

3/20/2018

To: Mr. Jason Coleman
High Plains Water District
Lubbock, Texas

From: Thomas Marek, PE, TAMUS Regents Fellow,
Vice Chair, Bushland Crop Sciences Coordinating Committee.
Dr. Jourdan Bell, Assistant Professor,
Member, Bushland Crop Sciences Coordinating Committee.
Dr. Qingwu Xue, Associate Professor,
Chair, Bushland Crop Sciences Coordinating Committee
6500 Amarillo Blvd, Texas A&M AgriLife Amarillo, Texas

Re: Final report for 2016 & 2017 awarded HPWD Bushland test well and monitoring grants.

This is to serve as a final record of performance regarding the awarded HPWD support funding in 2016 for the test holes drilled at the Texas A&M AgriLife James Bush Farm located north of Bushland and for performance of the awarded 2017 HPWD monitoring equipment support grant of test wells. The titles of the projects were:

- 1) An Evaluation of the Depth and Water Quality of the Dockum Aquifer in Southwestern Potter County (\$12,500) and
- 2) Well Monitoring Instrumentation for the Northern HPWD Region (4,000).

Thomas Marek provided a research project briefing of the above projects to the High Plains Water District Board on March 20, 2018 at the HPWD headquarters in Lubbock regarding the use of the awarded support funds. The briefing was attended by the Texas A&M AgriLife personnel of Drs. Jourdan Bell, Qingwu Xue and Kevin Heflin (Amarillo irrigation program Assistant Research Scientist).

The purpose of the two HPWD awarded grants was to acquire accurate data for improved assessment of water availability for the HPWD data base and to provide sound data for strategic planning purposes with Texas A&M AgriLife -Amarillo regarding on-going and future research and demonstration efforts. It is also to be used for assessment of the impact of and to the localized urban development adjacent to the James Bush Farm. These efforts build upon previous support that HWPD has provided in prior years to the Amarillo based Bushland irrigation efforts and conducted cooperatively with the USDA-ARS. These cooperative and joint efforts have resulted in some innovative and intensive irrigation research projects in several years and promises to lead to new gains in production efficiency and subsequently water planning efforts. These include, but is not limited to, the advanced center pivot control system developed for fully automated and advanced sprinkler irrigation control.

The HPWD awarded funding was highly leveraged by Texas A&M AgriLife-Amarillo with other grant project and administrative funding provided by Thomas Marek and Dr. Brent Auvermann, Amarillo center director. All funds were used to share in project costs for address of the overall effort. The combined support effort will provide beneficial information regarding R&D efforts in advanced water conservation technologies.

Thomas Marek reported on the test hole results, as provided verbally by the driller, of the three (3) test sites on the James Bush Farm. A copy of the test hole logs is attached. Summary results are that in the NW corner of the JBF property there is approximately 35 feet of static water remaining in the Ogallala formation. In the NE corner, no available water was discerned by the driller. Thus, the isoline data of the HPWD, as recalled, appears in error regarding the NW point value and this value can be used for update in the HPWD saturated thickness database. The NE test hole value appears commensurate with the HPWD database value. (It is also apparent that the rather large playa located between these two test holes has not had the confining Randall clay level breached and thus does not have significant recharge as apparent by the lack of static level in the Ogallala plus due to the fact that surface water is being retained for years subject to only essentially evaporation losses.) The JBF "center of the farm" test hole was drilled to a depth of 700 feet for irrigation potential assessment of the Dockum aquifer below the Ogallala redbed level. That test hole result indicated only in nominal available water (19 feet) in the Ogallala aquifer and less in the Dockum with only a 3 feet and another 4 feet water bearing strata in the nearly 400 feet of the Dockum aquifer tested. Thus, the Dockum formation to this depth at this location would only support a windmill type operation at best.

Thomas also provided information on the advanced monitoring equipment procured and to be used with two of the monitoring test holes. The recording equipment procured has both on site memory and automated transmission capability to the Bushland research location. The water level data is programmed for 15-minute readings acquisition. As the NE test hole had no detectable static water level, relocation of the procured monitoring equipment scheduled for it will be made to the newly drilled well near the "south-central location" of the property where renovation is currently proposed of a prior HPWD logged irrigation well. The "old well" has not been operational in 15 years but was prior used for decades. The presentation concluded by acknowledging the significant crop research outputs by Texas A&M AgriLife irrigation research efforts including several conducted jointly with ARS colleagues.

