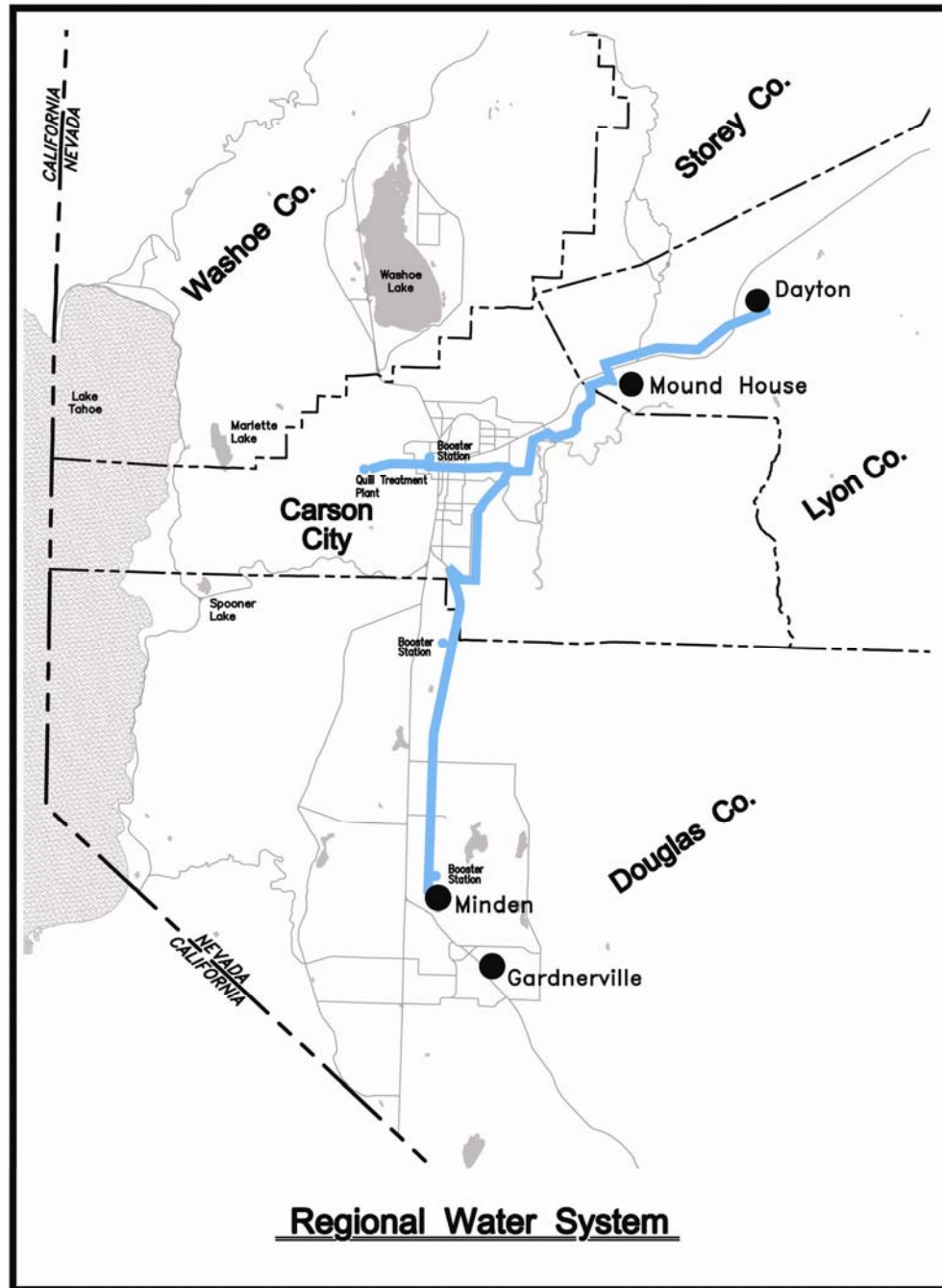


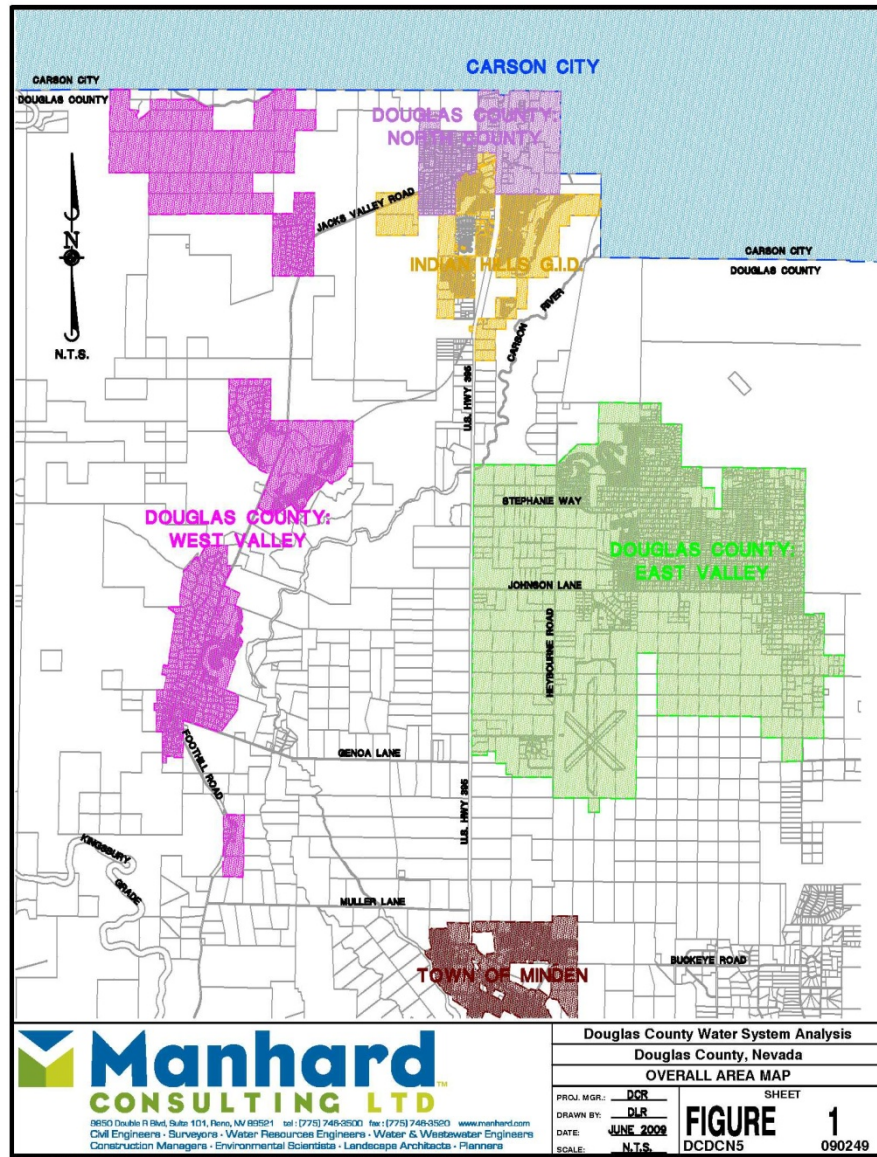
*“A Regional Approach to  
Water Resource Allocation  
and Management”*

# REGIONAL PROJECT BENEFITS

- **Protects and Better Manages the Water Resources for the Town of Minden and Douglas County**
  - Forfeiture for Non-Use
  - Exportation
- **Immediate Water Quality Improvements via Blending**
  - Douglas County (Arsenic)
  - Indian Hills GID (Arsenic)
  - Carson City (Uranium & Arsenic)
- **Provides Carson City with Additional Water to Meet Future Demands and Provides Drought Supply**
  - Approximately 3,500 GPM from Town of Minden during peak demand times. **Phase 2-4,500 GPM**
    - ✓ Infrastructure to Deliver 2,000 Acre Feet of Existing Carson City Valley Owned Water Rights Plus 1,250 Acre Feet of New Water Rights Purchased from the Town of Minden for \$10 million.

