An Update on the Regional Water Quality Protection Plan

Development of a Regional Water Quality Protection Plan for the Barton Springs Segment of the Edwards Aquifer and its Contributing Zone

Hill Country Alliance
June 4, 2008

Project Sponsors

- City of Dripping Springs
- City of Austin
- City of Buda
- City of Kyle
- City of Rollingwood
- City of Sunset Valley
- Village of Bee Cave
- Blanco County
- Hays County
- Travis County
- Barton Springs/Edwards Aquifer Conservation District
- Hays Trinity Groundwater Conservation District
- Blanco-Pedernales Groundwater Conservation District

Funding

- Principal Funding – Grants from:
  - Texas Water Development Board - $148,000
  - Lower Colorado River Authority - $100,000
- Other Local Public Entities (Cash/In-kind)
  - City of Austin
  - Austin Community College
  - Barton Springs/Edwards Aquifer Conservation District
  - Village of Bee Cave
  - Blanco-Pedernales Groundwater Conservation District
  - City of Dripping Springs
  - Hays County
  - Hays Trinity Groundwater Conservation District
  - City of Kyle
  - Lower Colorado River Authority
  - City of Sunset Valley

Funding (Continued)

- Other Entities & Individuals (Cash/In-kind)

  - The Austin Waldorf School
  - Carpenter and Langford, P.C.
  - George Cofer
  - The Oak Hill United Methodist Church
  - The Salt Lick Bar B-Q
  - John Orr
  - The Save Barton Creek Association
  - TechPeople, Inc.
  - Terri Buchanan, M.P.H.
  - Urban Design Group

The Historic Perspective

"Good water quality is one of the things that contributes most to the health of the citizens of a city. There is nothing of more interest to magistrates than maintaining the healthfulness of the water that serves both men and animals and preventing accidents that can cause the water to become polluted, whether in springs, rivers and streams where it flows or in places where diverted water is stored, or in the wells used as sources."

(De Jussieu, Histoire de l'Academie royale des sciences [History of the Royal Academy of Science], 1733, p.331. From The Public Fountains of the City of Dijon by Henry Darcy, translated by Patricia Bobeck, Kendall/Hunt Publishing Co., 2004.)

Why A Plan Was Necessary?

- Water Resources in the Region are Invaluable and Deserve to be Protected
- Pressure for Growth & Development is Already Being Felt – The Region Must Be Ready
- Some of What We Have Been Doing is Not Working
  - If we do what we've always done, we'll get what we've always gotten
  - No one wants to destroy the natural resources
- Competing Ideas About How the Resources Should Be Protected

Stakeholder Representation

- Stakeholder Categories
  - **Property Owners**
  - **Concerned Citizens**
  - **Development Interests**
  - **Environmental Preservation & Good Governance Interests**
  - **Neighborhood Interests**
  - **Public Interest Organizations**
  - **Governmental Entities**
  - **Economic Interests**
- 3 to 5 Representatives from Each Category
- Public validation of representation
- Adjustments to better reflect stakeholder groups:
  - INCREASE landowner representation
  - INCREASE government representation
  - REDUCE duplicate representation

Stakeholder Committee Effort

- 27 Members + 8 Alternates
- Meetings from June 2004 thru March 2005:
  - 16 full meetings
  - 6 subcommittee and workshop meetings
  - Over 2000 hours valued at $51,000
  - PLUS time outside of meetings
- Average attendance for 16 meetings: **93%**
- Identification and Prioritization of Issues
- “Give and Take” Exchanges
- Critical Feedback on Technical Work Products

Stakeholder Committee Goal Statement

"Develop an implement-able Regional Water Quality Management Plan that preserves and protects resources and manages activities within the planning region so that existing and future land use, land management, and development activities maintain or enhance the existing water quality of the groundwater and surface water within both the Barton Springs segment of the Edwards Aquifer and the contributing portion of the watersheds within the Planning Region, for the benefit of people and the environment."

