



City of Marco Island

Meeting Date: 11/10/14
To: City Council
From: Jeffrey E. Poteet, General Manager- Water & Sewer
Through: Roger T. Hernstadt, City Manager
Re: W&S Department- Monthly Report

Both the drinking water and wastewater operations are in compliance with the FDEP regulations and all other regulatory entities. The W&S Department is operating under budget.

Rainfall for Time Period	7.7 Inches	Sep- 2014
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Water & Sewer Department Staff Openings

The W&S Department has several openings to replace current vacancies. These positions range from entry level technicians to highly skilled tradesmen. Current Openings:

- Utility Service Technician
- Utility Maintenance Technician
- Drinking Water Operator Trainee, I, II, or III
- Engineering Technician
- Customer Service Manager

Staff Recognition

On October 27, 2014, Mike Snyder, Jr. was hired as a Utility Service Technician on our Collections & Distribution (C&D) team. The C&D Department still has one unfilled position.

Jon Sally was promoted to a Utility Maintenance Technician II. The Maintenance team is interviewing candidates for an entry level opening.

Legal

Beach Construction has filed a legal complaint concerning liquidated damages assessed for delays caused by their defective work at the NWTP. Staff is compiling information for the City Attorney.

Employee Training

- Joy Harris and Scott Edson are scheduled to attend an "Operating & Troubleshooting

Membrane Systems Workshop” hosted by SEDA in Fort Myers, FL on October 30th.

- Oscar Castellanos attended the “Membrane Operators Certification” (MOC) Short School hosted by SEDA in Pompano Beach, FL.
- Managerial and administrative staff attended training for the new Tyler Munis financial software during various dates in October.

Facility Tour

On October 21, 2014 a first grade class from the First Baptist Academy visited our facilities. The students are working on a “Community Helpers Unit” and toured the NWTP to learn about water treatment operations. Approximately 25 first graders attended the tour.



Veteran’s Park

The W&S Department will be installing the water system piping that will feed the Veterans Memorial Fountain. A date for the installation has not yet been set. The C&D team is coordinating this work with Public Works Department and the fountain contractor.

Disinfection Change- Marco Shores

Collier County’s temporarily changing their method of disinfection and this modification affects our Marco Shores customers. This temporary drinking water disinfection change from chloramines to free chlorine started on October 24th and will go through November 21st. We have notified our Marco Shores customers through the billing process, the condominium managers have been notified individually, and an electronic message board has been placed at the entrance to Marco Shores to ensure all residents are aware of the change.

Customer Service

- Staff fielded approximately 1400 phone calls for this time period and performed 408 work orders. Included in the number of work orders was 42 stuck meters. Staff is investigating the cause of the meter failures.
- A message on the billing informing customers of the upcoming discussions that could affect their water rates on November 10th is to be included on the October 31st billing.

Drinking Water Operations

NWTP

- The installation of pump bases and the rail systems at the plant backwash basin is complete. Work resulted in four separate plant shut downs for a total of 32 hours of down time between 10/2/14 and 10/7/14.
- FDEP reviewed 2014 lead and copper sampling results and found no action level exceedances and set our next lead and copper sample event for June through October of 2017.
- On 10/8/14, Collier County Environmental Specialist James Sparks inspected the NWTP generator and diesel storage. We are awaiting the county’s report.
- A leak was discovered in the wall of the NWTP operations building. A local plumber

repaired a piping joint in the attic. Staff will obtain pricing to replace the damaged drywall.

Source Water Facility

- Staff finished installing new valves to the ASR filter tanks on 9/26/14 in preparation for the injection cycle.
- Staff worked on the ASR SCADA and pump programming to start the injection cycle.
- Staff started injecting water into the ASR wells on 10/28/14.

SWTP

- Membranes in the second stage of RO train #5 were shipped to the manufacturer in California to be autopsied to determine the cause of a loss of conductivity.
- A small section of the reject water line was replaced with HDPE pipe. The old fiberglass pipe was failing.
- A flange gasket on Train #4 was replaced and the train was put in service on 10/16/14.
- Both caustic soda feed pumps have been repaired and returned to service on 10/20/14.
- The 75hp high service pump has been repaired and placed in service on 10/24/14.
- Ground water well #19 was repaired and placed in service on 10/27/14.
- All operational RO Plant membrane trains have been profiled for conductivity. Staff will utilize this information to gauge and track performance and efficiency.

