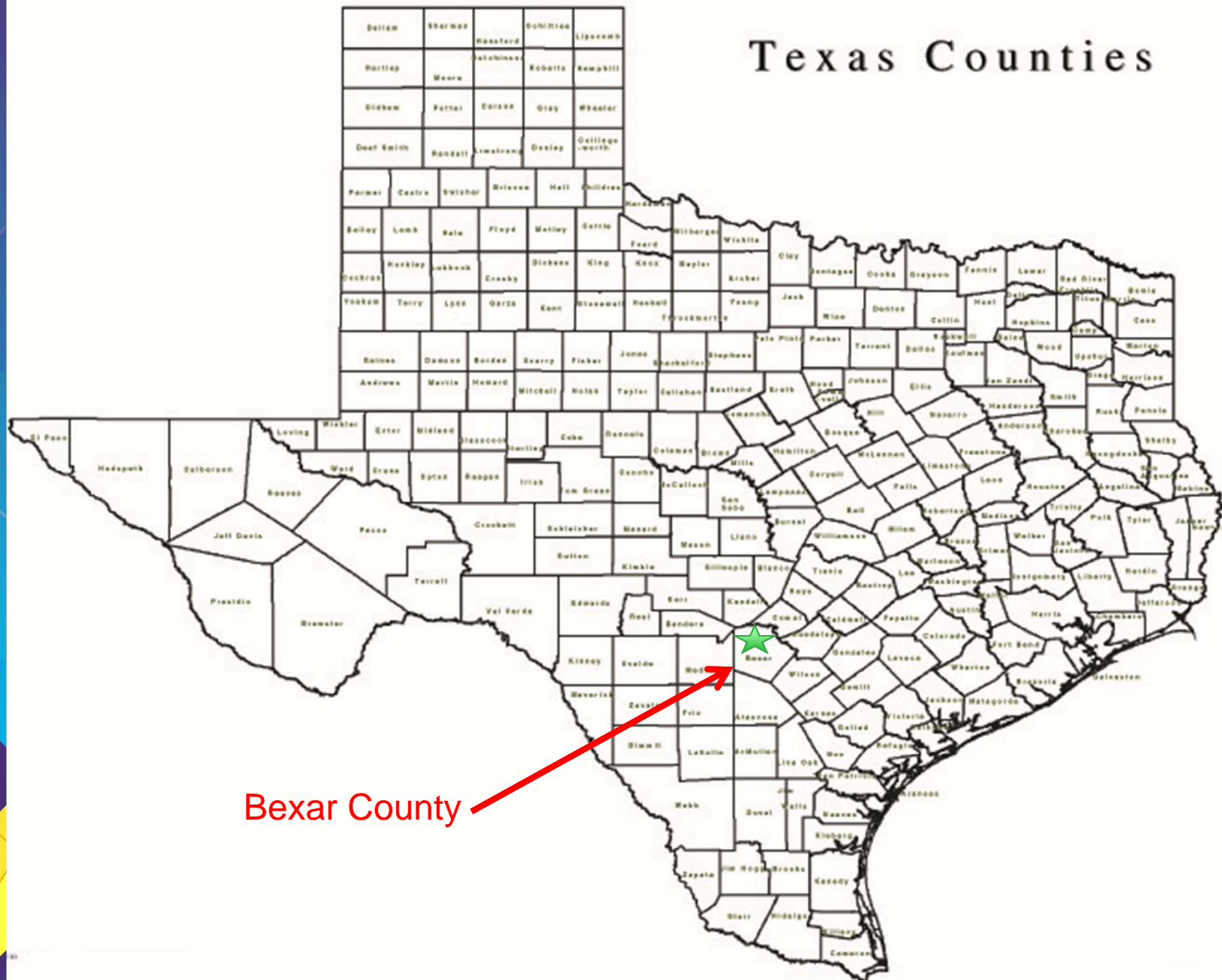




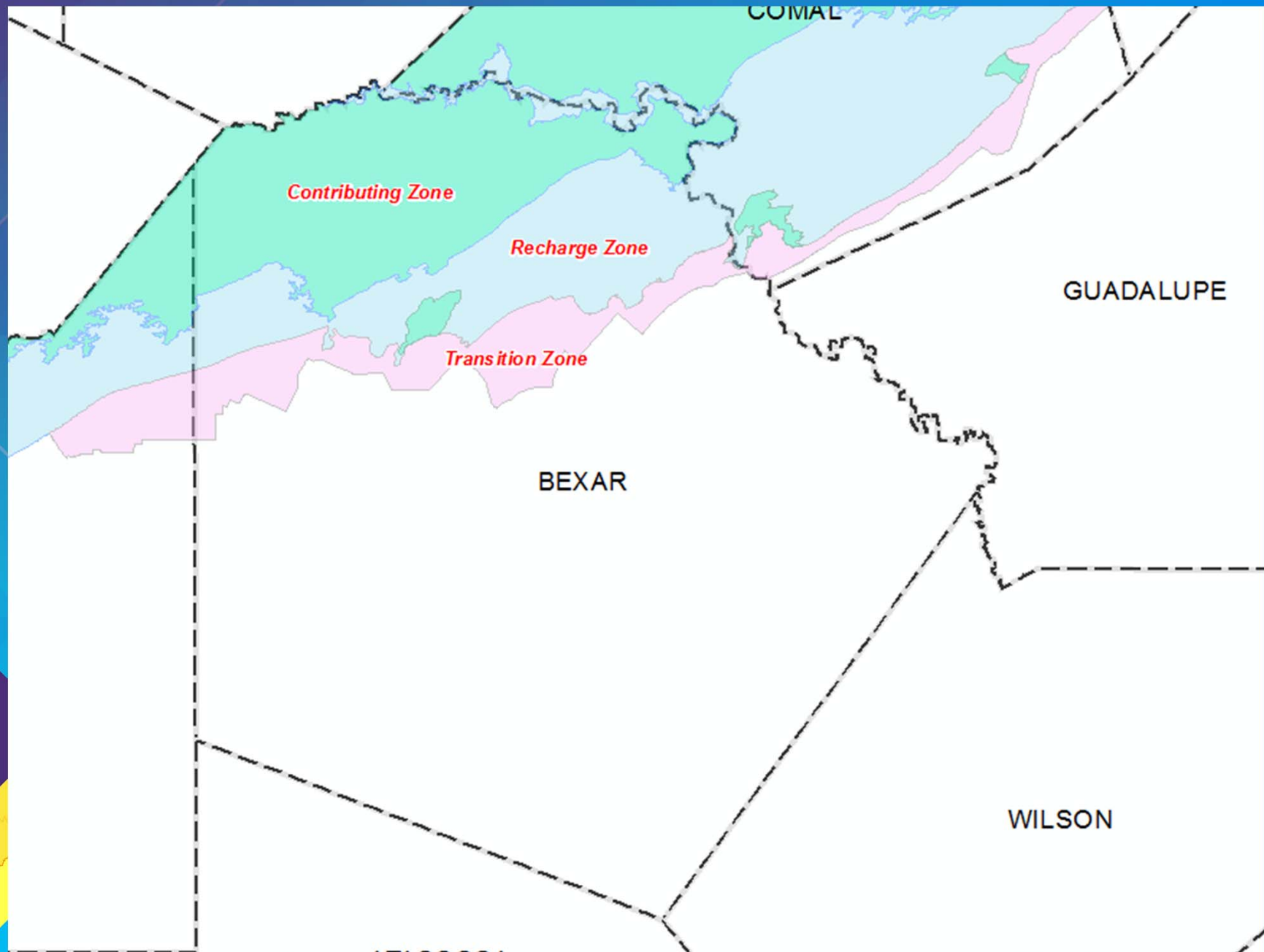
# Designing a Water Pipeline Across Seven Counties with GIS

