SPECIAL PUBLICATION SJ2007-SP18

SEMINOLE COUNTY WATER SUPPLY PLAN

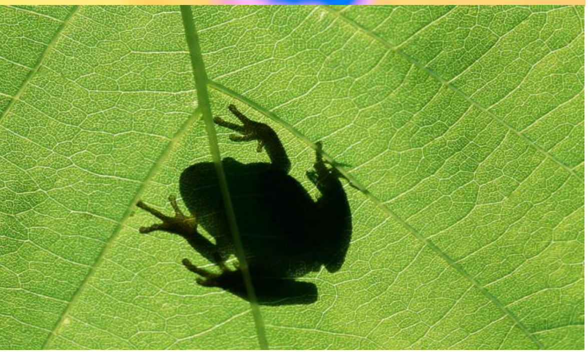
Seminole County Water Supply Plan

March 2007

Prepared For:

Seminole County Cooperators

Altamonte Springs
Casselberry
Lake Mary
Longwood
Oviedo
Sanford
Seminole County
Winter Springs



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Seminole County Water Supply Plan

By

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March 2007

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EXECUTIVE SUMMARY

Objectives

The Seminole County Water Supply Plan (Plan) objectives are to meet Cooperators' current and future water demands with traditional and alternative water sources while sustaining water quality and protecting wetland and aquatic systems.

Background

Historically, Florida has primarily used groundwater as a potable water supply source. Concerns have arisen from the nearly exclusive use of groundwater and the effort of doing so has on the nature systems of the state. Therefore, new water supply sources have been identified and are considered "non-traditional" or "alternative" water supply sources. Examples of alterative water supply sources are surface water, sea water, or brackish water. The water management districts of Florida are encouraging potable and non-potable (irrigation) water suppliers to investigate and implement the use of alternative water supply sources for future capacity expansion and/or new facilities.

Seminole County and surrounding areas are experiencing development and population growth that have led to increased demands on water resources and the related natural environment. To this end, Seminole County and the municipalities of Altamonte Springs, Casselberry, Lake Mary, Longwood, Oviedo, Sanford and Winter Springs (Cooperators) formed a coalition, in cooperation with the SJRWMD to prepare the Seminole County Water Supply Plan (the "Plan"). The Plan is the fulfillment of a local water supply plan to investigate traditional and alternative water supply sources that will be incorporated wholly or in part into the SJRWMD District Water Supply Plan. ARCADIS was hired to prepare the Plan and coordinate with the Cooperators to ensure that future demands are met while preserving and protecting environmental resources.

Water Deficits in Seminole County

As part of Tasks E and F of the Plan, flow/demand projections were complied. To evaluate future needs, a supply deficit was calculated. The deficit was calculated by subtracting the demand projections from the supply. The supply part of the equation was estimated as the SRJWMD consumptive use permit limitation for each entity. The Seminole County water supply future needs for the Plan horizons are summarized in the following table.

Projection Date	Supply (1)	Demand (2)	Demand Difference
2005	71	58	13
2010	75	73	3
2015	77	80	-3
2020	77	83	-6
2025	77	90	-13
2030	77	103	-26
2035	77	114	-37
2040	77	127	-50
2045	77	140	-63

Notes:
1. Supply is equal to demand in 2013
2. Demand is Cooperator provided projections through 2025 (blended data set).
3. 2030 - 2045 Demand is projected by linear forecast from the 2005 to 2025 data.

Proposed Alternative Water Supply Projects

Alternative Water Supply Projects (AWS) projects were developed from input gathered from the Cooperators at workshops and meetings. Several of the projects were included in the 2005 District Water Supply Plan. Initially traditional groundwater water supply sources were identified; however, following a cooperator discussion on impacts from potential additional groundwater withdrawals, AWS projects gained favor over the traditional supply sources. A list of Alternative Water Supply Projects is as follows:

1 – Water Conservation/Demand Reduction

2 – North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study
- 2a – Sanford North WRF Augmentation/Reclaimed Water System Improvements
- 2b – Markham Woods Road Reclaimed Water Transmission Main
- 2c –Orange Boulevard Reclaimed Water Transmission Main
- 2d – New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46
- 2e – Timacuan Reclaimed Water Main Upgrade
- 2f – Heathrow Boulevard Reclaimed Water Transmission Main
- 2g – Residential Reclaimed Water Retrofit – Phase I
- 2h – Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins
- 2i – Seminole County/Sanlando Utilities Interconnect with Altamonte Springs
- 2j – Greenwood Lakes Rapid Infiltration Basins Rehabilitation

3 – East Orange and Seminole Counties Regional Reuse Project

4 – Altamonte Springs and Apopka Project RENEW APRICOT

5 – Winter Springs Lake Jesup Reclaimed Water Augmentation Project

6 – Sanford Surface WTP on Lake Monroe – Potable

7a – Seminole County Yankee Lake Reclaimed Water System Augmentation Project
7b – Seminole County Yankee Lake Regional Surface Water Facility – Potable

8 – Oviedo Reclaimed Water Projects

9a – Surface WTP on St Johns River at SR46 - Non-Potable with Storage
9b – Surface WTP on St Johns River at SR46 – Potable

10a – Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage
10b – Surface WTP on St Johns River at Mullet Lake - Potable

Plan Technical Memoranda

The Plan development efforts began in June 2005 as an effort between the Cooperators and ARCADIS to promote viable alternative water supply projects for planning purposes to satisfy future source water needs. After the July 19, 2005 kick-off meeting which confirmed objective, schedule, and means of communication, the data gathering and processing procedures began. The June 2005 Scope of Services for the Plan includes Tasks A to H as follows:

- Task A - Project Management
- Task B - Data Gathering & Processing; Review of Existing Plans*
- Task C - Data Gathering & Processing; Data Collection, Compilation and Reduction*
- Task D - Data Gathering & Processing; Water Conservation and Reuse*
- Task E - Data Gathering & Processing; Flow Projections*
- Task F1 - Analysis and Recommendations; Identification of Readily Identifiable Traditional and Alternative Water Supply Development Projects*
- Task F - Analysis and Recommendations; Evaluation of Existing Facilities and Alternatives Development *
- Task G - Analysis and Recommendations; Regional Monitoring Plan
- Task H- Analysis and Recommendations; Groundwater Modeling

In August 2006, a contract change was requested by the Seminole Cooperators and SJRWMD to address water supply needs through the year 2045 (to affect Tasks E and F) and eliminate Task G and H as groundwater projects were not being considered in the Plan. Tasks with an asterisk indicate deliverables in the form of Technical Memoranda (TM) that are presented in the Appendices. The June 2005 Scope of Services and August 2006 Scope of Service Amendment are provided in Appendix A for reference.

Tasks and Technical Memoranda descriptions are described below.

Task A - Project Management and Administration

Task A was a managerial task with no deliverable.

Task B – Review Existing Plans

The efforts of Task B - Data Gathering & Processing; Review of Existing Plans were summarized in a December 2005 TM is included herein as Appendix B. The Task B TM provided a list of applicable and significant information sources for the Plan.

Task C – Data Collection, Compilation and Reduction

A database was developed in Task C using the information sources outlined in Task B. The task required data collection from the Cooperators, SJRWMD, and the Florida Department of Environmental Protection and compilation of data in an Access database and GIS format.

The data includes:

- Compilation and identification of present and future water sources and their treatment requirements, including surface water, wastewater and reclaimed water throughout the County;
- Status report and schedule of all consumptive water use permits in Seminole County in excess of 100,000 gallons per day (gpd) and an estimate of the total water use for all groundwater users below the 100,000 gpd threshold;
- Tabulation, correlation and adjustment as necessary of existing population and water demand projections through 2025 using data from the Cooperators and the Bureau of Economic and Business Research (BEBR); and
- A composite map based on existing information of water lines, reuse lines, and interconnects. The TM discussed the content of the database and how it was compiled.

The March 2006 Technical Memorandum, is included as Appendix C. The Technical Memorandum outlines and presents the following information;

- Data Collection Efforts
- Content of the Database
- Database Compilation Procedures
- User's Guide

Task D – Water Conservation and Reuse

Task D considered water conservation and water reuse efforts that were implemented, proposed for implementation, and a literature review for potential uses and procedures. Water conservation includes methods to reduce the amount of water used through enhancements in efficient use of water. Water reuse entails the capture of water discarded from one user for use by another. Water reuse involves the use of treated wastewater effluent as a resource for irrigation and other non-potable water purposes.

ARCADIS conducted a workshop to help identify practical means of water conservation and reuse measures that may be implemented within Seminole County. The Technical Memorandum also served as a summary of the strategies that were discussed at the workshop. Information regarding specific strategies used by the Cooperators was provided by the Cooperators.

The Task D TM for the Plan includes:

- A review of the District's literature search available on water conservation. ARCADIS summarized the methods that are being primarily implemented in the State of Florida and secondarily outside of Florida.

- A description of each water conservation measure currently being implemented or scheduled for implementation by the Cooperators in Seminole County.

- A summary of findings and recommendations for water conservation and reuse.

The March 2006 Task D Technical Memorandum is included as Appendix D.

Task E – Flow Projections

Task E provides an evaluation of flow/demand projections supplied by the Cooperators and private utilities. In Subtask E.1, ARCADIS was requested to review the projected users' water needs and render an opinion on whether the projected uses are reasonable. Further, ARCADIS was requested to review SJRWMD land use projections and determine if the maps are consistent with the Cooperator's anticipated plans and population projections.

Population and potable water demand projections were provided by the SJRWMD and the Cooperators. Population and potable water demand projections in 5-year increments were provided through the year 2020 for the following entities: Altamonte Springs, Casselberry, Lake Mary, Oviedo, Sanford, Seminole County (4 service areas), Sanlando Utilities, and Winter Springs. With the exception of Altamonte Springs, and the Seminole County Southwest, Northeast and Northwest service areas, projections for 2025 also were provided by the Cooperator's. For completeness, 2025 potable demand projections for Altamonte Springs and the 3 Seminole County Service areas were estimated by average percent change between 2015 and 2020.

Note that the flow/demand projections presented in the May 2006 Technical Memorandum were subsequently modified. The modified flow/demand projections were used as a basis for future needs in Task F. Details are described in the Task F section of this executive summary. The May 2006 Task E Technical Memorandum is included as Appendix E.

Task F1 – Identification of Readily Identifiable Traditional and Alterative Water Supply Development Projects

The Task F1 Technical Memorandum presents projects identified under "Task F1. Identification of Readily Identifiable Traditional and Alternative Water Supply Development Projects" developed for the Plan. These projects were identified through a polling of public and private utilities in Seminole County, presented, and discussed in a public workshop held on September 8, 2005.

The Task FI Technical Memorandum presents proposed projects submitted to SJRWMD for consideration for the cost sharing for construction of alternative water supply options under Senate Bill 444 and inclusion in their District Water Supply Plan. The projects in the Technical Memorandum are not ranked and the project information reflects information provided by the specific entities that have proposed the projects and is not the result of an analysis by the Cooperators.

The September 2005 Task F1 Technical Memorandum is included as Appendix F.

Task F – Evaluation of Existing Facilities and Alternative Development

ARCADIS facilitated a workshop on July 12, 2006 to review Cooperator-proposed projects and to help identify other traditional and alternative water supply development projects to be considered for further review. Evaluation criteria was also discussed and selected at the workshop. To identify preferred alternatives, ARCADIS performed an evaluation of potential traditional and alternative water supply development projects for future water supply. The evaluation scored each project based on the selected criteria and ranked the AWS projects.

In August 2006 a contract change was requested by the Seminole Cooperators and SJRWMD to address water supply needs through the year 2045. The modification to the Scope of Services extended the time frame for flow/demand projections for the Plan. Although flow/demand projections had been presented in the May 2006 Technical Memorandum, ARCADIS revised those projections by extending them from 2025 to 2045 on a county wide basis in order to satisfy the scope of services amendment.

Another element effecting water deficits in the Plan is the proposed "Recommended Action Plan for the Central Florida Coordination Area (CFCA), A Cooperative Effort of the South Florida, Southwest Florida and St. Johns River Water Management Districts".

The November 2006 SJRWMD WaterWatch publication summarizes the CFCA efforts as follows:

> "In Spring 2006, the executive directors of the three districts instructed their staffs to work together to develop a plan for better coordination and communication in the high-growth area of central Florida. This effort was necessitated by the frequency and complexity of issues in each of the districts related to the sustainability of groundwater resources to meet current and future demands. Decisions made by one district in an area often impact the two neighboring districts."

The three districts are developing an action plan to assure a coordinated and consistent approach throughout the CFCA, which includes Polk, Orange, Osceola and Seminole Counties, and southern Lake County. The plan for the CFCA requires AWS projects to be developed to meet allocation of groundwater beyond 2013-projected demands.

The CFCA action plan includes three elements — regulatory, water supply planning, and modeling and tools. In the short term, the CFCA action plan:

- Limits new groundwater allocations to a maximum needed to meet 2013 demands;
- Provides opportunity for 20-year permit durations based on the 2013 allocation for those utilities committed to alternative water source projects by 2013

Over the long range, the CFCA plan will help develop consistent permitting criteria among the districts, as well as develop and implement a long-term water supply strategy for alternative water sources and for equitable allocation of any additional available groundwater."

Task E considered supply was as equal to each facility's existing consumptive use permit (CUP). The CFCA action plan limits caps future CUP allocation to the respective facilities 2013 demand. Future needs were calculated as the difference of supply minus demand. The CFCA action plan affected the "supply" portion of the equation used to evaluate future needs in the Plan. Additionally the CFCA action plan stressed the need for alternative water supply sources such as surface water rather than traditional groundwater supplies. Task F takes both of these items (long term projections and the CFCA action plan) into consideration when calculating future needs.

Task F Technical Memorandum presents the following efforts;

- Future water supply needs were calculated;

- Alternative Water Supply (AWS) projects identified in Task F1 were considered for evaluation,

- New AWS projects stemming from workshops were identified,

- A consolidated AWS project list was complied and agreed upon by the Cooperators,

- Evaluation criteria was agreed upon over the course of several workshops,
- The weighting of the evaluation criteria was developed and applied to the AWS projects for ranking,
- The evaluated and ranked AWS projects were presented.

The January 2007 Task F TM is presented herein as Appendix G. In summary the ranked AWS projects are shown in the following table.

Total Ranking	Project Number	Project	Capacity (mgd)	Total Adjusted Capital Cost $M	Unit Production Cost ($/kgal)	Environmental Impacts Evaluation Score	Environmental Impacts Ranking	Cost Evaluation Score	Cost Ranking	Total Evaluation Score
Potable Projects										
11	6	Sanford Surface WTP on Lake Monroe - Potable	4.0	$8.3	$0.62	26	9	8	14	34
17	10b	Surface WTP on St Johns River at Mullet Lake - Potable	7.0	$29.6	$1.27	23	14	4	21	27
20	7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable	25.0	$120.0	$3.05	15	19	4	19	19
21	9b	Surface WTP on St Johns River at SR46 - Potable	7.0	$29.1	$1.25	15	21	4	20	19
Non-Potable Projects										
2	2j	Greenwood Lakes Rapid Infiltration Basins Rehabilitatior	1.0	$0.5	$0.09	34	2	14	7	48
3	2c	Orange Boulevard Reclaimed Water Transmission Main	2.5	$0.4	$0.03	32	3	14	3	46
4	2e	Timacuan Reclaimed Water Main Upgrade	2.9	$0.8	$0.05	32	4	14	4	46
5	2h	Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	$4.3	$0.42	30	7	11	9	41
6	2f	Heathrow Boulevard Reclaimed Water Transmission Main	2.5	$1.7	$0.12	26	8	14	5	40
7	2b	Markham Woods Road Reclaimed Water Transmission Main	3.0	$3.9	$0.23	24	10	14	2	38
8	2g	Residential Reclaimed Water Retrofit – Phase I	1.1	$3.8	$0.61	30	5	8	12	38
9	2i	Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	$5.1	$0.23	24	11	14	6	38
10	8	Oviedo Reclaimed Water Projects	1.5	$5.2	$0.60	30	6	8	13	38
12	2d	New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46	2.0	$3.6	$0.31	21	12	8	11	32
13	3	East Orange and Seminole Counties Regional Reuse Project	4.7	$14.8	$0.18	18	16	14	8	32
14	5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project	2.3	$4.7	$0.58	22	15	8	15	30
15	10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage	5.0	$17.1	$0.87	23	13	7	16	30
16	4	Altamonte Springs and Apopka Project RENEW APRICOT	6.0	$10.8	$0.36	18	17	11	10	29
18	9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage	5.0	$15.8	$0.82	15	20	7	17	22
19	7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project	10.0	$22.0	$1.26	15	18	4	18	19

Note: Where evaluation scores are equal, projects are ranked alphabetically.

Suggested Cooperator Action Items

As water sources become limited or unavailable, regional planning will be required to satisfy the water supply needs of Florida. This is evidenced in the CFCA action plan. The Cooperators have shown their ability to consider regional planning with the culmination of this Seminole County Water Supply Plan. To conduct regional planning and implementation efforts, new partnerships and instruments of implementation may need to be developed.

Two examples of municipalities seeking and developing cooperative agreements to satisfy regional needs are discussed below.

Example one is past and present regional planning and partnering efforts between Seminole County, Oviedo, University of Central Florida, Orlando (Orlando Utilities Commission (OUC)), and Orange County Utilities. In summary, the OUC Water Conserv I wastewater treatment facility (Conserv I) will be decommissioned and a pumping facility will send raw wastewater through an existing pipeline to OUC's Iron Bridge Regional Water Pollution Control Facility (Iron Bridge) for treatment. Iron Bridge has an agreement with Seminole County Utilities to supply reclaimed water and Seminole County Utilities has agreements with Oviedo, University of Central Florida for reclaimed water. At present a reclaimed water pipeline is under construction from Iron Bridge south into Orange County. Orange County Utilities has a draft agreement with OUC for purchase of reclaimed water from Iron Bridge. Therefore, through the use of multiple agreements the Iron Bridge facility can supply both eastern Orange and Seminole Counties making it a true regional facility.

The second example of cooperative action is an endeavor in western Seminole County including Seminole County Utilities' efforts to partner with strategically located municipalities such as Lake Mary, Sanford, Utilities Inc. - Sanlando, Lake County and Volusia County. The parties to the cooperative agreement would benefit from the Seminole County Utilities' proposed potable and reclaimed water facilities. The partnerships would be used to successfully develop Projects 7a - Seminole County Yankee Lake Reclaimed Water System Augmentation Project and 7b - Seminole County Yankee Lake Regional Surface Water Facility.

Possible benefits for regional cooperative efforts may be, but are not limited to the following:

- Reduced costs to each cooperator
    - Water management districts may extend funding to partners who develop AWS projects. Cost sharing may be obtained for preliminary planning and design (up to 30%) and capital construction costs (up to 40%).
    - By taking advantage of the economy of scale with capital and O&M costs for the AWS projects.
- Achievement of sustainable yields, by identifying long term regional needs and working with regulators to help protect and maintain the source

Regional planning must be supplemented by critical interconnections to allow water (raw water, wastewater, potable water and/or reclaimed water) resource sharing throughout Seminole County and with adjacent counties. The country can be viewed geographically to identify potential interconnections.

Western Seminole County

The northwestern portion of Seminole County has several projects that would allow water (raw water, wastewater, potable water and/or reclaimed water) resource sharing with southwestern and central county areas. Some of these opportunities can be developed with implementation of interconnection(s) outlined within the North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study (aka Tri-Party Plan). Sanford, Lake Mary and Seminole County are the parties involved with the Tri-Party Plan. The above mentioned projects at Seminole County Utilities Yankee Lake facility could promote implementation of interconnections between Seminole County Utilities, Lake Mary, Sanford, Utilities Inc. - Sanlando Utilities, Lake County and Volusia County. Therefore a "bridge" would be established between the north and south portions of western Seminole County.

Central Seminole County

Sanford as part of the Tri-Party group has current interconnections with Seminole County Utilities - Northwest, Lake Mary, and Seminole County Utilities – Northeast. These interconnections link Sanford with the northwest and central Seminole County areas. Other potential interconnections for Sanford are within the eastern Seminole County area.

Eastern Seminole County

Potential AWS Projects collectively referred to as the St. Johns River Facility include

9a – Surface WTP on St. Johns River at SR46 - Non-Potable with Storage
9b – Surface WTP on St. Johns River at SR46 – Potable
10a – Surface WTP on St. Johns River at Mullet Lake - Non-Potable with Storage
10b – Surface WTP on St. Johns River at Mullet Lake - Potable

This facility(s) would "bridge" the eastern portions of the county from north to south. Potential interconnections may be between

- Sanford and the St. Johns River facility
- St. Johns River facility and Volusia County
- St. Johns River facility and Oviedo
- Oviedo and Winter Springs
- Winter Springs and Casselberry

Through these partnerships and interconnections a regional facility located at the St. Johns River could allow water (raw water, wastewater, potable water and/or reclaimed water) resource sharing north into Volusia County and south along the eastern half of Seminole County. With several additional interconnections, the eastern and western portions of the county could be linked, by means of east-west interconnections in the southern portion of the county. These interconnections may be between

- Casselberry and Longwood
- Casselberry and Altamonte Springs
- Altamonte Springs and Utilities Inc. - Sanlando

These interconnections would in theory connect most Seminole County municipalities directly or indirectly and also link Seminole County to Lake, Volusia, and Orange Counties.

The above suggested interconnections are based on geographical location only. Additional consideration is needed for implementability and cost effectiveness of interconnections. These are suggested in order to create dialogue between potential cooperators.

This Plan and the knowledge of the AWS project details, scoring outcome of the criteria points, and is a basis for the Cooperators to take the next step in the process of developing and implementing alternative water supply sources for future needs.

The following action item is scheduled.

- The Chairperson of the Seminole County Cooperators presents the Plan to the Seminole joint County/City elected officials meeting in April 2007.

Other suggested milestones/schedules for Cooperator's consideration are:

- 2007 - Development of implementation strategies; and Partnership Evaluation and Potential Agreements;

- 2007 to 2013 - Initiate Planning, Design, Permitting, and Construction as appropriate.

Appendix A

Seminole County Water Supply Plan Scope of Services dated June 16, 2005 and August 30, 2006 Seminole County Water Supply Plan – Amendment No. 1

Scope of Services

The following reflects the scope of services.

Phase I - Project Management and Administration

Task A. Project Management and Administration

Project management and administration will be implemented throughout the project until completion. ARCADIS will satisfy this task using an ARCADIS-certified Project Manager, and our proven Project Management system.

1. Project Coordination/Initiation:

ARCADIS will initiate a project kick-off meeting to confirm client objectives, discuss project schedule, define procedures and means of communications. ARCADIS will provide one point of contact, the project manager, through whom all communication shall pass. Day-to-day project coordination will be conducted through ARCADIS' project manager and the contact as identified by the City of Casselberry. Progress meetings will be held on a monthly basis between the ARCADIS project manager and the City.

2. Scheduling, Progress Monitoring and Reporting:

At the project kick-off meeting, ARCADIS will furnish a project schedule that identifies task production periods, project deliverables, workshops, and review periods. The project schedule, which will be provided in a Microsoft Project format, will be updated throughout the project. Deviations from the project schedule will be noted in monthly project status reports with justification or corrective measures. The monthly progress reports will accompany each invoice and will identify activities performed.

Deliverables:

- Monthly Progress Reports
- Project Schedule in Microsoft Project

Phase II – Data Gathering & Processing

ARCADIS will gather readily available information regarding existing water supply plans, current consumptive use permits, pending consumptive use permit applications, present and known future water supplies and water and wastewater treatment capabilities throughout Seminole County.

Task B. Review Existing Plans

ARCADIS will review existing plans by the St. Johns River Water Management District (District); each Cooperator, where available; and other plans as appropriate. ARCADIS will review at a minimum:

- The District Water Supply Plan (DWSP),
- The Draft 2003 Water Supply Assessment, and
- Other commissioned studies by District and the Cooperators
- District alternative water supply planning studies (such as surface water from the St. Johns River)

- Facility plans by the Cooperators that identify water supply needs and water supply sources

ARCADIS will contact each of the Cooperators, local agencies and other utilities, as appropriate, to determine the extent of information available regarding water supply plans and to obtain that information

Deliverables:

- List and summary of existing water supply plans and other reports related to needs and sources including date of report, purpose, and planning years.

Task C. Data Collection, Compilation and Reduction

1. A compilation of the present and future sources of water (including surface water wastewater and reclaimed water) and treatment requirements for those sources will be prepared, including amount, reliability and cost for each source. Actual capacity, permitted capacity and long-term planned capacity will be included, to the extent available. ARCADIS assumes that most of the data will be available from the District with the remaining data available from the Cooperators and the Florida Department Environment of Protection.

ARCADIS will use GIS to create an interactive database and maps to identify each source of supply and its level of treatment in the study area.

2. A status report and schedule of all consumptive water use permits in Seminole County in excess of 100,000 gallons per day (annual average), and an estimate or accounting of the total water use for all groundwater users below the 100,000-gpd threshold will be prepared. ARCADIS assumes that most of the data will be available from the District with the remaining data available from the Cooperators.

ARCADIS will add the CUP information to the GIS to identify the relationship between water demand to water supply.

3. ARCADIS will tabulate existing population and demand projections through 2025 (for 2010, 2015, 2020 & 2025) or as available based on the current District Water Supply Assessment. To confirm the data, ARCADIS will review the demand projections with each of the Cooperators and compare the projections to population projections performed by the BEBR projections taking into account non-domestic demands such as industry and agriculture. Where the demand projections differ significantly from the District Water Supply Plan, ARCADIS will adjust the projections to match what is anticipated by the Cooperators in their respective communities. ARCADIS assumes that most of the data will be available from the District with the remaining data available from the Cooperators.

4. ARCADIS will review information concerning existing water and reuse lines and interconnects. ARCADIS assumes that the information can be provided as infrastructure maps in AutoCAD by the various Cooperators. The maps will be used to determine the ability to provide additional interconnects between adjacent systems and to determine the most viable locations for bulk and centralized delivery. A hydraulic analysis is not included in this scope.

Deliverables:

- Summary of present water supply sources (water and wastewater) and identified future supply in a GIS format and Access database
- Tabulation of existing CUP permits in a GIS format and Access database
- Tabulation of existing population and demand projections in a GIS format and Access database

Task D. Water Conservation and Reuse

1. ARCADIS will describe each water conservation measure currently being implemented or scheduled for implementation by Cooperators in Seminole County.

ARCADIS will organize a one-day workshop to help identify practical means of water conservation measures within Seminole County. ARCADIS will prepare an agenda and act as facilitator. Prior to the workshop, ARCADIS will gather information from each of the Cooperators regarding current and proposed measures. This information will be sent to each of the meeting participants prior to the workshop. ARCADIS will also provide information gathered as part of the literature search. ARCADIS will schedule the meeting to correspond to a regularly scheduled Cooperators meeting, if appropriate.

2. ARCADIS will review the District's literature search available on water conservation. ARCADIS will summarize the methods that are being implemented primarily in the State of Florida and secondarily outside of Florida.

3. ARCADIS will prepare a Technical Memorandum identifying the results and recommendations for improved efficiencies including water conservation and reuse. These recommendations will be used in developing traditional and alternative water supply development projects as part of the Water Supply Plan.

Deliverables:

- Workshop to identify Water Conservation and Reuse Methods
- Technical Memorandum – Water Conservation and Reuse

Task E. Flow Projections

1. ARCADIS will perform a review of the projected uses and render an opinion on whether the use represents a reasonable demand for water use through at least 2025 by land water use projections and geographical areas in Seminole County.

ARCADIS will review the District's land water use projections and determine if the maps are consistent with the Cooperator's anticipated plans and population projections. ARCADIS assumes that the land water use projection information is available in an electronic format.

2. ARCADIS will perform an analysis of the effects of declining agricultural water use and the associated increased availability of groundwater for public use.

Deliverables:

- GIS mapping and tabulation of Flow Demands Projections

- GIS mapping and tabulation of water demand changes caused by reduction in agricultural use.
- Technical Memorandum defining methodology and results

Phase III – Analysis and Recommendations

Task F1. Identification of Readily Identifiable Traditional and Alternative Water Supply Development Projects

The main purpose of this task is to summarize and identify traditional and alternative water supply development projects, that are readily identifiable and/or currently in an implementation or conceptual phase of development.

These alternatives will be identified at a one-day workshop held with the Cooperators upon completion of the Phase II tasks. ARCADIS will organize a one-day workshop to help identify readily identifiable traditional and Alternative Water Supply Development Projects. ARCADIS will prepare an agenda and act as facilitator.

ARCADIS will provide a brief summary of the readily identifiable traditional and alternative water supply development projects including:

- Description including key features
- Entities served
- Project magnitude and capacity
- Preliminary Opinion of Total Project Cost
- Preliminary Opinion of Probable Cost per gallon of water supplied
- Proposed schedule
- Project status
- Order of magnitude cost estimate
- Stakeholder preferences

Deliverables:

- Workshop to identify readily identifiable traditional and alternative water supply development projects
- Technical Memorandum

Task F. Evaluation of Existing Facilities and Alternatives Development

The main purpose of this task will be to match the present and future demands with current and future sources. ARCADIS will facilitate a workshop to help identify traditional and alternative water supply development projects to be considered for review.

ARCADIS will use GIS and other tools to identify the most preferred traditional and alternative water supply development projects to meet the water needs of Seminole County. To identify preferred alternatives, ARCADIS will review each traditional and alternative water supply development project for five-year planning increments (2010, 2015, 2020, and 2025) for, but not limited to the following:

- Maximize water supply quantity for the least cost
- Minimize environmental impacts

- Ability to use existing infrastructure and water supplies to deliver water with minimal new facilities
- Providing new water supplies through maximum use of current allocations, water conservation, and reuse (either through direct supply or through offsets to have greater permitted groundwater withdrawal).
- Preliminary opinion of cost per gallon of water supplied.

ARCADIS will perform an evaluation of potential traditional and alternative water supply development projects for future water supply, including but not limited to:

a) The feasibility of interconnecting existing water supply facilities (raw and treated) and interconnecting reuse facilities, including developing a feasibility methodology, ARCADIS will review existing supply capacity to determine if interconnects can provide future water supply to other systems in need;

b) Water conservation

c) New groundwater withdrawals and/or relocating existing facilities to maximize withdrawals and to minimize ground water and surface water impacts;

d) The feasibility of additional reuse projects, including expanding existing systems, amending existing agreements, replacing present groundwater use with reuse water, supplementing reuse water with lower quality waters, and cooperative projects by local governments;

e) Storage of water using ASR to offset high demands during peak use periods;

f) Recommendations on potential joint permitting of existing and future sources and monitoring efforts by local governments in Seminole County;

g) Recommendations on potential aquifer recharge sites;

h) Review other possible water supply solutions currently being implemented in the state of Florida and elsewhere, including but not limited to:

- surface water from the St. Johns River
- brackish groundwater (including identification of suitable areas for development), and
- other lower quality sources;

ARCADIS will facilitate a workshop to review the traditional and alternative water supply development projects review and evaluation.

For the preferred alternatives, ARCADIS, cooperating with SJRWMD, will perform analyses of the effects of existing and proposed Minimum Flows and Levels (MFL's) for springs and lakes on withdrawals from the aquifer. In addition, ARCADIS will consider other resource constraints used by the District in its water supply assessment process. This will be included as part of the modeling efforts for this project. An allowance is included as Task H.

ARCADIS will provide a brief summary of the preferred alternatives including:

- Description

- Schedule
- Specific recommendations
- Order of magnitude cost estimate

Deliverables:

Technical Memorandum including:

- Definition of traditional and alternative water supply development projects to provide water supply for Seminole County
- Traditional and alternative water supply development projects review
- Preferred/ recommended water supply project description
- Order of magnitude capital and operation & maintenance cost estimate for each alternative

Task G. Regional Monitoring Plan

To monitor the implementation of the proposed water supply plan projects, ARCADIS will develop a regional monitoring plan including, but not limited to, the following elements:

- Salt water intrusion
- Lakes and surface water impacts
- Wetlands impacts
- Minimum Flows and Levels for streams, springs, etc.

Deliverables:

Regional Monitoring Plan including recommended:

- Frequency
- Modeling
- Means and methods

Task H. Groundwater Modeling

This task includes groundwater modeling in support of the alternative analysis conducted in Task F. The specific scope of work with respect to modeling will be determined during the study. This task provides an allowance for this work.

Deliverables:

To be determined

Infrastructure, environment, facilities

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Orlando
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www.arcadis-us.com

Mr. Gerald Chancellor, PE
City of Casselberry
95 Triplet Lake Drive
Casselberry, Florida 32707

Subject:
Seminole County Water Supply Plan – Amendment No. 1

WATER RESOURCES

Date:
30 August 2006

Contact:
John D. Hermann

Phone:
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Email:
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Our ref:
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Florida License Numbers:

Engineering
EB00007917

Geology
GB310

Landscape Architecture
LC26000269

Surveying
LB7062

Dear Mr. Chancellor:

As we discussed with you and Mr. Seeber, we propose that our contract be modified to address water supply demand needs through 2045. This contract change is being requested because the Seminole Cooperators and the District have determined that:

- The water supply plan needs to address a wider vision to examine longer-term demands and potential long-term sources that may be compromised in the future by other competing demands from communities outside of the planning area.

- A plan with a schedule needs to be established so that the Cooperators of Seminole County can make prudent planning decisions to assure that efforts can be made far enough in advance to help secure new water sources to meet the long-term needs of Seminole County.

To this end, we propose the following contract scope changes:

- Delete Task G Regional Monitoring Plan. The Regional Monitoring Plan is no longer needed because the original intent of this task would have been to monitor the effects of additional groundwater withdrawals. Since the alternative water supply projects identified in the planning process do not involve changes to groundwater withdrawals a monitoring plan is not needed.

- Reduce Task H Groundwater Modeling fee to $. The remaining fee represents services for a comparison and review of groundwater models. Groundwater modeling is no longer needed because the alternative water supply projects identified in the planning process do not involve changes to groundwater withdrawals

The $62,500 fee available from deleting Task G and reducing Task H should be reallocated into the following tasks with the additional work as follows:

- Task E Flow Projections - Develop flow projections to the year 2045 and revise appropriate documentation to reflect these numbers.

  Add $

  Total revised fee for Task E is $

- Task F Evaluation of Existing Facilities and Alternatives Development - Prepare a Tech Memo that summarizes the 2045 demands and identifies alternative sources of water that can be used to meet these demands. The Tech Memo will include a section on the additional demands from 2025 and 2045 that will not be met with the projects identified by the Cooperators. The Tech Memo will include an Executive Summary and recommendations of projects or actions that can be taken to meet demands for the periods of 2005-2025 and 2025-2045.

  Add $

  Total revised fee for Task F is $

The total fee for the contract will not change.

Sincerely,

ARCADIS G&M, Inc.

John D. Hermann, P.E.
Project Manager

Copies:
File

Appendix B

Task B - Data Gathering & Processing; Review of Existing Plans

Review of Existing Plans – Task B

For The

Seminole County Water Supply Plan

By

ARCADIS
4307 Vineland Road H-20
Orlando, Florida

December 1, 2005

INTRODUCTION

This document represents a review of existing plans under "Task B - Review Existing Plans" developed for the Seminole County Water Supply Plan. The documents reviewed consist of St. Johns River Water Management District (SJRWMD) plans as applicable, other commissioned studies by the District, the Cooperators, and Facility plans by the Cooperators that identify water supply needs and water supply sources.

This document represents the deliverable identified under Task B, which is "List and summary of existing water supply plans and other reports related to needs and sources including date of report, purpose, and planning years".

"Task C – Data Collection, Compilation and Reduction" includes a separate deliverable (not included as part of this document) that represents a summary and tabulation of data for the present and future sources of water within Seminole County.

The documents represent those provided by the Cooperators and the District. They will be used as a reference for the Plan.

The Cooperators consist of the Cities of Altamonte Springs, Casselberry, Lake Mary, Longwood, Oviedo, Sanford and Winter Springs and Seminole County. The Cooperators have formed a coalition, in cooperation with SJRWMD to prepare the Seminole County Water Supply Plan ("Plan").

DOCUMENTS REVIEWED

Cooperator Documents

City of Sanford

- Wastewater Management System, 201 Facilities Plan Addendum, November 1998.
  - This Plan was prepared for the expansion of the City of Sanford Wastewater Management System. The Plan characterizes the existing wastewater system and identifies improvements to the system including:
    - Collection and Transmission System Improvements
    - Improvements to/ expansion of the Sanford North & South Water Reclamation Facilities
    - Enhancements to the delivery of reclaimed water

- Wastewater Management System, 201 Facilities Plan Addendum, November 2003.
  - This Plan was prepared for the expansion of the City of Sanford Wastewater Management System Plan to characterize the existing wastewater system and identify necessary improvements to the system.
  - This plan was used to provide information for the update of the wastewater management system improvements, including descriptions of the Sanford North Water Reclamation Facility (WRF) improvements and the new Sanford South WRF.

- Water Facilities Plan, November 1998.
  - This Plan characterizes the existing water supply system and identifies necessary improvements to the system.
  - This plan included a description of the water system, including treatment plants, storage and high service pumping; and water facilities improvement plan recommendations. Most of the information in this plan was not used due to the more recent information available.

City of Longwood

- Water Distribution and Wastewater Transmission System Hydraulic Model Update for the City of Longwood, May 2003.
  - The purpose of this analysis was to identify any immediate system improvements required, identify any system improvements required over a ten year planning horizon and to provide a tool for future planning efforts.
  - This report included a hydraulic model update (water and wastewater system), a summary of water and wastewater treatment facilities, and recommended system modifications.