**Eliminates Need for Very Costly Treatment Plants**

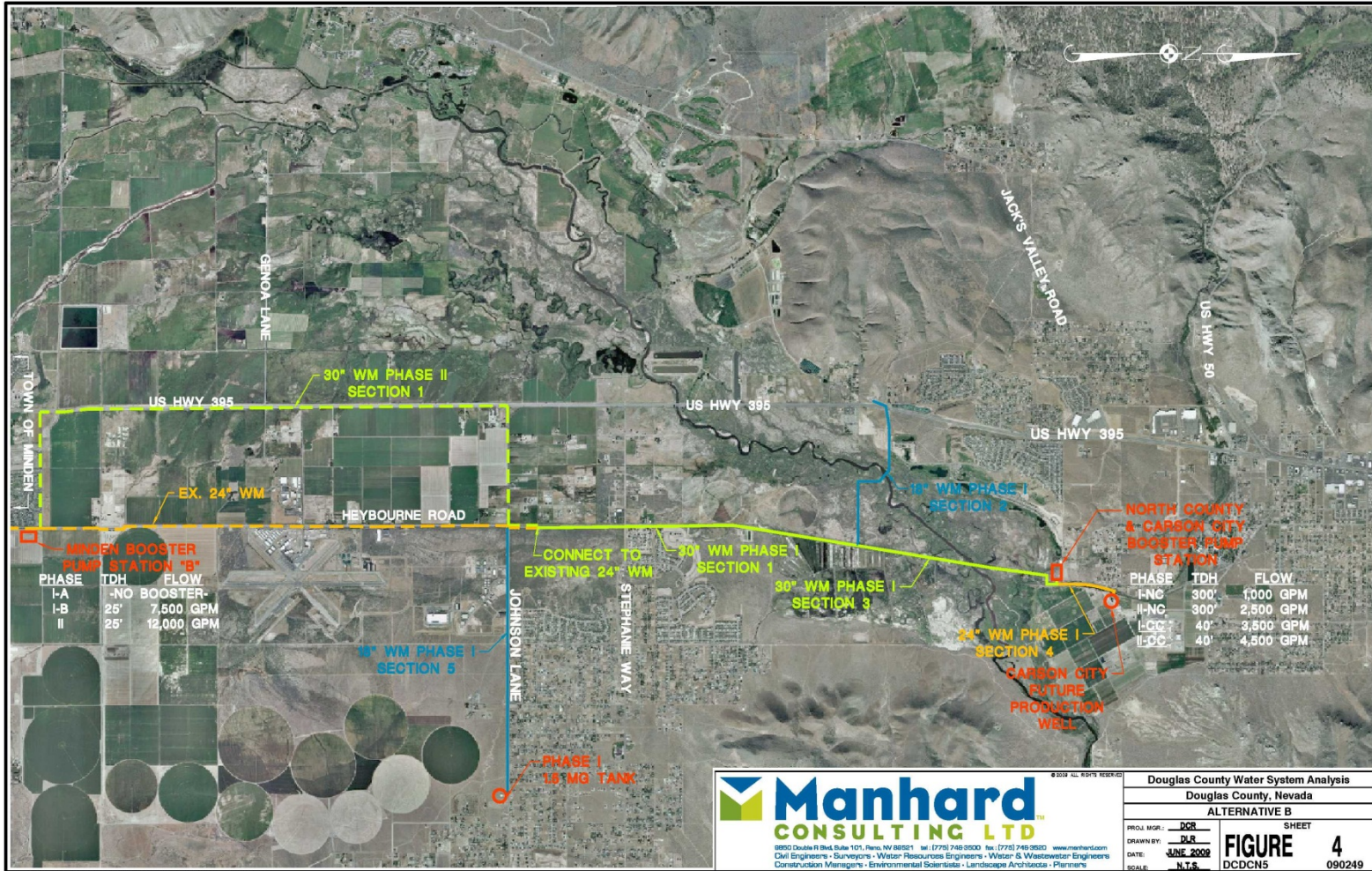


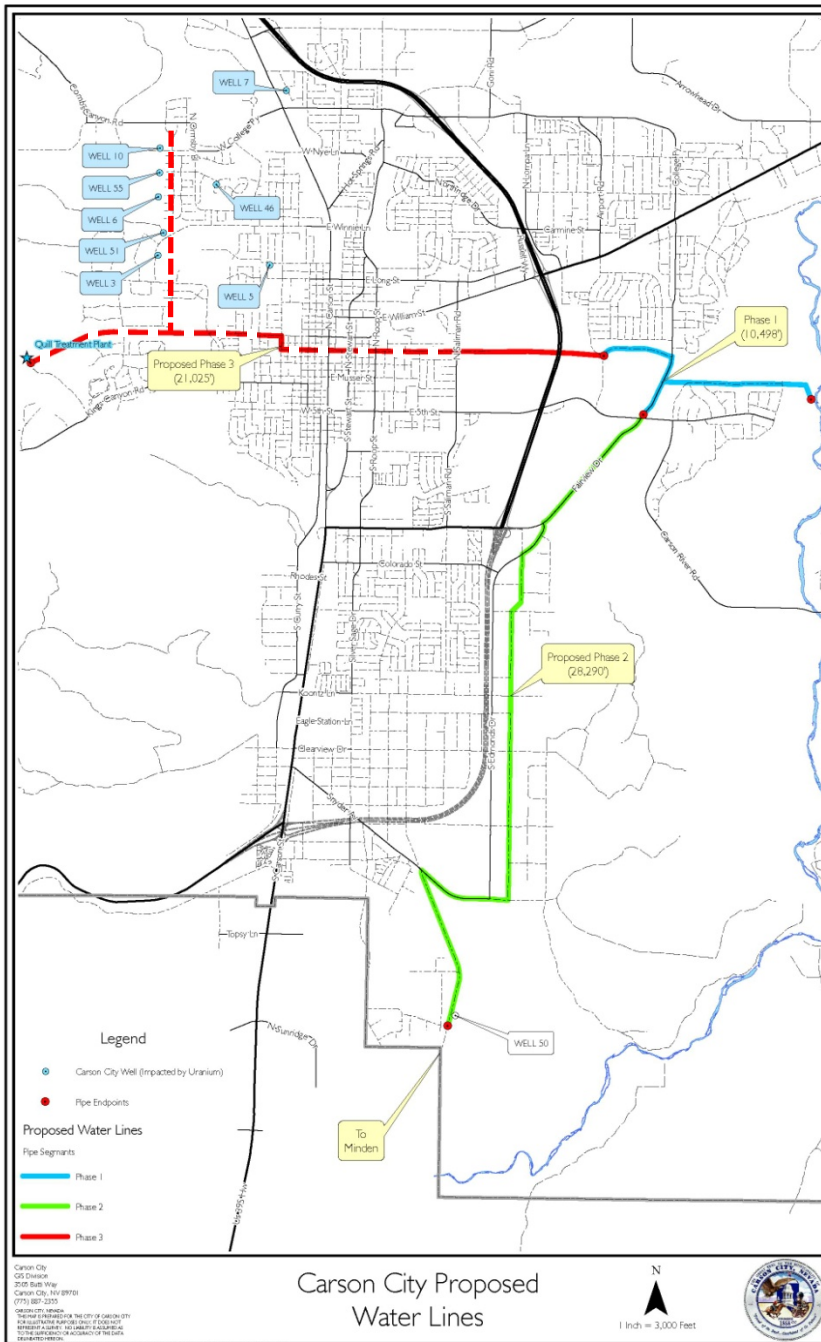


# North Douglas County Water System Analysis



# RECOMMENDED ALTERNATIVE





# PROJECT COMPONENTS

## Water Line Intertie Project



- 10.5 Miles – 30-Inch Water Main
- 15.3 Miles – 24-Inch Water Main
- 4.0 Miles – 16-Inch Water Main
- 6 Booster Pump Stations (3 Future)
- 5 Water Storage Tanks (2 Future)
- Appurtenances
  - Flow Control Stations, Meter Stations, Flush Valve & Air-Vacuum Assemblies
- 59.6 Miles – 4-Inch Conduits for Future Fiber Optic Control Systems
- Multi-Use Pathway
- Street Re-Construction
- Drainage Structures

