Managing Total Dissolved Solids in Agricultural Water Supplies Along the Texas/Mexico Border

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Continuous Water Quality Monitoring Network

TCEQ

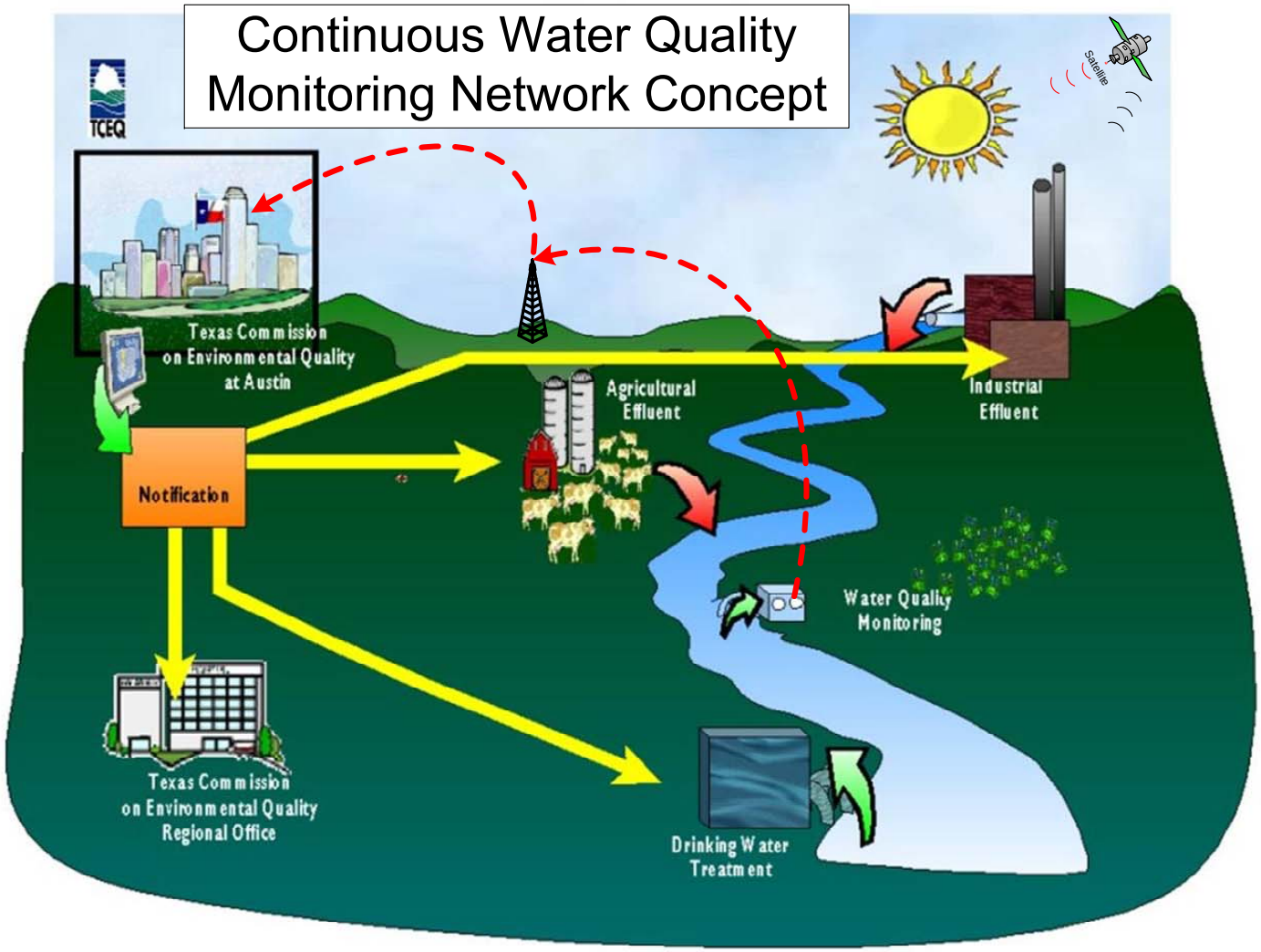
TCEQ Statewide Water Quality Monitoring

Texas has an established water quality monitoring network based on quarterly sampling at 3444 stations statewide

