Presentation By Shannon Terry & Dr. Larry Lehr Coryell Hydropower, Inc.



Geothermal Opportunity



Introduction:

High enthalpy geothermal resources of the world are within the seismic belts associated with ones of crustal weakness such is plate margins and centers of olcanic activity.







Tectonic Setting: FMI log cont.



14000'-15350'

These are the strike trends of the conductive (red diamonds, at least partly open) and resistive (yellow diamonds, healed) between 14000'-15350'. Strikes are N20E-S20W, N75E-S75W. A second set strikesN35W-S35E.



Introduction: Ouachita Overthrust

Ouachita Overthrust: Old zone of crustal weakness: plate margin





Tectonic Setting: FMI log



Shown are two fold axes and a cluster of microfaults (or shear fractures.)

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Forward Plans: Does Barnhill Qualify?

1. Tectonic Seating: Ouachita Overthrust is Old zone of crustal weakness, i.e. plate margin.

2. Temperature: 305deg F, the minimum requirement is >100 deg F (GPGT reservoir brines temperature) range: 250-500deg F, Temperature gradient are 25-30 degrees C)

3. Pressure: 5,734 psi, it is a highly over-pressured reservoir, (GPGT reservoir brines pressure range: 1,000-4,000 PSI)

4. Flow Rate: data not available. (GPGT reservoir brines flow range: 15,000-40,000 BWPD). Flow test needed in the open borehole to establish accurate flow. Special Note: Possible brine extraction from **Upper Ellenberger for Binary Loop.**

CC: Barnhill #1 well needs to be tested for 2 reasons:

- a. For hydrocarbons production;
- **b.** To be qualified for as Geothermal resource.
- c. Studies to be carried out in 4 phases before surface facilities construction.









Phase	2Q2025	3Q2025	4Q2025	1Q2026	2Q2026	3Q2026	4Q2026	1Q2027	2Q2027	3Q2027	4Q2027
Feasibility & Environmental											
Drilling & Recompletion											
Surface Facilities Construction											
Plant Commissioning											
Commercial Operations Start											



Coryell HyrdroPower Energy Station Number 1





PHASE 1: Water Composition of Barnhill #1

Parameter	Parameter	Measurement (mg/l)	Anions	
Cationa			Alkalinity	HC
Callons			Borate	B(C
Barium	Ba²⁺	1.7	Bromide	Br⁻
Cadmium	Cd ²⁺	<0.006	Carbonate	CO
Calcium	Ca ²⁺	18200	Chloride	Cl⁻
Chromium	Cr ³⁺	<0.007	Fluoride	F^-
Cobalt	Co ²⁺	<0.01	lodide	-
Copper	Cu ²⁺	1.7	Nitrate	NO
Iron (dissolved)	Fe ²⁺	<0.01	Nitrite	NO
Iron (Total)	Fe ²⁺	44	Phosphate	PO
Lead	Pb²⁺	<2.2	Sulfate	SO
Litium	Li⁺	20	Sulfide	S ²⁻
Magnesium	Mg ²⁺	1790		
Manganese	Mn ²⁺	19	Total Cation Meg's	
Molybdenum	Mo6⁺	<0.044	Total Anion Meg's	
Nickel	Ni ²⁺	<0.02	TDS	
Phosphorus	P3+	<0.17	lon Balance	
Potassium	K⁺	2450		
Silicon	Si+6	11	pН	
Sodium	Na⁺	46260	Resistivity	
Strontium	Sr ²⁺	655	(OM)@77deF	
Vanadium	V ²⁺	<0.01	Conductivity mS/cm	
Zinc	Zn ²⁺	18	Specific Gravity	
QA/QC Run ID's			50/60deF	
ICP		09012011 1 to 4	Stability Index @	
ICP - Anions		February 2011 #672	100degF	
ICP - Organic Acids		N/A	Stability Index @	
Titration Bicarbonate			200degF	
& Chloride		9/1/2011	% Deviation in Mag.	
			Bal.	