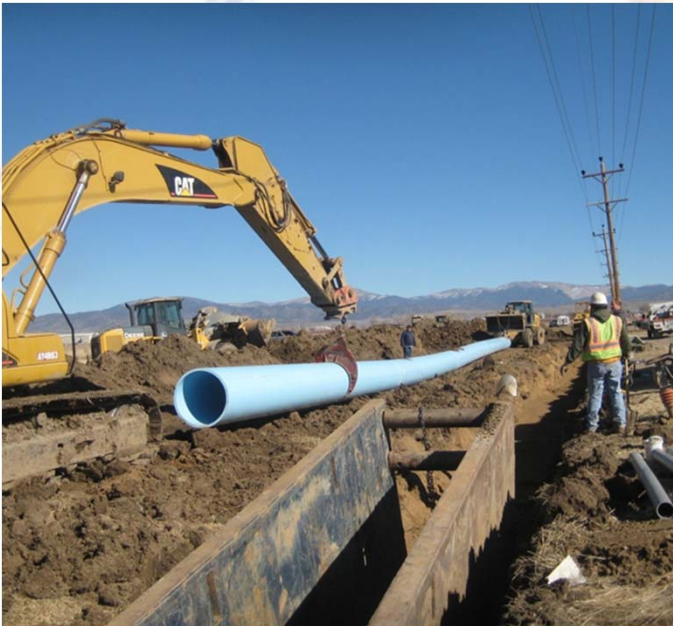
# PROJECT INFORMATION

## Town of Minden

### Components:

- 2.5 Million Gallon Concrete Storage Tank
- 23,000 LF of 30-Inch Water Main

**Construction Cost: \$5,523,000**



# PROJECT INFORMATION

## Douglas County

### Components:

- 28,000 LF of 30-Inch Water Main
- 12,000 LF of 16-Inch Water Main
- 1.5 Million Gallon Steel Storage Tank
- 9,135 LF of 30-Inch Main  
(Construction Spring 2012)

**Construction Cost:** \$8,290,000 (est.)



# PROJECT INFORMATION

## North/South Water Transmission Main Project – Phase I (Carson City)

### Components:

- 11,200 LF of 24-Inch Water Main
- Fiber Optic Conduits

**Start of Construction:** February 2010

**Project Completion:** June 2011

**Construction Cost:** \$1,991,000

Currently have outstanding construction claim  
issue to resolve.



# PROJECT INFORMATION

## Prison Hill Water Tank (Carson City)

### Components:

- 3.0 Million Gallon Steel Storage Tank

**Start of Construction:**

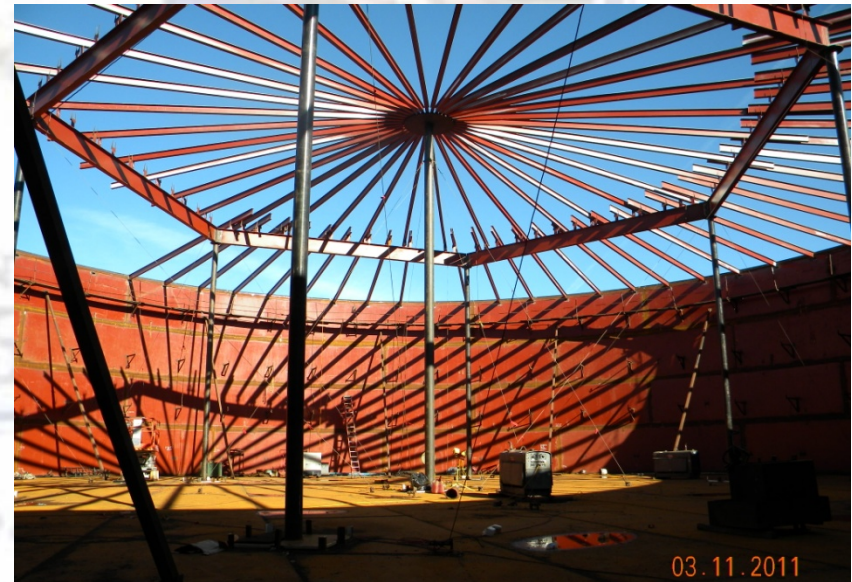
March 2010

**Project Completion:**

In-Service

**Construction Cost:**

\$1,240,000



# PROJECT INFORMATION

## North/South Water Transmission Main Project – Phase II (Carson City)

### Components:

- 29,000 LF of 24-Inch Water Main
- Fiber Optic Conduits
- 6,300 LF of 8-Inch Sewer Line
- Flow Control and Meter Stations
- Multi-Pathway Construction
- Storm Drains and Drainage Structures
- Street Reconstruction

**Start of Construction:** June 2011

**Project Completion:** March 2012

**Construction Cost:** \$7,303,000





# PROJECT INFORMATION

## East/West Water Transmission Main Project – Phase I (Carson City)

### Components:

- 5,500 LF of 24-Inch Water Main
- Fiber Optic Conduits
- Horizontal Directional Drill (940 LF)  
Under Freeway
- Intersection Reconfiguration
- Storm Drains and Drainage  
Structures
- Street Reconstruction