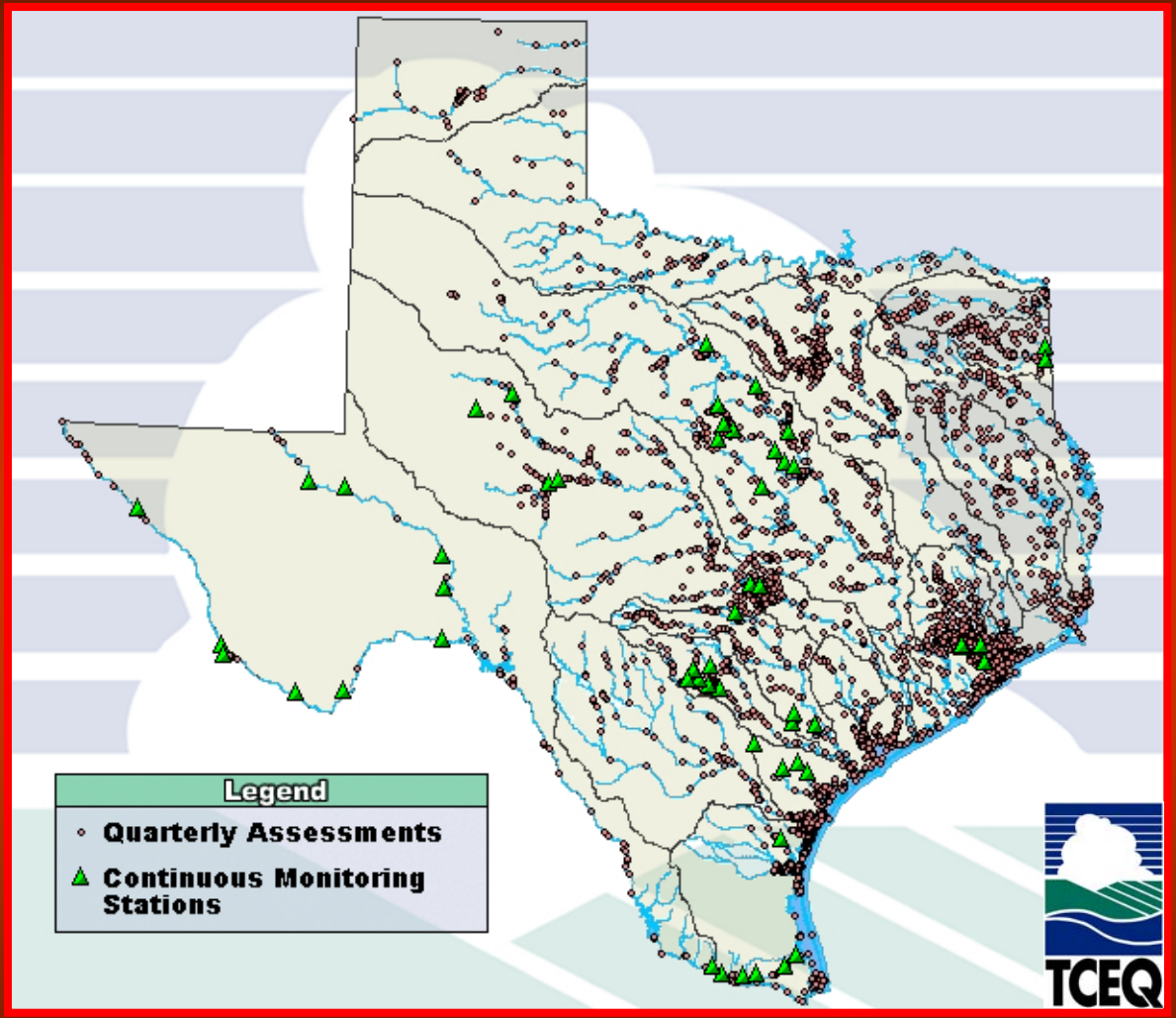
Texas relies on an extensive network of state employees, partners, contractors and cooperators to monitor these sites

Additionally, Texas has established a continuous water quality monitoring network which currently includes over 50 sites

Continuous Water Quality Monitoring Network



TCEQ Statewide Water Quality Monitoring



Issues in the Rio Grande Watershed

The problems in the Rio Grande are related: too much TDS and too little water:

In the upper reaches of the Rio Grande in New Mexico, agricultural return flows have high TDS.

In the Pecos River subwatershed, salt cedar (*Tamerisk sp.*) infestations remove vast quantities of water and concentrate TDS.

In the lower reaches of the Rio Grande, agricultural return flows from Mexico have high TDS.

