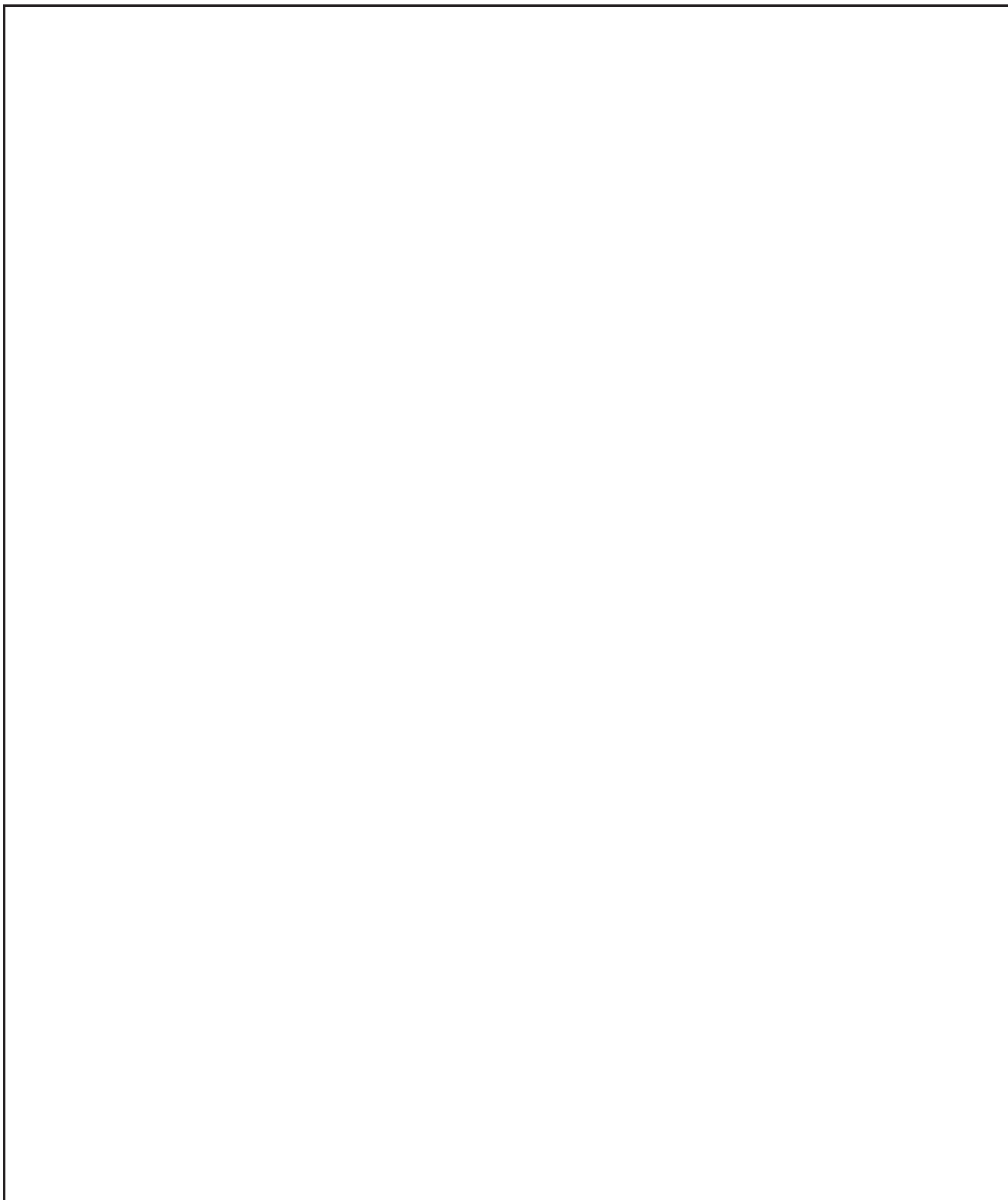


Geohydrologic Data Section Work Plan 2024



Southwest Florida
Water Management District

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Cover Photo: Core drilling and testing operation at the ROMP 88.5 – Northeast Polk well site. Photograph by Julie Zydek.

Geohydrologic Data Section Work Plan 2024

July 2023

Southwest Florida Water Management District

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Horstman, T.M., 2023, Geohydrologic Data Section Work Plan 2024: Southwest Florida Water Management District, 56 p.

Preface

The 2024 Geohydrologic Data Section Work Plan lists the projects planned by the Geohydrologic Data Section (GEO) for fiscal years 2024 to 2028. The GEO is responsible for the collection of hydrogeologic data and the oversight of monitor well construction activities at the Southwest Florida Water Management District (District). The GEO conducts exploratory core drilling and aquifer testing, and contracts private well drilling firms to construct the monitor wells to support the data collection needs for various District projects.

The Regional Observation and Monitor-well Program (ROMP), administered by the GEO, has historically been the primary source for hydrogeologic data collection. The ROMP was started in 1974 in response to the need for hydrogeologic information by the District. The focus of the ROMP is to characterize the hydrogeology and water quality of the groundwater systems that serve as the primary source of drinking water within southwestern Florida. The original design of the ROMP consisted of an inland 10-mile grid network composed of 122 well sites and a coastal transect network composed of 24 coastal monitor transects of two to three well sites each. The number of wells at a well site varies with specific regional needs; usually two to five permanent monitor wells are constructed at each site. The numbering system for both networks generally increases from south to north with ROMP-labeled wells representing the inland grid network and TR-labeled wells representing the coastal transect network. Currently, 107 inland grid network well sites are complete¹ and 24 coastal monitor transects have one or more well sites in the transect complete¹. The need for additional ROMP inland and coastal transect well sites will depend on the future priorities of the District.

Expanded District initiatives have created the need for data from new well sites outside the original two well networks. These well sites, known as Project Support well sites, facilitate the exploration of target areas within the District such as the Southern Water Use Caution Area, Central Florida Water Initiative, and the Northern District Water Resources Assessment Project. Some well sites provide information for multiple projects, as well as enhancing the original two well networks. Currently, 223 project support well sites are complete¹.

The broad objectives at each well site are to determine the geology, hydrology, groundwater quality, hydraulic properties, and to install wells for long-term monitoring. Site activities include exploratory core drilling, aquifer testing, and well construction. These activities provide data necessary for the hydrogeologic and groundwater quality characterization of the well sites. At the completion of each well site, a summary report is generated and can be found at the District's website at <https://www.swfwmd.state.fl.us/resources/data-maps/geohydrologic-data>. The monitor wells form the backbone of the District's long-term aquifer monitoring networks, which supply critical data for the District's regional models, hydrologic conditions, and water quality reporting.

¹Complete means the core drilling and testing, well construction, and/or aquifer performance testing is complete. Summary reports may still be pending.

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Conversion Factors

Multiply	By	To obtain
foot (ft)	0.3048	meter (m)
gallon (gal)	3.785	liter (L)
gallon (gal)	0.003785	cubic meter (m ³)
gallon (gal)	3.785	cubic decimeter (dm ³)
million gallons (Mgal)	3,785	cubic meter (m ³)
mile (mi)	1.609	kilometer (km)
ounce, avoirdupois (oz)	28.35	gram (g)

Acronyms and Abbreviations

APT	aquifer performance test
bls	below land surface
CFWI	Central Florida Water Initiative
CGWQMN	Coastal Groundwater Quality Monitoring Network
CME	Central Mining Equipment 85 drill rig
DCIR	Data Collection Initiative Request
District	Southwest Florida Water Management District
DMIT	Data, Monitoring, and Investigation Team
DWRM	District Wide Regulation Model
ECFTX	East-Central Florida Transient Groundwater Model Expanded
FY	Fiscal Year
GEO	Geohydrologic Data Section
HAS	Hawthorn aquifer system
LFA	Lower Floridan aquifer
MFL	Minimum Flows and Levels
MIA	Most Impacted Area
MCU	Middle Confining Unit
NDDP	Northern District Drilling Program
NDM	Northern District Groundwater Flow Model
NDWRAP	Northern District Water Resources Assessment Project
ROMP	Regional Observation and Monitor-well Program
SWUCA	Southern Water Use Caution Area
UDR	Universal Drill Rigs 200D LS drill rig
UFA	Upper Floridan aquifer
UFANMN	Upper Floridan aquifer Nutrient Monitoring Network
Work Plan	Geohydrologic Data Section Work Plan
WRMP	Well Repair and Maintenance Program

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Geohydrologic Data Section Work Plan 2024

Introduction

As the demand for water resources within the Southwest Florida Water Management District (District) increases, the need to monitor and evaluate the condition of the water resources also increases. The Geohydrologic Data Section (GEO) Work Plan 2024 (Work Plan) identifies current and future core drilling and testing, and well construction sites, details the required work, and prioritizes the well sites to ensure the hydrogeologic data needs of the District are being met for fiscal years (FY)² 2024 to 2028. As of FY2021, all well sites added to the Work Plan are vetted through the Data Governance Process to ensure they are in alignment with the District's mission, are scientifically needed, are managed with the best data collection practices, are cost-efficient, and do not have a negative impact on the operation or efficiency of the District's data collection programs. The goal of the data collected from the construction of these well sites is to improve the understanding of the hydrogeologic systems in the District.

The Work Plan is generally updated every two years. The GEO solicits information from the Water Resources, Natural Systems and Restoration, Data Collection, and Water Use Permit Bureaus about future hydrogeologic data collection and well construction requirements of the District. These future project requirements are detailed on GEO scope of work forms or work orders submitted through FootPrints prior to FY2022 and Data Collection Initiative Request (DCIR) forms after FY2022. The scope of work forms, FootPrints work orders, and DCIR forms received for the listed projects are presented in appendix A.

Data collected at the well sites identified in this Work Plan will be used for hydrologic conditions reporting, water quality monitoring, groundwater modeling, minimum flows and levels development, long-term water resource availability estimates, well field recovery monitoring and evaluating, and regulatory guidelines evaluating. The data collection objectives for each project will vary depending on the data needs in the particular area. These objectives may include: identifying the potable water thickness, locating the saltwater/freshwater interface, determining the thickness of the Upper Floridan aquifer, determining the presence and groundwater quality of the Lower Floridan aquifers (below middle confining units I, II, VI, and VIII), and other similar objectives. A summary of the hydrogeology of the District, and the stratigraphic and

hydrologic terms used in this Work Plan are given in appendix B.

The GEO is responsible for the Well Repair and Maintenance Program (WRMP) that was implemented in FY2021. As part of the WRMP, the GEO responds to well problems and performs repairs or abandonments as required for wells the District monitors. Also, routine inspection of all District-owned monitor wells is an objective of the WRMP to ensure the integrity of the wells and the associated resource data (water quality and levels) collected from the wells.

Work Plan Organization

Projects in the Work Plan are grouped according to the data collection needs. Projects requiring the highest level of data collection are listed as Core Drilling and Testing projects (table 1). Figure 1 presents a forecast timeline of the core drilling and testing projects. Projects requiring well construction and minimal data collection are listed as Project Support Well Construction projects. Table 2 lists all the monitor wells planned for both project types. Projects that require aquifer performance tests (APTs) are presented in table 3. Figure 2 presents the locations of the projects. Table 4 lists additional work required at ongoing well sites to complete the core drilling and testing phase or to finish the project. The core drilling and testing, monitor well construction, and APTs proposed to be completed by the GEO section from FY2024 to FY2028 are what can be reasonably accomplished with the available resources.

The number of wells identified as needing evaluation, repair, or abandonment under the WRMP is presented in table 5 and the number of District-owned monitor wells that will need inspection as part of the WRMP is presented in table 6.

Core Drilling and Testing Projects

Well construction sites selected for core drilling and testing are completed in three phases and require the highest level of data collection. The first phase includes collecting continuous rock core samples from land surface up to 3,000 feet below land surface (bls) to delineate formation boundaries, aquifers, permeable zones, and confining units. In addition, slug tests are conducted, and water quality samples are collected while core drilling to characterize the hydrogeologic

²The fiscal year begins October 1 and ends September 30

2 Geohydrologic Data Section Work Plan 2024

Table 1. Planned core drilling and testing projects for fiscal years 2024 – 2028

[bls, below land surface; CGWQMN, Coastal Groundwater Quality Monitoring Network; FAS, Floridan aquifer system; MCU I, middle confining unit I; MCU II, middle confining unit II; NDWRAP, Northern District Water Resources Assessment Project; ROMP, Regional Observation and Monitor-well Program; ROW, right-of-way; SWUCA, Southern Water Use Caution Area; TR, transect; UFANMN, Upper Floridan aquifer Nutrient Monitoring Network]

Site Number	Site Name	Project	County	Starting Fiscal Year ¹	Easement Status	Starting Depth (feet bls)	Estimated End Depth (feet bls)	Core Drilling Objective
TR 9-4	Ruskin	CGWQMN, SWUCA, ROMP	Hillsborough	2024	ROW permit/ Access License Agreement	0	850	Locate saltwater interface
-	Coon Wal-low	CGWQMN, UFANMN	Hernando	2024	District Prop-erty	0	700	Locate saltwater interface
112	Rutland (Carlton Half Moon)	NDWRAP, ROMP	Sumter	2025	District Prop-erty	0	2,000	Locate base of the FAS
TR 10-3	Camden Field	CGWQMN, SWUCA, ROMP	Hillsborough	2027	Not Acquired	0	850	Locate saltwater interface
-	Camp Mining Replace-ment	NDWRAP, UFANMN	Citrus	2027	Not Acquired	0	800	Delineate MCU I and top of MCU II
TR 7-3	Durante Park	CGWQMN, SWUCA, ROMP	Manatee	2028	No Expiration	0	600	Locate saltwater interface

¹Starting fiscal year is projected if a future site.

units encountered. Core drilling and testing can take twelve or more months to complete depending on the planned depth of data collection. The District-owned Universal Drill Rigs 200D LS (UDR) and Central Mining Equipment 85 (CME) drill rigs are used for core drilling and data collection. The current and proposed core drilling and testing projects are detailed below and listed in table 1. Refer to appendix A for more details about each project. Figure 1 presents the estimated timeline to complete the current and proposed core drilling and testing projects.

Phase two includes the construction of the permanent and temporary monitor wells, which is performed by private drilling firms contracted by the District. Well construction usually begins after core drilling and testing is complete. The monitor wells proposed for construction for FYs 2024 to 2028 are presented in table 2.

Phase three includes conducting APTs, which are performed after all wells are constructed. The APTs proposed for FYs 2024 to 2028 are presented in table 3.

ROMP 75 – Auburndale

This well site is in Polk County and supports the Central Florida Water Initiative (CFWI) and the ROMP inland 10-mile grid network. Core drilling and testing was completed to a

depth of 2,810 feet bls in the top of the basal confining unit of the Floridan aquifer system in 2013. A detailed characterization of the surficial aquifer, Hawthorn aquifer system, Upper Floridan aquifer, and Lower Floridan aquifers was performed during core drilling at the site.

Wells have been completed in the surficial aquifer, Upper Floridan aquifer, and Lower Floridan aquifer below middle confining unit I. A permanent Lower Floridan aquifer below middle confining unit II monitor well was completed in July 2016, as part of the 2016 CFWI Data, Monitoring, and Investigations Team (DMIT) Hydrogeologic Work Plan Update for FY2016-FY2020 (Data, Monitoring, and Investigations Team, 2016).

Additional well construction needed includes permanent and temporary Upper Floridan aquifer monitor wells and a temporary Lower Floridan aquifer below middle confining unit I well for conducting APTs. APTs are planned in the surficial aquifer, Upper Floridan aquifer, and the Lower Floridan aquifer below middle confining unit I. This well site will be equipped for long-term monitoring of water levels and water quality.

ROMP 88 – Rock Ridge

This is an existing ROMP site located in northern Polk County that contained one permanent Upper Floridan aquifer well. The site was revisited in accordance with the CFWI DMIT Hydrogeologic Annual Work Plan FY2020-FY2025 (Data, Monitoring, and Investigations Team, 2020). Core drilling and testing started in FY2017 and ended at 2,607 feet bls in April 2020. Monitor wells were constructed in the Lower Floridan aquifer below middle confining unit I and Lower Floridan aquifer below middle confining unit VIII. APTs in the Upper Floridan aquifer and Lower Floridan aquifers below middle confining units I and VIII were completed in May 2023. Remaining work to complete includes removing core rods and temporary casing, abandoning two core holes, and back-plugging the Lower Floridan aquifer below middle confining unit VIII monitor well.

This site is part of the ROMP inland 10-mile grid network and the data collected from this site is important for monitoring and evaluating the Lower Floridan aquifers that have been identified as an alternative water supply source in Polk County and improving the calibration of the District Wide Regulation Model (DWRM), Northern District Groundwater Flow Model (NDM), and the East Central Florida Transient (ECFTX) model.

ROMP 88.5 – Northeast Polk

This well site is in northeastern Polk County. Well construction and testing at this location is being performed in accordance with the CFWI DMIT Hydrogeologic Annual Work Plan FY2020-FY2025 (Data, Monitoring, and Investigations Team, 2020). This site will infill the ROMP inland 10-mile grid network, and will improve the calibration of the DWRM, NDM, and the ECFTX model. Data collection from this site is important for monitoring the Lower Floridan aquifer as it is tested as an alternative water source in Polk County. This site will provide a detailed characterization of the Upper and Lower Floridan aquifers, and delineate the extent of middle confining units I, II, and VIII.

Core drilling and testing started during FY2018 and ended at 2,387 feet bls in the sub-Floridan confining unit in June 2023.

