

AGENDA FOR THE KERRVILLE CITY COUNCIL WORKSESSION

TUESDAY, AUGUST 13, 2019, 5:15 P.M.

KERRVILLE CITY HALL, UPSTAIRS CONFERENCE ROOM

701 MAIN STREET, KERRVILLE, TEXAS



KERRVILLE CITY COUNCIL AGENDA
WORKSESSION, AUGUST 13, 2019, 5:15 PM
CITY HALL UPSTAIRS CONFERENCE ROOM
701 MAIN STREET, KERRVILLE, TEXAS



ROLL CALL

1. INFORMATION AND DISCUSSION

- 1.A Kerr Basin Paleozoic Groundwater Definition Project: Headwaters Conservation District Exploration Activity

Attachment:

[20190813_Report_Kerr Basin Paleozoic Groundwater Definition Project.pdf](#)

ADJOURNMENT





**TO BE CONSIDERED BY THE CITY COUNCIL
CITY OF KERRVILLE, TEXAS**

SUBJECT: Kerr Basin Paleozoic Groundwater Definition Project: Headwaters Conservation District Exploration Activity

AGENDA DATE OF: August 13, 2019 **DATE SUBMITTED:** Aug 06, 2019

SUBMITTED BY: Stuart Barron

EXHIBITS: [20190813_Report_Kerr Basin Paleozoic Groundwater Definition Project.pdf](#)

Expenditure Required:	Remaining Budget Balance in Account:	Amount Budgeted:	Account Number:
N/A	N/A	N/A	N/A

PAYMENT TO BE MADE TO: N/A

Kerrville 2050 Item?	Yes
Key Priority Area	W - Water / Waste-Water / Drainage
Guiding Principle	W2. In the development of the long-range water plan, anticipate growth, consider all sources and plan for future droughts
Action Item	W2.1 - Evaluate the possible installation of more aquifer storage and recovery (ASR) wells and try to capture river water that is being lost downstream

SUMMARY STATEMENT:

RECOMMENDED ACTION:

No action.

KERR BASIN PALEOZOIC GROUNDWATER DEFINITION PROJECT

PRIMARY TARGETS ARE THE ELLENBURGER GROUP OF ORDOVICIAN AGE AND
THE WILBERNS AND RILEY FORMATIONS OF CAMBRIAN AGE

DEFINE AREAS FOR PRODUCIBLE FRESHWATER

MAINTAIN RECOVERABLE FRESHWATER VOLUME PROBABILITY
CURVES FOR TARGET RESERVOIRS

DEFINE WATER STORAGE POTENTIAL

SECONDARY TARGET IS BRACKISH WATER FOR FUTURE DESALINATION PROJECTS FROM THE CANYON
AND BEND GROUP OF PENNSYLVANIA AGE, PLUS MORGAN CREEK UNIT OF CAMBRIAN AGE

JULY 29, 2019



HEADWATERS GROUNDWATER
CONSERVATION DISTRICT
125 Lehmann Drive, Ste 202 • Kerrville, Texas 78028

July 29, 2019

Kerr Basin Paleozoic Groundwater Project

Kerr Basin Paleozoic Groundwater Exploration Team

Digger Grey
Robbie Hurt
Bobbie Joines
Ed Warren
Bryant Williams
Geologist- Technical Advisor- William Feathergail Wilson PG 21
Gillespie County interpretation after Paul Tybor

Project Goal:

Define areas for producible freshwater, water storage, and brackish water for future desalination projects in the Paleozoic section of the Kerr Basin. Primary targets are the Ellenburger Group of Ordovician age, the Wilberns and Riley Formations of Cambrian age, and the Canyon and Bend Group of Pennsylvanian age.

Data Base:

- Kerr Basin Residual Gravity Map
- Approximately 97 miles of Petroleum Industry Seismic Coverage
- 280 Oil and Gas Tests
- 95 water wells that reached the Paleozoic
- Llano Uplift Aquifers Report by Daniel B. Stephens and Associates
- Previous Workers:
 - Dan Brennan, Feathergail Wilson, Gillespie County interpretation after Paul Tybor.

General Process:

Secure all available well logs and test data on all Oil and Gas tests and water wells that reached Paleozoic formations in the basin.

