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AGRICULTURE & LIFE SCIENCES

TEXAS A&M AGRILIFE RESEARCH | EXTENSION

City of San Antonio Water Report

Institute of Renewable Natural Resources
Texas Water Resources Institute

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TEXAS A&M IRNR Institute of Renewable Natural Resources

Presentation Outline

1. Report History
2. Science Panel Process
3. Science Panel Findings
4. Report Use

Report History

- **Scope of Work**
  - Project commissioned in October 2014
  - Water Conservation and Technology Center (WCTC)
  - Report purpose
    - 12 projects (risk values) – e.g., ASR, Desal, Conservation, Vista Ridge
    - 24 issues (grades) – e.g., climate, public education, population estimates
  - Retired in Summer 2015
- **Process**
  - *Early Drafts* submitted for review over Summer
  - *Final Draft* received October 1, 2015
  - Initiated Science Panel review
  - Final report – *objective and scientifically-sound*

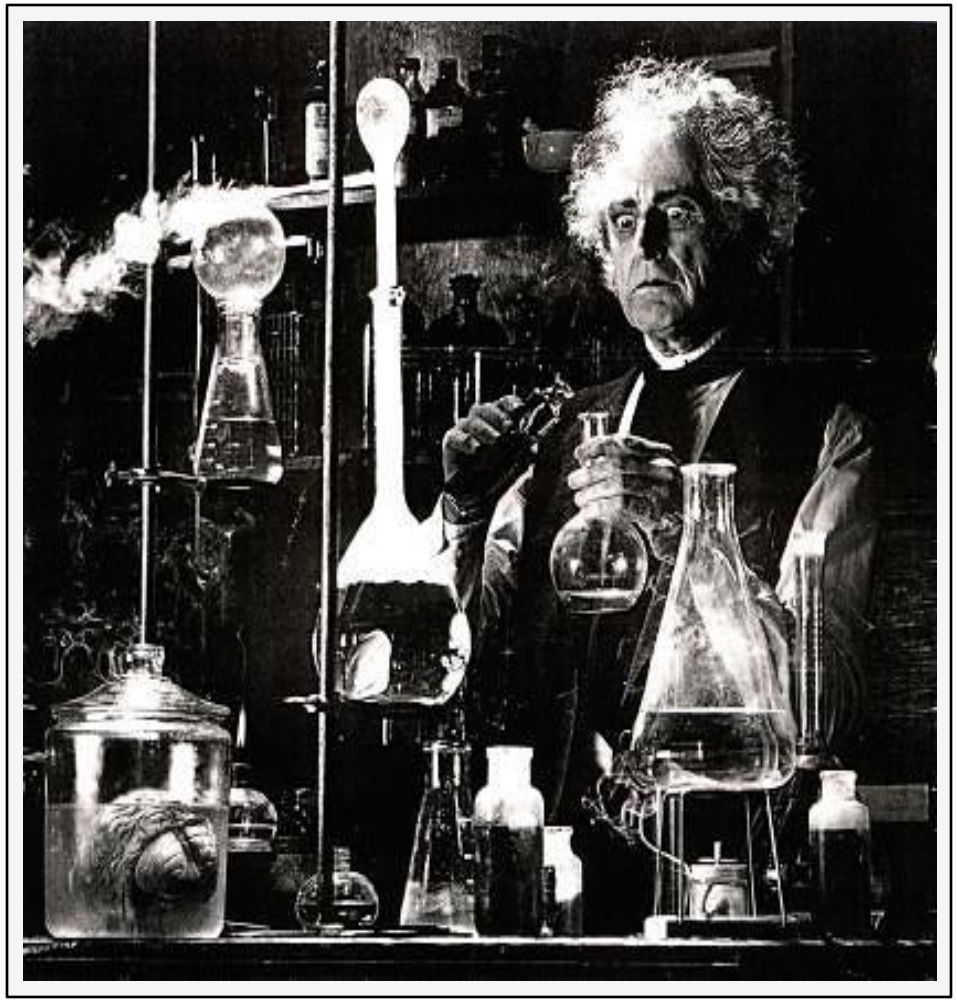
Science Panel Review

- **Process**
  - Commonly used in academia/research (i.e., "blind" review)
    - Encourages candid and objective review
    - Serves to enhance the report
    - Example in application
- **Broad Representation**
  - 5 experts in water policy, water engineering, water economics, hydrology, and watershed planning
  - 20+ years of research experience
  - 50+ peer-reviewed articles
  - Avoided potential conflict of interest

Science Panel Review

Findings/Issues:

- **Methods and Data Integrity**
- **Risk Scorecard**
  - Scale issues
- **Water Grades**
  - Subjective



Science Panel Review

Findings/Issues:

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Issue/Challenge:

- Information needed on how analysis conducted
- Validate data and values used

Solution:

- Reformatted report to centralize information
- Addressed data overstatements

Science Panel Review

Findings/Issues:

- Methods and Data Integrity
- **Risk Scorecard**
  - Scale issues
- Water Grades
  - Subjective

Remember….all measures should be balanced

Scales Matter…									
0	+		-	0	+			0	+
0	+		-	0	+		-	0	+
0	+		-	0	+		-		+
Low			Medium				???		