Monitor wells are required in the Upper Floridan aquifer, Lower Floridan aquifer below middle confining unit I, Lower Floridan aquifer below middle confining unit II, and Lower Floridan aquifer below middle confining unit VIII, if present. The Upper Floridan aquifer monitor well was completed in FY2020. APTs are needed in the Upper Floridan aquifer, Lower Floridan aquifer below middle confining unit I, Lower Floridan aquifer below middle confining unit II, and Lower Floridan aquifer below middle confining unit VIII, if present. This well site will be equipped for long-term monitoring of water levels and water quality.

ROMP 46 – Baird

This well site is in southwestern Polk County. Well construction and testing at this location is being performed in accordance with the CFWI DMIT Hydrogeologic Annual Work Plan FY2020-FY2025 (Data, Monitoring, and Investigations Team, 2020). This site will infill the ROMP inland 10-mile grid network, support the SWUCA, and will improve the calibration of the DWRM, NDM, and ECFTX model.

Core drilling and testing was completed to a depth of 2,957 feet bls in the sub-Floridan confining unit in September 2022. It provided a detailed characterization of the surficial aquifer, Hawthorn aquifer system, and Floridan aquifer system.

Monitor wells are needed in the surficial aquifer, any of the aquifers present within the Hawthorn aquifer system, and any discrete permeable zones of the Upper Floridan and Lower Floridan aquifers. APTs are needed for any aquifer or permeable zone containing freshwater. This well site will be equipped for long-term monitoring of water levels and water quality.

TR 9-4 – Ruskin

This well site is in southwestern Hillsborough County and is proposed to replace the TR 9-3 – Simmons 3 well site that is expected to be impacted by a South Hillsborough Aquifer Recharge Project (SHARP) well proposed to be installed nearby. A replacement is important for data continuity because the Upper Floridan aquifer monitor well at the TR 9-3 well site is one of ten wells used for the Saltwater Intrusion Minimum Aquifer Level (SWIMAL) network, which will be important for evaluating the SWUCA recovery. This well site also supports the Coastal Groundwater Quality Monitoring Network (CGWQMN) that monitors the saltwater interface. This site is in an area with insufficient data and is critical for understanding the Hawthorn aquifer system and determining the top of the Upper Floridan aquifer, which will aid in regulation permitting.

Core drilling and testing at this site is needed from land surface to the saltwater/freshwater interface and will provide a detailed characterization of the surficial aquifer, Hawthorn aquifer system, and the saltwater interface within the Upper Floridan aquifer. Monitor wells are required in the surficial aquifer, the aquifer present within the Hawthorn aquifer system, and the Upper Floridan aquifer. This well site will be equipped for long-term monitoring of water levels and water quality.

Coon Wallow

This well site is in northwestern Hernando County about 1.5 miles west of the Centralia well site. This site supports the CGWQMN and the Upper Floridan aquifer Nutrient Monitoring Network (UFANMN). Core drilling and testing at this

Table 2. Planned monitor well construction projects for fiscal years 2024 – 2028

[-, none; CFWI, Central Florida Water Initiative; CGWQMN, Coastal Groundwater Quality Monitoring Network; FDOT, Florida Department of Transportation; LFA I, Lower Floridan aquifer below middle confining unit I; LFA II, Lower Floridan aquifer below middle confining unit II; LFA VIII, Lower Floridan aquifer below middle confining unit VIII; MFL, Minimum Flows and Levels; NDWRAP, Northern District Water Resource Assessment Project; Perm, permanent; ROMP, Regional Observation and Monitor-well Program; ROW, right-of-way; SWUCA, Southern Water Use Caution Area; Temp, temporary; TLA, temporary license area; UFA, Upper Floridan aquifer; UFANMN, Upper Floridan aquifer Nutrient Monitoring Network]

Site Number	Site Name	Project	County	Easement Status	Monitor Wells								Perm LFA I	Temp LFA I	Perm LFA II	Temp LFA II	Perm LFA VIII	Temp LFA VIII
					Perm surficial	Temp surficial	Perm Hawthorn	Temp Hawthorn	Perm UFA	Temp UFA								
FISCAL YEAR 2024																		
ROMP 88.5	Northeast Polk	ROMP, CFWI	Polk	Acquired; TLA expires at project completion	-	-	-	-	-	1	1	1	1	1	1	1		
TR 9-4	Ruskin	CGWQMN, SWUCA, ROMP	Hillsborough	ROW permit/ Access License Agreement	1	-	1	-	2	-	-	-	-	-	-	-		
-	Thornhill Ranch Replacement	CFWI	Polk	Acquired	-	-	-	-	-	-	1	-	-	-	-	-		
-	Lake Starr	CFWI, MFL	Polk	Acquired	1	-	-	-	1	-	-	-	-	-	-	-		
-	Moon Lake Replacement	MFL	Pasco	Not Acquired	1	-	-	-	1	-	-	-	-	-	-	-		
ROMP 51	Little Manatee River	CGWQMN	Hillsborough	District Property/ FDOT access	-	-	-	-	1	-	-	-	-	-	-	-		
ROMP 86R	Woodland	ROMP	Pasco	Not Acquired	1	-	-	-	1	-	-	-	-	-	-	-		
-	Peace River at Bartow	CFWI	Polk	Not Acquired	1	-	-	-	-	-	-	-	-	-	-	-		
-	Peace River at Fort Meade	CFWI	Polk	Not Acquired	1	-	-	-	-	-	-	-	-	-	-	-		
-	Homeland DEP 9	CFWI	Polk	Not Acquired	1	-	-	-	-	-	-	-	-	-	-	-		
-	Sanlon Ranch	CFWI	Polk	Not Acquired	1	-	-	-	-	-	-	-	-	-	-	-		
-	Lake Annie	CFWI, MFL	Polk	Not Acquired	1	-	-	-	1	-	-	-	-	-	-	-		
-	Coley Deep	CFWI	Polk	Not Acquired	1	-	-	-	-	-	-	-	-	-	-	-		
TOTAL FOR FISCAL YEAR 2024					10	0	1	0	7	1	2	1	1	1	1	1		

Table 2. (Continued) Planned monitor well construction projects for fiscal years 2024 – 2028

[-, none; CFWI, Central Florida Water Initiative; CGWQMN, Coastal Groundwater Quality Monitoring Network; FDOT, Florida Department of Transportation; LFA I, Lower Floridan aquifer below middle confining unit I; LFA II, Lower Floridan aquifer below middle confining unit II; LFA VIII, Lower Floridan aquifer below middle confining unit VIII; MFL, Minimum Flows and Levels; NDWRAP, Northern District Water Resource Assessment Project; Perm, permanent; ROMP, Regional Observation and Monitor-well Program; ROW, right-of-way; SWUCA, Southern Water Use Caution Area; Temp, temporary; TLA, temporary license area; UFA, Upper Floridan aquifer; UFANMN, Upper Floridan aquifer Nutrient Monitoring Network]

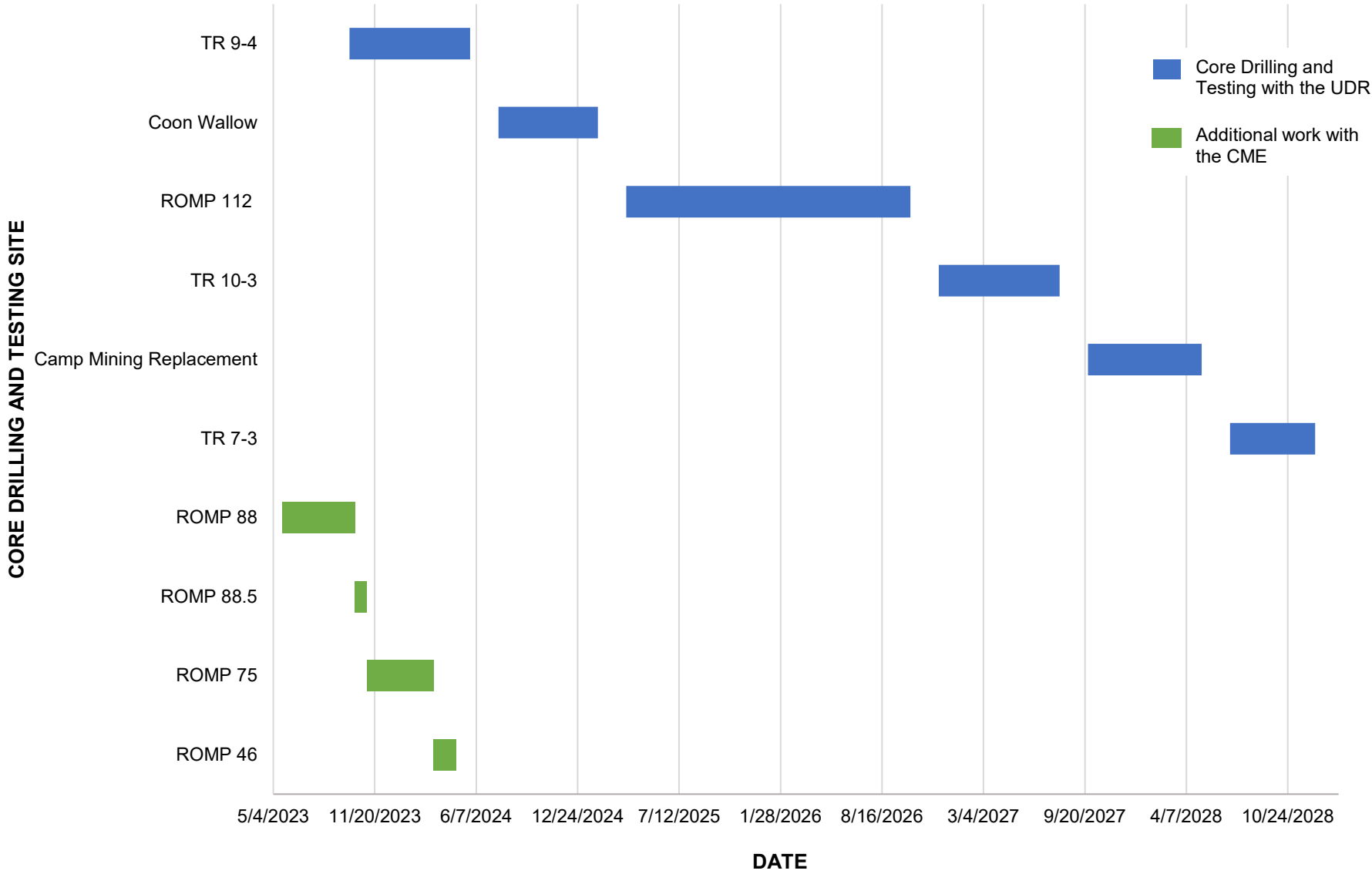
Site Number	Site Name	Project	County	Easement Status	Monitor Wells								Perm LFA I	Temp LFA I	Perm LFA II	Temp LFA II	Perm LFA VIII	Temp LFA VIII
					Perm surficial	Temp surficial	Perm Hawthorn	Temp Hawthorn	Perm UFA	Temp UFA	Perm LFA I	Temp LFA I						
FISCAL YEAR 2025																		
ROMP 46	Baird	ROMP, CFWI	Polk	Acquired; TLA (Polk County) expires 6/13/2028	1	-	2	-	2	-	-	-	-	-	-	1	-	
-	Lake Mabel	CFWI, MFL	Polk	Not Acquired	1	-	-	-	-	-	-	-	-	-	-	-	-	
-	Lake Lowery	CFWI, MFL	Polk	Not Acquired	1	-	-	-	1	-	-	-	-	-	-	-	-	
-	Lake Bonnie	CFWI, MFL	Polk	Not Acquired	1	-	-	-	-	-	-	-	-	-	-	-	-	
-	North Lake Wales	CFWI, MFL	Polk	Not Acquired	1	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL FOR FISCAL YEAR 2025					5	0	2	0	3	0	0	0	0	0	0	1	0	
FISCAL YEAR 2026																		
ROMP 46	Baird	ROMP, CFWI	Polk	Acquired; TLA (Polk County) expires 6/13/2028	-	1	-	1	-	1	-	-	-	-	-	-	-	
-	Coon Wallow	CGWQMN, UFANMN	Hernando	District Property	-	-	-	-	1	-	-	-	-	-	-	-	-	
TOTAL FOR FISCAL YEAR 2026					0	1	0	1	1	1	0	0	0	0	0	0	0	
FISCAL YEAR 2027																		
ROMP 112	Rutland (Carlton Half Moon)	NDWRAP, ROMP	Sumter	District Property	-	-	-	-	-	-	-	-	1	1	1	1	1	
ROMP 75	Auburndale	ROMP	Polk	Easement expires 2041	1	-	-	-	1	1	-	1	-	-	-	-	-	
TOTAL FOR FISCAL YEAR 2027					1	0	0	0	1	1	0	1	1	1	1	1	1	

Table 2. (Continued) Planned monitor well construction projects for fiscal years 2024 – 2028

[-, none; CFWI, Central Florida Water Initiative; CGWQMN, Coastal Groundwater Quality Monitoring Network; FDOT, Florida Department of Transportation; LFA I, Lower Floridan aquifer below middle confining unit I; LFA II, Lower Floridan aquifer below middle confining unit II; LFA VIII, Lower Floridan aquifer below middle confining unit VIII; MFL, Minimum Flows and Levels; NDWRAP, Northern District Water Resource Assessment Project; Perm, permanent; ROMP, Regional Observation and Monitor-well Program; ROW, right-of-way; SWUCA, Southern Water Use Caution Area; Temp, temporary; TLA, temporary license area; UFA, Upper Floridan aquifer; UFANMN, Upper Floridan aquifer Nutrient Monitoring Network]

Site Number	Site Name	Project	County	Easement Status	Monitor Wells								Perm LFA I	Temp LFA I	Perm LFA II	Temp LFA II	Perm LFA VIII	Temp LFA VIII
					Perm surficial	Temp surficial	Perm Hawthorn	Temp Hawthorn	Perm UFA	Temp UFA								
FISCAL YEAR 2028																		
TR 10-3	Camden Field	CGWQMN, SWUCA, ROMP	Hillsborough	Not Acquired	1	-	-	-	2	-	-	-	-	-	-	-	-	
ROMP 112	Rutland (Carlton Half Moon)	NDWRAP, ROMP	Sumter	District Property	-	1	-	-	-	1	1	1	-	-	-	-	-	
-	Camp Mining Replacement	NDWRAP, UFANMN	Citrus	Not Acquired	-	-	-	-	1	-	-	-	-	-	-	-	-	
TR 7-3	Durante Park	CGWQMN, SWUCA, ROMP	Manatee	No Expiration	1	-	2	-	1	-	-	-	-	-	-	-	-	
TOTAL FOR FISCAL YEAR 2028					2	1	2	0	4	1	1	1	0	0	0	0	0	
GRAND TOTAL FISCAL YEARS 2024 – 2028					18	2	5	1	16	4	3	3	2	2	3	2		

Geohydrologic Data Section Work Plan 2024 Core Drilling and Testing Timeline¹



[¹Timeline forecast is based on an exploratory core drilling and testing rate of 25 feet per week (average rate from completed sites over last 10 years) plus site preparation time, an additional work (including removing rods, back-plugging, and abandoning core holes) rate of 150 feet per week, and current staff and resources; CME, Central Mining Equipment 85 drill rig; ROMP, Regional Observation and Monitor-well Program; TR, Transect; UDR, Universal Drill Rigs 200D LS drill rig]

Figure 1. Geohydrologic Data Section core drilling and testing projects forecast timeline.

Table 3. Planned aquifer performance tests for fiscal years 2024 – 2028

[-, none; ROMP, Regional Observation and Monitor-well Program; TLA, temporary license area]

Site Number	Site Name	County	Easement Status	Fiscal Year	Aquifer Performance Tests			
					Surficial	Hawthorn	Upper Floridan	Lower Floridan
-	Thornhill Ranch	Polk	Acquired	2024	-	-	1	-
ROMP 88.5	Northeast Polk	Polk	Acquired; TLA expires at project completion	2025	-	-	1	3
ROMP 46	Baird	Polk	Acquired; TLA Expires 12/1/2023	2026	1	2	2	-
ROMP 75	Auburn-dale	Polk	Easement expires 2041	2027	-	-	1	-
ROMP 75	Auburn-dale	Polk	Easement expires 2041	2028	1	-	2	1
TOTAL FOR FISCAL YEARS 2024 – 2028					2	2	7	4

site will provide a detailed characterization of the saltwater interface within the Upper Floridan aquifer.

Core drilling and testing is needed from land surface to the saltwater/freshwater interface. A monitor well is required in the Upper Floridan aquifer to monitor the saltwater interface. The surficial aquifer and shallow Upper Floridan aquifer wells at the Centralia well site will be used in conjunction with this saltwater interface well. This well site will be equipped for long-term monitoring of water levels and water quality.

ROMP 112 – Rutland (Carlton Half Moon)

This is an existing well site in northwestern Sumter County within the District's Gum Slough property. Prior work at this well site includes lithologic sampling from land surface to 1,026 feet bls and construction of a surficial aquifer well and Upper Floridan aquifer well. This well site is part of the ROMP inland 10-mile grid network and supports the Northern District Water Resources Assessment Project (NDWRAP). Core drilling and testing at this site will provide a detailed characterization of the Upper and Lower Floridan aquifers, and delineate the extent of middle confining units I, II, and VIII.

Core drilling and testing is needed from land surface to the base of the Floridan aquifer system. Monitor wells are required in the Lower Floridan aquifer below middle confining unit I, Lower Floridan aquifer below middle confining unit II, and Lower Floridan aquifer below middle confining unit VIII, if present. Temporary wells are needed in the surficial aquifer, Upper Floridan aquifer, and the Lower Floridan aquifer below middle confining unit I, Lower Floridan aquifer below middle confining unit II, and Lower Floridan aquifer below middle confining unit VIII, if present. This well site will be equipped for long-term monitoring of water levels and water quality.

