

Hydrogeological Investigation of the Lower Floridan Aquifer in Polk County (P280)

Crooked Lake, Frostproof and Lake Wales Sites

**Presentation to the Industrial Advisory Committee
May 15, 2018**

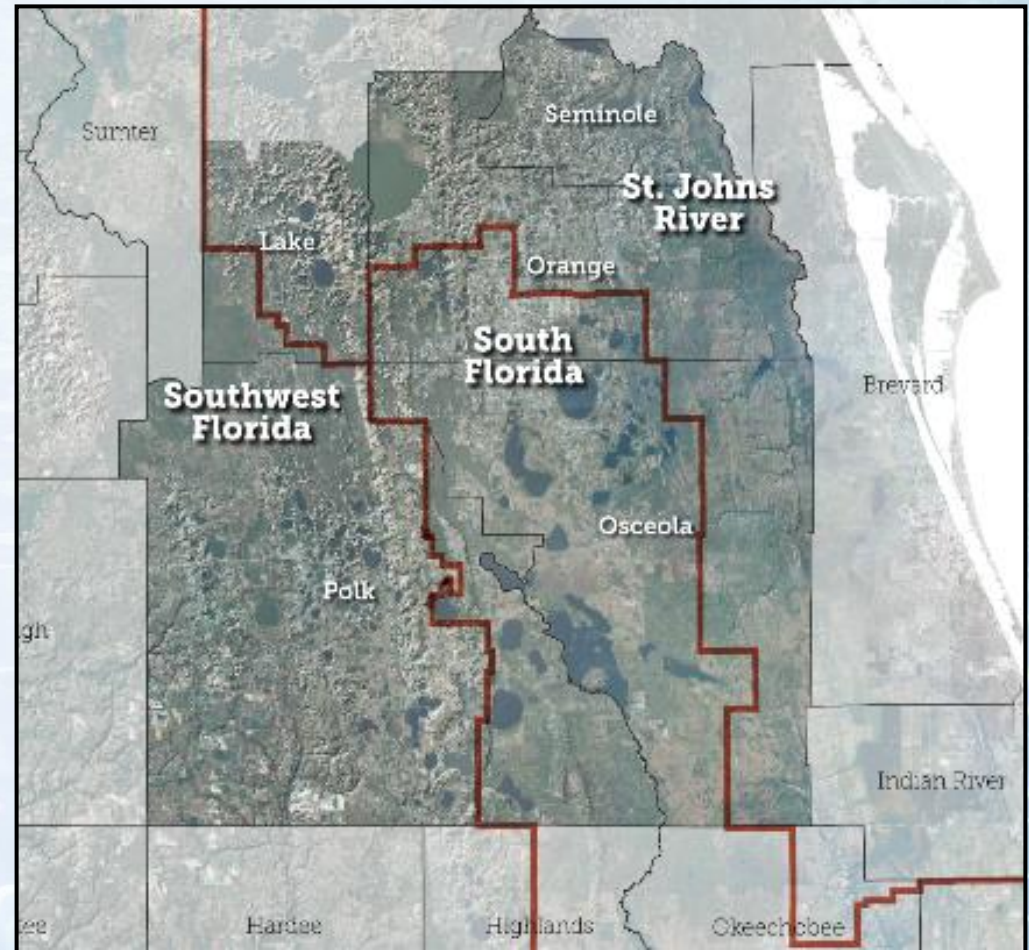


Agenda

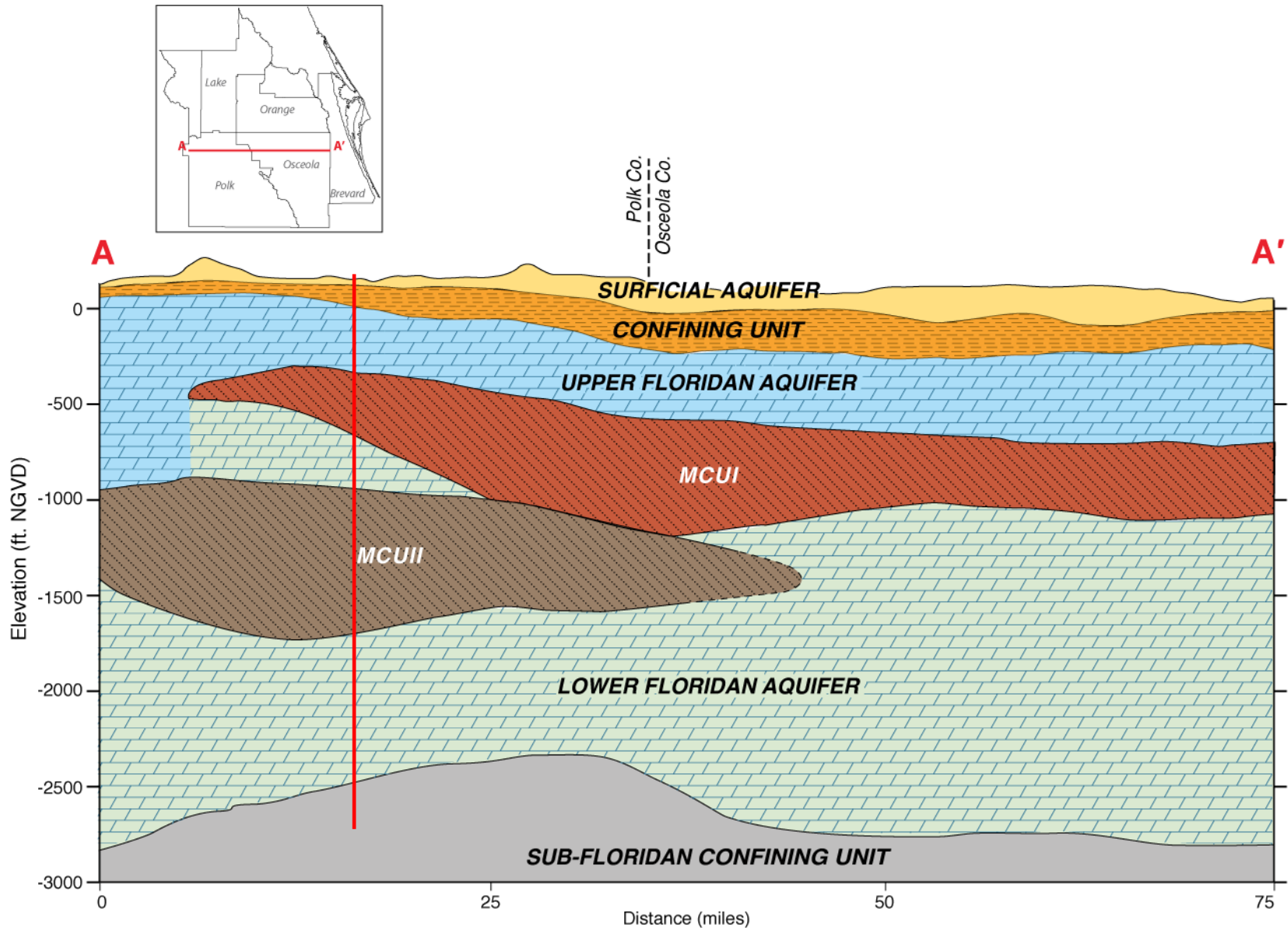
- Project Location
- Project Overview
- Crooked Lake Status
- Frostproof Status
- Lake Wales Status
- Communications

Central Florida Water Initiative (CFWI)

A collaborative regional water supply planning effort to protect, develop, conserve and restore central Florida's water resources



Generalized Hydrogeologic Cross Section A-A'



Project Overview

- Three-year testing program in two phases
- Phase 1
 - Initial drilling and testing
 - Installation of multiple monitor wells
- Phase 2
 - Drilling and testing of test/production wells
 - Aquifer performance tests:
 - Aquifer characteristics
 - Water quality

Crooked Lake Well Site

A project to explore the Lower Floridan aquifer in Polk County is under way at this site. For more information, call the Southwest Florida Water Management District at:

1-800-423-1476, ext. 4212

*Southwest Florida
Water Management District*

Funded by the
Southwest Florida Water Management District



Versa-Drill coring rig

Crooked Lake LFA Site Update

- Project duration January 2017 – January 2018
- Monitoring well **constructed**
 - Lower Floridan aquifer (LFA) within Middle Confining Unit II (MCU II)
 - Upper Floridan aquifer (UFA)
 - Surficial aquifer (SA)

LFA
monitoring
well



Crooked Lake Update

- Testing **completed**
 - Coring
 - Packer tests
 - Water quality testing
 - Geophysical logging
- United States Geological Survey (USGS)
Optical Borehole Imaging **completed**
- USGS Age Dating – **Fall 2018**