Marco Island Finished Water Testing - Sep-14								
	Monthly Max	Monthly Min				Report Max	Report Min	
Turbidity	0.08	0.04	NTU		Chlorides	124	82	mg/L
Total Dissolved Solids	324	265	SU		Color	9	1	mg/L
P-Alkalinity	5	0	mg/L		Phosphate	0.86	0.49	mg/L
M-Alkalinity	39	31	mg/L		Ammonia	0.08	0	mg/L
Cal-Hardness	136	105	mg/L		Aluminum	0.12	0.05	mg/L
Total Hardness	164	124	mg/L		pH	8.93	8.17	mg/L
Minimum Chlorine Residual	0.8 mg/L							

Marco Shores

Marco Shores DW Purchase CL2 Residual- Min	Marco Shores Drinking Water - Sep-14			
	Monthly Q- MGD		Monthly Max Q- MGD	
	Avg. Q	Total Q	Date	Max Day Q
	0.179	5.3779	9/3/2014	0.2912
	1.2	mg/L		

Wastewater Operations

RWPF

- Return Activated Sludge is now being sent to the influent side of the headworks to abate the hydrogen sulfide levels and provide additional screening of the sludge. This process change will make the area safer to work in and will give additional protection of the hollow fiber membranes.
- Staff is sealing the openings at the headworks to improve air flow suction for conveyance to

the odor control unit.

- A contractor removed the settled grit from the floor of MLE tank #1. The tank will be placed back into service on 11/7/14.
- Staff is in the process of cleaning the membranes in MBR train #5. This work is extremely tedious and staff wears protective clothing while cleaning the membranes.
- Water and Sewer Department staff will be visiting other wastewater plants throughout the State to determine most appropriate equipment and technology for the replacement of the headworks structure budgeted in FY15.
- Plant operators are developing protocols to optimize chemical consumption.
- Air leaks in the underground steel air piping have been discovered. The air leaks are a result of corrosion. Staff is in the process of analyzing the best alternatives for the repairs.

RWPF					Marco Island Wastewater Testing		
Marco Island Wastewater Flows - Sep-14							
	Monthly Flows		Monthly Max Flow			Monthly Average- mg/L	
	Avg. Q	Total Q	Date	Max Day Q		Influent	Effluent
RWPF INF Q	1.87	56.106	9/2/2014	2.612	BOD	184.5	1.9
Reuse	1.27	38.12	9/8/2014	1.9	TSS	145.3	0.59
MG Deep Well Injected ADF	0.863	25.888	9/20/2014	1.87			

Marco Shores WWTP

- Collier County inspected the MSWWTP on 10/28/14. No deficiencies were noted.
- The second process blower was installed and is now operational.
- The plant air diffusers need to be replaced in three out of four aeration tanks. Staff is evaluating the best solution for replacement while maintaining plant operations.

Marco Shores							
	Monthly Flows	Total	Monthly Max Flow			Monthly Average- mg/L	
						Influent	Effluent
Shores INF Q	0.078	2.35	9/21/2014	0.09			
					BOD	123.5	1.9
					TSS	138	2.95

Collections & Distribution

Water Service Interruption:

835 W Elkcarn Circle
 4000 Royal Marco Way
 324 Lamplighter
 114 Templewood Ct
 1518 Mainsail Dr
 125 Delbrook Way
 235 W Seaview Ct
 740 N Collier Blvd

of Customers Under Boil Water

32
 100
 151
 45
 148
 20
 20
 Esplanade Stores/Condos

All precautionary boil water notices have been rescinded at the time this report was created.

Collection Issues

Removed roots inside sewer lateral at 1356 Freeport.

Distribution Issues

Water service line breaks that are not related to precautionary boil water:

1746 Dogwood	1630 Rainbow Ct	215 Columbus Way
144 Sandhill St	150 Balfour Drive	175 S Barfield Drive
196 Columbus Way	190 Sandhill St	161 Delbrook Way
161 Clyburn St		

Parking Lot Improvements at North Plant

Staff completed the removal of the gravel that had nails and sharp metal that was causing flat tires. The surface layer of soil, re-graded and replaced with new gravel was done in-house. This parking lot will be designated as employee parking. This will eliminate personal vehicles throughout the plant site reducing the potential for damage to those vehicles.