TR 10-3 – Camden Field

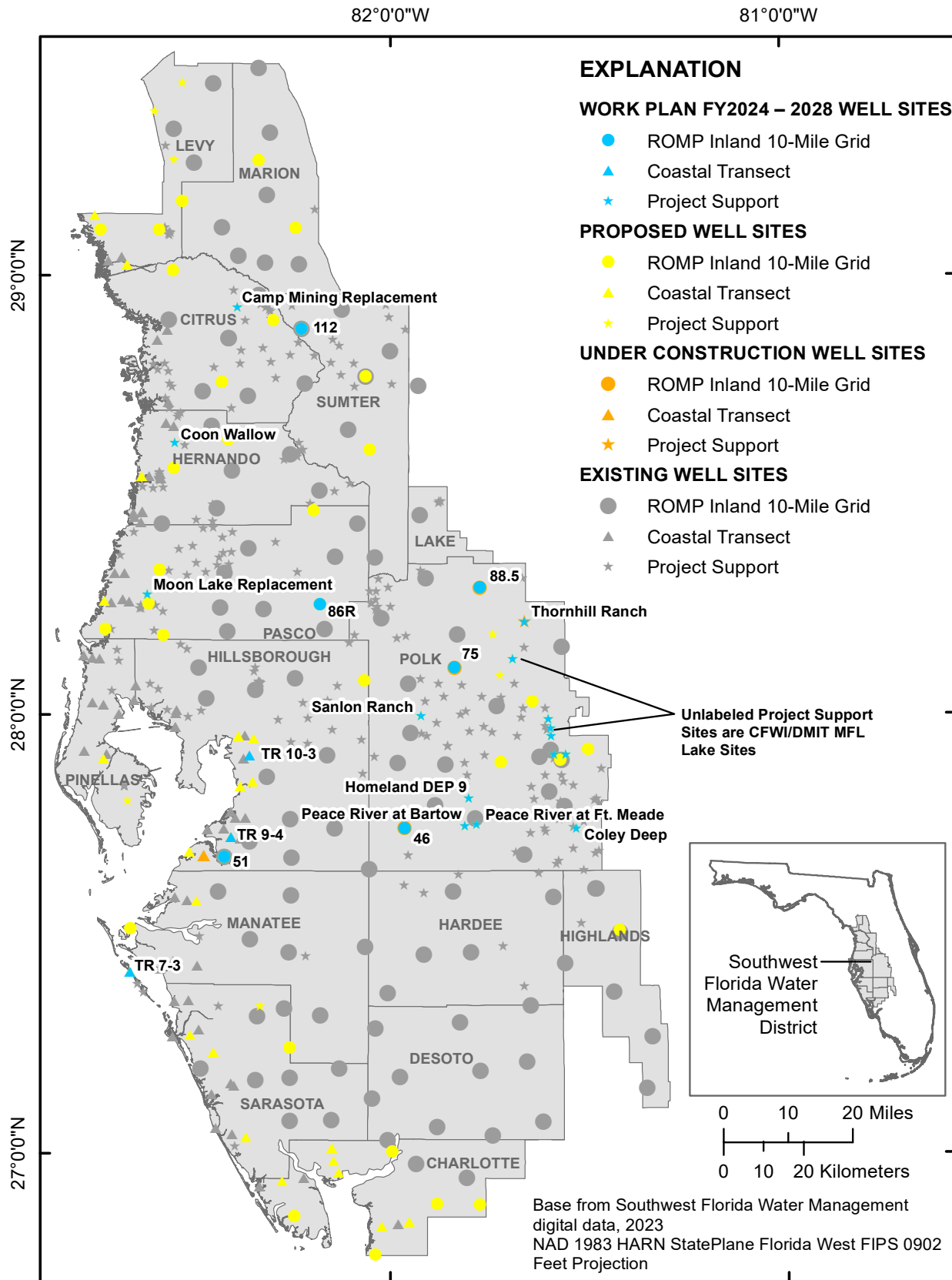
This well site is in west-central Hillsborough County. This well site is part of the ROMP coastal transect network and will assist in completing a coastal transect of existing wells to monitor the saltwater interface. Also, this well site is in an ideal location to provide data affects from a nearby SHARP well and it supports the SWUCA.

Core drilling and testing is needed from land surface to the saltwater/freshwater interface and will provide a detailed characterization of the surficial aquifer, Hawthorn aquifer system, and Upper Floridan aquifer. Monitor wells are required in the surficial aquifer and the Upper Floridan aquifer. This well site will be equipped for long-term monitoring of water levels and water quality.

Camp Mining Replacement

This well site is proposed to be located in northeastern Citrus County about a half mile from the plugged Camp Mining Upper Floridan aquifer well. This area is ideal for monitoring the Upper Floridan aquifer water levels to aid in groundwater modeling and May/September potentiometric mapping. This site also supports the NDWRAP and the UFANMN.

Core drilling and testing will determine the geographical extent of the middle confining units I and II. Core drilling is needed to 50 feet within the middle confining unit II. This site will require the construction of one Upper Floridan aquifer monitoring well. This well site will be equipped for long-term monitoring of water levels and water quality.



[CFWI, Central Florida Water Initiative; DMIT, Data, Monitoring, and Investigations Team; FIPS, Federal Information Processing Standard; FY, fiscal year; HARN, High Accuracy Reference Network; NAD, North American Datum; MFL, minimum flows and levels; ROMP, Regional Observation and Monitor-well Program; TR, Transect]

Figure 2. Geohydrologic Data Section core drilling and well construction sites.

TR 7-3 – Durante Park

This well site is in southwestern Manatee County. This well site is part of the ROMP coastal transect network, which supports the CGWQMN that monitors the saltwater interface, and will assist in completing a coastal transect of existing wells within the Most Impacted Area (MIA) of the SWUCA. This site is in an area with insufficient data and is critical for understanding the Hawthorn aquifer system and determining the top of the Upper Floridan aquifer, which will aid in regulation permitting.

Core drilling and testing is needed from land surface to the saltwater/freshwater interface and will provide a detailed characterization of the surficial aquifer, Hawthorn aquifer system, and the saltwater interface within the Upper Floridan aquifer. Monitor wells are required in the surficial aquifer, any of the aquifers present within the Hawthorn aquifer system, and the Upper Floridan aquifer. This well site will be equipped for long-term monitoring of water levels and water quality.

Project Support Well Construction Projects

Project support well construction sites require well construction and minimal hydrogeologic data collection. The data collection work is limited to split-spoon sampling, drill cuttings collection, and geophysical logging. These well sites are typically completed in two to three weeks from the start of construction because of the limited data collection activities. Some well sites are included in more than one District project. The monitor wells planned for each project are presented in table 2.

Central Florida Water Initiative

The CFWI is a water supply planning effort to review existing and projected water use demands in a five-county region of Central Florida. The boundaries of the St. Johns River Water Management District, the South Florida Water Management District, and the Southwest Florida Water Management District meet in the area of southern Lake, Orange, Osceola, Seminole, and Polk Counties. This project involves the collaborative efforts of the three water management districts to determine the sustainable limits of the Floridan aquifer system and study alternative sources of water to address central Florida's current and long-term water supply needs (Central Florida Water Initiative, 2023).

The DMIT was created to identify existing hydrologic data currently collected within the CFWI boundaries and to make recommendations for future monitoring activities in the CFWI region. The DMIT produced a Hydrogeologic Work Plan which was updated in February 2020, that identifies and lists monitoring requirements for wetlands, the surficial aquifer, the Upper Floridan aquifer, and the Lower Floridan aquifer. Well sites requiring coring and testing, well installation

and/or aquifer testing include ROMP 88.5 – Northeast Polk and ROMP 46 – Baird, which are discussed in the previous section. Most CFWI sites will also provide data for the MFL project, which is explained in the next section (Data, Monitoring, and Investigations Team, 2020).

Minimum Flows and Levels

This project involves the establishment of MFLs for lakes, wetlands, rivers, and aquifers to identify the minimum flow and level at which further withdrawals would be significantly harmful to the water resources or ecology of the area (Southwest Florida Water Management District, 2023). Rivers, streams, springs, and estuaries require the establishment of minimum flows; and lakes, wetlands, and aquifers require the establishment of minimum levels. These projects require split-spoon sample collection and the construction of surficial aquifer and/or Upper Floridan aquifer monitor wells adjacent to the water body.

Surficial aquifer monitor wells are required to help establish and/or monitor minimum levels at several lakes within the CFWI. Upper Floridan aquifer monitor wells are required for the following Polk County lakes: Lake Starr, Lake Annie, and Lake Lowery (Data, Monitoring, and Investigations Team, 2020).

Monitor well construction is required at two locations along the Peace River. Surficial aquifer monitor wells are required at Bartow and Fort Meade to quantify the relationship between the Peace River and the surficial aquifer (Data, Monitoring, and Investigations Team, 2020).

Coastal Groundwater Quality Monitoring Network

The CGWQMN is a network of wells used to monitor the groundwater quality in areas of the District that are susceptible to saltwater intrusion and/or upwelling of mineralized water (Kraft, 2011). Proposed projects that will be included in this network include: TR 9-4 – Ruskin, Coon Wallow, TR 10-3 – Camden Field, and TR 7-3 – Durante Park.

In addition, 27 Upper Floridan aquifer well sites were proposed to be added to existing transect sites and were approved in the FY2023 Business Plan Summary. These well sites will be evaluated in the future to determine if more inland well sites are needed because of saltwater intrusion (Southwest Florida Water Management District, 2021). As of May 2023, the construction of these additional wells is on hold until funds and staff are available.

Upper Floridan aquifer Nutrient Monitoring Network

The Upper Floridan aquifer Nutrient Monitoring Network (UFANMN) is a network of wells used to monitor nutrients

Table 4. Additional work required at ongoing Geohydrologic Data section well sites for fiscal years 2024 – 2028

[-, none; LFA VIII, Lower Floridan aquifer below middle confining unit VIII; ROMP, Regional Observation and Monitor-well Program; TLA, temporary license area]

Site Number	Site Name	County	Easement Status	Number of Back-plugs needed	Number of Abandonments Needed	Summary of Work
ROMP 88.5	Northeast Polk	Polk	Acquired; TLA expires at project completion	1	-	Remove rods and back-plug core hole
ROMP 88	Rock Ridge	Polk	District Property	1	2	Remove rods, abandon core hole 2 and 3, and back-plug LFA VIII monitor well
ROMP 75	Auburndale	Polk	Easement expires 2041	-	1	Remove rods and abandon core hole
ROMP 46	Baird	Polk	Acquired; TLA (Polk County) expires 6/13/2028	1	-	Remove rods and back-plug core hole

Table 5. Well repair requests received by the Geohydrologic Data Section as of May 2023

Total Number of Well Repair Requests	Completed Well Repair Requests	Pending Repairs	Percent Completed
344	176	168	51

Table 6. District-owned monitor wells needing inspection per the Well Repair and Maintenance Program as of May 2023

District-owned Monitor Wells	Number of Wells Inspected	Total Number of Wells Pending Inspection	Percent Completed
1,948	1,585	363	81

in groundwater basins of major springs within the District. The network is mostly made up of existing monitor wells and private wells volunteered by homeowners for sampling. Sixty three well site replacements were proposed in the FY2023 Business Plan Summary to replace existing private wells and infill gaps in the existing monitor well networks for nutrient assessments and modeling (Southwest Florida Water Management District, 2021). However, after reevaluation, it was determined that existing and already proposed District well sites would be sufficient for the UFANMN and the 63 well replacements were not included in the FY2024 Business Plan Summary (Southwest Florida Water Management District, 2022). Water quality from these well sites will support the springs restoration initiatives in the northern portion of the District.

Well Sites Requiring Additional Work

Additional work is required at ongoing well sites to complete the core drilling and testing phase or to finish the project.

This work can include removing core rods and temporary casing from core holes, back-plugging monitor wells or core holes, and abandoning core holes. Approximately 10,500 feet of core rods and temporary casing need to be removed from core holes and 7,300 feet of open hole needs to be back-plugged or abandoned at existing core drilling and testing well sites. Table 4 lists the work required at four core drilling and testing well sites for FYs 2024 to 2028 and figure 1 presents an estimated timeline to complete the work.

Well Repair and Maintenance Program

The WRMP was established to routinely assess District monitor wells and perform necessary repairs, modifications, or abandonments as needed. Since the 1970s, hundreds of monitor wells have been constructed or acquired by the GEO section within the District as part of the ROMP and other support projects. Many of these wells are now 30 to 40 years old and repair and maintenance are needed to maintain the

integrity of these wells. Wells acquired by the District after they were constructed may need to be modified to comply with the District's well construction standards and to ensure there is no cross-connection of aquifers. Monitor wells that are damaged by vehicles or vandalism and wells in the way of road construction projects may require repair, replacement, or abandonment.

Historically, the GEO section has responded to well problems and performed repairs or abandonments on an as-needed basis and when work loads permit. The WRMP ensures a proactive approach by routinely inspecting and maintaining the District's monitor wells to avoid failing wells and allow continuous collection of accurate data.

Table 5 shows the number of well repair requests received by the GEO section as of May 2023 and percent completed. Table 6 shows the number of District-owned monitor wells that require routine inspection and maintenance by the GEO section as part of the WRMP and percent completed. The backlog of repair requests will need to be worked on while incorporating a certain number of routine inspections and maintenance during FY2024 to FY2028. Appendix C presents additional metrics for the WRMP.

Summary and Conclusions

Groundwater demand continues to increase throughout the District. The potential to adversely affect the water resources increases as a result of this demand. Hydrogeologic data and thorough monitoring are necessary to ensure that sound management decisions can be made.

The GEO Section's data collection programs and monitor well networks serve as the District's primary source for hydrogeologic data. This Work Plan identifies the hydrogeologic data collection and well construction activities planned for FY2024 to FY2028. Construction of 61 new wells are planned to support District projects during those fiscal years.

Projects requiring extensive data collection are grouped as core drilling and testing projects. Four ongoing core drilling and testing projects (ROMP 88 – Rock Ridge, ROMP 88.5 – Northeast Polk, ROMP 46 – Baird, and ROMP 75 – Auburn-dale) will be completed and six new core drilling and testing projects will be started. The construction of 42 wells and completion of 15 aquifer performance tests are planned for these projects from FY2024 to FY2028. These projects support District regional projects including the CFWI, CGWQMN, NDWRAP, ROMP, SWUCA, and UFANMN.

Projects that require monitor well construction but minimal data collection are grouped as project support well construction projects. The construction of 19 monitor wells are planned for these projects from FY2024 to FY2028. The project support well construction projects aid District regional projects including the CFWI, CGWQMN, and MFL.

Selected References

- Central Florida Water Initiative, 2023, What is CFWI: https://cfwater.com/what_is_CFWI.html (accessed April 20, 2023).
- Data, Monitoring, and Investigations Team, 2016, DMIT Hydrogeologic Annual Work Plan for FY2016–2020, 21 p.
- Data, Monitoring, and Investigations Team, 2020, DMIT Hydrogeologic Annual Work Plan for FY2020–2025, 23 p.
- Kraft, Carol, 2011, Coastal Groundwater Quality Monitoring Network/Water-Use Permit Network Report Volume VI: Brooksville, Florida, Southwest Florida Water Management District, 146 p.
- Southwest Florida Water Management District, 2021, FY2023 Business Plan Summary: Brooksville, Florida, Southwest Florida Water Management District, 27 p.
- Southwest Florida Water Management District, 2023, Strategic Plan 2023–2027: Brooksville, Florida, Southwest Florida Water Management District, 23 p.

Appendix A. Work Requests

ROMP Site Scope of Work Checklist

Site Information

Name ROMP 75 - Auburndale

County Polk

Project Regional Observation and Monitor-well Program

STR 29/27/25

Is this an existing District well site? ☒ No ☐ Yes

Lat/Long 28 06 31.7 / 81 50 13.9

Geologic Sampling ☐ No ☒ Yes

Depth of exploration:

- ☐ to top of rock
- ☐ to saltwater/freshwater interface
- ☐ 50 feet into middle confining unit I
- ☒ 50 feet into middle confining unit II
- ☐ 50 feet into middle confining unit VI
- ☐ to the base of the Floridan aquifer system
- ☐ Other (please specify in comments)

Aquifer Performance Testing ☐ No ☒ Yes

parameters to be tested

- surficial aquifer: ☒ T ☒ S
- Peace River aquifer (PZ1): ☐ T ☐ S ☐ L
- upper Arcadia aquifer (PZ2): ☒ T ☒ S ☒ L
- lower Arcadia aquifer (PZ3): ☐ T ☐ S ☐ L
- Upper Floridan aquifer: ☒ T ☒ S ☒ L
- Lower Floridan aquifer below MCU I: ☐ T ☐ S ☐ L
- Lower Floridan aquifer below MCU II: ☐ T ☐ S ☐ L
- Lower Floridan aquifer below MCU VI: ☐ T ☐ S

An APT may not be possible if water quality is poor

Well Construction ☐ No ☒ Yes

The primary long-term use for the well(s) will be:

- ☒ Water Level Monitoring
- ☒ Water Quality Monitoring
- ☐ Other (please specify in comments)

Check all aquifers that require long-term monitoring:

- ☒ surficial aquifer
- ☐ Peace River aquifer (PZ1)
- ☒ upper Arcadia aquifer (PZ2)
- ☐ lower Arcadia aquifer (PZ3)
- ☒ Upper Floridan aquifer
- ☐ Lower Floridan aquifer below MCU I
- ☒ Lower Floridan aquifer below MCU II
- ☐ Lower Floridan aquifer below MCU VI
- ☐ Other (please specify in comments)

Other Data Collection ☒ No ☐ Yes

- ☐ Geophysical Logging
- ☐ Video Logging
- ☐ Flow Logging
- ☐ Sonic Logging
- ☐ Other (please specify in comments)

Comments:

Wells and APTs needed for all aquifers present in the HAS. I suspect we should look at the Lower Floridan at this site. But I will defer to M Barcelo on this.