Issues in the Rio Grande Watershed

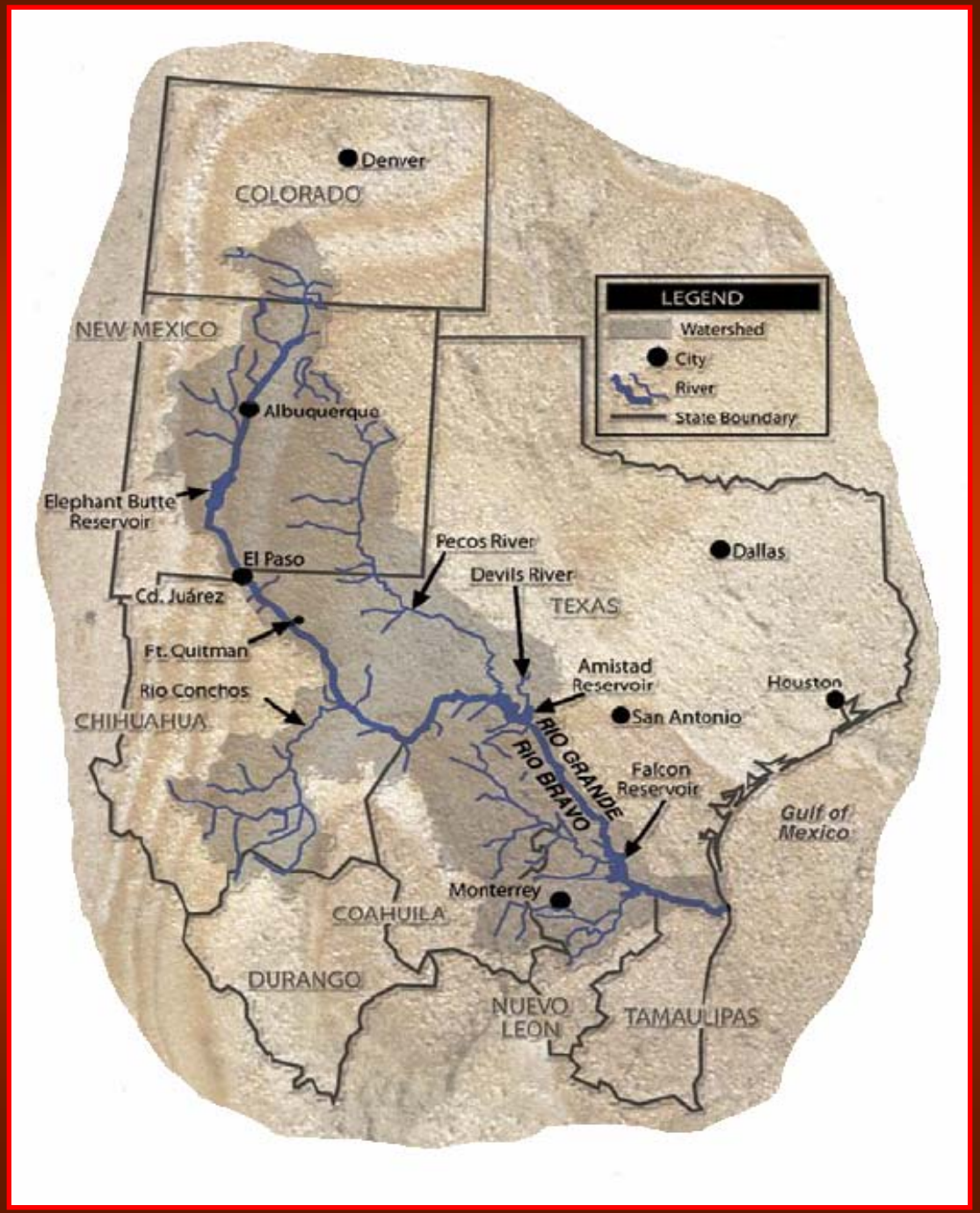
TCEQ and other State and Federal entities are addressing the problems in the Rio Grande in multiple projects:

Monitoring TDS loads in the upper Rio Grande using continuous water quality monitoring.