Michael A. Garza, GISP

# Texas Counties

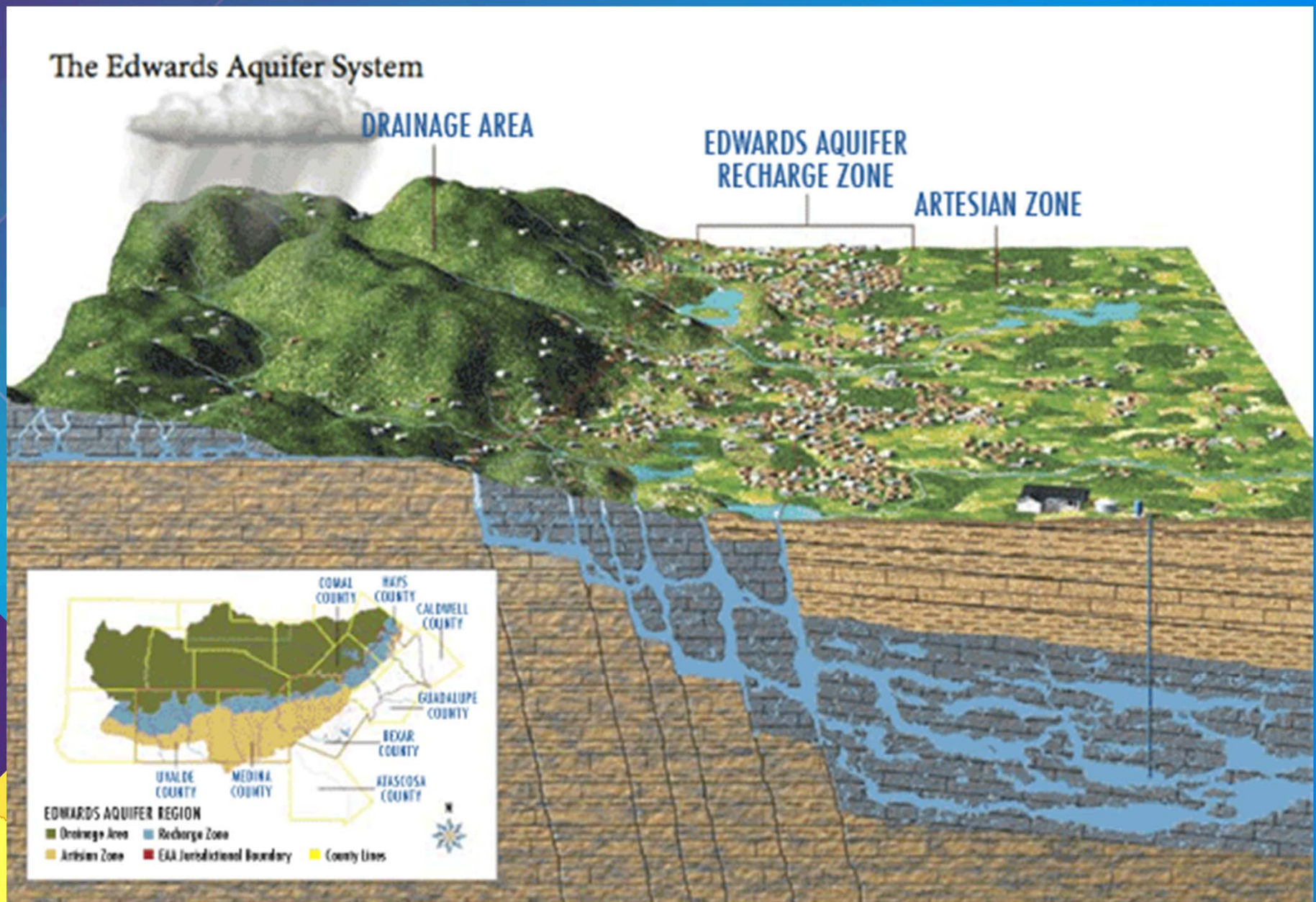


# EDWARDS AQUIFER RECHARGE ZONES





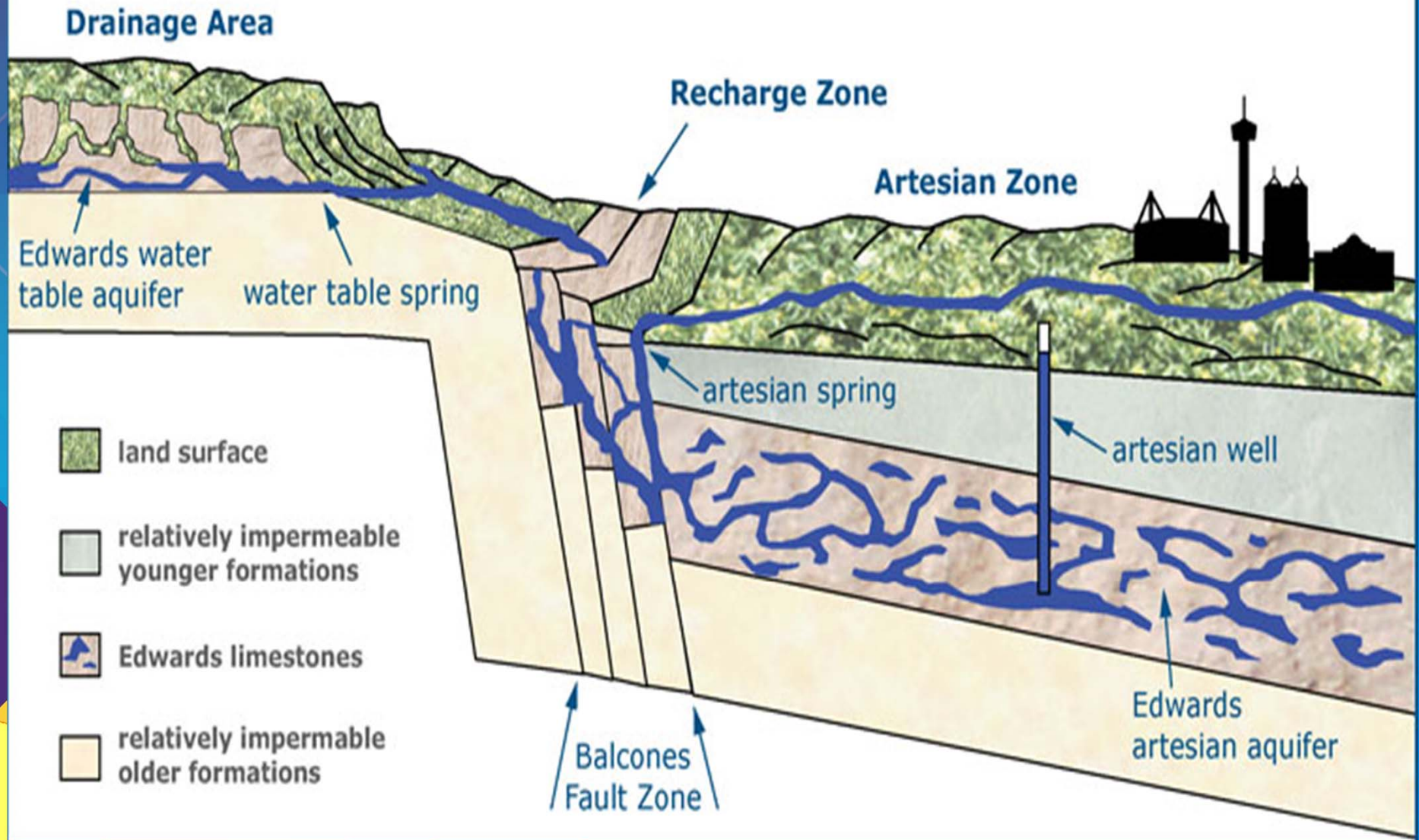
# What is the Edwards Aquifer?





The Edwards Aquifer is the primary water source for a growing population of more than 1.7 million people.

### Typical Cross-Section of the Edwards Aquifer



# DEMOGRAPHICS

Select Language ▼

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## DEMOGRAPHICS

San Antonio, the seventh largest municipality in the U.S., grew by 6.6% between 2010 and 2015, and is projected to grow an additional 6.34% through the year 2020. The city's metropolitan area grew by 9.05% between 2010 and 2015, and is projected to grow an additional 7.64% through the year 2020.

San Antonio, the largest city in Bexar County, encompasses a total geographic area of 467 square miles with a population density of 3,393 persons per square mile. The total land area for Bexar County is 1,247 square miles with a population density of 1,383 persons per square mile.

*Source: 2014 U.S. Census Bureau*

### Population and Projections

Area	2010 Census	Est. Pop. 2014	Projected Growth 2015-2020
San Antonio	1,327,407	1,416,291	6.34%
Bexar County	1,714,773	1,861,562	7.40%
Metro Area	2,142,508	2,336,330	7.64%

*Source: Claritas*


### CONTACT US

602 E. Commerce St.  
San Antonio, Texas 78205

210.226.1394

Toll Free 1.866.949.0357

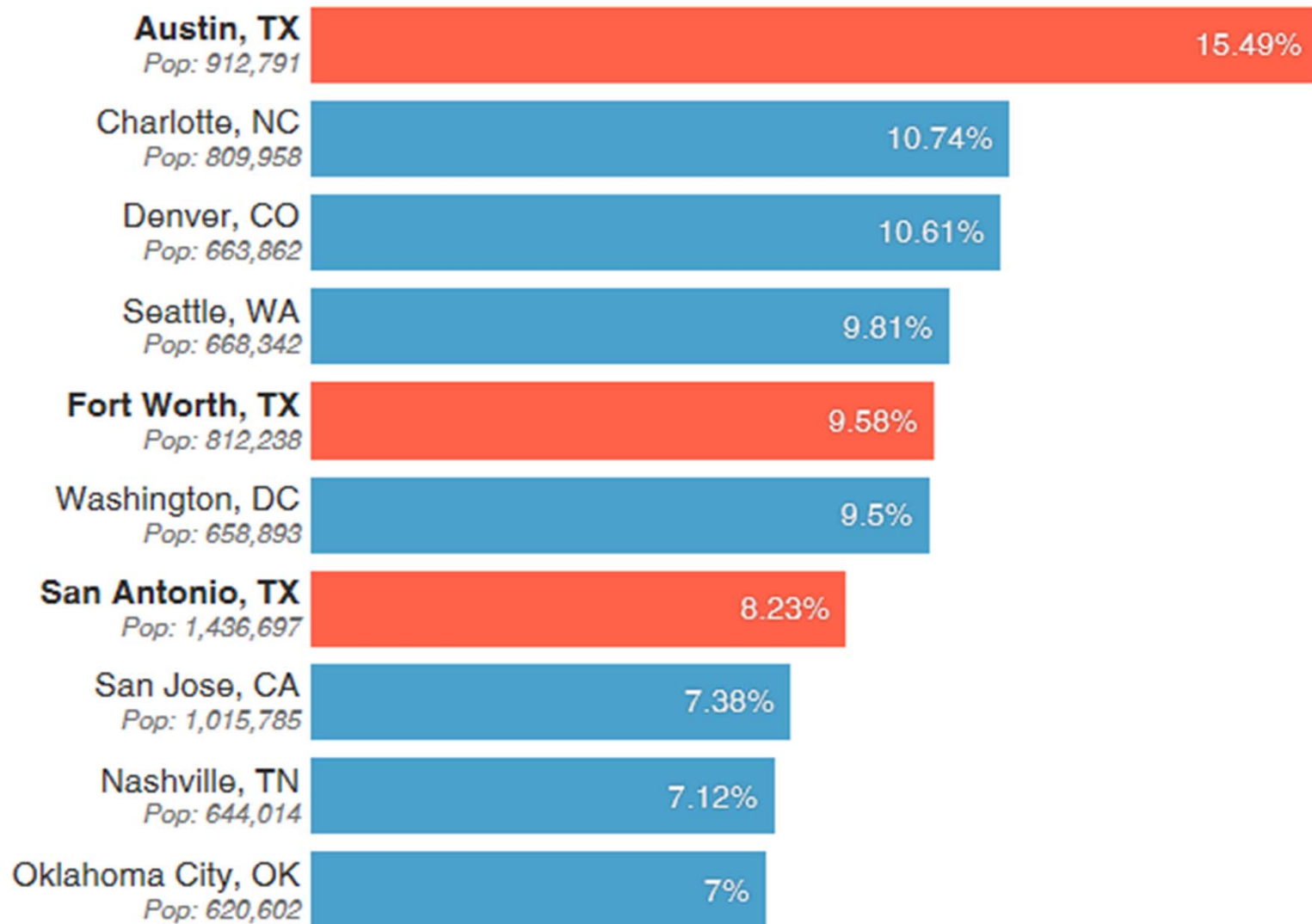
[edf@sanantonioedf.com](mailto:edf@sanantonioedf.com)  
[Community Partners & Information](#)

FOLLOW US   



## Ten Fastest-Growing Cities in the U.S.

Between 2010 and 2014, three Texas cities were among the 10 fastest-growing cities in the U.S. for cities with a population larger than 500,000. Austin, the nation's fastest-growing big city, grew by nearly 16 percent.







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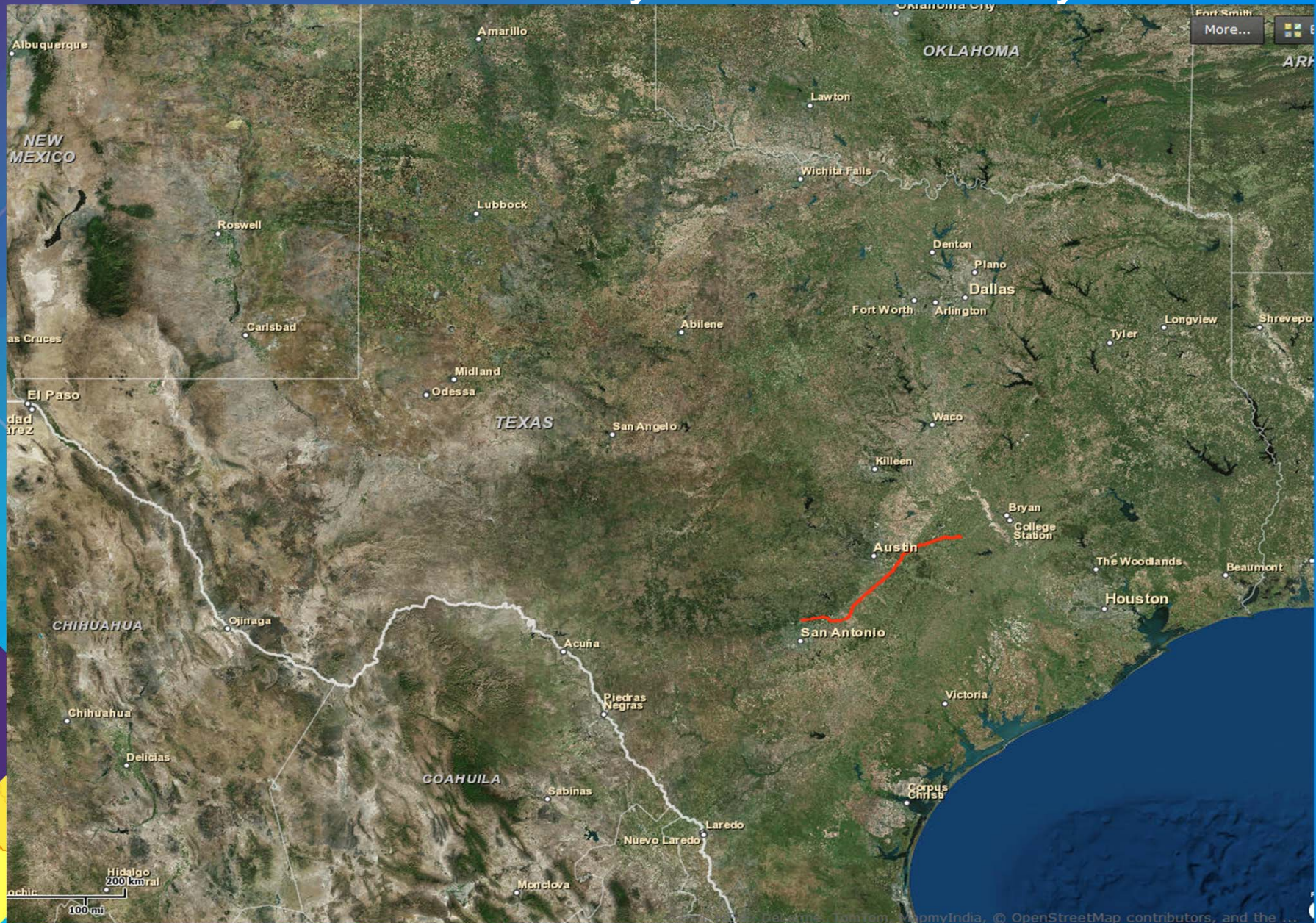
## Hot, Crowded and Smart