☐ No changes☒ Changes noted above☐ New Site

Initial: MHB

Well Site Scope of Work Checklist

Is this an existing District well site? ☐ No ☒ Yes

Date 7/30/2015

Site Name ROMP 88

Project Central Florida Water Initiative/P005

County Polk

STR 16/25/24

Justification (cost/benefit) Described on Page 2

Lat/Long 28 18 38.5 / 81 54 40.0

PIMS Project No. (if applicable) _____

Geologic Sampling ☐ No ☒ Yes

Depth of exploration:

- ☐ to top of rock
- ☐ to saltwater/freshwater interface
- ☐ 50 feet into middle confining unit I
- ☐ 50 feet into middle confining unit II
- ☐ 50 feet into middle confining unit VI
- ☒ to the base of the Floridan aquifer system
- ☐ Other (please specify in comments)

Aquifer Performance Testing ☐ No ☒ Yes

parameters to be tested

- surficial aquifer: ☐ T ☐ S
- Peace River aquifer (PZ1): ☐ T ☐ S ☐ L
- upper Arcadia aquifer (PZ2): ☐ T ☐ S ☐ L
- lower Arcadia aquifer (PZ3): ☐ T ☐ S ☐ L
- Upper Floridan aquifer: ☒ T ☒ S ☒ L
- Lower Floridan aquifer below MCU I: ☒ T ☒ S ☒ L
- Lower Floridan aquifer below MCU II: ☒ T ☒ S ☒ L
- Lower Floridan aquifer below MCU VI: ☐ T ☐ S

An APT may not be possible if water quality is poor

Well Construction ☐ No ☒ Yes

The primary long-term use for the well(s) will be:

- ☒ Water Level Monitoring
- ☒ Water Quality Monitoring
- ☐ Other (please specify in comments)

Check all aquifers that require long-term monitoring:

- ☒ surficial aquifer
- ☐ Peace River aquifer (PZ1)
- ☐ upper Arcadia aquifer (PZ2)
- ☐ lower Arcadia aquifer (PZ3)
- ☐ Upper Floridan aquifer
- ☒ Lower Floridan aquifer below MCU I
- ☒ Lower Floridan aquifer below MCU II
- ☐ Lower Floridan aquifer below MCU VI
- ☐ Other (please specify in comments)

Other Data Collection ☐ No ☒ Yes

- ☒ Geophysical Logging
- ☒ Video Logging
- ☒ Flow Logging
- ☐ Sonic Logging
- ☐ Other (please specify in comments)

Comments:

Existing ROMP 88 site. Site currently has an Upper Floridan aquifer well. A surficial aquifer well and a minimum of two Lower Floridan aquifer wells below middle confining units I and II are being proposed.

Geologic sampling: Exploratory drilling to determine presence of both middle confining units I and II. Water quality, water level and hydraulic property profiling is necessary to determine presence of both middle confining units I and II.

☐ No changes

☐ Changes noted above

☐ New Site

Initial: JGP

Justification for the work required (cost and benefit):**Purpose and Scope:**

This is an existing ROMP site located in an area that is critical toward establishing the geographic extent of middle confining units I and II and the extent of the Lower Floridan aquifers below these confining units. This site will be improved to a "full ROMP site" with the addition of a surficial aquifer well, a Lower Floridan aquifer well below middle confining unit I and a Lower Floridan aquifer well below middle confining unit II. Exploration will be conducted to the degree necessary to define the boundaries of the middle confining units I and II and the Lower Floridan aquifers. Discrete zone testing for water quality and water level should be conducted to assist in defining these boundaries and to characterize the water supply potential of the aquifers. Exploration will extend to the base of the Floridan aquifer system.

Wells will be constructed in the surficial aquifer and Lower Floridan aquifers below middle confining units I and II. Additional temporary wells in the Lower Floridan aquifers below middle confining units I and II may be constructed in order to conduct multi-well aquifer performance tests. Multi-well aquifer performance tests are essential in this region to determine the sustainability of water quality for the Upper Floridan and the Lower Floridan aquifers below each unit. The multi-well aquifer performance tests will also determine the leakage coefficients between the surficial aquifer and the Upper Floridan, the Upper Floridan and the Lower Floridan below middle confining unit I and between the Lower Floridan aquifers below middle confining units I and II.

Justification:

1. This site is located within Polk County which is part of the Central Florida Water Initiative (CFWI) region. The Lower Floridan aquifers have been identified in the CFWI Regional Water Supply Plan as an alternative water supply as a non-traditional groundwater source. Increased withdrawals from the Lower Floridan aquifers are anticipated due to the expectation of meeting water supply demands within the CFWI region through non-traditional water supply sources.
2. This site has been identified in the Data, Monitoring and Investigations Team (DMIT) FY2015-FY2020 Work plan. The DMIT is a subgroup of the CFWI and has identified this location as a key site to collect water levels and water quality data in the Lower Floridan aquifers below middle confining units I and II.
3. This site will refine the hydraulic properties of the Lower Floridan aquifer below middle confining units I and II for use in the District Wide Regulatory Model (DWRM), Northern District Model (NDM), East Central Florida Transient Expanded Model (ECFTX) and future modeling efforts.
4. This site will improve the calibration of the DWRM, NDM, ECFTX and future modeling efforts.
5. This site will be used for collecting long-term water levels for the Lower Floridan aquifers below middle confining units I and II.
6. This site will improve current knowledge of the extent of middle confining units I and II within the region of the WMD jurisdictional boundary.

The unit boundaries, hydraulic test data, and long-term monitoring will be utilized by the District, local water users and the CFWI. Data collection will be key in the determination of the health of the resource in northern Polk County as future water supply demands from the Lower Floridan aquifers within this region grows.

Benefits:

Expansion of data collection in this region will help manage and protect the resource. These data will allow the District to forecast limitation in groundwater supply so cost-effective solutions can be properly planned. This will prevent unanticipated impacts that will need to be resolved with water users of the region under a recover strategy. These data will also contribute to the prevention of environmental impacts that may not be able to be recovered or mitigated once experienced.

Supported Projects:

Data- Aquifer Exploration & Monitor Well Drilling Program (ROMP) Districtwide Initiatives (C005)
 CFWI- Data, Monitoring and Investigations Team
 CFWI- Expansion of East Central Florida Transient Model
 Hydrogeological Investigation of the Lower Floridan Aquifer in Polk County (P280)
 District Wide Regulatory Model - (P625)
 MFL Technical Support- Northern District WRAP (P876)

Potentially Supported projects:

WUP- Water Use Permitting Program (M002)
 Regional Water Supply Plan
 Water Quality Monitoring Network
 Hydrologic Conditions Reporting



Well Site Scope of Work Checklist

Is this an existing District well site? ☒ No ☐ Yes

Date 3/9/2021

Site Name ROMP 88.5

Project Central Florida Water Initiative/P005

County Polk

STR TBD

Justification (cost/benefit) Described on Page 2

Lat/Long TBD

PIMS Project No. (if applicable) _____

Geologic Sampling ☐ No ☒ Yes

Depth of exploration:

- ☐ to top of rock
- ☐ to saltwater/freshwater interface
- ☐ 50 feet into middle confining unit I
- ☐ 50 feet into middle confining unit II
- ☐ 50 feet into middle confining unit VI
- ☒ to the base of the Floridan aquifer system
- ☐ Other (please specify in comments)

Aquifer Performance Testing ☐ No ☒ Yes

parameters to be tested

- surficial aquifer: ☐ T ☐ S
- Peace River aquifer (PZ1): ☐ T ☐ S ☐ L
- upper Arcadia aquifer (PZ2): ☐ T ☐ S ☐ L
- lower Arcadia aquifer (PZ3): ☐ T ☐ S ☐ L
- Upper Floridan aquifer: ☒ T ☒ S ☒ L
- Lower Floridan aquifer below MCU I: ☒ T ☒ S ☒ L
- Lower Floridan aquifer below MCU II: ☒ T ☒ S ☒ L
- Lower Floridan aquifer below MCU VI: ☐ T ☐ S

An APT may not be possible if water quality is poor

Well Construction ☐ No ☒ Yes

The primary long-term use for the well(s) will be:

- ☒ Water Level Monitoring
- ☒ Water Quality Monitoring
- ☐ Other (please specify in comments)

Check all aquifers that require long-term monitoring:

- ☒ surficial aquifer
- ☐ Peace River aquifer (PZ1)
- ☐ upper Arcadia aquifer (PZ2)
- ☐ lower Arcadia aquifer (PZ3)
- ☒ Upper Floridan aquifer
- ☒ Lower Floridan aquifer below MCU I
- ☒ Lower Floridan aquifer below MCU II
- ☐ Lower Floridan aquifer below MCU VI
- ☐ Other (please specify in comments)

Other Data Collection ☐ No ☒ Yes

- ☒ Geophysical Logging
- ☒ Video Logging
- ☒ Flow Logging
- ☐ Sonic Logging
- ☐ Other (please specify in comments)

Comments:

Geologic sampling: Exploratory drilling to determine presence of both middle confining units I and II and the glauconite marker unit. Water quality, water level and hydraulic property profiling is necessary to determine presence of both middle confining units I and II and the glauconite marker unit.

☐ No changes

☐ Changes noted above

☒ New Site

Initial: JGP

Justification for the work required (cost and benefit):**Purpose and Scope:**

This is a new ROMP site located in an area that is critical toward establishing the geographic extent of middle confining units I and II, the glauconite marker unit (GMU), and the extent of the Lower Floridan aquifers below these confining units. This site will be a "full ROMP site" with a surficial aquifer well, Upper Floridan aquifer well, Lower Floridan aquifer well below middle confining unit I, Lower Floridan aquifer well below middle confining unit IIa, and a Lower Floridan aquifer well below the GMU (Lower Floridan aquifer IIb), for a total of 5 monitor wells. Exploration will be conducted to the degree necessary to define the boundaries of the middle confining units I and II, the GMU, and the Lower Floridan aquifers I, IIa, and IIb. Discrete zone testing for water quality and water level should be conducted to assist in defining these boundaries and to characterize the water supply potential of the aquifers. Exploration will extend to the base of the Floridan aquifer system.

Wells will be constructed in the surficial aquifer, Upper Florida aquifer, Lower Floridan aquifers below middle confining units I and II, and Lower Floridan aquifer below the GMU. Additional temporary wells in the Lower Floridan aquifers below middle confining units I, IIa, and below the GMU may be constructed in order to conduct multi-well aquifer performance tests. Multi-well aquifer performance tests are essential in this region to determine the sustainability of water quality for the Upper Floridan and the Lower Floridan aquifers below each unit. The multi-well aquifer performance tests will also determine the leakance coefficients between the surficial aquifer and the Upper Floridan, the Upper Floridan and the Lower Floridan below middle confining unit I and between the Lower Floridan aquifers below middle confining units I and II.

Justification:

1. This site is located within Polk County which is part of the Central Florida Water Initiative (CFWI) region. The Lower Floridan aquifers have been identified in the CFWI Regional Water Supply Plan as an alternative water supply as a non-traditional groundwater source. Increased withdrawals from the Lower Floridan aquifers are anticipated due to the expectation of meeting water supply demands within the CFWI region through non-traditional water supply sources.
 2. This site has been identified in the Data, Monitoring and Investigations Team (DMIT) FY2015-FY2020 Work plan. The DMIT is a subgroup of the CFWI and has identified this location as a key site to collect water levels and water quality data in the Lower Floridan aquifers below middle confining units I and II and the Lower Floridan aquifer below the GMU (IIb).
 3. This site will refine the hydraulic properties of the Lower Floridan aquifers below middle confining units I, and II, and the Lower Floridan aquifer below the GMU (IIb) for use in the District Wide Regulatory Model (DWRM), Northern District Model (NDM), East Central Florida Transient Expanded Model (ECFTX) and future modeling efforts.
 4. This site will improve the calibration of the DWRM, NDM, ECFTX and future modeling efforts.
 5. This site will be used for collecting long-term water levels for the Lower Floridan aquifers below middle confining units I, II, and the Lower Floridan aquifer below the GMU (IIb).
 6. This site will improve current knowledge of the extent of middle confining units I and II, and the glauconite marker unit within the region of the WMD jurisdictional boundary.
- The unit boundaries, hydraulic test data, and long-term monitoring will be utilized by the District, local water users and the CFWI. Data collection will be key in the determination of the health of the resource in northern Polk County as future water supply demands from the Lower Floridan aquifers within this region grows.

Benefits:

Expansion of data collection in this region will help manage and protect the resource. These data will allow the District to forecast limitation in groundwater supply so cost-effective solutions can be properly planned. This will prevent unanticipated impacts that will need to be resolved with water users of the region under a recover strategy. These data will also contribute to the prevention of environmental impacts that may not be able to be recovered or mitigated once experienced.

Supported Projects:

Data- Aquifer Exploration & Monitor Well Drilling Program (ROMP) Districtwide Initiatives (C005)
 CFWI- Data, Monitoring and Investigations Team
 CFWI- Expansion of East Central Florida Transient Model
 Hydrogeological Investigation of the Lower Floridan Aquifer in Polk County (P280)
 District Wide Regulatory Model - (P625)
 MFL Technical Support- Northern District WRAP (P876)
 Potentially Supported projects:
 WUP- Water Use Permitting Program (M002)
 Regional Water Supply Plan
 Water Quality Monitoring Network
 Hydrologic Conditions Reporting

Well Site Scope of Work Checklist

Is this an existing District well site? ☐ No ☒ Yes

Date _____

Site Name ROMP 46 - Baird

Project _____

County Polk

STR 31/31/24

Justification (cost/benefit) Described on Page 2

Lat/Long 27 44 24.3 / 81 57 02.6

PIMS Project No. (if applicable) _____

Geologic Sampling ☐ No ☒ Yes

Depth of exploration:

- ☐ to top of rock
- ☐ to saltwater/freshwater interface
- ☐ 50 feet into middle confining unit I
- ☒ 50 feet into middle confining unit II
- ☐ 50 feet into middle confining unit VI
- ☐ to the base of the Floridan aquifer system
- ☐ Other (please specify in comments)

Aquifer Performance Testing ☐ No ☒ Yes

parameters to be tested

- | | | | |
|--------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| surficial aquifer: | <input checked="" type="checkbox"/> T | <input checked="" type="checkbox"/> S | |
| Peace River aquifer (PZ1): | <input type="checkbox"/> T | <input type="checkbox"/> S | <input type="checkbox"/> L |
| upper Arcadia aquifer (PZ2): | <input checked="" type="checkbox"/> T | <input checked="" type="checkbox"/> S | <input checked="" type="checkbox"/> L |
| lower Arcadia aquifer (PZ3): | <input checked="" type="checkbox"/> T | <input checked="" type="checkbox"/> S | <input checked="" type="checkbox"/> L |
| Upper Floridan aquifer: | <input checked="" type="checkbox"/> T | <input checked="" type="checkbox"/> S | <input checked="" type="checkbox"/> L |
| Lower Floridan aquifer below MCU I: | <input type="checkbox"/> T | <input type="checkbox"/> S | <input type="checkbox"/> L |
| Lower Floridan aquifer below MCU II: | <input type="checkbox"/> T | <input type="checkbox"/> S | <input type="checkbox"/> L |
| Lower Floridan aquifer below MCU VI: | <input type="checkbox"/> T | <input type="checkbox"/> S | |

An APT may not be possible if water quality is poor

Well Construction ☐ No ☒ Yes

The primary long-term use for the well(s) will be:

- ☒ Water Level Monitoring
- ☒ Water Quality Monitoring
- ☐ Other (please specify in comments)

Check all aquifers that require long-term monitoring:

- ☒ surficial aquifer
- ☐ Peace River aquifer (PZ1)
- ☒ upper Arcadia aquifer (PZ2)
- ☒ lower Arcadia aquifer (PZ3)
- ☒ Upper Floridan aquifer
- ☐ Lower Floridan aquifer below MCU I
- ☐ Lower Floridan aquifer below MCU II
- ☐ Lower Floridan aquifer below MCU VI
- ☐ Other (please specify in comments)

Other Data Collection ☒ No ☐ Yes

- ☐ Geophysical Logging
- ☐ Video Logging
- ☐ Flow Logging
- ☐ Sonic Logging
- ☐ Other (please specify in comments)

Comments:

This site has been acquired.

Wells and ATPs need for all aquifers present in the HAS.

☐ No changes

☐ Changes noted above

☐ New Site

Initial: _____

Data Collection Bureau Initiative Request Section I (To be completed by requestor)

For instructions, refer to guidance documentation. After completing, route this form to requestor's Manager and Bureau Chief for approvals. Upon receipt, forward approvals and this completed form to data.maps@watermatters.org. Contact DCB data stewards for assistance.