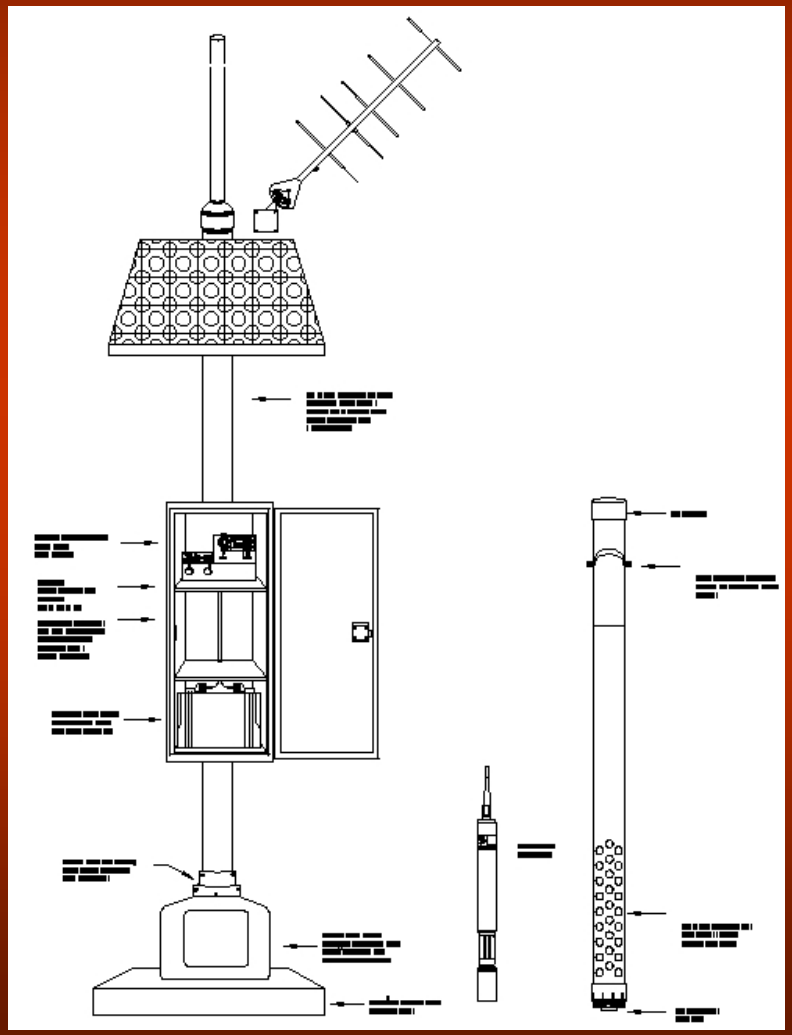
Managing salt cedar in the Pecos River subwatershed and continuous water quality monitoring in the Pecos River sub-watershed.

Monitoring and managing TDS in the lower Rio Grande watershed using continuous water quality monitoring to mitigate high TDS agricultural return flows.