% Deviation in TDS

O_{3}^{-}	220
DH)-4	27
	700
) ₃ ²⁻	0
	113350
	<25
	<50
) ₃ ²⁻	<25
)2⁻	<25
)4 ³⁻	<25
)4 ²⁻	665
-	0
	3153
	3224
	184432
	0.011
	6.54
	0.05
	201000
	1.125
	0.36
	0.61
	1.12
	0.39



Comparative Analysis of Barnhill Water with Standar

Water Quality Standards are federal standards related to specific chemicals (b

A mg/l is a part per thousand or ppt; a µg/l is a part per billion or ppb.

indicates not detected or not anal above standard

Physical Characteristics	Standard	Barnhill
specific gravity		1.126
conductivity (microSiemens/cm)		201,000
pH	6.5-8.5	7
Primary Standards Analtyes		mg/l
Antimony (µg/l)	6	
Arsenic (µg/l)	10	
Barium (mg/l)	2	1.7
Beryllium (µg/l)	4	
Cadmium (µg/l)	5	<0.006
Chromium (µg/l)	100	<0.007
Coliform bacteria	0	
Fluoride (mg/l)	4	<25
Gross Alpha radiation (pCi/l)	15	
Mercury (µg/l)	2	
Nitrate (mg/l)	10	<25
Nitrite (mg/l)	1	<25
Radium (pCi/l)	5	
Selenium (µg/l)	50	
Thallium (µg/l)	2	
Uranium (µg/l)	30	
Secondary Standards Analytes		
Aluminum (µg/l)	50-200	
Chloride (mg/l)	300	113,350
Copper (mg/l)	1	2
Fluoride (mg/l)	2	
Iron (µg/l)	300	<0.01
Manganese (µg/l)	50	19
Silver (µg/l)	100	
Sulfate (mg/l)	300	665
Total dissolved Solids (TDS)	1000	184,432
Zinc (mg/l)	5	15

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Parameter	Expected Range	T
Total Dissolved Solids (TDS)	500 - 3,000 mg/L (183,637 mg/l)	R
Hardness (Ca²*, Mg²*)	100 - 500 mg/L(18,200 mg/l/1,790 mg/l)	S
Iron (Fe²+, Fe²+)	0.1 - 5 mg/L (,0.01 mg/l)	0
Sulfate (SO₄°⁻)	50 - 500 mg/L <mark>(665 mg/l)</mark>	A
Fluoride (F ⁻)	0.1 - 4 mg/L	R
pH	6.0 - 7.5 (6.54)	p
Bacteria (Coliform, SRB)	Possible	D
Nitrate (NO ₃ -)	1 - 10 mg/L	R
Natural Gas (CH4, Methane)	Seen on the Log data	

- reatment Required?
- everse osmosis (if >1,000 mg/L)
- oftening needed if >250 mg/L
-)xidation/filtration required if >0.3 mg/L
- cceptable unless >250 mg/L
- lemove if >2 mg/L
- H adjustment if < 8.5
- isinfection required
- lemove if >10 mg/L



Summary of Corvell Hydropower Inc. Project Near Gatesville, Texas

Summary

Shannon Terry drilled a 16,500 ft. shaft into the Quachita Overthrust Formation (QF) in Coryell County, circa 2009. The well is referred to as the "Barnhill 1". It has a bore diameter of 7.25 inches and is characterized by 1,350 feet of fracture zone at circa 12,500 feet. Water temperature was recorded at a nominal 350 ° F.

The purpose for drilling the well was to use the heated water, augmented by solar assisted technology and multi-stage compressors, for production of electricity. Because of continual water flow originating well below existing aquifers, (notably the Middle Trinity Formation) the well also represents a new production water source that can be utilized for agricultural, commercial, and residential needs. The fracture system allows continual recharge of the bore. Well logs are available that characterize the bore, depth, temperature, and fracture system. Technologies to recover/ameliorate impurities are currently being evaluated.

The well was capped circa 2016 to facilitate the development of other projects by Mr. Terry. Recent interest in water resources, energy sources, and economic development in the I-35 corridor has stimulated re-investigation of the well as a water and energy resource.

The water source is believed to be distributed along the entire edge of the Quachita Overthrust Formation. Efforts to quantify flow, pressure, and water quality are currently underway.

Goals

The goal of the project is to:

- 1) produce 4 B gallons of water/year that is compliant with existing surface water quality standards,
- 2) generate 25 MW of electricity / year.