Utility Maintenance

Computers, Security, and Communications

- A 24-port network switch failed at the water and sewer south administration trailer. Staff ordered a replacement.
- Staff replaced a faulty monitor at the SWTP control room and replaced an old monitor at the RWPF control room.
- Lightning damaged all security cameras at the MS WWTP, two switches, and the corresponding signal (Cat 5) cable. We replaced the Cat 5 cable with fiber optic which does not conduct electricity and the two affected switches. The replacement cameras have been ordered.
- The security card reader at the source water facility pump building door was replaced. This was damaged by lightning.

SWTP

- The replacement of the existing electrical enclosures, conduit and wiring for the Brine well pumps has begun. This work includes alterations to the existing MCC to allow for each pump to have its own starter compartment. This is slated to be completed by mid-January of 2015 due to the lead time on the MCC parts.
- Staff replaced the piping and valves on #1 caustic pump.
- Staff replaced main breaker in MCC for 75 HP transfer pump.
- Staff modified the SCADA screens so that plant staff can better monitor deep injection wells 1 & 2.

Lift Station/RO Wells

- The installation of a new control panel for LS-23 in Hideaway Beach is complete. Staff is now installing railing around the control panel to comply with OSHA regulations.
- The sidewalk in the Utility easement in front of LS-69 was damaged. Repairs are scheduled to be completed by 11/14/14.
- Due to delivery delays from the manufacturer the replacement of the lift station pumps for LS-41 has been re-scheduled for 12/28/14. These pumps are over 13 years old and are not performing to rated capacities.
- New impellers are scheduled to be installed on the pumps for LS-69 on 10/31/14. The existing impellers cause air entrapment issues. The new impeller will eliminate this problem.
- Replacement of the control panel for LS-25 has been rescheduled due to higher priority needs. This project has been rescheduled for 1/15/15.

RWPF

- The AC units on two of the Zenon MBR skid control panels have failed. The replacement of these units will be complete by 11/07/14.
- Staff continues working on sealing off the holes that are emitting H²S gases on the headworks structure. These repairs will be completed by 11/28/14.
- The flow meter converters that were sent out for repair have been returned and installed.
- The seal on deep injection well pump #3 has been ordered. Repairs will be made upon receipt of the seal.
- Staff is working on the repair of a section of the odor control piping to the headworks. Hydrogen sulfide and moisture has deteriorated some of the supports. This is to be completed by 11/14/2014.
- Staff has repaired the air release valve on Injection Well #2.

MS WWTP

- The installation of both new positive displacement blowers is complete.
- The sound barrier wall installation is complete and the old wall removed. Staff will install an exhaust fan in the enclosure to alleviate the heat inside. This will be complete by 11/14/14.
- Staff has replaced the second half of the diffusers in the Plant process. This was completed on 10/28/14.

NWTP

- The installation of new submersible pumps, piping, and fittings for the backwash basin is approximately 95% complete. Concrete work around the hatch door is slated for 11/17/14.
- The installation of the new valves, actuators and solenoids for the ASR filters at Marco Lakes is complete. Staff is completing some minor programming on the filter PLC.
- Staff replaced the driver wheels on Gate B operator.
- Staff replaced both 3" discharge hoses on the sludge press pumps.

Water & Sewer Department, Engineering and Projects:

Water Main Improvements- San Marco Road and Nassau Court

San Marco Road portion of the water main improvement project is approximately 95% complete. Remaining work is FDEP clearance certification, final main connection, punch list items and record drawings for the project.

The Nassau Court water main improvement portion of this project is approximately 70% complete. The last 30% of the project consists of replacing driveways, swale grading, sod, irrigation, flushing the water main, bacterial sampling, service connections, and record drawings. Once this work is completed we can submit for FDEP clearance of the main.

Annual Sewer Inspection

The annual sewer cleaning, TV inspection and repair project is approximately 90% complete. Through this project a steel pipe on West Elckam Circle has shown signs of failure; bad rust inside the pipe is reducing the flow capacity by approximately 60%. The contractor will attempt to remove the rust and restore the flow to 95% or greater. It is possible that the pipe will have to be replaced; however, if the rust is removed successfully we may be able to line the pipe with a structural type liner for permanent repair and not have to excavate. Another failure has been discovered on North Collier Blvd. off of Rose Court where the pipe liner has separated from the pipe. We are working with the contractor to find the best solution for this repair.