HYDROSTRATOGRAPHIC UNITS		Depth
		0'
Surficial aquifer		
		96'
Hawthorn aquifer system		238'
	Upper Floridan aquifer	270'
Ocala low-permeability zone		480'
		653'
Avon Park high-permeability zone		885'
		1120'
MCU II		1453'
LFA II (a)	Lower Floridan aquifer	1730'
		1980'
Glauconitic marker unit		2285'
		2480'
LFA II (b)		2665'
SFCU		

typical
production
zone

confinement between
UFA and LFA

1st production zone from
the LFA

confinement between upper LFA
production zone and lower
potential injection zone

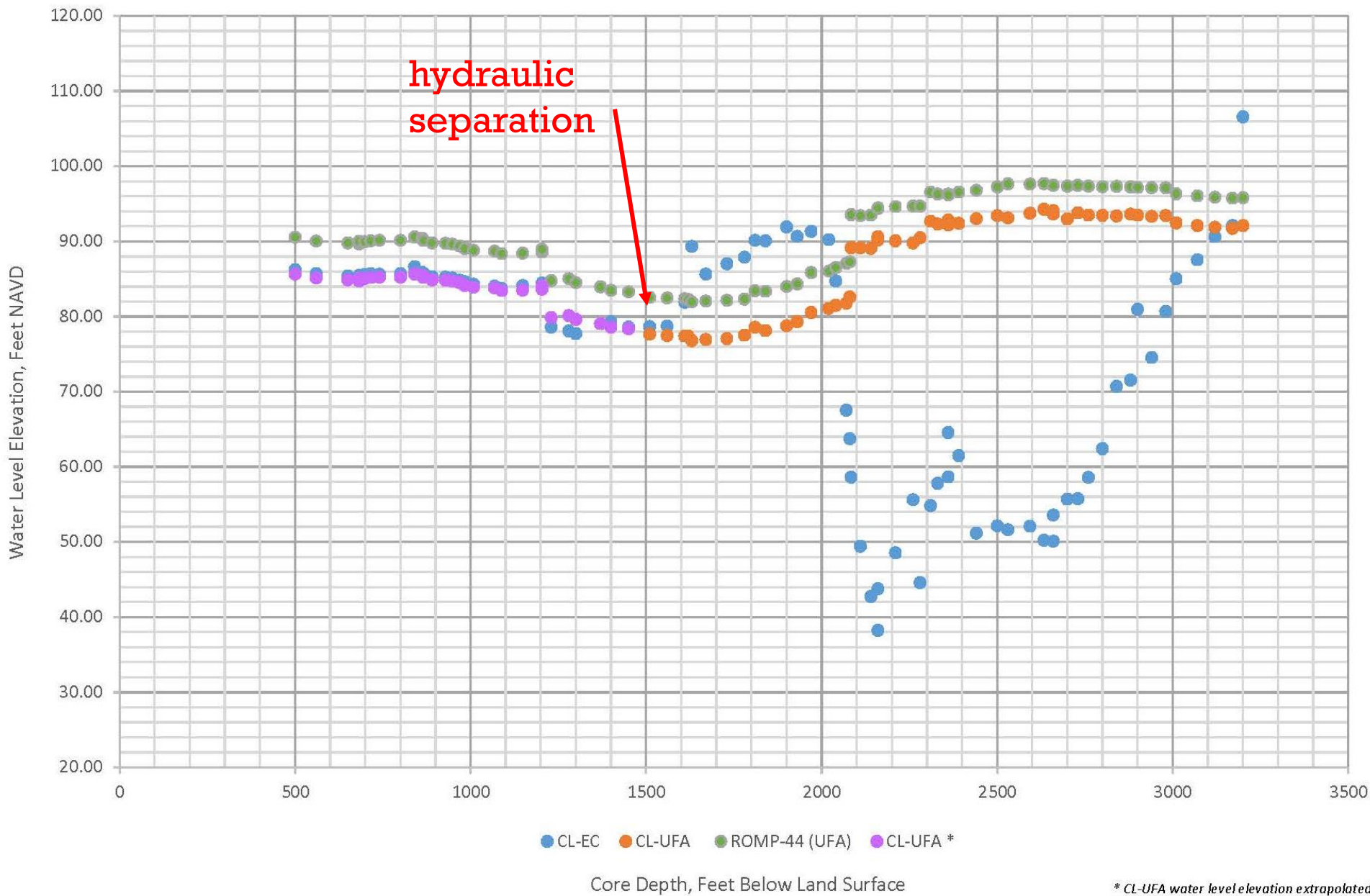
Upper Depth (ft bls)	Lower Depth (ft bls)	Temp (°C)	Specific Cond. (μS/cm)	pH	TDS (mg/L)
30	50	20.7	75	6.0	-
270	400	20.2	390	7.9	180
-	872	26.0	324	7.9	170
-	968	27.5	295	8.3	140
1,270	1,300	29.5	2,567	7.7	1,667
1,450	1,480	24.0	1,480	7.8	1,300
1,590	1,620	29.6	3,624	7.5	2,360
-	1,930	26.7	2,698	7.5	2,600
2,010	2,040	29.9	3,905	7.7	2,539
-	2,070	25.5	4,004	6.3	2,603
2,130	2,160	31.8	18,060	7.8	11,739
-	2,250	26.4	18,561	7.3	12,065
2,310	2,360	29.7	4,179	8.1	2,728
2,430	2,460	31.9	2,710	7.8	1,762
2,530	2,560	33.3	10,878	7.0	7,070
2,630	2,660	23.2	11,052	7.3	7,186
2,900	3,000	25.6	25,784	6.9	16,758
-	2,800	23.5	103,504	6.9	67,315
2,400	2,490	28.1	9,134	7.9	5,934
2,050	2,630	30.3	4,482	9.3	2,911
1,450	1,835	27.8	3,802	7.8	2,468