Seminole County

- Master Plan Update Water, Wastewater, and Reclaimed Water, August 2003.
    - Planning Years: 2005 – 2020
    - The Master Plan evaluates the existing water, wastewater, and reclaimed water systems and identifies alternatives and proposed projects to serve the long-term needs of Seminole County.
    - The following information is included:
        - Population, water, wastewater, and reuse flow projections
        - Summary of CUPs
        - Water System, including water treatment plants, storage, and well capacities
        - Water alternatives analysis and plan recommendations
        - Summary of wastewater collection and reclaimed water distribution system.
        - Wastewater and reuse alternatives and plan recommendations

Tri-Party (Seminole County, City of Sanford, and City of Lake Mary)

- North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study, November 1998.
    - This study was performed to evaluate the existing reclaimed and augmentation water system to optimize the use of reclaimed water within the regional system.
    - This study provides a description of the wastewater treatment and water reclamation facilities, and the reclaimed water system for the Seminole County, Lake Mary and Sanford service areas. The current and projected reclaimed water supplies and uses, recommended system improvements and project prioritization is also included in the study.

SJRWMD Documents

- 2004 Interim Update to Special Publication SJ2000-SP1 District Water Supply Plan, 2004.
    - The Interim Update identifies potential water supply development projects that were not identified in the District Water Supply Plan of 2000.
    - The St. Johns River near Lake Monroe Project was the only project identified in the Interim update located in Seminole County.

- Affordability Analysis of Alternative Water Supply, February 2004.
    - This analysis assists in identifying viable and affordable alternative water supply resources in order to allow the time necessary to bring an alternative water supply option into production.
    - This study identified three population clusters, one of which in Western Seminole County. The population clusters were configured into water Demand Centers. The size and cost of required surface water treatment

facilities were evaluated as an alternative to groundwater to meet projected water demands in the water Demand Centers . The effect of the cost of surface water upon the cost of water and the affordability of the increased cost of water at the retail level was also assessed.

- East-Central Florida Water Supply Planning Initiative Phase II Annual Report of Activities and Accomplishments, 2003.
    - The purpose of this report is to build upon the results of the Phase I Initiative with the development of action plans and identification of specific projects to implement the Agenda recommendations and strategies.
    - Developing 50 mgd from Lake Monroe for Volusia and Seminole County was identified as a potential project. The report also references the results of the North Seminole Regional Reclaimed Water Optimization Study.

- Environmental Evaluations for the Development of Minimum Flows and Levels for the St. Johns River Near DeLand at State Road 44, Volusia County, May 2003.
    - This document conducts an environmental assessment and determines whether the preliminary minimum flow and level (MFL) for the St. Johns River near DeLand at State Road 44 protects specified natural resource and environmental values.
    - The report concludes that the preliminary MFL for the St. Johns River near Deland will protect the natural resources and environmental values. These conclusions are made with varied degrees of certainty ranging from high to medium certainty.

- Groundwater Flow and Solute Transport Modeling Study for Seminole County, Florida, and Adjoining Regions, March 1994.
    - This study is part of an ongoing program to address the need for a long-term, environmentally sound water resources management policy. The primary purpose of this study is to provide a quantitative tool to assist with groundwater resources planning and management efforts in Seminole County.
    - Modeling efforts determined that in order to maintain fresh ground-water resources in Seminole County, it is very important that regions of high-moderate recharge are maintained as much as possible. The model simulations also indicate that groundwater exceeding 250 mg/l chloride concentration underlies much of Seminole County in the middle semi-confining unit. Along the western and northern borders of Seminole County, groundwater with chloride concentrations exceeding 250 mg/l exists in relatively narrow bands centered along the Wekiva and St. Johns River channels.

- Lower St. Johns River Salinity Regime Assessment: Effects of Upstream Flow Reduction near DeLand, July 2002.

  - This document evaluates whether the preliminary minimum flows and levels established by the St. Johns River Water Management District for the St. Johns River near DeLand will provide protection to the estuarine resources, as required by Rule 62040.471(1)(c), Florida Administrative Code.
  - Based on the results of the salinity assessment in the Lower St. Johns River, the document suggests that the MFL regime recommended by SJRWMD *will* provide protection of the estuarine resources.

- Population Projection Methodology of the SJRWMD's 2003 District Water Supply Assessment and 2005 District Water Supply Plan, 7 August 2003.
  - This document presents results of a service area demand study used to determine the projected water demands for surface water in Volusia and Seminole counties through 2025.
  - The District's GIS-based model projects growth based on historical and spatial elements, growth calculations at the census block level, and aggregation to utility service areas and traffic analysis zones.
  - The population projections determined by the District are used as a part of the Seminole County Water Supply Plan.

- Preliminary Investigation of Supplementing the City of Apopka Reuse System with Water Withdrawn from Lake Apopka, 30 May 2001
  - The purpose of this document is to further identify, examine, and evaluate issues involved in the development of Lake Apopka as a supplemental supply for the City of Apopka reuse system.

- SJRWMD Water Management Plan, 2005.
  - Planning Years: 2005-2025
  - The purpose of this document is to provide long-term guidance for Water Management District activities and presents a compilation of water resource information that forms the basis for water management. The Plan is to provide goals, issues, objectives, and strategies for the Water Management District areas of responsibilities, such as water supply, flood protection and floodplain management, water quality, and natural systems.
  - The plan offers direction on the regional water supply plans, water conservation, conservation rate structures, the use of reclaimed water, water shortage planning, and cost-effectiveness of water supply alternatives to ensure the availability of an adequate and affordable supply of water.

- SJRWMD Water Management Plan, 2000.
  - Planning Years: 2000-2020
  - This document provides long-term guidance for Water Management District activities and presents a compilation of water resource information that forms the basis for water management. The Plan is to provide goals, issues, objectives, and strategies for the Water Management District areas

of responsibilities, such as water supply, flood protection and floodplain management, water quality, and natural systems.

- St. Johns River Water Supply Project: Literature Review of Surface Water Treatment Technologies, 2004.
  - This report provides a general overview and basic summary of the different types of treatment technology that could potentially be applied to a specific surface water source. The report also references recent studies that are applicable to treatment of surface water from the St. Johns River.

- St. Johns River Water Supply Project: Surface Water Treatment and Demineralization Study: Preliminary Raw Water Characterization, 2001.
  - This report provides raw water characterization for the St. Johns River Water Supply Project Surface Water Treatability and Demineralization Study. This report was conducted to identify the treatment requirements for the St. Johns River water for a potential treatment facility to be located in between Titusville and DeLand.
  - A 2-year pilot study was performed conducting biweekly sampling at four points within the study area. The sampling points located in Seminole County are at the St. Johns River in Sanford and at the Wekiva River near Cassia. The parameters monitored for this study were temperature, pH, nitrogen, phosphorus, oxygen, organic parameters, and inorganic parameters.

- Style Guide for Written Communication, 2001.
  - This manual is a guide for the SJRWMD and its contractors in preparing reports for the District. This guide identifies correct grammar, punctuation, and word usage, and for consistency in documents. To be consistent with other SJRWMD water supply planning efforts, this manual will be used as a guideline for all documents, graphs and figures for the Seminole County Water Supply Plan.

- Surface Water Treatability and Demineralization Study, 2004.
  - The purpose of this study is to demonstrate the treatability of a specific water source, identify the appropriate technology and basic design parameters for treatment, and determine both the capital and operational costs for a potential facility. This source of alternative supply is being evaluated to offset the water supply deficit project in eastern central Florida. Lake Monroe in Sanford is the raw water source for the pilot study.

- Technical Feasibility of Artificial Recharge of Reclaimed Wastewater and Its Hydrologic Impacts on the Regional Ground Water Systems, 2000.
  - This study investigates the technical feasibility and hydrologic impacts of artificial recharge of reclaimed wastewater through rapid infiltration basins (RIBS) into the groundwater system. Twenty-one potential new

RIB sites were identified within the study area, which is located in Seminole and Orange Counties. The study determined that up to 22.5 mgd of additional reclaimed water may be recharged. The study concluded that RIBs can increase the potentiometric surface elevations in the surficial aquifer and can also augment spring flow.

- Technical Memorandum: Cost Estimating and Economic Criteria for 2005 District Water Supply Plan, 16 June 2004.
  - This Technical Memorandum provides cost estimating and economic criteria to ensure that all costs are directly comparable. The criteria include: peak flow ratio, cost index, non-construction capital cost, land cost, land acquisition cost, interest rate, economic life of facilities, and present worth. This document will be used as a guide for the Seminole County Water Supply Plan during the evaluation of the alternative water supply projects identified in the Plan to be consistent with the District's Water Supply Plan.

- Technical Memorandum Financial Impact of Alternative Water Supply, 2005.
  - This Technical Memorandum provides guidance regarding the determination of the cost of alternative water facilities for the typical utility evaluated.
  - The objective of this analysis was to determine the relative comparative impact of using an alternative water supply source upon the cost of delivered potable water for typical local utilities in East/Central Florida. The supply source evaluated was surface water from the St. Johns River. This report includes a projection of the cost of delivered water over a twenty-year period. The report concludes that by the end of the 20-year projection period, the impact of the cost of surface water as an alternative to groundwater will require cumulative rate increases of a high of about 135% compared to about 35% projected if groundwater were available throughout of the projection period. The analysis also concludes that Seminole County is within the accepted thresholds of affordability for all years of the projection period.

- Water 2020 Constraints Handbook, September 1998.
  - This document describes water resource constraints and defines thresholds (for planning purposes) beyond which unacceptable impacts to water quality and to wetland and aquatic systems is expected to occur. The water resource constraints reviewed in this document are minimum flows and levels, native wetland vegetation, and ground water quality.

- Water Supply Assessment, 2003.
  - This document defines the limits and projects the water resource impacts that could occur in 2025 as a result of projected changes in water use, and identifies priority water resource caution areas (PWRCA).

  - The report identifies that some public water supply areas in Seminole County have a high likelihood of experiencing unacceptable impacts to groundwater quality. The majority of Seminole County is located within a PWRCA; however portions of northern Seminole County included in the 1998 PWRCA are no longer designated as a PWRCA in the 2003 water supply assessment.

- Water Supply Needs and Sources Assessment: Alternative Water Supply Strategies Investigation: Artificial Recharge of the Floridan Aquifer through Drainage or Injection Wells In Orange and Seminole Counties, 1997.
  - This report documents the use of drainage wells in Orange and Seminole Counties, which primarily provide surface drainage and prevent flooding in closed surface basins. The report recommends that drainage or artificial recharge injection wells be recognized as a technology useful for total water resources management.

- Water Supply Needs and Sources Assessment: Alternative Water Supply Strategies Investigation: Brackish Groundwater: Planning-level Cost Estimates, 2001.
  - This report is the third in a series concerned with the feasibility of developing brackish groundwater sources to help meet municipal water supply needs within the St. Johns River Water Management District, and presents a cost analysis. Cost equations were developed to be used as the basis for estimating the cost of brackish groundwater supply evaluations, including a cost equation for Lake Jesup, located in Seminole County. Lake Jesup is one of six candidate brackish groundwater withdrawal sites identified, based on relative water supply development potential and proximity to demand centers

- Water Supply Needs and Sources Assessment: Alternative Water Supply Strategies Investigation: Brackish Groundwater: Source Identification and Assessment, 2001.
  - This document addresses the availability of lower-quality or brackish groundwater as an alternative water supply source within the priority water resource caution areas of the St. Johns River Water Management District. This is the first in a series addressing the feasibility of developing brackish groundwater supplies to augment existing and future public water supply needs. Lake Jesup is one of six candidate brackish groundwater withdrawal sites identified, based on relative water supply development potential and proximity to demand centers. Each site was analyzed to identify long-term changes in water quality due to pumping.

- Water Supply Needs and Sources Assessment: Alternative Water Supply Strategies Investigation: Planning Level Cost Estimates: Aquifer Storage and Recovery Utility Evaluations, 1997.

  - This report, the second in the aquifer storage recovery (ASR) series, applies an ASR feasibility tool to selected sites within the St. Johns River Water Management District as part of continuing investigations of alternative water supplies.

United States Geological Survey Documents

- Hydrogeology, Water Quality, and Simulated Effects of Ground-Water Withdrawals from the Floridan Aquifer System, Seminole County and Vicinity, Florida, 2001. (Water Investigations Report 01-4182)
  - This report summarizes the results of a groundwater flow model developed to simulate the effects of both present day (September 1996 through August 1997) and projected 2020 ground-water withdrawals on the water levels in the surficial aquifer system and the potentiometric surface of the Upper and Lower Floridan aquifers in Seminole County and vicinity.

Appendix C

Task C - Data Gathering & Processing; Data Collection, Compilation and Reduction

Data Collection, Compilation and Reduction

Task C

For The

Seminole County Water Supply Plan

By

ARCADIS G&M, Inc.
4307 Vineland Road H-20
Orlando, Florida

Technical Memorandum

March 30, 2006

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APPENDIX

Water Treatment Plant Reports .... A
Wastewater Treatment Plant Reports .... B

INTRODUCTION

The project team developed a database in fulfillment of the requirements of Task C of the Seminole County Water Supply Plan. This task requires that the data collected from the Cooperators, St. Johns River Water Management District (SJRWMD), and the Florida Department of Environmental Protection (FDEP) is compiled in an Access database and GIS format.

The data include:

- Compilation and identification of present and future water sources and their treatment requirements, including surface water, wastewater and reclaimed water throughout the County;
- Status report and schedule of all consumptive water use permits in Seminole County in excess of 100,000 gallons per day (gpd) and an estimate of the total water use for all groundwater users below the 100,000 gpd threshold;
- Tabulation, correlation and adjustment as necessary of existing population and water demand projections through 2025 using data from the Cooperators and the Bureau of Economic and Business Research (BEBR); and
- A composite map based on existing information of water lines, reuse lines, and interconnects. Viable locations for bulk and centralized delivery will also be identified.

In the following sections, this technical memorandum discusses the content of the database and how it was compiled. This information is presented in the following sections.

- Data Collection Efforts
- Content of the Database
- Database Compilation Procedures
- User's Guide

DATA COLLECTION EFFORTS

An initial data request was sent to all major water suppliers in Seminole County on July 21, 2005. We requested that the data be provided in georeferenced ESRI-shapefiles and/or georeferenced AutoCAD files where possible. ESRI is the GIS and mapping software. A general list of the requested information follows:

- Demand Projections
- Master Plans
- Water Treatment Plant Data
- Wastewater Treatment Plant Data
- Service Areas and Utility Mains
- Septic Areas
- Reclaimed Water Users
- Water Supply Sources

ARCADIS requested that information be submitted by August 16, 2005. ARCADIS received data up to January 2006.

A second data request was transmitted to the major water suppliers on October 31, 2006. This request included a checklist showing what items were received and/or missing for each utility. Information continued to be received until January 2006.

A data request was sent to SJRWMD on July 21, 2006. ARCADIS has continually worked with the SJRWMD to collect additional information as needed. Water and wastewater treatment facility information was collected from the FDEP website. The available wastewater treatment plant permits also were received from FDEP.

CONTENT OF THE DATABASE

This section summarizes all data collected from the Cooperators, FDEP, and SJRWMD. The database was compiled using the information collected and organized into four sections.

- Wastewater Treatment/Reclaimed Water
- Water Supply
- Summary of Consumptive Use Permits (CUPs)
- Demand Projections

Wastewater Treatment/Reclaimed Water

The information collected by the project team and entered into the database regarding wastewater treatment and reclaimed water is:

1. General Information
    a. Name of wastewater treatment plant (WWTP);
    b. FDEP identified WWTP ID;
    c. Owner and address of facility;
    d. Location by latitude and longitude;
    e. Treatment process;
    f. Effluent quality.
2. Permit Information
    a. Permitted Capacity, mgd;
    b. Current Average Daily Flow (ADF), mgd;
    c. Permit status;
    d. Other conditions relating to storage or reuse;
    e. Planned capacity.

3. Reclaimed Water

    a. Total effluent disposal available as reuse;

    b. Major reclaimed water users including permit information for each major user, such as location, permitted capacity, and current flow; and

    c. Rapid Infiltration Basins (RIBs) including WWTP, location in latitude and longitude, permitted capacity, total area and current flow.

The majority of this information was collected from FDEP and the Cooperators.

Water Supply

The information collected by the project team and entered into the database regarding water supply is:

1. Name of Water Treatment Plant (WTP);
2. FDEP identified WTP ID;
3. Owner and address of facility;
4. Location by latitude and longitude;
5. Water source;
6. Well locations;
7. Treatment process;
8. Permitted Capacity, current flow, total well capacity, total storage capacity, future planned capacity; and
9. Permit status.

Summary of Consumptive Use Permits

All consumptive water use permits in Seminole County in excess of 100,000 gallons per day (gpd) were entered in the database. An estimate of the total water use for all groundwater users below the 100,000 gpd threshold was calculated and entered as "Small Utilities". The information collected by the project team and entered into the database regarding the consumptive use permits are:

1. CUP name;
2. CUP number;
3. Water source and aquifer;
4. Permitted allocation;
5. Expiration date; and
6. Planned capacity in five-year increments through 2025.

This information gathered was primarily from the SJRWMD and the Cooperators

Demand Projections

The information collected by the project team and entered into the database regarding the 2025 demand projections are:

1. Potable Water Projections;
2. Reuse water projections;
3. Wastewater flow projections; and
4. Population projections.

Information from documents provided by SJRWMD as well as information obtained from the Cooperators was entered into the database. SJRWMD provided potable water and population projections, which will be reviewed and compared to the projections received from each Cooperator. Reuse water and wastewater flow projections through 2025 were also obtained and entered into the database.

GIS DATA COMPILATION

This section summarizes the methodology of the compilation of the GIS database. It will also discuss the data collection, data processing, spatial analysis, and data review quality assurance/quality control (QA/QC) procedures.

1. Data Collection

   The utility data was provided in varying formats.

   a. AutoCAD, DXF or DWG format

      A number of methods were employed to make the AutoCAD data usable in a GIS format.

      - If the file was properly spatially referenced, it was imported directly into a single central ESRI personal geodatabase, based on layer selection criteria for individual features (i.e. sewer lines, sewer valves, water lines, water valves)

      - AutoCAD data that were not spatially referenced were reprocessed by our conversion group and exported out to ESRI shapefiles. The shapefiles were then loaded into a single central ESRI personal geodatabase.

   b. ESRI personal geodatabase or shapefiles.

      - Data received in an ESRI format required minimal processing and was loaded into a single central ESRI personal geodatabase.

   c. Microsoft Access and Excel tables

      Data received in these formats were typically handled by one of two methods.

      - If the data contained coordinate information, an event feature class was created using the coordinates and loaded into the common ESRI personal geodatabase.

      - If data contained an address, it was geocoded to produce a feature class of points, which was then loaded into the common ESRI personal geodatabase.

   d. Other GIS Data such as city boundaries, service areas, lakes, rivers, wetlands, agricultural land, conservation lands, resource protection areas, population, land use, and zoning, etc. were collected and loaded into the common ESRI personal geodatabase.

2. Data Processing

    a. Data that was loaded to the common ESRI personal geodatabase was translated into a common coordinate system.

    b. The ESRI ArcGIS Utilities data models were set up in the common ESRI personal geodatabase.

        - Data that was loaded into the common ESRI personal geodatabase was analyzed to determine if redundant or missing data existed. Much of the data received had incomplete information (i.e. line attributes, valve types, etc).

        - After combining and/or deleting redundant columns in the database, data from the various cooperators was loaded into the ArcGIS data models.

        - Once loaded into the data model, a geometric network was generated to check for spatial integrity of features. Errors noted were corrected.

3. Spatial Analysis of Unserved Areas

    a. Preservation areas, areas where zoning is incompatible with residential or commercial use, areas of water or wetland, and environmental resource areas were identified and used as an exclusionary mask for processing.

    b. Parcels which comprised the remaining land mass were used in the analysis.

        - Parcels within 200 feet of existing utilities infrastructure were assumed to be "served" by the utility.

        - The inverse of this was assumed to be "unserved" by utilities (i.e. on well and/or septic). This assumption takes in to consideration limitations in using addresses in a customer information database, which would not account for master metered neighborhoods.

        Note: As it is reliant on complete infrastructure data, there are limitations of this approach. Complete infrastructure data was not provided by each utility in the County.

4. Data Review QA/QC

    The Cooperators were provided with a scaled-down version of the data for consistency review. Data was provided in digital map format using ESRI ArcReader.

a. ArcReader was chosen because it is free, easy to use, and allows one to browse, zoom, print, and query data.

b. A data/map file timeout was placed on the ArcReader data in order to ensure that the data provided was only used in a limited capacity for review purposes.

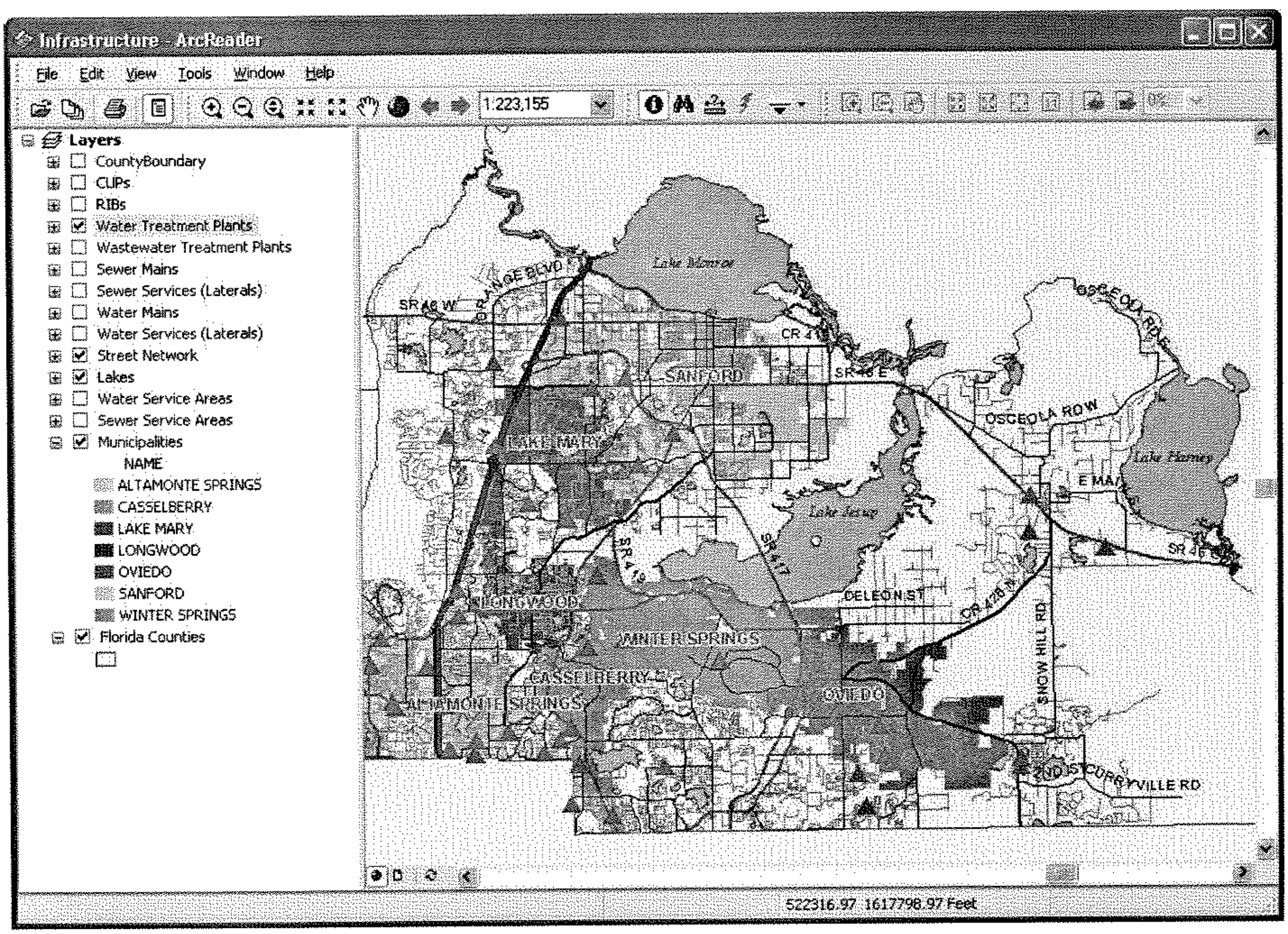
USER'S GUIDE

Each Cooperator is given a DVD of the GIS database prepared in association with Task C. The steps below outline how to use the file and view the various aspects of the database.

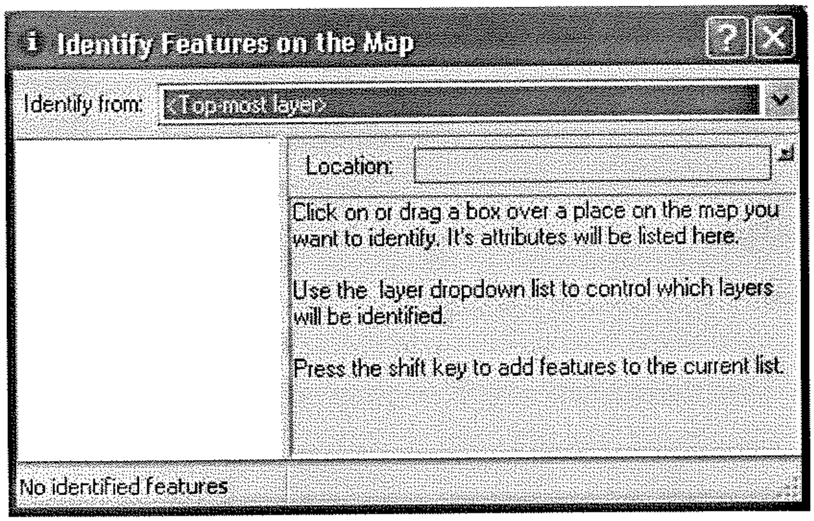
1. First, if not already installed, install ArcReader. To do this, navigate to the "ArcReader 9.1" folder on the CD-ROM drive. Double-click the "Setup.msi" file and follow the instructions on the screen.

2. Once ArcReader is installed, the map file can be launched by navigation to the "Maps" folder and then to the "pmf" folder on the CD-ROM drive. Double-click on the "map.pmf" file to open the map in ArcReader.

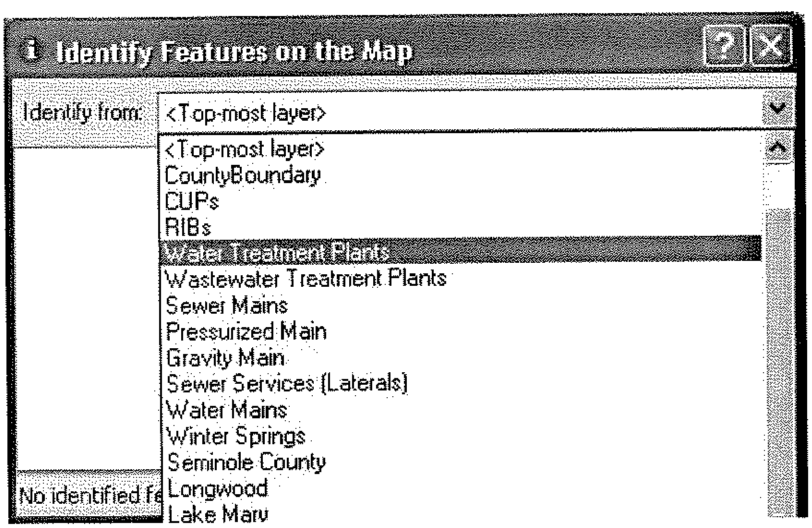
3. To view detailed information, click the box next to "Water Treatment Plants" to check it and make it visible.



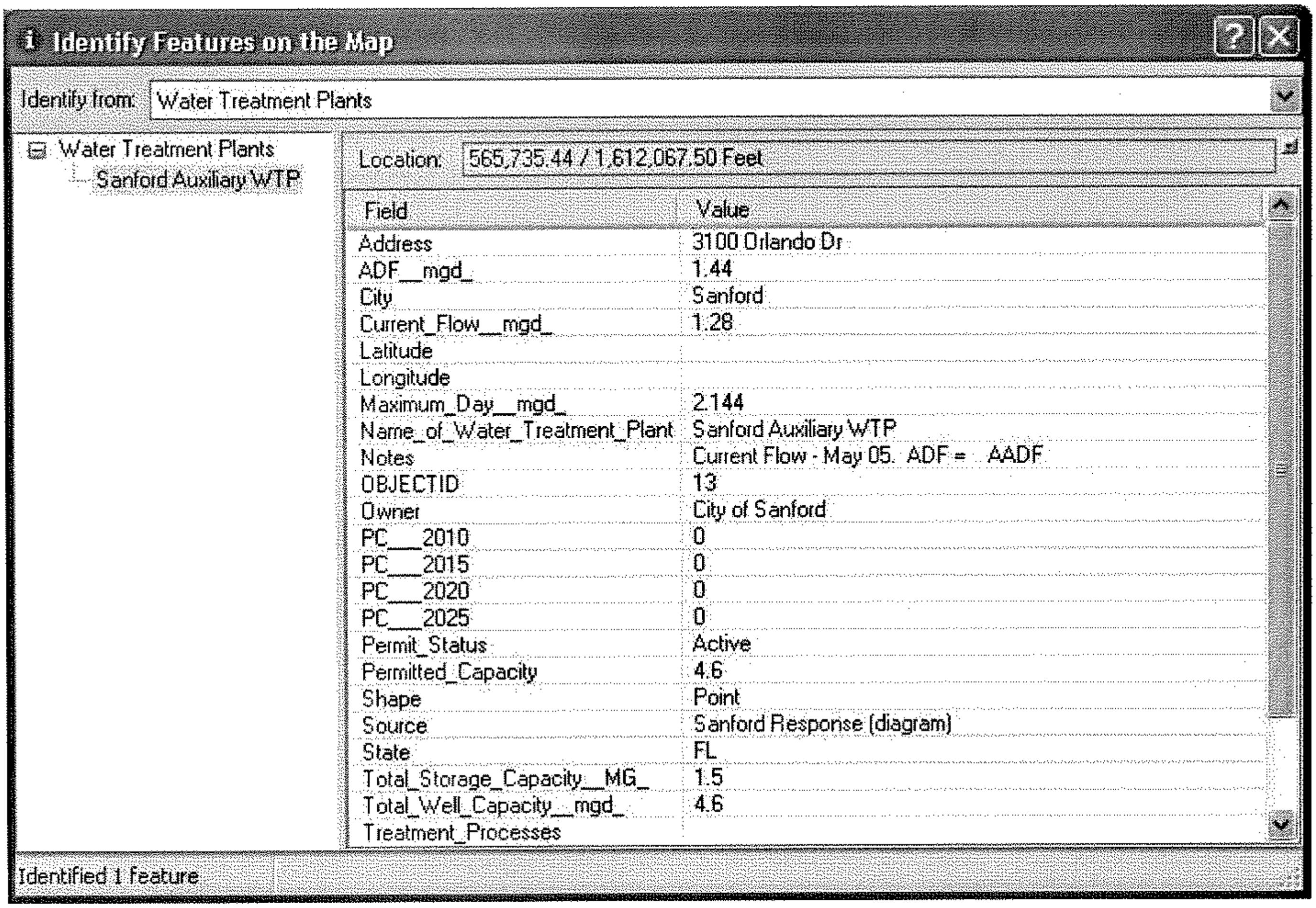
4. Next, click on the "Identify" button; it looks like the letter "I" in a blue circle toward the middle of the toolbar. A new dialog box will appear like below:



5. Select "Water Treatment Plants" from the "Identify From" pick list:



6. Now click on the water treatment plant that you want to see and all of the associated information should pop up:



Field	Value
Address	3100 Orlando Dr
ADF__mgd_	1.44
City	Sanford
Current_Flow__mgd_	1.28
Latitude	
Longitude	
Maximum_Day__mgd_	2.144
Name_of_Water_Treatment_Plant	Sanford Auxiliary WTP
Notes	Current Flow - May 05. ADF = AADF
OBJECTID	13
Owner	City of Sanford
PC___2010	0
PC___2015	0
PC___2020	0
PC___2025	0
Permit_Status	Active
Permitted_Capacity	4.6
Shape	Point
Source	Sanford Response (diagram)
State	FL
Total_Storage_Capacity__MG_	1.5
Total_Well_Capacity__mgd_	4.6
Treatment_Processes	

The same process can be repeated for any layer in the map.

APPENDIX A

Water Treatment Plant: A.M. Jones (Oviedo)

Plant ID: 3590970-2

Owner	City of Oviedo	***Latitude***	28 39 09.36
Address	1600 Alafaya Woods Blvd	***Longitude***	81 11 27.85
City	Oviedo		

Water Source Groundwater

Treatment Process Primary treatment aeration, stabilization, disinfection

FDEP Permitted Plant Capacity (mgd)	7.236
Total Well Capacity (mgd)	3.24
Current Flow (mgd)	3.35
Permit Status	Active
Total Storage Capacity (MG)	1

Planned Capacity (mgd)

2010	7.236
2015	7.236
2020	7.236
2025	7.236

Source DEP MOR data/ Oviedo data checklist response

Notes Current flow as of 12/04

Water Treatment Plant: Altamonte Springs WTP 2

Plant ID: 3590026-2

Owner	City of Altamonte Springs	***Latitude***	28 38 49.63
Address		***Longitude***	81 22 14.41
City	Altamonte Springs		

Water Source Floridan Aquifer

Treatment Process Aeration, disinfection (Cl gas), corrosion control (HPO4), flouride addition.

FDEP Permitted Plant Capacity (mgd)	6.912	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)	10.7	***2010***	
Current Flow (mgd)	3.01	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)	3.75	***2025***	

Source CUP permit application/capacity-FDEP MOR file

Notes 10.7 mgd is total well capacity (3 wells). Current flow as of 12/04. Total Storage Capacity for entire Alt. Spgs. system=6.05 mgd. WTP 2 has 0.75 GSR. Added 3.0MG from elevated storage to this plant, but serves entire system.

Water Treatment Plant: Altamonte Springs WTP 4

Plant ID: 3590026-4

Owner	City of Altamonte Springs	***Latitude***	28 39 37.8
Address		***Longitude***	81 24 24.48
City	Altamonte Springs		

Water Source Floridan Aquifer

Treatment Process Aeration, disinfection (Cl gas), corrosion control (HPO4), flouride addition.

FDEP Permitted Plant Capacity (mgd)	2.596	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)	3.3	***2010***	
Current Flow (mgd)	0.085	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)	0.2	***2025***	

Source CUP permit application/capacity-FDEP MOR file

Notes 3.3 mgd is total well capacity (2 wells). Current flow as of 12/04.

Water Treatment Plant: Altamonte Springs WTP 5

Plant ID: 3590026-5

Owner	City of Altamonte Springs	**Latitude**	28 39 17.57
Address		**Longitude**	81 25 43.1
City	Altamonte Springs		

Water Source Floridan Aquifer

Treatment Process Aeration, disinfection (Cl gas), corrosion control (HPO4), flouride addition.

FDEP Permitted Plant Capacity (mgd)	8.496	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	10.36	**2010**	
Current Flow (mgd)	2.275	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	2.1	**2025**	

Source CUP permit application/capacity-FDEP MOR file

Notes 10.4 mgd is total well capacity (3 wells). Current flow as of 12/04.

Water Treatment Plant: Apple Valley WTP
Plant ID: 3590039

Owner	Seminole County	***Latitude***	
Address		***Longitude***	
City			

Water Source

Treatment Process

FDEP Permitted Plant Capacity (mgd)	1.5	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	
Current Flow (mgd)	0.5	***2015***	
Permit Status		***2020***	
Total Storage Capacity (MG)		***2025***	

Source FDEP

Notes

Water Treatment Plant: Bear Lake Manor

Plant ID: 3590069

Owner	Utilities Inc	***Latitude***	28 39 34.45
Address	Lake Asher Cir	***Longitude***	81 26 43.44
City	Apopka		

Water Source Floridan Aquifer

Treatment Process Disinfection, hypochlorination.

FDEP Permitted Plant Capacity (mgd)	0.288	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	
Current Flow (mgd)	0.05	***2015***	
Permit Status		***2020***	
Total Storage Capacity (MG)		***2025***	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Chuluota WTP #1

Plant ID: 3590186-1

Owner	Aqua Utilities Florida	**Latitude**	28 38 22.2
Address		**Longitude**	81 07 41.16
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, disinfection/chloramines, taste and odor control/aeration, iron removal/sequestration.

FDEP Permitted Plant Capacity (mgd)	0.72	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	0.028	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP MOR file

Notes

Water Treatment Plant: Chuluota WTP #2

Plant ID: 3590186-1

Owner	Aqua Utilities Florida	**Latitude**	28 38 12.34
Address		**Longitude**	81 07 40.84
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, disinfection/chloramines, taste and odor control/aeration, iron removal/sequestration.

FDEP Permitted Plant Capacity (mgd)	1.08	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	0.34	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Country Club WTP (NEUSA)

Plant ID: 3590473-2

Owner	Seminole County	**Latitude**	28 44 02.51
Address	505 Wexdon Ct	**Longitude**	81 19 45.59
City	Lake Mary		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, taste and odor control/aeration, fluoridation

FDEP Permitted Plant Capacity (mgd)	1.5	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	3.24	**2010**	
Current Flow (mgd)	0.087	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	0.5	**2025**	

Source Sem Co Master Plan

Notes Current flow as of 10/25.

Water Treatment Plant: Crystal Lake

Plant ID: 3590258

Owner	Utilities Inc	***Latitude***	28 43 08.65
Address	Sunset Dr	***Longitude***	81 21 54.72
City	Sanford		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, iron removal/sequestration.