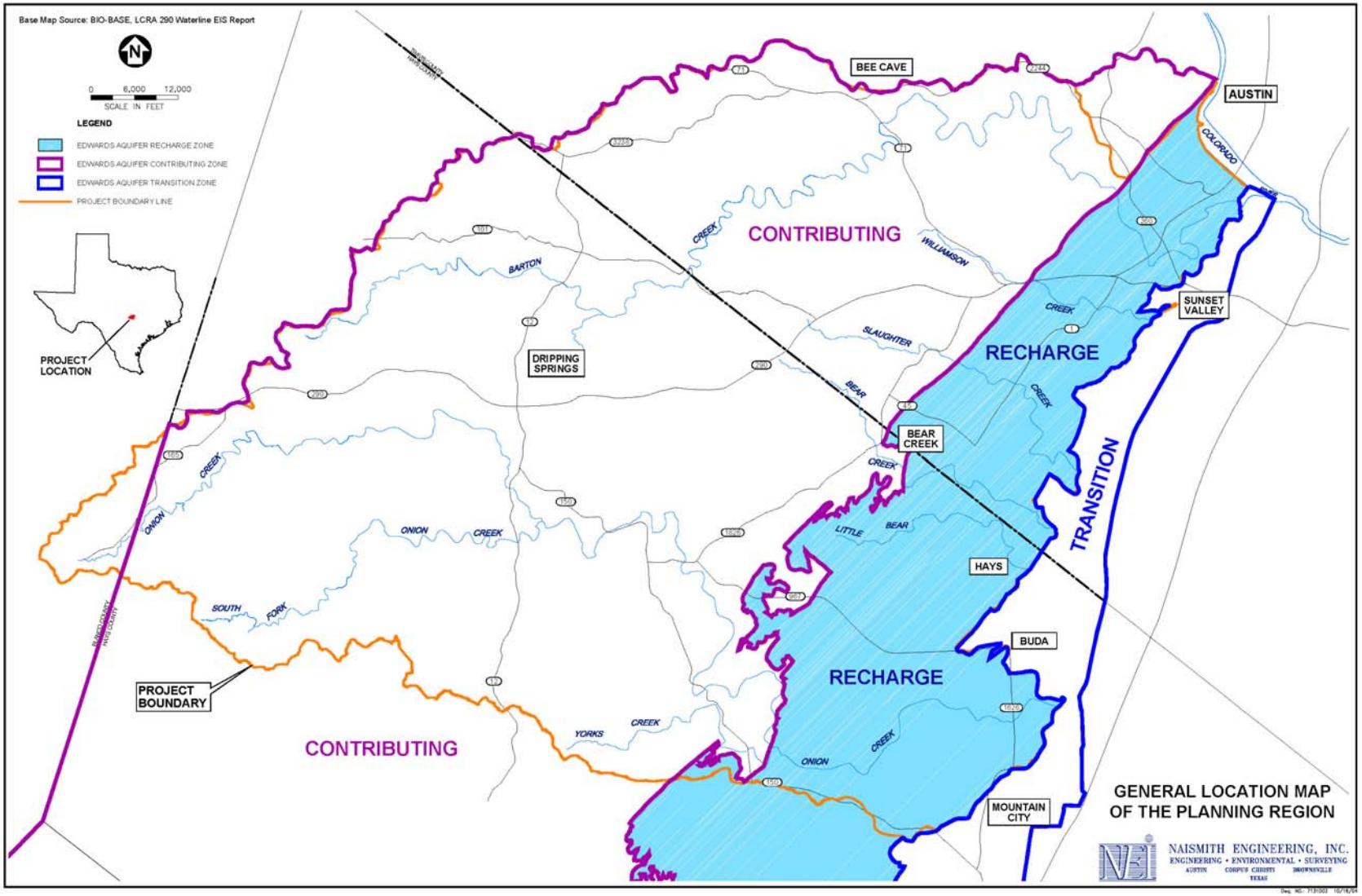
Stakeholder Guiding Principles

1. The economy and environment of this unique part of Texas depend upon the preservation, conservation and management of dependable supplies of clean water. We all recognize the unacceptable consequences that would result if we take no action to protect our water.
2. Both private individuals and the Public have a responsibility to respect the legitimate interests of others and to do no harm in their activities.
3. Those who benefit from an activity must bear the responsibility for the costs and impacts of that activity.
4. We will favor measures which, all else being equal, minimize the risk of failure or of damage to the watershed.

Stakeholder Guiding Principles (Cont'd)

5. The water quality protection measures we recommend will strive to balance Government regulations with appropriate economic incentives.
6. The regulatory measures we recommend shall be accompanied by strategies for administration and enforcement that provide as much certainty as possible while discouraging exemptions and exceptions.
7. We will make all our decisions being mindful of the economic impact of the measures recommended and strive to achieve a fair and reasonable balance among the various interests.
8. We will not permit any party or group in this process to have undue or unfair control over the outcome.

THE PLANNING REGION



Scientific Basis

- Data Compilation – Large Volume of Data
- Technical Review by Consulting Team Experts
- Coordination of Technical Issues with the Technical Review Group
- Coordination of Technical Issues by the Consulting Team with outside Technical Experts
- Approach for Areas of Uncertainty in the Science
  - Assess Potential Vulnerabilities
  - Tie to the “Best Available” Science
  - Where necessary, incorporate safety factors

Implementation

- Short Term
  - Relies Only on Local Jurisdictions
  - Existing Entities Under Existing Legal Authority
  - New Entities, Created by Existing Entities Under Existing Legal Authority
  - Built-in Funding Mechanisms
  - Advantages: Doesn't Rely on Others, No Changes to Existing Legal Authority
  - Disadvantages: Possible Non-Uniform Implementation and Political Influences
- Long Term – Possible Single Jurisdiction/ Regional Entity

Primary Entities Affected

- Unincorporated Hays County (30.4%)
  - (Including Various ETJs: 60.0%)
- City of Dripping Springs CL + ETJ (29.7%)
- City of Austin CL + ETJ (28.7%)
- Unincorporated Travis County (3.7%)
  - (Including Various ETJs: 23.5%)
- Village of Bee Cave CL + ETJ (2.8%)
- *Total for These 5 Entities: > 95%*

Goals and Objectives of the Plan

- Protect Surface Water and Groundwater
- Address W.Q. in All Areas of the Planning Region (Not just Edwards or Barton Springs)
- Goal: “Maintain”
  - Mandatory applicability
  - No net increase in pollutant loadings
  - Applies to all future development activities
- Goal: “Enhance”
  - Primarily voluntary measures
  - Designed to improve existing water quality

A Consensus Based Plan

- General Agreement Among Various Interests
- Stakeholder Committee Bylaws/Procedures
  - Strive for Full Consensus
  - Voting Is A “Last Resort”
  - 75% Agreement Needed to Change Plan
- Results
  - Vast Majority of Issues – Consensus with No Voting
  - Only Handful of Issues Submitted for Vote
  - Of Issues Voted, Most Resolved Through Consensus (>75%)

Items in the Plan with Less than Consensus Agreement

- Min. Contributing Areas for Stream Buffer Zones
- Specific Widths for Stream BZs
- Recognized Treatment Capacity for Stream BZs/CEF Setbacks
- Wastewater/Stormwater Irrigation Design
- Inclusion of Wetlands in Plan
- Safety Factors/Design for Structural BMPs
- Funding Sources for O&M of BMPs
- Use of Development Agreements
- Details of the Impervious Cover Table and the Thresholds for Requiring TDRs

Proposed Water Quality Protection Measures

- Natural Area and Open Space Conservation
- Transferable Development Rights (TDRs)
- Comprehensive Site Planning and Pre-Development Review
- Location of Development
- Intensity of Development
- Control of Hydrologic Regime
- Structural BMPs
- Local Enforcement of Construction Site Controls

Proposed Water Quality Protection Measures (Cont'd)

- Wastewater Management
- Alternative Water Sources/Uses and Conservation
- Characteristics of Development
- Land Use Restrictions
- Restrictions on Use, Storage and Disposal of Potentially Harmful Materials
- Land Management
- Public Education/Outreach

Location of Development

- Stream Buffers

Contributing Area (Ac.)	Width (ft. from C.L.)	Total
32 to 120	100	200
120 to 300	150	300
300 to 640	200	400
Greater than 640	300	600