SFWMD Consumptive Water Use Permit (CUP)

The City has a permit from the South Florida Water Management District (SFWMD) for the withdrawal and use of surface water and brackish groundwater to supply the community's water needs. The permit contains an annual allocation for water pumped from the lakes and ASR wells at the source water facility and the RO brackish water wells within the Marco Island city limits. Recently, SFWMD started calculating consumption on a rolling 12 month basis rather than a calendar year basis. This has resulted in exceedances of the annual allocation for the lakes component of the total allocation. Staff has had several discussions with SFWMD regarding this matter and has concluded that the permitted allocation should be increased to remain in compliance. The existing CUP expires on February 8, 2016 so the funding for the renewal was not expected until FY16. SFWMD will allow us to seek an increased allocation with the permit renewal application provided we proceed with the renewal now rather than in FY16. As such, staff will be requesting funding and authorization from council to proceed with the professional consultant services and permitting required. The hydrogeology consulting services for this work costs \$71,790 and the SFWMD permitting fees are \$12,500.

SCADA System Upgrades

Both the City's drinking water and wastewater systems utilize a central computer program to control various parts of the water & sewer operations. The computerized system is known as a SCADA (Supervisory Control and Data Acquisition) system. The SCADA system uses coded signals over communication channels so as to provide control of remote equipment. Our SCADA system is amalgamated with data acquisition of our system processes to meet regulatory compliance. The City's current SCADA system software is outdated, based on Windows XP and is no longer supported by Microsoft. The Water & Sewer Department, in conjunction with the IT Department staff have evaluated multiple SCADA programs to ensure the best solutions for needs of the Department are met at the most reasonable cost.

As part of the FY15 capital improvement program \$148,000 was allocated by City Council to upgrade the W&S Department's SCADA system. The funding request is deficient by approximately \$74,000. Staff has eliminated the lowest priority FY15 projects to accommodate for this expense. Deferring the installation of VFD's (Variable Frequency Drive) at the offsite wells (\$60,000) and reducing the installation of binary meters (\$12,000) will fully fund the SCADA upgrades.

This original price included upgrading the current system software (Wonderware) to the latest version; including the associated licenses, hardware, and replacement of PLC's, modems, switches, controls and other infrastructure used for offsite operational control, data acquisition and treatment plant operation. It did not include integration and implementation which is a service that is not offered by the supplier, Wonderware. Therefore, integration and implementation would require an additional vendor which was estimated to be an additional \$45,000.

As staff investigated the integration it was discovered that the \$45,000 cost did not provide the functionality and reliability needed for our system. There are six system applications that are required for our system located throughout various plant sites on and off the Island. Also, each of the six system applications would have to be individually modified with any programming changes (staff must modify the applications multiple times per week to accommodate operational changes). This in itself makes this type of application unfeasible. The all-in cost to upgrade our system utilizing a merged Wonderware application is approximate of \$370,000. Upgrading with Wonderware would require Staff to work with the vendor for the hardware and software and a separate integrator to make the system functional.

The cost of integration and implementation of Wonderware caused staff to step back and relook at our evaluation of other SCADA packages. Staff's second choice was Trihedral's VT SCADA system.

VT SCADA is currently used by many water utilities in the State including the City of Naples. Staff has contacted several of the utilities that utilize VT SCADA and all are happy with their choice.

The VT SCADA system does not require a separate independent contract for integration and implementation, as it is done by Trihedral, and it is included in the package. The annual licensing, maintenance and support for the VT SCADA system is approximately 30% of the cost for the proposed Wonderware system's annual licensing, maintenance and support. The all-in cost of the VT SCADA system is just under \$222,000. This expense will go to City Council for the approval on December 1, 2014.

Permitting Reviews

Water and Sewer staff continues to conduct utilities permitting reviews in support of the Growth Management Department. The following are recently reviewed projects: Marriott SDP amendment, Crystal Shores SDP, Starbucks, Moose Lodge, Island Plaza PUD, and Rose Marina.

MS WWTP Permit Renewal

FDEP has deemed the Marco Shores WWTP permit renewal application submittal complete and has indicated that they will issue the permit in mid-November. The permit duration is five years.