FDEP Permitted Plant Capacity (mgd)	0.173	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	
Current Flow (mgd)	0.042	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)		***2025***	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Despinar Plant

Plant ID: 3591121-1

Owner	Sanlando Utilities	**Latitude**	28 42 24.19
Address		**Longitude**	81 22 42.85
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, corrosion control/ph adjustment, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	5.04	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	3.18	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Druid Hills WTP

Plant ID: 3590111

Owner	Seminole County	**Latitude**	
Address		**Longitude**	
City			

Water Source Groundwater

Treatment Process

FDEP Permitted Plant Capacity (mgd)	0.936	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	0.1	**2015**	
Permit Status		**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP

Notes

Water Treatment Plant: Greenwood Lakes WTP (NEUSA)

Plant ID: 359043-1

Owner	Seminole County	**Latitude**	28 44 26.81
Address	299 Silk Bayplace	**Longitude**	81 20 50.14
City	Lake Mary		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, corrosion control/ph adjustment, taste and odor control/aeration, fluoridation.

FDEP Permitted Plant Capacity (mgd)	2.53	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	7.056	**2010**	
Current Flow (mgd)	1.72	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	1	**2025**	

Source Seminole County Master Plan

Notes Current flow as of 12/04

Water Treatment Plant: Hanover Woods WTP (NWUSA)

Plant ID: 3594107-2

Owner	Seminole County	**Latitude**	28 46 03.9
Address		**Longitude**	81 23 00.46
City	Lake Mary		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, taste and odor control/aeration, fluoridation

FDEP Permitted Plant Capacity (mgd)	0.4	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	2.304	**2010**	
Current Flow (mgd)		**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	0.1	**2025**	

Source Seminole County Master Plan

Notes

Water Treatment Plant: Harmony Homes

Plant ID: 3590497

Owner	Aqua Utilties Florida	**Latitude**	28 39 32.51
Address		**Longitude**	81 25 33.71
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, iron removal/sequestration

FDEP Permitted Plant Capacity (mgd)	0.216	
Total Well Capacity (mgd)		
Current Flow (mgd)	0.011	
Permit Status	Active	
Total Storage Capacity (MG)		

Planned Capacity (mgd)	
2010	
2015	
2020	
2025	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Heathrow WTP (NWUSA)

Plant ID: 3594107-1

Owner	Seminole County	**Latitude**	28 45 48.92
Address		**Longitude**	81 21 41.83
City	Lake Mary		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, taste and odor control/aeration, fluoridation

FDEP Permitted Plant Capacity (mgd)	4.04	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	9.173	**2010**	
Current Flow (mgd)	1.105	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	1.5	**2025**	

Source Seminole County Master Plan

Notes Current flow as of 12/04. No further expansion room.

Water Treatment Plant: Howell Park

Plant ID: 3590459-1

Owner	City of Casselberry	**Latitude**	28 39 07.27
Address	720 Semoran Blvd	**Longitude**	81 19 43 W
City	Casselberry		

Water Source Floridan Aquifer

Treatment Process Corrosion control/corrosion inhib, taste and odor control/aeration.

FDEP Permitted Plant Capacity (mgd)	4.03	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	4.95	**2010**	
Current Flow (mgd)	1.204	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	0.75	**2025**	

Source 072005 MOR

Notes Well capacity - Table 4.4

Water Treatment Plant: Indian Hills WTP (SEUSA)

Plant ID: 3590571-2

Owner	Seminole County	**Latitude**	28 38 50.53
Address		**Longitude**	81 19 59.56
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, taste and odor control/aeration, fluoridation

FDEP Permitted Plant Capacity (mgd)	1.25	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	4.65	**2010**	
Current Flow (mgd)	1.812	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	0.5	**2025**	

Source Seminole County Master Plan

Notes Current flow as of 12/04

Water Treatment Plant: Jansen S/D

Plant ID: 3590615

Owner	Utilities Inc	**Latitude**	28 38 44.59
Address	Bear Lake Dr.	**Longitude**	81 26 55.1
City	Apopka		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, iron removal/sequestration

FDEP Permitted Plant Capacity (mgd)	0.31	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	0.061	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Lake Hayes WTP (SEUSA)

Plant ID: 3590571-3

Owner	Seminole County	***Latitude***	28 38 00.6
Address		***Longitude***	81 12 01.01
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, corrosion control/ph adjustment, taste and odor control/aeration, fluoridation

FDEP Permitted Plant Capacity (mgd)	2.3	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)	5.184	***2010***	
Current Flow (mgd)	2.414	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)	1.1	***2025***	

Source Seminole County Master Plan

Notes Current flow as of 12/04

Water Treatment Plant: Lake Mary WTP

Plant ID: 3590201

Owner	City of Lake Mary	***Latitude***	28 45 44.71
Address	235 Rinehart Road	***Longitude***	81 20 47.72
City	Lake Mary		

Water Source Floridan Aquifer

Treatment Process Forced-air stripping, chlorination, and fluoridation.

FDEP Permitted Plant Capacity (mgd)	12.96	***Planned Capacity (mgd)***		
Total Well Capacity (mgd)	15.26		***2010***	17.28
Current Flow (mgd)	3.468		***2015***	17.28
Permit Status	Active		***2020***	17.28
			2025	17.28
Total Storage Capacity (MG)				

Source FDEP MOR file/Lake Mary response

Notes Current flow as of 12/04

Water Treatment Plant: Lake Monroe WTP (NWUSA)

Plant ID: 3594107-3

Owner	Seminole County	**Latitude**	28 48 49.54
Address		**Longitude**	81 19 57.29
City	Lake Mary		

Water Source Floridan Aquifer

Treatment Process Disinfection/gaseous chlorine, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	0.64	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	1.44	**2010**	
Current Flow (mgd)	0.225	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	0.3	**2025**	

Source Seminole County Master Plan

Notes Current flow as of 12/04

Water Treatment Plant: Little Wekiva Estates

Plant ID: 3590762

Owner	Utilities Inc	***Latitude***	28 40 37.7
Address	Little Wekiva Drive	***Longitude***	81 25 04.44
City	Altamonte Springs		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination,

FDEP Permitted Plant Capacity (mgd)	0.048	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	
Current Flow (mgd)	0.013	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)		***2025***	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Longwood WTP #2

Plant ID: 3590202-2

Owner	City of Longwood	***Latitude***	28 42 00.29
Address	870 West Church Ave	***Longitude***	81 21 48.1
City	Longwood		

Water Source Floridan Aquifer

Treatment Process Aeration, fluoridation, chlorination and pH adjustment.

FDEP Permitted Plant Capacity (mgd)	4.5
Total Well Capacity (mgd)	7.056
Current Flow (mgd)	1.2
Permit Status	Active
Total Storage Capacity (MG)	1.05

Planned Capacity (mgd)

2010	4.5
2015	4.5
2020	4.5
2025	4.5

Source Consump Use Tech Serv Rpt/RM report

Notes 3 wells (# 3, 4, and 5). Current flow as of 12/04.

Water Treatment Plant: Longwood WTP#1

Plant ID: 3590202-1

Owner	City of Longwood	**Latitude**	28 42 01.66
Address	175 E Warren Ave	**Longitude**	81 20 41.14
City	Longwood		

Water Source Floridan Aquifer

Treatment Process Aeration, fluoridation, chlorination and pH adjustment.

FDEP Permitted Plant Capacity (mgd)	2.592	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	2.592	**2010**	2.6
Current Flow (mgd)	0.739	**2015**	2.6
Permit Status	Active	**2020**	2.6
Total Storage Capacity (MG)	0.7	**2025**	2.6

Source Consump Use Tech Serv Rpt/RM report

Notes Well's 1 and 2 supply this plant. Current flow as of 12/04.

Water Treatment Plant: Lynwood WTP (SWUSA)

Plant ID: 3590785

Owner	Seminole County	**Latitude**	28 39 51.3
Address		**Longitude**	81 26 47.54
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, fluoridation

FDEP Permitted Plant Capacity (mgd)	2.56	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	7.776	**2010**	
Current Flow (mgd)	1.157	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	0.7	**2025**	

Source Seminole County Master Plan

Notes Current flow as of 12/04

Water Treatment Plant: Markham Regional WTP (NWUSA)

Plant ID: 3594107-4

Owner	Seminole County	**Latitude**	28 47 45.92
Address		**Longitude**	81 21 43.49
City	Lake Mary		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, taste and odor control/aeration, fluoridation

FDEP Permitted Plant Capacity (mgd)	3.07	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	6.912	**2010**	
Current Flow (mgd)	3.76	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	1.5	**2025**	

Source Seminole County Master Plan

Notes Current flow as of 12/04

Water Treatment Plant: Meredith Manor WTP

Plant ID: 3590823

Owner	Seminole County	**Latitude**	
Address		**Longitude**	
City			

Water Source Groundwater

Treatment Process

FDEP Permitted Plant Capacity (mgd)	0.828	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	0.22	**2015**	
Permit Status		**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP

Notes

Water Treatment Plant: North Plant

Plant ID: 3590159-2

Owner	City of Casselberry	***Latitude***	28 41 00.56
Address	530 Bridle Path	***Longitude***	81 19 15.6
City	Casselberry		

Water Source Floridan Aquifer

Treatment Process Corrosion-Control/Corrosion inhib, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	5.256	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)	6.87	***2010***	
Current Flow (mgd)	1.61	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)	1	***2025***	

Source 072005 MOR

Notes Well capacity - table 4.4

Water Treatment Plant: Oakland Shores

Plant ID: 3590912

Owner	Utilities Inc	**Latitude**	28 38 30.59
Address	Lakeshore Dr	**Longitude**	81 22 17.98
City	Altamonte Springs		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	0.333	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	0.076	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Overstreet Plant

Plant ID: 3591121-2

Owner	Sanlando Utilities	***Latitude***	28 44 03.01
Address		***Longitude***	81 19 49.37
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, corrosion control/ph adjustment, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	0.576	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	
Current Flow (mgd)	0.036	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)		***2025***	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Oviedo WTP

Plant ID: 3590970-1

Owner	City of Oviedo	**Latitude**	28 39 36.29
Address	707 South Central Ave	**Longitude**	81 12 33.01
City	Oviedo		

Water Source Groundwater

Treatment Process Primary Treatment Aeration, Stabilization, Disinfection

FDEP Permitted Plant Capacity (mgd)	3.24	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)	3.672	**2010**	
Current Flow (mgd)	0.525	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)	0.7	**2025**	

Source DEP MOR data/ Oviedo data checklist response

Notes Current flow as of 12/04. Will be taken off-line in Spring 2006 when new Mitchell Hammock Rd plant is in service.

Water Treatment Plant: Palm Valley MHP WTP

Plant ID: 3590988

Owner	Palm Valley MHP	**Latitude**	
Address		**Longitude**	
City			

Water Source

Treatment Process

FDEP Permitted Plant Capacity (mgd)	0.9	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	0.15	**2015**	
Permit Status		**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP

Notes

Water Treatment Plant: Park Ridge

Plant ID: 3590993

Owner	Utilities Inc	***Latitude***	28 45 20.59
Address	W Ridge Dr	***Longitude***	81 17 52.12
City	Sanford		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, Corrosion control/corrosion inhib, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	0.246	***Planned Capacity (mgd)***
Total Well Capacity (mgd)		***2010***
Current Flow (mgd)	0.017	***2015***
Permit Status	Active	***2020***
		2025
Total Storage Capacity (MG)		

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Phillips Section

Plant ID: 3591008

Owner	Utilities Inc	***Latitude***	28 40 34.5
Address	422 West Crystal Dr	***Longitude***	81 11 33.4
City	Sanford		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, iron removal/sequestration

FDEP Permitted Plant Capacity (mgd)	0.079	***Planned Capacity (mgd)***
Total Well Capacity (mgd)		***2010***
Current Flow (mgd)	0.067	***2015***
Permit Status	Active	***2020***
Total Storage Capacity (MG)		***2025***

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Ravenna Park

Plant ID: 3591061

Owner	Utilities Inc	***Latitude***	28 47 21.98
Address	Temple Ave	***Longitude***	81 18 13.9
City	Sanford		

Water Source Floridan Aquifer

Treatment Process Disinfection/gaseous chlorine, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	0.36	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	
Current Flow (mgd)	0.078	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)		***2025***	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Sanford Auxiliary WTP

Plant ID: 3590205-2

Owner	City of Sanford	***Latitude***	28 46 05.09
Address	3100 Orlando Dr	***Longitude***	81 16 56.17
City	Sanford		

Water Source Floridan Aquifer

Treatment Process Disinfection/gaseous chlorine, corrosion control/ph adjustment, taste and odor control/aeration, fluoridation.

FDEP Permitted Plant Capacity (mgd)	4.6	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)	4.6	***2010***	
Current Flow (mgd)	1.28	***2015***	
Permit Status	Active	***2020***	
		2025	
Total Storage Capacity (MG)	1.5		

Source Sanford Response (diagram)

Notes Current Flow as of May 05. ADF = AADF

Water Treatment Plant: Sanford Main WTP

Plant ID: 3590205-1

Owner	City of Sanford	***Latitude***	28 47 08.48
Address	3701 Country Club Rd	***Longitude***	81 19 06.85
City	Sanford		

Water Source Floridan Aquifer

Treatment Process Disinfection/gaseous chlorine, corrosion control/ph adjustment, taste and odor control/aeration, fluoridation.

FDEP Permitted Plant Capacity (mgd)	10.5	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)	10.5	***2010***	
Current Flow (mgd)	5.76	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)	3	***2025***	

Source Sanford response (diagram)

Notes Current flow as of May 05. 1.5 MG storage (two, 0.75 GSRs) are at the main WTP. Mellonville Elev tank (0.25 MG) and Silver Lake Elev tank (0.25), and a 1.0 MG GSR are in the system but interconnected with both plants. Total storage for both plants is 4.5 MG.

Water Treatment Plant: South Plant

Plant ID: 3590159-3

Owner	City of Casselberry	***Latitude***	28 37 03.29
Address	1890 Casselton Drive	***Longitude***	81 18 38.05
City	Casselberry		

Water Source Floridan Aquifer

Treatment Process Corrosion-Control/Corrosion inhib, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	4.948	***Planned Capacity (mgd)***
Total Well Capacity (mgd)	7.27	***2010***
Current Flow (mgd)	2.029	***2015***
Permit Status	Active	***2020***
Total Storage Capacity (MG)	1.25	***2025***

Source 072005 MOR

Notes Well capacity - table 4.4

Water Treatment Plant: Southeast Regional WTP

Plant ID: 3590571-1

Owner	Seminole County	***Latitude***	28 38 12.95
Address		***Longitude***	81 17 11.87
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/gaseous chlorine, corrosion control/ph adjustment, fluoridation.

FDEP Permitted Plant Capacity (mgd)	9.53	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)	26.64	***2010***	
Current Flow (mgd)	3.619	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)	5	***2025***	

Source Seminole County Master Plan

Notes Current flow as of 12/04

Water Treatment Plant: Weathersfield

Plant ID: 3591451

Owner	Utilities Inc	***Latitude***	28 39 45.5
Address	200 Weathersfield Ave	***Longitude***	81 24 28.98
City	Altamonte Springs		

Water Source Floridan Aquifer

Treatment Process Disinfection/gaseous chlorine, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	0.864	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	
Current Flow (mgd)	0.311	***2015***	
Permit Status	Active	***2020***	
Total Storage Capacity (MG)		***2025***	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: Wekiva Hunt Club

Plant ID: 3591121-3

Owner	Sanlando Utilities	**Latitude**	28 41 49.31
Address		**Longitude**	81 26 04.24
City			

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, corrosion control/ph adjustment, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	11.088	**Planned Capacity (mgd)**	
Total Well Capacity (mgd)		**2010**	
Current Flow (mgd)	4.846	**2015**	
Permit Status	Active	**2020**	
Total Storage Capacity (MG)		**2025**	

Source FDEP MOR file

Notes Current flow as of 12/04

Water Treatment Plant: West Mitchell Hammock Rd WTP

Plant ID: 3590970-3

Owner	City of Oviedo	***Latitude***	28 39 19.69
Address	250 West Mitchell Hammock Road	***Longitude***	81 12 43.02
City	Oviedo		

Water Source Groundwater

Treatment Process Primary Treatment Aeration, Stabilization, Disinfection

FDEP Permitted Plant Capacity (mgd)	10
Total Well Capacity (mgd)	12.96
Current Flow (mgd)	
Permit Status	Under Construction
Total Storage Capacity (MG)	2.5

Planned Capacity (mgd)

2010	12
2015	12
2020	12
2025	12

Source Oviedo response

Notes Proposed start-up: Winter 2006

Water Treatment Plant: Winter Springs Plant No. 1

Plant ID: 3591394

Owner	City of Winter Springs	***Latitude***	28 40 42.24
Address	851 Northern Way	***Longitude***	81 15 43.88
City	Winter Springs		

Water Source Floridan Aquifer

Treatment Process Disinfection/gaseous chlorine, corrosion control/ph adjustment, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	6.01	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	6.01
Current Flow (mgd)	2.95	***2015***	6.01
Permit Status	Active	***2020***	6.01
Total Storage Capacity (MG)		***2025***	6.01

Source

Notes 3 wells. Current flow as of 12/04.

Water Treatment Plant: Winter Springs WTP 2

Plant ID: 3590879-1

Owner	City of Winter Springs	***Latitude***	28 42 42.88
Address	700 Sheoah Blvd	***Longitude***	81 18 59.8
City	Winter Springs		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, taste and odor control/aeration

FDEP Permitted Plant Capacity (mgd)	2.736	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	2.736
Current Flow (mgd)	0.53	***2015***	2.736
Permit Status	Active	***2020***	2.736
Total Storage Capacity (MG)		***2025***	2.736

Source

Notes Current flow as of 12/04

Water Treatment Plant: Winter Springs WTP 3

Plant ID: 3590879-2

Owner	City of Winter Springs	***Latitude***	28 41 12.3
Address	110 West Bahama Rd	***Longitude***	81 18 16.88
City	Winter Springs		

Water Source Floridan Aquifer

Treatment Process Disinfection/hypochlorination, taste and odor control/aeration, iron removal/sequestration

FDEP Permitted Plant Capacity (mgd)	2.7	***Planned Capacity (mgd)***	
Total Well Capacity (mgd)		***2010***	2.7
Current Flow (mgd)	0.543	***2015***	2.7
Permit Status	Active	***2020***	2.7
		2025	2.7
Total Storage Capacity (MG)			

Source

Notes

APPENDIX B

Wastewater Treatment Plant: Alafaya Utility

Plant ID: FLA011074

General Information

Owner	Utilities Inc.	***Latitude***	28 38 25.62
Address	1067 McKinnon Rd	***Longitude***	81 11 18.71 W
City	Oviedo		

Treatment Process Dual train step aeration, filtration.

Permitted Capacity (mgd)	2.4	***Planned Capacity***
Average Flow (mgd)	1.15	***2010***
Permit Status	Active	***2015***
Other Conditions Relating to Reuse	Effluent to 9 percolation ponds and golf course irrigation.	***2020***
		2025

Wastewater Treatment Plant: Altamonte Springs Regional WRF

Plant ID: FL0033251

General Information

Owner	City of Altamonte Springs	**Latitude**	28 38 30.66
Address	950 Keller Road	**Longitude**	81 23 59.46
City	Altamonte Springs		

Treatment Process Influent Screening, grit removal, primary sedimentation, anoxic/aerobic nitrification, secondary clarification, flocculation, denitrification, filtration, chemical feed system, postaeration, chlorination, dechlorination/neutralization, aerobic digestion of residuals, gravity thickening and belt filter press dewatering. Allows conversion of 2 of 4 primary clarifiers to surge tanks.

		Planned Capacity	
Permitted Capacity (mgd)	12.5		
Average Flow (mgd)	6.05	**2010**	14
Permit Status	Active	**2015**	14
Other Conditions Relating to Reuse	One - 0.25 MG effluent holding tank. Discharge to Little Wekiva River & "APRICOT - Reuse"	**2020**	14
		2025	

Effluent Disposal Available

Permitted Capacity (mgd) 12.5

Current Total Reclaimed Flow (mgd) 5.89

Reclaimed Water User

Slow-rate public access (R-001)

Permitted Capacity (mgd)	12.5	**Latitude**	
Current Flow (mgd)		**Longitude**	

Notes Includes two - 3 MG RW storage tanks, 1 elevated storage tank, 1 pond - Cranes Roost. Approx 6163 acres

Wastewater Treatment Plant: Casselberry WRF

Plant ID: FLA011066

General Information

Owner	City of Casselberry	***Latitude***	28 40 58.33
Address	700 Cross Street	***Longitude***	81 18 57.6 W
City	Casselberry		

Treatment Process Flow equalization, influent screening, aeration, chemical feed system, secondary clarification, filtration, chlorination and aerobic digestion of residuals followed by rotary drum thickening of residuals and aerobic digestion.

		Planned Capacity	
Permitted Capacity (mgd)	2.2		
Average Flow (mgd)	1.076	***2010***	
Permit Status	Active	***2015***	
Other Conditions Relating to Reuse	Storage: 1.0 MG and 2.0 MG Crom tanks Lined Reject Pond 1.5 MG offsite at Cross St. Lined Reject/Wet Weather Pond 4.23 MG offsite at Belle Ave. Reuse to 4 percolation ponds and golf course.	***2020*** ***2025***	

RIBs R-002

Permitted Capacity (mgd)	0.285	***Latitude***	28 41 27N
Current Flow (mgd)	0.185	***Longitude***	81 18 52W

Notes Total wetted area = 10.58 ac; 4 Percolation Ponds

Reclaimed Water User Casselberry Golf Course

Permitted Capacity (mgd)	0.358	***Latitude***	
Current Flow (mgd)	0.156	***Longitude***	

Notes Acreage - 60

Reclaimed Water User Residential Irrigation

Permitted Capacity (mgd)	1.557	***Latitude***	
Current Flow (mgd)	0.691	***Longitude***	

Notes Acreage - 797

Wastewater Treatment Plant: Chuluota WWTF

Plant ID: FLA011076

General Information

Owner	Florida Water Services	***Latitude***	28 38 12.34
Address	125 E 10th St	***Longitude***	81 07 40.84 W
City	Chuluota		

Treatment Process Extended aeration domestic WWTP .

		Planned Capacity	
Permitted Capacity (mgd)	0.1		
Average Flow (mgd)	0.03	***2010***	
Permit Status	Active	***2015***	
Other Conditions Relating to Reuse	0.3 MG holding pond and reuse to 17.4 acre sprayfield (slow-rate restricted public access system).	***2020***	
		2025	

Wastewater Treatment Plant: Florida Central Commerce Park

Plant ID: FLA011078

General Information

Owner	Florida Water Services	***Latitude***	28 41 42.18
Address	140 Hope Street	***Longitude***	81 21 20.05 W
City	Longwood		

Treatment Process Extended aeration, flow equalization, filtration.

Permitted Capacity (mgd)	0.095	***Planned Capacity***	
Average Flow (mgd)		***2010***	
Permit Status	Active	***2015***	
Other Conditions Relating to Reuse	Irrigation to areas of public access.	***2020***	
		2025	

Wastewater Treatment Plant: Forest Lake Elementary School WWTF

Plant ID: FLA011089

General Information

Owner	Forest Lake Elem. Educational Center	**Latitude**	28 40 48.36
Address	2801 Sand Lake Road	**Longitude**	81 26 17.12 W
City	Longwood		

Treatment Process Extended aeration.

Permitted Capacity (mgd)	0.01	**Planned Capacity**	
Average Flow (mgd)		**2010**	
Permit Status	Active	**2015**	
Other Conditions Relating to Reuse	Effluent to dual cell percolation pond.	**2020**	
		2025	

Wastewater Treatment Plant: Geneva Elementary School WWTF

Plant ID: FLA011057

General Information

Owner	Seminole Co. School Board, Facilities	***Latitude***	28 45 45.43
Address	275 First Street	***Longitude***	81 19 04.76 W
City	Geneva		

Treatment Process Extended aeration.

Permitted Capacity (mgd)	0.01	***Planned Capacity***	
Average Flow (mgd)		***2010***	
Permit Status	Active	***2015***	
Other Conditions Relating to Reuse	Effluent to dual cell absorption field.	***2020***	
		2025	

Wastewater Treatment Plant: Greenwood Lakes

Plant ID: FLA011086

General Information

Owner	Seminole County	**Latitude**	28 44 02.22
Address	701 Greenway Blvd	**Longitude**	81 20 43.19
City	Lake Mary		

Treatment Process Extended aeration.

Permitted Capacity (mgd)	3.5	**Planned Capacity**
Average Flow (mgd)	1.91	**2010**
Permit Status	Active	**2015**
Other Conditions Relating to Reuse	Effluent to 9 percolation ponds and public access irrigation.	**2020**
		2025

Effluent Disposal Available

Permitted Capacity (mgd) 3.5

Current Total Reclaimed Flow (mgd) 1.92

Name of RIBs *Greenwood Lakes*

Permitted Capacity (mgd)	1.8	**Latitude**	28 44 11 N
Current Flow (mgd)		**Longitude**	81 22 02 W

Notes 9 percolation ponds with berm irrigation as needed.

Name of Reclaimed Water User *Public Access Irrig*

Permitted Capacity (mgd)	1.7	**Latitude**	28 44 11 N
Current Flow (mgd)		**Longitude**	81 22 02 W

Notes R-002

Name of Reclaimed Water User *Sprayfield*

Permitted Capacity (mgd)	0.35	**Latitude**	
Current Flow (mgd)		**Longitude**	

Notes

Wastewater Treatment Plant: Iron Bridge

Plant ID: FL0037966

General Information

Owner	City of Orlando	**Latitude**	28 37 23.2 N
Address	601 Iron Bridge Circle	**Longitude**	81 13 08.98
City	Oviedo		

Treatment Process Physical, chemical, biological processes.

Permitted Capacity (mgd)	40	**Planned Capacity**	
Average Flow (mgd)	27.5	**2010**	
Permit Status	Active	**2015**	
Other Conditions Relating to Reuse	Reuse to Little Econ. River, wetlands, and public access.	**2020**	
		2025	

Reclaimed Water User Little Econ River

Permitted Capacity (mgd)	28		**Latitude**	28 37 00 N
Current Flow (mgd):		8	**Longitude**	81 13 10 W

Notes Surface Water Discharge D001

Reclaimed Water User Wetlands System

Permitted Capacity (mgd)	20		**Latitude**	28 35 02 N
Current Flow (mgd):		20	**Longitude**	81 00 16 W

Notes Surface water discharge ultimately to St Johns River. Manmade treatment/reuse wetland system.

Wastewater Treatment Plant: Jackson Heights Middle School WWTF

Plant ID: FLA011060

General Information

Owner	Seminole Co. School Board, Facilities	***Latitude***	28 48 01.4 N
Address	141 Academy Drive	***Longitude***	81 17 38.72 W
City	Oviedo		

Treatment Process Extended aeration.

Permitted Capacity (mgd)	0.015	***Planned Capacity***
Average Flow (mgd)		***2010***
Permit Status	Active	***2015***
Other Conditions Relating to Reuse	Effluent to dual percolation ponds.	***2020***
		2025

Wastewater Treatment Plant: Oviedo High School WWTF

Plant ID: FLA011058

General Information

Owner	Seminole Co. School Board, Facilities	***Latitude***	28 40 19.92
Address	601 King Street	***Longitude***	81 13 08.54 W
City	Oviedo		

Treatment Process Extended aeration with surge control.

Permitted Capacity (mgd)	0.065	***Planned Capacity***	
Average Flow (mgd)		***2010***	
Permit Status	Active	***2015***	
Other Conditions Relating to Reuse	Effluent to 2 percolation ponds.	***2020***	
		2025	

Wastewater Treatment Plant: Palm Valley MHP

Plant ID: FLA011085

General Information

Owner	Chateau Communities Inc.	***Latitude***	28 36 43.49
Address	13781 Alafaya Trail	***Longitude***	81 12 27.36 W
City	Oviedo		

Treatment Process Extended aeration.

		Planned Capacity
Permitted Capacity (mgd)	0.15	
Average Flow (mgd)	0.09	***2010***
Permit Status	Active	***2015***
Other Conditions Relating to Reuse	Effluent to 3 percolation ponds.	***2020***
		2025

Wastewater Treatment Plant: Sanford North WRF

Plant ID: FL0020141

General Information

Owner	City of Sanford	**Latitude**	28 48 53.96
Address	1201 West Semoran Blvd	**Longitude**	81 16 41.59
City	Sanford		

Treatment Process Flow equalization, influent screening, grit removal, aeration, secondary clarification, chemical feed, filtration, chlorination, followed by dechlorination prior to surface water discharge.

Permitted Capacity (mgd)	7.3	**Planned Capacity**	
Average Flow (mgd)	7.55	**2010**	7.3
Permit Status	Active	**2015**	7.3
Other Conditions Relating to Reuse	Storage: 2 GSRs at 1.5 MG each. Reuse irrigation and wet weather discharge to Lake Monroe	**2020**	7.3
		2025	7.3

Effluent Disposal Available

Permitted Capacity (mgd) 8.14

Current Total Reclaimed Flow (mgd) 5.43

Reclaimed Water User Public Access Irrigation

Permitted Capacity (mgd) 4.3 **Latitude**

Current Flow (mgd) **Longitude**

Notes

Reclaimed Water User Site 10

Permitted Capacity (mgd) 2.84 **Latitude**

Current Flow (mgd) **Longitude**

Notes

Reclaimed Water User St. Johns River

Permitted Capacity (mgd) 1 **Latitude**

Current Flow (mgd) **Longitude**

Notes

Wastewater Treatment Plant: Sanford South WRC

Plant ID: FLA181714

General Information

Owner	City of Sanford	**Latitude**	28 46 04.37
Address	3540 Cameron Ave	**Longitude**	81 12 51.59 W
City	Sanford		

Treatment Process Influent screening, grit removal, advanced secondary treatment using Kruger T-Ditch Process

		Planned Capacity	
Permitted Capacity (mgd)	2		
Average Flow (mgd)		**2010**	6
Permit Status	Under Construction	**2015**	6
Other Conditions Relating to Reuse		**2020**	6
		2025	6

Wastewater Treatment Plant: Seimens ICN WWTF

Plant ID: FLA011079

General Information

Owner	Seimens ICN	***Latitude***	28 45 44.71
Address	400 Rhinehart Road	***Longitude***	81 20 47.72 W
City	Lake Mary		

Treatment Process Extended aeration.

Permitted Capacity (mgd)	0.035	***Planned Capacity***
Average Flow (mgd)		***2010***
Permit Status	Active	***2015***
Other Conditions Relating to Reuse	Reuse to 2 percolation ponds.	***2020***
		2025

Wastewater Treatment Plant: Shadow Hills WWTF

Plant ID: FLA011105

General Information

Owner	Utilities Inc	***Latitude***	28 42 53.28
Address	910 Longwood Hills Rd	***Longitude***	81 21 41.33 W
City	Longwood		

Treatment Process Step aeration with surge control.

		Planned Capacity	
Permitted Capacity (mgd)	0.47		
Average Flow (mgd)	0.42	***2010***	
Permit Status	Active	***2015***	
Other Conditions Relating to Reuse	Reuse to 7 percolation ponds.	***2020***	
		2025	

Wastewater Treatment Plant: Spring Hammock Park

Plant ID: FLA011077

General Information

Owner	Spring Hammock MHP	**Latitude**	28 43 39.61
Address	1651 Spring Hammock Way	**Longitude**	81 18 40.03 W
City	Longwood		

Treatment Process Extended aeration.

Permitted Capacity (mgd)	0.01	**Planned Capacity**
Average Flow (mgd)		**2010**
Permit Status	Active	**2015**
Other Conditions Relating to Reuse	Reuse to percolation pond and sprayfield.	**2020**
		2025

Wastewater Treatment Plant: Toucan Willy's Restaurant WWTF

Plant ID: FLA 011073

General Information

Owner	Oviedo Inn & Pelican Lounge Inc	**Latitude**	28 39 30.35
Address	829 Eyrie Drive	**Longitude**	81 13 23.59 W
City	Oviedo		

Treatment Process Extended aeration with surge control and filtration.

		Planned Capacity
Permitted Capacity (mgd)	0.007	
Average Flow (mgd)		**2010**
Permit Status	Active	**2015**
		2020
Other Conditions Relating to Reuse	Effluent to 2 drainfields.	**2025**

Wastewater Treatment Plant: Town & Country RV Resort

Plant ID: FLA011104

General Information

Owner	Town & Country RV Resort	**Latitude**	
Address	Orange Blvd	**Longitude**	
City	Lake Monroe		

Treatment Process Extended aeration with 6000 gallon surge tank.

		Planned Capacity	
Permitted Capacity (mgd)	0.03		
Average Flow (mgd)		**2010**	
Permit Status	Active	**2015**	
		2020	
Other Conditions Relating to Reuse	Reuse to 2 drainfields.	**2025**	

Wastewater Treatment Plant: Twelve Oaks RV Resort

Plant ID: FLA011095

General Information

Owner	Twelve Oaks Resort	***Latitude***	28 48 41.8 N
Address	6300 W. SR 46	***Longitude***	81 22 18.8 W
City	Sanford		

Treatment Process Extended aeration.

Permitted Capacity (mgd)	0.025	***Planned Capacity***	
Average Flow (mgd)		***2010***	
Permit Status	Active	***2015***	
Other Conditions Relating to Reuse	Reuse to 2 percolation ponds.	***2020***	
		2025	

Wastewater Treatment Plant: Wekiva Hunt Club

Plant ID: FL0036251

General Information

Owner	Utilities Inc	**Latitude**	28 41 49.31 N
Address	144 Ledbury Drive	**Longitude**	81 26 04.24 W
City	Longwood		

Treatment Process 3 parallel contact stabilization, filtration.

Permitted Capacity (mgd)	2.9	**Planned Capacity**	
Average Flow (mgd)	2.34	**2010**	
Permit Status	Active	**2015**	
Other Conditions Relating to Reuse	Discharge to Sweetwater Creek.	**2020**	
		2025	

Effluent Disposal Available

Permitted Capacity (mgd)	2.603
Current Total Reclaimed Flow (mgd)	1.38

Wastewater Treatment Plant: Wekiwa Springs St Pk #1 (Main Area)

Plant ID: FLA011107

General Information

Owner	FL DEP Division of Recreation and Parks
Address	1800 Wekiwa Cir.
City	Apopka
Latitude	28 41 14.06
Longitude	81 26 56.62 W
Treatment Process	Extended aeration.

Permitted Capacity (mgd)	0.02
Average Flow (mgd)	
Permit Status	Active
Other Conditions Relating to Reuse	Reuse to sprayfield.

Planned Capacity

2010	
2015	
2020	
2025	

Wastewater Treatment Plant: Winter Springs - East WWTF

Plant ID: FLA011068

General Information

Owner	City of Winter Springs	**Latitude**	28 40 31.94
Address	1560 Winter Springs Blvd	**Longitude**	81 14 33.97
City	Winter Springs		

Treatment Process Secondary treatment, filtration, and hi-level disinfection.

Permitted Capacity (mgd)	2.012	**Planned Capacity**	
Average Flow (mgd)	1.16	**2010**	
Permit Status	Active	**2015**	
Other Conditions Relating to Reuse	Reuse to Golf Course, parks, lawns, and percolation pond.	**2020**	
		2025	

Effluent Disposal Available

Permitted Capacity (mgd) 3.79

Current Total Reclaimed Flow (mgd) 1.21

Reclaimed Water User Tuscawilla Golf Course

Permitted Capacity (mgd)	0.2	**Latitude**	
Current Flow (mgd)		**Longitude**	

Notes

RIBs Dayron Ponds

Permitted Capacity (mgd)	0.53	**Latitude**	28 42 41 N
Current Flow (mgd)		**Longitude**	81 18 46 W

Notes Total wetted area = 20 acres. Winter Springs total RIB capacity = 1.35 mgd.

RIBs Tuscawilla

Permitted Capacity (mgd)	0.61	**Latitude**	57 91 19.91
Current Flow (mgd)		**Longitude**	15 80 990.00

Notes Total area = 6.8 acres. Winter Springs total RIB capacity = 1.35 mgd.

Wastewater Treatment Plant: Winter Springs - West

Plant ID: FLA011067

General Information

Owner	City of Winter Springs	**Latitude**	28 42 19.19
Address	1000 West SR 434	**Longitude**	81 19 11.5 W
City	Winter Springs		

Treatment Process Secondary treatment, filtration and hi-level disinfection.

Permitted Capacity (mgd)	2.07	**Planned Capacity**
Average Flow (mgd)	1.161	**2010**
Permit Status	Active	**2015**
Other Conditions Relating to Reuse	Plant reuse to golf course, 3 ponds, irrigation.	**2020**
		2025

Effluent Disposal Available

Permitted Capacity (mgd) 2.07

Current Total Reclaimed Flow (mgd) 1.07

Reclaimed Water User Central Winds Park

Permitted Capacity (mgd)	0.136	**Latitude**	
Current Flow (mgd)		**Longitude**	

Notes 35 acres. User Type - Other landscape Irrigation

Reclaimed Water User Spray Field (R-002)

Permitted Capacity (mgd)	0.2	**Latitude**	28 41 17 N
Current Flow (mgd)		**Longitude**	81 16 13 W

Notes 37 acre spray field

Reclaimed Water User Winter Springs Golf Course

Permitted Capacity (mgd)	0.15	**Latitude**	
Current Flow (mgd)		**Longitude**	

Notes 169 acres.

Wastewater Treatment Plant: *Winter Springs - West*

Plant ID: FLA011067

(continued)

RIBs Mt. Greenwood Ponds

Permitted Capacity (mgd)	0.11	**Latitude**	56 09 22.51
Current Flow (mgd)		**Longitude**	15 82 95.81

Notes Total wetted area = 5.5 acres. Winter Springs total RIB capacity = 1.35 mgd.