**Start of Construction:** July 2011

**Project Completion:** March 2012

**Construction Cost:** \$3,472,000



# PROJECT INFORMATION

## Projects Under Construction

### **Heybourne Booster Pump Station (Town of Minden) \$2,106,500**

- Start of Construction: December 2012
- Project Completion: December 2013

### **North Douglas County/Carson City Booster Pump Station \$2,859,000**

- Start of Construction: February 2013
- Project Completion: January 2014

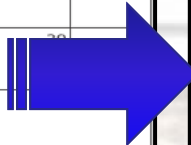
### **Phase 1 Section 2 Transmission Main (Douglas County) \$4,694,000**

- Start of Construction: March 2012
- Project Completion: March 2013

# PROJECT TARGET DATES

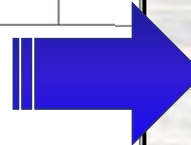
| FEBRUARY 2014 |        |         |           |          |        |          |
|---------------|--------|---------|-----------|----------|--------|----------|
| SUNDAY        | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|               |        |         |           |          | 1      | 2        |
| 3             | 4      | 5       | 6         | 7        | 8      | 9        |
| 10            | 11     | 12      | 13        | 14       | 15     | 16       |
| 17            | 18     | 19      | 20        | 21       | 22     | 23       |
| 24            | 25     | 26      | 27        | 28       | 29     | 30       |
| 31            |        |         |           |          |        |          |

**Start  
Up**



| MARCH / APRIL 2014 |        |         |           |          |        |          |
|--------------------|--------|---------|-----------|----------|--------|----------|
| SUNDAY             | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|                    | 1      | 2       | 3         | 4        | 5      | 6        |
| 7                  | 8      | 9       | 10        | 11       | 12     | 13       |
| 14                 | 15     | 16      | 17        | 18       | 19     | 20       |
| 21                 | 22     | 23      | 24        | 25       | 26     | 27       |
| 28                 | 29     | 30      |           |          |        |          |

**Testing**



| MAY 2014 |        |         |           |          |        |          |
|----------|--------|---------|-----------|----------|--------|----------|
| SUNDAY   | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|          |        |         | 1         | 2        | 3      | 4        |
| 5        | 6      | 7       | 8         | 9        | 10     | 11       |
| 12       | 13     | 14      | 15        | 16       | 17     | 18       |
| 19       | 20     | 21      | 22        | 23       | 24     | 25       |
| 26       | 27     | 28      | 29        | 30       | 31     |          |