San Antonio Is Growing and the Water Supply Is Diminishing.  
What's the Strategy?

Source: [nextcity.org](http://nextcity.org)



## The solution is to design a waterline to bring water from Burleson County down to Bexar County





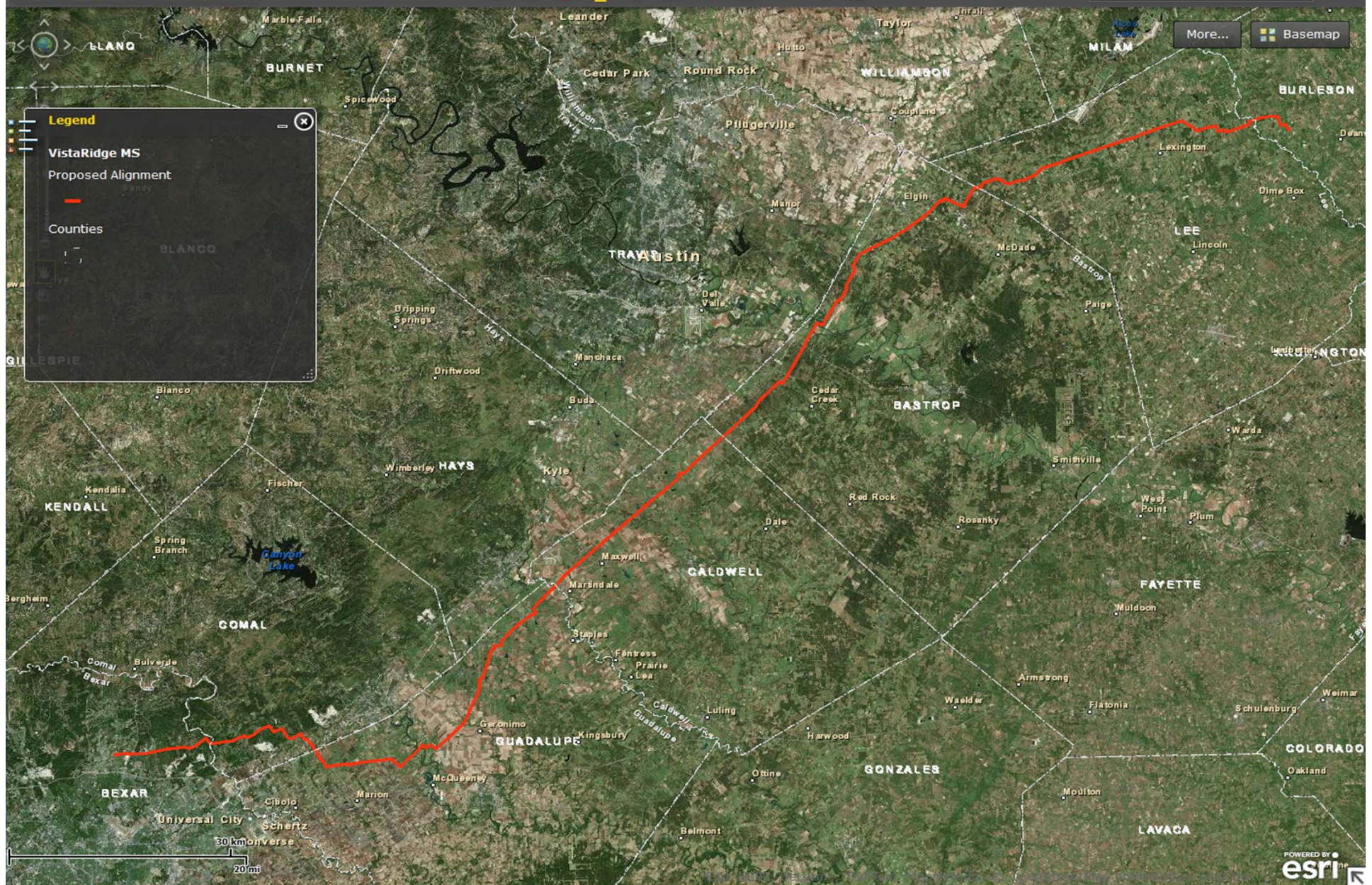
# The waterline Spans Seven Counties, Crosses 490 +/- Parcels, and is approx. 140 Miles in length.

VRRSP Consultants, LLC



Enter address

About





# Who are the Players that are involved in this Project?

Financial Investors



Geo-Technical Engineers



Engineers



Environmentalism



Surveyors



Land Acquisition Group  
(ROE's, Appraisals, Easements,  
& Title Tracking)



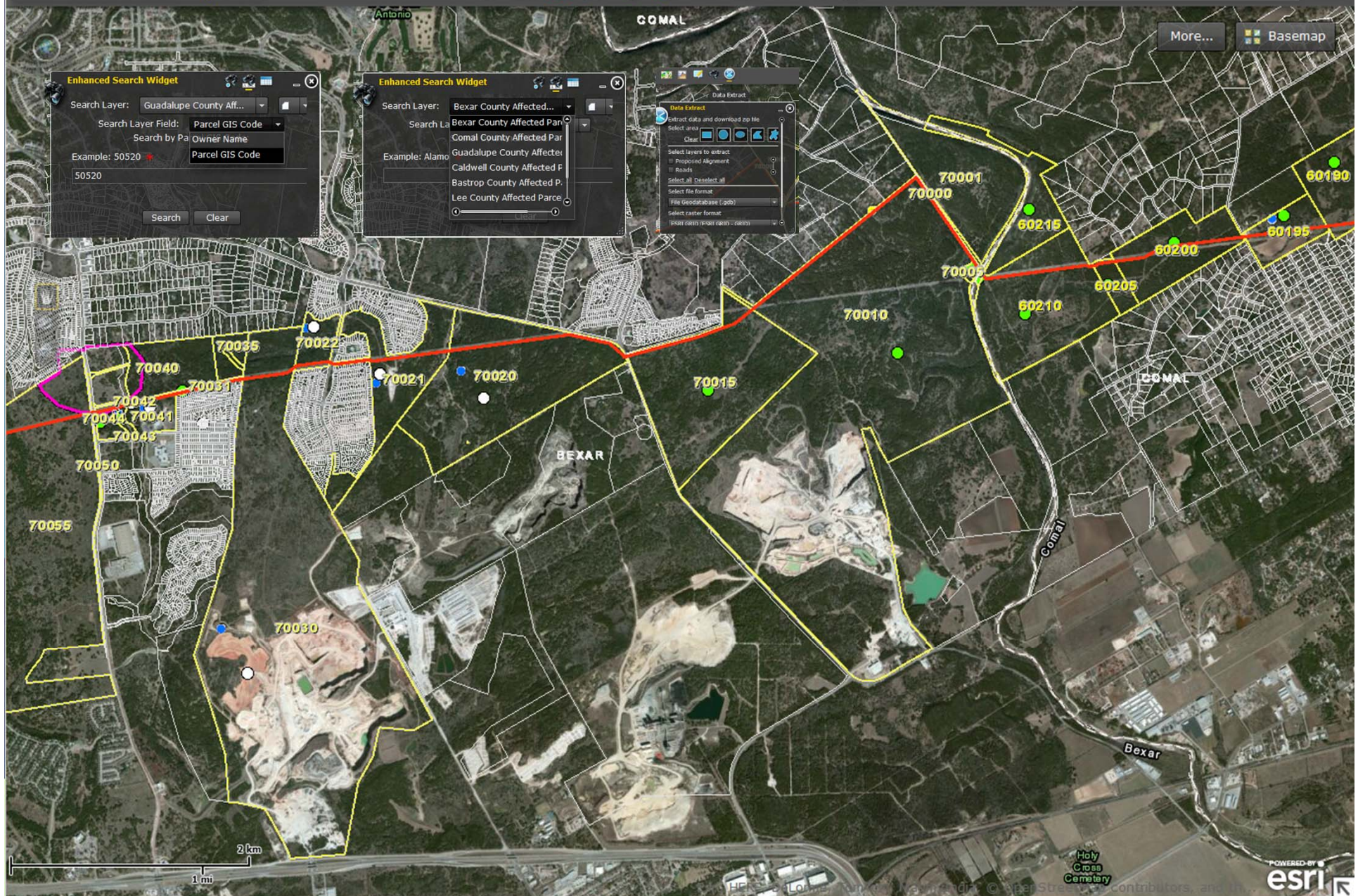


# Flex site with multiple widgets

VRRSP Consultants, LLC

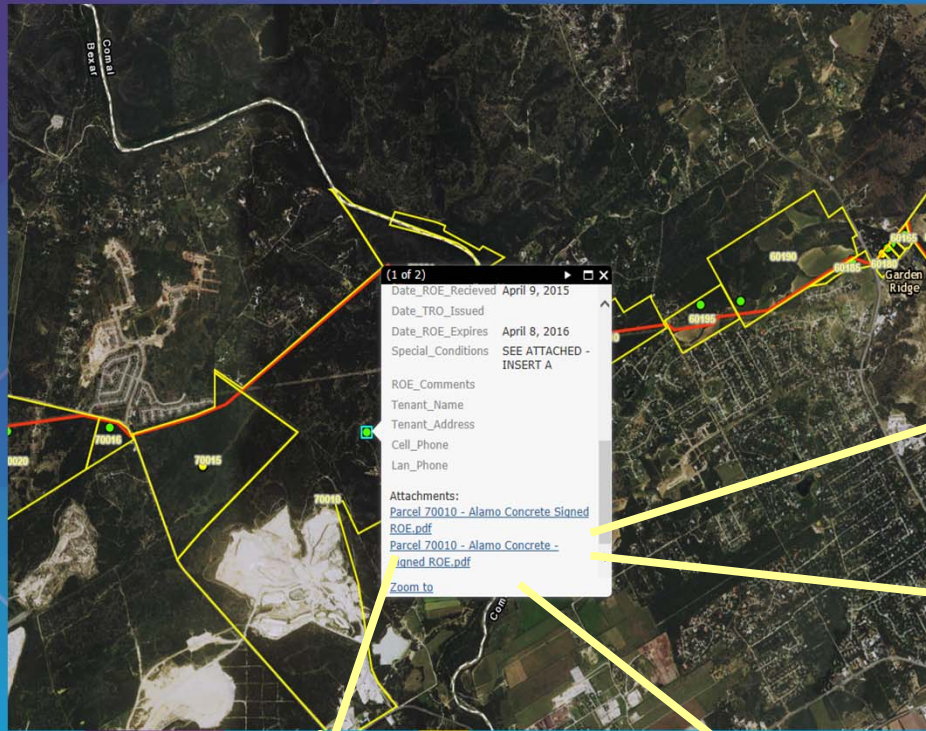
Enter address

About





# Signed PDF



(1 of 2)