Requestor: Ron Basso

Date: 3/21/2022

Sponsor: Ron Basso

Project/Network Name:

Saltwater Intrusion Minimum Aquifer Levels

Project/Network Number:

SWIMAL (P628)

Anticipated Begin Date:

10/1/2022

Anticipated End Date:

9/30/2023

Associated Permit Numbers:

Data Collection Stewardship Category:

☐ Geospatial (MGIS) ☐ Land Survey
☒ Geohydrologic ☒ Hydrologic
☒ Water Quality ☐ Other

Area of Responsibility Linkages:

☐ Flood Protection ☒ Natural Systems
☐ Water Quality ☒ Water Supply

Initiative Request Description:

Add another ROMP site (TR9-4) to replace the existing TR9-3 Avon Park monitor well that is currently one of 10 SWIMAL wells. The Saltwater Intrusion Minimum Aquifer Level is a composite UFA water level comprised of a weighted average of 10 monitor wells in the MIA of the SWUCA. A SHARP injection well (RW-5) is proposed to be installed about 1,200 feet from the existing TR9-3 site. It will be important to substitute the new Avon Park Fm well at TR9-4 site for the existing one at TR9-3 since its water levels will likely be locally influenced by nearby injection. It will be vital to have a period of overlap between the two wells prior to injection so that a statistical relation can be developed to hindcast an average 1990-1999 water level at the new TR9-4 Avon Park well. This overlap should be as long as possible to develop the best statistical fit but include a minimum of one to two years if possible.

District/Business Purpose, Benefits, and Key Stakeholders:

The new site will support the continuity of the original SWIMAL network and composite level. The wells are referenced along with the minimum aquifer level in administrative rules. The new site will serve as an additional background site to monitor water levels and water quality outside the immediate influence of SHARP injection. The SWIMAL level will be a significant "barometer" to evaluate the effectiveness of the SWUCA recovery plan in 2025.

Data Collection Frequency and Duration:

Hourly, but not real time, on an ongoing basis for water levels. Quarterly or bi-annually for water quality as part of the coastal saltwater intrusion network.

Geographic Coverage:

The new location is near Ruskin, Florida in southwest Hillsborough County.

Easement or License Agreement or Permitting Details:

A parcel has been donated by Hillsborough County at a location about 1.5 miles southeast of the existing TR9-3 site.

Data Collection Entity (describe who will be responsible for the data collection):

Responsible Entity	Task Type	Entity Type
Data Collection Bureau	Water levels and Water quality	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor
Data Collection Bureau	Coring and Instillation of Monitoring Wells	<input checked="" type="checkbox"/> Staff <input checked="" type="checkbox"/> Contractor
		<input type="checkbox"/> Staff <input type="checkbox"/> Contractor
		<input type="checkbox"/> Staff <input type="checkbox"/> Contractor

Assumptions and Dependencies:

<ul style="list-style-type: none"> Hillsborough County may fund the cost of the new site (TR9-4). Availability of Hydrologic Data Section staff to install monitoring equipment. Assumed multiple sensors can be connected to one datalogger and telemetry setup.
Business Risks: <ul style="list-style-type: none"> High – if not implemented, the SWIMAL and background water level and water quality conditions may be artificially affected by SHARP injection – thus negating the intent of the SWIMAL well monitoring and assessment of recovery in the SWUCA area.
Other Options: <ul style="list-style-type: none"> none

Data Collection Bureau Initiative Requirements Section II (To Be Completed by DCB Staff)	
Initiative Request Description: Perform exploratory core drilling and testing to locate the depth of the 1,000 mg/L chloride concentration. Construct 1 Avon Park/UFA saltwater interface monitor well, construct 1 Suwannee Fm/UFA monitor well, construct 1 surficial aquifer monitor well.	
DCWG Investment Classification <input type="checkbox"/> Operational: Recurring/No workload issue <input checked="" type="checkbox"/> Significant: Ad hoc/Workload Issue	Initiative Priority <input checked="" type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Initiative Complexity: Fairly complex – may require drilling staff to operate UDR drill rig and CME drill rig simultaneously. Could potentially require hiring of temporary worker to assist with labor requirements on CME.	Coordination with Real Estate and/or WUP: Real Estate staff needed to work with Hillsborough County staff to locate and acquire a suitable location for temporary construction easement and permanent well site.
Proposed Solution: District staff will perform exploratory core drilling and testing with District-owned CME drill rig to delineate aquifers and locate 1,000 mg/L chloride depth. Staff will design required permanent monitor wells. Private sector well drilling contractors will be contracted to construct the permanent monitor wells.	
Proposed Solution Components (see addendum for costs breakdown): Well Construction: <ul style="list-style-type: none"> 1 surficial monitor well 1 Suwannee Formation/UFA monitor well 1 Avon Park Formation/UFA SWI monitor well Monitoring Equipment: <ul style="list-style-type: none"> Hydrologic Data Monitoring Equipment – see Data Monitoring Equipment and Parts & Supplies Costs table below Monitoring Labor Effort: <ul style="list-style-type: none"> Water Quality Monitoring – 2 wells monitored 3x/year as part of saltwater intrusion network; surficial well would not be monitored for WQ. Hydrologic Data – 3 wells continuous monitoring – 4 hrs/year operation, 1.5 hrs/yr maintenance Other: <ul style="list-style-type: none"> Laboratory Analysis – Analysis of standard saltwater intrusion network analyte list for 2 wells sampled 3x/year. 	
Initiative Risks: No risks for water quality monitoring.	

DCB Workload Assessment: GEO Section – 2 drilling staff and 1 hydrogeologist will be assigned to conduct exploratory drilling to locate the depth of the salt-water interface. This work can be accomplished with existing staff utilizing the District-owned CME core drilling rig. One drilling staff will oversee a private well drilling company contracted to construct the permanent wells. **Water quality monitoring** – the additional of 2 wells sampled 3x per year will not result in a significant or undue burden on existing workloads; these wells will be added to groundwater network runs already established in the geographic area.

Costs (to update values for labor, equipment and other columns from addendum calculations, right click in cell and select 'Update Field')

Well Construction	Monitoring Equipment	Monitoring Labor	Other	Total
322,750	6,582	1,180	\$534.12 (Lab analysis)	\$ 331,046.12

Funding

Budgeted	Budget Transfer Required?
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Financial Assumptions and Dependencies:

Hydrologic Data – funds for equipment will need to be budgeted in the year construction is anticipated.

DCB Data Collection Bureau Initiative Request Dispensation

Referred to Governance?	Governance Meeting Date	Final Approval Status
<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Approved <input type="checkbox"/> Denied

Governance Related Comments:

Addendum: To be completed separately by each DCB section involved in the request. To update values in total column, right click in cell and select 'Update Field'

Well Construction Costs

Description	Total Cost
1 Permanent Surficial Aquifer Monitor Well (TD 50 feet bls)	\$5,000
1 Permanent UFA Suwannee Limestone Monitor Well (TD 375 feet bls)	\$93,750

1 Permanent UFA Avon Park Formation SWI Monitor Well (TD 800 feet bls)	\$224,000
	\$
Total Wellsite Construction	\$322,750

Assumption(s):

Data Monitoring Equipment and Parts & Supplies Costs:

Description	Cost/Item	Quantity	Total Cost
Equipment Shelters	\$289	3	\$867
Data Logger	\$2,100	1	\$2,100
Sensors	\$1,138	3	\$3,414
Power Supply	\$201	1	\$201
Telemetry	\$0	0	\$0
Overall Equipment Cost			\$6,582

Assumption(s):

Labor Costs:

Labor Description	Hours Required	Labor Cost/hr	# of Stations	# of Events	Total Cost
Water Quality Monitoring	4	\$23	2	3	\$552
Hydrologic Data Monitoring Equipment Installation (no telemetry)	7	\$	3	1	\$215
Hydrologic Data O&M	5.5	\$	3		\$413
Overall Labor					\$1,180

Assumption(s): Hydrologic Data = 11 hrs installation, 4 hrs annual operation, 1.5 hrs annual maintenance for all 3 wells.

Other Costs:

Description	Qty Required	Cost/Item	# of Stations	# of Events	Total Cost
Laboratory Analysis	1	\$89.02	2	3	\$534.12
Overall Other Cost					\$534.12

Assumption(s):

Geohydrologic Data Request for Well Construction, Modification, Testing

Work Request Number	562	Submitted On	08/14/2019
Priority	Normal	Submitted At	11:55:42
Status	Assigned	Last Edited On	08/14/2019
Submitted By	ddewitt	Last Edited At	11:55:45
Assignees	Manager		
Description			
Entered on 08/14/2019 at 11:55:42 AM EDT (GMT-0400) by Dave Dewitt: [no Description entered]			
Well Site Name	Saltwater interface monitor well at Coon Wallow	Name of Project	ROMP
Is this an Existing District Well Site?	NO	Is the Well Site Already Acquired?	YES
County	Hernando		
Description of Work			
Core drilling and testing needed to identify the depth to the saltwater interface inland of the Chassahowitzka Swamp in coastal Hernando County. A single Upper Floridan aquifer monitor well will be constructed following test drilling.			
Is New Well Construction Required?	YES	Select Aquifers that Require Long-Term Monitoring:	Upper Floridan aquifer
Is Exploratory Data Required?	YES	Depth of Exploration for Lithologic	to saltwater/freshwater interface
Is Aquifer Performance Testing Required?	NO	Logging, Other Data Collection Needs	YES
Select All Other that Apply	Geophysical Logging	I have read the TERMS OF REQUEST	Yes
Request Type	Well Construction, Modification, Testing	Priority Explanation	Requested work will be included in the GEO workplan and scheduled accordingly
PIMS Project Number	C005		
Justification (Cost-Benefit)			
Addition of this saltwater interface monitoring site was discussed during the 2019 GEO Workplan meeting with members of the Resource Evaluation section and the WQMP. An apparent gap in groundwater-quality monitoring had been identified between the recently completed TR 19-3 site and the two TR-20 transect sites to the north. This new well site will close that gap in the coastal interface monitoring, and will aid in delineating the subsurface saline water for tracking saltwater intrusion in the coastal margin of Hernando County.			
The Primary Long-Term Use for the Well(s) will be	Water Level and Quality Monitoring	Is Existing Well Modification Required?	No
Lithologic Sampling Required?	Yes	Water Quality Profile Required?	Yes
Depth of Exploration for Water Quality	to saltwater/freshwater interface	Water Level Profile Required?	Yes
Depth of Exploration for Water Level	to saltwater/freshwater interface	Hydrologic Profile (Slug Test) Required?	No
Master Ticket Number	562	Last Name	Dewitt
First Name	Dave	Email Address	dave.dewitt@swfwmd.state.fl.us
User ID	DDEWITT	Call Back Number	4512

Data Collection Bureau Initiative Request Section I (To be completed by requestor)		
For instructions, refer to guidance documentation. After completing, route this form to requestor's Manager and Bureau Chief for approvals. Upon receipt, forward approvals and this completed form to data.maps@watermatters.org . Contact DCB data stewards for assistance.		
Requestor: Cortney Cameron, Environmental Flows & Levels Sec.	Date: 10/17/2022	
Sponsor: Geohydrologic Data Section		
Project/Network Name: Northern District WRAP	Project/Network Number: P876	
Anticipated Begin Date: ASAP	Anticipated End Date: Ongoing	Associated Permit Numbers:
Data Collection Stewardship Category: <input type="checkbox"/> Geospatial (MGIS) <input type="checkbox"/> Land Survey <input checked="" type="checkbox"/> Geohydrologic <input checked="" type="checkbox"/> Hydrologic <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Other		Area of Responsibility Linkages: <input type="checkbox"/> Flood Protection <input checked="" type="checkbox"/> Natural Systems <input type="checkbox"/> Water Quality <input checked="" type="checkbox"/> Water Supply
Initiative Request Description: This proposal is for expanded construction at the existing ROMP 112 site, which is currently comprised of surficial and Upper Floridan aquifer wells. Exploration will confirm the presence or absence of middle confining unit I (MCU I). This confirmation will help delineate the westward extent of MCU I and the Lower Floridan aquifer below MCU I (LFA I) in this area. The site is ideal as it exists near the current extrapolated edge of MCU I based on existing data and would close a data "gap." If the MCU I/LFA I is present, the site will also provide data regarding hydraulic parameters and water quality of the LFA I, which are not well-defined in this area. Exploration will also delineate and provide similar data for deeper Lower Floridan aquifers LFA II and LFA VIII, which are also poorly defined in this area, and could be targeted for alternative water supply development in years to come. The proposed location for this ROMP site is on District-owned property and therefore does not require an easement or access agreement.		
District/Business Purpose, Benefits, and Key Stakeholders: <ul style="list-style-type: none"> Hydrogeologic and hydrologic data from this site will support LFA parameterization and calibration for several regional groundwater models, which have been constrained by data availability. These models include the Central Springs Model (P300), ECFTX (P284), and District-Wide Regulatory Model (P625), as the site falls within their model domains. These groundwater models are used to support regional water supply planning (P466), the establishment and assessment of minimum flows and levels (MFLs), and water use permitting evaluations (M002). The site is near several waterbodies with established or scheduled MFLs, including Tsala Apopka Lake and Lake Panasoffkee (P256), Gum Slough (B824), and the Withlacoochee River (B223). The data will aid MFL evaluations, reevaluations, and assessments. The site is near an area of special interest due to ongoing growth in the region, including the southwestward expansion of the Villages, and associated anticipated LFA withdrawals. 		
Data Collection Frequency and Duration: <ul style="list-style-type: none"> Water levels: Hourly, but not real time, on an ongoing basis. Water quality: Quarterly for the LFA and at least annually for the UFA, on an ongoing basis. 		
Geographic Coverage: Inverness (Sumter County), approximately -82.22814, 28.88051		
Easement or License Agreement or Permitting Details: The proposed site is located on District property adjacent to existing wells.		
Data Collection Entity (describe who will be responsible for the data collection):		
Responsible Entity	Task Type	Entity Type
Geohydrologic	Stratigraphy, Hydraulic Properties (T, S, L)	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor
Hydrologic	Water Levels	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor
Water Quality	Water Quality Monitoring	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor
Assumptions and Dependencies:		

<ul style="list-style-type: none"> The existing Tsala Apopka Lake 2 nested well site, on District-owned property, serves as a good candidate for the location of or upgrade to a ROMP site. This excludes access issues and provides opportunities to consolidate monitoring efforts associated with the proposed site.
Business Risks: <ul style="list-style-type: none"> Medium – Without this data, staff will continue to rely on existing data to infer the extent of MCUI in this area, as well as properties of LFAI. Groundwater modelling of the LFA in this area will be associated with more uncertainty relative to if the data were collected, particularly since the proposed site closes a data “gap” regarding MCUI/LFAI.
Other Options: <ul style="list-style-type: none"> Rely on extrapolated or modelled LFA water levels and parameters based on the District’s existing LFA well network and regional groundwater models results. Construct the well at a later date.

Data Collection Bureau Initiative Requirements Section II (To Be Completed by DCB Staff)

Initiative Request Description: Geohydrologic Data deep exploration, well construction, and aquifer pump testing at an existing ROMP site in Sumter County (ROMP 112 – Rutland).		
DCWG Investment Classification <input type="checkbox"/> Operational: Recurring/No workload issue <input checked="" type="checkbox"/> Significant: Ad hoc/Workload Issue		Initiative Priority <input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low
Approved Through Requestor’s Leadership <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Initiative Complexity: High: Wireline coring with hydraulic/WQ packer testing, well construction design/oversight, and conduct aquifer performance tests	Coordination with Real Estate and/or WUP Little to none; proposed well site is located on District-owned property
Proposed Solution: 1. Utilize GEO Section staff and equipment to perform exploratory core drilling and testing to base of Floridan aquifer system (sub-Floridan confining unit) and design permanent monitors and temporary pump wells for all aquifers 2. Contract private well drilling contractor(s) to construct all wells with GEO staff oversight 3. Utilize GEO Section staff and equipment to conduct aquifer pump tests of all aquifers 4. Contract private well drilling contractor(s) to abandon all temporary wells 5. Add permanent wells to appropriate monitoring network and begin WL and WQ monitoring once necessary monitoring equipment have been installed on well(s)		
Proposed Solution Components (see addendum for costs breakdown): Well Construction: <ul style="list-style-type: none"> Surf Aq - 1 temporary pump well U Fldn Aq – 1 temporary pump well L Fldn Aq I – 1 permanent monitor and 1 temporary pump well L Fldn Aq II – 1 permanent monitor and 1 temporary pump well L Fldn Aq VIII – 1 permanent monitor and 1 temporary pump well Monitoring Equipment: <ul style="list-style-type: none"> Includes datalogger for >2 sensors, electronics enclosure, 3 well (PT) sensors, 3 equipment shelters, power supply (battery, solar panel, regulator) Monitoring Labor Effort: <ul style="list-style-type: none"> WQ sample collection quarterly from 4 wells Hydro Data - 7 hours installation, 4 hours annual labor, 1.5 hour maintenance labor (All included in costs section below.) Installation labor (\$245), annual operation (\$140), annual O&M (\$53) Other: <ul style="list-style-type: none"> In-house laboratory analysis of quarterly samples from 3 LFA wells and annual samples from the UFA well 		
Initiative Risks:		

DCB Workload Assessment: WQ – the addition of 1 day of work per quarter for 2 technicians for this type of routine sampling can be assumed without the need for additional overtime, equipment, or staff.				
Hydro Data Installation 7 hours Annual Operation 4 hours Annual Maintenance 1.5 hour				
Costs (to update values for labor, equipment and other columns from addendum calculations, right click in cell and select 'Update Field')				
Well Construction	Monitoring Equipment	Monitoring Labor	Other	Total
Error! Reference source not found.2,810,200			\$1,157	\$
Funding				
Budgeted			Budget Transfer Required?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input type="checkbox"/> Yes <input type="checkbox"/> No	
Financial Assumptions and Dependencies: Hydrologic data collection equipment could be budgeted in future years after project is approved and for the year well construction is anticipated to be complete. Effort assumes budget requests for construction and equipment are approved.				
DCB Data Collection Bureau Initiative Request Dispensation				
Referred to Governance?		Governance Meeting Date	Final Approval Status	
<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Approved <input type="checkbox"/> Denied	
Governance Related Comments:				