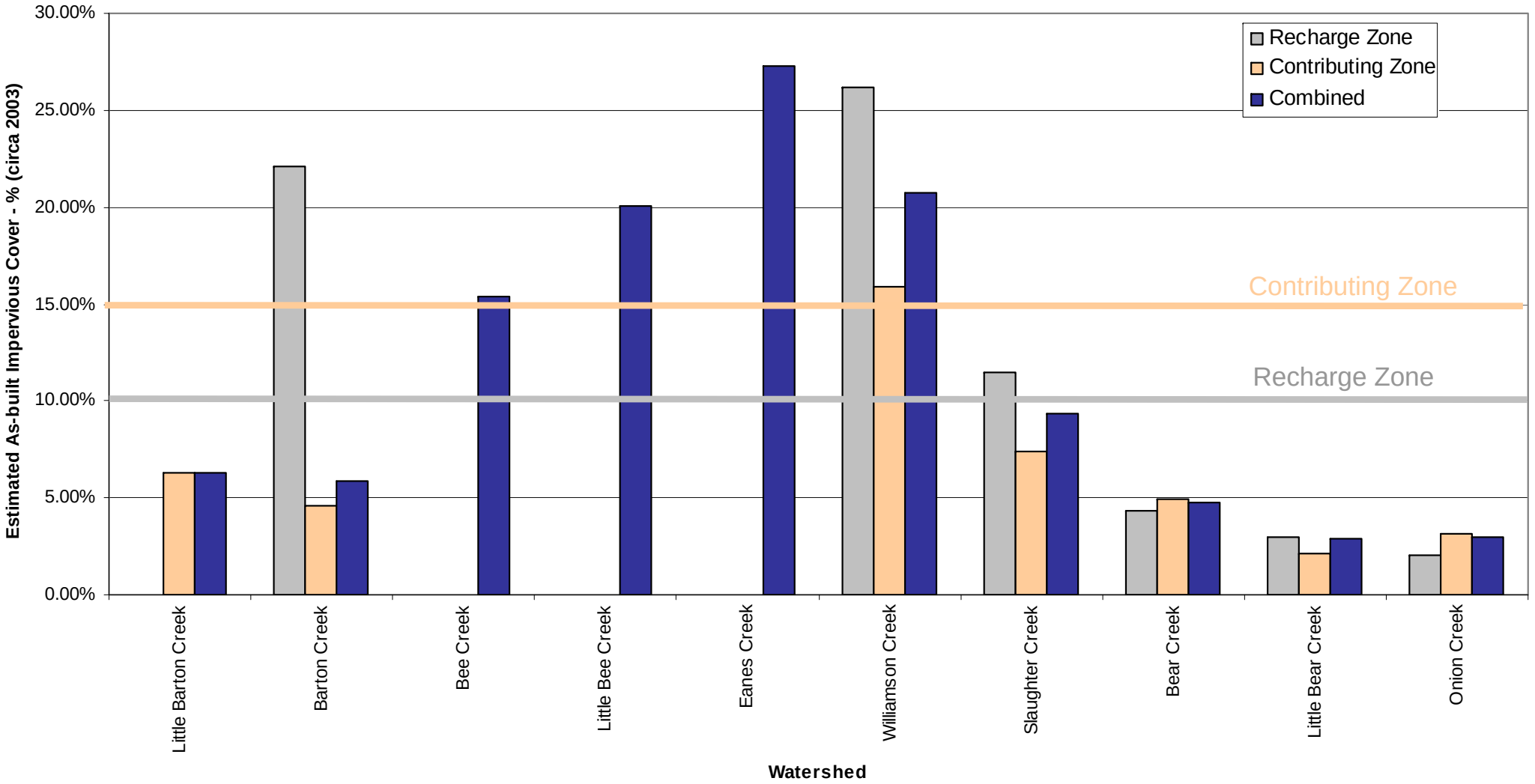
Location of Development (Cont'd)

- Critical Environmental Features (CEFs)
  - Point Recharge Features
    - Upstream: Drainage divide up to 300', not less than 150'
    - Downstream: 150'
  - Indirect Recharge Features – 150'

Impacts of Impervious Cover (IC)

- IC – Roofs, Driveways, Streets, Parking Lots, etc. that intercept rainfall and generally do not allow percolation/seepage of rainfall into soil
- Data Sources
  - U.S. Geological Survey
  - City of Austin
  - LCRA
- Begin to see statistically significant impacts between 5-18%
- At 20%, Degradation Using TCEQ Criteria
- Protective Levels Established
  - 10% for Recharge Zone
  - 15% for Contributing Zone

As-built IC in the Planning Region (2004)



Recommended IC Limitations (%)

Location	Simplified	Standard Methods	Standard Methods + TDRs
Recharge Zone	5	10	15
Contributing Zone (CZ), outside Preferred Growth Areas (PGAs)	7.5	15	25
CZ, s.f. residential, in PGA	7.5	15	30
CZ, high dens. Res., commercial, in PGA	7.5	25	45 or No Limit*

*Requires rainwater harvesting from building roofs

Explanatory Notes for IC Table

- Limited Review
  - No connected blocks of IC > 20,000 sf.
  - Off-site discharges to sheet flow
  - No hard-lined drainage conveyance structures
  - On-site survey for CEFs and streams
  - Geometric review of site plan, no technical demonstration of performance required.
- Standard Methods
  - Comp. Site Design + Calc. Demo. “no net increase”
  - Where on-site IC exceed the established IC Limit:
    - O&M program includes site specific performance monitoring
    - Monitoring program by a public entity
    - Secured funding for O&M and monitoring

Explanatory Notes for I. C. Table (Cont'd)

- TDRs
  - Recharge Zone
    - TDRs Used in RZ must be obtained from RZ
    - Combined IC of all tracts must be 10% or lower
  - Contributing Zone
    - TDRs used in the CZ may be obtained from RZ or CZ
    - TDRs from properties outside of PGAs
    - Combined IC of all tracts must be 15% or lower
- Preferred Growth Areas (PGAs)
  - Defined by local govts. - Comprehensive Planning
  - Within municipal boundaries
  - Zoning – industrial/commercial or high-den. Res.
- "No Limit" - roof runoff rainwater harvesting