low
brackish
water
quality

Upper Depth (ft bls)	Lower Depth (ft bls)	Chloride (mg/L)	Sulfate (mg/L)
30	50	6.4	3.2
270	400	7.9	0.75
-	870	7.5	3.2
-	968	7.1	8.5
1,270	1,300	13	1,600
1,450	1,480	9.8	740
1,590	1,620	47	2,300
-	1,930	35	1,700
2,010	2,040	213	2,250
-	2,070	77	2,200
2,130	2,160	4,700	3,700
-	2,250	5,800	2,400
2,310	2,360	220	2,700
2,430	2,460	2,300	2,500
2,530	2,560	2,500	2,600
2,630	2,660	2,700	2,700
2,900	3,000	11,000	2,200
-	2,800	49,000	3,300
2,400	2,490	1,900	2,300
2,050	2,630	490	2,100
1,450	1,835	81	2,600

low
brackish
water
quality

Upper Floridan and Lower Floridan Water Level Elevation vs. Corehole Depth - Crooked Lake Wellsite



* CL-UFA water level elevation extrapolated from ROMP-44 water level elevation for same POR



Sub Floridan
confining unit

Abundant
evaporites in
the core
sample



Sample
storage

Frostproof LFA Well Site



**WELL CONSTRUCTION, DRILLING, AND
TESTING SERVICES TO APPROXIMATELY
3,200 FEET NEAR FROSTPROOF, FL**

PROJECT COST: \$3,151,650.00

Southwest Florida
Water Management District

FUNDING PROVIDED BY THE
SOUTHWEST FLORIDA WATER
MANAGEMENT DISTRICT

Frostproof LFA Site Status

- Phase 1 project started **January 2018**
- Monitoring well **constructed**
 - Upper Floridan aquifer (UFA)
 - Surficial aquifer (SA)
- Dual zone LFA monitoring well **under construction**

Frostproof Status

- Testing **ongoing**
 - Coring
 - Packer tests
 - Water quality testing
 - Geophysical logging
- USGS Optical Borehole Imaging **ongoing**