Addendum: To be completed separately by each DCB section involved in the request. To update values in total column, right click in cell and select 'Update Field'

Well Construction Costs (Cost Estimated 10/14/2022 mtg)

Description	Labor and Materials Cost/Foot	Estimated Total Depth (Feet)	Total Cost
Surf Aq Temporary Pump Well	\$110	20	\$2,200
U Fldn Aq Temporary Pump Well	\$250	350	\$87,500
L Fldn Aq I Monitor	\$290	700	\$203,000
L Fldn Aq I Temporary Pump Well	\$300	700	\$210,000
L Fldn Aq II Monitor	\$350	1350	\$472,500
L Fldn Aq II Temporary Pump Well	\$360	1350	\$486,000

L Fldn Aq VIII Monitor	\$350	1900	\$665,000
L Fldn Aq VIII Temporary Pump Well	\$360	1900	\$684,000
Total Wellsite Construction			\$2,810,200

Assumption(s):

Data Monitoring Equipment and Parts & Supplies Costs:

Description	Cost/Item	Quantity	Total Cost
Campbell datalogger (CR1000X)	\$1,750	1	\$1,750
Pressure Transducer (WL Sensor)	\$1,138	3	\$3,414
Equipment Shelter	\$550	3	\$1,650
Electronics Enclosure	\$350	1	\$350
Power Supply (Battery, Solar Panel, Regulator)	\$201	1	\$201
Overall Equipment Cost			\$7,365

Assumption(s):

Labor Costs:

Labor Description	Hours Required	Labor Cost/hr	# of Stations	# of Events	Total Cost
WQ Labor (Annually)	20	\$23		4	\$1,840
Hydro Data Installation (one-time cost)	7	\$35			\$245
Hydro Data Operation (Annually)	4	\$35			\$140
Hydro Data Maintenance (Annually)	1.5	\$35			\$53
Overall Labor					\$2,278

Assumption(s):

Other Costs:

Description	Qty Required	Cost/Item	# of Stations	# of Events	Total Cost
Laboratory Analysis	1	89		13	\$1,157
Overall Other Cost					\$1,157

Assumption(s):

Data Collection Bureau Initiative Request Section I (To be completed by requestor) For instructions, refer to guidance documentation. After completing, route this form to requestor's Manager and Bureau Chief for approvals. Upon receipt, forward approvals and this completed form to data.maps@watermatters.org . Contact DCB data stewards for assistance.																	
Requestor: Robert Peterson		Date: 10/22/2021															
Sponsor: Ted Gates																	
Project/Network Name: ROMP TR 10-3/CGWQMN/SHARP		Project/Network Number: CGWQMN P078, SHARP II N855															
Anticipated Begin Date: 01/03/2022	Anticipated End Date: 06/03/2022	Associated Permit Numbers:															
Data Collection Stewardship Category: <input type="checkbox"/> Geospatial (MGIS) <input type="checkbox"/> Land Survey <input checked="" type="checkbox"/> Geohydrologic <input checked="" type="checkbox"/> Hydrologic <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Other		Area of Responsibility Linkages: <input type="checkbox"/> Flood Protection <input type="checkbox"/> Natural Systems <input checked="" type="checkbox"/> Water Quality <input checked="" type="checkbox"/> Water Supply															
Initiative Request Description: Conduct exploratory core drilling and monitor well construction on the ROMP TR 10-3 well site easement located at Simmons Bower county park in the Progress Village area of Tampa, in association with the SHARP RW-2 groundwater recharge site which is approximately 8/10 mi. southwest of the TR 10-3 site. A suite of permanent monitoring wells needs to include an Avon Park-Upper Floridan monitor with a similar aquifer interval to that of the RW-2 injection well.																	
District/Business Purpose, Benefits, and Key Stakeholders: The SHARP/SHARE CFI projects are a major initiative for groundwater recharge in the SWUCA and MIA regions of southern Hillsborough County that necessitates infill and expansion of the current monitoring available through existing well sites. The TR 10-3 site is in a favorable location to provide both groundwater level and water-quality data affected by the SHARP in support of Hillsborough County and the District.																	
Data Collection Frequency and Duration: Hourly/daily continuous groundwater levels monitoring and periodic water-quality sample collections (triennial), ongoing in duration.																	
Geographic Coverage: Central and southern Hillsborough County, coastal margin of Tampa Bay in the SWUCA.																	
Easement or License Agreement or Permitting Details: Existing ROMP perpetual easement in place on the county park property																	
Data Collection Entity (describe who will be responsible for the data collection): <table border="1"> <thead> <tr> <th>Responsible Entity</th> <th>Task Type</th> <th>Entity Type</th> </tr> </thead> <tbody> <tr> <td>Geohydrologic Data section</td> <td>Drilling and well construction</td> <td><input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor</td> </tr> <tr> <td>Hydrologic Data section</td> <td>Instrumenting wells and levels</td> <td><input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor</td> </tr> <tr> <td>Water Quality Monitoring section</td> <td>Periodic sample collections</td> <td><input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor</td> </tr> <tr> <td></td> <td></td> <td><input type="checkbox"/> Staff <input type="checkbox"/> Contractor</td> </tr> </tbody> </table>			Responsible Entity	Task Type	Entity Type	Geohydrologic Data section	Drilling and well construction	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor	Hydrologic Data section	Instrumenting wells and levels	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor	Water Quality Monitoring section	Periodic sample collections	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor			<input type="checkbox"/> Staff <input type="checkbox"/> Contractor
Responsible Entity	Task Type	Entity Type															
Geohydrologic Data section	Drilling and well construction	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor															
Hydrologic Data section	Instrumenting wells and levels	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor															
Water Quality Monitoring section	Periodic sample collections	<input checked="" type="checkbox"/> Staff <input type="checkbox"/> Contractor															
		<input type="checkbox"/> Staff <input type="checkbox"/> Contractor															
Assumptions and Dependencies: Availability of core drilling rig and crew, dependent on revising drilling schedules for other sites. Availability of Hydrologic Data Section staff to install monitoring equipment. Assumed multiple sensors can be connected to one datalogger and telemetry setup.																	

Business Risks: Medium: Revision of drilling schedules for other sites could delay construction Coordination with other Division(s) in the District required.
Other Options: Group the TR 10-3 site with other additional site requests pending for the SHARP

Data Collection Bureau Initiative Requirements Section II (To Be Completed by DCB Staff)				
Initiative Request Description: 1. Exploratory core drilling and testing to locate the 1,000 milligram/liter chloride concentration (saltwater interface). 2. Design and construction of three monitor wells for long-term monitoring of the surficial and Upper Floridan aquifer water levels and water quality.				
DCWG Investment Classification <input checked="" type="checkbox"/> Operational: Recurring/No workload issue <input type="checkbox"/> Significant: Ad hoc/Workload Issue			Initiative Priority <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	
Initiative Complexity: High. GEO staff will use core drilling rig to locate the SW Interface and design monitor wells. Next RFB must be initiated to contract with a private well drilling contractor to construct the proposed permanent monitor wells.			Coordination with Real Estate and/or WUP: GEO staff working with Real Estate staff to procure a temporary construction easement near an existing permanent wellsite located within a Hillsborough County park.	
Proposed Solution:				
Proposed Solution Components (see addendum for costs breakdown):				
Well Construction: <ul style="list-style-type: none"> GEO staff will use core drilling rig to locate the SW Interface and design monitor wells. Next RFB must be initiated to contract with a private well drilling contractor to construct the three proposed permanent monitor wells. 				
Monitoring Equipment: <ul style="list-style-type: none"> Hydrologic Data Monitoring Equipment – see Data Monitoring Equipment and Parts & Supplies Costs table below 				
Monitoring Labor Effort: <ul style="list-style-type: none"> Water Quality Monitoring – 2 wells monitored 3x/year as part of saltwater intrusion network; surficial well would not be monitored for WQ. Hydrologic Data – 3 wells continuous monitoring – 4 hrs/year operation, 1.5 hrs/yr maintenance 				
Other: <ul style="list-style-type: none"> Laboratory Analysis – Analysis of standard saltwater intrusion network analyte list for 2 wells sampled 3x/year. 				
Initiative Risks: No risks for water quality monitoring.				
DCB Workload Assessment: GEO: staff can begin core drilling and testing at the TR10-3 Simmons Bower Park site in October 2022. Core drilling and testing is estimated to take approximately 5 months to complete (February 28, 2023). Monitor well construction should begin in March 2023 and be completed in 3 months (May 30, 2023). Water quality monitoring – the additional of 2 wells sampled 3x per year will not result in a significant or undue burden on existing workloads; these wells will be added to groundwater network runs already established in the geographic area.				
Costs (to update values for labor, equipment and other columns from addendum calculations, right click in cell and select 'Update Field')				
Well Construction	Monitoring Equipment	Monitoring Labor	Other	Total

\$236,5000	7,245	Error! Reference source not found.458	\$534.12	\$ 269,237.12
Funding				
Budgeted			Budget Transfer Required?	
<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Yes <input type="checkbox"/> No	
Financial Assumptions and Dependencies: Hydrologic Data – Estimated equipment costs added to GENOPER budget on 3/18/22 but may need to re-budget in FY24, since TR 9-4 was decided by RMD to be the higher priority on 3/22/22 and these funds could be used to accomplish that monitoring install first.				
DCB Data Collection Bureau Initiative Request Dispensation				
Referred to Governance?		Governance Meeting Date	Final Approval Status	
<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Approved <input type="checkbox"/> Denied	
Governance Related Comments:				

Addendum: To be completed separately by each DCB section involved in the request. To update values in total column, right click in cell and select 'Update Field'

Well Construction Costs (Updated 10/19/2022 mtg)

Description	Total Cost
Surficial Monitor	\$ 2,500
Permanent UFA Suwannee Limestone Monitor (375 feet bls)	\$ 90,000
Permanent UFA Avon Park Formation Monitor (600 feet bls)	\$ 144,000
	\$
Total Wellsite Construction	\$236,500

Assumption(s):

Data Monitoring Equipment and Parts & Supplies Costs:

Description	Cost/Item	Quantity	Total Cost
Equipment Shelters	\$289	3	\$867
Data Logger	\$2,100	1	\$2,100
Sensors	\$1,138	3	\$3,414
Power Supply	\$201	1	\$201

Telemetry	\$663	1	\$663
Overall Equipment Cost			\$7,245

Assumption(s):

Labor Costs:

Labor Description	Hours Required	Labor Cost/hr	# of Stations	# of Events	Total Cost
Water Quality Monitoring	4	\$23	2	3	\$552
Hydrologic Data Monitoring Equipment Installation	8	\$	3	1	\$245
Hydrologic Data O&M	5.5	\$	3		\$458
Overall Labor					\$1,255

Assumption(s): Hydrologic Data = 8 hrs installation, 4 hrs annual operation, 1.5 hrs annual maintenance for all 3 wells.

Other Costs:

Description	Qty Required	Cost/Item	# of Stations	# of Events	Total Cost
Laboratory Analysis	1	\$89.02	2	3	\$534.12
Overall Other Cost					\$534.12

Assumption(s):

Geohydrologic Data Request for Well Construction, Modification, Testing

Work Request Number	566	Submitted On	10/22/2019
Priority	Normal	Submitted At	11:02:09
Status	Assigned	Last Edited On	02/08/2021
Submitted By	jpatterson	Last Edited At	14:00:52
Assignees	Manager Well Repair Team: Chris Tomlinson Individual Users: Tiffany Horstman		

Description

Entered on 10/22/2019 at 1:19:29 PM EDT (GMT-0400) by Ted Gates:
Tiffany, please initiate a new site acquisition request for a new site to replace this existing well.

Entered on 10/22/2019 at 11:02:09 AM EDT (GMT-0400) by Jason Patterson:
[no Description entered]

Well Site Name	Camp Mining UFA	Name of Project	Camp Mining FLDN
Is this an Existing District Well Site?	YES	County	Citrus

Description of Work

Installation of an Upper Floridan aquifer within 1/4 to 1/2 mile from original Camp Mining well site.

Is New Well Construction Required?	YES	Select Aquifers that Require Long-Term Monitoring:	Upper Floridan aquifer
Is Exploratory Data Required?	YES	Depth of Exploration for Lithologic	50 feet into middle confining unit II

Exploratory Data Comments

Verify existance of MCUI and tag top of MCUII.

Select Aquifers that Require Testing	Upper Floridan aquifer	Logging, Other Data Collection Needs	YES
Select All Other that Apply	Geophysical Logging	I have read the TERMS OF REQUEST	Yes
Request Type	Well Construction, Modification, Testing	Priority Explanation	Install a replacement Upper Floridan aquifer monitoring well near the recently plugged Camp Mining FLDN well

Justification (Cost-Benefit)

Camp Mining FLDN is approximately 1.25 miles west of the closest active monitoring well. The well is in a key location to monitor Upper Floridan aquifer water levels to aid in groundwater modeling and create the May/September potentiometric mapping.

SID #1	23439	STR for SID #1	10 18 19
Latitude for SID #1	28 56 08.75	Longitude for SID #1	82 23 34.74
The Primary Long-Term Use for the Well(s) will be	Water Level and Quality Monitoring	Is Existing Well Modification Required?	No
Transmissivity	Monitoring	Storativity	Monitoring
Leakance	Monitoring	Submit Site Acquisition Memo to Real Estate	Completed

Notes for Site Acquisition Memo to Real Estate

Submitted FootPrints Land Acquisition Request ticket #149 and attached memo.

Field Site Evaluation and Approval

Completed

Notes for Field Site Evaluation and Approval

6/9/20 - Tana to visit possible sites soon. 1/25/2021 - Followed up with Tana. No visits completed but did locate a county ROW that may be feasible. Will perform a visit on 2/1/2021 with Chris T. 2/8/2021 - site seems suitable. Prepared field review for Tana.

Easement Agreement

Work in Progress

Note for Easement Agreement

Sent field review of county ROW to Tana to pursue.

Lithologic Sampling Required?	Yes	Water Quality Profile Required?	Yes
Water Level Profile Required?	Yes	Depth of Exploration for Water Level	Other
Hydrologic Profile (Slug Test) Required?	No	Depth of Exploration Hydrologic Profile	Other
Master Ticket Number	566	Last Name	Patterson
First Name	Jason	Email Address	jason.patterson@swfwmd.state.fl.us
User ID	JPATTERSON	Call Back Number	4234

Well Site Scope of Work Checklist

Reset Form

Is this an existing District well site? ☒ No ☐ Yes

Date Jul 12, 2012

Site Name	ROMP TR 7-3 Durante Park	
Project	SWUCA Recovery Strategy	County Manatee
Justification (cost/benefit)	Described on Page 2	STR 25/35/16
PIMS Project No. (if applicable)	P085, C005	Lat/Long 27 24 52.72 / 82 39 30.00

Geologic Sampling ☐ No ☒ Yes

Depth of exploration:

- ☐ to top of rock
- ☒ to saltwater/freshwater interface
- ☐ 50 feet into middle confining unit I
- ☐ 50 feet into middle confining unit II
- ☐ 50 feet into middle confining unit VI
- ☐ to the base of the Floridan aquifer system
- ☐ Other (please specify in comments)

Aquifer Performance Testing ☒ No ☐ Yes

parameters to be tested

- surficial aquifer: ☐ T ☐ S
- Peace River aquifer (PZ1): ☐ T ☐ S ☐ L
- upper Arcadia aquifer (PZ2): ☐ T ☐ S ☐ L
- lower Arcadia aquifer (PZ3): ☐ T ☐ S ☐ L
- Upper Floridan aquifer: ☐ T ☐ S ☐ L
- Lower Floridan aquifer below MCU I: ☐ T ☐ S ☐ L
- Lower Floridan aquifer below MCU II: ☐ T ☐ S ☐ L
- Lower Floridan aquifer below MCU VI: ☐ T ☐ S

An APT may not be possible if water quality is poor

Well Construction ☐ No ☒ Yes

The primary long-term use for the well(s) will be:

- ☒ Water Level Monitoring
- ☒ Water Quality Monitoring
- ☐ Other (please specify in comments)

Check all aquifers that require long-term monitoring:

- ☒ surficial aquifer
- ☐ Peace River aquifer (PZ1)
- ☒ upper Arcadia aquifer (PZ2)
- ☒ lower Arcadia aquifer (PZ3)
- ☒ Upper Floridan aquifer
- ☐ Lower Floridan aquifer below MCU I
- ☐ Lower Floridan aquifer below MCU II
- ☐ Lower Floridan aquifer below MCU VI
- ☐ Other (please specify in comments)

Other Data Collection ☒ No ☐ Yes

- ☐ Geophysical Logging
- ☐ Video Logging
- ☐ Flow Logging
- ☐ Sonic Logging
- ☐ Other (please specify in comments)

Comments:

This site is acquired and there is no expiration date for temporary construction easement.

-Wells are needed for any aquifer present in the HAS.
-Saltwater intrusion well.