RIBs Site 17 Ponds

Permitted Capacity (mgd)	0.1	**Latitude**	56 43 96.47
Current Flow (mgd)		**Longitude**	15 82 543.28

Notes Total wetted area = 17.5 acres. Winter Springs total RIB capacity = 1.35 mgd.

Wastewater Treatment Plant: Yankee Lake WRF (Northwest)

Plant ID: FL0042625

General Information

Owner Seminole County

Address 501 Yankee Lake Road

City Sanford

Latitude 28 49 35.65

Longitude 81 23 44.12

Treatment Process Secondary treatment, flocculation, filtration.

Permitted Capacity (mgd) 2.5

Average Flow (mgd) 1.63

Permit Status Active

Other Conditions Relating to Reuse 2 MG storage tank.
Wet-Weather back-up discharge via an array distribution system then to an upland/wetland system

Planned Capacity

2010

2015

2020

2025

Effluent Disposal Available

Permitted Capacity (mgd) 6.92

Current Total Reclaimed Flow (mgd) 1.62

Name of RIBs *Yankee Lake*

Permitted Capacity (mgd) 0.36

Current Flow (mgd)

Latitude 28 49 19 N

Longitude 81 32 12 W

Notes 5 basins; area=800,000 sf

Name of Reclaimed Water User *Public Access Irrig.*

Permitted Capacity (mgd) 3.71

Current Flow (mgd)

Latitude

Longitude

Notes

Name of Reclaimed Water User *Receiving Wetlands System*

Permitted Capacity (mgd) 2.5

Current Flow (mgd)

Latitude

Longitude

Notes

Appendix D

Task D - Data Gathering & Processing; Water Conservation and Reuse

Water Conservation and Reuse - Task D

For The

Seminole County Water Supply Plan

By

ARCADIS
4307 Vineland Road H-20
Orlando, Florida

Technical Memorandum

March 6, 2006

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SCOPE OF TECHNICAL MEMORANDUM

This Technical Memorandum addresses one of eight major tasks that will be completed in development of the Seminole County Water Supply Plan. Two of the elements considered within this task are water conservation and water reuse. Water conservation includes methods to reduce the amount of water used through enhancements in efficient use of water. Water reuse entails the capture of water discarded from one user for use by another. Water reuse involves the use of treated wastewater effluent as a resource for irrigation and other non-drinking water purposes.

The optimum use of water resources can reduce the need for future water supply source development and treatment facility construction. Therefore, efficient water use must be one of the first considerations when planning to meet future water demands.

Task D of the Seminole Water Supply Plan includes:

- A review of the District's literature search available on water conservation. ARCADIS will summarize the methods that are being primarily implemented in the State of Florida and secondarily outside of Florida.
- A description of each water conservation measure currently being implemented or scheduled for implementation by the Cooperators in Seminole County.
- Preparation of a Technical Memorandum identifying a summary of findings and recommendations for water conservation and reuse.

As part of Task D, ARCADIS conducted a workshop to help identify practical means of water conservation and reuse measures that may be implemented within Seminole County. This technical memorandum also serves as a summary of the strategies that will discussed at the workshop.

The information regarding specific strategies used by the Cooperators was provided by the Cooperators. We wish to thank the Cooperators for providing information regarding their specific programs.

INTRODUCTION

Although almost 80 percent of the Earth is covered with water, only 3 percent of the planet's water resources represent fresh water. Less than 1 percent of all water is available for human consumption; the rest is salty ocean water, or freshwater that is bound up in glaciers and polar ice caps. Of the water available to humans, animals, and plants, only a tiny fraction is used as drinking water. Most of what is consumed is used to create electricity, grow crops, run factories, and for household and sanitation needs.

Global water consumption rose almost tenfold in the last century, and many parts of the world are now reaching the limits of their supply. Populations continue to increase while water supplies dwindle. To highlight this growing problem, the United Nations declared 2003 to be The International Year of Freshwater. According to the U.N., if current trends continue, "two out of every three people on earth will suffer moderate to severe water shortages in little more than two decades from now. Globally, one in six people still have no regular access to safe drinking water, and more than twice that number (2.4 billion people) lack access to adequate sanitation facilities."

The problem is local as well as global. In the Southeast, drought combined with depleted stores of groundwater and burgeoning Sunbelt populations are putting unprecedented strains on the water supply. Water is in demand for a myriad of uses: recreational, mining and industry, fishing, irrigation, and riparian habitat preservation, among others. In the U.S., almost 100 gallons per day of drinking water are used per capita.

Excessive use of water has the following adverse effects on our society, economy, and environment:

- Increased groundwater consumption, the main water source in Florida, may lead to surface water impacts including decreased spring flows, reduction in wetlands, and reduction of the quality of the groundwater sources.
- The water infrastructure requires increased operation and maintenance costs for pipes, sewers, and treatment facilities from increased water flows
- Water bodies such as rivers, wetlands, and bays are degraded from the high levels of water extracted and from the polluted runoff that feeds into them.

It is clear that protection of and conservation of our water supplies must have a high priority.

Water Conservation Practices

When properly executed, water conservation practices can save thousands of gallons of water per person per year. This Technical Memorandum identifies some ways that utilities and their customers can make a difference in the effort to conserve water.

The State of Florida is the third highest water user in the United States. While the high water use reflects aspects of our economy, it also shows that there is significant potential to conserve water.

To meet the water demands of the future, Seminole County's citizens must embrace water conservation practices to help preserve and extend their available water resources in order to maintain the quality of life Floridians have come to enjoy.

Water conservation seeks to reduce water use through the promotion of more efficient water use and the elimination of waste. Water conservation does not necessarily mean total water withdrawals will decline. Economic growth creates new demands for water. A successful water conservation program will mean that water withdrawals will grow more slowly than they otherwise would have.

Benefits of Conservation

One advantage of water conservation is that it can increase economic efficiency and thus reduce costs. Pumping water requires significant amounts of energy and can be a major cost for irrigators and for municipalities. Wise use of water will save energy, thus reducing costs for water users. Similarly, reducing water use reduces the need for new infrastructure and other related costs. If a community can grow within its existing water supply, it can avoid expensive expansions to water treatment and other water facilities. This produces direct savings to users.

A second benefit is that water conservation makes water available for other uses, allowing new economic opportunities. While the importance of this is greatest in areas where water is fully allocated, efficient use of all resources is an essential component of a green and prosperous economy.

Within the context of overall water management and conservation, emphasis on long-term sustainability benefits our environment, our health and our economy. From an environmental and health perspective, water conservation policies ensure that quantity and quality requirements are sustained relative to supply and demand in both short and long-term planning. From an economic perspective, proactive and progressive water conservation policies offer significant potential in terms of enhancing and improving Seminole County's advantages in terms of growth and expansion. Whether it is at the industrial input level or as a factor affecting our quality of life, water quantity and quality will continue to increase in importance and influence the location of socioeconomic development and population concentrations.

The environment also benefits from water conservation. Each river and lake is an ecosystem. As water is removed from aquatic systems, they become stressed. The greater the percentage of water removed, the less that remains for natural processes such as instream flows that support fish and other life. Thus, water conservation helps to maintain healthy ecosystems, protect biodiversity, maintain an attractive environment and contribute to our health and quality of life.

Many provincial and state governments have implemented water conservation plans in North America. Internationally, the European Community and many Asian countries have developed programs similar to those used in North America. The majority of these jurisdictions tend to implement water conservation programs targeted to municipal users. Jurisdictions facing the most severe shortages have also targeted industrial and agricultural uses.

The water conservation plans of various national and international governments have common themes and characteristics between them. Many of the goals are the same in that they address the importance of water conservation in terms of improved quality and quantity, protecting the environment and addressing limits to growth.

Many of these plans focus on education and extension activities, development of best management practices, promotion of low consumption devices and circulation of informational material. A few jurisdictions have established specific reduction targets and have implemented both regulatory controls and incentives for water conservation.

Examples of the varied water conservation measures currently being implemented and/or considered in Seminole County and the United States are described in this document.

Water Use Statistics

From 1996-1999, the American Water Works Association Research Foundation (AWWARF) spearheaded a study to determine how North American households use water around the house. The study discovered that the presence of teenagers tended to increase a household's water usage, while the presence of adults working full-time decreased usage. Other findings include:

- The households included in this study used approximately146,000 gallons annually. Of this amount, 42 percent (61,300 gallons) was used indoors. The remaining 58 percent (84,700 gallons) was used outdoors.
- In households not using water-efficient fixtures, toilets used the most water on a daily basis (20.1 gallons per person per day). Clothes washers were the second largest water users (15 gallons per person per day) and showers were third (13.3 gallons per person day).
- In households that used water-efficient fixtures, Clothes washers assume the role of top water user (15 gallons per capita per day), followed by faucets (10.9 gallons per capita per day), showers (10 gallons per capita per day), and toilets (9.6 gallons per capita per day). *Source: Residential End Uses of Water (Denver, Colo.: AWWARF, 1999).*

- Water-conserving fixtures installed in U.S. households in 1998 alone save 44 million gallons of water every day, resulting in total dollar-value savings of more than $33.6 million per year.

- Average household water use annually: 127,400 gallons

- Average daily household water use: 350 gallons.

Over 40 % of water is used indoors and the remainder outdoors. Consequently, different considerations must be addressed to effectively address water conservation and develop effective conservation strategies. These considerations include:

- Indoor use vs. outdoor use; and

- Type of consumer, i.e., residential, commercial and/or industrial

Other Statistics

- Approximately 346,800 million gallons per day (mgd) of freshwater and 61,200 mgd of saltwater were withdrawn during 2000 for use by the nation's homes, farms, and industries.

- In 2000, the highest consuming states withdrew: California - 51,200 mgd; Texas - 29,600 mgd; and Florida - 20,100 mgd. In comparison, the lowest consuming states withdrew Alaska – 305 mgd; Rhode Island – 429 mgd; and Vermont – 447 mgd. (USGS)

- Americans drink more than 1 billion glasses of tap water per day.

- On average, 50 to 70 percent of home water is used outdoors for watering lawns and gardens.

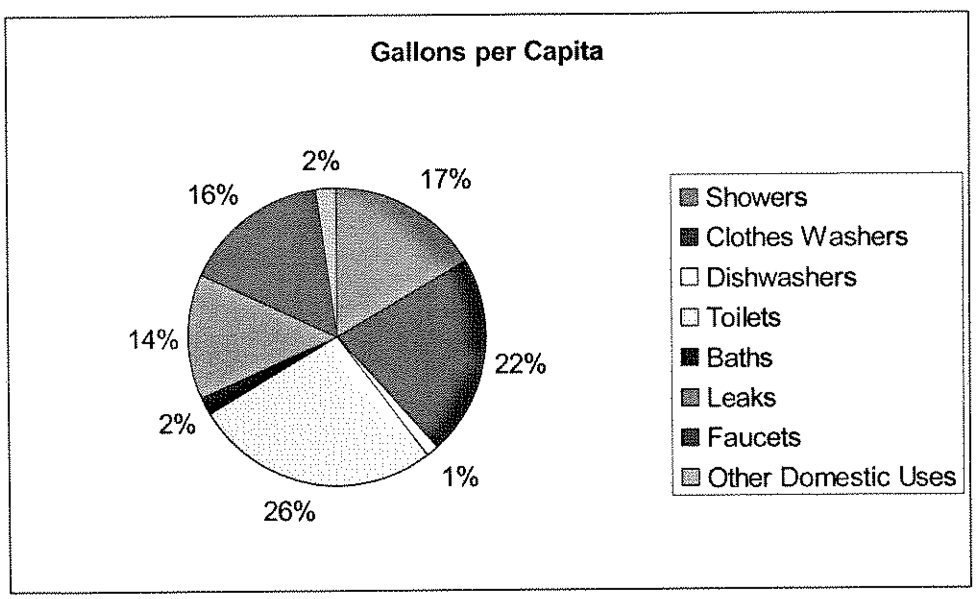
- Daily indoor per capita water use in the typical single family home is 69.3 gallons.

Here is the breakdown:

Table 1

Domestic Per Capita Water Usage

Use	Gallons per Capita	Percentage of Total Daily Use
Showers	11.6	16.8%
Clothes Washers	15.0	21.7%
Dishwashers	1.0	1.4%
Toilets	18.5	26.7%
Baths	1.2	1.7%
Leaks	9.5	13.7%
Faucets	10.9	15.7%
Other Domestic Uses	1.6	2.2%



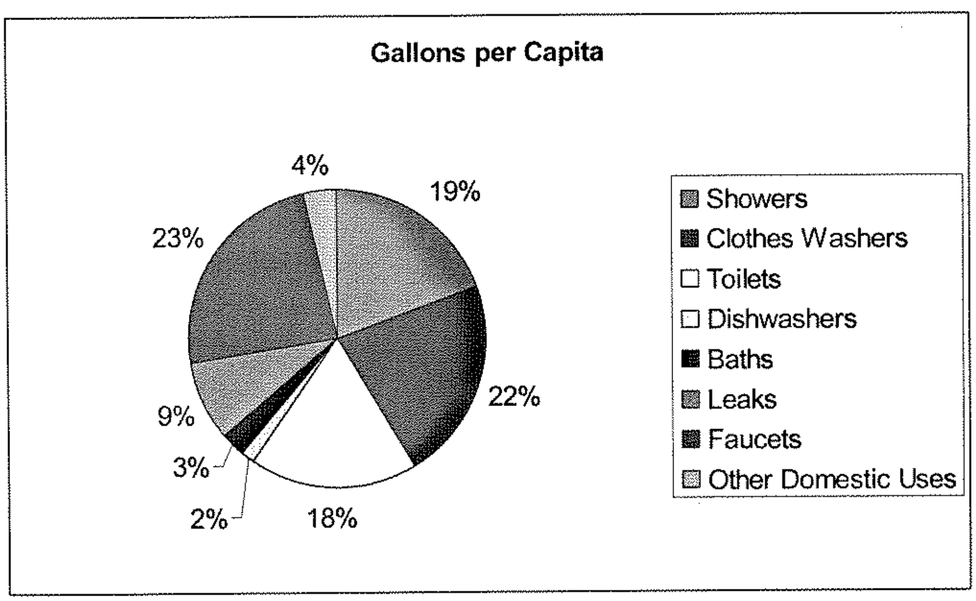
Source: 1999 Residential End Uses of Water, American Water Works Association Research Foundation

By installing more efficient water fixtures and regularly checking for leaks, households can reduce daily per capita water use by about 35 percent to about 45.2 gallons per day. Here is the break down for households using conservation measures:

Table 2

Domestic Per Capita Water Usage Employing Water Conservation

Use	Gallons per Capita	Percentage of Total Daily Use
Showers	8.8	19.5%
Clothes Washers	10.0	22.1%
Toilets	8.2	18.0%
Dishwashers	0.7	1.5%
Baths	1.2	2.7%
Leaks	4.0	8.8%
Faucets	10.8	23.9%
Other Domestic Uses	1.6	3.5%



Source: Handbook of Water Use and Conservation, Amy Vickers

If all U.S. households installed water-saving features, water use would decrease by 30 percent, saving an estimated 5.4 billion gallons per day. This would result in dollar-volume savings of $11.3 million per day or more than $4 billion per year.

WATER CONSERVATION AND REUSE WATER STRATEGIES

Cooperator Water Conservation and Reuse Water Strategies

Information was gathered from each of the Cooperators regarding current and proposed water conservation and reuse water measures. A data request was sent to each of the Cooperators requesting identification and a description of each specific strategy. The data request is presented in Appendix A. This section represents a summary of these strategies reported.

Table 3
Conservation Summary by Cooperator

Water Conservation and Reuse Water Strategies	City of Altamonte Springs	City of Casselberry	City of Lake Mary	City of Longwood	City of Oviedo	City of Sanford	Seminole County	City of Winter Springs
Water Restrictions	•	•	•	•	•	•	•	•
Conservation Rate Structure	•	•	•	•	•	•	•	•
Meter Replacement Program		•			•	•	•	
Low Volume Plumbing Programs		•		•	•	•	•	
Audits						•	•	
Reuse Water Program	•	•	•		•	•	•	•
Xeriscape™ Projects/Codes				•	•	•	•	
Public Education/Outreach	•	•	•		•	•	•	
Mail Outs to High Consumption Water Customers		•				•	•	
Rain Sensor Program							•	
Aquifer Recharge Projects (Drainwells)	•						•	
Water Line Retrofits						•		
Automatic Meter Reading						•		
Potable Irrigation Meter Ban					•	•		

City of Altamonte Springs

The City of Altamonte Springs identified the following water conservation/ water reuse measures.

- Water Restriction Enforcement
- Conservation Rate Structure
- Reuse Water Program
- Public Education/Outreach
- Aquifer Recharge

A description of these measures follows:

1. **Water Restriction Enforcement**

   In 2001, the City began to enforce the St. Johns River Water Management District watering restrictions on the Project APRICOT distribution system, even though these water restrictions were not intended to be applicable to reuse water systems. This will help to extend the City's available water supply. Parts of the City's water system are outside of city jurisdiction, which limits the City's ability to enforce water restrictions. The ordinance also set forth the following fines and penalties:

   "A separate offense shall be deemed committed for each day during which a violation, disobedience, omission, neglect or refusal shall continue:

   a. First offense of these restrictions: warning.
   b. Second offense: $50 fine.
   c. Third offense: $125 fine and reuse water will be shut off which requires a $25 reconnect fee for a total fine of $150.
   d. Fourth offense: $475 fine and reuse water will be shut off which requires a $25 reconnect fee for a total fine of $500."

2. **Conservation Rate Structure**

   The conservation rate structure charges increased rates to high water users.

3. **Reuse Water Program**

   Project APRICOT: The City of Altamonte Spring's Project APRICOT began in the early 1980s and represents one of the first urban reuse systems in the state. The reuse water distribution system conveys reuse water throughout the City of Altamonte Springs and is used for irrigation of residential, commercial, and public properties, highway medians, parks, and other athletic recreational facilities. Project APRICOT also included modifications to the City's wastewater treatment facility to provide tertiary treatment. Over the years, the City has spent in excess of $45 million dollars to implement Project APRICOT and has reduced its groundwater use from 170 gpd per capita to 97 gpd per capita. As of the end of Fiscal Year 2003, reuse water is being provided to the following customers:

- 6,143 single family homes,
- 1 golf course (limited use due to watering restrictions)
- 430 commercial properties
- 80 multi-family dwelling properties, and
- 15 City properties.

Other Project APRICOT statistics (FY 2003):

- 83 miles of 4-inch through 48-inch reuse water mains
- The annual running average reuse rate was 75.3%. Historically, this reuse rate was higher (in the 90% range); however, as the City has enforced SJRWMD irrigation limits, this value has dropped.
- Permitted Water Reclamation Facility (WRF) capacity is 12.5 mgd.
- WRF treated plant flow was 6.05 mgd (with 4.55 mgd to reuse)

The City supplements reuse water by directing stormwater from Lake Orienta, Cranes Roost, Lake Matlbie, and the West Altamonte pond to the WRF for retreatment prior to use as reuse supplement. Cranes Roost was redesigned to be a permanent surface water/stormwater intake facility. At certain elevations of Cranes Roost, approximately 14 MG of reuse water can be stored.

The City has an agreement with Sanlando Utilities to receive reuse water from Wekiva Hunt Club WWTF. A 16" interconnect was completed and went on line in 2002.

4. **Public Education/Outreach**

- Community and Public Education Tools: Water conservation flyers are mailed with the bills.
- The City has discussed Project APRICOT on television news and presented the project and its innovative use of Cranes Roost as a

storage and recovery facility for reuse water to schools and community groups.

- The City has given numerous tours of the WRF over the years to various groups affiliated with the wastewater treatment and engineering industry.
- Information is available from the City's website: (www.seminolecountyfl.gov/envsrvs/watercon/watertips.asp)
- New Customer Education: When customers are added to the system, they receive several brochures concerning the reuse water and its water conserving benefits.

5. **Aquifer Recharge**

- Artificial Recharge Demonstration Project: In 2003, the City reactivated an existing drainwell on Lake Orienta. The reactivation included debris removal, televising the well, abandonment of the existing severed lake connection that resided under a residential structure, installation of a new lake water intake pipe in a public easement using direction drilling techniques, and reconstruction of the well vault to enable maintenance access.
- Maintenance of Drainwells: City staff inspects and cleans drainwell vaults to ensure continued the continued function of wells. City staff fabricated cylindrical screen covers to keep trash, large vegetative debris, snakes, turtles, fish etc. from entering drainwells located on Lake Orienta.

City of Casselberry

The City of Casselberry identified the following water conservation measures.

- Water Restriction Enforcement
- Conservation Rate Structure
- Meter Replacement Program
- Low Volume Plumbing Exchange Programs
- Reuse Water Program
- Public Education/Information

A description of these measures is as follows:

1. **Water Restriction Enforcement**

   The City issues "warning notices" and/or "courtesy notices" to first time offenders, but also use each of these occurrences to further educate citizens regarding water shortages and provide water conservation tips to them.

2. **Conservation Rate Structure**

   - The conservation rate structure charges increased rates to high water users.

3. **Meter Replacement Program**

   (No other information was provided.)

4. **Low Volume Plumbing Programs**

   - Showerhead Exchange Day

5. **Reuse Water Program**

   - The City uses reuse water for irrigation of golf courses, parks, and residential areas.

6. **Public Education/Outreach**

   - AWWA "Drop Savers" Water Conservation Poster Contest
   - Landscape Seminars (twice yearly)
   - SJRWMD's Water Conservation Public Awareness Campaign
   - Water Conservation Awareness during annual Seminole County "Teach-In" at local schools
   - Water Conservation Awareness during annual "Earth Day" at local middle school
   - Water Conservation Monthly Mail Outs (October 2002 - Present): Educational packets are mailed to customers with water consumption records showing they used over 50,000 gallons in the previous month, as well as to new customers upon request. These packets are filled with informational brochures and flyers produced and/or purchased by the City of Casselberry Public Works Department from SJRWMD; Institute of Food and Agricultural Sciences (IFAS)/Florida Yards &

Neighborhoods Program; American Water Works Association (AWWA); Association of Florida Native Nurseries; Channing L. Bete Co.; and, Niagara Conservation. Forty-two various publications are compiled and mailed and/or handed out to educate customers on saving water indoors and outdoors. Mail outs and water consumption are tracked to determine success of this program.

- Watering Variances (4th Year): Watering variances (good for 30 days) to the current SJRWMD Water Restrictions Rules are issued upon request by residents along with receipt for new sod/plantings.

City of Lake Mary

The City of Lake Mary identified the following water conservation measures.

- Water Restrictions
- Conservation Rate Structure
- Public Education/Outreach
- Reuse Water Program

A description of these measures is as follows:

1. **Water Restrictions**

   The City follows the watering restrictions recommended by SJRWMD. Watering is prohibited between the hours of 10 a.m. to 4 p.m. Even addresses can water on Thursdays and Sundays; odd addresses can water on Wednesdays and Saturdays.

2. **Conservation Rate Structure**

   The conservation rate structure charges increased rates to high water users.

3. **Public Information/Outreach**

   SJRWMD brochures and information is available.

4. **Reuse Water Program**

   The City does not own a wastewater treatment facility. However, they receive reuse water from Seminole County for irrigation of residential, commercial, and public properties.

City of Longwood

The City of Longwood identified the following water conservation measures.

- Water Restrictions
- Conservation Rate Structure
- Low Volume Plumbing Fixture Requirements
- Xeriscape™/Irrigation

A description of these measures is as follows:

1. **Water Restrictions**

   The City follows the watering restrictions recommended by SJRWMD. Watering is prohibited between the hours of 10 a.m. to 4 p.m. Even addresses can water on Thursdays and Sundays; odd addresses can water on Wednesdays and Saturdays.

2. **Conservation Rate Structure**

   The rate structure, implemented in 2001 charges increased rates to high water users. The City has measured minimal success with this program.

3. **Low Volume Plumbing Fixture Requirements**

   Low volume toilet and sink fixture requirements were implemented in 1990 as part of building code.

4. **Xeriscape™/Irrigation**

   Xeriscape™ landscaping and rain sensors on irrigation systems are requirements that were implemented in the 1990s as part of the development code.

City of Oviedo

The City of Oviedo identified the following water conservation measures.

- Water Restrictions and Enforcement
- Conservation Rate Structure
- Meter Replacement Program
- Low Volume Plumbing Exchange Programs
- Reuse Water Program

- Xeriscape™/Irrigation
- Public Education/Outreach
- Potable Irrigation Meter Ban

A description of these measures is as follows:

1. **Water Restrictions and Enforcement**

   The City follows the watering restrictions recommended by SJRWMD. Watering is prohibited between the hours of 10 a.m. to 4 p.m. Even addresses can water on Thursdays and Sundays; odd addresses can water on Wednesdays and Saturdays. This Ordinance is enforced by patrolling the city on a regular basis and notifying customers of any violations noted.

2. **Conservation Rate Structure**

   - The conservation rate structure charges increased rates to high water users.

3. **Meter Replacement Program**

   (No other information was provided.)

4. **Low Volume Plumbing Exchange Programs**

   - The City's Water Conservation Department is working with the Capital Projects Division on outfitting new city buildings and existing buildings with new low flow devices.

   - The City is developing a retrofit program to allow residents to exchange their showerhead and toilets for low flow showerheads and toilets.

5. **Reuse Water Program**

   The City has an agreement with Seminole County to receive 3.0 mgd of reclaimed water. A transmission main is currently being constructed ffrom the City of Orlando transmission main up to and through the City of Oviedo. The reclaimed water to be used by the City is from the Iron Bridge Wastewater Treatment Facility.

6. **Xeriscape™/Irrigation**

   - The City currently provides for a free inspection of resident's irrigation timer to ensure that it is set according to the current watering level.

- The City is in the process of refurbishing its recreational parks and the water conservation officer is involved with park development using water-wise/Xeriscape™ landscapes.

- The water conservation officer is working with the City's Land Development Department on a new irrigation ordinance that will enforce irrigation permitting and water-wise landscaping to be used in new construction and existing home sites.

7. **Public Education/Outreach**

- The City of Oviedo employs a full time water conservation officer who organizes and participates in community events in a Water Conservation booth with conservation literature.

- The City distributes conservation literature from the SJRWMD, AWWA, and the City to all new utility customers. The literature provides indoor and outdoor water conservation tips.

- The water conservation department has created a character, Lee K. Pipe, to educate its children on the effects of wasting water and the benefits of water conservation.

- In an effort to help customers better understand how and where their water is being used, the City provides customers with a Home Water Use Survey. This form is provided by SJRWMD.

- The City provides funding to the SJRWMD campaign for the "It Takes Two" irrigation campaign, as well as attending meetings in support of the campaign.

- The City plans to continue to develop conservation exhibits and participate in community outreach events such as Taste of Oviedo, Great Day in the Country, and Arbor Day.

- The City is developing an education awareness program to be presented in local schools, including a teacher's workshop with handouts and videos, and the statewide Drop Saver poster contest on water conservation sponsored by the AWWA.

8. **Potable Irrigation Meter Ban**

(No other information was provided.)

City of Sanford

The City of Sanford identified the following water conservation measures.

- Water Restrictions
- Conservation Rate Structure
- Meter Testing and Replacement
- Low Volume Plumbing Programs
- System Audits
- Reuse Water Program
- Xeriscape™/Irrigation
- Public Education/Outreach
- Well Metering
- Water Line Retrofits
- System Depressurization
- Calibration of Master Meters
- Automatic Meter Reading
- Potable Irrigation Meter Ban

Where provided, a description of these measures follows:

1. **Water Restrictions**

   The City follows the watering restrictions recommended by SJRWMD. Watering is prohibited between the hours of 10 a.m. to 4 p.m. Even addresses can water on Thursdays and Sundays; odd addresses can water on Wednesdays and Saturdays.

2. **Conservation Rate Structure**

   The conservation rate structure charges increased rates to high potable and reuse water users.

3. **Metering Testing and Replacement**

   (No information was provided.)

4. **Low Volume Plumbing Programs**

   - Toilet rebate program.

- Showerhead exchange program.
- Utility department retrofit program (planned).
- Adoption of Florida Building Code with low flush and flow fixture requirements

5. **System Audits**

(No other information was provided.)

6. **Reuse Water Program**

The City of Sanford requires all new developments to connect to the reuse water system for irrigation and other uses that do not require potable water.

7. **Xeriscape™/Irrigation**

- The City also requires that at least twenty percent (20%) of all landscape material obtained from off-site sources for use on any site shall have a soil moisture range of 'dry', as characterized in the list of plants from SJRWMD's publication: *Waterwise Florida Landscape.* No more than forty percent (40%) of all plant material shall have a high water demand, characterized by 'moist' in *Waterwise Florida Landscape.*
- Potable irrigation meter ban.
- Xeriscape demonstration project
- Water usage plan and an irrigation plan for new developments

8. **Public Education/Outreach**

- The City participates in special events such as landscape seminars and Earth Day.
- Conservation information is available on the City's website.
- The City participates in the AWWA Water Conservation Committee and the Florida Water and Environment Association (FWEA) Water Reuse Committee.
- A brochure rack containing water conservation information and tips is located in City Hall. Brochures are mailed to new and existing customers.

- The City developed a high bill response program.

9. **Well Metering**

(No other information was provided.)

10. **Water Line Retrofits**

(No other information was provided.)

11. **System Depressurization**

(No other information was provided.)

12. **Calibration of Master Meters**

(No other information was provided.)

13. **Automatic Meter Reading**

(No other information was provided.)

14. **Potable Irrigation Meter Ban**

(No other information was provided.)

Seminole County

Seminole County identified the following water conservation measures.

- Water Restrictions and Enforcement
- Conservation Rate Structure
- Meter Replacement Program
- Low Volume Plumbing Fixture Programs
- Audits
- Reuse Water Program
- Xeriscape™/Irrigation
- Public Information/Outreach
- Rain Sensor Program
- Aquifer Recharge Project

A description of these measures is as follows:

1. **Water Restrictions and Enforcement**

   - The County follows the watering restrictions recommended by SJRWMD. Watering is prohibited between the hours of 10 a.m. to 4 p.m. Even addresses can water on Thursdays and Sundays; odd addresses can water on Wednesdays and Saturdays.

   - Twenty-three (23) staff members are trained as code enforcement officers and conduct nighttime water patrols several times a week. An average of 323 notices was given each month between the months of February and July of 2004.

2. **Conservation Rate Structure**

   - A conservation rate structure was implemented in 2003 and had little effect on water use.

3. **Meter Replacement Program**

   - (No other information was provided.)

4. **Low Volume Plumbing Programs**

   - Annual Multi-Utility Showerhead Exchange Day: Seminole County and the Cities of Sanford and Casselberry participate in an Annual Showerhead Exchange Day. The SJRWMD funds 50% through their water conservation cost-share program. Approximately 357 low flow showerheads were exchanged which save about 5,431 gallons per day or 2 million gallons per year.

   - Toilet Fill Cycle Diverter Giveaway: The County gave away about 2,000 toilet fill cycle diverters that have an estimated savings of 12,750 gallons per day.

   - A low flow toilet rebate project is planned to be full-scale in 2005/06.

5. **Audits**

   - 223 irrigation evaluations were conducted which resulted in a decrease of water use by 10,227 gallons per minute.

   - 64 landscape evaluations were conducted in 2004.

6. **Reuse Water Program**

- Reuse Water Retrofit of Existing Subdivisions: This retrofit displaces 0.9 mgd of potable water use for irrigation.

- Developers are required to install reuse water lines; and customers are prohibited from irrigating with potable water when reclaim becomes available.

7. **Xeriscape™/Irrigation**

- Land development codes require irrigation and landscaping plans to be reviewed to ensure they include water-conserving features.

- The County has a leak detection program that compares a customer's current month use with their annual average use and identifies customers with big increases in use.

8. **Public Information/Outreach**

- "Down with The Water Bill" Class: The County offers a free class covering the following topics: Check for Leaks; Follow Watering Restrictions; Water Lawn the Right Amount; Install and/or Maintain Rain Sensor; Check Irrigation Controller; Walk Irrigation System; Reduce Watering of Mulched Beds and Hedges; Retrofit Beds and Hedges with Micro-irrigation.

- Outreach to Homeowners Associations (HOAs): Contract with Seminole Soil and Water Conservation District to provide outreach programs including: speaking services to HOA meetings; short articles for HOA newsletters and websites; Waterwise Landscape Award program with interested HOAs and review of landscaping covenants of participating HOAs.

- The County's website contains water conservation information. www.seminolecountyfl.gov/envsrvs/watercon/watertips.asp.

- The County participates in the AWWA Waterwise Committee.

- The County provides telephone technical assistance with customers concerned about high water bills.

- Inserts with conservation information are included with bills.

9. **Rain Sensor Program**

- A rain sensor giveaway project was planned in 2005.

- The County has a contract with Clear Water Products & Services to install rain sensors if lacking or not functioning.

10. **Aquifer Recharge Project**

    - (No other information was provided.)

Winter Springs

The City of Winter Springs identified the following water conservation measures.

- Water Restrictions
- Conservation Rate Structure
- Reuse Water Program

A description of these measures is as follows.

1. **Water Restrictions**

   The City follows the watering restrictions recommended by SJRWMD. Watering is prohibited between the hours of 10 a.m. to 4 p.m. Even addresses can water on Thursdays and Sundays; odd addresses can water on Wednesdays and Saturdays. This ordinance was implemented in 2001 and restricts for all uses, including potable, reuse, and surface water, and shallow wells.

2. **Conservation Rate Structure**

   The City has an increasing potable water rate structure implemented in 1998.

3. **Reuse Water Program**

   - The City uses reuse water for irrigation of golf courses, parks, and residential areas.

   - All new developments are required to construct a reuse water distribution system.

SJRWMD RECOMMENDED CONSERVATION MEASURES

Water conservation is a major component in the SJRWMD's strategy used to meet projected water demands. The District has numerous water conservation publications, materials available describing mandatory programs, and indoor and outdoor conservation tips.

SJRWMD has identified several water conservation programs. These projects include:

- Conserve Florida Water Conservation Information Clearinghouse
- Model Landscape Water Conservation Ordinance
- Water Conservation Public Awareness Campaign
- Florida Water Star SM

These programs are described in more detail below.

Conserve Florida Water Conservation Information Clearinghouse

SJRWMD is a participant in the development of a comprehensive statewide water conservation program for public water supply. This effort includes the Florida Department of Environmental Protection (FDEP), the five Water Management Districts (WMDs), the Florida Rural Water Association (FRWA), and organizations representing public water supply utilities. As part of this effort, the development of a clearinghouse for water conservation information is planned. SJRWMD proposes to support this effort in hopes that it will provide information valuable to determining the cost and effectiveness of various water conservation approaches.

Model Landscape Water Conservation Ordinance

SJRWMD developed a document to provide guidance and example language for the creation of local landscape water conservation ordinances that meet the requirements specified in Section 373.185, FS. Local governments are required by Sections 125.568 and 166.048, FS, to consider adopting ordinances that will reduce the amount of water used to irrigate landscape. The document is located at the following website. (http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/SJR05mlo.pdf)

Water Conservation Public Awareness Campaign

SJRWMD partners with local governments and water supply utilities to conduct an annual paid-advertising, multimedia campaign, which has included television, radio, newspaper, the Internet, direct mail and billboard advertising, a Web site, and printed materials. The budget for the campaign in FY 2004–2005 was $1.848 million. This campaign has successfully increased public awareness of water conservation.

Florida Water Star SM

The Florida Water Star SM program encourages water efficiency in household appliances, plumbing fixtures, irrigation systems and landscapes and promotes the economic and environmental benefits of efficiency in new home construction. To do this, the program currently offers resources and incentives to builders and homebuyers who value water efficiency in new home construction. The program may later be expanded to include ways to update or retrofit older homes. It is a point-based, new home certification program, similar to the federal Energy Star® program.

The program focuses on water use efficiency as well as leak and breakage protection and practices that minimize the potential for mold and mildew. The program objectives are to increase the knowledge level of the building industry about water-efficient building practices and to provide educational resources and incentives to make these practices common to the market place.

The SJRWMD is further developing the Florida Water Star SM program in partnership with several groups, including the University of Florida's Energy Extension Service, JEA, the Northeast Florida Builders Association and local governments. More information can be found at the following link.
http://sjr.state.fl.us/programs/outreach/conservation/water_star/water_star.html

Other SJRWMD Programs

Other programs are endorsed and promoted by the SJRWMD are summarized below.

Conservation Rate Structure

Customers are encouraged to consume less water overall by structuring conservation-oriented rates that are higher at certain usage levels or during certain time periods. This encourages more efficient use of water by shifting demand from peak periods to off-peak periods. The surcharge rate approach is depicted by a higher rate being charged during the season (peak) for all consumption above a set threshold. Rates structures to consider include:

Increasing Block Rate, or Tiered, Pricing. Increasing block rate, or tiered, pricing reduces water use by increasing per-unit charges for water as the amount used increases. For example, the first volume of water (block) used is charged a base rate, the second block is charged the base rate plus a surcharge, and the third block is charged the base rate plus a higher surcharge. It is necessary to increase real prices significantly to overcome the effects of conservation (Martin and Kulakowski, 1991).

For example, as the cost of water increased in Tucson, Arizona, residents used 33 percent less water between 1974 and 1980. A 10 percent increase in water rates provided about 3 percent more revenue while triggering a 7 percent reduction in use (Billings and Day, 1989). Using seasonal increasing block rate pricing during summer and winter months, to encourage year-round conservation, resulted in estimated water savings for the single-family residential class in Tucson of an average 2.23 mgd during 1983-1986 (Cuthbert, 1989).