ASR Permit Renewal

Work has commenced on the ASR permit renewal. This will require groundwater hydraulic modelling by our hydrogeologist consultant.

Marco Shores/Isles of Capri Service Area Feasibility Study

Information collection work has commenced on the feasibility study. Staff will seek proposals from property appraisers in support of the study. Findings are scheduled to be presented to council for review in February.

RWPF Phase V

The plans for this project are being revised. This project will be re-bid in FY15.

RWPF Head Works

The City has advertised a Request for Qualifications (RFQ) from professional consultants for the design of this project. Award of the contract for design is tentatively scheduled for City Council approval on 12/1/14. Staff scheduled six (6) equipment manufacturers to provide presentations of their products for evaluation by staff. The following equipment manufacturers presented their products on 10/21/14 and 10/22/14: Ovivo, Huber, Parkson, FilterOne, Kusters, and Muffin Monster.

RWPF Headworks Groundwater Monitoring

Petroleum contamination of the soil at the base of the headworks was discovered during excavation in 2003. The nature and concentration of the constituents qualified the site for state's natural attenuation monitoring program. The City installed monitoring wells at the time and has sampled, tested, permitted, and re-permitted the monitoring program with FDEP ever since. The concentrations of petroleum constituents have subsided over time, and recently staff requested a determination of "no-further-action" to remove the monitoring requirements and wells. FDEP approved the request 10/20/14. Staff is now researching the permitting requirements to abandon these monitoring wells.

Injection Well #2

FDEP issued the permit to remove the existing surge tank from injection well #2 on 10/27/14. Staff will seek pricing from a contractor to do the work.

NWTP Lime Thickener Tank Drive

Staff is in the process of preparing technical specifications and a scope of work for this project for bidding. This project is included in the FY 2015 CIP.

Clifton Waterway Bridge Pipe Repairs/Replacement

The Clifton Waterway Bridge pipe replacement project is on schedule. The ductile iron pipe that replaces the spiral steel welded pipe is expected to arrive on October 31, 2014. This is a special bridge crossing pipe and the manufacturers typically don't stock this material, work will begin shortly after the pipe is delivered.

Bridge Pipe Inspections

The bridge piping inspection project is complete. The contractor will be providing the City a written report by the 12/1/14.

SWTP Generator

The City finalized the purchase of the SWTP 2.0 MW emergency standby electric power generator from LCEC. The executed bill of sale is dated 10/16/14. Staff will seek a service contract from a generator maintenance contractor to service the generator. Staff is also proceeding with the rust removal and painting of the generator enclosure.

Manhole Rehab

The manhole rehabilitation project is approximately 95% complete. This work is expected to be completed by 12/1/14.

Smoke Testing

The smoke testing project is complete. Over 450,000-ft of gravity sewer pipe was tested. The contractor has given staff a detailed document of their findings. The document is 353 pages long with photographs, GPS positioning, addresses and descriptions of the defects that were found. Over 350 defects have been identified, from leaking manholes, broken pipes, broken clean outs, broken manhole risers, and illegal connections. Staff will be prioritizing the repairs and tackling the highest priority issues first. Any defects that were found relating to areas that the City is not responsible for will be notified in writing.

Collier Blvd/US 41 Construction

The contractor started removing pipe on the north and south end of the 951 intersection. To date approximately 500-foot of pipe has been removed.

◇ October 6, 2014

Justin Martin
Senior Project Manager
Marco Island Utilities
771 Elkcarn Circle, East
Marco Island, FL 34145

Re: Proposal for Hydrogeological Services Related to the Preparation of Compliance Report for LC 37 and Renewal of the Consumptive Use Permit 11-00080-W

Dear Mr. Martin:

KLJ is pleased to submit this proposal for hydrogeological support services related to the re-permitting of the Marco Island Utilities (MIU) South Florida Water management District (SFWMD) consumptive water use permit (WUP No. 11-00080-W)) for the facilities in Collier County and Marco Island, FL. The proposal describes anticipated phased and concurrent work elements that can be implemented immediately under a work-order authorization, in accordance with contract No. 14-007.