**Delivery**

# FUTURE PROJECTS

## **East/West Transmission Main – Phase IIIA2 and IIIA3 (Carson City)**

- Required for Blending

## **Ormsby Booster Pump Station (Carson City)**

- Required for Blending

## **Ormsby Water Storage Tank (Carson City)**

- Required for Blending

## **Blending Transmission Main (Carson City)**

- Required for Blending

## **Phase II Improvements (Minden, Douglas County, Carson City)**

- Growth Driven

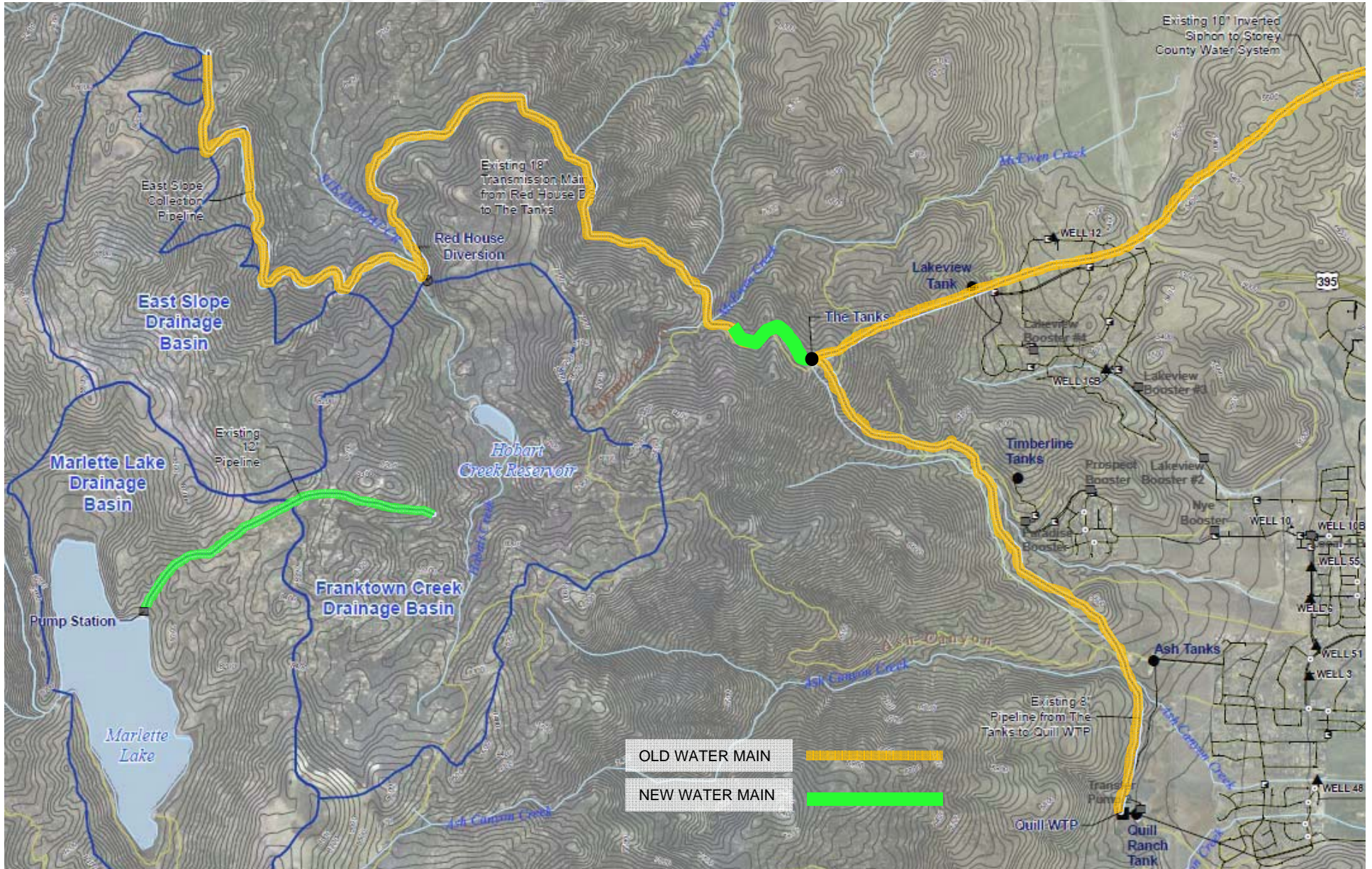