Decreasing Block Rate Pricing. Decreasing block rate prices reflect per-unit costs of production and delivery that go down as customers consume more water.

The monthly water use records of 101 customers were measured in a study of municipal water use in the city of Denton, Texas. Summer water use records from 1976 to 1980 during a decreasing block rate period were compared to summer use records from 1981 to 1985 during an increasing block rate period. It was found that the decreasing block rate scenario encouraged greater water use, whereas the increasing block rate scenario resulted in a reaction to the price increase and a corresponding decrease in water use (Nieswiadomy and Molina, 1989).

Time-of-Day Pricing. Time-of-day pricing charges users relatively higher prices during a utility's peak use periods. Because customers are sensitive to price increases, these charges curtail demand. Time-of-day pricing can cut generating capacity and reduce reliance on expensive secondary fuel sources (Sexton et al., 1989).

Water Surcharges. A water surcharge imposes a higher rate on excessive water use. The customer pays more money per gallon for water use that is considered higher-than-average.

Surcharges include unit surcharges, winter/summer ratios, and alternative seasonal rates. The unit surcharge method establishes a threshold level for excess consumption based on average daily per capita or per-household consumption. A surcharge is imposed for all water use above that threshold level. For the winter/summer ratio, metered water use during the winter period is compared to consumption during the corresponding summer period, and a higher rate or surcharge is imposed for water consumption above the average winter use. Typically, an increase in usage of 14-20 percent occurs during the summer. Under an alternative seasonal rate structure, all water used during the summer or peak season is billed at a higher rate than that used during the other seasons. The increased rate is applied to all customers at all water-use levels (Schlette and Kemp, 1991).

District-Wide Water Restrictions

Landscape irrigation is restricted to a maximum of two days per week and shall not occur between the hours of 10 a.m. and 4 p.m. Existing landscapes with odd addresses are allowed to irrigate on Wednesday and Saturday. Existing landscapes with even addresses or no addresses are allowed to irrigate on Thursday and

Sunday. Irrigation on these designated days shall only occur when actually needed because of a lack of rainfall, and shall be limited to the application of no more than 3/4-inch of water in the irrigated area.

Irrigation System Retrofits

Modifications to an existing irrigation system are made to improve their efficiency. Typical modifications include checking for leaks, retrofitting a well with a smaller pump, or installing surge irrigation.

Low Flow Showerheads

Showers account for about 20 percent of total indoor water use. A standard 4.5 gallon per minute showerhead is replaced with a 2.5 gallon per minute showerhead. Many utilities have low flow showerhead exchange programs (EERE).

Low Flush Toilets

Replacement of conventional toilets with low-flush toilets is a practical and economical alternative. Conventional toilets use 3.5 gallons or more of water per flush. Effective in 1992, the Energy Policy Act of 1992 (Public Law 102-486) requires that all new toilets produced for residential use must operate on 1.6 gallons per flush or less (FEMP).

Ornamental Fountains

All ornamental fountains must use recirculating systems that produce no off-site discharge.

Public Information and Education Programs

Public information and education programs can be one of the simplest and most cost-effective strategies to employ. Distributing flyers and pamphlets through mail or monthly bills and participating in seminars are activities that can be incorporated into the program.

Rain Sensors

Automatic sprinkler systems are required to have a rain-sensor device or soil moisture sensor shut-off that will override the system when adequate moisture is available.

Reclaimed Water

Reclaimed water can be used for industrial uses, landscape irrigation, agricultural irrigation, aesthetic uses such as fountains, and fire protection.

System Audits

Residential water audit programs involve sending trained water auditors to participating family homes to encourage water conservation efforts. The auditors identify water conservation opportunities, such as repairing leaks and low-flow plumbing, and recommend changes in water use practices to reduce home water use. An average leak detection survey and repair program can result in a 25 to 50 percent recovery of water being lost due to leaks (Air Force).

Water-Efficient Landscaping

Landscaping water usage can account for 20% or more of facility water consumption. Landscape plants that need little water and group plants with similar water needs. Draft and encourage adoption of an ordinance to require landscaping of new nonresidential properties to use only native or water conserving species. Provide personnel to educate those affected by the ordinance and ensure effective implementation once the ordinance is adopted.

Xeriscape™ Landscaping

Xeriscape landscaping incorporates the following seven basic principles that lead to saving water:

- Planning and design
- Soil analysis
- Practical turf areas
- Appropriate plant selection
- Efficient irrigation
- Use of mulches
- Appropriate maintenance

CONSERVATION MEASURES USED BY OTHER ENTITIES

There are numerous water conservation strategies being employed or considered for implementation across the nation. A list was compiled primarily by research conducted over the World Wide Web using an Internet search engine. The strategy was to:

- Identify published Water Conservation Plans and/or measures being used or being considered by water purveyors across the United States, and to a lesser degree, abroad; and
- Determine which specific water conservation measures were being actively promoted.
- Identify the most successful and easily implemented conservation measure(s).

It should be noted that the most popular conservation measures largely seem to be the same measures from program to program, with measures such as those currently being used by the Cooperators and the SJRWMD being the norm. These included conservation measures such as the use of a water conservation rate structure, shower head replacement programs, mandatory 1.6 gallon/flush toilets, incentives for the use of Xeriscape™ Landscaping, etc. In addition, it was also noted that virtually every program consisted of a combination of water conservation measures, as opposed to just one or two measures. The list includes:

Gray Water Use

An alternative water source for some systems is "gray water," or treated wastewater for nonpotable water uses. In the residential setting, gray water is collected from showers/baths and clothes washing and can be used by homeowners for home gardening, lawn maintenance, landscaping, and other innovative uses.

Since water reuse and recycling practices reduces production demands on the water system, water utilities can work with their nonresidential customers to identify potential areas for reuse or recycling of gray water. Some industries can substantially reduce water demand through water reuse (or multiple use) in manufacturing processes. Recycled wastewater can be used for some industrial purposes, agricultural purposes, groundwater recharge, and direct reuse.

Dual Pipe Systems

Dual pipe water systems deliver potable water and reuse water to a home or business. Dual pipe systems have been used in the United States for outdoor use for many years. Other parts of the world use a dual pipe system for other purposes such as toilet flushing.

Home Pressure Reduction

The maximum water flow from a household fixture can be reduced by installing pressure-reducing valves. For homes served by wells, the system pressure can be reduced to save both water and energy. Pressure reduction can also reduce the likelihood of leaking water pipes, leaking water heaters, and dripping faucets.

Water System Pressure Reduction

Reducing excessive pressures in the distribution system can save a significant quantity of water. Reducing water pressure can decrease leakage, the amount of flow through open faucets, and stresses on pipes and joints that may result in leaks. Lower water pressure may also decrease system deterioration, reducing the need for repairs and extending the life of existing facilities. Furthermore, lower pressures can help reduce wear on end-use fixtures and appliances.

System-wide pressure management. For residential areas, pressures exceeding 80 psi should be assessed for reduction. Pressure management and reduction strategies must be consistent with state and local regulations and standards, as well as take into account system conditions and needs. Obviously, reductions in pressure should not compromise the integrity of the water system or service quality for customers.

Pressure-reducing valves. A more aggressive plan may include the purchase and installation of pressure-reducing valves in street mains, as well as individual buildings. Utilities might also insert flow restrictors on services at the meter. Restrictors can be sized to allow for service length, system pressure, and site elevation. Utilities can consider providing technical assistance to customers to address their pressure problems and install pressure-reducing valves to lower the customers' water pressure. This may be especially beneficial for large-use customers.

Rainwater Harvesting

Rain barrels can be used by residents for garden irrigation. The idea behind this initiative is to draw attention to wasteful irrigation practices. Residential irrigation accounts for a significant portion of domestic summer water consumption. By providing a practical alternative to using potable water for irrigation, and giving residents the ability to take responsible action in discretionary water use, high seasonal consumption can be reduced.

Rainwater that falls on a customer's property is used to irrigate trees, lawns and other landscaping. Rainwater harvesting can help lower water bills, reduce local flooding and reduce landscaping and property needs.

Single-Pass Cooling Equipment

Efficient process equipment can be required for selected businesses (restaurants, hotels/motels, office sanitation) and prohibit once through cooling and non-recycling fountains and other non-efficient water features. Examples of single pass cooling equipment are medical equipment, HVAC systems, hydraulic equipment, condensers, air compressors, welding machines, vacuum pumps, and ice machines that circulate water once through the equipment and then discharge the water. The equipment is modified to operate on a closed loop that recirculates the water instead of discharging it (Air Force).

Metering

Metering is a very fundamental tool of water system management and conservation. Most utilities employ source water and service connection metering for residential, commercial, industrial and wholesale customers. Both the supplier and the customer benefit from metering. Source water and service connection metering is essential for water accounting and billing purposes. Other metering strategies include:

- ***Service-connection metering.*** Service-connection metering is needed to inform customers about how much water they are using; suppliers use metering data to track more accurately water usage and bill customers for their usage.

- ***Public-use water metering.*** All water provided free of charge for public use should be metered and read at regular intervals. This will allow the utility to account more accurately for water. Lack of metering undermines loss control, costing and pricing, and other conservation measures.

- ***Fixed-interval meter reading.*** A program of fixed-interval meter reading is essential to determine the amount of non-revenue producing water. Source meters and service connection meters should be read at the same relative time in order to facilitate accurate comparisons and analysis. Readings generally should occur at regular intervals, preferably monthly or bimonthly.

- ***Meter accuracy.*** Water meters can be damaged and deteriorate with age, thus producing inaccurate readings. Inaccurate readings will give misleading information regarding water usage, make leak detection difficult, and result in lost revenue for the system. All meters, especially older meters, should be tested for accuracy on a regular basis. The system also should determine that meters are appropriately sized. Meters that are too large for a customer's level of use will tend to under-register water use.

- ***Meter testing, calibration, repair, and replacement.*** After determining the accuracy of the metering system, the utility should provide a schedule of activities necessary to correct meter deficiencies. Meters should be recalibrated on a regular basis to ensure accurate water accounting and billing.

Sub-Metering

Sub-metering is used in units such as apartments, condominiums, and trailer homes to indicate water use by those individual units, instead of the entire complex of units be metered by the main supplier. Submetering of water use in apartment or business complexes makes it possible to bill tenants for the water that they actually use rather than for a percentage of the total water use for the complex. Submetering makes water users more aware of how much water they use and its cost, and tenants who conserve water can benefit from lower water use costs. Sub-metering would be encouraged through water audits and direct mail promotions, and possibly incentives to building owners. Utilities should consider requiring all new multi-family units to provide sub-meters on individual units. To help reduce financial impacts on tenants, regulations can be adopted that specify acceptable methods of metering and billing.

Mandatory 1.6 Gallons/Flush Toilets Installation at Time of Sale of Existing Buildings

Working with the real estate industry, utilities can require a certificate of compliance be submitted to the water provider that verifies that a plumber has either inspected the property and determined that efficient fixtures were already in place, or were installed at the time of sale, before close of escrow.

Rebates for High Efficiency Residential Clothes Washers (HEW)

Together with local energy companies, rebates can be offered for purchase of water efficient washing machines. HEW machines:

- Use 40% less water.
- Use 55% less energy per load than standard top-loading machines.
- Cut the drying time in half.
- Clean clothes more thoroughly.
- Use less detergent.
- Reduce wear and tear on clothing.

Rebates would be scaled to water efficiency as rated by the Consortium for Energy Efficiency Inc.

Free Distribution of Retrofit Kits w/ Low Flow Showerheads

During an audit, through direct mail solicitation, or through community associations, a free or "at cost" retrofit kit is provided to existing older single-family residential homes. The kit could contain a low-flow showerhead; toilet leak detection dye tablets, displacement device, or early closure device; a faucet aerator, faucet washers to fix leaky faucets; and a pamphlet on how to conserve water.

Utilities might institute targeted programs for different customer classes (residential, commercial, industrial, public buildings, etc.). Retrofits of industrial premises can include facilities used by the public and employees, as well as facilities used for production purposes. A program to retrofit low-income housing units may conserve considerable water in older residential housing units with inefficient plumbing fixtures.

Increased Public Education

Water providers' web site can be expanded and videos and CD's provided to the consumer. The water provider would increase public education efforts to encourage water conservation and provide information on demand management techniques. The education program would work in accordance with other selected conservation measures and thereby increase the implementation rate and savings of the other measures. The water provider would provide information to create and produce articles and segments in the newspapers on TV, on billboards, and for the radio encouraging and explaining conservation methods and the importance of saving water. Include trigger shut-off valves and hose end timers and new home award programs, combined with increased school education program.

Weather Based Irrigation Controller (WBIC) Installation Program

A rebate for advanced irrigation controllers is provided that has at least a water budgeting feature and multiple start times and a rain sensor/soil moisture sensor. The WBIC Installation Program will help save water, time, and money by using local weather conditions to scientifically calculate and automatically adjust an irrigation schedule to meet the specific needs of residential and/or commercial landscaping.

The program offers historical and real-time WBIC controllers that manage and change a user's watering schedule. Weather Based Irrigation Controllers evaluate local weather conditions and Evapo-Transpiration (ET) rates to create a site-specific irrigation schedule for the landscape's needs.

Regulations for Rain Sensor/Shut-offs on New and Existing Automatic Irrigation

The installation of rain sensors with automatic irrigation systems is required in new construction. The water provider or building department inspects irrigations accounts (or randomly inspect large summer volume users) and issue fines to those who do not have a rain shut-off device installed. Rebates or free rain-sensing devices would be offered to existing accounts with automatic irrigation systems.

Landscape Watering Calculator

An easy-to-use Landscape Watering Calculator that helps estimate the right amount of water to give your landscape or garden is provided for the consumer. This calculator is typically provided on the water provider's web site.

The calculator is designed to provide a weekly schedule for the maximum amount of water that a customer's plants may need each month of the year. Because everyone's landscape is different, the calculator is simplified by using average numbers for weather, plants, and soils in the utilities geographical area.

Free Commercial Water Audits and Feasibility Reports

The water provider would target high water-using accounts for this commercial water audit program. Accounts that agree to participate in the program would also agree to make a good faith effort to install cost-effective water conserving equipment. Incentives can be offered to increase participation and effectiveness.

Commercial Landscape Survey Program

This service is typically provided free of charge to commercial, industrial and institutional customers. Qualifying properties usually have more than one acre of landscaped property. Many properties can expect water savings of between 20 and 40 percent. Audits have shown potential savings of up to $1,000 per acre of landscape.

Auditors can review the water-use history of the property to determine where water savings are possible. Participants typically receive a written evaluation of the irrigation system's performance, aerial photos of the property, a water-use estimate for the upcoming year and an irrigation controller schedule for each month.

There are typically five components to an evaluation:

- ***System Check.*** Auditors evaluate the entire water delivery system and point out deficiencies that can add up to significant water losses. Catch-can tests determine the average precipitation rate and distribution uniformity, which helps the owner understand system performance and leads to better scheduling strategies.

- ***Hydrozones and Budgets.*** Auditors classify plant groups into hydrozones to estimate each site's actual water need. This results in the optimum water budget, which is compared with past use to determine possible savings.

- ***Scheduling and Tracking Usage.*** Auditors provide a suggested yearly watering schedule and set up a system to log meter readings, calculate weekly water use and graphically compare current use with the budget. This weekly tracking is critical because it provides a gauge to monitor actual savings. Best results rely on the owner's active participation in maintaining the site.

- ***Site report.*** The site's owner receives a report that evaluates the existing irrigation system and landscape water management. The report also includes a plan to improve the site's water-use efficiency.

- ***Follow-up services.*** Auditors are available for telephone consultations and follow-up visits.

Guaranteed Water Program

The Guaranteed Water Program exempts research and development or industrial manufacturing firms from mandatory water restrictions in times of drought in exchange for their participation in daily water conservation programs, including the use of recycled water.

To qualify, a company must use recycled water where feasible, install ultra low-flow toilets, water-conserving showerheads and other water-efficient fixtures. Once qualified, the business is exempt from mandatory water supply cuts during times of water restrictions when other businesses are being required to conserve water.

Rebates for High Use Commercial Urinals and 1.6 Gallon per Flush Toilets

The water provider selectively provides rebates or direct installation to businesses to convert to efficient toilets only where toilets are subject to high use, such as restaurants, theaters, etc.

Incentives for Replacement of Clothes Washers in Coin-operated Laundries

Laundromat managers would be offered incentives to retrofit or use efficient clothes washers. The rebate would go to the manager or the washing machine leasing company.

Rebates for Meters on Cooling Towers

The water provider can require or offer a rebate to buildings that install submeters to measure the make-up and bleed-off water of cooling towers. Additionally, they can provide educational brochures and a phone contact of a knowledgeable person to provide assistance.

Free Installation of Low Flow Spray Rinse Nozzles in Restaurants

Free installation of 1.6 gpm spray nozzles for the rinse and clean operation in restaurants can be provided. These spray nozzles have a high velocity spray pattern, which increases their ability to remove food from dishes.

The devices use 1.6 gallons per minute compared to the standard nozzles that use up to 6 gpm.

Focused Water Audits for Hotels/Motels

Following a free water audit, the hotel/motel receives a rebate offer for equipment identified that would save water. Provide rebate schedule efficient equipment, such as air-cooled ice machines, so hotels/motels could apply without an audit.

Incentive to Reuse Pool & Spa Filter Backwash

Incentives are provided to home owners and commercial pool/spa owners to direct backwash from pools and spas to some type of reuse. The filters in swimming pools and outdoor spas are periodically backwashed to remove collected material. This water can be directed onto turf or other landscaping plants. Constructing shallow basins around trees and shrubs located near the filters will facilitate reuse of this water. The goal is try to use the water for some constructive purpose, such as watering a lawn or landscaping.

Incentive to Provide Pool & Spa Cover

Incentives are provided to commercial and residential swimming pool and spa owners to provide covers during periods of non-use. Covers reduce evaporation, thus conserving water.

Capacity Buy-Back for Industrial/Commercial/Industrial (ICI) Process Improvements

Low interest loan or grant program can be set up to buy back capacity from large users who install water efficient equipment. The customer would propose a project (possibly as the result of a water audit). The water provider would estimate the water savings and calculate a rebate based on their avoided costs for new capacity. Customers would receive an upfront payment upon signing a contract to install the equipment.

Rebates for X-Ray Recycling Units

A brief audit of X-Ray machines can be conducted to identify machines where the process water, developer, or filter solution can be recycled. Offer rebates for water-recycling equipment.

Self-Closing Faucets Requirement on New ICI Buildings

Non-residential accounts can be required to install automatic (infrared sensor) or manual self-closing faucets for all new customer or high use restrooms.

0.5 Gallon per Flush Urinals Requirement in New ICI Buildings

New buildings can be required to be fitted with 0.5 gallon per flush urinals rather than the current standard of 1.0-gal per flush models.

Free Irrigation Audits of Large Turf Areas

Outdoor audit of the top 20% of high water-using landscape facilities can be provided. The auditor would determine how irrigation practices are undertaken, present the results of the audit, and provide recommendations for the facility to conserve water including irrigating during appropriate times, not irrigating upon pavement and using evapo-transpiration programs, if available. Irrigation conservation methods are encouraged through the media.

Incentive to Reduce Non-residential Cost/Share Landscape

A permanent reduction for grass used for landscaping purposes can be promoted. This program is aimed at HOAs, multi-family units and businesses.

At least 1,000 square feet of turf is typically the minimum qualifying amount of turf removed. Removed grass area will be landscaped (bare, unplanted soil is unacceptable). Typically, the utility provides a rebate to the qualifying entity.

Xeriscape™ Landscaping of City/County and Utility Facilities

Appropriate and publicly visible sites would be selected for Xeriscape™ demonstration gardens. Gardens would be professionally designed and managed. Signs and brochures would explain plant material choices. Gardens would be promoted and tours offered through the public education program. Provider could use this garden(s) to provide a virtual tour on its website.

System Water Audits/Leak Detection

The water distribution system is audited every year and the amount of water projected to be lost through leakage is identified. Leak detection equipment is used to find leaks and, upon locating them, the leaks are repaired as soon as possible. A goal reduction for Unaccounted for Water (UFW) is typically around 15%.

Repairing leaks controls the loss of water that water agencies have paid to obtain, treat, and pressurize. The early detection of leaks also reduces the chances that leaks will cause major property damage. When water leaks from a system before it reaches the consumer, water agencies lose revenue and incur unnecessary costs. Such costs should provide an incentive for system operators to implement a leak detection program.

One way to detect leaks is to use listening equipment to survey the distribution system, identify leak sounds, and pinpoint the exact locations of hidden underground leaks. Metering can also be used to help detect leaks in a system.

Programs for finding and repairing leaks in water mains and laterals (conduits) might be cost-effective in spite of their high initial costs. Leak detection programs have been especially important in cities that have large, old, deteriorating systems (RMI, 1991).

Free Residential Water Audits

Water providers would offer water audits to single-family homeowners for several years after major water price increases as a customer response.

Enact Conservation Standards on New Developments

Standards on new developments with regard to landscaping, drainage, and irrigation practices can be imposed as a "package". Many water systems, including privately owned systems, lack authority to implement this measure. Systems that have such authority must exercise it carefully. In general, restrictions on water use should be justified by the system's circumstances and should not compromise the customer's rights or quality of service.

Enact Water Waste Prohibition

Methods include enacting and enforcing measures prohibiting gutter flooding, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

Require High Efficiency Water Softeners

Consideration can be given to developing state law regarding exchange-type water softeners that would:

(1) Allow the sale of only more efficient, demand-initiated regenerating (DIR) models;

(2) Develop minimum appliance efficiency standards that:

- Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used; and
- Implement an identified maximum number of gallons discharged per gallon of soft water produced;

(3) Allow local agencies, including municipalities and special districts, to set standards that are more stringent and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the re-claimed water or groundwater supply.

Water softener checks can be included in home water audit programs and include information about DIR and exchange-type water softeners in their educational efforts to encourage replacement of less efficient timer models.

Incentives to Wholesale Water Recipients

Wholesale water suppliers can provide financial incentives, or equivalent resources, as appropriate, beneficial, and mutually agreeable to their retail water agency customers to advance water conservation efforts and effectiveness.

Incentives for Best Management Practices for Agricultural Irrigation

Water-saving irrigation practices fall into three categories: field practices, management strategies, and system modifications. Field practices are techniques that keep water in the field, distribute water more efficiently across the field, or encourage the retention of soil moisture. Examples of these practices include the chiseling of extremely compacted soils, furrow diking to prevent runoff, and leveling of the land to distribute water more evenly. Typically, field practices are not very costly.

Management strategies involve monitoring soil and water conditions and collecting information on water use and efficiency. The information helps in making decisions about scheduling applications or improving the efficiency of the irrigation system. The methods include measuring rainfall, determining soil moisture, checking pumping plant efficiency, and scheduling irrigation.

System modifications require making changes to an existing irrigation system or replacing an existing system with a new one. Because system modifications require the purchase of equipment, they are usually more expensive than field practices and management strategies. Typical system modifications include adding drop tubes to a center pivot system, retrofitting a well with a smaller pump, installing surge irrigation, or constructing a tailwater recovery system (Kromm and White, 1990).

On-line Irrigation Scheduling Calculators can be provided for both fields and orchards that are drip irrigated and sprinkler irrigated fields and orchards. Each of them makes it easy to calculate a crop's irrigation requirements based on local weather station data and the percentage of your field that is shaded by the crop around noon.

These calculators can be used to estimate the irrigation water used by crops for the last few days ("in arrears"), or to forecast a crop's water use in the coming few days ("in advance").

In addition, incentives to change from spray irrigation to drip irrigation should be explored. Spray irrigation is a common irrigation method where water is sprayed from high-pressure sprayers onto crops. Because water is sprayed high into the air, some water is lost to evaporation. Drip irrigation is becoming accepted as a more efficient means of irrigating crops. It is a low-pressure method of irrigation and less water is lost to evaporation than high-pressure spray irrigation.

HELP GUIDES FOR WATER CONSERVATION AND WATER REUSE

A list of websites and other water conservation guides is provided below.

Internet Guides:

- American Water Works Association, http://www.awwa.org/waterwiser/
- St. Johns River Water Management District, http://sjr.state.fl.us/programs/outreach/conservation/restrictions/index.html
- Southwest Florida Water Management District, http://www.swfwmd.state.fl.us/conservation/
- South Florida Water Management District, http://www.sfwmd.gov/site/index.php?id=37
- Environmental Protection Agency, http://www.epa.gov/owm/water-efficiency/
- Water Use It Wisely Organization, http://www.wateruseitwisely.com/toolsLinks/
- H2OUSE Organization, http://www.h2ouse.org/index.cfm

Other Guides:

- *Preventing Water Loss in Water Distribution Systems: Money Saving Leak Detection Programs.* US Army Corp of Engineers Construction Engineering Research Laboratory, Technical Report Number N-86/05.
- *Fundamentals of Implementing a Water Conservation Program: Water Wiser*; September 1995. Rick Albani.
- *Long-Term Options for Municipal Water Conservation: Journal AWWA*; March 1989. Alice Grisham, William M. Fleming.
- *Water Supply Needs and Sources Assessment: Alternative Water Supply Strategies Investigation: Assessment of the Cost Effectiveness of Specific Water Conservation Practices*; 1999. St. Johns River Water Management District.
- *Water Use Reductions from Retrofitting Indoor Water Fixtures*: Water Resources Bulletin, American Water Resources Association, Vol. 26, No. 6, December 1990. John B. Whitcomb.
- Water Conservation Programs – A Planning Manual; American Water Works Association, Manual M52, 2006.

REUSE WATER IN SEMINOLE COUNTY

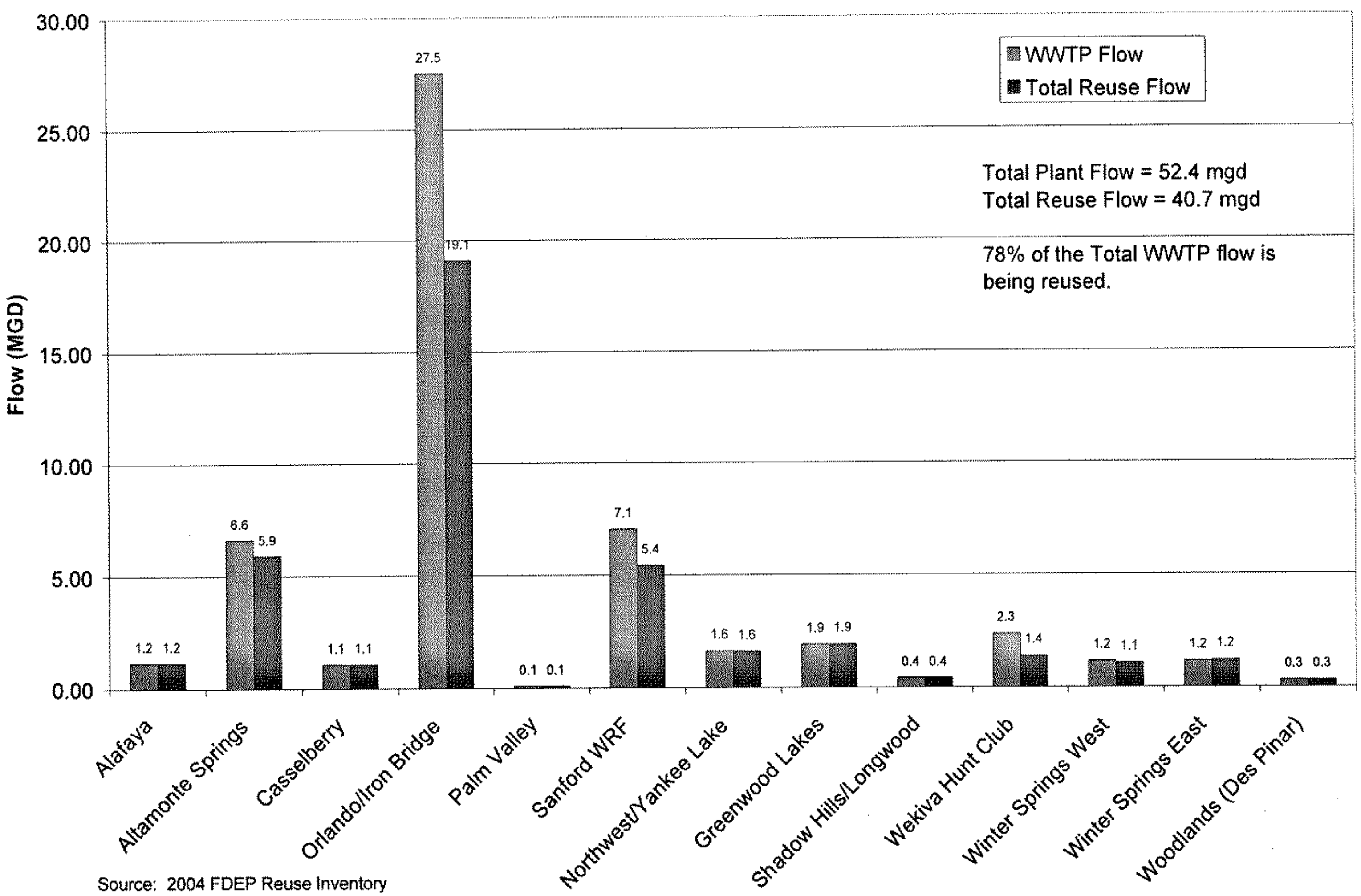
As communities around the world approach the limits of their available water supplies, reuse water has become necessary for conserving and extending available water supplies. Water reuse describes the process whereby wastewater treated to an appropriate standard, is reused for a variety of beneficial purposes. The treated water ready to be reused is termed recycled or reclaimed water. The use of reuse water is a highly effective method to supplement potable water resources. Other benefits of water reuse include:

- Increasing water resource availability
- Making scarce potable water previously used for non potable applications available for drinking
- Reduced consumption of expensively treated potable water supplies (cost saving where there is water metering)
- Reduced effluent flow to sewers
- Reduced nutrient discharge to water bodies
- A less drought sensitive water resource
- Enhanced recreation and tourism opportunities and biodiversity benefits through the restoration/creation of wetlands

Reuse is used throughout much of Seminole County for irrigation of lawns, golf courses, highway medians, common areas, and parks. In some cases within the County, the reuse water is supplemented by surface water sources. In 2004, the total reuse flow for Seminole County is 40.69 million gallons per day and the total percentage of reuse flow to WWTF is 78%. Seminole County has the highest rate of reuse flow per capita at 101 gallons per day per person within the state (FDEP).

The following figure presents the total reuse flow compared to the total WWTF flow for each WWTF producing reuse water in Seminole County. This data is collected from the FDEP 2004 Reuse Inventory. This report was used due to the inconsistency of reporting periods and sources of data received.

Figure 1
2004 WWTP Flow vs Reuse Flow



Source: 2004 FDEP Reuse Inventory

Table 4
Current Reuse Water Summary

WWTP	Location	WWTP Capacity	WWTP Flow	Supplemental Groundwater Supplies	Reuse Capacity	Reuse Flow	% of WWTF Flow that is Reused
Alafaya	Oviedo	1.53	1.15		1.54	1.15	100
Altamonte Springs	Altamonte Springs	12.50	6.61	0.32	14.62	5.89	89
Casselberry	Casselberry	2.20	1.08		1.39	1.08	100
Chuluota	Chuluota	0.10	0.03		0.10	0.03	100
Orlando/Iron Bridge	Oviedo	40.00	27.50		38.50	19.10	69
Palm Valley	Oviedo	0.15	0.09		0.04	0.09	100
Sanford WRF	Sanford	7.3	7.06	0.03	15.04	5.43	77
Sanford South	Sanford	2.00	0.01		2.00	0.01	100
Northwest/Yankee Lake	West of Sanford	2.5	1.63		6.92	1.62	99
Greenwood Lakes	Lake Mary	3.5	1.91		3.49	1.92	100
Shadow Hills/Longwood	Longwood	0.47	0.42		0.47	0.42	100
Wekiva Hunt Club	Longwood	2.90	2.34		2.75	1.38	60
Winter Springs West	Winter Springs	2.07	1.15		3.33	1.07	93
Winter Springs East	Winter Springs	2.01	1.15	0.06	3.01	1.21	100
Woodlands (Des Pinar)	Longwood	0.50	0.31		0.50	0.31	100
TOTAL		**79.73**	**52.44**	**0.41**	**93.7**	**40.71**	**78**

Source: 2004 FDEP Reuse Inventory

GLOSSARY OF TERMS

Aquifer – The underground layer of water-soaked sand and rock that acts as a water source for a well.

Conservation – The continuing protection and management of natural resources in accordance with the principles that assure their optimum long-term economic and social benefits.

Consumptive Use – The difference between the total quantity of water withdrawn from a source for any use and the quantity of water returned to the source.

Contaminant – Any physical, chemical, biological, or radiological substance or matter that has an adverse affect on air, water, or soil.

Demand – The numerical expression of the desire for goods and services associated with an economic standard for acquiring them.

Discharge – The outflow of water.

Domestic use – The quantity of water used for household purposes such as washing, food preparation, and bathing.

Effluent - The sewage or industrial liquid waste that is released into natural water by sewage treatment plants, industry, or septic tanks.

Gray Water - Domestic wastewater composed of wash water from kitchen sinks and tubs, clothes washers, and laundry tubs.

Irrigation – The controlled application of water to cropland, hay land, and/or pasture to supplement that supplied through nature.

Reclaimed Water – The reuse of wastewater.

Reuse - The reclamation of water from a municipal or industrial wastewater conveyance system

Runoff - The amount of precipitation appearing in surface streams, rivers, and lakes; defined as the depth to which a drainage area would be covered if all of the runoff for a given period of time were uniformly distributed over it.

Water Supply System – The collection, treatment, storage, and distribution of potable water from source to consumer.

Xeriscape™ - The use of native or climate appropriate plants that are adapted to the local climate, and thus require less water, are more likely to survive drought conditions, and are more pest and disease tolerant. A complete Xeriscape™ strategy also considers the climate appropriate plant's growth patterns, maintenance requirements, and their interaction with local climate and soil conditions.

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APPENDIX A

ARCADIS

ARCADIS G&M, Inc.
4307 Vineland Rd.
Suite H-18
Orlando, FL 32811
Tel 407.835.0266
Fax 407.835.0267
www.arcadis-us.com

Gerald Chancellor
City of Casselberry
407-262-7700
gchancellor@casselberry.org

Subject:
Seminole County Water Supply Plan
Water Conservation Data Request

Date:
December 19, 2005

Contact:
J. Hermann

Phone:
407.835.0266

Email:
jhermann@arcadis-us.com

Our ref:
OR000205

Dear Gerald:

As part of the Seminole County Water Supply Plan, ARCADIS will organize a one-day workshop to help identify practical means of water conservation measures within Seminole County. The workshop is tentatively planned for late January.

We have addressed this letter to you to request detailed information regarding each water conservation measure currently being implemented or proposed for implementation in your community.

Please complete the attached Data Request Form and return to our office at your earliest convenience. Your cooperation and assistance will be appreciated.

Please submit all information and direct any questions regarding this request directly to ARCADIS at the following address:

John Hermann
ARCADIS
4307 Vineland Rd., H-20
Orlando, FL 32811

jhermann@arcadis-us.com
tel: 407-835-0266
fax: 407-835-0267

If you should have any questions with regard to the project, please feel free to contact me. We appreciate your prompt response to this request. Please forward the information to ARCADIS by December 30, 2005. Thank you for your time and assistance.

Sincerely,

John D. Hermann

John D. Hermann, P.E.
Project Manager

Copies:
SJRWMD Terry Clark, Lisa Parks

Appendix E

Task E - Data Gathering & Processing; Flow Projections

Flow Projections – Task E

For The

Seminole County Water Supply Plan

By

ARCADIS G&M
4307 Vineland Road H-20
Orlando, Florida

Since the issuance of this Task E Technical Memorandum, regulatory conditions and the Plan's scope of services have changed. Therefore some of the data shown in this document has been modified. The modified data is included in the Task F Technical Memorandum of the Seminole County Water Supply Plan. In summary, changes include:

- Demand projections were extended to 2045 on a County-wide basis.
- SJRWMD made changes to their demand projections.
- SJRWMD implemented a directive to use alterative water supply projects for considering future needs satisfaction.
- SJRWMD has indicated that groundwater consumptive use permit will be extended to meet an entities demand only until 2013.

These conditions have altered the way of calculating future needs for Seminole County. These conditions and data changes were considered in Task F and are not reflected this Task E Technical Memorandum.

May 2006

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INTRODUCTION

Task E requires an evaluation of flow projections. In Subtask E.1, ARCADIS was requested to review the projected users and render an opinion on whether the use represents a reasonable demand. Further, ARCADIS was requested to review the SJRWMD land use projections and determine if the maps are consistent with the Cooperator's anticipated plans and population projections.

Population and potable water demand projections were provided from the SJRWMD and the Cooperators. Population and potable water demand projections in 5-year increments were provided through the year 2020 for the following entities: Altamonte Springs, Casselberry, Lake Mary, Oviedo, Sanford, Seminole County (4 service areas), Sanlando Utilities, and Winter Springs. With the exception of Altamonte Springs, and the Seminole County Southwest, Northeast and Northwest service areas, projections for 2025 also were provided. For completeness, 2025 potable demand projections for Altamonte Springs and the 3 Seminole County Service areas were estimated by average percent change between 2015 and 2020. The population projections are presented in Table 1 and the potable water demand projections are presented in Table 2.

Studies have documented that certain areas could have adverse impacts to water resources and natural systems if the rate of groundwater withdrawal continues to sustain at the current level or increases at a higher rate. SJRWMD has recently indicated that existing Consumptive Use Permit (CUP) allocations may not be increased by the traditional source of groundwater withdrawal for future demands. Therefore, future water use will be required to be met by the development of alternative water supply methods.

