Independent Texans Convention

Groundwater & Surface Water 101

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Phil Cook
Lost Pines Sierra Club

September 21, 2013
Important Natural Resources

- **Carrizo-Wilcox Major Aquifer**
- **Colorado River**
- **Brazos River**
- **Bastrop/Lee Counties**
- **Milam/Robertson Counties**
What We’ll Cover

• Regional Planning
• Groundwater Planning/Management
• Surface Water Planning/Management
• Environmental Flows
• LPGCD Briefing Slides
• Permit drawdowns vs. DFC, MAG
• What’s Next
Groundwater & Surface Water Law in Texas

**SURFACE WATER**
- Owned by the State
- Regulated by Texas Commission on Environmental Quality (TCEQ)
- Water Rights (Senior/Junior based on priority date)

**GROUNDWATER**
- Owned by Landowner
- Regulated by Groundwater Conservation Districts (GCD)
- Assistance & Guidance from Texas Water Development Board (TWDB)
- Well Permits

**The State of Texas does not formally, in law, recognize that Groundwater and Surface Water Interact**
- Conflicts in law
- Not Conjunctively Managed
Regional Water Planning

- Senate Bill 1  75th Legislature, 1997
- Managed by Texas Water Development Board (TWDB)
- Central → Local Planning (bottom up)
- Drought of Record (1950’s)
- Stakeholder Group
- Plan Supply & Demand (groundwater & surface water)
- Do Not Implement
  - counties, cities, water suppliers, private
- Strategies must be “recommended” in plan to access State funds
- Strategies must be prioritized (recent)
Regional Water Planning

Region K
Lower Colorado Region WPG

Region G
Brazos Regional WPG

Lower Colorado River Authority
Brazos River Authority
Regional Water Planning

Region K
Lower Colorado Region WPG  Central Texas Regional WPG

Region L

Lower Colorado River Authority  Guadalupe Blanco River Authority
Groundwater Management Areas

• Multiple Conservation Districts
• Plan “Desired Future Conditions” - DFC
  – Physically Possible
    • Individually and collectively across Districts
  – Compatible
    • Between Districts (spring flow vs. de-watering)
• Modeled Available Groundwater – MAG
  – “Provides MAG to Regional Planning Group
• Petitions Challenging
  – TWDB: Challenging reasonableness of DFC
    • ES appealed GMA-12 DFC
  – TCEQ: Challenging adequacy of GCD Rules
Groundwater
Management Area 12

- Groundwater Conservation Districts:
  - Lost Pines
    - Bastrop & Lee
  - Fayette County
    - Fayette
  - Post Oak Savannah
    - Milam & Burleson
  - Brazos Valley
    - Robertson & Brazos
  - Mid East Texas
    - Freestone, Leon & Madison

- Worked Together to Adopt Desired Future Conditions (DFC) (5+ years)

- TWDB determined Modeled Available Groundwater (MAG) from DFC (1+ year)
Groundwater Management Area 13

- Conservation Districts:
  - Edwards Aquifer Authority
  - Evergreen UWCD
  - Gonzales County UWCD
  - Guadalupe County GCD
  - McMullen GCD
  - Medina County GCD
  - Plum Creek CD
  - Uvalde County UWCD
  - Wintergarden GCD

- GCD = Groundwater Conservation District
- UWCD = Underground Water Conservation District
Lost Pines Groundwater Conservation District

- Lost Pines GCD
  - Bastrop & Lee counties
  - Carrizo-Wilcox
  - Queen City/Sparta
  - Colorado River
  - GMA-12
  - Region K RWPG (Bastrop Co)
  - Region G RWPG (Lee Co)
  - Target of Water Marketers
    - GBRA Simsboro Project
      - End-OP, Forestar & Others
    - Blue Water (Post Oak Savannah GCD, Burleson Co.)
Surface Water

• **Regulated by TCEQ**
  – Grants water rights (priority date)
  – Approves LCRA Water Management Plan
    • Approves emergency orders
  – Managed Environmental Flow Allocation Process
  – Approves Environmental Flow Standards

• **Lower Colorado River Authority**
  – Administers in Lower Colorado River Basin
    • Highland Lakes and lower basin
    • Water Management Plan
    • Owns majority of water rights in basin
    • Serves on Region G Water Planning Group

• **Upper Colorado River Authority**
  • Administers in Upper basin to New Mexico
Surface Water Environmental Flows