## **Basin Tank (Carson City)**

- Growth Driven

## **Prison Hill Booster Pump Station (Carson City)**

- Growth Driven

# Marlette/Hobart Water System



# Marlette/Hobart Water System

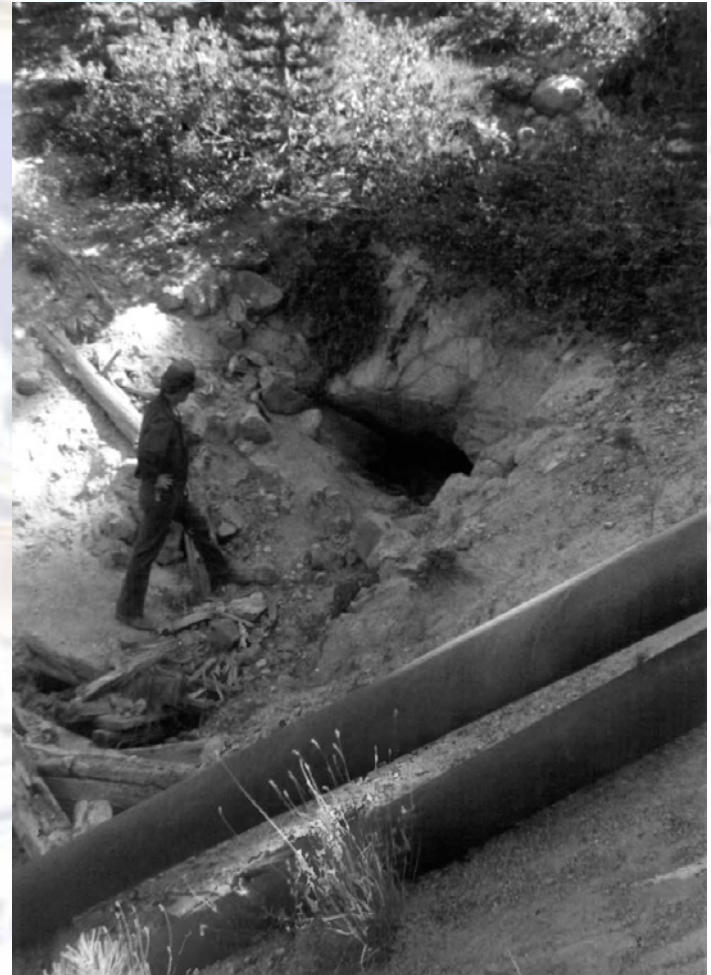
## Sawmill Canyon Waterline Replacement

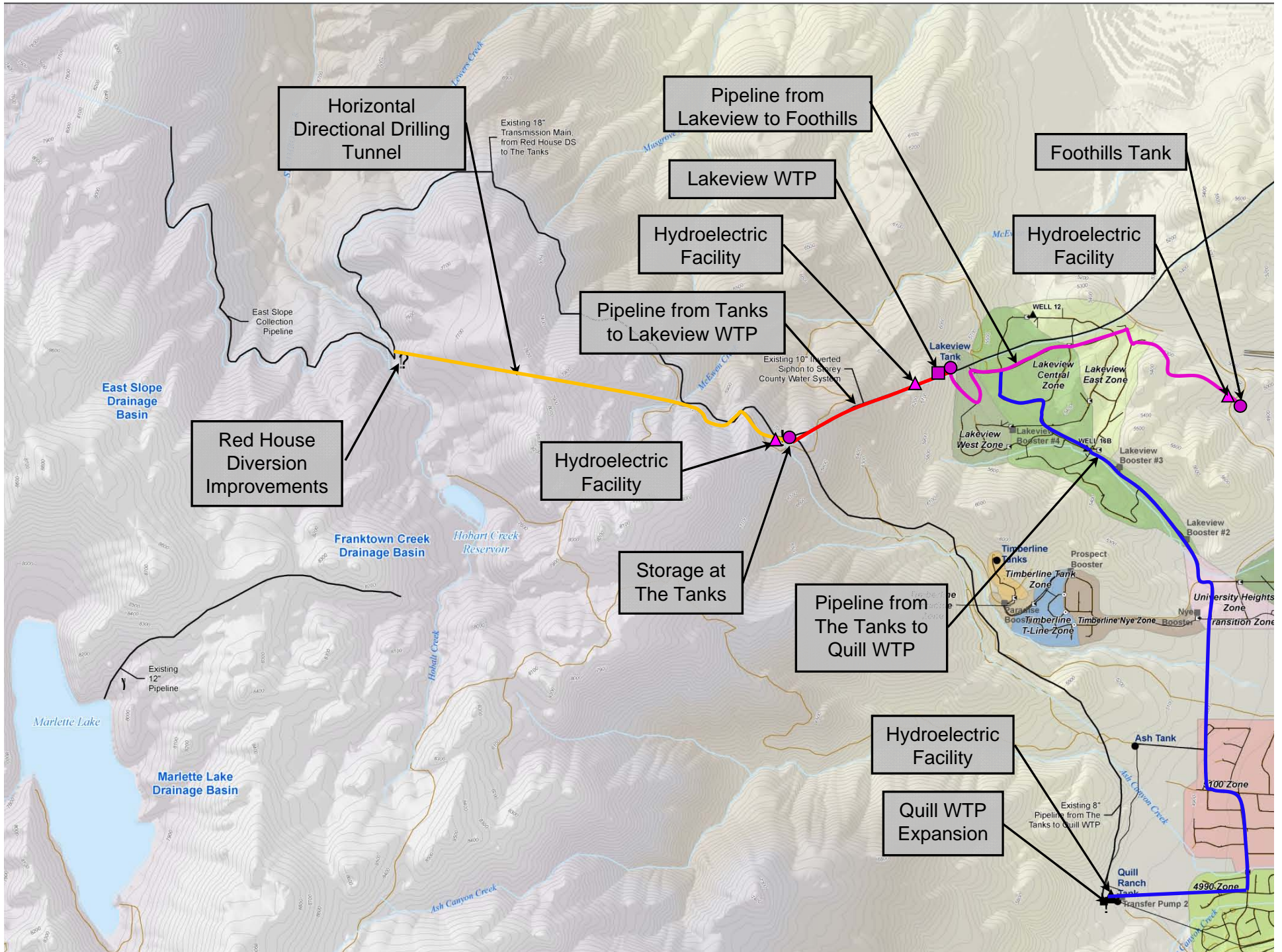
### Components:

- 3,500 LF of 24-Inch Transmission Main
- Designed by Carson City through EPA Grant
- Constructed by State Public Works