BACKGROUND

MIU currently operates its potable water supply system under the SFWMD WUP 11-00080-W which permits MIU to withdraw up to 4.535 Billion gallons of water annually. The current individual water use permit was last renewed in 2005 and has an expiration date of February 2016. The current allocation serves the City of Marco Island, various off island contract users, and miscellaneous raw water demands. Water is supplied by three discreet sources, Marco Lakes raw water intakes, the Marco Lakes ASR facility, and brackish groundwater produced from the mid-Hawthorn Aquifer wellfield.

The SFWMD recently communicated an issue with alleged potential non-compliance with the permit due to the rolling twelve month pumping average. Although no violation was occurring as related to the maximum month or annual pumping volumes, the SFWMD indicated that there could be a non-compliance issue in the near future. Although MIU produces water unevenly throughout the year which is based on seasonality, the current flows did indicate the Marco Lakes component of the water supply would be pumping in excess of about 50 million gallons more than its annual allocation, based on the SFWMD accounting method (12-month rolling average). The SFWMD recommended that a permit modification be submitted to increase the annual and maximum monthly allocation. The SFWMD also indicated that the permit modification should be submitted as soon as reasonably possible to avoid over pumpage conditions and permit non-compliance.

Based on these conversations with the SFWMD it was decided that the best course of action would be to modify/renew the permit with one submittal as MIU would have had to re-submit in the following year. Since the modification will request additional allocations, modifications to the impact assessments will be required. Additional modeling may be required to evaluate the increased allocation from the Marco Lakes in respect to wetland impacts and/or saline intrusion.

PROPOSED OUTLINE AND SCOPE OF WORK

The proposed work elements include the following: 1) preparation of a letter report for compliance to Limiting Condition (LC) No. 37, 2) pre-application meeting with the SFWMD and additional meeting throughout the permitting process, 3) groundwater modeling for the mid-hawthorn Aquifer withdrawals and the Marco Lakes allocations for the ASR raw water supply, and 4) the preparation of an initial submittal of an application and review fee. Each of these individual task are detailed below.

Since the application submittal will put the permit in administrative review, the continued operations would be allowed as the permitting process is navigated. Although a full application submittal package will not be submitted initially, the first Request for Additional Information will be responded to with a request for an additional 90-days to complete the required documentation. The modeling and supporting documentation would then be prepared in support of the permit application. It is the intent of KLJ to hire a Florida Professional Engineer with working knowledge of the Marco Lakes facility to provide third party review of the supporting documents prior to submittal and to provide additional insight to the systems operations. The anticipated activities necessary to meet these goals are presented below.

I. Limiting Condition 37 Compliance Report

Limiting Condition 37 states the following: “The permittee shall submit a plan on an annual basis (starting six months from permit issuance) that will address: 1) All proposed facility construction for the next year, 2) a report on the year’s proposed ASR activities, 3) report on ASR storage and recovery activities, 4) Discussion addressing the prioritization of the utilization of ASR on Marco Island especially congruent to the RO wellfield, and 5) proposed grant application(s) for activities that are not exempt from water use permitting, to ensure compatibility with the water use permitting program.”

KLJ will prepare a letter report addressing items 1 to 4, and assist the City in addressing item 5. The response will take into consideration the future construction

schedule, a discussion of both the ASR system's utilization, and the impact to the RO facilities operational requirements. The preparation of this letter report will require information from the ASR and RO flows and operations. This information will be processed and synthesized from data requested in Task II of this proposal and from the information requested from the Marco Lakes ASR during the preparation of the Florida Department of Environmental Protection (FDEP) ASR Underground Injection Control (UIC) permit renewal, which is scheduled to be completed concurrently with the SFWMD WUP renewal. The responses to the above referenced items will require input and review from the City prior to submittal.

II. Preparation of Permit Renewal Application

a. Project Meetings

This proposal includes four (4) project meetings, and will include at minimum the initial pre-application meeting with the SFWMD and MIU, and the Governing Board meeting when the permit application is recommended for approval. Two additional meetings are included in this work task to go over the application package submittal documents, and/or to resolve issues with the data. All travel on the southwest coast of Florida is inclusive, as well as travel to West Palm Beach for the governing Board meeting.

b. Impact Assessments

KLJ will complete impact assessments for the groundwater resource allocations which will include both the Marco Lakes ASR facility and the mid-Hawthorn Aquifer withdrawals. Groundwater modeling completed will be validated against historic site data and calibrated to minimize the residuals between simulated and observed historic data.