☐ No changes☒ Changes noted above☐ New Site

Initial: JGP

Site Name ROMP TR 7-3 Durante Park

Justification for the work required (cost and benefit):

Purpose and Scope:

This site will be a critical part of the the ROMP coastal transect network used to measure the movement of the saltwater/freshwater interface in Manatee County. The site will assist in completing a transect of existing wells within the Most Impacted Area (MIA) of the SWUCA to monitor the saltwater/freshwater interface. In order to provide detailed information about the location of the saltwater/freshwater interface, exploration will be conducted to the degree necessary to define the boundaries of the surficial aquifer, Hawthorn (intermediate) aquifer system, and Upper Floridan aquifer. Coring and testing will be conducted to the saltwater/freshwater interface.

The development and maintenance of this site will assist in the evaluation of the SWUCA Recovery Strategy and future Regional Water Supply Plan assessments. The data collection program, which includes this site, is used to set minimum aquifer levels within the SWUCA and MIA.

Justification:

1. This site will be used for collecting long-term Upper Floridan water levels.
2. This site will be used for collecting long-term water quality data.
3. This site will be the only hydrogeologic data point located within the Manatee County barrier islands.
4. This site will be used to determine the rate and rate of change of saltwater/freshwater within the MIA.
5. This site will be key for future modeling efforts in this region.
6. This site can potentially be used as an APT site for refining the hydraulic properties of the Hawthorn (intermediate) aquifer system as well as the Upper Floridan aquifer within the SWUCA/MIA.

Benefits:

Expansion of data collection in this region will help manage and protect the resource. These data will allow the District to forecast limitations in groundwater supply and the saltwater/freshwater interface along the coastal regions so cost-effective solutions can be properly planned. This will help prevent additional impacts that need to be resolved with water users of the region under the current recovery strategies (SWUCA and MIA). These data will also contribute to reducing environmental impacts that are not able to be recovered or mitigated.

Supported Projects:

SWUCA Recovery Strategy (P085)
 Data - Aquifer Exploration & Monitor Well Drilling Program (ROMP) District-wide Initiative (C005)
 Hydrologic Conditions Reporting
 Upper Floridan Aquifer Potentiometric Surface Mapping
 Regional Water Supply Plan

Appendix B. General Hydrogeology of the Southwest Florida Water Management District

[modified from Hydrostratigraphic Framework of the Southwest Florida Water Management District: Technical Report of the Regional Observation and Monitor-well Program (LaRoche and Horstman, 2022)]

Introduction

There has been a lot of variation in nomenclature conventions used to describe the aquifers and confining units underlying Florida. Although uniform guidelines for hydrostratigraphic nomenclature have not been formally adopted nationwide, the United States Geological Survey (Laney and Davidson, 1986) recognized the importance of consistent hydrostratigraphic terminology and their definitions for effective scientific communication and developed uniform nomenclature guidelines for designating and naming aquifers that is consistent with the stratigraphic nomenclature recommendations of the North American Stratigraphic Code (North American Commission on Stratigraphic Nomenclature, 2005). The District's hydrostratigraphic nomenclature convention (based on Miller [1986]) is consistent with the aquifer nomenclature guidelines of Laney and Davidson (1986) to appropriately rank and name the hydrogeologic units underlying the District. A comparison of the nomenclature convention used by the District and other published conventions is in figure B1.

Hydrostratigraphic Framework

The District is underlain by several aquifers of varying productivity, water quality, and regional extent. Generally, these aquifers include, in descending order: the undifferentiated surficial aquifer, the Peace River aquifer, the upper Arcadia aquifer, the lower Arcadia aquifer, the Upper Floridan aquifer, the Lower Floridan aquifer below middle confining unit I, the Lower Floridan aquifer below middle confining unit II, the Lower Floridan aquifer below middle confining unit VIII, and rarely the Lower Floridan aquifer below middle confining unit VI (fig. B2). The undifferentiated surficial aquifer is present throughout most of the central and southern District but is not a major source of water. The Peace River, upper Arcadia, and lower Arcadia aquifers compose the Hawthorn (formerly Intermediate) aquifer system and are present throughout much of the southern portion of the District (fig. B3). The Upper and Lower Floridan aquifers compose the Floridan aquifer system and underlie all of Florida and parts of Georgia, Alabama, and South Carolina (Miller, 1986). The Upper Floridan aquifer contains most of the fresh water underlying the District and is the primary water source in the District. The Lower Floridan aquifer below middle confining unit I contains fresh water in some areas and is withdrawn in parts of northeastern Sumter County at this time. The Lower Floridan aquifers below middle confining unit II and VIII commonly contain non-potable water and are not major water sources historically but are being investigated as alternative water sources in Polk County.

Surficial aquifer

The undifferentiated surficial aquifer (where present) is the uppermost aquifer within the District and mostly consists of undifferentiated sand, but may also contain shell, gravel, and clay. It contains water under unconfined (water table) conditions and is delineated where basal confinement is present. The undifferentiated surficial aquifer is absent in all or parts of Hillsborough, Pasco, Hernando, Sumter, Citrus, Marion, and Levy counties where basal clay is absent or very thin and breached by sinkholes or fractures that precludes characterization as a laterally extensive and functional surficial aquifer because of a lack of hydraulic continuity (Arthur and others, 2008). The undifferentiated surficial aquifer can be greater than 250 feet thick along the Lake Wales Ridge and Intraridge Valley in parts of Polk and Highlands counties (fig. B3). In two areas of Florida where surficial deposits are thick, highly permeable, and extensively used as a water source, they have been given aquifer names such as the sand-and-gravel aquifer in the westernmost panhandle and the Biscayne aquifer in southeastern Florida (Miller, 1986). These aquifers grade laterally into thin sands that are called the undifferentiated surficial aquifer (Miller, 1986). Although these three uppermost aquifers are often collectively referred to as the surficial aquifer system, they do not conform to the definition of an aquifer system because they are not separated at least locally by confining units that impede groundwater movement (Poland and others, 1972). Therefore, the District identifies them as aquifers.

Hawthorn aquifer system

The Hawthorn aquifer system is present only in the southern part of the District and pinches out north of central Hillsborough County (fig. B3). The Hawthorn aquifer system within the District contains up to three aquifers: the Peace River aquifer, the upper Arcadia aquifer, and the lower Arcadia aquifer (fig. B2). The Hawthorn aquifer system thickness generally ranges from about 50 feet in the northern portion to about 300 feet in the southern portion of where it is present in the District. At any location, the top of the Hawthorn aquifer system coincides with the top of the uppermost aquifer present, and the bottom coincides with the base of the lowermost aquifer present. Where no aquifers are present, the Hawthorn sediments are confining and pinch out north of central Pasco County. This aquifer system has inappropriately been referred to as the intermediate aquifer system and the aquifers within it have inaccurately been ranked as zones 1, 2, and 3. However, the District has made considerable progress in correcting the preceding naming, ranking, and vertical boundary errors based on aquifer nomenclature guidelines proposed by Laney and Davidson (1986) and the North American Stratigraphic Code (North American Commission on Stratigraphic Nomenclature, 2005). DeWitt and Mallams (2007) proposed the revised name of Hawthorn aquifer system and its aquifers as the Peace River

A

WYRICK 1960		LICHTLER 1960		CLARKE 1964		LEVE 1966		WOLANSKY 1978		MILLER 1980		BOGESS 1986; ARTHUR AND OTHERS 2008		SWFWMD PRESENT	
nonartesian aquifer		Shallow aquifer		water-table aquifer		shallow aquifer system		unconfined aquifer		surficial aquifer		surficial aquifer system		surficial aquifer	
confining unit		confining unit		confining unit		confining unit		confining unit		confining unit		confining unit		confining unit	

[SWFWMD, Southwest Florida Water Management District]

B

SPROUL AND OTHERS 1972		JOYNER, SUTCLIFFE 1976		WEDDERBURN AND OTHERS 1982		WOLANSKY 1983		BARR 1996		TORRES AND OTHERS 2001		KNOCHENMUS 2006		ARTHUR AND OTHERS 2008		SWFWMD PRESENT	
confining unit		confining unit		confining unit		confining unit		confining unit		confining unit		confining unit		confining unit		confining unit	
sandstone aquifer		Zone 1		Sandstone aquifer		Intermediate aquifers	Tamiami - upper Hawthorn aquifer	Permeable Zone 1		Intermediate aquifer system	Tamiami/ Peace River zone (PZ1)	Zone 1		Intermediate aquifer system / intermediate confining unit	zones/ aquifers were not delineated	Peace River aquifer	
confining unit		confining unit		confining unit				confining unit				confining unit				confining unit	
upper Hawthorn aquifer		Zone 2		mid-Hawthorn aquifer		Lower Hawthorn - upper Tampa aquifer	Upper Arcadia zone (PZ2)	Permeable Zone 2		Lower Arcadia zone (PZ3)	Zone 2	Zone 3		upper Arcadia aquifer	lower Arcadia aquifer	Hawthorn aquifer system	
confining unit		confining unit		confining unit				confining unit									
lower Hawthorn aquifer		Zone 3		lower Hawthorn / Tampa producing zone		confining unit		Permeable Zone 3		confining unit	confining unit	confining unit		confining unit	confining unit	confining unit	
confining unit		confining unit		confining unit				confining unit									

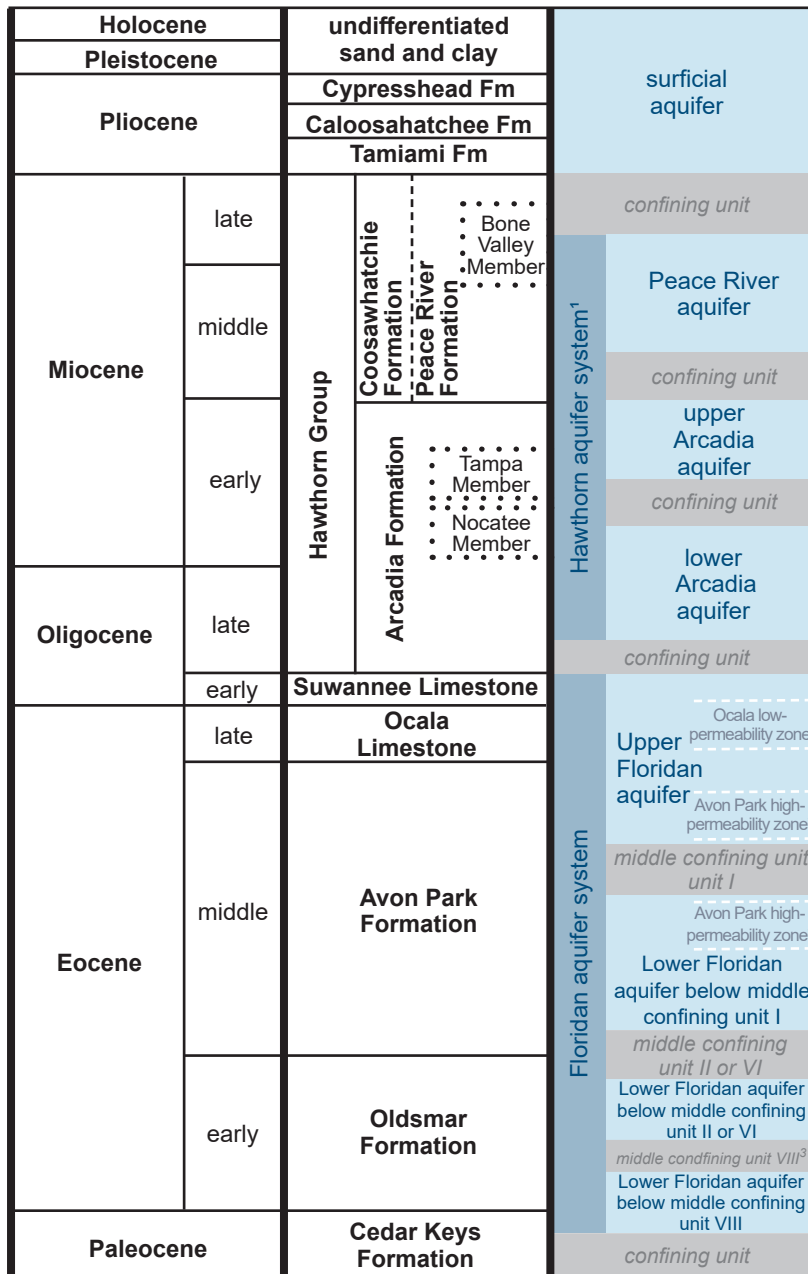
[FAS, Floridan aquifer system; PZ, permeable zone; SWFWMD, Southwest Florida Water Management District]

Figure B1. Nomenclature of (A), the surficial aquifer, (B), the Hawthorn aquifer system, and (C), the Floridan aquifer system used by the Southwest Florida Water Management District compared to nomenclature in previously published reports.

[illegible]

[Terms shown are for hydrogeologic units present within the Southwest Florida Water Management District (SWFWMD); ¹Arthur and others acknowledge existence of the middle confining unit I within the Southwest Florida Water Management but do not map it for Special Publication 68; ²The Avon Park high-permeability zone (SWFWMD fracture zone) crosses middle confining unit I in central Polk County; therefore, it occurs above the middle confining unit I in northern Polk and below the middle confining unit I in southern Polk; ³The middle confining unit VIII of Miller (1986) in south Florida was extended across the entire peninsula based on new data in Williams and Kuniansky (2015) and reidentified as the Glauconite marker unit]

Figure B1. (Continued) Nomenclature of (A), the surficial aquifer, (B), the Hawthorn aquifer system, and (C), the Floridan aquifer system used by the Southwest Florida Water Management District compared to nomenclature in previously published reports.



[FM, Formation; ¹The Hawthorn aquifer system was previously referred to as the Intermediate aquifer system; ²The Avon Park high-permeability zone (SWFWMD fracture zone) crosses middle confining unit I in central Polk County; therefore, it occurs above the middle confining unit I in northern Polk and below the middle confining unit I in southern Polk; ³The middle confining unit VIII of Miller (1986) was extended beyond the original extent in south Florida based on new data]

Figure B2. Chart correlating chronostratigraphic and lithostratigraphic units to the current hydrogeologic framework of the Southwest Florida Water Management District.

aquifer, the upper Arcadia aquifer, and the lower Arcadia aquifer. The Hawthorn aquifer system generally coincides with the Hawthorn Group, which contains highly variable deposits of siliciclastics, phosphates, various clays, and carbonates (fig. B2). The groundwater within the Hawthorn aquifer system is under confined conditions. A chart correlating past and present nomenclature used for the Hawthorn aquifer system and its aquifers is in figure B1.

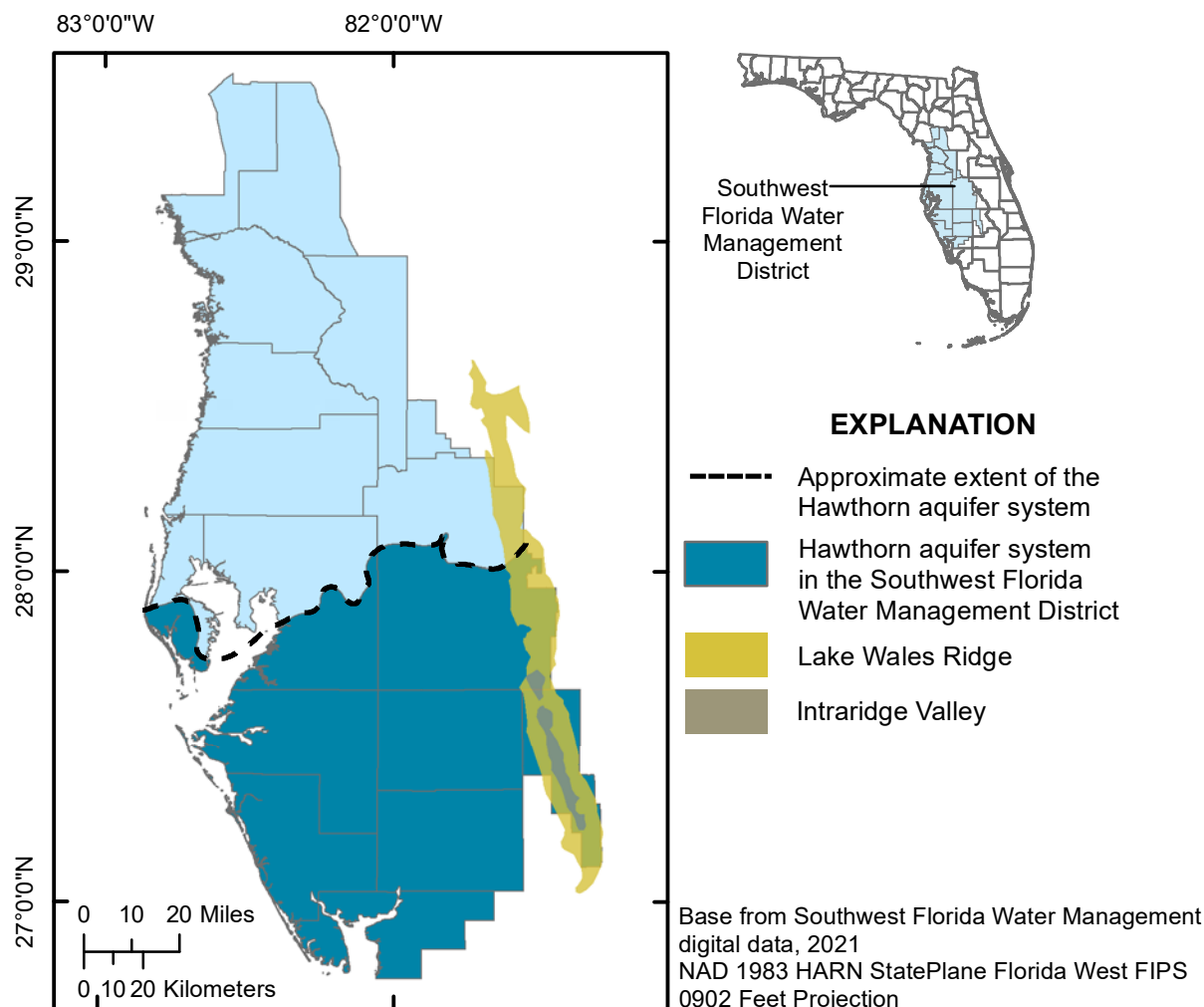
Floridan aquifer system

The Floridan aquifer system underlies all of Florida and parts of Georgia, Alabama, and South Carolina (Miller, 1986). The Floridan aquifer system thickness ranges from

about 1,800 feet in the northern portion of the District to more than 2,500 feet in the southern portion of the District. Within the District, generally four of the eight subregional middle confining units delineated by Miller (1986) are encountered. Where present, these units divide the Floridan aquifer system into the Upper Floridan aquifer and separate Lower Floridan aquifers (figs. 1 and 2). The four subregional middle confining units include middle confining unit I, middle confining unit II, middle confining unit VI, and middle confining unit VIII.