**Start of Construction:** June 2012  
**Project Completion:** October 2012

**Construction Cost:** \$2,700,000





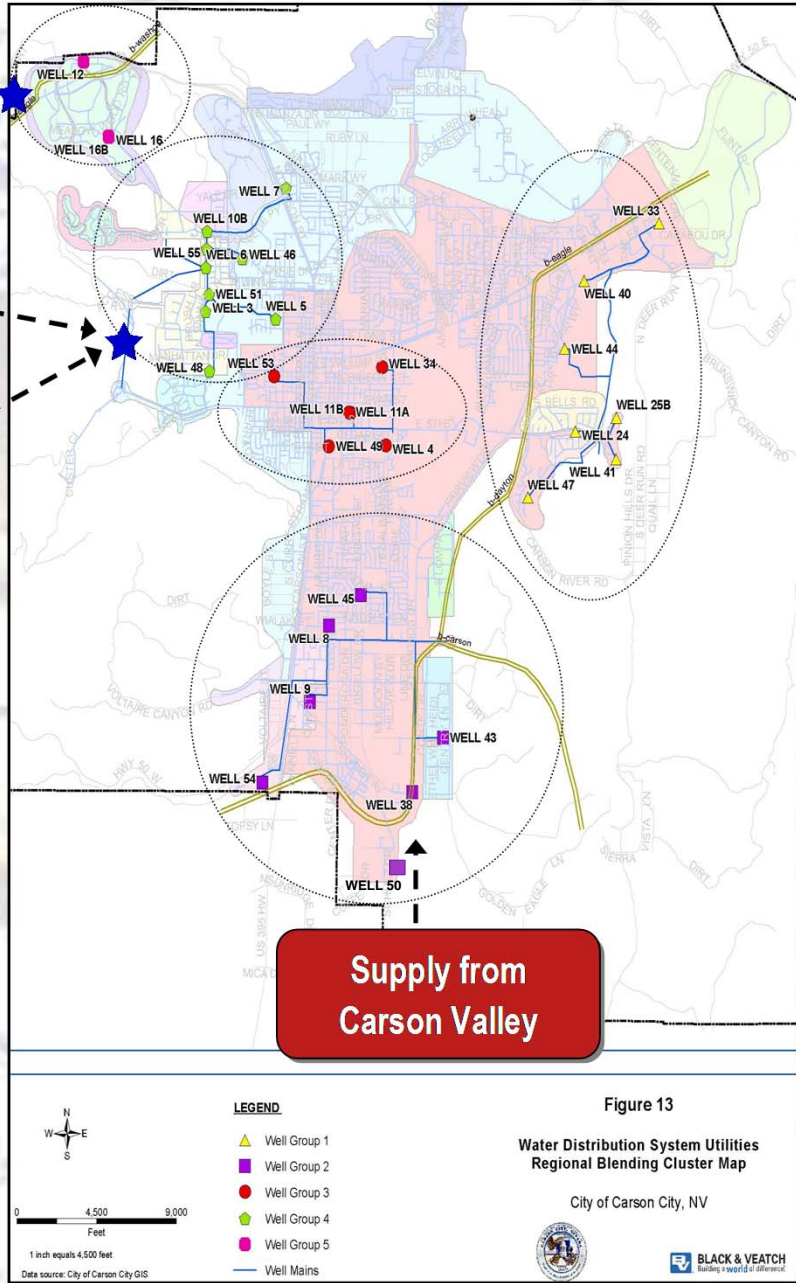
# Revised Water Supply Sources

Supply From State MHWS to New Lakeview WTP

State Supply to Quill

Ash and Kings Canyon Supply through Quill

Supply from Carson Valley





# Water Facility Inventory

## Components:

- 23 – Pressure Zones
- 14 – Booster Pumping Stations
- 10 – Water Storage Tanks (26 MG Total Storage)
- 33 – Groundwater/Induction Wells (22 MGD Production)
- Quill Ranch Water Treatment Plant (4 MGD Capacity)
- Arsenic Treatment Plant (2 MDG)
- 43 – Pressure Regulating Stations
- 329 Miles – Water Distribution/Transmission Line
  - 6 Miles (Built in 1950's)
  - 42 Miles (Built in 1960's)
  - 89 Miles (Built in 1970's)
  - 54 Miles (Built in 1980's)
  - 65 Miles (Built in 1990's)
  - 73 Miles (Built in 2000's)

- **Waterline Replacement/Rehabilitation**

|  |             |
|--|-------------|
| • Adams-Division to Stewart              | 325,000     |
| • Anderson Ranch Water Main Relocation   | 288,000     |
| • Ash Canyon-Winnie to Ormsby            | 306,000     |
| • Corbett and Fall                       | 179,000     |
| • Division-Bath to Fleischmann           | 242,000     |
| • Kit Sierra                             | 244,000     |
| • Lukens Lane                            | 244,000     |
| • Mayflower Way                          | 244,000     |
| • Nye Lane                               | 358,000     |
| • Meyer and N. Nevada                    | 204,000     |
| • Merrimac Wy                            | 204,000     |
| • Northgate-Hot Springs to Lone Mountain | 245,000     |
| • Musser and Phillips                    | 153,000     |
| • Nye-Merrimac to Bowers                 | 219,000     |
| • Sherman Lane                           | 229,000     |
| • William-Plaza to Roop                  | 278,000     |
| • Winnie-Carson to Ash Canyon            | 1,300,000   |
| • Sub-total                              | \$5,262,000 |
| • Design, Const Mang, Testing, etc. @15% | \$789,300   |
| • Total                                  | \$6,051,300 |
| • Annually over 7 Yrs                    | \$1,210,260 |

# Water 5 Year CIP Costs

| Maintenance Projects             | FY14               | FY15               | FY16               | FY17               | FY18               | Total              |
|----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Waterline Replacement Program    | \$1,210,260        | \$1,210,260        | \$1,210,260        | \$1,210,260        | \$1,210,260        | \$6,051,300        |
| Pumps/Motors Replacement Program | \$100,000          | \$100,000          | \$100,000          | \$100,000          | \$100,000          | \$500,000          |
| Equipment Replacement Program    | \$167,500          | \$195,600          | \$107,240          | \$18,500           | \$172,600          | \$661,440          |
| Facility Maintenance Program     | \$75,000           | \$75,000           | \$75,000           | \$75,000           | \$75,000           | \$375,000          |
| Tank Maintenance Program         | \$250,000          | \$50,000           | \$250,000          | \$50,000           | \$250,000          | \$850,000          |
| Well Maintenance Program         | \$75,000           | \$75,000           | \$75,000           | \$75,000           | \$75,000           | \$375,000          |
| SCADA Antenna                    | \$35,000           |                    |                    |                    |                    | \$35,000           |
| <b>Subtotal</b>                  | <b>\$1,912,760</b> | <b>\$1,705,860</b> | <b>\$1,817,500</b> | <b>\$1,528,760</b> | <b>\$1,882,860</b> | <b>\$8,847,740</b> |

Part... Confidential

# Water 5 Year CIP Costs

| Regional Water Project               | FY14               | FY15               | FY16               | FY17               | FY18               | Total               |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
| East West Phase 2A-1                 | \$1,750,000        |                    |                    |                    |                    | \$1,750,000         |
| East West Phase 2A-2                 |                    |                    | \$2,000,000        |                    |                    | \$2,000,000         |
| East West Phase 2B                   |                    |                    |                    | \$2,000,000        |                    | \$2,000,000         |
| East West Phase 2C                   |                    |                    |                    |                    | \$2,000,000        | \$2,000,000         |
| COSTCO Intertie<br>(Freeway Related) |                    | \$635,000          |                    |                    |                    | \$635,000           |
| <b>Subtotal</b>                      | \$1,750,000        | \$635,000          | \$2,000,000        | \$2,000,000        | \$2,000,000        | <b>\$8,885,000</b>  |
| <b>Grand Total</b>                   | <b>\$3,662,760</b> | <b>\$2,340,860</b> | <b>\$3,817,500</b> | <b>\$3,528,760</b> | <b>\$3,882,860</b> | <b>\$17,232,740</b> |