Date\_ROE\_Received April 9, 2015  
 Date\_TRO\_Issued  
 Date\_ROE\_Expires April 8, 2016  
 Special\_Conditions SEE ATTACHED - INSERT A  
 ROE\_Comments  
 Tenant\_Name  
 Tenant\_Address  
 Cell\_Phone  
 Lan\_Phone

Attachments:  
 Parcel 70010 - Alamo Concrete Signed ROE.pdf  
 Parcel 70010 - Alamo Concrete - Signed ROE.pdf

Zoom to

Parcel: 999807  
 Vista Ridge Pipeline Project

### RIGHT OF ENTRY AGREEMENT

THIS RIGHT OF ENTRY AGREEMENT ("Agreement") is entered into this day of 2015 by and between the Central Texas Regional Water Supply Corporation ("GRANTEE") and ALAMO CONCRETE PRODUCTS LTD. (referred to as "OWNER", whether one or more).

**Property Description:** Ennis  
 NCB 34960 BLK 1 LOT 1\*SEE LAND DETAILS FOR LEGAL BREAKDOWN\* NCB 34914, NCB 34915, NCB 34959 & NCB 34962

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

Grantee and its contractors and assigns shall have twelve (12) months from the date of this Agreement to enter upon the above described Property, to conduct investigations, including without limitation, soil tests (including borings as necessary), topographical and boundary surveys, engineering studies, planning feasibility studies, archeological and environmental inspections (including shovel tests and backhoe trenching, as necessary), a study of drainage and access, appraisals, and all such other investigations and surveys (collectively "Investigations") as Grantee may require to determine the suitability of the Property for Grantee's intended use. Grantee, in the conduct of its investigations, shall not unreasonably interfere with any existing operations on the Property, and Owner shall not unreasonably interfere with Grantee's Investigations. Furthermore, Grantee shall backfill and restore any hole or trench resulting from Grantee's Investigations as soon as reasonably practicable after completing its Investigations.

Grantee shall provide reasonable notice to OWNER of the dates and anticipated durations of the necessary investigations.

This Agreement shall be construed and enforced in accordance with the laws of the State of Texas.

**OWNER: ALAMO CONCRETE PRODUCTS LTD** **GRANTEE: Central Texas Regional Water Supply Corporation**

By: Kirk Taylor By: Michael Inbeck  
 Print Name: Kirk Taylor Print Name: Michael Inbeck  
 Title: COO Title: President  
 Telephone: 710-208-1818 Date: 4/15/2015  
 Date: 4/15

## Reports

LOG OF BORING NO. B-70021-01 VISTA RIDGE REGIONAL SUPPLY PROJECT TEXAS									
DRILLING METHOD: Straight Flight Auger & NX Coring		LOCATION: N 29 63962; W 98 39713							
DEPTH, FT	SYMBOL	DESCRIPTION OF MATERIAL	BLOWS PER FT	WATER CONTENT, %	SHEAR STRENGTH, TONS/FT <sup>2</sup>				
					0.5	1.0	1.5	2.0	2.5
					PLASTIC LIMIT	WATER CONTENT	LIQUID LIMIT		
					10	20	30	40	50
					60	70	80		
5		SURFACE ELEVATION: 944 ft CLAY, Gravelly, Tan, with calcareous deposits LIMESTONE, Tan - soft from 1 ft to 3 ft							
		REC = 83% RQD = 8% - hard from 3 ft to 25 ft							
10		REC = 85% RQD = 37% - with vertical fractures from 10 ft to 25 ft	154						200.00
15		REC = 97% RQD = 48%	158						243.00