Stakeholder Comments on Recommended IC Limits (%)

Location	Simplified	Standard Methods	Standard Methods + TDRs
Recharge Zone	3-7.5	10-15	10-25
Contributing Zone (CZ), outside Preferred Growth Areas (PGAs)	3-10	10-25 +TDRs	15-30
CZ, s.f. residential, in PGA	3-20	15-30 +TDRs	30
CZ, high dens. Res., commercial, in PGA	5-20	20-40 +TDRs	30 to No Limit

Structural BMPs

- Primary
  - Retention/Irrigation
  - Bioretention
- Secondary – Others recognized by TCEQ
- Limitations
  - Limited Design Data – Base on Good Science
  - Good for TSS, not so good for dissolved
  - Need for redundancy
  - Need for proper Operations & Maintenance

Transferable Development Rights (TDRs)

- New Concept in Texas (New Currency)
- Based on Uniform Intensity Limits
  - 10% IC for Recharge Zone
  - 15% IC for Contributing Zone
- Voluntary System-Gives Value to All Land
  - Optional for Development – Plan Limits or TDRs
  - Requires Approval of “To” and “From” Jurisdictions
- Address Equity (Principle # 7)
- Restrictions/Limitations
  - Not intended to change tax status
  - No eminent domain/condemnation allowed

Anticipated Implementation Challenges

- Municipalities
  - All powers in municipal boundaries
  - No zoning and limited ability to regulate IC in ETJ
- Counties
  - Prohibited from regulating (density) intensity or IC
  - Can accomplish this through other entities (MUDs, WCIDs)
- Special Districts
  - Specific Limitations in enabling legislation
  - Can regulate various aspects depending on location
- Development Agreements

Who Pays?

- Guiding Principle – Those Who Benefit Bear the Cost
- Capital Requirements – Included with Development
- Operations & Maintenance
  - Up-front funding
  - Public Entity Assumes Operations
  - Taxing Entity (MUD, WCID or PID) with Water Quality responsibilities

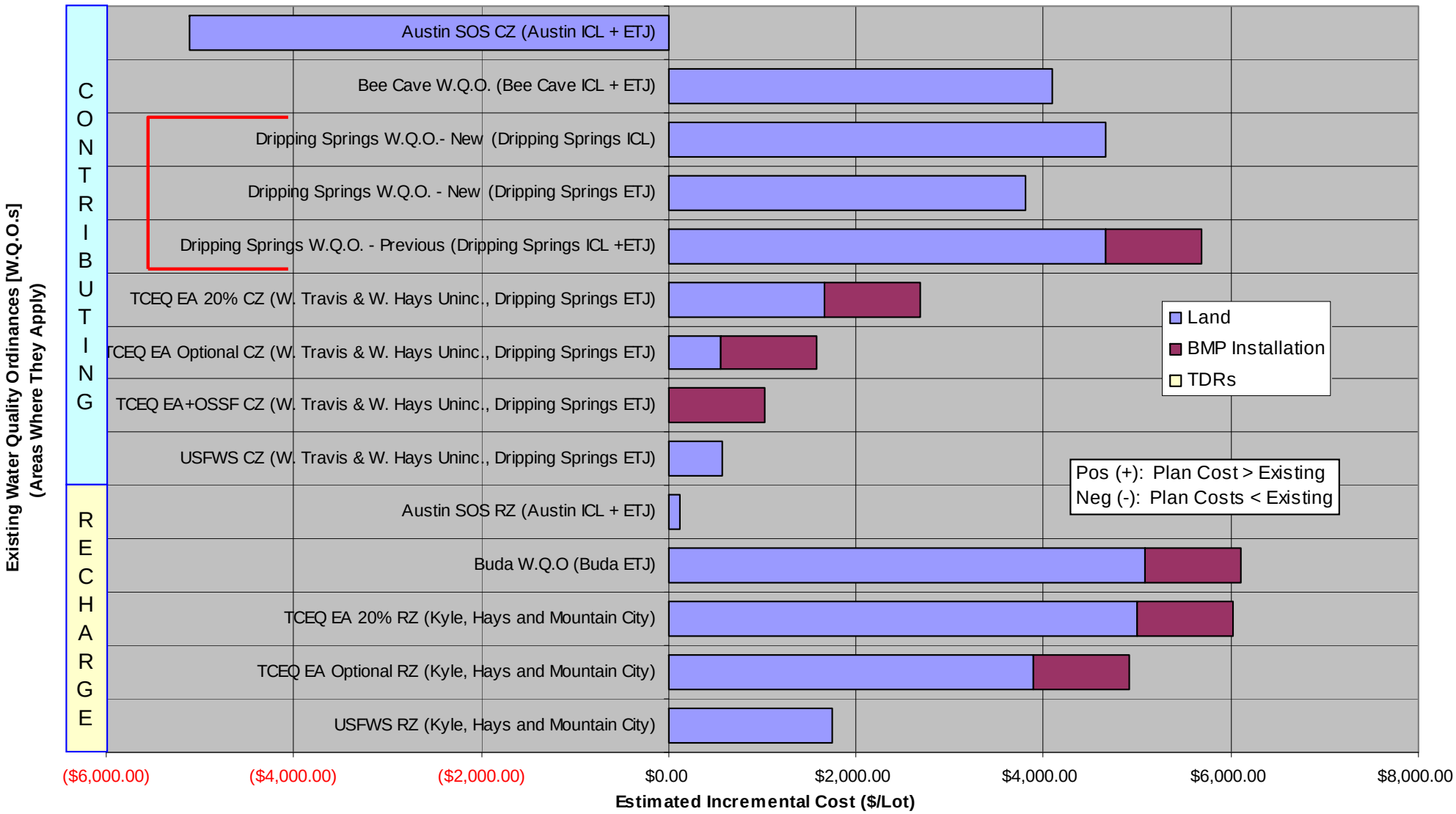
Economic Implications

- Incremental Costs of Measures
  - Depends on starting point – Larger impact on areas with minimal current W.Q. measures
  - Depends on location - Lower impact on total cost for higher $ areas
- Other Cost Savings/Benefits?