Review available Geophysical data and acquire where possible.

Review reports of previous workers and integrate concepts (D. Brennan, F. Wilson, Paul Tybor, and Daniel B. Stephens & Assoc).

Porosity Calculations and summation of porosity greater than 8% on all available well logs.

Construct and maintain structural and stratigraphic cross-section grid with well data to formulate structural fabric interpretation.

Construct Base of Cretaceous Structure map (sub crop Pennsylvanian and Ellenburger) integrating the cross-section grid, available seismic data to test structural fabric interpretation. (12-16) (update with new data).

Interval isopach the Upper Paleozoic section to confirm basin configuration and to highlight Potential Target Areas for Project Goals.

Structure map first Ellenburger 1"= 8,000' (500 million year unconformity) .

Construct 1"= 2000' data package (maps, cross-sections, and recoverable volumes of freshwater) for the City of Kerrville with six recommended drill sites.

Structure map on Riley formation 1"= 8,000' to assist in middle Cambrian brackish water volumes.

Data Map for Porosity thickness greater than 8% in primary reservoirs based on B. Joines formation Evaluation. (Pending).

Construct recoverable fresh water volume probability curves for east Kerr County drainage area. (Update and expand as needed).

Construct recoverable fresh water volume probability curves for west Kerr County drainage area.

Recommend well test program to confirm project team interpretation. HGCD MW #17 was drilled and tested as the first successful fresh water well from the Ordovician and Cambrian sections in Kerr County.

Evaluate structural interpretation for MW# 18 which established down dip limits for Cambro/Ordovician fresh water reservoirs.

Expose recoverable fresh water potential to those parties that could initiate the control of Paleozoic ground water rights for the City of Kerrville in the prospective areas. **(Very High Priority)**.

Volumetric probability interpretation for Upper Paleozoic and Middle Cambrian brackish water reservoirs using well data and regional interval isopaches.

Recommend areas for fresh water production, storage, and desalination projects in the Kerr Basin. (Ellenburger Group of Ordovician age, Moore Hollow Group of Cambrian age, and Canyon and Bend groups of Pennsylvanian age.

Plan program, maintain interpretations, draft conclusions of the "Project" and recommendations for future efforts.

7-29-19

Primarily Cretaceous Carbonates
Cretaceous Paluxy Formation
Cretaceous Hensell Sand
Cretaceous Cow Creek Limestone
Cretaceous Sycamore Formation

Pennsylvanian Smithwick Shale
Pennsylvanian Marble Falls Fm.
Mississippian - Devonian -
not present everywhere

Ordovician Ellenburger Group

Cambrian San Saba Member

Cambrian Point Peak Member

Cambrian Morgan Creek Member

Cambrian Cap Mountain Member

Cambrian Hickory Member

Combined Precambrian

Stratigraphic Column

Era	Period	Group	Formation/Unit	Description	
Mesozoic	Cretaceous	Fredericksburg	Edwards	Karstified limestone	
		Trinity	Hensell	Silt to pebble-sized sediments derived from Paleozoic rocks	
	Paleozoic	Pennsylvanian	Canyon	Undivided	Limestone, sandstone, shale alternating
Bend			Smithwick	Sandstone, claystone, siltstone	
			Marble Falls Limestone	Limestone with spiculite, oolites	
		Honeycut			
Ordovician		Ellenburger	Gorman	Alternating limestone and dolostone; highly karstified	
			Tanyard		
			San Saba	Dolomite, limestone; moderately glauconitic	
Cambrian		Moore Hollow	Wilberts	Point Peak	Siltstone with stromatolitic bioherms
				Morgan Creek	Limestone; glauconitic; trilobites common
				Welge Sandstone	Non-glauconitic sandstone grades up to Morgan Creek
	Lion Mountain			Quartzose green sand; highly glauconitic	
	Cap Mountain		Limestone; sparingly glauconitic		
	Hickory Sandstone		Red sandstone, eolian and fluvial. Contains Precambrian sediments.		
				Pink coarse-grained and aplite granite; Quartzofeldspathic gneisses	
Proterozoic	Precambrian				

Present Production

Not Present

Objective Section

Aquifer

- Strong Geophysical log correlation surface
- Geophysical log correlation surface