Rio Grande Basin



Continuous Water Quality Monitoring in the Rio Grande Watershed

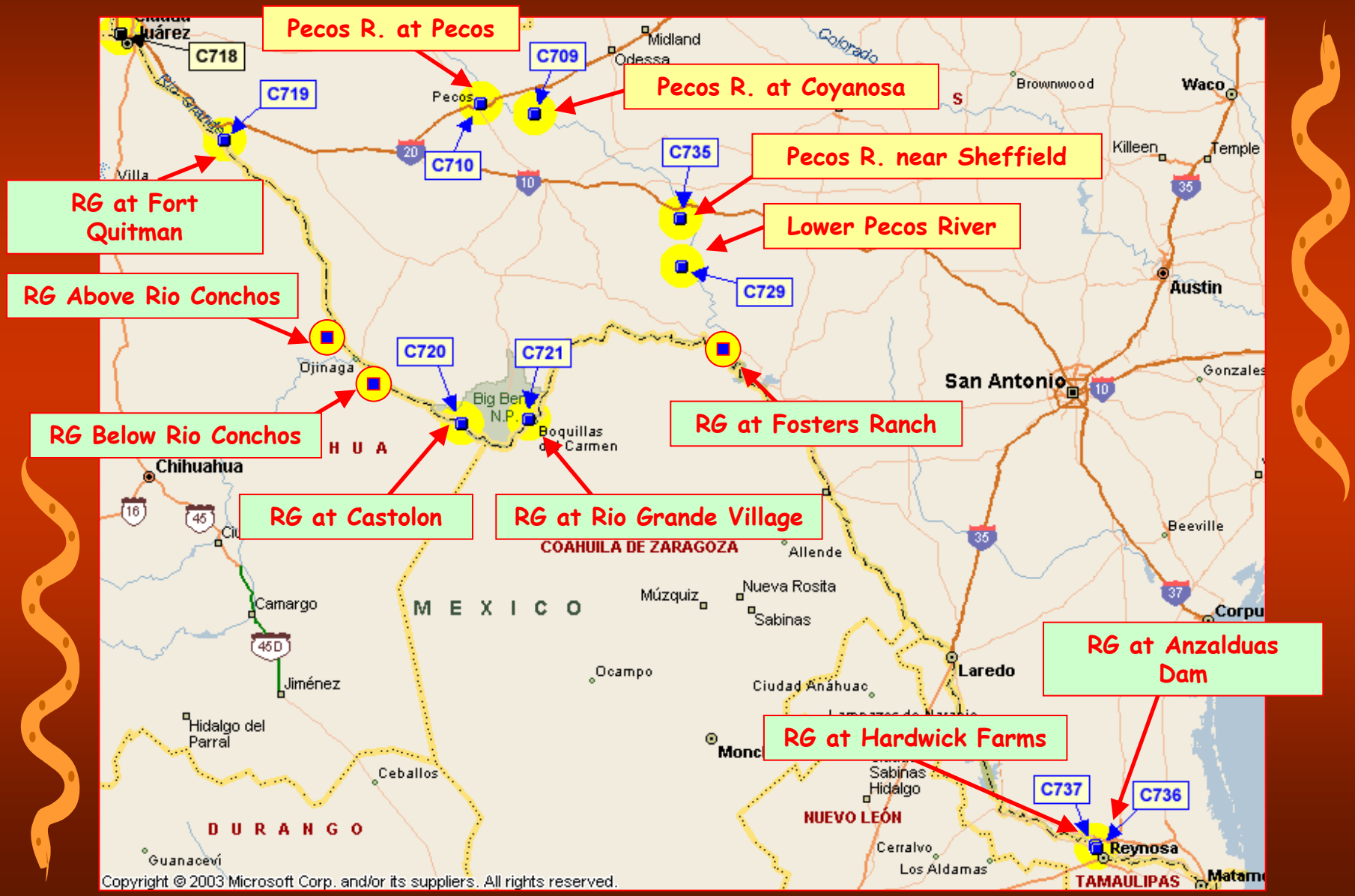


Continuous Water Quality Monitoring Stations in the Rio Grande Watershed commonly monitor temperature, pH, dissolved oxygen and specific conductance using established multiparameter sonde technology, a data logger and communication / telemetry equipment

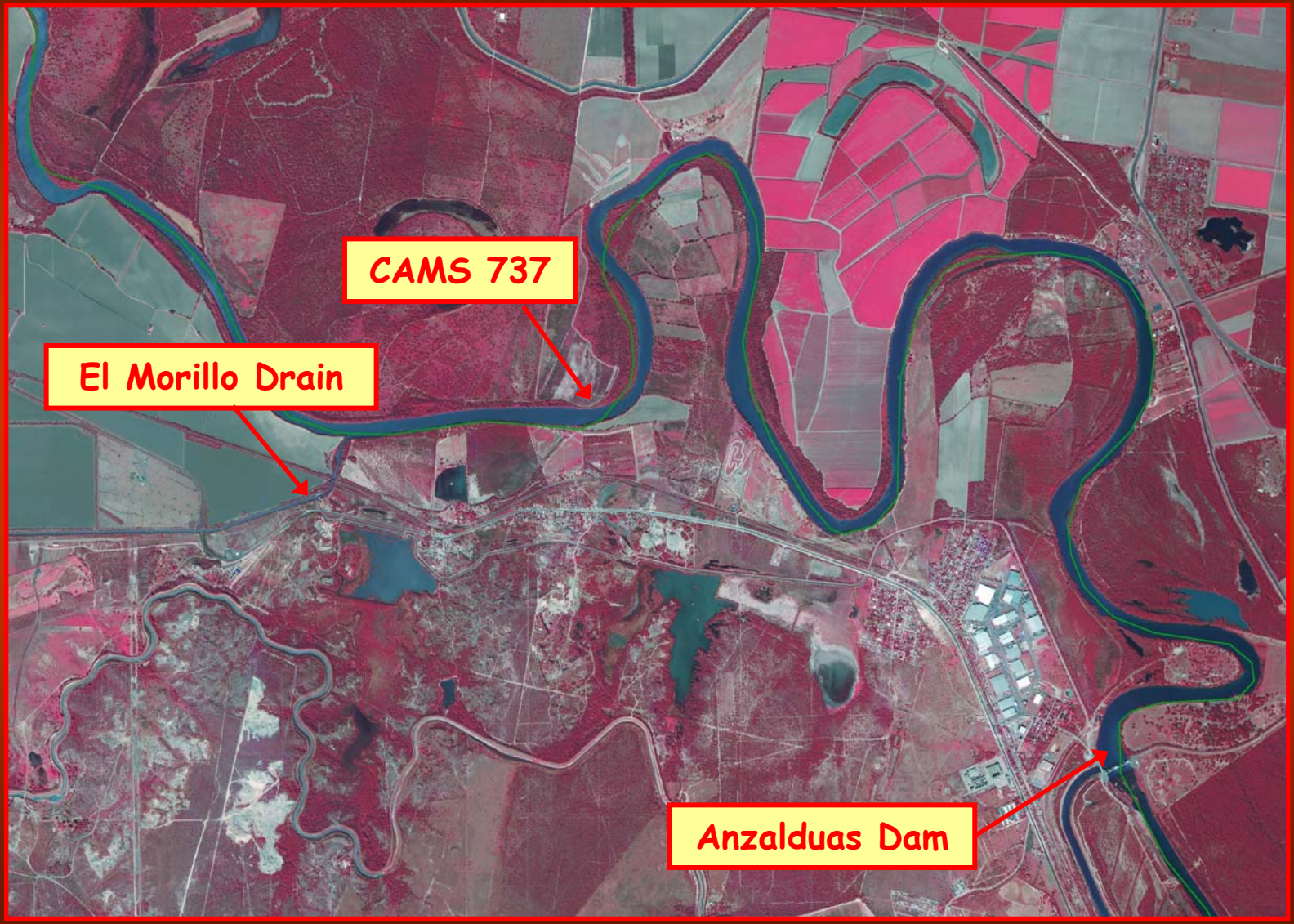
Continuous Water Quality Monitoring in the Rio Grande Watershed