The CUP allocations through 2025 are summarized in Table 3, along with the Cooperator potable water demand projections and water treatment plant capacities. The projected CUP allocations assume that after the CUP expiration date, there is no increase in permitted allocation. For example, if the CUP expired today, at a permitted amount of 10 mgd, the projected allocations for the next twenty (20) years remain at 10 mgd. CUP allocations could also be subject to decrease per decision of the SJRWMD.

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

DEMAND/FLOW PROJECTIONS AND REASONABLE USE

Potable water demand projections and population projections provided by various Utilities and by SJRWMD were reviewed for consistency. Wastewater flow projections and reuse projections provided by various Utilities were reviewed. The projections were reviewed for "reasonableness".

City of Altamonte Springs

Potable water demand for Altamonte Springs has been projected to increase steadily by both the City and by SJRWMD. Demand projections by Altamonte Springs consistently exceed SJRWMD projections through 2025. However, the difference is only about 0.3 mgd (more or less) in 2020, or about 3 %. Since the projected population figures are the same, this difference represents about 4 gallons per capita per day (gpcd) in average daily consumption. SJRWMD and the City projected no change in per capita consumption (138 gpcd and 142 gpcd).

Altamonte Springs projected that its wastewater flows will more than double (107 %) between 2005 and 2020 (6.05 mgd to 12.5 mgd). Projected 2025 wastewater flows exceed potable water demand by 2.5 to 3.0 mgd, indicating that other systems are connecting. Reuse demand is only projected to increase by 29 % in the same period. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 1.

The projected per capita potable water demand suggests that the City anticipates an increase in reuse, although it appears that the City does not anticipate significant retrofitting of existing development. Excess wastewater for reuse would appear to be available, but Altamonte Springs may have committed that excess capacity to other utilities.

City of Casselberry

Potable water demand for Casselberry has been projected to increase steadily by both the City and SJRWMD, although the City projects the increase to occur much more slowly (lower increase per year). Projections by Casselberry were consistently lower than SJRWMD through 2025. The gap is about 1.3 mgd (25 %) in 2005 but increases to 2.5 mgd (40 %) in 2025.

The differences between the City's potable water demand projections and the SJRWMD's projections appear to result from differences in population projections as well as per capita consumption. SJRWMD projected the Casselberry population to increase from 49,727 in 2005 to 64,778 in 2025, an increase of 30 %. In contrast, Casselberry projected a population increase from 53,739 in 2005 (higher than SJRWMD) to 61,500 in 2025, an increase of 14 %. SJRWMD projected no change in

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

per capita consumption (132 gpcd); Casselberry projected a slight increase (98.1 to 99.4 gpcd) during the 2005-2025 period.

Casselberry projected that its wastewater flows will increase by 76 % between 2005 and 2025 (1.1 mgd to 1.9 mgd). Casselberry projected 100 % reuse of its wastewater through 2025. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 2.

With Casselberry's low per capita potable water demand and 100 % reuse, it appears that conservation is effective and the only opportunity to reduce consumption or increase reuse capacity would be to extend sewer service to more customers.

City of Lake Mary

Potable water demand for the City of Lake Mary has been projected to increase slowly by both the City and the SJRWMD. The City projected a 5 % increase (from 4.0 to 4.2 mgd) between 2010 and 2025. SJRWMD projected a 16 % increase (from 3.8 to 4.4 mgd) in the same period. By 2025, potable demand projections differ by only 0.2 mgd.

The SJRWMD and the City of Lake Mary use distinctly different population projections and per capita consumption rates to make potable demand projections. Lake Mary projected a population of 18,000 by 2010, increasing to 19,000 by 2015 which would remain stable through 2025. SJRWMD projected a population of 14,815 in 2010 with an increase of 2,000 by 2015 and a further increase of 2,200 by 2025. The difference in population in 2025 between the City's projection (19,000) and the SJRWMD's projection (17,187) is 1,813. SJRWMD anticipated a per capita consumption of 258 gpcd throughout the planning period. Lake Mary projected a slight decrease in per capita consumption from 222 gpcd in 2010 to 221 in 2025.

Lake Mary projected wastewater flow at less than 1 mgd during the years 2010-2025. Lake Mary provided no reuse demand projections. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 3.

Based on the high per capita consumption and the low wastewater generation rate, Lake Mary may benefit from further conservation and reuse. The limited projected growth indicates that additional wastewater generation and additional reuse would have to be achieved by retrofitting existing development.

City of Longwood

The City of Longwood has projected potable water demand to increase only slightly between 2005 (2.4 mgd) and 2025 (2.48 mgd), about 3 %. SJRWMD projected Longwood's potable demand to increase significantly between 2005 (2.1 mgd) and 2025 (2.9 mgd), an increase of 35.7 %.

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

SJRWMD estimated consumption at 149 to 150 gpcd; Longwood estimated consumption at 169 to 170 gpcd. The big discrepancy is the population projection. Although both entities projected a population of near 14,200 for 2005, SJRWMD's 2025 projected population of nearly 18,000 far exceeded Longwood's projected population of 14,612. A flow summary is presented in Figure 4.

Longwood provided no projections of wastewater flow or reuse demand. SJRWMD did not project wastewater flow or reuse demand.

Based on the moderate (and unchanging) projection of per capita consumption and limited future growth, it appears Longwood would have to retrofit existing development in order to benefit from conservation and reuse.

City of Oviedo

Potable water demand for the City of Oviedo has been projected to increase steadily by the SJRWMD and more rapidly by the City. The City projected a 100 % increase (from 4.2 to 8.5 mgd) between 2005 and 2025. SJRWMD projected a 26 % increase (from 4.5 to 5.7 mgd) in the same period. By 2025, potable demand projections differ by 49 % (2.8 mgd).

The SJRWMD and the City of Oviedo applied approximately the same per capita consumption rates (159 gpcd compared to 160 gpcd) to make potable demand projections. The discrepancy lies in population projections. Oviedo projected a population of 26,316 in 2005, with a steady increase to 53,138 by 2025. SJRWMD projected a higher population of 28,478 in 2005 with a steady increase to 35,861 by 2025. The difference in population in 2025 between the City's projection (53,138) and the SJRWMD's projection (35,861) is 17,277 (48 %). A flow summary is presented in Figure 5.

Oviedo projected wastewater flow increasing from 0.4 mgd in 2005 to 1.4 mgd in 2025. Oviedo provided no reuse demand projections. SJRWMD did not project wastewater flow or reuse demand.

Based on the projected rapid growth and the low wastewater generation rate, Oviedo may benefit by providing wastewater service and reuse supply to new development. Additional wastewater customers would generate additional wastewater with the opportunity for increased reuse capacity.

City of Sanford

Potable water demand for the City of Sanford has been projected to increase steadily by the SJRWMD and more rapidly by the City. The City projected a 62 % increase (from 5.4 to 9.6 mgd) between 2005 and 2025. SJRWMD projected a 52 % increase (from

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7.2 to 10.9 mgd) in the same period. By 2025, potable demand projections differ by 14% (1.3 mgd).

The SJRWMD and the City of Sanford have similar population projections and per capita consumption rates to make potable demand projections. Sanford projected a population of 52,103 in 2005, increasing to 72,193 by 2025. SJRWMD projected a population of 47,982 in 2005 with an increase to 70,333 by 2025. The difference in population in 2025 between the City's projection (72,193) and the SJRWMD's projection (70,333) is 1,860 (3 %). SJRWMD anticipated a slight increase in per capita consumption from 150 to 156 gpcd. Sanford projected an increase in per capita consumption from 113 gpcd in 2005 to 133 gpcd in 2025.

Sanford projected wastewater flow to increase from 8.4 mgd in 2005 to 12.2 mgd in 2025 and reuse demand to increase to the same volume. As wastewater is projected to exceed potable demand, it is obvious that Sanford intends to accept wastewater from other areas. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 6.

Sanford's increase in projected water demand appears to be offset by its increase in wastewater flows and reuse. It appears that all of Sanford's wastewater is committed to reuse, which explains the reduction in per capita consumption.

City of Winter Springs

Potable water demand for Winter Springs has been projected to increase slowly by the City and more quickly by the SJRWMD. The City projected a 4.5 % increase (from 4.4 to 4.6 mgd) between 2005 and 2025 with most of the increase between 2015 and 2020. SJRWMD projected a consistent increase from 5.1 to 6.0 mgd between 2005 and 2025 (18%). By 2020, potable demand projections differ by 1.6 mgd (35.2 %).

The SJRWMD and the City use distinctly different per capita consumption rates but similar population projections to make potable demand projections. The City projected a population of 40,261 in 2010 rising to 43,889 by 2025. SJRWMD projected a population of 37,641 in 2010 with an increase to 43,595 by 2025. The difference in population in 2025 between the City's projection (43,889) and the SJRWMD's projection (43,595) is 294 (0.7 %). SJRWMD anticipated a per capita consumption of 138 gpcd throughout the planning period. The City projected a slight increase in per capita consumption from 109 gpcd in 2010 to 105 gpcd in 2020.

The City projected wastewater flow to increase from 2.6 mgd in 2010 to 3.5 mgd in 2025. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 7.

Based on the low per capita consumption the City may not benefit significantly from increased conservation. As wastewater is projected to exceed potable water use, it

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

appears Winter Springs will import wastewater and could further benefit from the additional wastewater for reuse.

Seminole County Northeast

Potable water demand for the County Northeast System has been projected to increase slowly by the SJRWMD and by the County. The County projected a 14.5 % increase (from 3.4 to 3.9 mgd) between 2005 and 2020. SJRWMD projected a 33.7 % increase (from 2.6 to 3.5 mgd) in the same period. By 2020, potable demand projections differ by 0.4 mgd (11.3 %).

The SJRWMD and the County use distinctly different per capita consumption rates and population projections to make potable demand projections. The County projected a population of 20,020 in 2005 rising to 22,681 by 2020. No projection to 2025 was provided. SJRWMD projected a population of 17,400 in 2005 with an increase to 23,336 by 2020 and a further increase 23,792 by 2025. The difference in population in 2020 between the County's projection (22,681) and the SJRWMD's projection (23,336) is 655 (2.9 %). SJRWMD anticipated a per capita consumption of 152 gpcd in 2005 and 151 in 2025. The County projected a slight increase in per capita consumption from 171 gpcd in 2005 to 173 gpcd in 2020.

The County projected wastewater flow for the County Northeast System increasing from 2.6 mgd in 2005 to 3.0 mgd in 2020. Reuse demand was projected to increase at the same rates and volumes. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 8.

It appears that the County Northeast System captures a high percentage of its potable water use as wastewater and has committed 100 % of its wastewater for reuse.

Seminole County Northwest

Potable water demand for the County Northwest System has been projected to increase rapidly by the SJRWMD and by the County. The County projected a 69.3 % increase (from 6.92 to 11.72 mgd) between 2005 and 2020. SJRWMD projected an 82.3 % increase (from 6.16 to 11.23 mgd) in the same period. By 2020, potable demand projections differ by 0.49 mgd (4.4 %).

The SJRWMD and the County use distinctly different per capita consumption rates and but similar population projections to make potable demand projections. The County projected a population of 16,848 in 2005 rising to 30,554 by 2020. No projection to 2025 was provided. SJRWMD projected a population of 17,143 in 2005 with an

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

increase to 30,437 by 2020 and a further increase 30,870 by 2025. The difference in population in 2020 between the County's projection (30,554) and the SJRWMD's projection (30,870) is 316 (1.3 %). SJRWMD anticipated a per capita consumption of 359 gpcd in 2005 and 370 gpcd in 2025. The County projected a decrease in per capita consumption from 411 gpcd in 2005 to 384 gpcd in 2020.

The County projected wastewater flow for the County Northwest System to increase from 2.2 mgd in 2005 to 3.5 mgd in 2020. Reuse demand was projected at the same rate and volume. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 9.

Based on the high per capita consumption and low wastewater production, the County Northwest System may benefit from further conservation and reuse. The projected reduction in per capita consumption suggests that conservation and reuse are expected to occur but that there will be limited opportunities for retrofits of existing development.

Seminole County - Southeast

Potable water demand for the County Southeast System has been projected to increase slowly by the SJRWMD and more rapidly by the County. The County projected a 54% increase (from 10.1 to 15.5 mgd) between 2005 and 2025. SJRWMD projected a 15 % increase (from 8.8 to 10.1 mgd) in the same period. By 2025, potable demand projections differ by 5.4 mgd (53.6 %).

The SJRWMD and the County use similar per capita consumption rates and distinctly different population projections to make potable demand projections. The County projected a population of 47,327 in 2005 rising to 57,900 by 2015 and a slight leveling out by 2020 (59,162). No projection to 2025 was provided. SJRWMD projected a population of 41,663 in 2005 with an increase to 47,007 by 2020 and a further increase 47,934 by 2025. The difference in population in 2020 between the County's projection (57,900) and the SJRWMD's projection (47,007) is 10,893 (23 %). SJRWMD anticipated a per capita consumption of 211 gpcd throughout the planning period. The County projected a slight increase in per capita consumption from 213 gpcd in 2005 to 214 gpcd in 2020.

The County provided no wastewater flow projection for the County Southeast System. Reuse demand was projected to increase from 4.1 mgd in 2005 to 5.8 mgd in 2020. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 10.

Considering the projected growth, and based on the high per capita consumption and depending upon wastewater generation, it appears that the County Southeast System may not be taking full advantage of opportunities for conservation and reuse.

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

Seminole County Southwest

Potable water demand for the County Southwest System has been projected to increase slowly by the SJRWMD and by the County. The County projected an 8.1 % increase (from 1.4 to 1.5 mgd) between 2005 and 2020. SJRWMD projected a 22.4 % increase (from 1.3 to 1.6 mgd) in the same period. By 2020, potable demand projections differ by 0.1 mgd (8 %).

The SJRWMD and the County use distinctly different per capita consumption rates and population projections to make potable demand projections. The County projected a population of 6,236 in 2005 rising to 6,603 by 2020. No projection to 2025 was provided. SJRWMD projected a population of 8,995 in 2005 with an increase to 10,970 by 2020 and a further increase 11,289 by 2025. The difference in population in 2020 between the County's projection (6,236) and the SJRWMD's projection (10,970) is 4,367 (66.1 %). SJRWMD anticipated a per capita consumption of 144 gpcd throughout the planning period. The County projected a slight increase in per capita consumption from 217 gpcd in 2005 to 221 gpcd in 2020.

The County projected no wastewater flow for the County Southwest System. Reuse demand was projected to increase from 0.4 mgd in 2005 to 0.43 mgd in 2020. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 11.

Considering the limited projected growth and the high per capita consumption, and depending upon wastewater generation, the County Southwest System may benefit only marginally from further conservation and reuse unless opportunities to retrofit existing development exist.

Sanlando Utilities

Potable water demand for Sanlando Utilities has been projected to increase slowly by the SJRWMD and by Sanlando Utilities. Sanlando Utilities projected an 8.8 % increase (from 6.8 to 7.3 mgd) between 2005 and 2025. SJRWMD projected an 8.2 % increase (from 9.9 to 10.8 mgd) in the same period. By 2025, potable demand projections differ by 3.4 mgd (46.5 %).

The SJRWMD and Sanlando Utilities use distinctly different per capita consumption rates and population projections to make potable demand projections. Sanlando Utilities projected a population of 34,097 in 2005 rising to 36,722 by 2025. SJRWMD projected a population of 35,174 in 2005 with an increase to 38,071 by 2025. The difference in population in 2025 between the Sanlando Utilities' projection (36,722) and the SJRWMD's projection (38,071) is 1,299 (3.5 %). SJRWMD anticipated a per capita consumption of 283 gpcd throughout the planning period. Sanlando Utilities

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

projected a slight increase in per capita consumption from 198 gpcd in 2005 to 200 gpcd in 2025.

Sanlando Utilities did not provide wastewater flow projections for the utility. Reuse demand was projected to increase from 3.1 mgd in 2005 to 3.4 mgd in 2015. SJRWMD did not project wastewater flow or reuse demand. A flow summary is presented in Figure 12.

Based on the high per capita consumption and depending upon wastewater generation, Sanlando Utilities may benefit from further conservation and reuse. At the present time, it appears Sanlando Utilities does not anticipate deriving much benefit from conservation or reuse of future development or retrofitting opportunities for existing development.

Conclusions

The total SJRWMD and Cooperator population projections were tabulated and compared as presented in Table 1. Cooperators who provided population projections projected an additional population of 22,395 for a difference of 5% in 2025 when compared to SJRWMD projections. The total 2025 population is projected by Cooperators to be 516,862. Please note, if population projections were not provided by the Cooperators, SJRWMD projections were assumed. 2025 population projections not provided were calculated to be the same percent increase between the 2015 and 2020 populations.

The total SJRWMD and Cooperator potable water demand projections were tabulated and compared as presented in Table 2. The Cooperators that provided demand projections estimated an additional potable water demand of 0.6 mgd in 2025 when compared to SJRWMD projections, or a difference of 1%. The total 2025 public supply water demand projected by Cooperators, for all utilities greater than 0.1 mgd, is 89.7 mgd. If projections were not provided, SJRWMD demand projections were assumed. As indicated in Table 3, for those utilities that provided projections only through 2020, the 2025 demand was calculated to be the same percent increase between the 2015 and 2020 demand. The projected total 2025 CUP allocation is 76.1 mgd, for a shortfall of 13.6 mgd. The total water demand and the CUP allocations are presented in Figure 13.

The wastewater treatment plant capacities, wastewater projections and reuse projections are summarized in Table 4. Projections were not provided for each facility. The total reported wastewater flow projection for 2025 is 87.3 mgd. The potential additional available reuse is 35.6 mgd. However, only a portion of the reuse flows generated will be allocated to utilities in Seminole County because the Iron Bridge Facility is located in Seminole County but owned by the City of Orlando.

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

CHANGES IN AGRICULTURAL WATER USE AND RESULTING AVAILABILITY OF GROUNDWATER FOR PUBLIC USE

Historical agricultural water use and agricultural acreage and projections to Year 2025 have been tabulated in the District's Water Supply Assessment (2003). The data indicate that agricultural water use will reduce from 9.8 mgd in 1995 to 8.2 mgd for an average rainfall year and to 9.2 mgd in a 1 in 10-year rainfall year. A predicted decrease in agricultural acreage (from 4,797 acres to 3,704 acres) is expected during the same time period. The reduction in water use amounts to 1500 gallons per day per acre ([9.8 – 8.2]/ [4,797 – 3,704]).

Based on the County Comprehensive Plan, most of the reduction in agricultural land will occur on parcels where the future land use is anticipated as Low Density Residential (4 to 7 Dwelling Units per acre). The County has adopted a level of service standard of 350 gallons per day (average daily flow) per Equivalent Residential Connection (ERC). Thus, for Low Density Residential development of agricultural land, the projected average daily flow can be expected to be 1400 (350 x 4) to 2450 (350 x 7) gallons per day per acre. On that basis, conversion of agricultural land to residential is likely to increase demand for water. To the extent that the agricultural land was supplied by surface water or reuse and the residential use needs to be supplied by groundwater, this will create a further gap in the availability of groundwater. The gap can only be narrowed by increased conservation and/or increased reuse to residential projects.

Based on events since the issuance of Task E, data changes were made that are reflected in Task F's basis for calculating future needs.

TABLES

Based in events since the issuance of Task E data changes were made that are reflected on Task F's basis for calculating future needs.

Table 1: Population Projection Comparison

Utility	SJRWMD					COOPERATOR					2025 Difference (Coop. - SJRWMD)	% Difference	Total 2025 Population [2]
	2005	2010	2015	2020	2025	2005	2010	2015	2020	2025			
City of Altamonte Springs [1]	55,576	60,620	64,625	67,540	68,701	55,576	60,620	64,625	67,540	70,586	1,885	3%	68,701
City of Casselberry	49,727	53,732	61,159	63,467	64,778	53,739	55,383	57,057	59,120	61,500	-3,278	-5%	61,500
City of Lake Mary	13,411	14,815	16,797	17,012	17,187	-	18,000	19,000	19,000	19,000	1,813	10%	19,000
City of Longwood	14,265	15,608	17,542	17,961	19,332	14,177	14,289	14,400	14,512	14,612	-4,720	-32%	14,612
City of Oviedo	28,478	31,094	34,393	34,847	35,861	26,316	29,928	37,444	42,675	53,138	17,277	33%	53,138
City of Sanford	47,982	57,022	64,423	68,180	70,333	42,252	63,391	81,589	105,011	135,158	64,825	48%	135,158
City of Winter Springs	36,944	37,641	39,694	42,093	43,595	-	40,261	41,447	42,668	43,889	294	1%	43,889
Florida Water Services - Chuluota	3,937	4,921	5,781	6,643	7,382	-	-	-	-	-	-	-	7,382
Palm Valley MHP	1,812	1,949	2,254	2,221	2,275	-	-	-	-	-	-	-	2,275
Seminole County - Apple Valley	2,966	3,344	3,774	4,101	4,380	-	-	-	-	-	-	-	4,380
Seminole County - Druid Hills/Bretton Woods	579	579	579	579	579	-	-	-	-	-	-	-	579
Seminole County - Meredith Manor	1,349	1,401	1,436	1,451	1,467	-	-	-	-	-	-	-	1,467
Seminole County - Northeast [1]	17,400	19,839	22,708	23,336	23,792	20,020	20,483	21,259	22,681	24,198	406	2%	23,792
Seminole County - Northwest [1]	17,143	23,485	30,005	30,437	30,870	16,848	25,623	29,878	30,554	31,245	375	1%	30,870
Seminole County - Southeast [1]	41,663	43,853	45,719	47,007	47,934	47,327	52,074	57,900	59,162	60,452	12,518	21%	60,452
Seminole County - Southwest [1]	8,995	9,824	10,582	10,970	11,289	6,236	6,451	6,603	6,603	6,603	-4,686	-71%	11,289
Utilities Inc - Oakland Shores	326	326	326	326	326	-	-	-	-	-	-	-	326
Utilities Inc - Ravenna Park	925	951	976	976	976	-	-	-	-	-	-	-	976
Utilities Inc - Sanlando Utilities	35,174	36,629	37,529	37,830	38,071	34,097	35,252	35,777	36,302	36,722	-1,349	-4%	36,722
Utilities Inc - Weathersfield	3,278	3,307	3,319	3,319	3,319	-	-	-	-	-	-	-	3,319
SUB-TOTAL	**381,930**	**420,940**	**463,621**	**480,296**	**492,447**	**316,588**	**421,755**	**466,979**	**505,828**	**557,103**	**85,360**	**17%**	**579,827**
Domestic Self Supply and Utilities <0.1 mgd	29,863	30,849	31,740	32,361	32,804	-	-	-	-	-	-	-	32,804
TOTAL	**411,793**	**451,789**	**495,361**	**512,657**	**525,251**	**316,588**	**421,755**	**466,979**	**505,828**	**557,103**	**85,360**	**16%**	**612,631**

Notes:

1. 2025 Cooperator projection was calculated as the average percent increase between 2015 and 2020.
2. If Cooperator projections were not provided,the Total 2025 Population is equal to the SJRWMD projection.

Table 2: Potable Water Demand Projection Comparison (mgd)

Utility	SJRWMD 2005	SJRWMD 2010	SJRWMD 2015	SJRWMD 2020	SJRWMD 2025	COOPERATOR 2005	COOPERATOR 2010	COOPERATOR 2015	COOPERATOR 2020	COOPERATOR 2025	2025 Difference (Coop. - SJRWMD)	% Difference	Total 2025 Water Demand [2]
City of Altamonte Springs [1]	7.69	8.39	8.94	9.34	9.50	7.91	8.63	9.20	9.62	10.06	0.56	6%	10.06
City of Casselberry	6.58	7.11	8.09	8.39	8.57	5.27	5.43	5.59	5.85	6.11	-2.46	-40%	6.11
City of Lake Mary	3.45	3.82	4.33	4.38	4.43	-	4.00	4.20	4.20	4.20	-0.23	-5%	4.20
City of Longwood	2.13	2.33	2.62	2.68	2.89	2.41	2.43	2.44	2.47	2.48	-0.41	-17%	2.48
City of Oviedo	4.52	4.94	5.46	5.53	5.69	4.21	4.79	5.99	6.83	8.50	2.81	33%	8.50
City of Sanford	7.21	8.72	9.95	10.58	10.94	5.87	6.89	8.84	9.49	9.62	-1.32	-14%	9.62
City of Winter Springs	5.11	5.21	5.49	5.82	6.03	-	4.40	4.40	4.60	4.60	-1.43	-31%	4.60
Florida Water Services - Chuluota	0.56	0.75	0.91	1.08	1.22	-	-	-	-	-	-	-	1.22
Palm Valley MHP	0.35	0.38	0.44	0.43	0.44	-	-	-	-	-	-	-	0.44
Seminole County - Apple Valley	0.55	0.62	0.70	0.76	0.81	-	-	-	-	-	-	-	0.81
Seminole County - Druid Hills/Bretton Woods	0.11	0.11	0.11	0.11	0.11	-	-	-	-	-	-	-	0.11
Seminole County - Meredith Manor	0.31	0.33	0.33	0.34	0.34	-	-	-	-	-	-	-	0.34
Seminole County - Northeast [1]	2.64	3.00	3.44	3.53	3.60	3.43	3.55	3.60	3.93	4.29	0.69	16%	4.29
Seminole County - Northwest [1]	6.16	8.58	11.06	11.23	11.39	6.92	9.96	11.51	11.72	11.93	0.54	5%	11.93
Seminole County - Southeast	8.79	9.25	9.64	9.91	10.11	10.08	11.20	12.43	12.67	15.53	5.42	35%	15.53
Seminole County - Southwest [1]	1.29	1.41	1.52	1.58	1.62	1.35	1.40	1.46	1.46	1.46	-0.16	-11%	1.46
Utilities Inc - Jansen S/D	0.07	0.07	0.07	0.07	0.07	-	-	-	-	-	-	-	0.07
Utilities Inc - Oakland Shores	0.10	0.10	0.10	0.10	0.10	-	-	-	-	-	-	-	0.10
Utilities Inc - Ravenna Park	0.09	0.10	0.10	0.10	0.10	-	-	-	-	-	-	-	0.10
Utilities Inc - Sanlando Utilities	9.94	10.35	10.61	10.69	10.76	6.75	7.05	7.16	7.26	7.34	-3.42	-47%	7.34
Utilities Inc - Weathersfield	0.37	0.37	0.37	0.37	0.37	-	-	-	-	-	-	-	0.37
SUB-TOTAL	**68.02**	**75.94**	**84.28**	**87.02**	**89.09**	**54.20**	**69.73**	**76.82**	**80.10**	**86.13**	**0.60**	**1%**	**89.69**
Domestic Self Supply and Utilities <0.1 mgd	3.81	3.94	4.05	4.13	4.19	-	-	-	-	-	-	-	4.19
TOTAL	**71.83**	**79.88**	**88.33**	**91.15**	**93.28**	**54.20**	**69.73**	**76.82**	**80.10**	**86.13**	**0.60**	**1%**	**93.88**

Notes:

1. 2025 Cooperator projection was not provided and calculated as the average percent increase between 2015 and 2020.
2. If Cooperator projections were not provided,the Total 2025 Water Demand is equal to the SJRWMD projection.

Table 3: Potable Water Demand Summary

Owner	Permitted WTP Capacity	2025 Planned WTP Capacity [1]	CUP Expiration Date	CUP Allocation (mgd)					Current Flow [2]	Potable Water Demand Projections (mgd)				
				2005	2010	2015	2020	2025		2005	2010	2015	2020	2025
City of Altamonte Springs*	18.00	18.00	3/7/2026	7.30	7.80	8.40	8.70	8.90	5.37	7.91	8.63	9.20	9.62	10.06
City of Casselberry	14.23	14.23	8/8/2020	6.42	6.62	6.82	7.00	7.02	4.84	5.27	5.43	5.59	5.85	6.11
City of Lake Mary	12.96	17.28	5/11/2025	4.50	4.90	4.40	4.40	4.40	3.47	-	4.00	4.20	4.20	4.20
City of Longwood	7.09	7.10	9/6/2022	2.52	2.54	2.24	2.24	2.24	1.94	2.41	2.43	2.44	2.47	2.48
City of Oviedo	20.48	19.24	10/9/2006	4.12	4.27	4.27	4.27	4.27	3.88	4.2	4.8	6.0	6.8	8.5
City of Sanford	15.10	15.10	2/8/2026	8.51	9.58	9.58	9.58	9.58	7.04	5.87	6.89	8.84	9.49	9.62
City of Winter Springs	11.45	11.45	10/8/2006	5.19	5.38	5.38	5.38	5.38	4.02	-	4.40	4.40	4.60	4.60
Florida Water Services - Chuluota	1.80	1.80	4/12/2007	0.53	0.53	0.53	0.53	0.53	0.37	0.56	0.75	0.91	1.08	1.22
Palm Valley MHP	0.90	0.90	12/20/2006	0.24	0.24	0.24	0.24	0.24	0.15	0.35	0.38	0.44	0.43	0.44
Seminole County - Apple Valley	1.50	1.50	3/7/2026	0.52	0.64	0.74	0.74	0.74	0.50	0.55	0.62	0.70	0.76	0.81
Seminole County - Druid Hills	0.90	0.90	9/16/2012	0.13	0.13	0.13	0.13	0.13	0.10	0.11	0.11	0.11	0.11	0.11
Seminole County - Meredith Manor	0.83	0.83	5/8/2022	0.35	0.35	0.35	0.35	0.35	0.22	0.31	0.33	0.33	0.34	0.34
Seminole County - Northeast*	4.03	4.03	11/30/2003	3.02	3.02	3.02	3.02	3.02	1.81	3.43	3.55	3.60	3.93	4.29
Seminole County - Northwest*	8.15	8.15	3/11/2010	6.43	8.23	8.23	8.23	8.23	5.09	6.92	9.96	11.51	11.72	11.93
Seminole County - Southeast	15.64	15.64	11/30/2003	9.15	9.15	9.15	9.15	9.15	9.00	10.08	11.20	12.43	12.67	15.53
Seminole County - Southwest*	2.56	2.56	9/11/2021	1.48	1.48	1.48	1.48	1.48	1.16	1.35	1.40	1.46	1.46	1.46
Utilities Inc - Jansen S/D	0.31	0.31	11/15/2005	0.10	0.10	0.10	0.10	0.10	0.06	0.07	0.07	0.07	0.07	0.07
Utilities Inc - Oakland Shores	0.33	0.33	10/15/2020	0.10	0.10	0.10	0.10	0.10	0.08	0.10	0.10	0.10	0.10	0.10
Utilities Inc - Revenna Park	0.36	0.36	11/15/2020	0.12	0.12	0.12	0.12	0.12	0.08	0.09	0.10	0.10	0.10	0.10
Utilities Inc - Sanlando Utilities	16.70	16.70	11/11/2004	9.71	9.71	9.71	9.68	9.71	8.06	6.75	7.05	7.16	7.26	7.34
Utilities Inc - Weathersfield	0.86	0.86	11/22/2005	0.37	0.37	0.37	0.37	0.37	0.31	0.37	0.37	0.37	0.37	0.37
SUBTOTAL	154.19	157.28	-	70.81	75.26	75.36	75.81	76.06	57.54	56.71	72.56	79.95	83.46	89.69
Domestic Self Supply and Utilities <0.1 mgd	3.52	3.52	-	-	-	-	-	-	4.13	3.81	3.94	4.05	4.13	4.19
TOTAL	157.71	160.80	-	70.81	75.26	75.36	75.81	76.06	61.67	60.52	76.50	84.00	87.59	93.87

Notes:
1. If a build-out capacity was not provided, assume current permitted capacity is equal to build-out capacity
2. The Current Flow provided by Cooperators or FDEP.
* If 2025 year projection was not provided, SJRWMD 2025 projection was used.

Table 4: Wastewater and Reuse Summary

Owner or Operator	Facility Name	Permitted Capacity (mgd)	Average Flow (mgd)	2025 Planned WWTP Capacity [1]	Projected Reuse Demands, mgd					Projected Wastewater Flows, mgd				
					2005	2010	2015	2020	2025	2005	2010	2015	2020	2025
Utilities Inc.	Alafaya PUD	2.40	1.15	2.40	-	-	-	-	-	1.15	1.18	1.22	1.25	1.28
City of Altamonte Springs	Altamonte Springs	12.50	6.05	12.50	5.26	-	-	6.78	-	6.05	11.02	11.90	12.50	13.1
City of Cassellberry	Cassellberry	2.20	1.08	2.20	1.05	1.45	1.75	1.85	1.85	1.05	1.45	1.75	1.85	1.85
Florida Water	Chuluota	0.10	0.03	0.10	-	-	-	-	-	0.03	0.04	0.05	0.05	0.06
Utilities Inc.	Shadow Hills	0.47	0.42	0.47	-	-	-	-	-	0.42	0.47	0.52	0.57	0.62
City of Orlando	Iron Bridge Regional [2]	40.00	27.50	40.00	-	-	-	-	-	27.50	31.73	35.95	40.17	44.39
Palm Valley Association	Palm Valley MHP	0.13	0.09	0.13	-	-	-	-	-	0.09	0.11	0.13	0.14	0.16
City of Sanford	Sanford	7.30	7.55	7.30	8.38	10.45	11.33	11.75	12.19	8.38	10.45	11.33	11.75	12.19
City of Sanford	Sanford South (Proposed)	2.00	-	6.00	-	-	-	-	-	-	-	-	-	3.42
Seminole County	Greenwood Lakes	3.50	1.91	3.50	2.59	2.75	2.83	2.96	-	2.59	2.75	2.83	2.96	3.1
Seminole County	Northwest Regional	2.50	1.63	2.50	2.15	3.02	3.42	3.51	-	2.15	3.02	3.42	3.51	3.6
Utilities Inc.	Lincoln Heights	0.12	-	0.12	-	-	-	-	-	-	-	-	-	-
Utilities Inc.	Wekiva Hunt Club	2.90	2.34	2.90	-	-	-	-	-	-	-	-	-	-
Utilities Inc.	Woodlands/Des Pinar	0.50	0.31	0.50	-	-	-	-	-	-	-	-	-	-
City of Winter Springs	Winter Springs East/Tuscawilla	2.01	1.16	2.01	-	-	-	-	-	2.30	2.60	2.88	3.18	3.51
City of Winter Springs [3]	Winter Springs West	2.07	1.16	2.07	-	-	-	-	-	-	-	-	-	-
		80.70	**52.38**	**84.70**	**19.43**	**17.67**	**19.33**	**26.85**	**14.04**	**51.71**	**64.81**	**71.96**	**77.93**	**87.31**

Notes:

1. If a build-out capacity was not provided, assume current permitted capacity = build-out capacity
2. Iron Bridge Regional is located in Seminole County, owned by City of Orlando, and serves parts of Orange and Seminole County.
3. The City of Winter Springs wastewater projections for the Winter Springs East Facility are projections for the East and West facilities.