The modeling of the ASR facilities will be based on a recently completed model which was completed to include data through December 2013. KLJ will update this model with current data and expand the existing groundwater model to include additional stress periods for pumpage, water level, and water quality data since the last model update. KLJ will then use the calibrated model to simulate projected ASR injection, storage, and recovery cycles for an additional five years.

Model Construction

KLJ will utilize Groundwater Vistas, a graphical user interface, to simulate the groundwater systems using computer programs developed by the United States Geologic Survey (USGS) which simulate three-dimensional variable-

density ground water flow and transport. These programs will account for the salinity and density differences of the injected water and the formation water, which are two critical parameters to consider for long term projections. Model inputs will include but may not be limited to: production/storage zone hydrogeology, historical pumpage, and dissolved chloride concentrations.

Model Calibration and Sensitivity Analysis

KLJ will calibrate the models using historic flow rates, water levels, and water quality data including the recently added data. Model calibration is the process of adjusting model parameters until simulated results match field-measured values. Sensitivity of selected parameters to model output will also be evaluated.

c. Preparation of Supporting Documentation

KLJ will prepare the required supporting documents in cooperation with MIU to be submitted to the SFWMD. KLJ will produce maps showing service areas, withdrawal facilities, interconnect locations, and future expansions. The supporting documents will discuss, at minimum, the information required by the SFWMD in respect to the following elements:

- Water Demand Components
- Population and Per Capita Use projections
- Historic and Projected Raw and Treated Water Demands
- Reuse Feasibility: Historic and Projected Flows and Service Areas
- Wellfield Operation Schedule
- Water Conservation Plan(s)
- Treatment methods and Losses.

Historical data must cover, at minimum, the last five years of operational data and will be compared with older historical data, if available, to assess any apparent trends over the previous five years and historic data. MIU assistance will be required for the completion of these responses. MIU will provide all MORs, including water quality analysis, and provide input and review of the documents prior to submittal.

d. Responses to Request for Additional Information

Although every attempt to prepare a complete and concise application package will be made on the first submittal, it is not uncommon for the

SFWMD's various reviewers to make request that are unanticipated. The proposed work includes one sufficiency response to the SFWMD, exclusive of additional computer modeling, field testing and/or wetlands impact assessments. The sufficiency responses will include reasonable request for minor modification of the groundwater models or clarifications of the modeling. Although, not included in the "Impact Assessment" the SFWMD may request additional modeling of the surface water withdrawals from Marco Lakes. This element may not be required, and subsequently was not included in our proposed scope of work.

The proposed work scope assumes that hydraulic characteristics of groundwater will be determined through review of existing data, and does not include any site specific testing. In the event SFWMD may require site-specific testing, groundwater modeling and/or wetlands assessment subsequent to the review of the application, and if so, a proposal for additional services may be prepared.

PROJECT PHASING AND PROFESSIONAL FEE

The tasks and subtasks are phased as outlined above with professional fees for Task I, and II in Exhibit A. The project is presented as a time and material project that will be billed based on progress. The total estimated fees for the work elements in Task I are **\$3,133**. The total estimated fees for the work elements in Task II are **\$68,657**. The estimated fees are presented as Not to Exceed (NTE) values without the prior authorization of the MIU Project Manager. This includes the initial responses to the first requests for additional information; additional responses will be negotiated based on the level of effort required to prepare a complete response. The submission of the initial application will require MIU to provide two checks made payable to SFWMD for the permit application review fee of **\$11,500** and a review fee check in the amount of **\$1,000** for the ASR component.

Task I and II would be completed concurrently. Although development and finalization of the work in Task I requires input from various sources, this work would be ready for submittal following the pre-application meeting. At the pre-application meeting a request for variance from the reporting of LC 37 will be sought. The full application package will answer the intent of LC 37, and the preparation and submittal would cause MIU to submit the same information twice in a three month window. The permit application will include provisions for the further development of the ASR facilities, even though additional construction permits (with the FDEP) are on hold. These wells can be permitted for construction and testing at a later date and closer to the anticipated time of need.

SCHEDULE

KLJ will begin work immediately upon written notice to proceed and acceptance of this proposal for processing of a MIU work order under the existing contract between KLJ and the MIU. To ensure adequate time for the preparation of the required submittals and meetings with FDEP, it is recommended the project starts as soon as possible in mid-October 2014. The scheduling of the pre-application meeting can be completed in advance of the final authorization to move the process forward but a formal authorization would be required shortly thereafter. It is estimated that the supporting documentation and impact assessments can be completed within 90-days of authorization.