Thanks are extended to the HPWD Board for their support and cooperative efforts with Texas A&M AgriLife irrigation research and extension activities.

cc: Dr. Kevin Heflin
Dr. Brent Auvermann
Ms. Kathy Wingate
SRS, College Station, TX

attachments: JBF well logs

3795 W. Jones Ave.
Garden City, KS 67846
PH: 620-277-2389



OCT 27 2017
PO Box 639
Garden City, KS 67846
Fax: 620-277-0224

Customer Name: Texas A&M AgriLife Research WO#: 12491 Date: 10/12/17
Street Address: 6500 Amarillo Blue Blvd Test #: 1-10 E LOG: Yes
City, State: Amarillo, Tx 79100 Driller: Dana Fizzell
County: _____ Quarter: _____ Section: _____ Township: _____ Range: _____
Location: _____ GPS: 35.22072°N 102.612305°W
Rig #: 10003 Elevation: _____ Static WL: 215 Estimated? Yes
Proposed Well Depth _____

2" monitoring well

%	From	Footage Pay	To	Description of Strata
	0		2	Surface
	2		7	Brown Clay, Caliche
	7		24	Brown-Red Clay, cemented sand
	24		64	Brown Clay, cemented sand
	64		71	Cemented sand limestone (Hazen)
	71		82	Brown-white clay, fine limestone
	82		97	Brown-white clay, fine green, fine limestone
	97		176	Cemented sand sand clay
	176		180	Limestone (New Hazen)
	180		206	Brown-red clay, cemented sand
	206		219	Sand, Silty, fine thin clay, fine limestone (red top)
	219		257	Sand, Silty, fine thin clay, fine limestone
	257		262	Red Clay (Hazen)
	262		267	Red, Grey-blue clay (Hazen)
	267		280	Red shale
				2" open Gal V
				10-Black Cattle
				2-2" PVC Caps
				Schedule
				272'-257' Plain
				257'-237' Head
				237'-0' Plain
				Cement
				12'-0'

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Customer Name: Texas A&M AgriLife Research WO#: 12436 Date: 10/24/17
 Street Address: 6500 Amarillo Blvd East Test #: 2-10 E LOG: NO
 City, State: Amarillo TX 79100 Driller: Danotazadi
 County: _____ Quarter: _____ Section: _____ Township: _____ Range: _____
 Location: _____ GPS: _____
 Rig #: 170028 Elevation: _____ Static WL: 215 Estimated? Yes
 Proposed Well Depth _____

%	Footage		Description of Strata
	From	To	
	0	2	Surface
	2	6	Brown Clay, Caliche
	6	24	Consolidated Sand, thin clay
	24	60	Brown Clay, Caliche Consolidated Sand
	60	76	Consolidated Sand, Manganese, yellow clay
	76	137	Sand, thin, thin clay
	137	150	Sand, thin, thin clay
	150	166	Brown Clay, Consolidated Sand, Manganese (H&B)
	166	181	White, Brown Clay, Consolidated Sand, Manganese
	181	191	Brown Clay, thin bed clay
	191	204	Sand, Silt, thin bed clay
	204	258	Brown Clay, Manganese, Silty sand
	258	262	Red, blue, gray clay
	262	280	Red Shale
			2-5' sand Gal X
			8' Gravel
			5' Gravel
			3- Sandstone Blk
			1- Reduc. Pipe

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OCT 27 2017

PO Box 639
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Customer Name: Texas A+M AgriLife Research WO#: 12496 Date: 10/12/17
 Street Address: 6500 Amarillo Blvd West Test #: 3-10 E LOG: Yes
 City, State: Amarillo, TX 79100 Driller: Dave Frizzell
 County: _____ Quarter: _____ Section: _____ Township: _____ Range: _____
 Location: _____ GPS: 35.220684N 102.04694W
 Rig #: 10003 Elevation: _____ Static WL: 225 Estimated? Yes
 Proposed Well Depth 244 (224) 1/2 south

%	Footage			Description of Strata
	From	Pay	To	
	0		2	Surface
	2		34	Barren Clay, cemented sand (lost 80% clay) air and
	34		71	Red Barren Clay, cemented sand
	71		85	Cemented sand, limestone, thin basins clay (H&O)
	85		88	Limestone (H&O)
	88		95	Cemented sand, some limestone
	95		147	Sand fine to medium clay thin cemented sand
	147		181	Cemented sand, thin clay
	181		186	Cemented sand, limestone
	186		192	Red cemented sand
	192		199	Red clay, cemented sand
	199		260	Red clay, some thin clay (Red bed)
	260		277	Sand, fine to medium clay thin clay
	277		278	Cemented sand (H&O)
	278		294	Red shale (H&O) like blue gray (H&O)
	294		321	Gray, green, blue shale, thin red (H&O)
	321		334	Red shale (H&O)
	334		354	Red, brown shale, thin limestone nodules
	354	3	357	Sand shale (H&O)
	357		422	Red shale, limestone (H&O)
	422		437	Red shale, thin blue-gray, limestone
	437	4	441	Sand shale (H&O)
	441		456	Red shale, blue-gray, thin white limestone
	456		496	Red shale, thin (H&O) limestone
	496		499	Limestone (H&O)
	499		513	Dark red shale, thin limestone (Sticky)
	513		569	Red shale, thin blue-gray (Sticky)
	569		594	Dark red shale, some thin limestone (Sticky)
	594		602	Blue-gray shale, red, thin limestone (Sticky)
	602		613	Dark red shale
	613		665	Blue-gray shale, red, thin limestone (Sticky)
	665		700	Dark red shale (Sticky)
				Red shale, blue-gray, thin limestone
				(a) Super Gal X
				10 - Grout
				3 - Rodent
				1 - Duck Collar
				1 - 2" PVC Plug
				2 - 6" x 1/2" Pipe

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