Table 5: Cooperator Potable Water Demand Per Capita Comparison

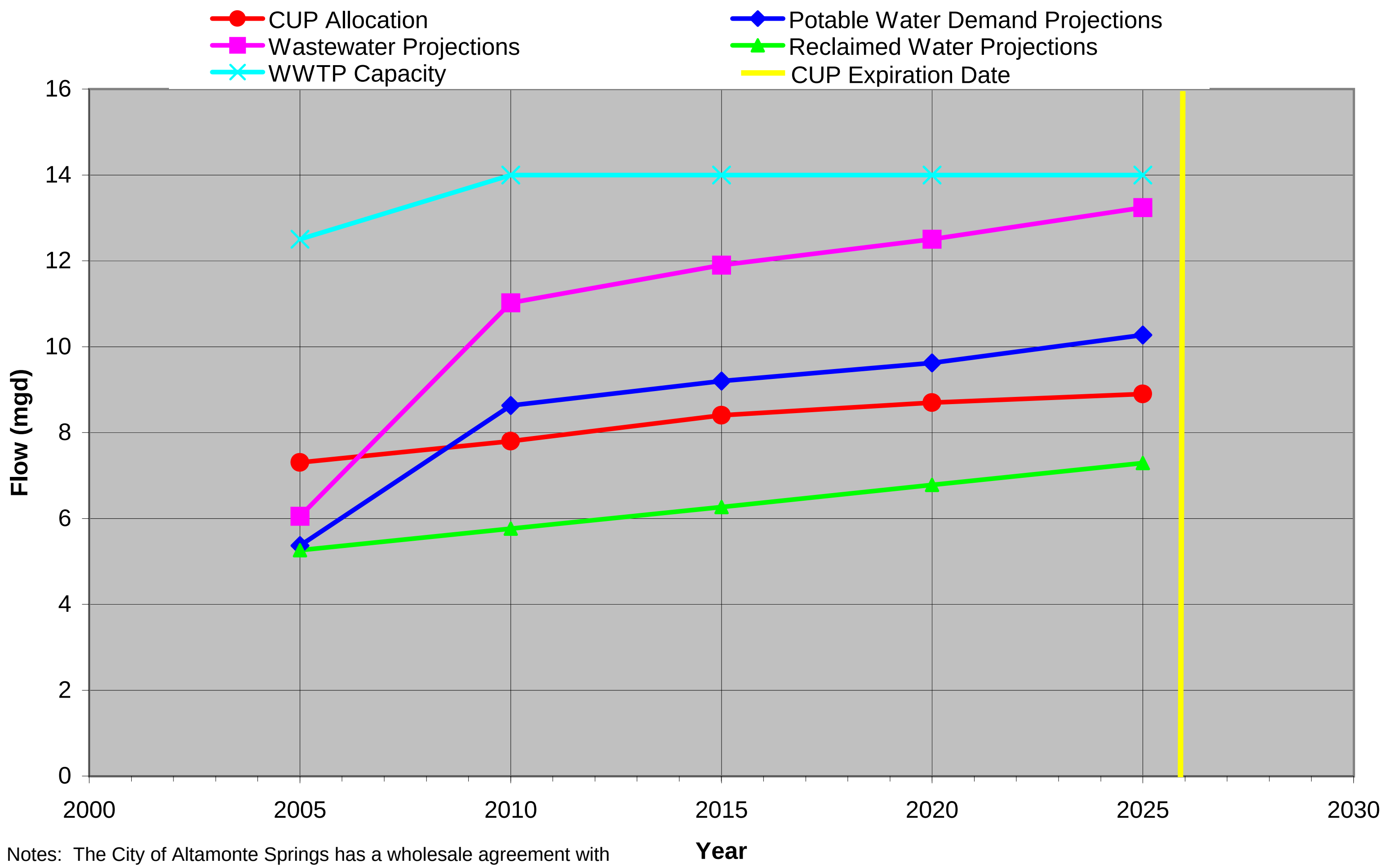
Utility	2005 Per Capita (gpd)	2020 or 2025 Per Capita (gpd)	Population Projections			Water Use Projections (mgd)			Reuse Water Projections (mgd)			Wastewater Flow Projections (mgd)			Increase over period of projection (mgd)	Wastewater Generation Potential at 100 gallons per day per capita (mgd)			Increase over period of projection (mgd)
			2005	2020	2025	2005	2020	2025	2005	2020	2025	2005	2020	2025		2005	2020	2025	
City of Altamonte Springs	142.33	142.43	55,576	67,540	-	7.91	9.62	-	5.26	6.78	-	6.05	12.50	-	6.45	5.00	6.08	-	1.08
City of Casselberry	98.07	99.35	53,739	59,120	61,500	5.27	5.85	6.11	1.05	1.85	1.85	1.05	1.85	1.85	0.80	4.84	5.32	5.54	0.70
City of Lake Mary	-	221.05	-	19,000	19,000	-	4.20	4.20	-	-	-	-	0.93	0.93	0.00	-	1.71	1.71	0.00
City of Longwood	169.99	169.72	14,177	14,512	14,612	2.41	2.47	2.48	-	-	-	-	-	-	-	1.28	1.31	1.32	0.04
City of Oviedo	159.98	159.96	26,316	42,675	53,138	4.21	6.83	8.50	-	-	-	0.42	1.15	1.39	0.97	2.37	3.84	4.78	2.41
City of Sanford	138.93	71.18	42,252	105,011	135,158	5.87	9.49	9.62	8.38	11.75	12.19	8.38	11.75	12.19	3.81	3.80	9.45	12.16	8.36
Seminole County - Southeast	212.99	214.16	47,327	59,162	-	10.08	12.67	15.53	-	-	-	4.61	5.84	-	1.23	4.26	5.32	-	1.07
Seminole County - Southwest	216.48	221.11	6,236	6,603	-	1.35	1.46	-	-	-	-	0.38	0.43	-	0.05	0.56	0.59	-	0.03
Seminole County - Northeast	171.33	173.27	20,020	22,681	-	3.43	3.93	-	2.59	2.96	-	2.59	2.96	-	0.37	1.80	2.04	-	0.24
Seminole County - Northwest	410.73	383.58	16,848	30,554	-	6.92	11.72	-	2.15	3.51	-	2.15	3.51	-	1.36	1.52	2.75	-	1.23
Utilities Inc - Sanlando Utilities	197.94	199.99	34,097	36,302	36,722	6.75	7.26	7.34	-	-	-	3.13	-	-	-	3.07	3.27	3.30	0.24
City of Winter Springs	-	104.81	-	42,668	43,889	-	4.60	4.60	-	3.18	3.51	-	3.18	3.51	0.33	-	3.84	3.95	0.11
TOTAL	171.20	160.39	316,588	505,828	364,019	54.20	80.10	58.38	19.43	30.03	17.55	28.76	44.10	19.87	15.37	28.49	45.52	32.76	15.51

Notes:
1. Information not provided was left blank.
2. If 2025 Projection was not provided, 2020 data was used.

FIGURES

Based in events since the issuance of Task E data changes were made that are reflected on Task F's basis for calculating future needs.

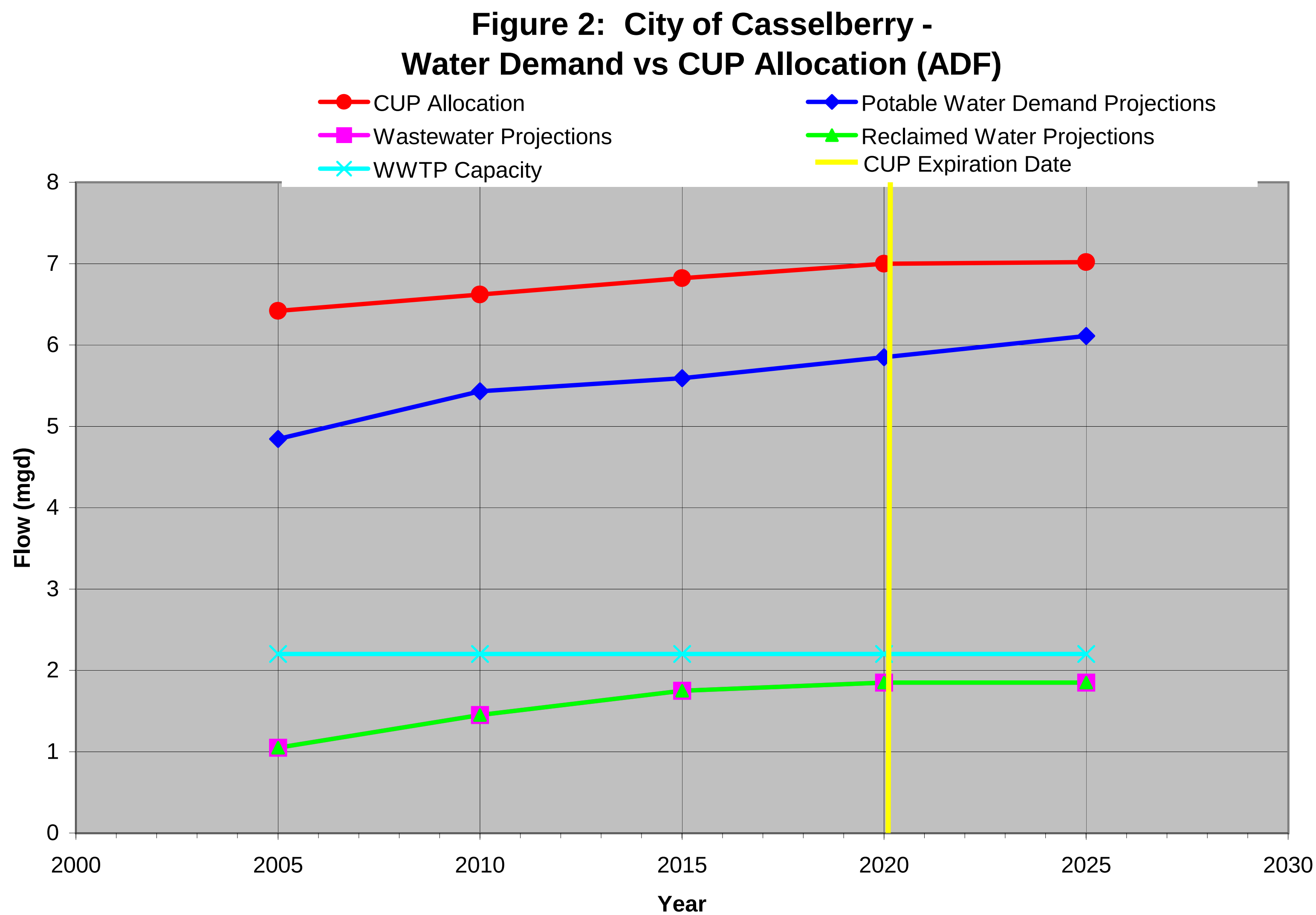
Figure 1: City of Altamonte Springs - Water Demand vs CUP Allocation (ADF)



Notes: The City of Altamonte Springs has a wholesale agreement with the Seminole County Southwest Wastewater Service Area.

SEMINOLE COUNTY WATER SUPPLY PLAN

ARCADIS



SEMINOLE COUNTY WATER SUPPLY PLAN

ARCADIS

Figure 3: City of Lake Mary - Water Demand vs CUP Allocation (ADF)

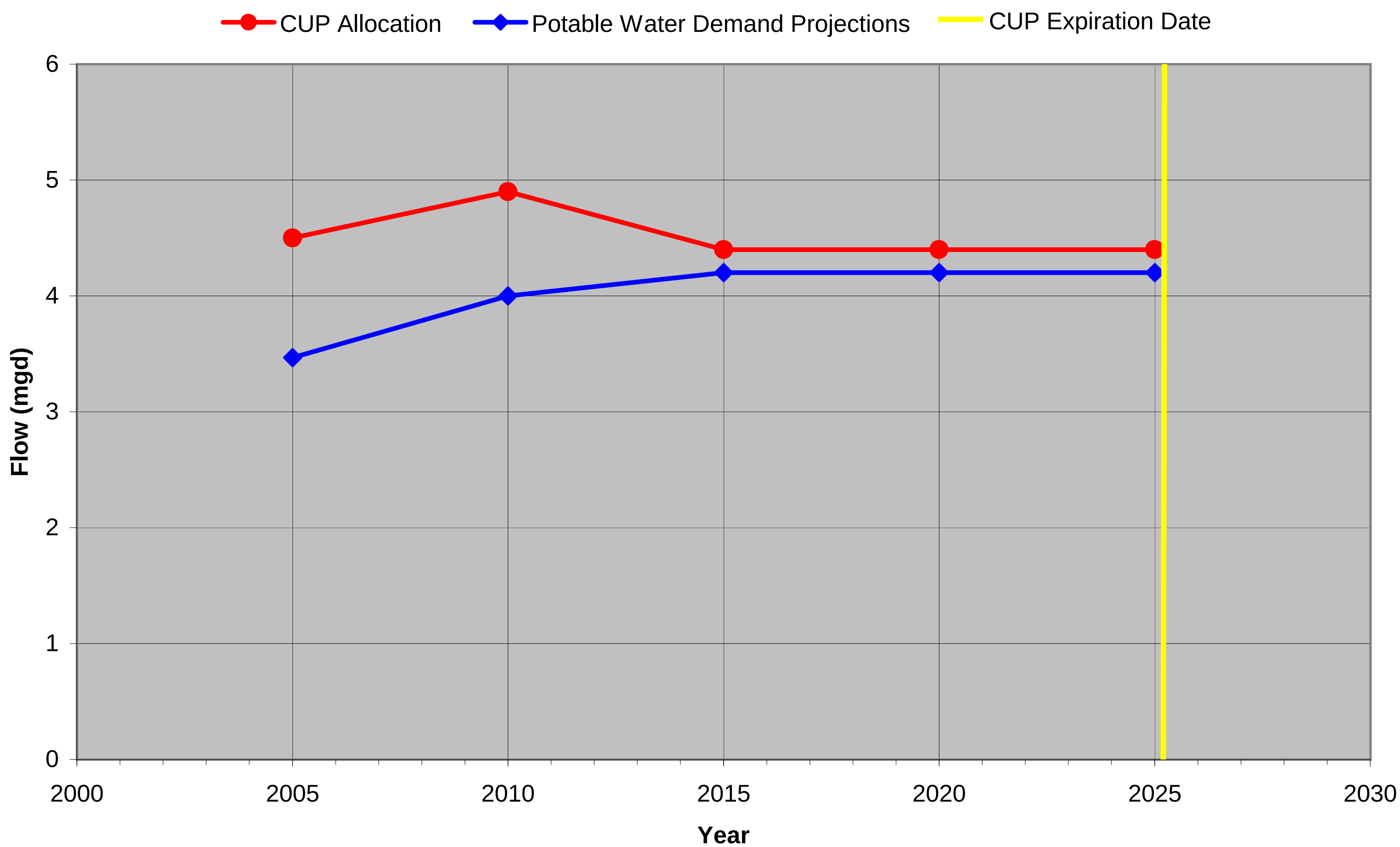


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Figure 4: City of Longwood - Water Demand vs CUP Allocation (ADF)

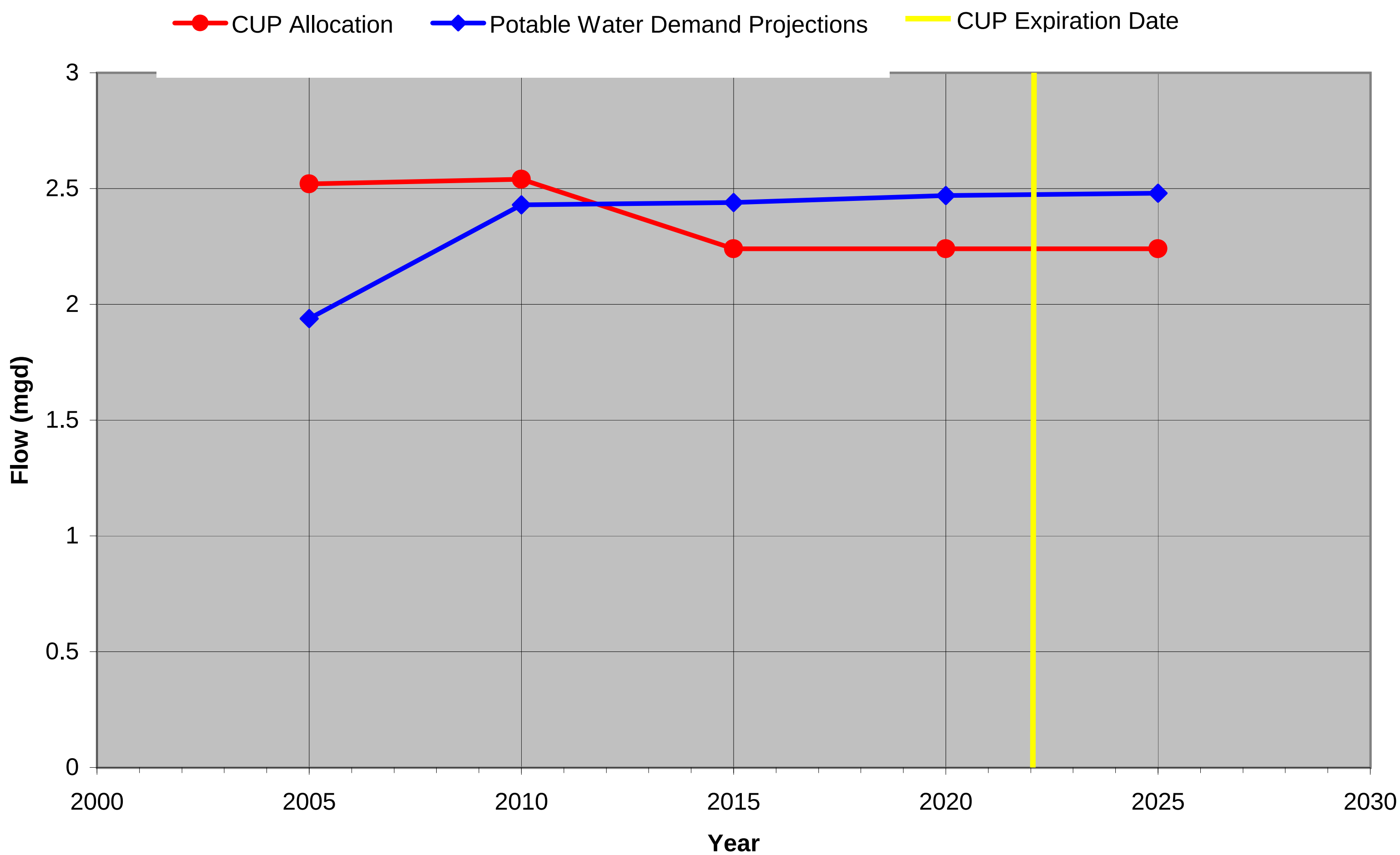


Figure 5: City of Oviedo - Water Demand vs CUP Allocation (ADF)

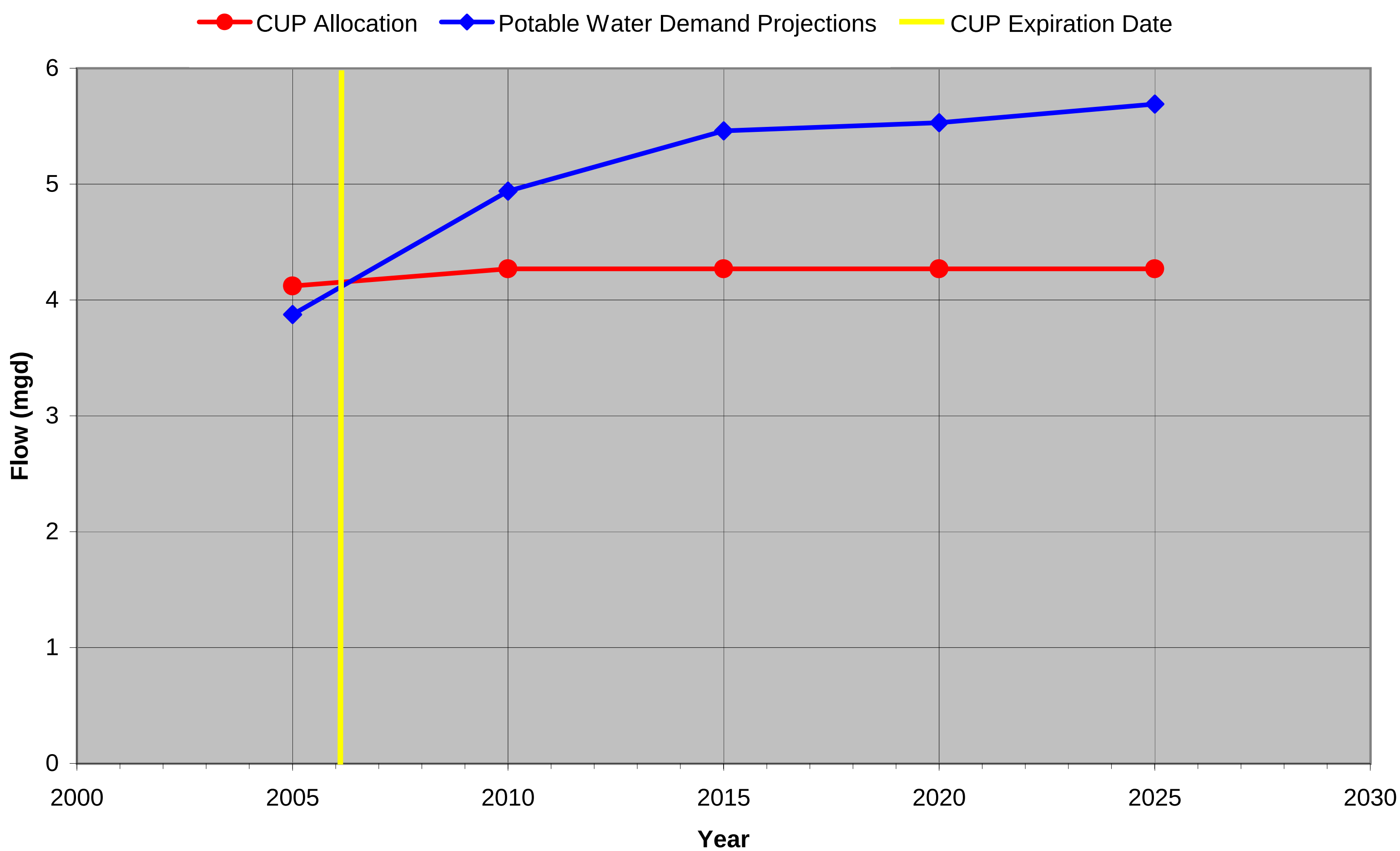
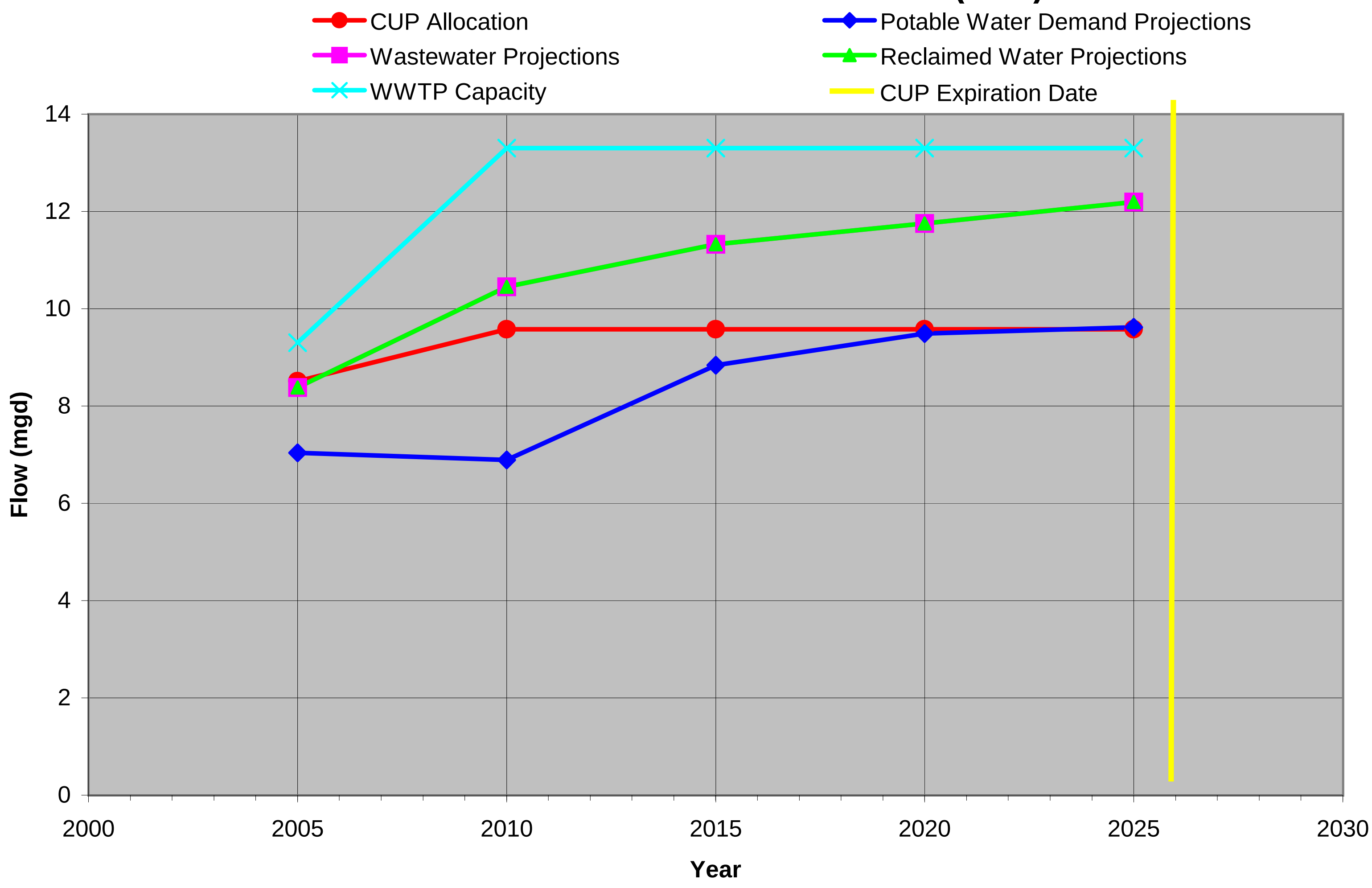


Figure 6: City of Sanford - Water Demand vs CUP Allocation (ADF)



ARCADIS

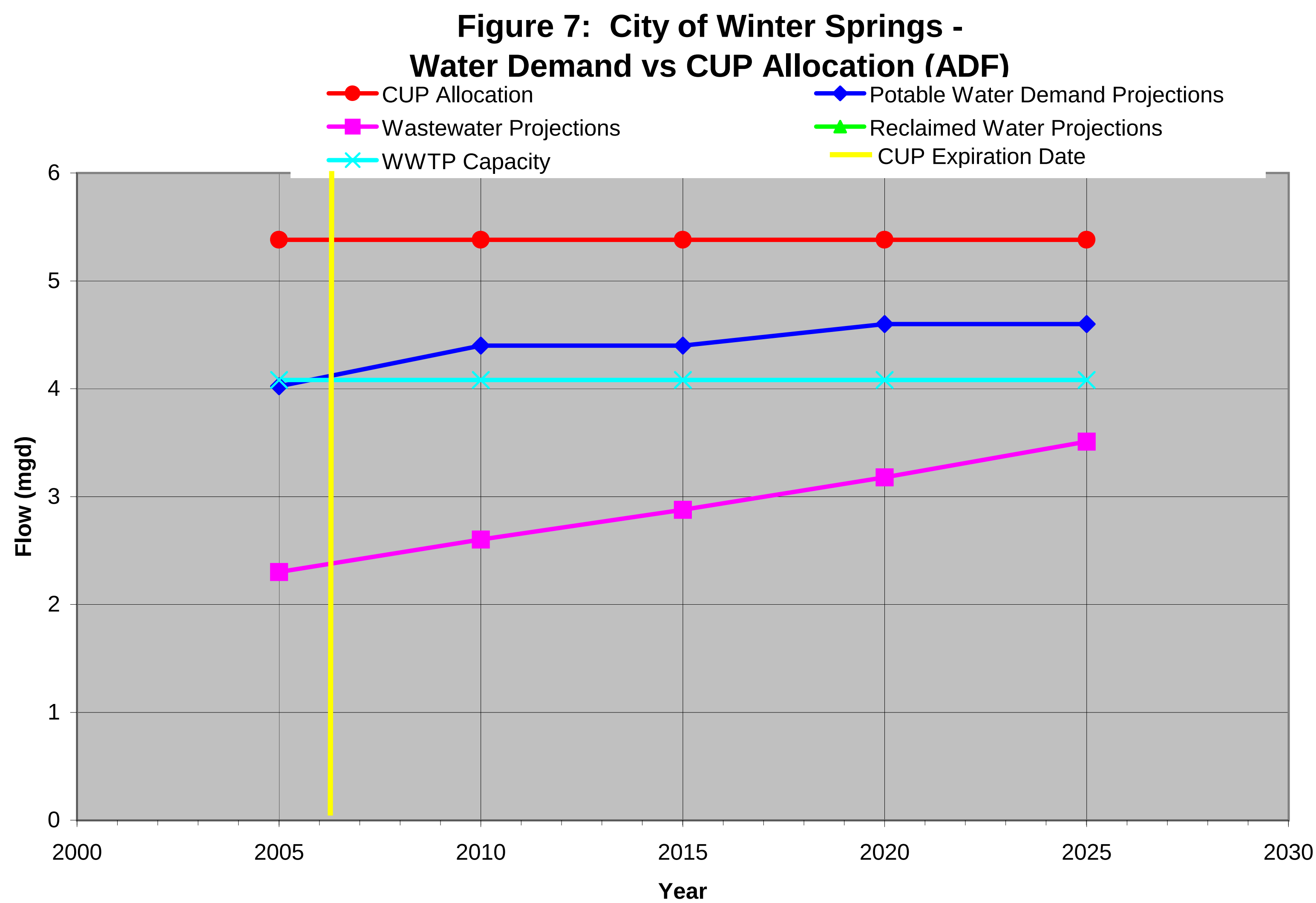
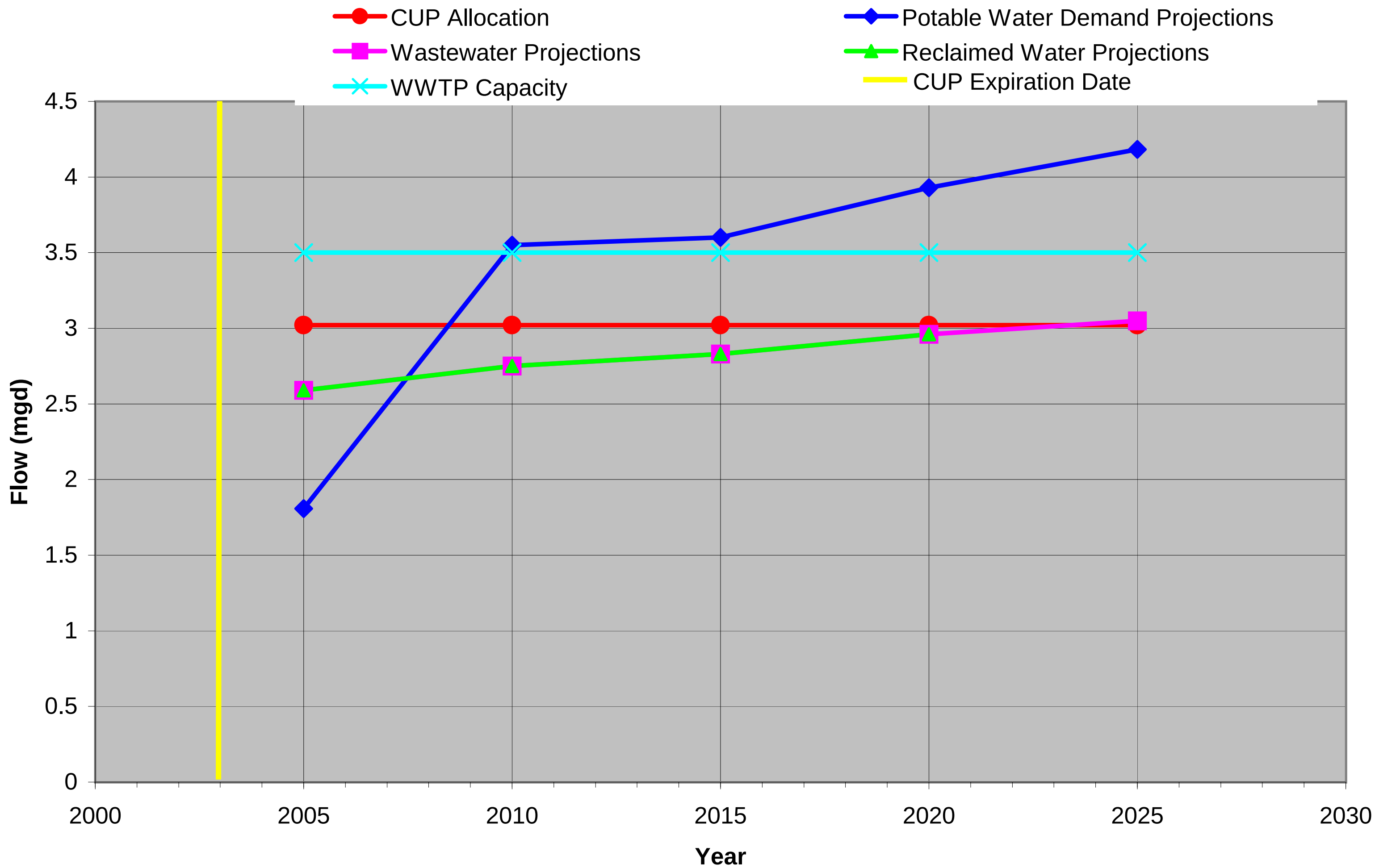


Figure 7: City of Winter Springs -
Water Demand vs CUP Allocation (ADF)
CUP Allocation
Potable Water Demand Projections
Wastewater Projections
Reclaimed Water Projections
WWTP Capacity
CUP Expiration Date
Flow (mgd)
0
1
2
3
4
5
6
2000
2005
2010
2015
2020
2025
2030
Year

Figure 8: Seminole County Northeast - Water Demand vs CUP Allocation (ADF)



Note: CUP renewal under review.

Figure 9: Seminole County Northwest - Water Demand vs CUP Allocation (ADF)

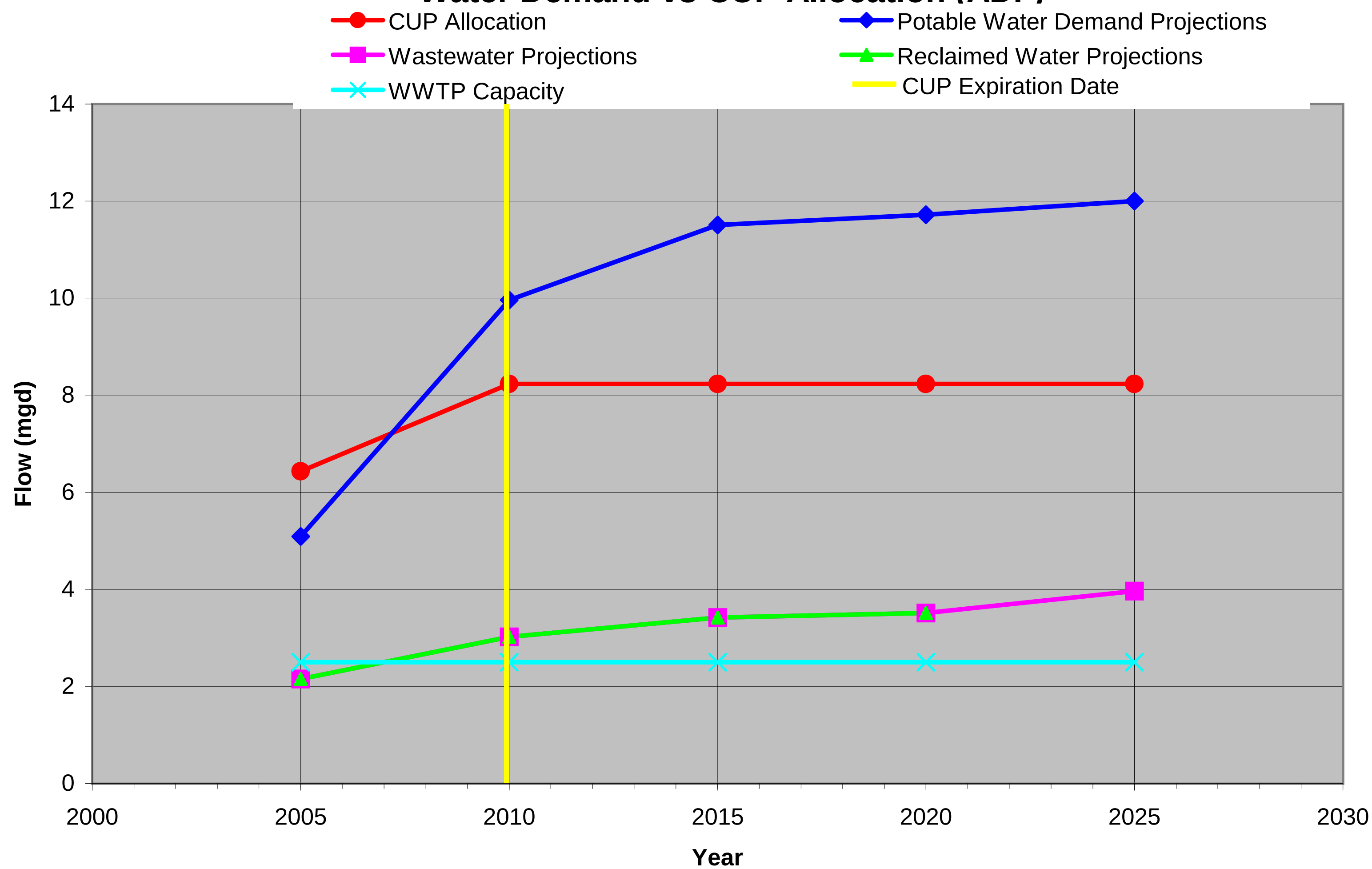
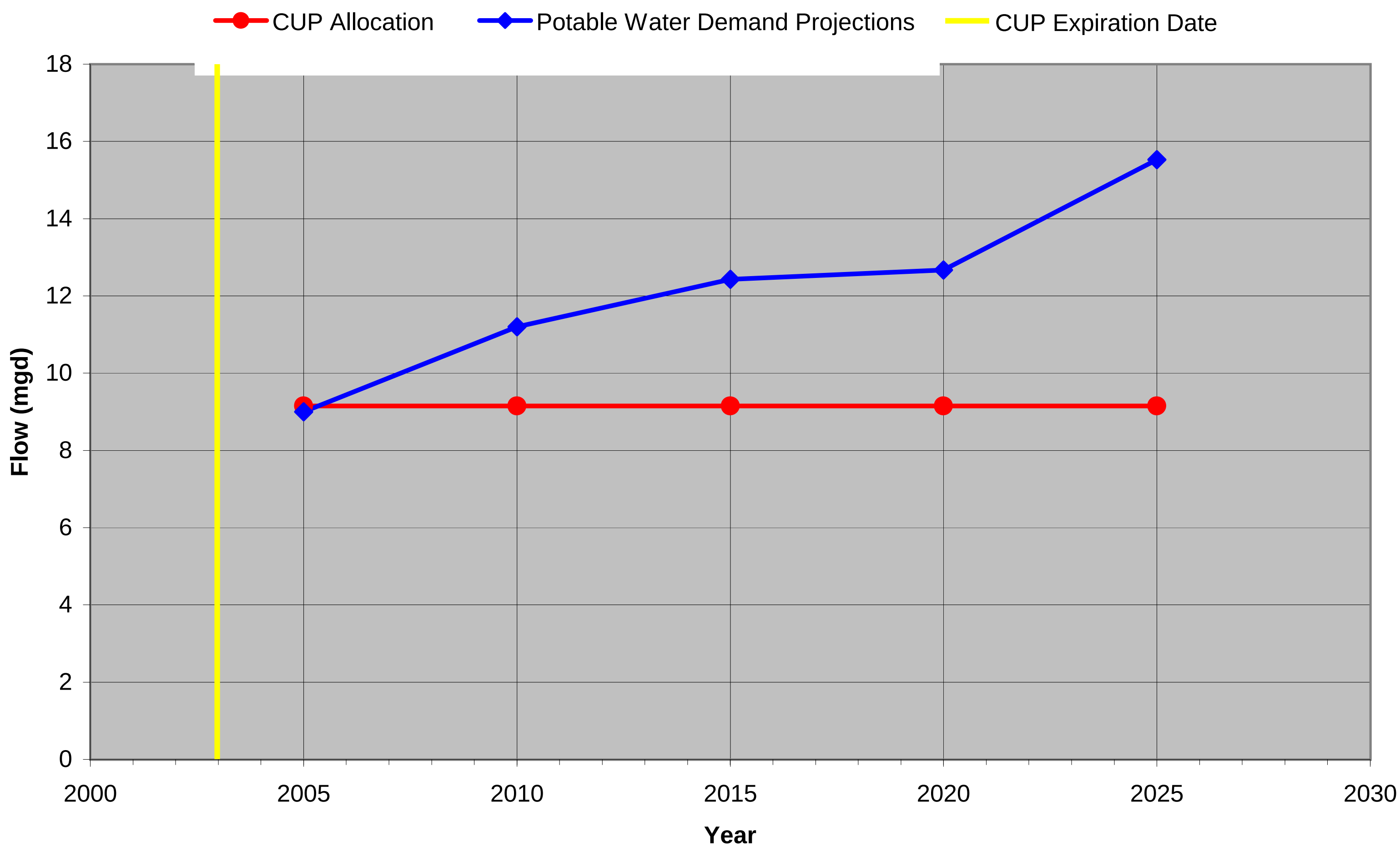


Figure 10: Seminole County Southeast - Water Demand vs CUP Allocation (ADF)



Note: CUP renewal under review.