The first submission (LC 37) was due to the SFWMD by August 30, 2014, so timely completion of this work element is essential. KLJ estimates that the letter report for LC 37 could be prepared and submitted within three (3) weeks of authorization pending the results of pre-application meeting request.

KLJ is usually successful in obtaining water use permits; however, the preparation and submittal of water use permit applications by KLJ does not constitute a guarantee from KLJ that the SFWMD will grant water use permit for the project.

KLJ appreciates the opportunity to meet with you and provide this proposal for hydrogeological services. Should you have any comments or questions, or require additional information, please do not hesitate to contact John Mayhut or Michael Waldron.

Sincerely,

KLJ

A handwritten signature in blue ink, appearing to read "John A. Mayhut".

John A. Mayhut
Senior Project Hydrogeologist
239 789 6123
john.mayhut@kljeng.com

A handwritten signature in black ink, appearing to read "Michael J. Waldron".

Michael J. Waldron, PG
Senior Hydrogeologist
561 847 2871
mike.waldron@kljeng.com

Enclosure(s): Exhibit A

EXHIBIT A
PROFESSIONAL FEE ESITMATE

MARCO ISLAND UTILITIES
SFWMD LIMITING CONDITION SUPPORT and CONSUMPTIVE USE PERMIT RENEWAL
Professional Fee Estimate

OCTOBER 2014

SFWMD Consumptive Use Permit SUPPORT SERVICES		Manpower																Expenses and Subconsultant	Total Estimated Fee
		Project Engineer		Senior Managing Hydrogeologist		Project Manager Hydrogeologist		Hydrogeologist/ Environmental Planner III		Environmental Permitting Specialist/Coordinator		CADD Technician		Professional Administration		Total Manpower			
		Hours	Cost at \$147.00 per hour	Hours	Cost at \$212.00 per hour	Hours	Cost at \$176.75 per hour	Hours	Cost at \$142.75 per hour	Hours	Cost at \$95.25 per hour	Hours	Cost at \$85.00 per hour	Hours	Cost at \$59.50 per hour	Hours	Cost		
Project Task and Activity		Hours	Cost at \$147.00 per hour	Hours	Cost at \$212.00 per hour	Hours	Cost at \$176.75 per hour	Hours	Cost at \$142.75 per hour	Hours	Cost at \$95.25 per hour	Hours	Cost at \$85.00 per hour	Hours	Cost at \$59.50 per hour	Hours	Cost		
Permitting Assistance FY2014-2015																			
I	Limiting Condition 37 Letter Report																		
I. a.	Preperation of Letter Report Addressing LC: 37	0	0.00	2	424.00	4	707.00	12	1,713.00	0	0.00	2	170.00	2	119.00	22	3,133.00	\$ -	3,133.00
II	Preperation of Permit Renewal Application																		
II. a.	Meetings (4): Pre-application, 2 Client coordination meetings, & Governing Board Meeting	0	0.00	4	848.00	12	2,121.00	12	1,713.00	0	0.00	2	170.00	4	238.00	34	5,090.00	\$ -	5,090.00
II. b.	Impact Assessments	2	294.00	8	1,696.00	8	1,414.00	80	11,420.00	24	2,286.00	8	680.00	2	119.00	132	17,909.00	\$ 3,000	20,909.00
II. c.	Preperation of Supporting Documentation for Permit Application	4	588.00	16	3,392.00	32	5,656.00	160	22,840.00	80	7,620.00	16	1,360.00	16	952.00	324	42,408.00	\$ 250	42,658.00
II. d.	Response to Request for Additional Information	0	0.00	0	0.00		0.00		0.00		0.00		0.00		0.00	0	0.00	\$ -	0.00
	Total Professional Fee	6	882.00	30	6,360.00	56	9,898.00	264	37,686.00	104	9,906.00	28	2,380.00	24	1,428.00	512	68,540.00	3,250.00	71,790.00

Subconsultants; copying; postage; and miscellaneous expenses to be charged at actual cost

Fee estimate does not include \$12,500 in permit processing fees charged by SFWMD