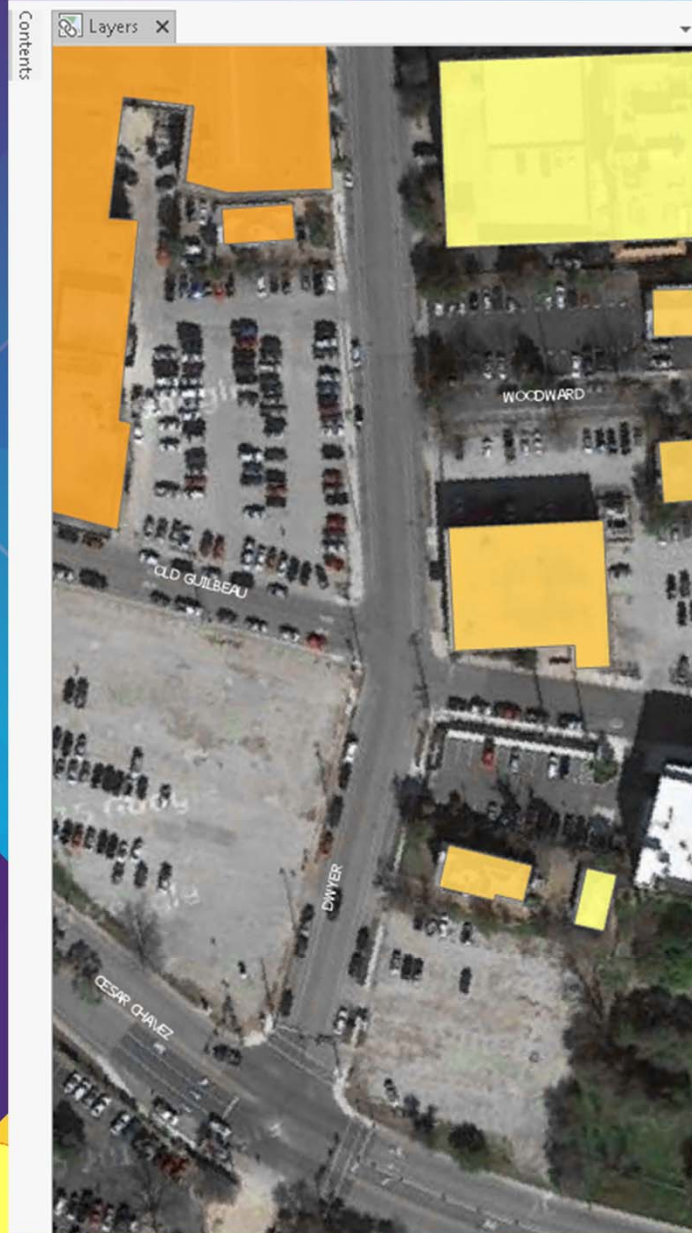
## Core Samples



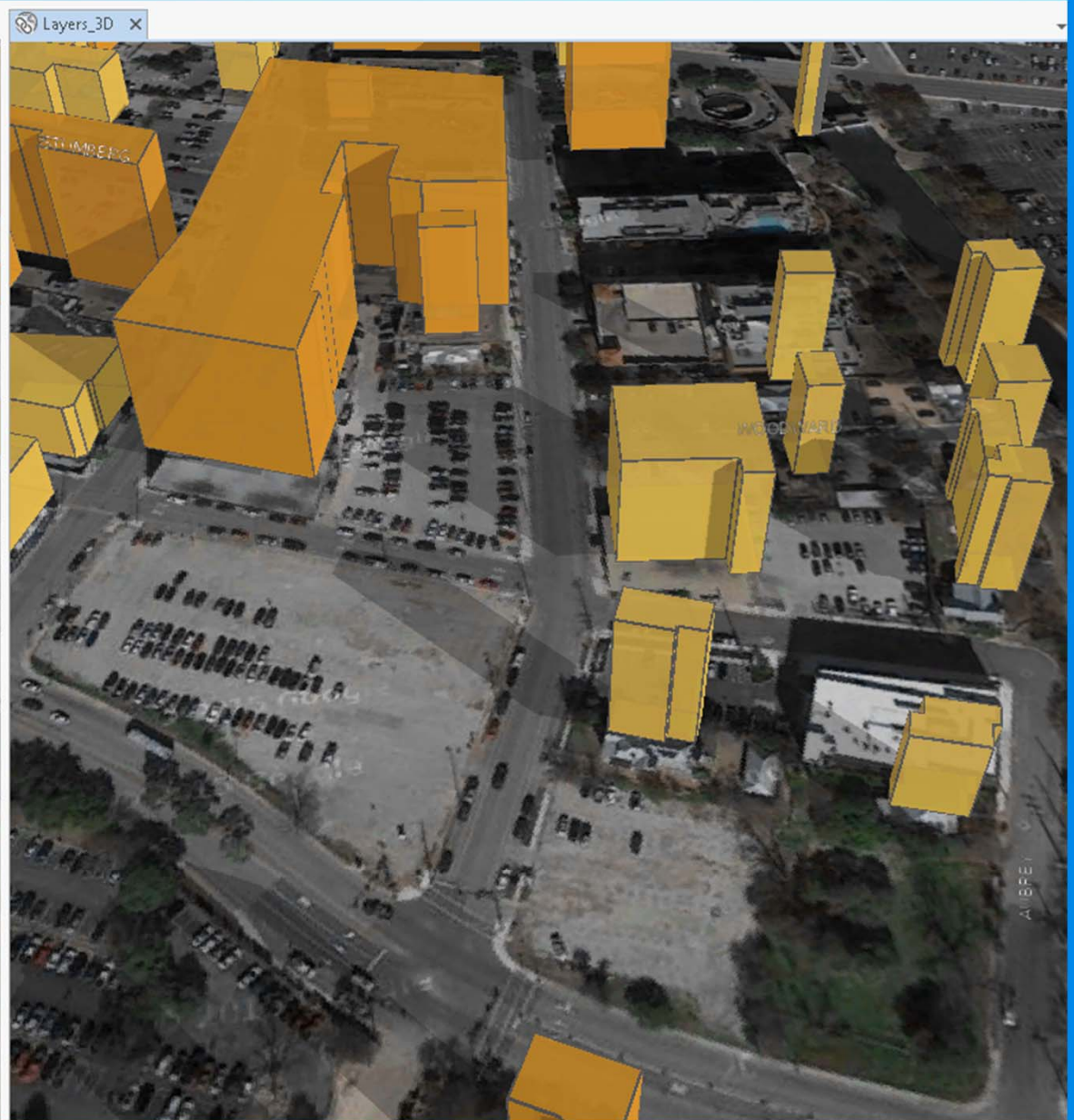
## Images



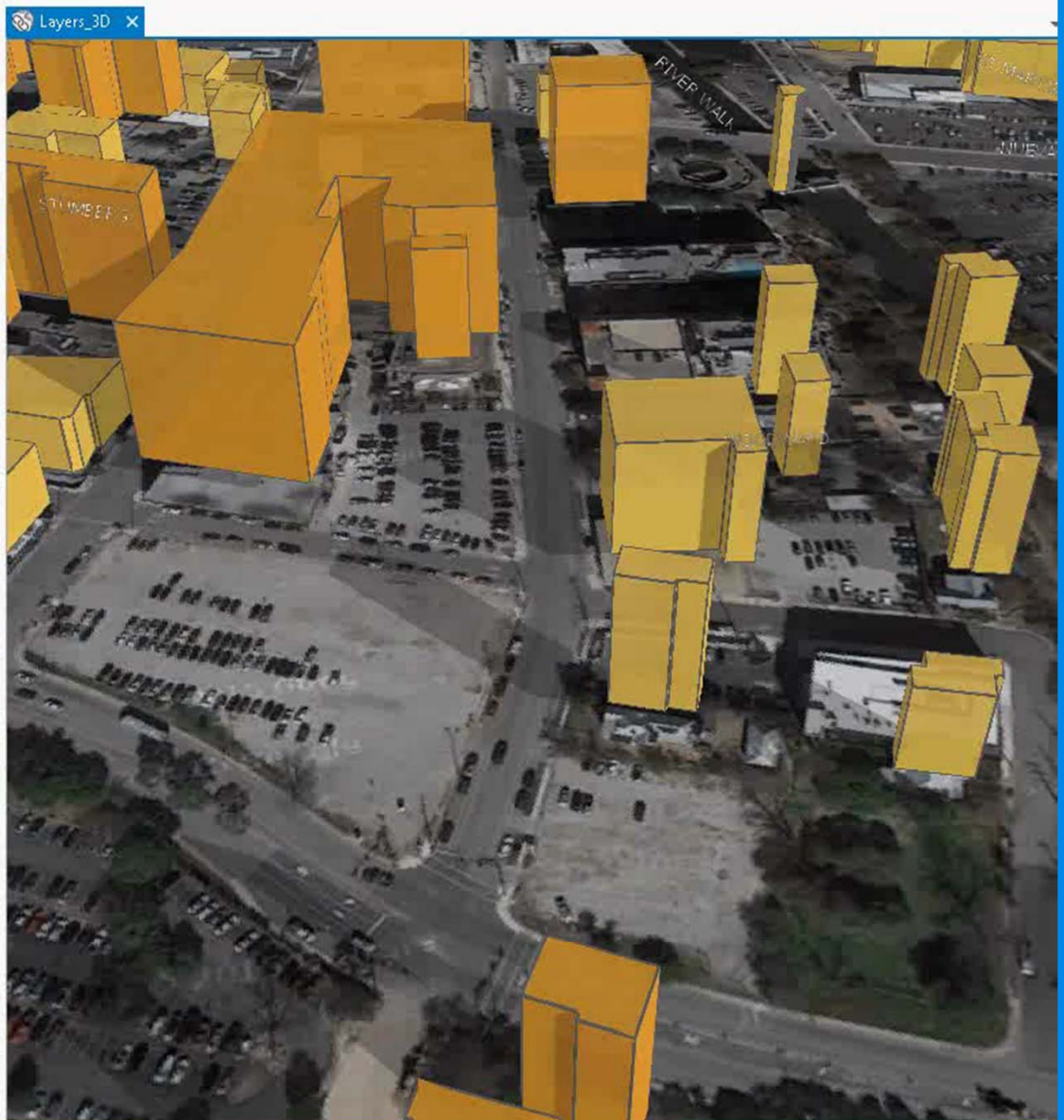
## 2-D



## 3-D





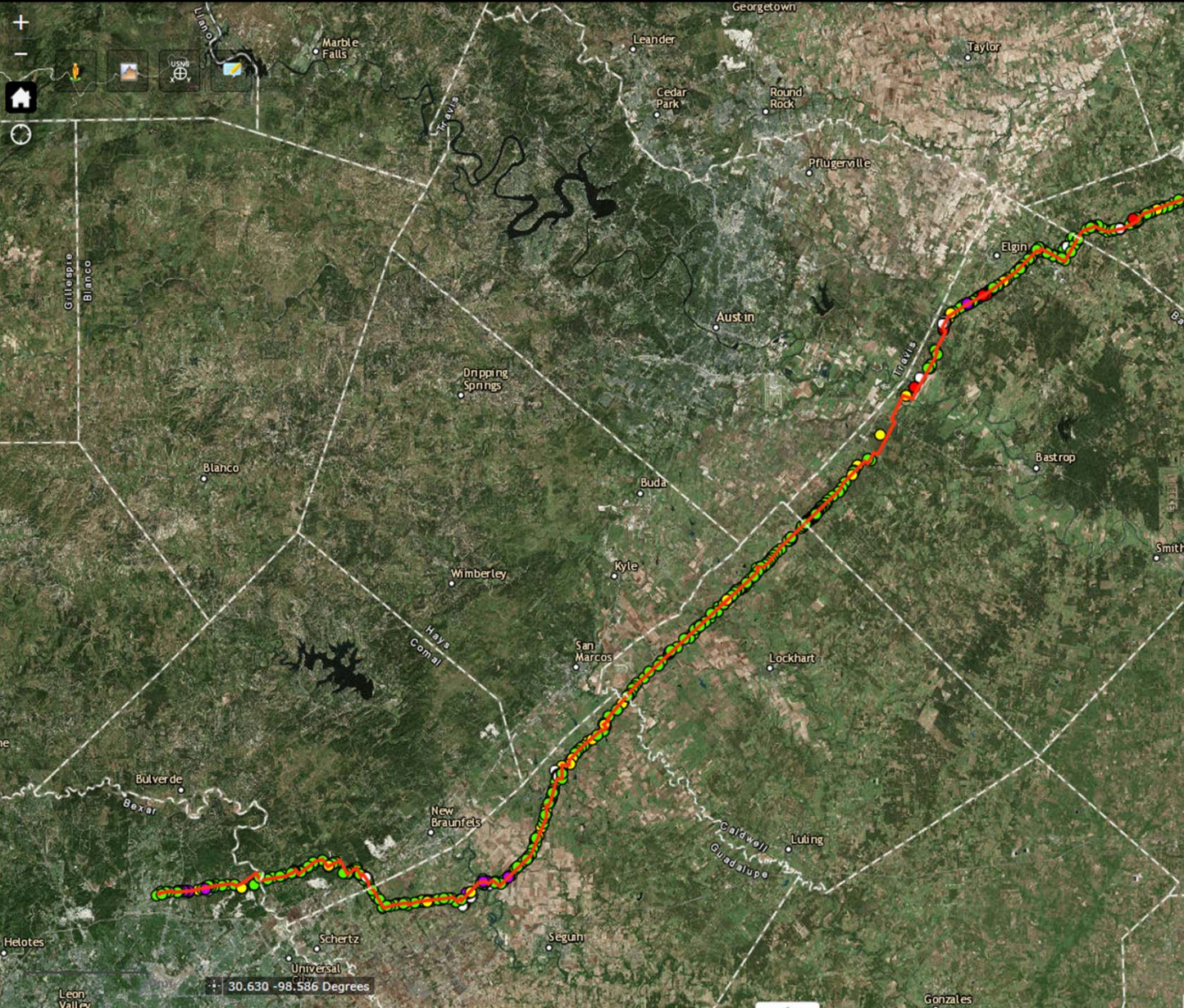






# Main Water Supply Line

Created by Pape-Dawson Engineers



## Legend

### Proposed Alignment

### ROE Tracking

- Not Needed
- No
- Yes
- Mailed
- Expired



# ArcGIS Online Groups

# ArcGIS Online Maps



Details

created by PD\_Admin on December 19, 2014



Details

Environmental  
Environmental Group  
created by PD\_Admin on March 25, 2015



Details

Landman  
Group  
created by PD\_Admin on March 25, 2015



Details

Survey  
Survey  
created by PD\_Admin on March 25, 2015



Details

created by PD\_Admin on April 29, 2015



My Content

papedawson.maps.arcgis.com/home/content.html

Home Gallery Map Scene Groups My Content My Organization

## My Content

+ Add Item Create Share Delete Move Change Owner

Folders

NEW DELETE

Title	Type
Test Web App Builder	Web Mapping Application
Vista Ridge	Web Map
Vista Ridge	Web Mapping Application
Vista Ridge Bexar Utilities	Web Map
Vista Ridge Environmental	Web Map
Vista Ridge Environmental	Web Mapping Application
VistaRidge Dashboard	Operation View
VistaRidge Survey Map	Web Map
VistaRidge Survey Map	Web Mapping Application
VistaRidge_Engineers	Web Mapping Application
VistaRidge_Engineers	Web Map
VistaRidge_Landman	Web Map
VistaRidge_Landman	Web Mapping Application
VistaRidge_Reports	Web Map
VistaRidge_SUE	Web Map
VistaRidge_SUE	Web Mapping Application
VR_GeoTech	Web Map
VR_GeoTech	Web Mapping Application
VRSP Consultants, LLC GeoForm	Web Mapping Application