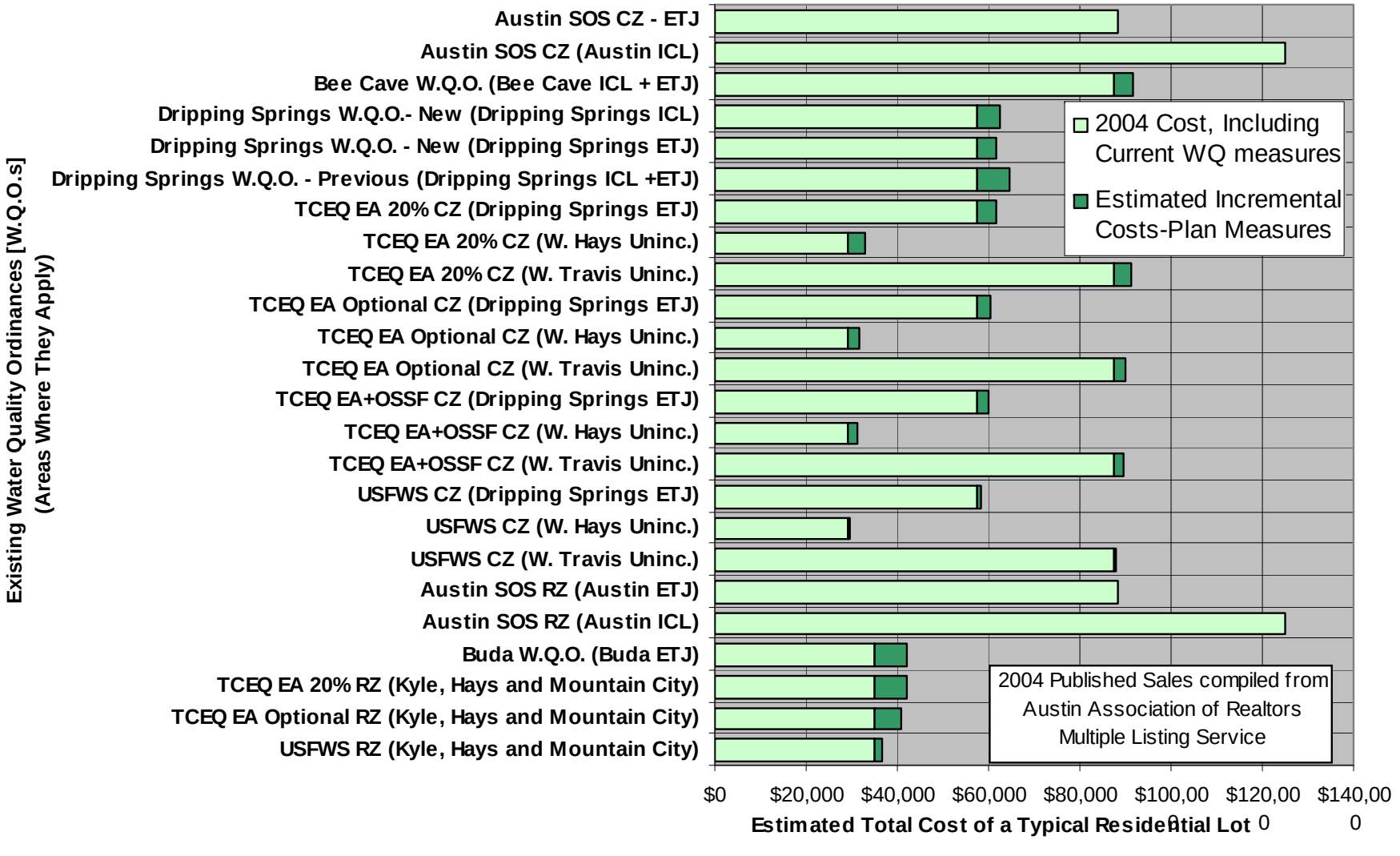
Incremental Cost Scenarios

- Current City of Austin SOS Water Quality Ordinance (WQO)
- Current Village of Bee Cave WQQ
- Current City of Buda WQO
- Current/previous City of Drippings Springs WQOs
- TCEQ's Edwards Aquifer Protection Program (EAPP) optional measures to avoid take of the Barton Springs salamander, approved by USFWS, with IC at 20%
- TCEQ's EAPP measures, with IC at 20%
- TCEQ's EAPP measures, with lot size restricted by current county (Hays and Travis) OSSF ordinances.
- The USFWS measures from the Memorandum of Understanding with the LCRA for providing surface water