Comparative Analysis of Barnhill Water with Standards and Local Water Sources

Water Quality Standards are federal standards related to specific chemicals (both organic and inorganic).

A mg/l is a part per thousand or ppt; a μ g/l is a part per billion or ppb.

Contraction of the second s

indicates not detected or not analyzed

above standard

Physical Characteristics	Standard	Barnhill	Well in Coryell Cty. (Footnote	Lake Beiton
specific gravity		1.126		surface water
conductivity (microSiemens/cm)		201,000		
pH	6.5-8.5	7		7.6
Primary Standards Analtyes		mg/l	mg/l	mg/l
Antimony (µg/l)	6			
Arsenic (µg/l)	10			
Barium (mg/l)	2	1.7	0.0638	
Beryllium (µg/l)	4			
Cadmium (µg/l)	5	<0.006		
Chromium (µg/l)	100	<0.007		
Coliform bacteria	0		1	
Fluoride (mg/l)	4	<25	0.2	0.3
Gross Alpha radiation (pCi/l)	15		5.52	
Mercury (µg/l)	2			
Nitrate (mg/l)	10	<25	0.43	0.045
Nitrite (mg/l)	1	<25		
Radium (pCi/l)	5			
Selenium (µg/l)	50			
Thallium (µg/l)	2			
Uranium (µg/l)	30			

Secondary Standards Analytes				
Aluminum (µg/l)	50-200			
Chloride (mg/l)	300	113,350		41
Copper (mg/l)	1	2	1.3	
Fluoride (mg/l)	2			0.3
Iron (µg/l)	300	<0.01		70
Manganese (µg/l)	50	19		40
Silver (µg/l)	100			
Sulfate (mg/l)	300	665		221
Total dissolved Solids (TDS)	1000	184,432		375
Zinc (mg/l)	5	15		

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Water Quality Standards are federal standards related to specific chemicals (both organic and inorganic). I am assuming that we won't have pesticides).

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Below is a chart showing the comparison between the primary and secondary standards, our water quality, data from the municipal well in Coryell County, and La Below is a chart showing the comparison between the primary and secondary standards, our water quality, data from the municipal well in Coryell County, and Lake Belton. A mg/l is a part per million or ppm; a μ g/l is a part per billion or ppb.

indicates not tested

above standard

Physical Characteristics	Standard	Barnhill	Well in Coryell Cty. (Footnote 1)	Lake Belton
specific gravity		1.126		surface water
conductivity (microSiemens/cm)		201,000		
рН	6.5-8.5	7		7.6
Primary Standards Analtyes		mg/l	mg/l	
Antimony (µg/l)	6			
Arsenic (µg/l)	10			
Barium (mg/l)	2	1.7	0.0638	
Beryllium (µg/l)	4			
Cadmium (µg/l)	5	<0.006		
Chromium (µg/l)	100	<0.007		
Coliform bacteria	0		1	
Fluoride (mg/l)	4	<25	0.2	0.3
Gross Alpha radiation (pCi/l)	15		5.52	
Mercury (µg/l)	2			
Nitrate (mg/l)	10	<25	0.43	0.045
Nitrite (mg/l)	1	<25		
Radium (pCi/l)	5			
Selenium (µg/l)	50			
Thallium (µg/l)	2			
Uranium (µg/l)	30			

Secondary Standards Analytes		
Aluminum (µg/l)	50-200	
Chloride (mg/l)	300	113,350
Copper (mg/l)	1	2
Fluoride (mg/l)	2	
Iron (µg/l)	300	<0.01
Manganese (µg/l)	50	19
Silver (µg/l)	100	
Sulfate (mg/l)	300	665
Total dissolved Solids (TDS)	1000	184,432
Zinc (mg/l)	5	15

Other	Analy	/tes
other	/ uncat	100

her Analytes		
lkalinity	220	
eta Emitters pCi/L		
orate	27	
Iromide	700	
Calcium	18,200	
Carbonate	0	
Cobalt	<0.01	
odide	<50	
ead	<2.2	
ithium	20	
1agnesium	1,790	
1olybdenum	<0.044	
lickel	<0.02	
hosphate	<25	
hosphorus	<0.17	
otassium	2,450	
ilicon	11	
ilica		
odium	46,260	
trontium	655	
sulfide	0	
'anadium	<0.01	