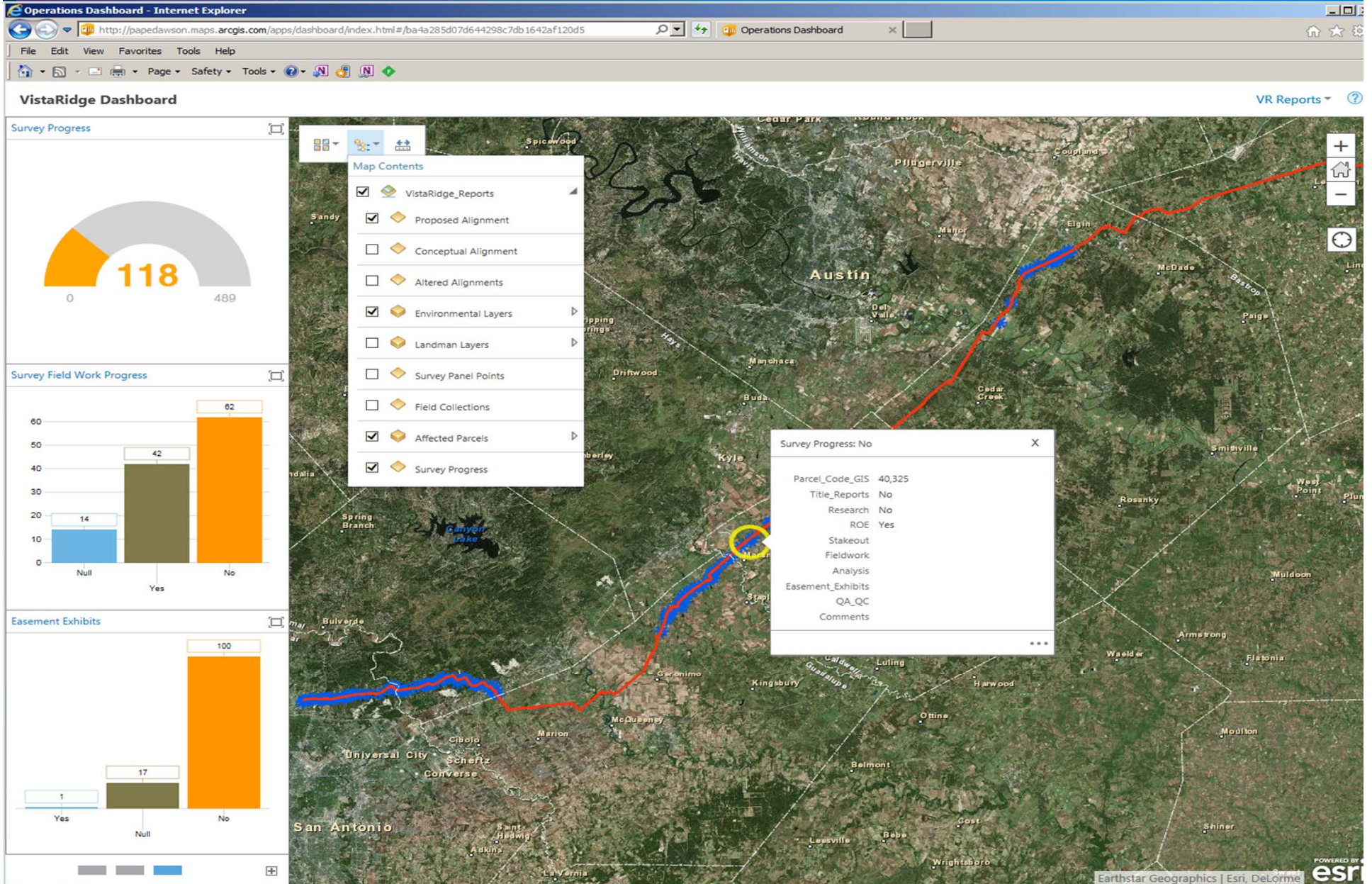
Show

All



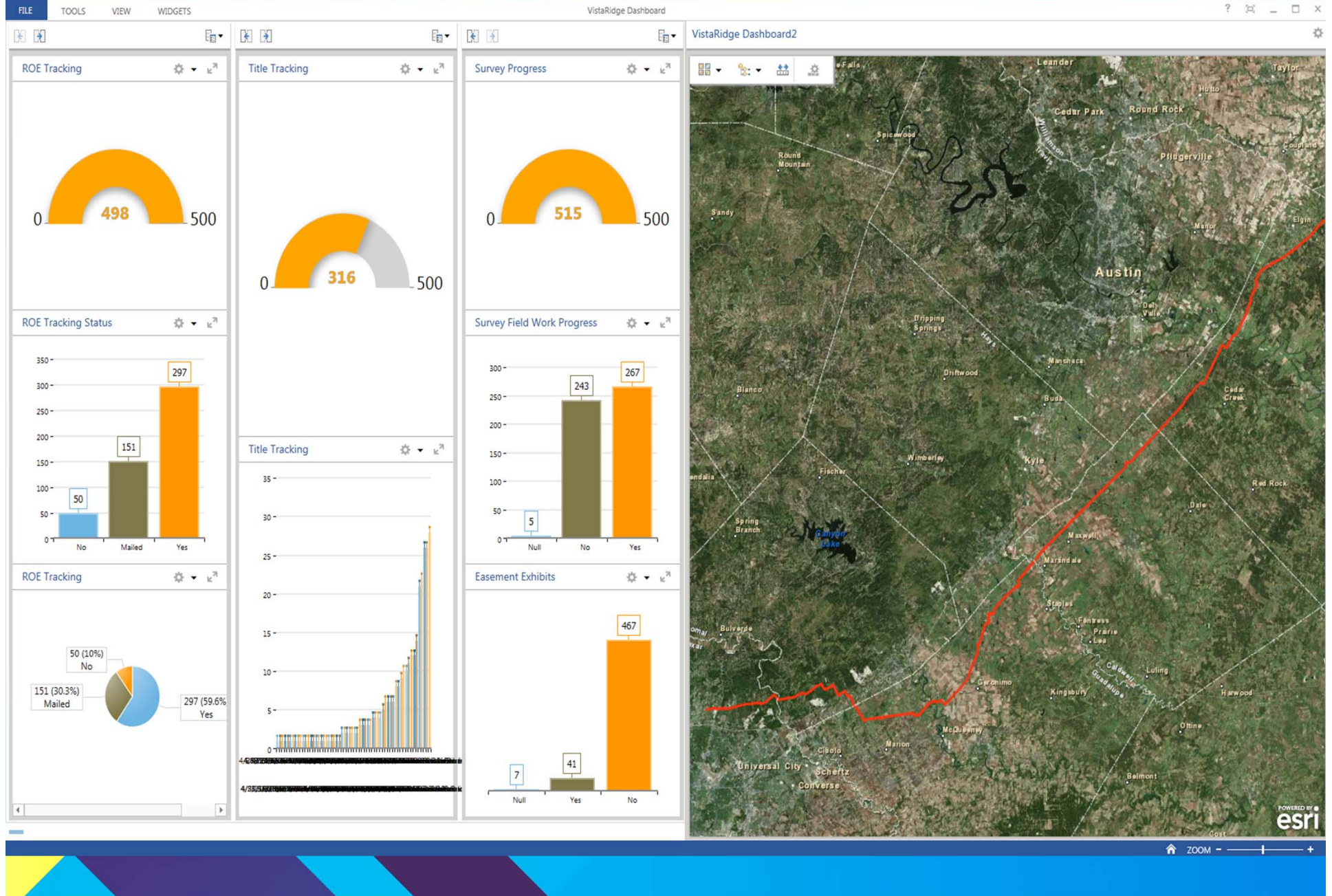


# Operations Dashboard

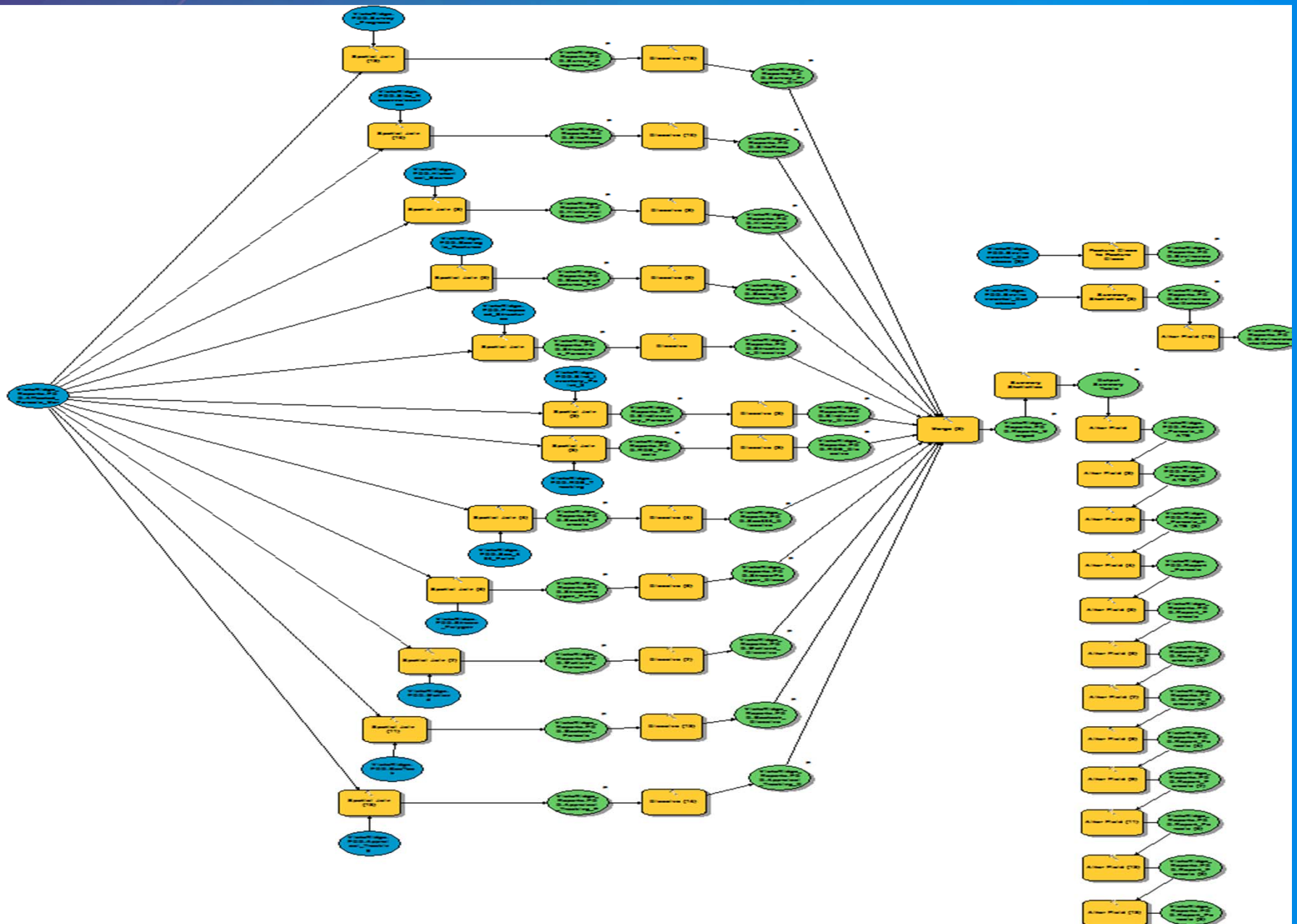




# Operations Dashboard

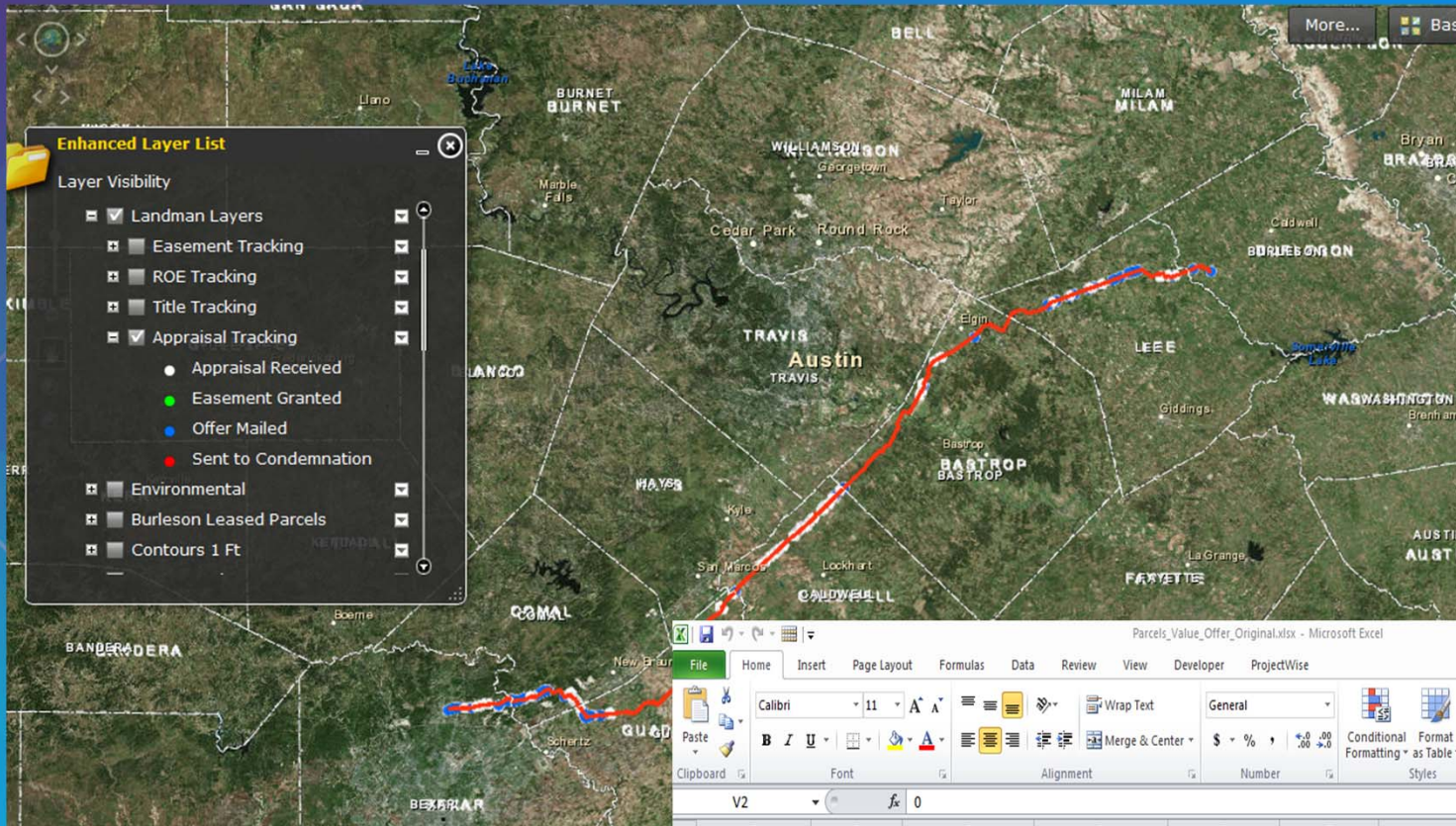


## The GIS Model That Tied it All Together for Reports





# Maps tied to Pivot Tables



Parcels\_Value\_Offer\_Original.xlsx - Microsoft Excel

	O	P	Q	R	S	T	U	V	W	X
						Estimated Cost				
1	Offer_Damages	Final_Value	Final_Perm_Value	Final_Temp_Value	Final_Damages	March	Appraised Cost	Offer Easement	Offer Damages	Total Offer
2						0	#DIV/0!	0	0	0
3						0	#DIV/0!	0	0	0
4						0	#DIV/0!	0	0	0
5						0	#DIV/0!	0	0	0
6						0	#DIV/0!	0	0	0
7						0	#DIV/0!	\$ -	\$ -	\$ -
8						0	#DIV/0!	0	0	0
9						0	#DIV/0!	0	0	0
10						0	#DIV/0!	0	0	0
11						0	#DIV/0!	0	0	0
12						0	#DIV/0!	0	0	0
13						0	#DIV/0!	0	0	0
14						0	#DIV/0!	0	0	0
15						0	#DIV/0!	0	0	0
16						0	#DIV/0!	0	0	0
17						0	#DIV/0!	0	0	0

# LESSONS LEARNED

Securing Rest  
Services &  
AGO Maps

Constant  
Schema  
Changes

Creating  
Multiple User  
Groups

Data Sync &  
Disconnected  
Editing



Username &  