- **Senate Bill 3  80th Legislature, 2007**
  - Managed by Texas Commission on Environmental Quality (TCEQ)
  - Colorado & Lavaca Rivers and Matagorda & Lavaca Bays Area Stakeholder Committee (CL BBASC)
  - Stakeholder Interests groups
    - River Authorities
    - Public Interest Groups
    - Recreational Water Users
    - Refining
    - Municipalities
    - Agricultural Irrigation
    - Free-Range Livestock
    - Commercial Fishermen
    - Recreational Water Users
    - Groundwater Conservation Districts
    - Chemical Manufacturing
    - Electricity Generation
    - Regional Water Planning Groups
    - Environmental
    - Soil and Water Conservation Districts

- Bay & Basin Expert Science Team (CL BBEST)
- Adopted by TCEQ; effective August 30, 2012
Environmental Flow Objectives of Texas Legislature - Senate Bill 3

▲ Maintaining the *biological soundness of the state's rivers*, lakes, bays, and estuaries is of great importance to the public's economic health and general well-being.

● A “Sound Ecological Environment”

▲ Provide for the *freshwater flows necessary to maintain the viability of the state's streams, rivers, bay and estuary systems*.

*Signed into Law June 16, 2007*
Surface Water Environmental Flows

- LCRA Water Management Plan
  - Highland Lakes, lower basin, Matagorda Bay
  - Stakeholder Advisory Committee (16 member)
    - Municipalities (FIRM)
    - Industrial (FIRM)
    - Energy (FIRM)
    - Golf/Recreation (FIRM)
  - Irrigation (Interruptible)
  - Environment
  - Highland Lakes - Residential
  - Highland Lakes – Business

- Current WMP completed in 2003; approved 2010
- Revised Plan Under TCEQ review
  - As of September, 2013
Environmental Flow Regime

Instream Flows for the Rivers
  – Critical/Subsistence Flow – drought conditions
    • Last three years
  – Base-Dry Flow Levels – dry conditions
  – Base-Wet Flow Levels – wet conditions
• LCRA-SAWS Colorado River habitat and blue sucker studies
Environmental Flow Regime

Freshwater Inflows for the Bays
  – Critical/Threshold – drought conditions
    • Last three years
  – Base-Low – dry conditions
  – Base-Moderate – wet conditions
• Maintains Target Salinities
• Works with Instream Flows
• LCRA-SAWS Matagorda Bay Health Evaluation Studies
Environmental Flow

Critical Flow - life support during drought
On Life Support for the last three years

Instream Flows for the Rivers
– Bastrop Gage
  • Minimum flow: 120 cfs
  • Recent flow: 170 cfs
  • Groundwater contribution: 36 cfs (30% of min.)

Freshwater Inflows for the Bays
– Matagorda Bay 14,500 acre-feet/month
Colorado River

- Environmental Flows
  - LCRA Water Management Plan
    - Highland Lakes vs. Rice Farmer
    - River Flow – likely cut off due to drought
    - Matagorda Bay - being cut off due to drought

- Groundwater-Surface Water Relationship
  - Colorado is a “gaining” river, but will become a “losing” river
    - River Flow vs. Over-pumping
Groundwater Base-Flows

Original drawdown in outcrop area = 50 ft.

New drawdown = 237 ft.

Lost Pines GCD originally set “sustainable” drawdown levels at 50 ft for the outcrop region of the Simsboro formation.

At March 2009 Board meeting the drawdown was increased to 150 ft for the outcrop region of the Simsboro formation.

Current drawdown in August 2010 adopted GMA-12 DFC is 237 ft for the Simsboro Aquifer in LPGCD.
LPGCD BOARD
Private Briefing Slides

Obtained through Public Information Act request by Environmental Stewardship
GMA 12
Final Simulation

LPGCD Pumpage = 29,556 ac-ft/year in 2010
32,731 ac-ft/year in 2020
31,362 ac-ft/year in 2030
34,916 ac-ft/year in 2040
36,544 ac-ft/year in 2050
37,249 ac-ft/year in 2060
Desired Future Conditions (DFC)
(General Manager’s Recommended Permit Levels)