Incremental Costs – Typical Lot



Impact of Incremental Cost on Total Cost



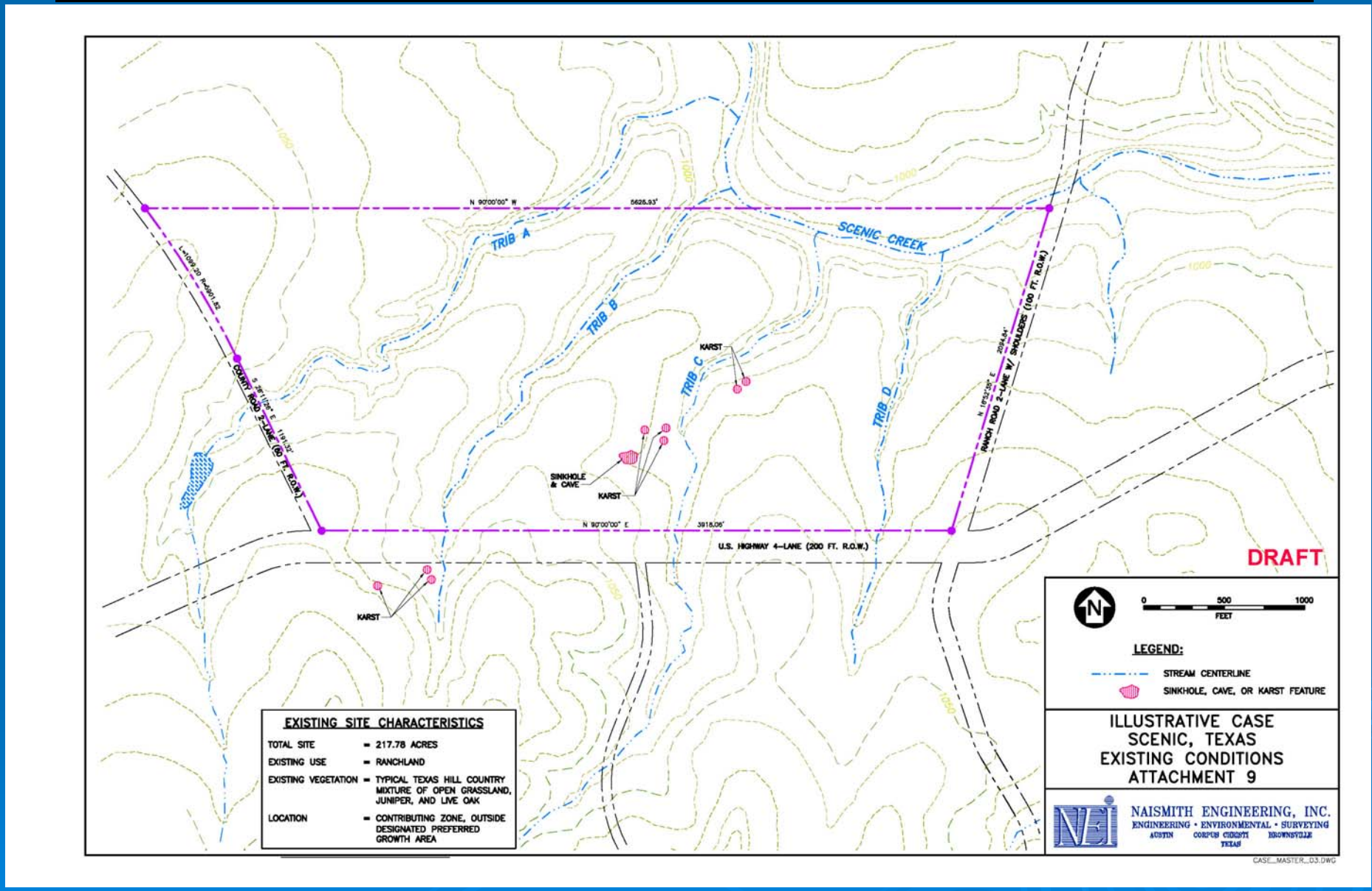
ILLUSTRATIVE CASES

- Intended to Illustrate Effects of Measures on Realistic Properties
  - Rural Tract – mixed development
  - Suburban Tract – commercial development
- Easier to Grasp than 150+ Pages of Text
- Serve as Examples for Implementation