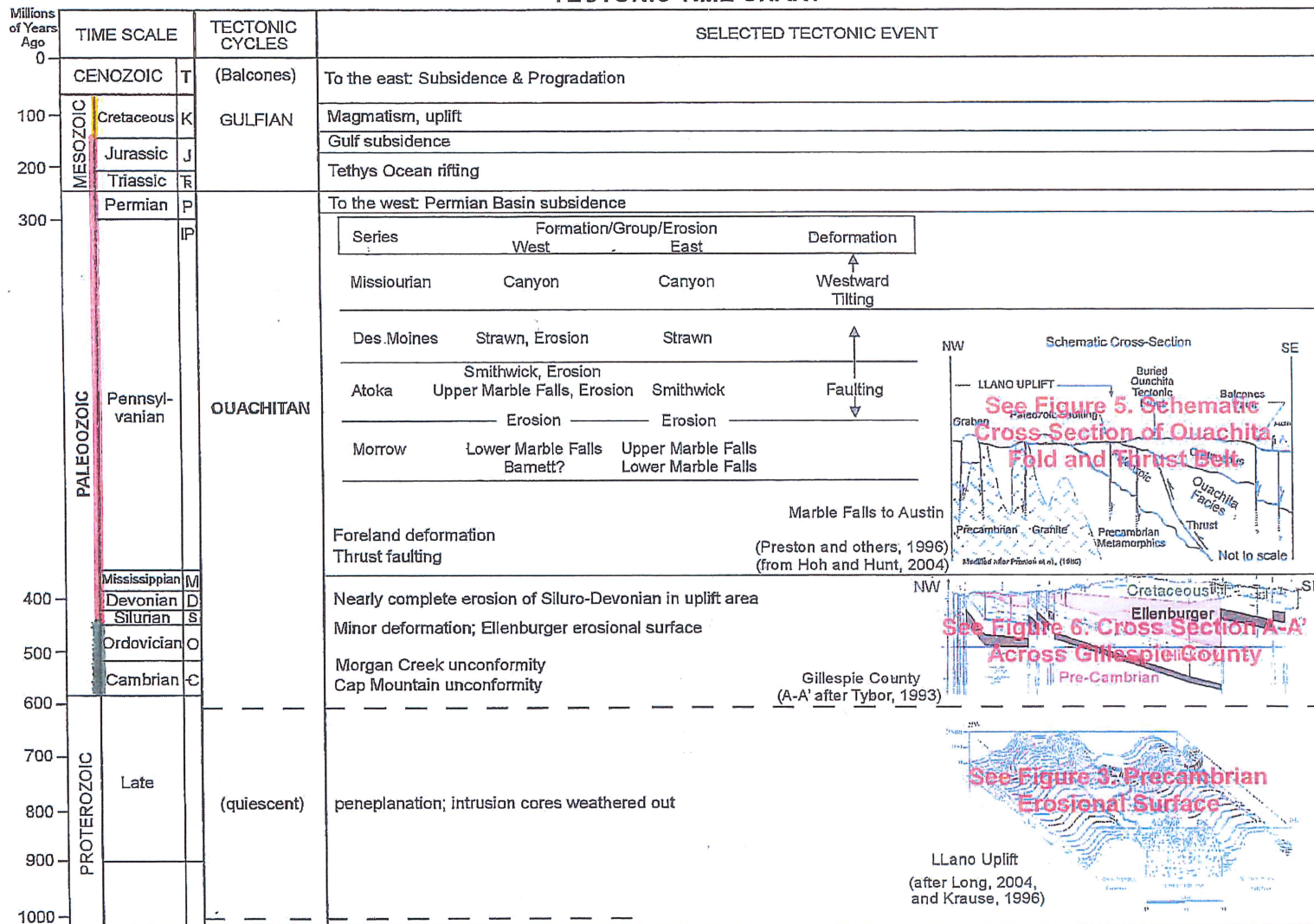
Source: Modified after Preston and others, 1996
Modified from Hoh and Hunt, 2004



Daniel B. Stephens & Associates, Inc.