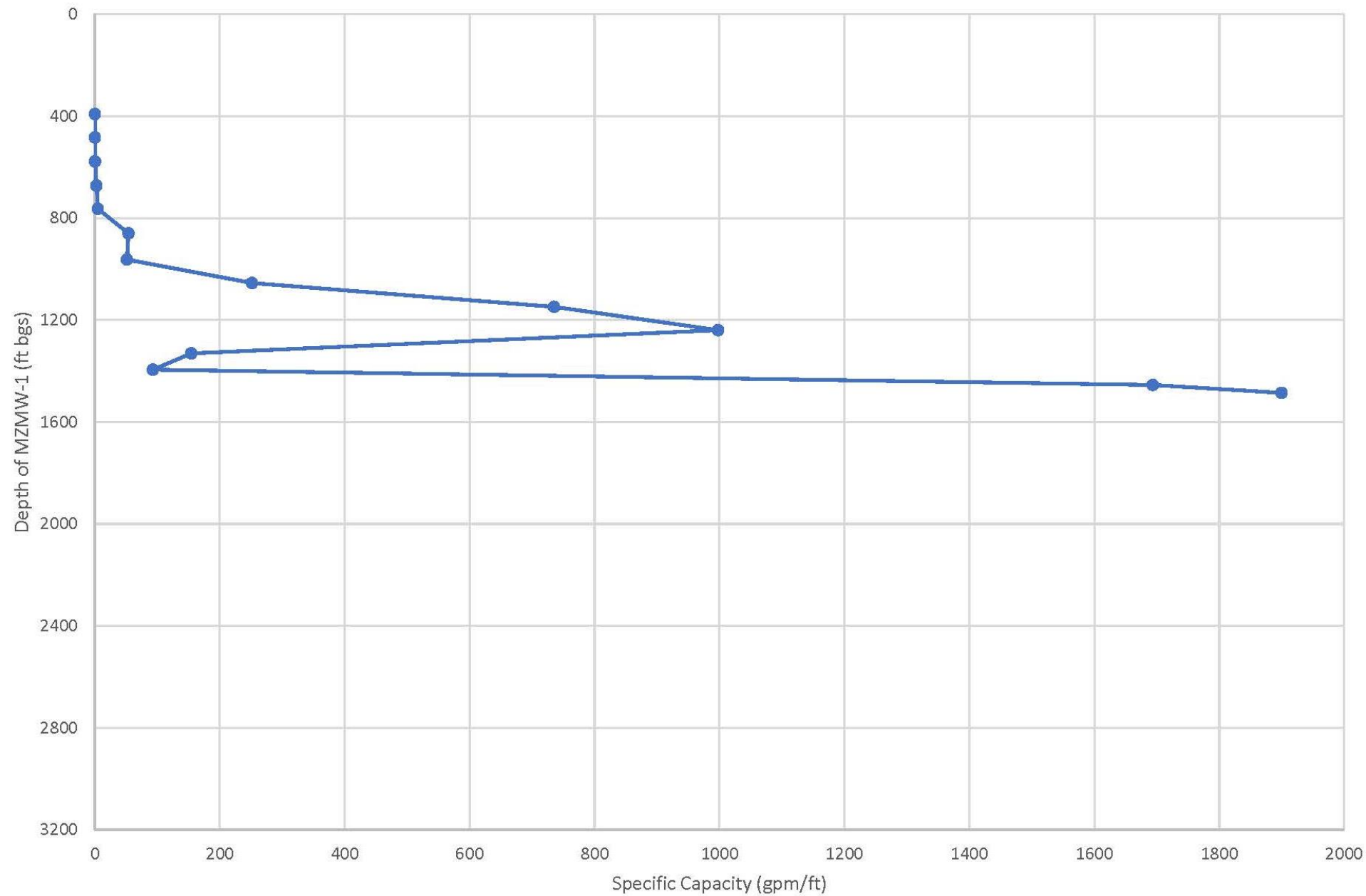
Depth (ft bgs)	Static WL (ft btoc)	Drawdown (ft)	Discharge (gpm)	Specific Capacity (gpm/ft)
392	94	110.4	31	0.3
484	89.3	117.7	38	0.3
578	90.2	95.8	58	0.6
673	92.66	37.99	103	2.7
764	90.2	27.13	129	5.0
860	90.2	2.89	156	54.0
963	88.61	3.24	167	51.4
1055	90.62	0.53	133	251.8
1149	98.6	0.19	140	735.3
1240	91.46	0.14	140	997.9
1331	90.94	0.86	133	154.7
1395	90.7	1.59	148	93.1
1455	94.12	0.08	136	1693.8
1486	95.54	0.09	171	1899.7

Production
well
capacity

low
brackish
water
quality

Depth (ft bgs)	pH	Temp (°C)	Specific Conductivity (µS)
673	7.17	24.3	978
764	8.21	26.6	337
860	8.33	24.7	417
963	8.3	27.7	337
1055	8.32	24.2	336
1148	8.32	27.6	350
1240	8.47	26.8	1088
1331	7.91	26.4	385
1395	8.24	28.1	426
1455	8.22	26.5	1180
1486	8.19	27	1200

Specific Capacity at MZMW-1



Core Sample #1
1st appearance of
evaporites

Sample
inspection



Gypsum

Lake Wales LFA Site Status

- Phase 1 project start October 2018
proposed
- Phase 1 monitoring well construction
 - Upper Floridan aquifer (UFA)
 - Surficial aquifer (SA)
 - Dual zone LFA

Next Steps at Crooked Lake/Frostproof/Lake Wales

Crooked Lake

- Select contractor for LFA dual zone monitor well
 - Start Fall 2018

Frostproof

- Complete Phase 1
 - Spring 2019
- Initiate Phase 2?
 - Summer 2019

Lake Wales

- Select contractor for Phase 1
 - Start Fall 2018

Communications

- LFA webpage launched July 25, 2017
 - WaterMatters.org/LFA
 - Regular updates
- LFA video
 - Create video #2 FY2018
- Future workshops/Input





QUESTIONS and COMMENTS