Passwords for  
Each Group

Republishing  
Feature/Map  
Services

Created a  
Separate Web  
Page for Security

Having To  
Login Twice/  
Creating a Proxy

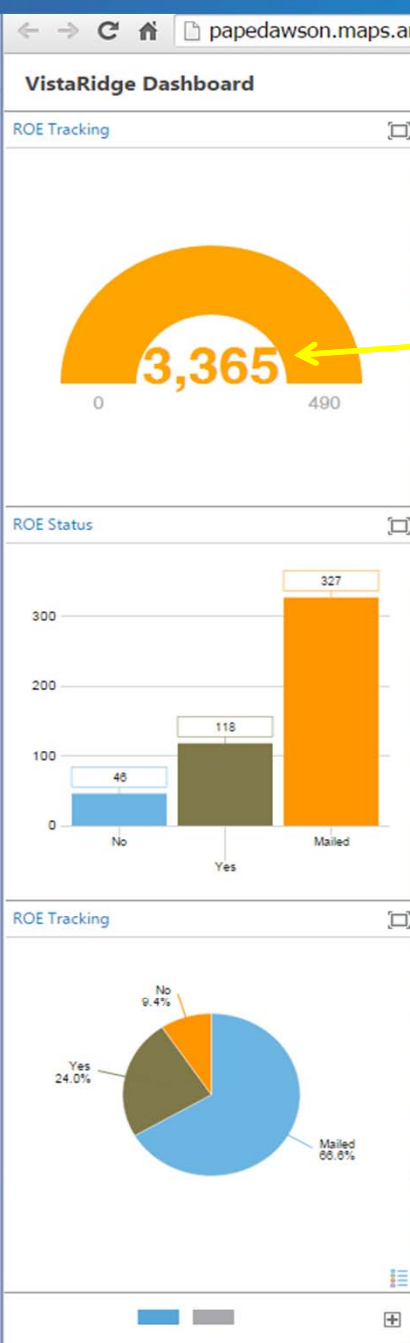
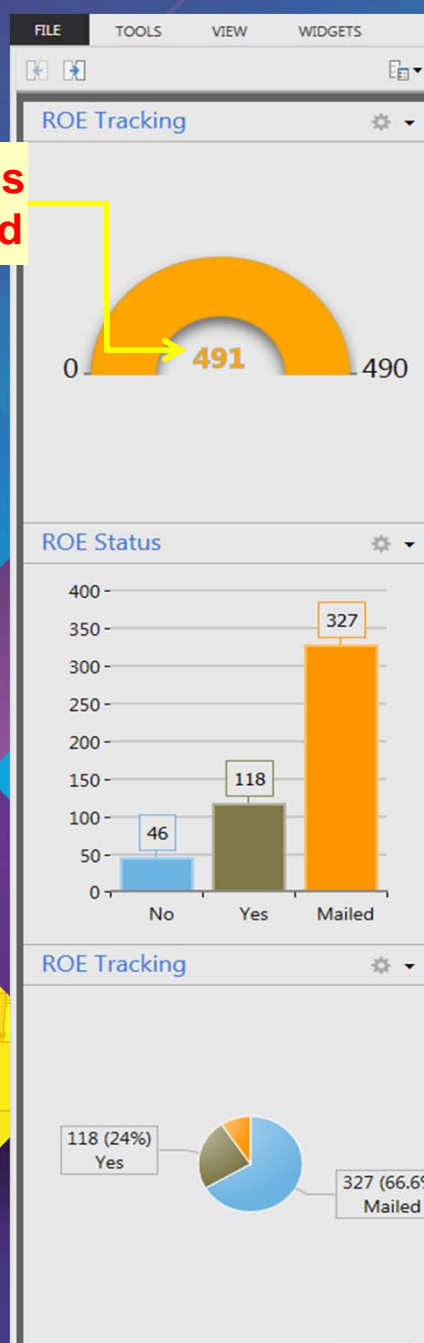




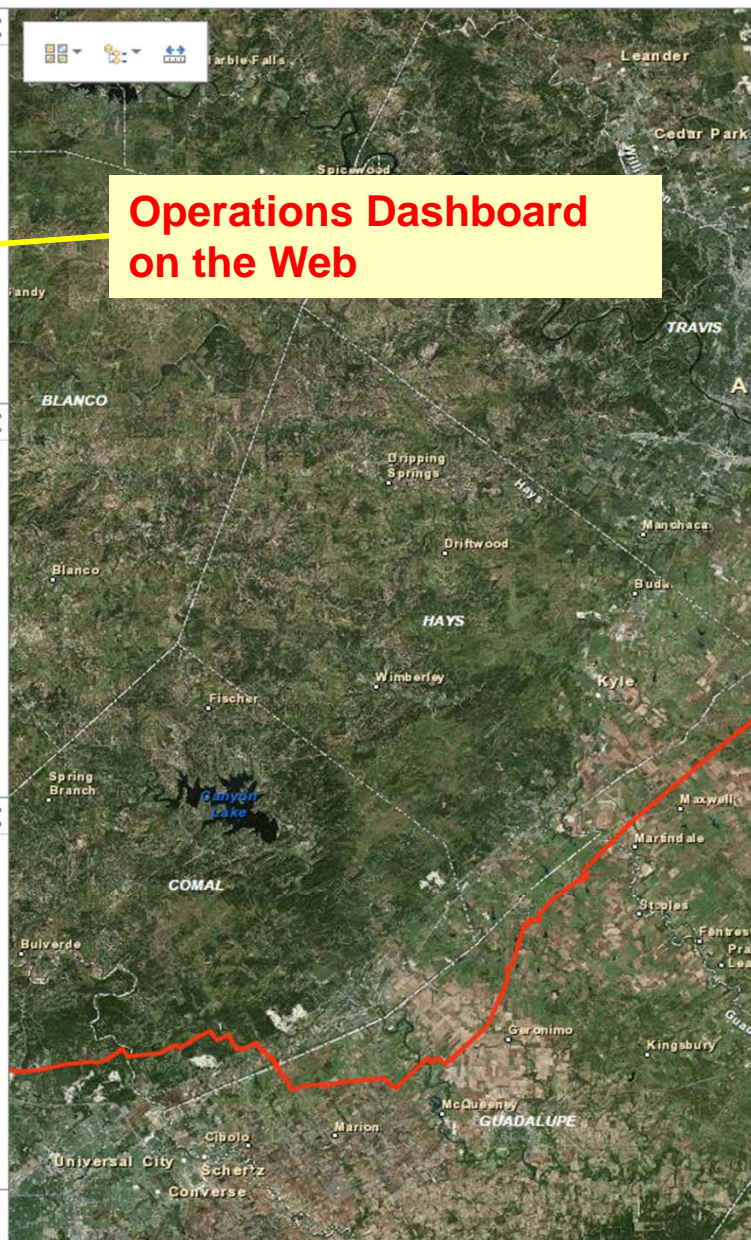
Understanding our world.

# Lessons Learned. You cannot track data that is intended for Disconnected editing.

Operations Dashboard



Operations Dashboard on the Web





# Server Manager Security Roles

**ArcGIS Server Manager** Services Site **Security**

Settings **Users** Roles

### Users in the Identity Store

A user is any person or software agent that will access an ArcGIS Server resource. When the built-in store is used to manage users, click the Add User button to add a user. To locate a specific user, enter the first few letters of the username in the Find User field.

Find User:

Username	Full name:	Email:
.Enviro		mgarza@pape-dawson.com
.GeoTech		mgarza@pape-dawson.com
.Landman		mgarza@pape-dawson.com
.PapeDawson		mgarza@pape-dawson.com
.Reports		mgarza@pape-dawson.com
.SUE		mgarza@pape-dawson.com
.Survey		mgarza@pape-dawson.com