Upper Floridan aquifer

The Upper Floridan aquifer is the most important source of groundwater in the District. The Upper Floridan aquifer



Hawthorn aquifer system extent modified from Florida Geological Survey contour data, 2008.

[FIPS, Federal Information Processing System; HARN, High Accuracy Reference Network; N, north; NAD, North American Datum; W, west]

Figure B3. The extent of the Hawthorn aquifer system and the location of the Lake Wales Ridge within the Southwest Florida Water Management District.

contains groundwater under confined conditions except in large parts of the northern District where the confining unit is absent. This is because the clays that compose the confining unit in this region are absent or discontinuous because of erosion, or are substantially breached by karst features. As a result, the Upper Floridan aquifer becomes regionally unconfined and the uppermost aquifer in the northern part of the District.

Laney and Davidson (1986) referred to regionally mappable units within aquifers that have permeability that is not characteristic of the entire aquifer, whether higher or lower, as zones. The District identifies two zones that could be present regionally within the District: the Ocala low-permeability zone and the Avon Park high-permeability zone. These zones are present throughout the southern part of the District but are mostly absent north of Pasco County where active and relict

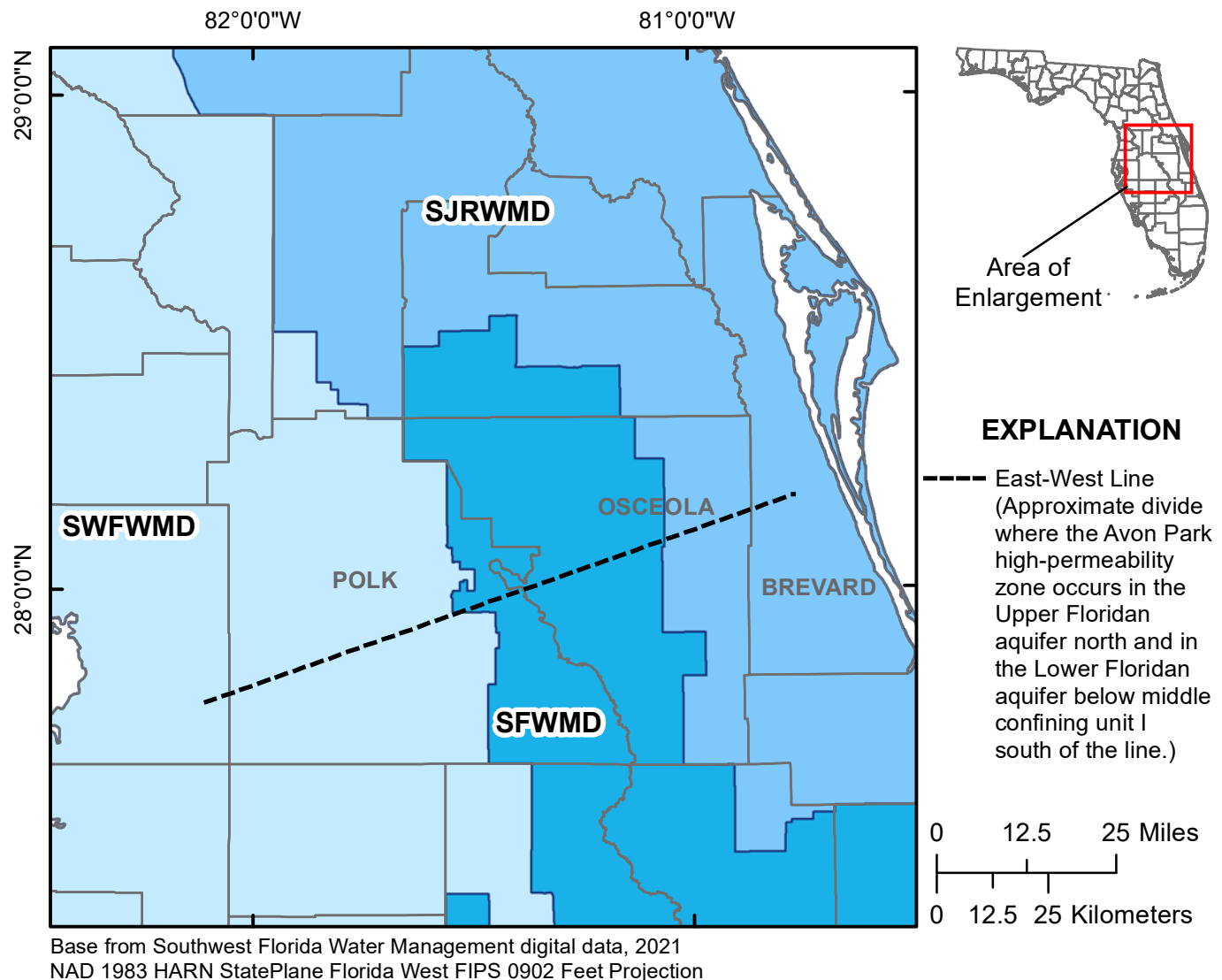
karst processes increase the permeability of the carbonates in the Ocala Limestone or where the carbonates are not dense and brittle for fractures to form in the Avon Park Formation. The Ocala low-permeability zone occurs exclusively within the Upper Floridan aquifer and generally coincides with the Ocala Limestone (fig. B2). The lower permeability is attributed to the finer grained texture of the Ocala Limestone relative to adjacent formations. Many aquifer performance tests across this zone and a statistical investigation of long-term water level data that assessed 26 monitor-well sites confirms the Ocala low-permeability zone is not a confining unit anywhere it exists (Ron Basso and Courtney Cameron, written commun., 2018). The higher permeability of the Avon Park high-permeability zone is attributed to secondary porosity from fractured and vugular dolostone. Comprehensive regional mapping using data collected from ROMP sites shows the

Avon Park high-permeability zone crosses middle confining unit I of Miller (1986) along a general east-west line through central Polk County and likely Osceola and Brevard counties (fig. B4). Therefore, it occurs in the Upper Floridan aquifer north of the east-west line and in the Lower Floridan aquifer below middle confining unit I south of the east-west line. The high-permeability zone gradually passes through middle confining unit I across approximately 30 miles and hydraulic testing and long-term water level monitoring show that confinement is not disrupted. The fractures that distinguish this high-permeability zone within the aquifers are secondary porosity features that formed after the primary carbonate units were deposited. As a result, the fractures are independent of

the carbonate units and may cross aquifer boundaries where conditions are favorable for rock fracture.

Lower Floridan aquifers

The Lower Floridan aquifers are present in permeable rock below any of the subregional middle confining units that are encountered. The base of the Upper Floridan aquifer is the top of the shallowest subregional middle confining unit and the permeable rock below is considered a distinct Lower Floridan aquifer below the subregional middle confining unit encountered. In west-central Florida and most of the District, very low permeability evaporitic dolostones of middle



[FIPS, Federal Information Processing System; HARN, High Accuracy Reference Network; N, north; NAD, North American Datum; SFWMD, South Florida Water Management District; SJRWMD, St. Johns River Water Management District, SRWMD, Suwannee River Water Management District; SWFWMD, Southwest Florida Water Management District; W, west]

Figure B4. The approximated line where the Avon Park high-permeability zone crosses the middle confining unit I and is in the Upper Floridan aquifer north of the line and in the Lower Floridan aquifer below middle confining unit I south of the line.

confining unit II (Miller, 1986) separate the Upper and Lower Floridan aquifers. In east-central Florida, at a higher elevation, low permeability micritic limestone and fine-grained dolomitic limestone of middle confining unit I (Miller, 1986) separate the Upper and Lower Floridan aquifers and is present exclusively within the upper part of the Avon Park Formation. In rare parts of the southernmost portion of the District, the evaporitic dolostones of middle confining unit VI can be present. Where no middle confining unit exists, only the Upper Floridan aquifer is present.

In a narrow northwest-trending band in central peninsular Florida, the middle confining unit II is overlapped and separated from the middle confining unit I by a few hundred feet of permeable rock (Miller, 1986). Where this overlap is encountered, the base of the Upper Floridan aquifer is the top of the middle confining unit I and at least two Lower Floridan aquifers are present. The permeable rock between the middle confining unit I and middle confining unit II is the Lower Floridan aquifer below middle confining unit I. The permeable rock below middle confining unit II is the Lower Floridan aquifer below middle confining unit II.

The middle confining unit VIII of Miller (1986) was originally mapped in south and east-central Florida within early Eocene rocks (Oldsmar Formation) above the Boulder Zone based on available data. Williams and Kuniansky (2016) extended the middle confining unit VIII across the entire peninsula as the 'Glaconite marker unit' based on the thin 'glaconite marker horizon' of Reese and Richardson (2008), which is an extension of the 'glaconite marker bed' described by Duncan and others (1994). Reese and Richardson (2008) extended the 'glaconite marker bed' by correlating gamma-ray curves from wells used by Duncan and others (1994) and wells beyond the original study area. Williams and Kuniansky (2008) further extended the 'glaconite marker horizon' beyond the middle confining unit VIII extent of Miller (1986) by coupling a gamma-ray peak with a low-resistivity response as a result of glauconite that is found in the Oldsmar Formation. The permeable rock below the middle confining unit VIII is the Lower Floridan aquifer below middle confining unit VIII.

Initially, the origin and stratigraphic rank of the 'Glaconite marker unit' being mapped in the District was unclear, and the permeable rock below it was informally referred to as the Lower Floridan aquifer below middle confining unit II-B. After further review, the 'Glaconite marker unit' in the District correlates (chronologically, lithologically, and hydraulically) to the middle confining unit VIII of Miller (1986); therefore, the naming was adopted to be consistent with the established Floridan aquifer system framework of Miller (1986) that the District hydrostratigraphic conceptualization is based.

In parts of the District where the middle confining unit I, middle confining unit II, and middle confining unit VIII overlap, three distinct Lower Floridan aquifers are present if separated by permeable rock. At present, an area in north-central Polk County and an area in southwestern Polk County, no

permeable rock is encountered between the middle confining units II and VIII; therefore, no Lower Floridan aquifer below middle confining unit II is present.

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Appendix C. Well Repair and Maintenance Program Metrics

Well Repair Work Requests Submitted: Completed vs Pending Since 2014

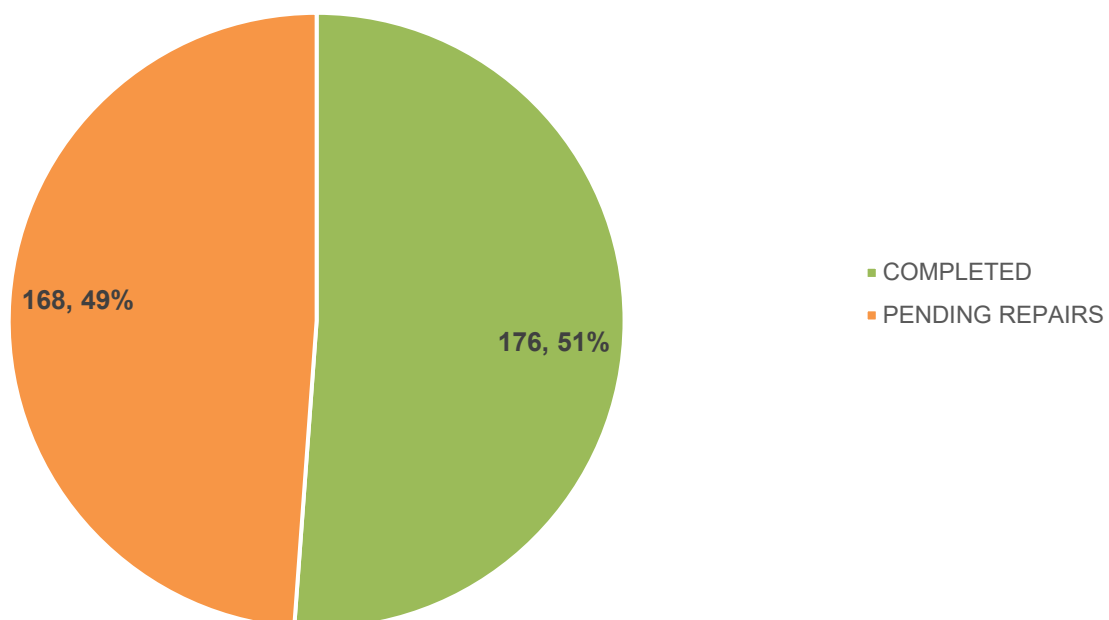
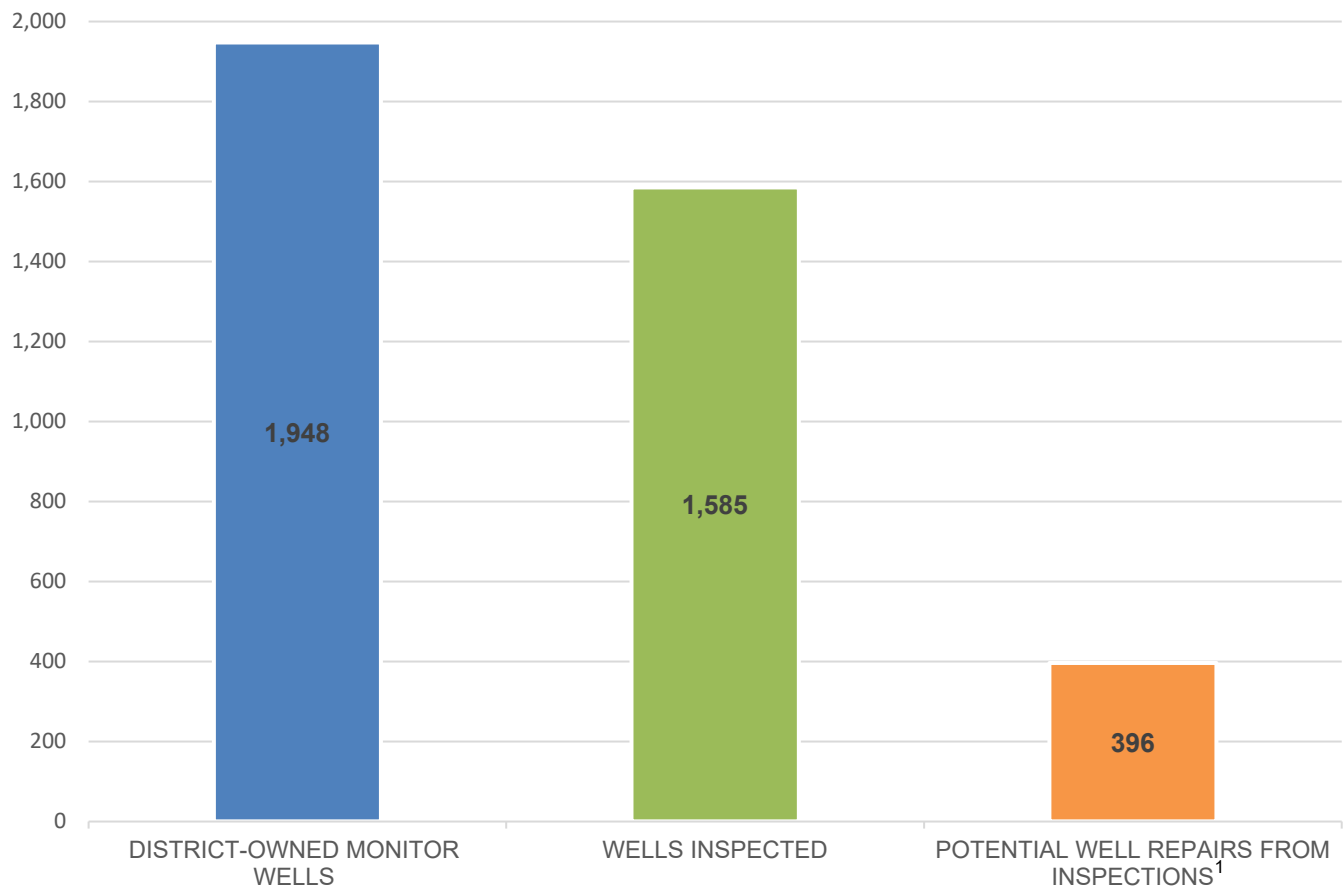


Figure C1. Well repair work requests received by the Geohydrologic Data section.

Monitor Well Integrity Inspections



¹Based on 25 percent of total well inspections resulting in a repair.

Figure C2. Monitor well integrity inspections performed and the number of potential well repairs after reviewing the inspections.

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