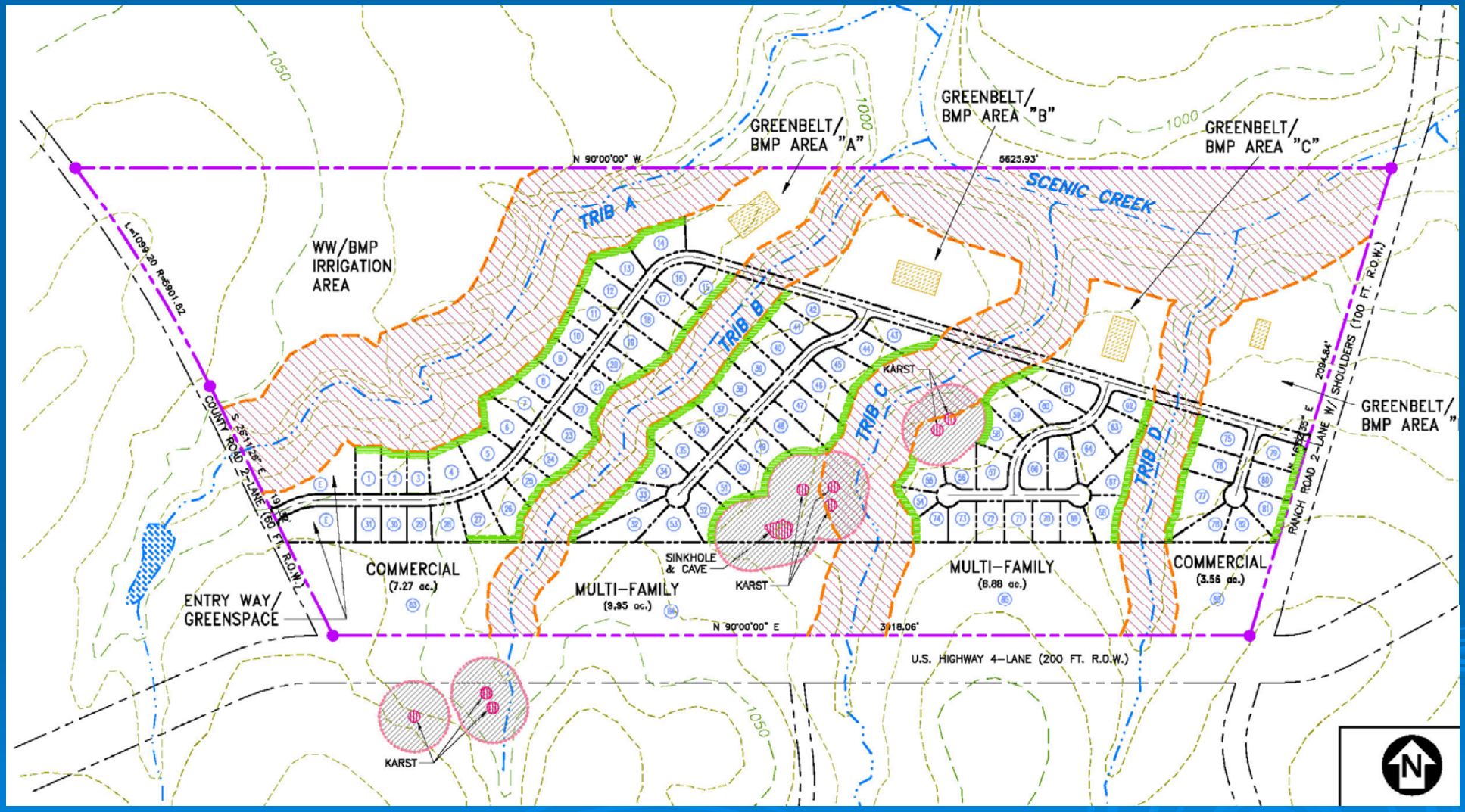
Illustrative Case #1 – Scenic, Texas

- Location
  - Contributing Zone
  - Rural – Outside Preferred Growth Areas
- Site Characteristics
  - 218 Acres, undeveloped ranch land
  - Boundaries: S – 4 lane US Highway, E – TX RR w/ paved shoulders, W – 2 lane CR, N – ranch land & Scenic Creek (>2,000 Ac drain.)
  - Several on-site streams/karst features

Pre-Development - Illustrative Case #1



Post-Development - Illustrative Case #1



Regional Water Quality Planning Project

June 4, 2008

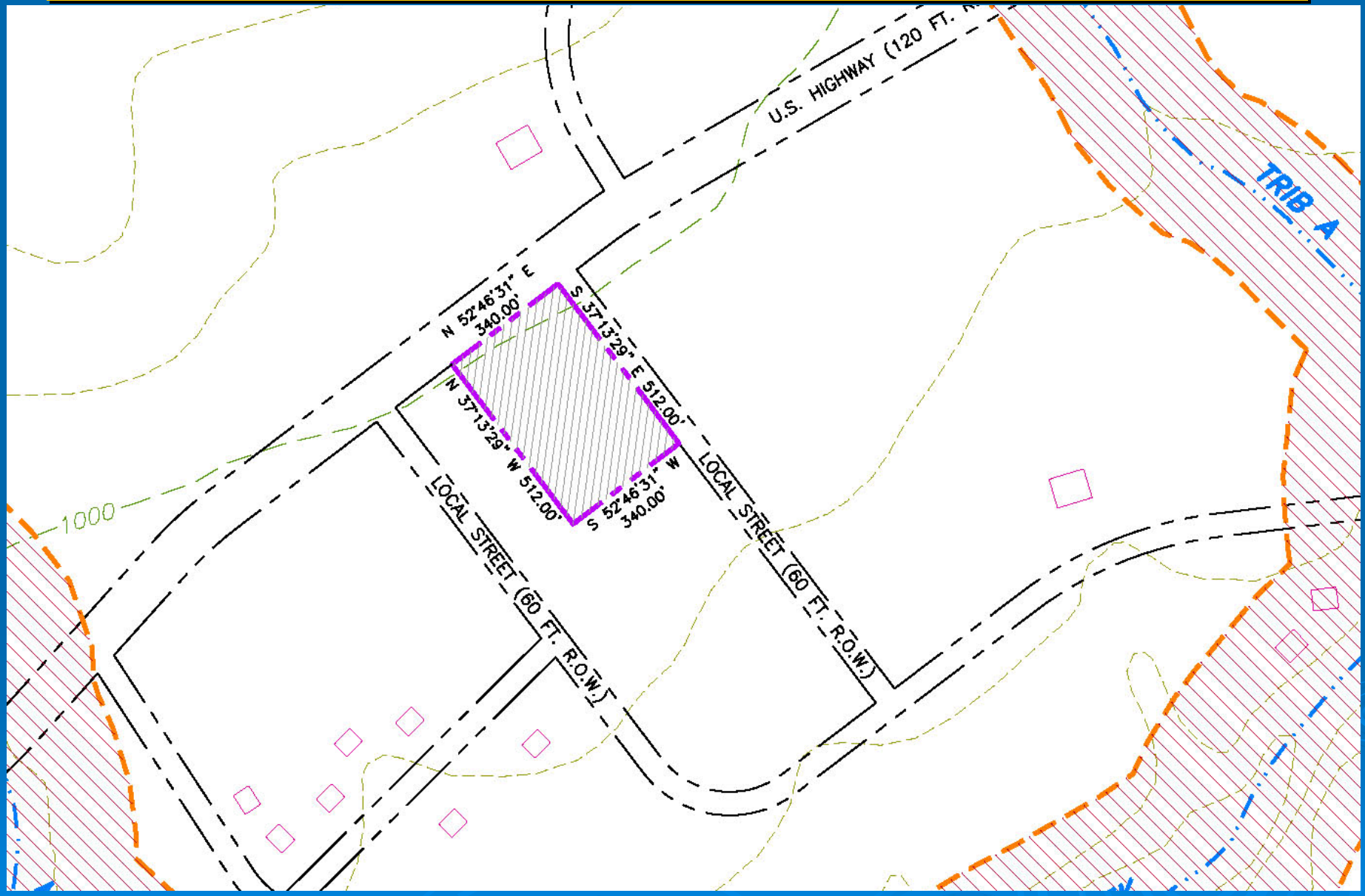
IC Calculations – Illustrative Case #1

Land Use	Impervious Cover (Acres)	Basis
Single Family Residential	9.41	82 lots @ 5,000 sf IC per lot
Multi-Family Residential	7.53	18.83 Ac. @ 40% IC
Commercial	6.5	10.83 Ac. @ 60% IC
Roadways	5.40	Length x Width
Totals	28.84	28.84 / 218 = 13.22%

Illustrative Case #2 – Mythic, Texas

- Location
  - Contributing Zone
  - Urban – Inside Preferred Growth Areas
- Site Characteristics
  - 4.0 Acres, undeveloped agricultural land
  - Boundaries: S & W – Open field, NW - 4 lane US Highway, SE – paved city street
  - Nearly flat, moderately deep soils