Where TCEQ monitors is quite varied …

Continuous Monitoring in the Rio Grande Basin



Anzalduas Reservoir in the Rio Grande Basin



El Morillo Drain on Anzalduas Reservoir

Anzalduas Dam in the Rio Grande Basin

Current Water Quality Management in Anzalduas Reservoir

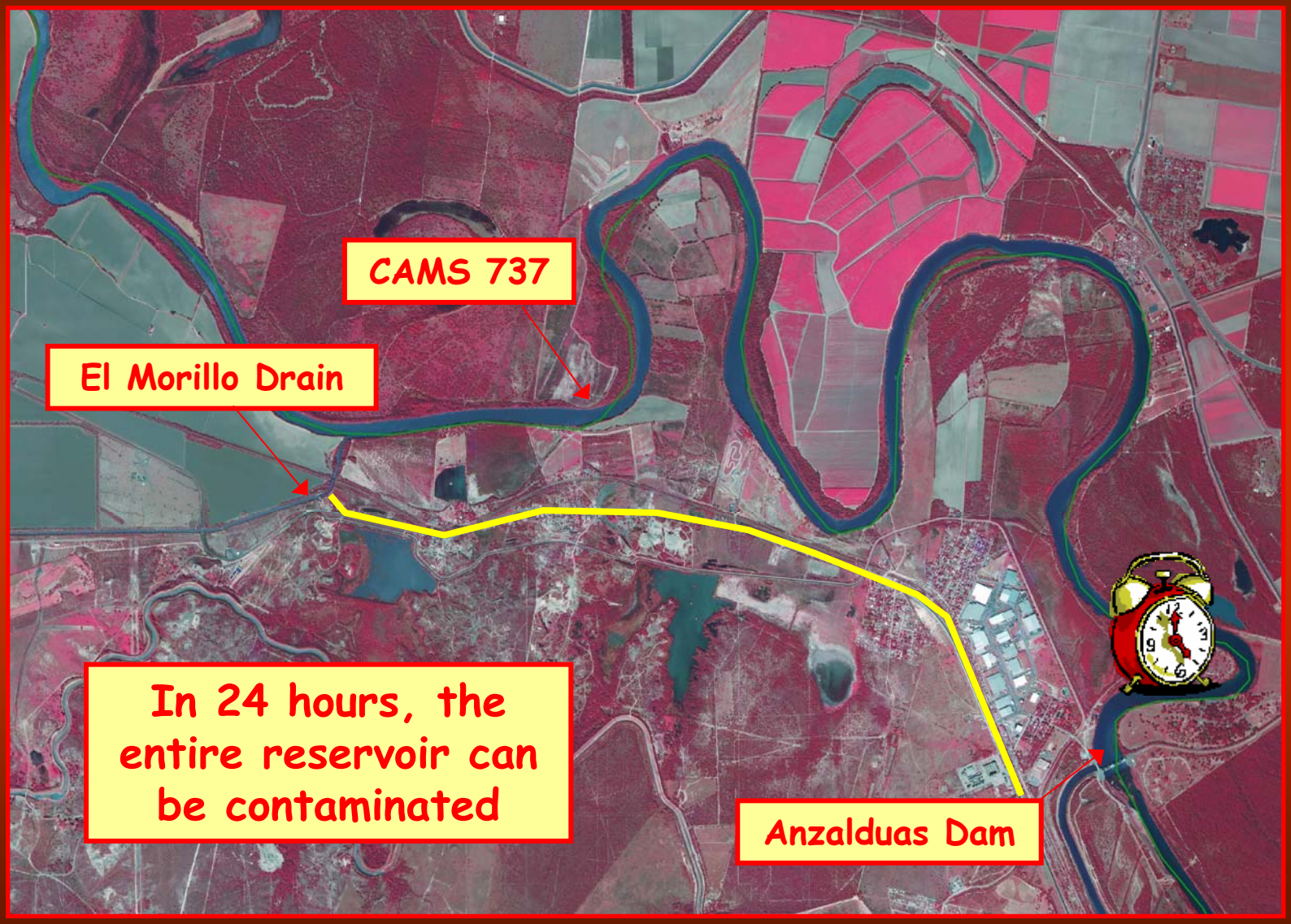
Current Practice is for Commission International de Limites e Aguas (CILA) staff to periodically drive to the El Morillo Drain, collect a sample, drive back to Anzalduas Dam