◀ 1 2 ▶

# AGOL Secured Groups

**Project**  
owned by PD\_Admin on December 19, 2015  
[Details](#)

**Environmental**  
Environmental Group  
owned by PD\_Admin on March 25, 2015  
[Details](#)

**Landman**  
Landman Group  
owned by PD\_Admin on March 25, 2015  
[Details](#)

**SUE**  
owned by PD\_Admin on October 5, 2015  
[Details](#)

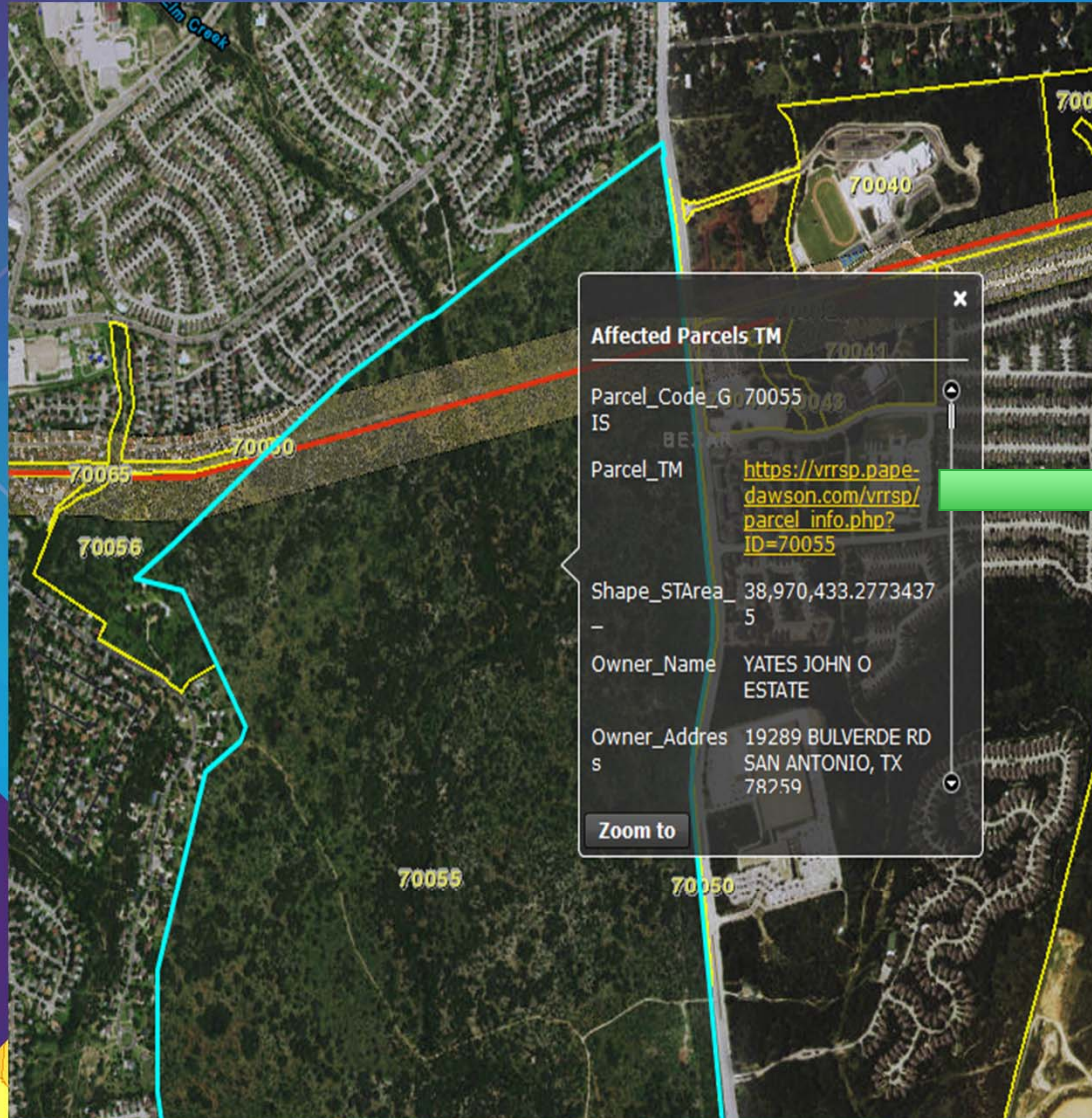
**Survey**  
Survey  
owned by PD\_Admin on March 25, 2015  
[Details](#)

**\_Engineers**  
Engineers Group  
owned by PD\_Admin on June 19, 2015  
[Details](#)

**\_GeoTech**  
Geotech group for  
owned by PD\_Admin on June 22, 2015  
[Details](#)

**\_Reports**  
owned by PD\_Admin on April 29, 2015  
[Details](#)





VRRSP Consultants, LLC  
Vista Ridge Regional Supply Project Parcel Crossing Information

You must log in to access the site.  
These are your specific log in credentials not the GIS log in.

Login:

Password:





# GIS

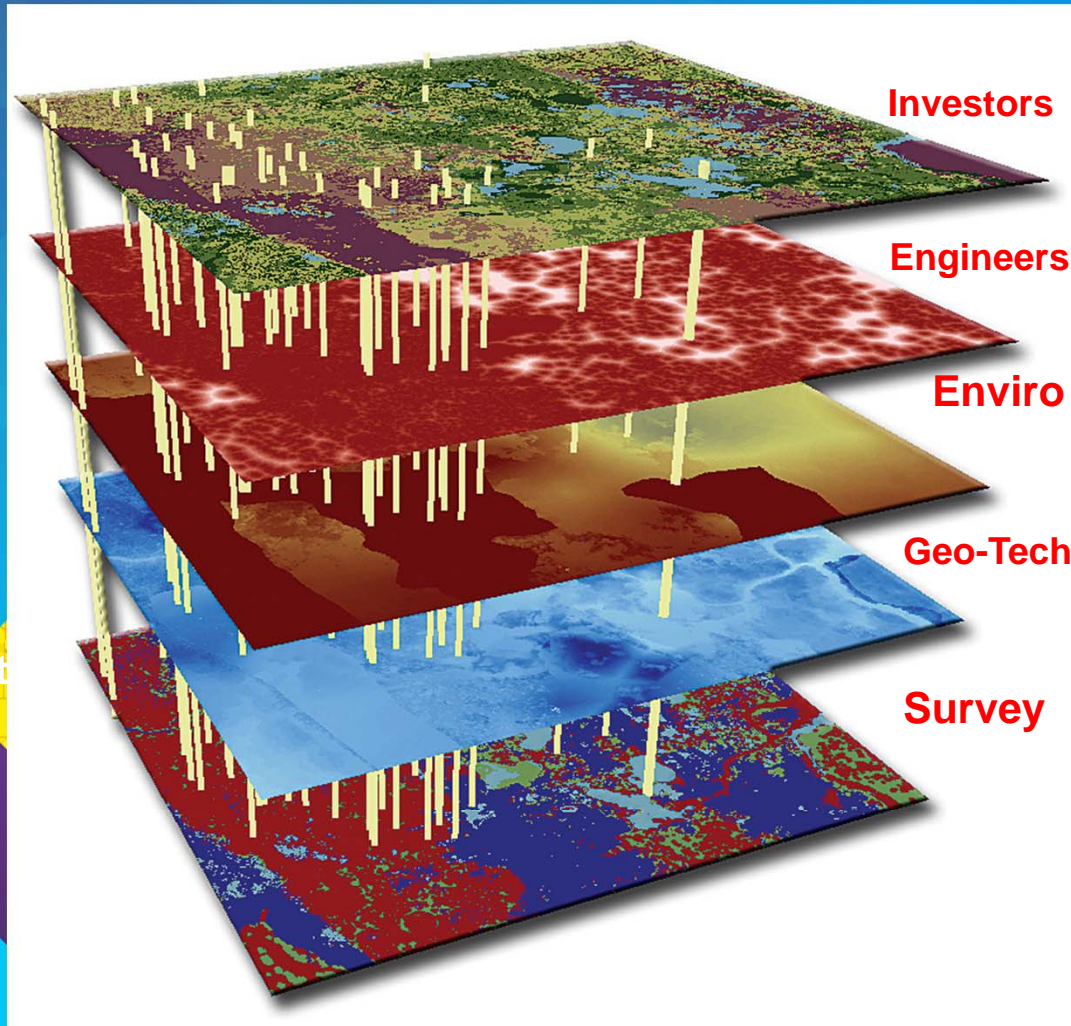
Investors



Landman



Environmentalist



Engineers



Geo-Technical



Surveyors

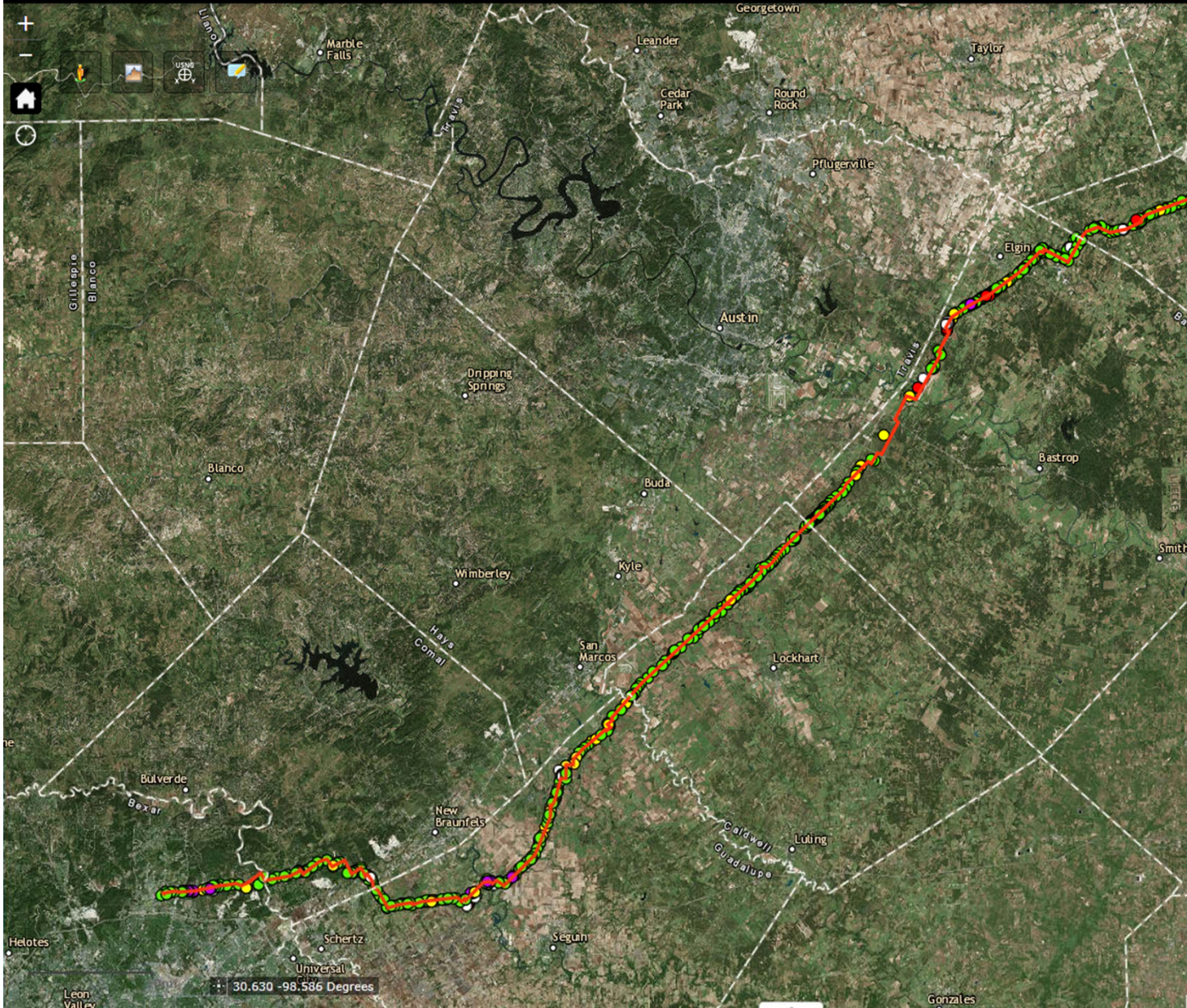




# WebApp Developer

Main Water Supply Line

Created by Pape-Dawson Engineers



## Legend

### Proposed Alignment

### ROE Tracking

- Not Needed
- No
- Yes
- Mailed
- Expired







<https://gis.pape-dawson.com/watermain/>

[http://gis.pape-dawson.com/VR\\_Reports](http://gis.pape-dawson.com/VR_Reports)





## *The Players that are involved in this Project*

- Financial Investors
- Engineers
- Environmentalist
- Land Acquisition Group (ROE's, Appraisals, Easements, & Title Tracking)
- Geo Technical Engineers
- Surveyors