<table>
<thead>
<tr>
<th>Simsboro Aquifer (ft)</th>
<th>Bastrop Co.</th>
<th>Lee Co.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adopted DFC</td>
<td>145</td>
<td>345</td>
<td>237</td>
</tr>
<tr>
<td>Current Permits(^1)</td>
<td>89</td>
<td>274</td>
<td>175</td>
</tr>
<tr>
<td>Applications Pending</td>
<td>223</td>
<td>350</td>
<td>283</td>
</tr>
<tr>
<td>Forestar(^2)</td>
<td>44</td>
<td>201</td>
<td>118</td>
</tr>
<tr>
<td>End Op (Pending)</td>
<td>145</td>
<td>136</td>
<td>141</td>
</tr>
<tr>
<td>LCRA(^3)</td>
<td>34</td>
<td>13</td>
<td>24</td>
</tr>
<tr>
<td>TOTAL Permits + Applications</td>
<td>312</td>
<td>936</td>
<td>458</td>
</tr>
<tr>
<td>Drawdown Exceeding DFC</td>
<td>167</td>
<td>591</td>
<td>221</td>
</tr>
</tbody>
</table>

\(^2\) Forestar permitted at 26.6%

\(^3\) LCRA permitted at 50% (non drought years)
# Modeled Available Groundwater (MAG)
(General Manager’s Recommended Permit Levels)

<table>
<thead>
<tr>
<th>Simsboro Aquifer (acre-feet/year)</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
<th>2060</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAG</td>
<td>29,556</td>
<td>32,731</td>
<td>31,362</td>
<td>34,916</td>
<td>36,544</td>
<td>37,249</td>
</tr>
<tr>
<td>Current Permits*</td>
<td>53,564</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Pumping</td>
<td>17,424</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applications Pending</td>
<td>111,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forestar</td>
<td>45,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End Op</td>
<td>56,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCRA</td>
<td>10,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL Permits + Applications</td>
<td>164,564</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL X MAG</td>
<td>5.6</td>
<td>5.0</td>
<td>5.2</td>
<td>4.7</td>
<td>4.5</td>
<td>4.4</td>
</tr>
</tbody>
</table>
All Permit Applications 100% Approved

LPGCD Pumpage = 124,226 ac-ft/year

Total drawdown (feet)
The Forestar, End Op, and LCRA applications will harm existing permitted wells, the environment, and are far in excess of the DFC and MAG. We believe that, if permitted at all, individual permit should first be reduced to levels actually supported by the applications and then all permits reduced overall as necessary to an aggregate level that, including existing permits, protect the Adopted Desired Future Conditions. In summary, if permitted at all, Forestar and End Op qualify for less than 5% of the water they are seeking. In addition the District needs to factor in the impact of existing permits before issuing any new permits. This has not been done.

Coalition: Environmental Stewardship
Neighbors for Neighbors
Lost Pines Sierra Club
Groups United to Advocate Responsible Development “GUARD”
Independent Texans
## Desired Future Conditions (DFC)
*(With Forestar and LCRA Permits reduced)*

<table>
<thead>
<tr>
<th></th>
<th>Bastrop Co.</th>
<th>Lee Co.</th>
<th>TOTAL</th>
<th>% of Requested</th>
</tr>
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<tbody>
<tr>
<td><strong>Adopted DFC</strong></td>
<td>145</td>
<td>345</td>
<td>237</td>
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<tr>
<td><strong>Current Permits</strong></td>
<td>89</td>
<td>274</td>
<td>175</td>
<td></td>
</tr>
<tr>
<td><strong>Applications Pending</strong></td>
<td>185</td>
<td>196</td>
<td>184</td>
<td></td>
</tr>
<tr>
<td>Forestar (now current permit)</td>
<td>23</td>
<td>53</td>
<td>31</td>
<td>27%</td>
</tr>
<tr>
<td>End Op (pending)</td>
<td>145 (16)</td>
<td>136 (11)</td>
<td>141 (19)</td>
<td>10-15%</td>
</tr>
<tr>
<td>LCRA (now current permit)</td>
<td>17</td>
<td>7</td>
<td>12</td>
<td>50%</td>
</tr>
<tr>
<td><strong>TOTAL Permits + Applications</strong></td>
<td>274</td>
<td>470</td>
<td>359</td>
<td></td>
</tr>
<tr>
<td><strong>Drawdown Exceeding DFC</strong></td>
<td>129 (0)</td>
<td>125 (0)</td>
<td>122 (0)</td>
<td></td>
</tr>
</tbody>
</table>

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1. Includes City of Bastrop, Heart of Texas, Manville
2. Forestar permitted as 26.6% (Estimated by ES)
3. LCRA permitted at 50%; non drought years. (Estimated by ES)
## Modeled Available Groundwater (MAG)
*(With Forestar and LCRA Permits Reduced)*