Examples…

Length of Contract		0	+
Water Ownership	-	0	+
Water Treatment	-		+

Science Panel Review

Findings/Issues:

- Methods and Data Integrity
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15%

Scales Matter….				
Distance to Source	-	0	+	++
Water Ownership	-	0	+	
Length of Contract	0	+		

11%

7%

Remember….all measures should be weighted <u>equally</u>…

Science Review Panel

Findings/Issues:

- Methodology
- Data Integrity
- **Risk Scorecard**
  - Scale
- Water Grades
  - Subjective

- Use of "Other Risks" *additive* – e.g., bond status, pipeline rental, customer participation.
- Marginal measures used e.g., distance to water source

Example:
3 Projects

Scales Matter…							
0	+		0	+		0	+
0	+		0	+		0	+
	+						
	+						

Remember….measures must be applied <u>consistently</u>

Distance to Water Source = *Reliability?*

130 miles – 1937.
Mainland to Key West, Florida

322 miles – 1966.
Lake Meredith to Amarillo

Science?

- ***Contamination***
- ***Reliability***

157 miles – 1992.
Ivie Reservoir to Odessa-Midland

260 miles – 2009.
Gallup Navajo Pipeline, New Mexico

Science Panel Review

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Summary

- **Limited/science bias:**
  - Different scales
  - Unbalanced weight
  - Inconsistent or marginal measures
- **Better scorecard needed for water projects**

Water: It's Complicated…

Can a single measure give you comprehensive estimate of risk?

- **Health**
  - *Weight*
  - Blood pressure
  - Cholesterol level
- **Water**
  - *Reliability of supply*
  - Cost certainty
  - Reliability over time

Understanding risk requires various measures.

Water *Supply Reliability*

Science Panel:

- *Asked to come up with better scorecard…*
  - Identify new measures (more informative)
  - Redefine existing measures that address scientific biases
  - Use existing original measures (2 cases)

"Supply Reliability"

  - Same data from original assessment was applied to new scorecard

Results – *Water Supply Reliability*

Science Panel Analysis		
Western Canyon	0.813	High
CRWA Lake Dunlap	0.75	High
Medina Lake	0.713	High
Trinity Oliver Ranch	0.688	High
Edwards Aquifer ★	0.563	Medium
Gonzales Carrizo	0.338	Medium
Vista Ridge Project ★	0.288	Medium
SAWS Twin Oaks ASR	0.188	Medium
Brackish Water Desal	0.163	Low
Local Carrizo (Bexar)	0.163	Low
SAWS Recycled Water	0.125	Low
Water Conservation	0.088	Low

Original Analysis		
Medina Lake	5	High
Vista Ridge Project	4	High
Western Canyon	3	High
CRWA Lake Dunlap	3	High
Gonzales Carrizo	2	High
Trinity Oliver Ranch	1	Medium
Edwards Aquifer	-1	Low
Brackish Water Desal	-1	Low
SAWS Twin Oaks ASR	-3	Low
Local Carrizo (Bexar)	-3	Low
SAWS Recycled Water	-4	Low
Water Conservation	-4	Low

Edwards Aquifer Reliability?

Year	Total AFY (Normal)	Reduced AFY (Drought)	Reduction (%)
2013	288,401	205,002	-30%
2014	289,024	188,143	-35%
2015*	288,916	236,713	-18%

**most recent update*

- Edwards rapid recharge/depletion – highly variable
- Permit requirements can limit up to 44% of water
- Carrizo-Wilcox Aquifer – low drought sensitivity (e.g., slow recharge/depletion), no restrictions in last 3 years.
- *Time reliability* (e.g., 20+ years) is important

Vista Ridge

- Scorecard ranks Vista Ridge as "medium" value for *supply reliability*.
- From a technical standpoint (i.e., supply reliability), Vista Ridge is viable.
- The Science Panel provided additional factors for consideration:
  - *Example*: Reliability of supply over time

Science Panel Review

Findings/Issues:

- Methodology and Data Integrity
- Risk Scorecard
  - Scale Issues
- **Water Grades**
  - Subjective

B = "Effective"

- Goal Attainment
- Program Approach
- Ratepayer Acceptance
- Corrections Needed

Subjective => Qualitative

Issue/Challenge:

- Scorecard missing specific criteria
- No history or data for some issues – grade?

Solution:

- Science Panel provided <u>independent</u> grading
- Few grade adjustments:
  - Due to updated information
  - No performance history (i.e., "no grade")

Revision Summary

- Report reformatted for ease of use
- Values and assumptions reviewed and validated – *important*.
- Scorecards (risk and grades) left intact for *transparency and comparison.*
- Alternative reliability analysis was offered by the Science Panel.
- Independent grade assessment also was offered by the Science Panel.

Report Use

- Use of Science Panel was beneficial to process.
- "Evolution" in report – enhanced the objectivity and science used.
- Addressed draft limitations within time and data availability constraints – *important*.
- Tool for decision-making, not a decision.

Remember….process serves to <u>enhance</u> report…

Final Thoughts…

- In summary, the report provides:
  - Broad descriptions of 12 water projects and 24 water issues (i.e., good primer for SA water)
  - Validation and improvement to water project *supply reliability* analysis
  - Validation and/or alternative assessment to water grading
  - Recommendations and other considerations from a diverse panel of water experts
- Acknowledgements

Report and other documents available at:

http://irnr.tamu.edu/

http://twri.tamu.edu/