Pre-Development - Illustrative Case #2



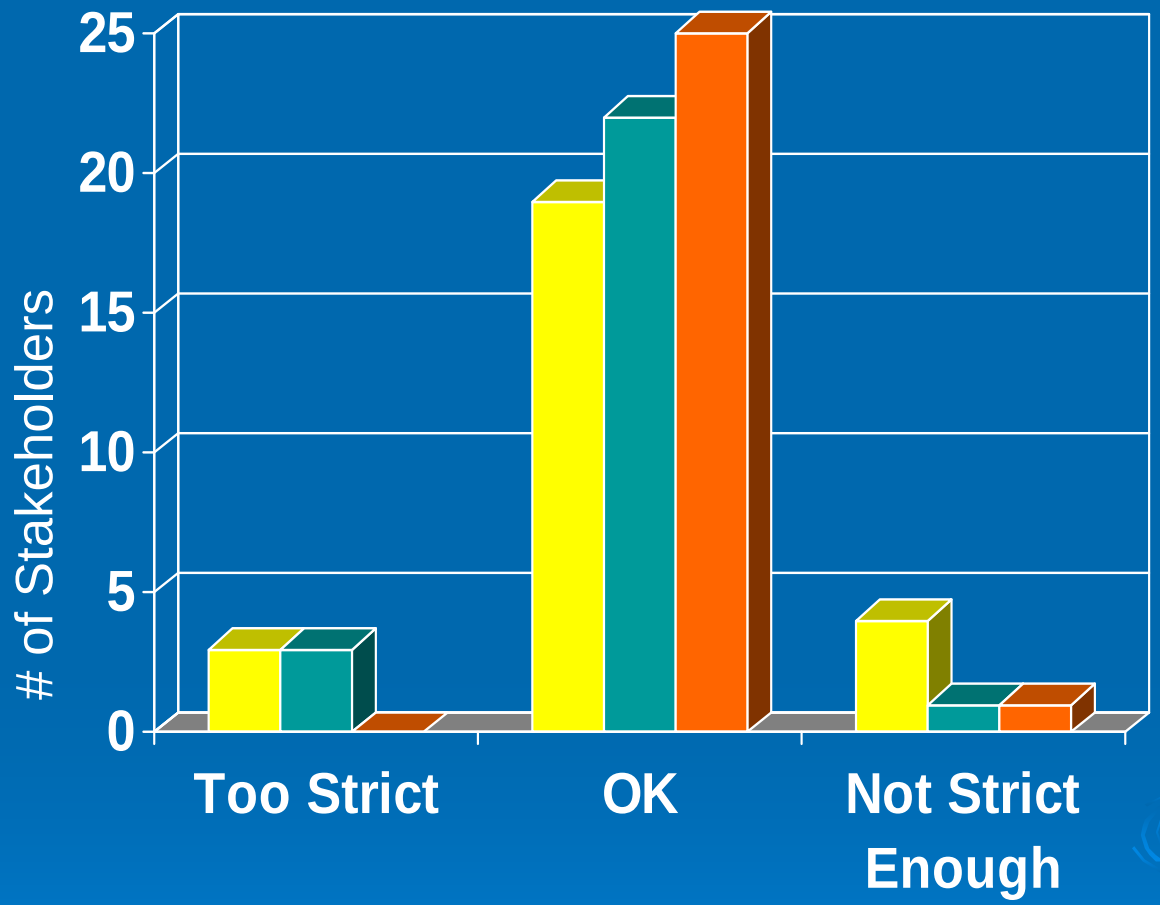
Illustrative Case #2 – Mythic, Texas

- Development Objectives
  - Retail Commercial
  - Max. building, material laydown and parking
- Design Restrictions
  - Ret./Irr. requires 1.0 Ac. of irrigation area
  - Resulting: 3.0 Ac. Or 75% IC (Requires rainwater harvesting)
- TDRs
  - On – site allows: 0.6 Ac. IC (4 x 15% = 0.6)
  - Off-site req'd: 2.4 Ac. IC or approx. 16 Ac.

Stakeholder Committee Positions on Key RWQPP Measures

Stakeholder Ballot Results

Support full adoption	17
Want to see changes before adoption	6
Did not vote (but 3 submitted comments)	4



RWQPP Measures

- **Impervious Cover**
- **Setbacks & Buffers**
- **Erosive Flow**

The Current Status of the RWQPP

June 13, 2005	Plan accepted by the Executive & Core Committees and endorsed as a framework for adoption by local governments
June 21, 2005	Submitted Final Plan to TWDB
July 14, 2005	Final Plan Accepted by TWDB
On-going	Implementation Efforts by Various Jurisdictions

Entities (I Am Aware Of) With Some Existing Regulations

- Municipalities – Austin, Bee Cave, Buda, Dripping Springs, Kyle, Rollingwood, San Marcos, Sunset Valley, Wimberley, Woodcreek
- Counties – Blanco, Hays & Travis
- GCDs – Barton Springs Edwards Aquifer, Blanco Pedernales, Hays Trinity
- Others - LCRA

Anticipated Steps

- Review, Adoption and Implementation by Local Jurisdictions
  - Integration into existing ordinances/rules
  - New ordinances/rules
  - Specific funding mechanisms
- Inter & Intra-jurisdictional Coordination
- Adaptive Management
  - Important to Identify What's working and Not
  - Accommodate new technologies and science
  - Helps facilitate coordination

Entities (I Am Aware Of) Who Are Implementing Some Portion of RWQPP

- Municipalities – Austin, Bee Cave, Buda, Dripping Springs, Kyle, Sunset Valley, Wimberley, Woodcreek
- Counties –Hays & Travis
- GCDs – Barton Springs Edwards Aquifer, Blanco Pedernales, Hays Trinity
- Others - LCRA

My Perspective on Actual Implementation Challenges

- Technical
  - Performance Capabilities of BMPs
  - Potential Regulatory Taking on Small Tracts
- Financial
- Political Resistance
  - Financial Impact (Perceived & Real)
  - Unwarranted Interference
- Shortcomings in Public Education
  - Unaware of Real Threats
  - Skeptical of Effectiveness of Measures

Additional Information on the Plan

- Website
  - www.waterqualityplan.org
  - www.neionline.com
- Public repository locations
  - Naismith Engineering – Austin (600 West 8th)
  - Texas Water Development Board (Stephen F. Austin Building, 17th & Congress)