10-31-07

TECTONIC TIME CHART



Source: From Ewing, 2004

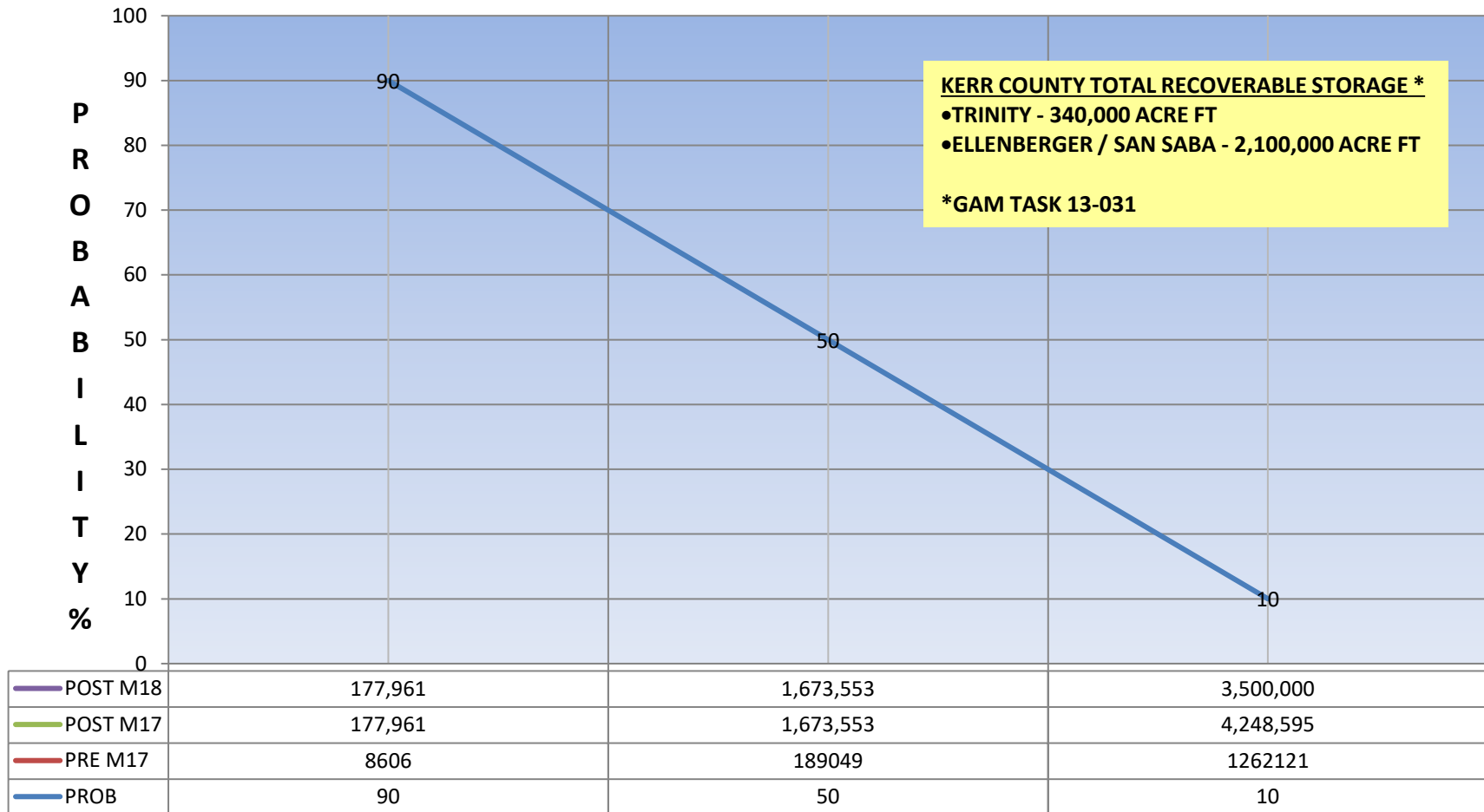
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10-31-07

LLANO UPLIFT AQUIFERS
Tectonic Time Chart

Figure 4

PROBABLE FRESH WATER RECOVERY, EAST KERR COUNTY (ELLENBURGER & MOORE HOLLOW GROUPS)



**ACRE-FEET POTENTIAL RECOVERY
(JULY 29, 2019)**