CILA returns to the laboratory and prepare the sample and conduct analysis by evaporative method and calculates total dissolved solids

CILA provides the results to the Commission National de Aguas who actually operates the pumps at El Morillo Drain

CAN decides whether or not to divert irrigation return flows to the El Morillo Drain

Anzalduas Reservoir in the Rio Grande Basin



Managing Water Quality in Anzalduas Reservoir Using CWQMN Data

CAMS 0737 monitors water quality in Anzalduas Reservoir at Hardwicke Farms every 15 minutes for temperature, pH, dissolved oxygen and specific conductance.

The Coastal Zeno datalogger at CAMS 0737 converts specific conductance to TDS (SC * 0.65 = TDS) and reports it along with the data from the *in situ* sonde.

The TCEQ LEADS program polls all sites in the CWQMN every 15 minutes to bring the accumulated data into the database

Managing Water Quality in Anzalduas Reservoir using CWQMN Data

The LEADS program scans incoming data for established "trigger" levels for CWQMN stations, including CAMS 0737

The trigger level for CAMS 0737 is TDS > 1000 mg/l based on the adverse impact of irrigating crops with the water.

When TDS at CAMS 737 exceeds 1000 mg/l, the LEADS program sends electronic notifications by email to all subscribers, including the Rio Grande Watermaster.

Managing Water Quality in Anzalduas Reservoir using CWQMN Data

When the Rio Grande Watermaster receives an alert from LEADS, the range assessed and tracked with prior and subsequent alerts.

The Rio Grande Watermaster contacts the International Boundary and Water Commission (IBWC) to verify the operation at El Morillo Drain.

There are other potential sources of high TDS agricultural return flows so the Rio Grande Watermaster also considers flows (discharge) from Rio San Juan and Rio Alamo and Arroyo Los Olmos.

The Rio Grande Watermaster monitors water quality above the El Morillo Drain to rule out other upstream sources.

Managing Water Quality in Anzalduas Reservoir using CWQMN Data

The Rio Grande Watermaster increases releases of US water from Falcon called for by RG Watermaster to dilute the high TDS concentrations in Anzalduas Reservoir.

Water arrives in Anzalduas Reservoir from Falcon Reservoir in approximately 1 $\frac{1}{2}$ days.

Subsequent alerts continue to be monitored to verify successful reduction of TDS concentrations in Anzalduas Reservoir to levels which are not detrimental to irrigated crops.

Managing Water Quality in Anzalduas Reservoir using CWQMN Data

If agricultural return flows from the El Morillo Drain are the cause of the impact/alerts, the Rio Grande Watermaster notifies IBWC is that US mitigated impacts from agricultural return flows from Mexico by increasing US release from Falcon Reservoir.

IBWC credits the US for water released from Falcon Reservoir from Mexico waters.

Additional sites will allow the Rio Grande Watermaster to confirm contributions/impacts from Mexican sources (Rio San Juan or Rio Alamo) or the Arroyo Los Olmos (a US tributary) and act accordingly.