<table>
<thead>
<tr>
<th>Simsboro Aquifer (acre-feet/year)</th>
<th>2010</th>
<th>2010 Permits</th>
<th>2020</th>
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<tr>
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<td>111,000</td>
<td>25,400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forestar</td>
<td>45,000</td>
<td>12,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End Op</td>
<td>56,000</td>
<td>8,400</td>
<td>(15%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCRA</td>
<td>10,000</td>
<td>5,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL Permits + Applications</td>
<td>164,564</td>
<td>78,964</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL X MAG</td>
<td>5.6</td>
<td>2.7</td>
<td>5.0</td>
<td>5.2</td>
<td>4.7</td>
<td>4.5</td>
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</tr>
</tbody>
</table>

*Includes Recently Approved: City of Bastrop (1,613), Heart of Texas (3,360), Manville (3,226)*

1 End Op estimated by ES
**Modeled Available Groundwater (MAG) (With Forestar and LCRA Permits Reduced)**

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<thead>
<tr>
<th>Simsboro Aquifer (acre-feet/year)</th>
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<td>37,249</td>
</tr>
<tr>
<td>Current Permits*</td>
<td>70,564</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Current Pumping</td>
<td>17,424</td>
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</tr>
<tr>
<td>End Op</td>
<td>56,000</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL Permits + Applications</td>
<td>126,574</td>
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<tr>
<td>TOTAL X MAG</td>
<td>4.3</td>
<td>3.8</td>
<td>4.0</td>
<td>3.6</td>
<td>3.5</td>
<td>3.4</td>
</tr>
</tbody>
</table>

- Includes Recently Approved: City of Bastrop (1,613), Heart of Texas (3,360), Manville (3,226), Forestar (12,000), LCRA (5,000)
Forestar Pumpage 100% Produced

Total drawdown (feet)
Forestar Pumpage
25% Produced

Drawdown (feet) due to Forestar pumpage only
LCRA Pumpage
100%
Produced
(10,000 acre-feet/year)

Drawdown (feet) due to LCRA pumpage only
LCRA
Pumpage 50% Produced
(10,000 acre-feet/year)

Drawdown (feet) due to LCRA pumpage only
End Op Pumpage 100% Produced

Drawdown (feet) due to End Op pumpage only
End Op Pumpage 25% Produced

Drawdown (feet) due to End Op pumpage only
All Permit Applications
25% Approved

LPGCD Pumpage = 31,057 ac-ft/year

Total drawdown (feet)
GMA 12 Final Simulation

LPGCD Pumpage = 29,556 ac-ft/year in 2010 32,731 ac-ft/year in 2020 31,362 ac-ft/year in 2030 34,916 ac-ft/year in 2040 36,544 ac-ft/year in 2050 37,249 ac-ft/year in 2060
Forestar Pumpage 100% Produced

Total drawdown (feet)
DFC: Regions G, K, and L

Groundwater Management Area Boundaries

Regional Water Planning Group Boundaries

DFCs for GMA-12 do not include EndOf or Sustainable projects
What is Next?

◆ End Op: Contested Case Hearing
  ➢ Contested by Aqua Water Supply Corporation
  ➢ State Office of Administrative Hearings (SOAH)
    • Bastrop
  ➢ “Party Status” requested by
    • Environmental Stewardship
    • Landowners

◆ Forestar
  ➢ Permit reduced to 12,000 ac-ft/yr from 45,000 ac-ft/yr
  ➢ Requested re-hearing (along with Aqua and ES)
  ➢ State District Court

◆ LCRA
  ➢ Permit reduced to 5,000 ac-ft/yr from 10,000 ac-ft/yr
    ➢ Except under severe drought conditions
  ➢ Requesting amendment to provide municipal water
    ➢ City of Bastrop, and 10,000 ac-ft/yr every year

◆ Texas Legislature
NIMBI

Now I Must Be Involved

GUARD
Environmental Stewardship
A Texas nonprofit 501(c)(3) public charity

Our purposes:

▲ Protect & enhance natural resources to meet current and future needs of the environment and humans (Advocacy)
▲ Use scientific information to restore & sustain ecological systems (Science).
▲ Provide education & outreach to encourage public stewardship of natural resources (Outreach).

Environmental-Stewardship.org
Vision for Water Future

Manage groundwater & surface water resources in a way that balances human and environmental needs now and into the future.

▲ Ensure a publicly informed process
▲ Provide for the needs of each county
▲ Provide base-flows for the rivers, streams, & springs
▲ Maximize recharge
▲ Establish “canaries” to warn of imbalances
▲ Provide export to the extent possible