Physical Characteristics	Barnhill	Tons/day	
specific gravity	1.126		
conductivity (microSiemens/cm)	201,000		
pH	7		
Primary Standards Analtyes	mg/l		
Antimony (µg/l)		0	0
Arsenic (µg/l)		0	0
Barium (mg/l)	1.7	4.624	0.002312
Beryllium (µg/l)		0	0
Cadmium (µg/l)	0.006	0.01632	8.16E-06
Chromium (µg/l)	0.007	0.01904	9.52E-06
Coliform bacteria		0	0
Fluoride (mg/l)	25	68	0.034
Gross Alpha radiation (pCi/l)		0	0
Mercury (µg/l)		0	0
Nitrate (mg/l)	25	68	0.034
Nitrite (mg/l)	25	68	0.034
Radium (pCi/l)		0	0
Selenium (µg/l)		0	0
Γhallium (µg/l)		0	0
Uranium (µg/l)		0	0

tons of solids recovered/day

Secondary Standards Analytes			
Aluminum (µg/l)			C
Chloride (mg/l)	113,350	308312	154.156
Copper (mg/l)	2	4.624	0.002312
Fluoride (mg/l)		0	C
Iron (µg/l)	0	0.0272	1.36E-05
Manganese (µg/l)	19	51.68	0.02584
Silver (µg/l)		0	(
Sulfate (mg/l)	665	1808.8	0.9044
Total dissolved Solids (TDS)	184,432	501655	250.8275
Zinc (mg/l)	15	40.8	0.0204
Other Analytes	1 - C		
Alkalinity	220	220	
Beta Emitters pCi/L		0	(
Borate	27	73.44	0.03672
Bromide	700	1904	0.952
Calcium	18200	49504	24.752
Carbonate	0	0	(
Cobalt	0.01	0.0272	1.36E-05
lodide	50	136	0.068
Lead	2.2	5.984	0.002992
Lithium	20	54.4	0.0272
Magnesium	1790	4868.8	2.4344
Molybdenum	0.044	0.11968	5.98E-05
Nickel	0.02	0.0544	2.72E-05
Phosphate	25	68	0.034
Phosphorus	0.17	0.4624	0.000231
Potassium	2450	6664	3.332
Silicon	11	29.92	0.01496
Silica		0	(
Sodium	46260	125827.2	62.9136
Strontium	655	1781.6	0.8908
Sulfide	0	0	(
Vanadium	0.01	0.0272	1.36E-05

Footnotes:

1

Primary Standards Analtyes	mg/l	
Antimony (µg/l)	6	
Arsenic (µg/l)	10	
Barium (mg/l)	2	1.7
Beryllium (µg/l)	4	
Cadmium (µg/l)	5 < 0.006	
Chromium (µg/l)	100 < 0.007	
Coliform bacteria	0	
Fluoride (mg/l)	4 <25	
Gross Alpha radiation (pCi/l)	15	
Mercury (µg/l)	2	
Nitrate (mg/l)	10 <25	
Nitrite (mg/l)	1 <25	
Radium (pCi/l)	5	
Selenium (µg/l)	50	
Thallium (µg/l)	2	
Uranium (µg/l)	30	
Secondary Standards Analytes		
Aluminum (µg/l)	50-200	
Chloride (mg/l)	300	113350
Copper (mg/l)	1	1.7
Fluoride (mg/l)	2	
Iron (µg/l)	300 < 0.01	
Manganese (µg/l)	50	19
Silver (µg/l)	100	
Sulfate (mg/l)	300	665
Total dissolved Solids (TDS)	1000	184432
Zinc (mg/l)	5	15
Other Analytes		
Alkalinity		220
Beta Emitters pCi/L		
Borate		27
Bromide		700
Calcium		18200
Carbonate		0
Cobalt	<0.01	
lodide	<50	
Lead	<2.2	
Lithium		20
Magnesium		1790
Molybdenum	<0.044	
Nickel	<0.02	
Phosphate	<25	
Phosphorus	<0.17	
Potassium		2450
Silicon		11
Silica		
Sodium		46260
Strontium		655
Sulfide		0
Vanadium	<0.01	