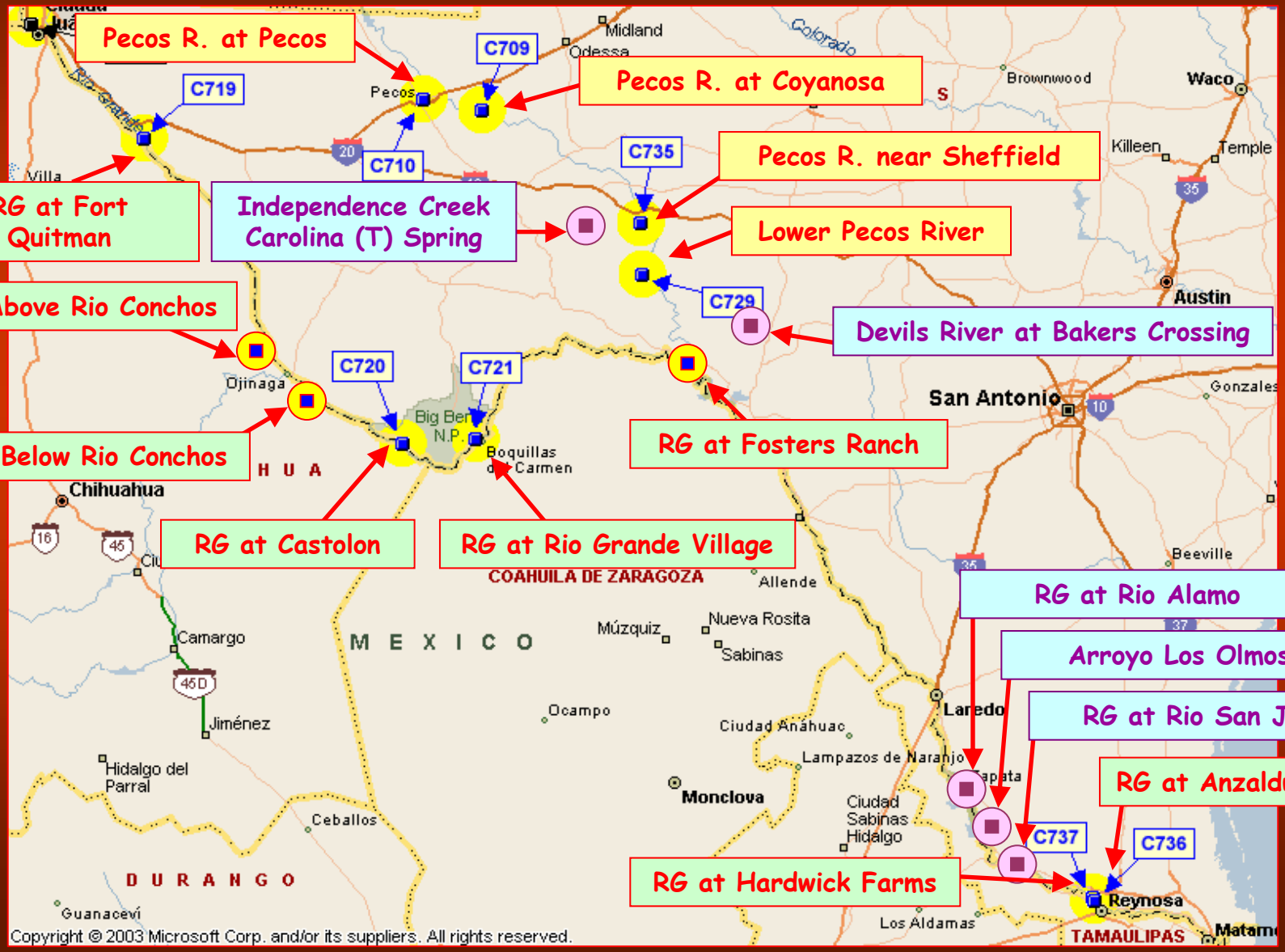
Future Plans for Managing Water Quality in Anzalduas Reservoir using CWQMN Data

TCEQ has approved a project proposed by the Rio Grande Watermaster to add CWQMN stations downstream of the Rio San Juan, Rio Alamo), and the Arroyo Los Olmos.

These three stations are projected to be deployed and operational by June 2008.

TCEQ and the Rio Grande Watermaster will work with IBWC and Commission National de Agua to consider deploying a CWQMN station at the El Morillo Drain in Mexico.

Continuous Monitoring in the Rio Grande Basin



Happy Trails!

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