Figure 11: Seminole County Southwest - Water Demand vs CUP Allocation (ADF)

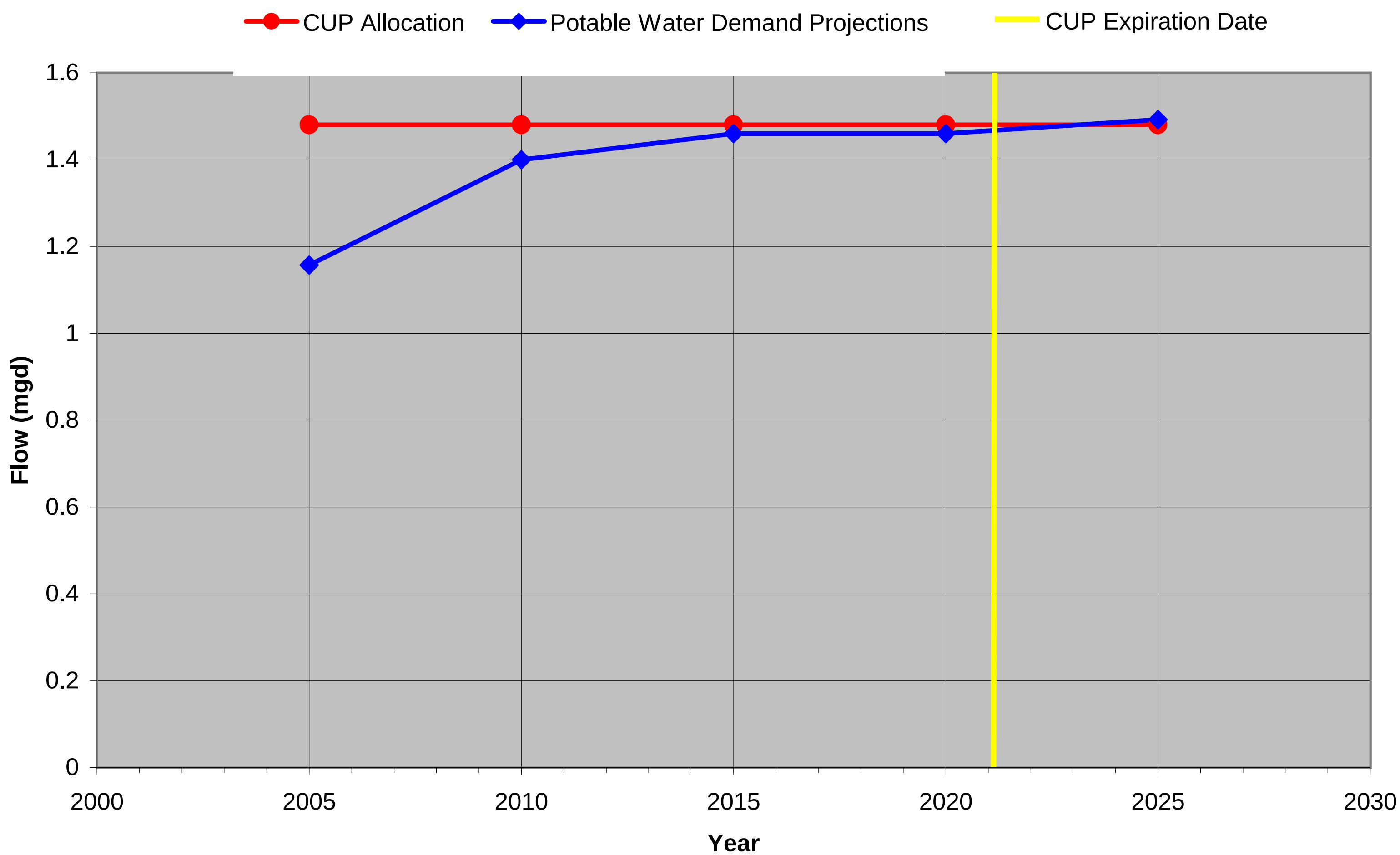
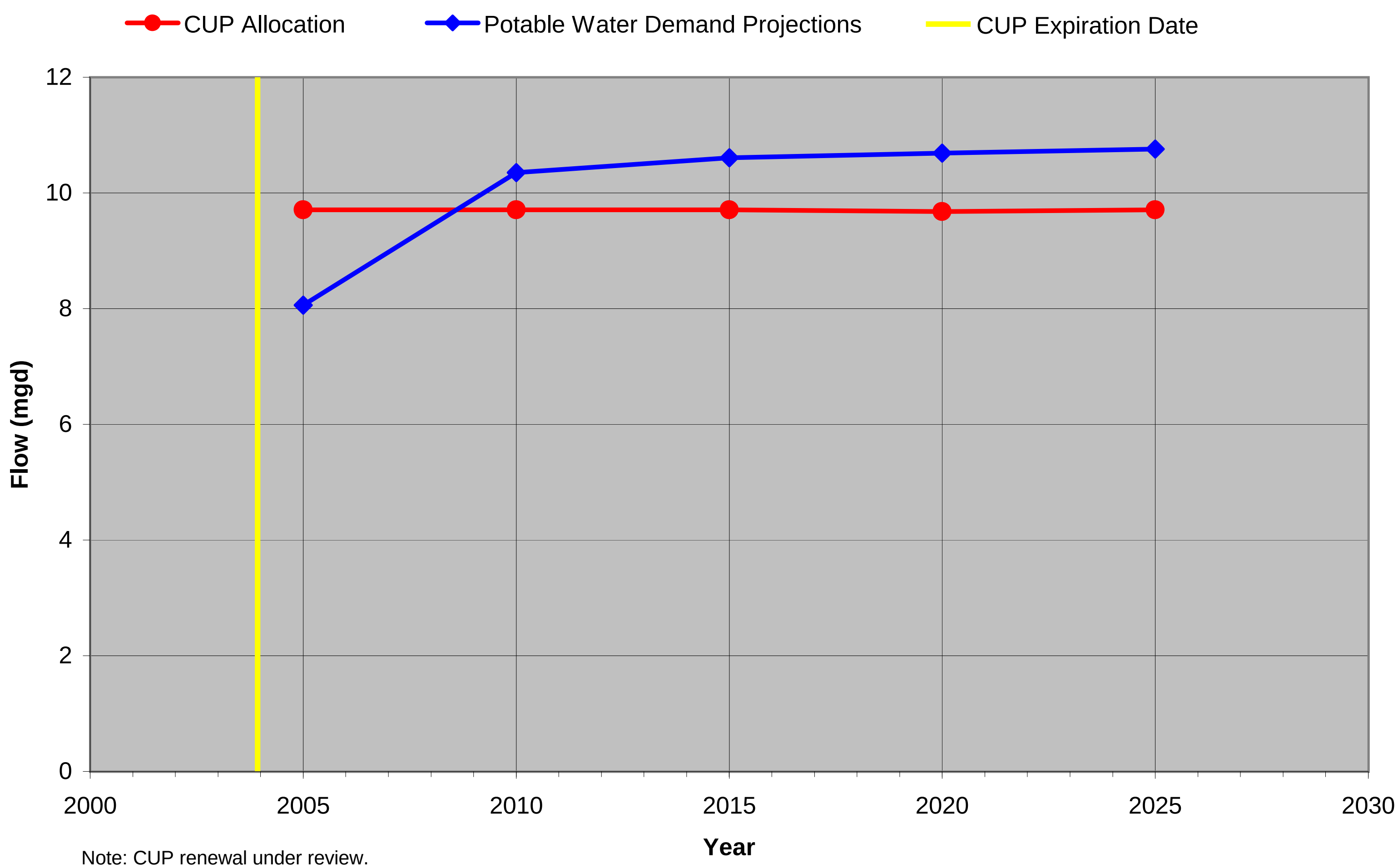
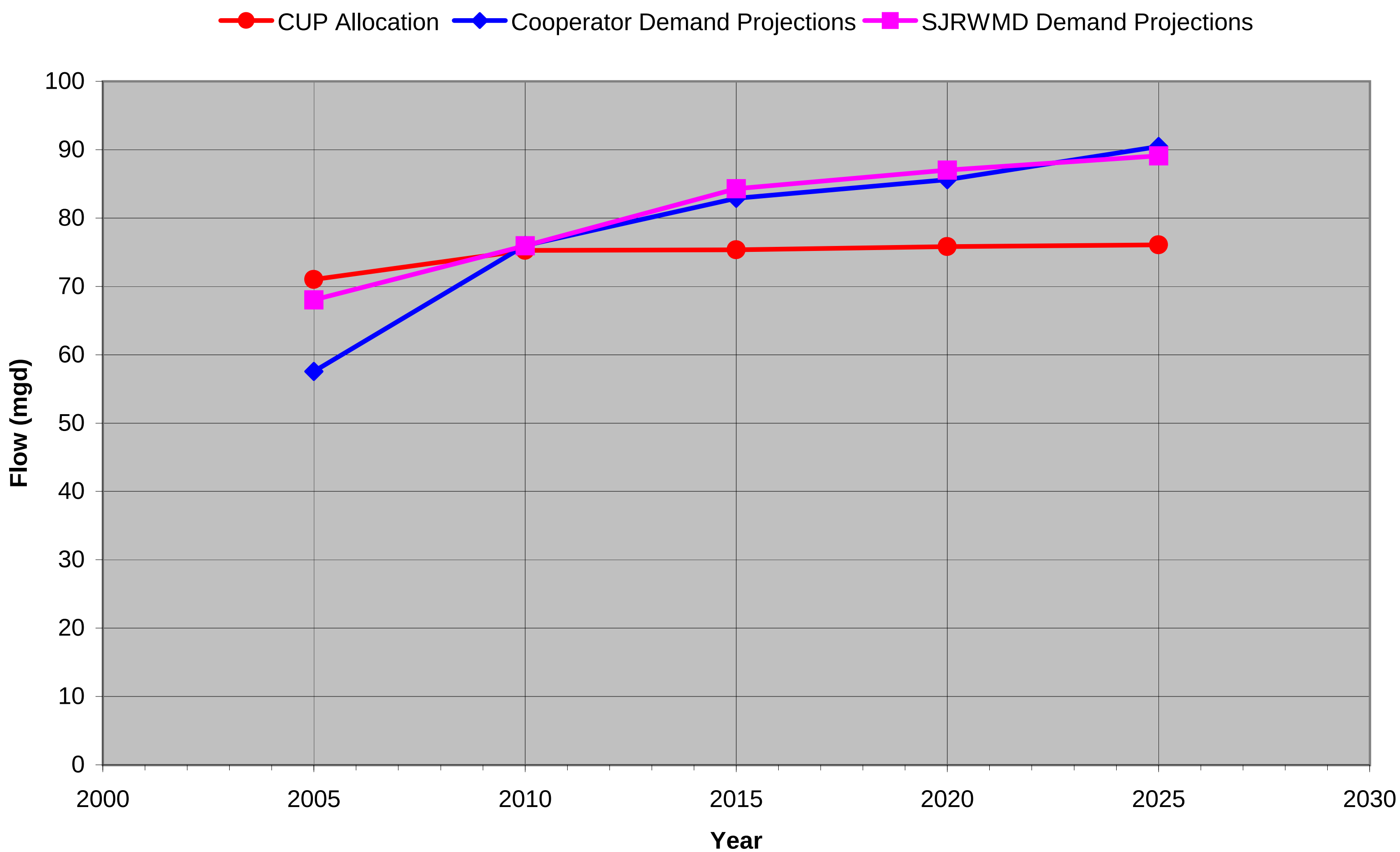


Figure 12: Sanlando Utilities -
Water Demand vs CUP Allocation (ADF)



Note: CUP renewal under review.

Figure 13: Total Water Demand vs CUP Allocation (ADF)



Note: Demands are for Utilities >0.1 mgd.

Appendix F

Task F1 - Analysis and Recommendations; Identification of Readily Identifiable Traditional and Alternative Water Supply Development Projects

CITY OF **OVIEDO** FLORIDA
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September 26, 2005

Barbara Vergara
St. Johns River Water Management District
P.O. Box 1429
Palatka, FL 32178-1429
bvergara@sjrwmd.com

Subject: Seminole County Cooperators – Proposed Alternative Water Supply Projects for Senate Bill 444 Funding

Dear Ms. Vergara:

The attached Technical Memorandum represents the project list submittal to the St. Johns River Water Management District for Senate Bill 444 funding. The project list was created through a solicitation to the Cooperators and other utilities in Seminole County. The projects were presented to and reviewed by the Cooperators at a workshop on September 8, 2005. The projects as presented are not ranked.

On behalf of the Cooperators Group of the Seminole County Water Supply Plan, this letter serves as an endorsement that these projects represent multi-community alternative water supply projects.

Please call if you have any questions.

Sincerely,

Gerald J. Seeber
City Manager

Copy: Terry Clark
Cooperators

ARCADIS
infrastructure, environment, buildings

Identification of Readily Identifiable Traditional and Alternative Water Supply Development Projects – Task F.1

For The

Seminole County Water Supply Plan

By

ARCADIS
4307 Vineland Road H-20
Orlando, Florida

Technical Memorandum

September 28, 2005

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INTRODUCTION

This document represents the project list submittal to the St. Johns River Water Management District (SJRWMD) on behalf of the Cooperators for Senate Bill 444 funding. The Cooperators consist of Seminole County and the municipalities of Altamonte Springs, Casselberry, Lake Mary, Longwood, Oviedo, Sanford and Winter Springs. These entities have formed a coalition, in cooperation with SJRWMD to prepare the Seminole County Water Supply Plan ("Plan").

The projects in this document are not ranked. The project information included in this Technical Memorandum reflects information provided by the specific entities that have proposed the projects and is not the result of an analysis by the Cooperators.

This document also represents those projects identified under "Task F1. Identification of Readily Identifiable Traditional and Alternative Water Supply Development Projects" developed for the Seminole County Water Supply Plan. These projects were identified through a polling of public and private utilities in Seminole County, presented, and discussed in a public workshop held on September 8, 2005 at the City of Altamonte Springs. ARCADIS has prepared this document on behalf of the Cooperators and is the consultant selected to prepare the "Plan" by the Cooperators.

The proposed projects are submitted to SJRWMD for inclusion in their District Water Supply Plan and consideration for the cost sharing for construction of alternative water supply options under Senate Bill 444. A summary of Senate Bill 444 follows this section.

SENATE BILL 444

Senate Bill 444 was passed during the 2005 legislative session, which provides cost-share funding for construction of alternative water supply projects. Up to $50 million dollars is available for the 2005-2006 fiscal year from state and District sources. Projects must be submitted to the District by September 30, 2005 in order to be identified in the District Water Supply Plan (DWSP). Projects must be identified in the DWSP to be eligible for the cost-sharing program. The District will reimburse up to 40% of the construction costs.

The SJRWMD Governing Board will determine those projects that will be selected for financial assistance based on the following criteria:

1. Whether the project provides substantial environmental benefits by preventing or limiting adverse water resource impacts.
2. Whether the project reduces competition for water supplies.
3. Whether the project brings about replacement of traditional sources in order to help implement a minimum flow or level or a reservation.

4. Whether the project will be implemented by a consumptive use permittee that has achieved the targets contained in a goal-based water conservation program approved pursuant to Florida Statute 373.227.

5. The quantity of water supplied by the project as compared to its cost.

6. Projects in which the construction and delivery to end users of reuse water are a major component.

7. Whether the project will be implemented by a multi-jurisdictional water supply entity or regional water supply authority.

8. Whether the project is part of a plan to implement two or more alternative water supply projects, all of which will be operated to produce water at a uniform rate for the participants in a multi-jurisdictional water supply entity or regional water supply authority.

9. The percentage of project costs to be funded by the water supplier or water user.

10. Whether the project proposal includes sufficient preliminary planning and engineering to demonstrate that the project can reasonably be implemented within the timeframes provided in the regional water supply plan.

11. Whether the project is a subsequent phase of an alternative water supply project that is underway.

12. Whether and in what percentage a local government or local government utility is transferring water supply system revenues to the local government general fund in excess of reimbursements for services received from the general fund, including direct and indirect costs and legitimate payments in lieu of taxes.

This document serves as the means for project identification and represents the projects submitted on behalf of the Cooperators. The sponsoring project entities (city, county etc.) will submit additional detailed information with regard to the projects directly to the District.

PROJECT IDENTIFICATION

The following projects are submitted by the Cooperators to the SJRWMD to be considered for the cost-sharing program under SB 444. The projects are listed alphabetically by the city of proposed the project and are not ranked in any specific order. Attachment A provides additional details in the form of Project Information Sheets.

1. Renew Apricot, Phase I and II

- Proposed By: City of Altamonte Springs
- Entities Served: City of Altamonte Springs, City of Apopka, and Orlando Utilities Commission (OUC)

- Project Purpose:

    - Description: The City of Altamonte Springs currently discharges excess reclaimed water from their Regional Reclamation Facility to the Little Wekiva River. The City is proposing to transmit up to 6 MGD (million gallons per day) of reclaimed water to Project ARROW in Apopka. Design of the transmission facilities will include the ability to convey up to 6 MGD with the additional 3 MGD coming from various sources. Phase I includes six miles of 16-inch transmission line with a capacity of 6 MGD. Phase II includes upgrades to the Altamonte RWRF to improve reclaim water quality as required by Project ARROW in Apopka.

    - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The proposed project will increase system capacity.

- Water Supply Source: Reclaimed Water

- Quantities:

    - Quantities of Water Proposed:
        - Long-term Average: 6.0 MGD

- Major Components:
    - Phase I: Six miles of 16-inch transmission line with 6 MGD capacity
    - Phase II: Upgrades to Altamonte RWRF to improve reclaimed water quality

- Estimated Cost:
    - Total Cost: $13.5 Million (Phase I: $9.5 Million, Phase II: $4.0 Million)

- Proposed Schedule:
    - Overall Start Date: 2005
    - Finish (start up)Date: 2007

- Current Project Status: Planning Phase

2. ***Alternative Potable Water Supply – Brackish Water Source***

- Proposed By: City of Oviedo

- Entities Served: City of Oviedo and Seminole County

- Project Purpose:
    - Description: The purpose of this project is to develop brackish water wells for new potable water supply. This also includes raw water piping, the addition of a

membrane treatment system to the West Mitchell Hammock Water Treatment Plant. The concentrate water will be sent to the AM Jones WTP to mix with the reclaimed water system to augment that supply. This project will use 3.7 MGD from brackish water to produce an additional 2.8 MGD of potable water.

- Water Supply Source: Brackish Water
- Quantities:
  - Quantities of Water Proposed:
    - Long-term Average: 2.8 MGD
- Components:
  - Source Developments: Brackish water wells
  - Pipelines: Raw water and concentrate piping
  - Treatment Systems: Addition of a membrane treatment system to the West Mitchell Hammock WTP
- Estimated Cost:
  - Total Cost: $11.8 Million
- Proposed Schedule:
  - Overall Start Date: 2006
  - Finish (start up)Date: 2009
- Current Project Status: Currently working on the CUP application and Master Plan water development. The membrane addition to the WTP will be completed in November 2005

3. *Yankee Lake Regional Surface Water Facility*

- Proposed By: Seminole County
- Entities Served: Seminole County with future regional cooperators
- Project Purpose:
  - Description: This project proposes construction of a 10 MGD surface water treatment plant to treat water to reclaimed water standards using the St. Johns River as a water source. The treatment will include chemical coagulation, high-rate clarification, and high-level chlorine disinfection.
- Water Supply Source: Surface water, St. Johns River
- Quantities:
  - Quantities of Water Proposed:
    - Long-term Average: 10 MGD

- Components:
    - Source Developments: River intake Infrastructure
    - Treatment Systems: Surface water treatment plant including chemical coagulation, high-rate clarification and disinfection.

- Estimated Cost:
    - Total Cost: $30 Million

- Proposed Schedule:
    - Overall Start Date: 2005
    - Finish (start up)Date: 2007

- Current Project Status: Planning Phase

4. Reclaimed Water Augmentation from Lake Jesup

- Proposed By: City of Winter Springs

- Entities Served: City of Winter Springs and surrounding entities.

- Project Purpose:

    - Description: Treatment, storage, and pumping of surface waters of Lake Jesup for reclaimed water augmentation and system expansion to reduce potable water demands. The City is also considering augmentation of an adjacent uncapped spring of approximately 0.7 MGD.
    - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: 2.25 MGD ADF of groundwater will become available for potable uses by transferring the irrigation demand from the water system to the reclaimed system.

- Water Supply Source: Surface water, Lake Jesup

- Quantities:

    - Quantities of Water Proposed:
        - Long-term Average: 2.25 MGD
        - Seasonal: 2.25 MGD

    - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: The City anticipates the withdrawal impact will be negligible. Further evaluation will be conducted during the CUP process.

- Major Components: Treatment plant, storage and pumping facilities

- Estimated Cost:
  - Total Cost: $7.0 Million, Phases 1 &2
  - Construction: $6.7 Million
  - Capital Cost: $0.150 Million (Property)
  - Annual O&M_: $0.150 Million

- Proposed Schedule:
  - Overall Start Date: 2005
  - Finish (start up)Date: 2010

- Current Project Status:
  - Planning: 2005 (underway)
  - Design: 2006
  - Permitting: CUP to be submitted 10/1/05
  - Construction: 2007-2010

5. *Sanford North SRF Augmentation / Reclaimed Water System Improvements*

- Proposed By: Tri-Party (Sanford, Lake Mary and Seminole County)

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

  - Description: The project includes the addition of the following improvements: augmentation, chlorine contact chamber and associated piping and fittings; augmentation transfer pump station; Actiflo systems and associated piping and fittings; sodium hypochlorite system modifications and augmentation system sludge management system components.

  - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project improves overall system reliability and quality to deliver 7.3 MGD of surface water to meet regional irrigation demands providing for recharge and reduction in groundwater withdrawals for irrigation.

- Water Supply Source: St. Johns River

- Quantities:

  - Quantities of Water Proposed:

- Long-term Average: 7.3 MGD
- Seasonal: 7.3 MGD

  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Consumptive Use Permit Issued by District

- Components:
  - Pumping Stations: Transfer pump station
  - Treatment Systems: Augmentation chlorine contact chamber, Actiflo systems, sodium hypochlorite system modifications and augmentation system sludge management system components

- Estimated Cost:
  - Total Cost: $6.1 Million
  - Annual O&M: $280,000

- Proposed Schedule:
  - Overall Start Date: 2005
  - Finish (start up)Date: 2010

- Current Project Status:
  - Planning: Complete
  - Design: Underway

6. Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

  - Description: Conveyance and storage of reclaimed water in an existing 240 MG pond in the Mill Creek drainage basin and installation of a pumping station, screening system and disinfection facilities to recover the stored water and deliver it to the existing reclaimed water distribution system .

  - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project provides the ability to deliver an additional 1.8 MGD of reclaimed/surface water for recharge and irrigation, improves system reliability, and reduces wet weather surface water discharges to the St. Johns River.

- Water Supply Source: Mill Creek drainage basin

- Quantities:

    - Quantities of Water Proposed:
        - Long-term Average: 1.8 MGD
        - Seasonal: 1.8 MGD

    - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Supply is available from reclaimed system and surface water augmentation system.

- Major Components:
    - Pumping Stations: Transfer pump station
    - Storage Units: 2.4 MG (million gallon) Pond
    - Treatment Systems: Screening system and disinfection facilities

- Estimated Cost:
    - Total Cost: $2.0 Million
    - Annual O&M: $48,000

- Proposed Schedule:
    - Overall Start Date: 2005
    - Finish (start up)Date: 2006

- Current Project Status:
    - Planning: Complete
    - Design: Underway

7. ***Timacuan Golf Course Reclaimed Water Storage Pond***

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

    - Description: Modification of an existing storm water pond to construct a new 2.3 MG reclaimed water storage pond.

    - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project provides 30 MGY of recharge, increases hydraulic capacity to deliver reclaimed/surface water by 2 MGD and provides 2 MG of storage.

- Water Supply Source: Reclaimed/Surface Water
- Quantities:
  - Quantities of Water Proposed:
    - Long-term Average: 2.3 MG pond
  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Supply available from reclaimed/surface water.
- Major Components:
  - Storage Pond
- Estimated Cost:
  - Total Cost: $422,062
  - Annual O&M: $0
- Proposed Schedule:
  - Overall Start Date: 2005
  - Finish (start up)Date: 2006
- Current Project Status:
  - Planning: Complete
  - Design: 2005
  - Permitting: Complete
  - Construction: 2005/2006

8. Greenwood Lakes Reclaimed Water System Improvements

- Proposed By: Tri-Party
- Entities Served: Sanford, Lake Mary and Seminole County
- Project Purpose:
  - Description: The project includes a new 1.75 MG reclaimed water ground storage tank and associated piping and fittings at Greenwood Lakes storage and re-pump facility

- Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project provides recharge of 653 million gallons/year of reclaimed/surface water.

- Water Supply Source: Stormwater

- Quantities:

  - Quantities of Water Proposed:
    - Long-term Average: 1.79 MGD

  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed/surface water.

- Major Components:
  - Pumping Stations: Re-pump facility
  - Storage Units: 1.75 MG ground storage tank

- Estimated Cost:
  - Total Cost: $1.7 Million

- Proposed Schedule:
  - Overall Start Date: 2005

- Current Project Status:
  - Planning: Complete
  - Design: 2005
  - Construction: 2006

9. *Modification to Recharge Basins*

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

  - Description: The project includes necessary appurtenances to allow for discharge of reclaimed / augmentation water into recharge basins.

  - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project provides for regional recharge of 2.3 MGD of reclaimed/surface water.

- Water Supply Source: Reclaimed/Surface Water
- Quantities:
  - o Quantities of Water Proposed:
    - Long-term Average: 2.3 MGD
  - o Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed /Surface Water.
- Major Components:
  - o Storage Units: Modification of storage pond
- Estimated Cost:
  - o Total Cost: $1.2 Million
  - o Annual O&M_: $70,000
- Proposed Schedule:
  - o Overall Start Date: 2005
  - o Finish (start up)Date: 2007
- Current Project Status: Planning Phase

10. New East Lake Mary Blvd Reclaimed Water Main

- Proposed By: Tri-Party
- Entities Served: Sanford, Lake Mary and Seminole County
- Project Purpose:
  - o Description: The project includes new reclaimed water main along East Lake Mary Blvd from Sanford South WRC to SR 46
  - o Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project will increase system capacity
- Quantities:
  - o Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed/Surface Water.
- Major Components:
  - o Pipelines: Reclaimed water main, Lake Mary Blvd

- Estimated Cost:
  - Total Cost: $1.2 Million

- Proposed Schedule:
  - Overall Start Date: 2005
  - Finish (start up)Date: 2005

- Current Project Status:
  - Planning: Complete
  - Design: Complete
  - Permitting: Complete
  - Construction: 50% Complete

11. New Reclaimed Water Main from Sanford South WRC to Victoria Street

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

  - Description: The project includes a new reclaimed water main extending west From Sanford South WRC around Sanford International Airport and tying into the existing main at the corner of Victoria St. and Willow Ave.

  - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project increases system capacity.

- Quantities:

  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed/Surface Water

- Major Components:
  - Pipelines: Reclaimed Water Main

- Estimated Cost:
  - Total Cost: $2.4 Million
  - Annual O&M: $5,000

- Proposed Schedule:
  - Overall Start Date: 2006

  - Finish (start up)Date: 2007

- Current Project Status:
  - Planning: Complete
  - Design: 2006
  - Construction: 2006

12. *New Reclaimed Water Main from US 17-92 to SR 46*

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

  - Description: New reclaimed water main along Riverview Ave from the existing 20" reclaimed water main at U.S. 17-92 to the existing 16" reclaimed water main on SR 46

  - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project increases system capacity.

- Quantities:

  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed/Surface Water.

- Major Components:
  - Pipelines: Reclaimed water main, Riverview Ave

- Estimated Cost:
  - Total Cost: $917,707

- Proposed Schedule:
  - Overall Start Date: 2006
  - Finish (start up)Date: 2007

- Current Project Status:
  - Planning: Complete
  - Design: 2006
  - Construction: 2006

13. Timacuan Reclaimed Water Main Upgrade

- Proposed By: Tri-Party
- Entities Served: Sanford, Lake Mary and Seminole County
- Project Purpose:
  - Description: The project includes a reclaimed water main along Timacuan Blvd from Rinehart Rd to Mohegan Blvd upgrade from 8" to 16".
  - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project increases system capacity.
- Quantities:
  - Quantities of Water Proposed:
    - Long-term Average: 2.9 MGD
  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed Surface Water.
- Major Components:
  - Pipelines: Reclaimed water main, Timacuan Blvd
- Estimated Cost:
  - Total Cost: $978,791 Million
- Proposed Schedule:
  - Overall Start Date: 2006
  - Finish (start up)Date: 2007
- Current Project Status:
  - Planning: Complete
  - Design: FY 2006
  - Construction: FY 2006

14. Markham Woods Road Reclaimed Water Transmission Main

- Proposed By: Tri-Party
- Entities Served: Sanford, Lake Mary and Seminole County

ARCADIS

- Project Purpose:

    - Description: The project includes construction of approximately 40,000 feet of reclaimed water transmission main to serve reuse customers in a high irrigation area along Markham Woods Road as recommended in Tri-Party Optimization Plan

    - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project increases system capacity.

- Quantities:

    - Quantities of Water Proposed:
        - Long-term Average: 3 MGD

    - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed water.

- Major Components:
    - Pipelines: 40,000 feet reclaimed water main

- Estimated Cost:
    - Total Cost: $4.9 Million

- Proposed Schedule:
    - Overall Start Date: 2005
    - Finish (start up)Date: 2006

- Current Project Status: Out for bids, construction in 05/06
    - Planning: Complete
    - Design: Complete
    - Construction: Imminent-2006 completion

15. Yankee Lake Road Reclaimed Water Transmission Main

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

    - Description: Design and construct a reclaimed water transmission main on Yankee Lake Rd from the Yankee Lake Water Reclamation Facility and future Yankee

Lake Regional Surface Water facility to SR 46 as recommended in Tri-Party Optimization Plan.

- Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project increases system capacity, reduces per capita consumption of potable water in high use areas, provides reuse water that directly recharges into the Water Use Caution Area, and provides displacement of current and future potable water demand.

- Quantities:
  - Quantities of Water Proposed:
    - Long-term Average: 5.0 MGD
    - Seasonal: 5.0 MGD
  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed water.

- Major Components:
  - Pipelines: Reclaimed Water Main

- Estimated Cost:
  - Total Cost: $1.6 Million

- Proposed Schedule:
  - Overall Start Date: 2005
  - Finish (start up)Date: 2006

- Current Project Status: Conceptual and preliminary design complete
  - Planning: 2005
  - Design: 2005
  - Construction: 2006

16. Heathrow Boulevard Reclaimed Water Transmission Main

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

- Description: Design and construct approximately 18,000feet of reclaimed water transmission main on CR 46A, Heathrow Blvd and Bridgewater Drive as recommended in the Tri-Party Optimization Plan.

- Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: Allows capability of users to move water between multi-jurisdictional Tri-party users. Maximizes effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption of potable water in high use neighborhoods. Transmits a large volume of reclaimed water that directly recharges into the Water Use Caution Area.

- Quantities:
  - Quantities of Water Proposed:
    - Long-term Average: 2.5 MGD
    - Seasonal: 2.5 MGD
  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed water.

- Major Components:
  - Pipelines: 18,000 feet reclaimed water main

- Estimated Cost:
  - Total Cost: $2.1 Million

- Proposed Schedule:
  - Overall Start Date: 2005
  - Finish (start up)Date: 2007

- Current Project Status:
  - Planning: 2005
  - Design: 2006
  - Construction: 2007

17. *Orange Boulevard Reclaimed Water Transmission Main*

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

- Description: Design and construct approximately 7,000 feet of reclaimed water transmission main on Orange Blvd from Markham Road to SR 46. Reclaimed main to increase capacity and interconnectivity of Tri-Party reclaimed water system.

- Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: Maximizes effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption potable water in high use neighborhoods.

- Quantities:
  - Quantities of Water Proposed:
    - Long-term Average: 2.5 MGD
    - Seasonal: 2.5 MGD
  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed water.

- Major Components:
  - Pipelines: 7,000 feet reclaimed water main

- Estimated Cost:
  - Total Cost: $509,262

- Proposed Schedule:
  - Overall Start Date: 2006

- Current Project Status:
  - Planning: Complete
  - Design: Currently underway
  - Construction: 2006

18. Yankee Lake Reclaimed Water Storage and Re-pump Facility

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

- Description: Design and construct a reclaimed water storage and re-pump facility at the Yankee Lake Water Reclamation Facility to provide more reliable reclaimed water capacity.

- Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project maximizes effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption potable water in high use neighborhoods.

- Quantities:
  - Quantities of Water Proposed:
    - Long-term Average: 8 MGD
  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed water.

- Major Components:
  - Storage facility
  - Re-pump facility

- Estimated Cost:
  - Total Cost: $2.4 Million

- Proposed Schedule:
  - Overall Start Date: 2005
  - Finish (start up)Date: 2007

- Current Project Status:
  - Planning: Currently underway
  - Design: 2007
  - Construction: 2007

19. *Greenwood Lakes Rapid Infiltration Basins Rehabilitation*

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:
  - Description: Design and construct rehabilitation of the Greenwood Lakes Rapid Infiltration Basin site. Optimize aquifer recharge capacity of reclaimed water for

existing basins. Assist with City of Sanford effluent disposal capacity displacement due to de-mucking of Lake Jesup. Rehabilitation will increase capacity of WWTF back to original design flows.

- Quantities:
    - Quantities of Water Proposed:
        - Long-term Average: 1 MGD
- Major Components:
    - Rapid infiltration basin
- Estimated Cost:
    - Total Cost: $500,000
- Proposed Schedule:
    - Overall Start Date: 2005
    - Finish (start up)Date: 2008
- Current Project Status: Conceptual Phase

20. Residential Reclaimed Water Retrofit – Phase I

- Proposed By: Tri-Party
- Entities Served: Sanford, Lake Mary and Seminole County
- Project Purpose:
    - Description: Construct a residential reclaimed water retrofit in Heathrow Woods, Bristol Park, Chestnut Hill, East Camden and Magnolia Plantation to directly offset approximately 1.09 MGD of potable water currently used for irrigation.
    - Description of how the project will contribute to the reduction in fresh groundwater withdrawals or to the mitigation of regional groundwater withdrawal impacts: The project reduces per capita consumption of potable water in high use neighborhoods. Provides a total daily volume of 1.09 MGD that directly recharges into the Water Use Caution Area.
- Quantities:
    - Quantities of Water Proposed:
        - Long-term Average: 1.09 MGD

  - Description of extent to which withdrawal is sustainable from proposed source of supply and description of how this was determined: Reclaimed water.

- Major Components:
  - Pipelines: Reclaimed water retrofit

- Estimated Cost:
  - Total Cost: $4.8 Million

- Proposed Schedule:
  - Overall Start Date: 2005
  - Finish (start up)Date: 2007

- Current Project Status: Planning Phase
  - Planning: Complete
  - Design: 90% Complete
  - Construction: Pending, 2006

21. Winter Springs Interconnect

- Proposed By: Tri-Party

- Entities Served: Sanford, Lake Mary and Seminole County

- Project Purpose:

  - Description: Construct a 16" reclaimed water main from Greenwood Lakes Wastewater Treatment Plant to Sanlando Utilities / Altamonte Springs Reclaimed System.

- Major Components:
  - Pipelines: 16-inch reclaimed water main

- Estimated Cost:
  - Total Cost: $2.8 Million

- Proposed Schedule:
  - Overall Start Date: 2006

- Current Project Status: Conceptual Phase

22. *Sanford Potable Surface Water Plant Full Scale Demonstration*

- Proposed By: Tri-Party
- Entities Served: Sanford, Lake Mary and Seminole County
- Project Purpose:
    - Description: At the Sanford North Water Reclamation Facility, the existing surface water augmentation system has a capacity of 7.3 MGD. The augmentation system draws water from the St. Johns River and includes treatment through an Actiflo system followed by filtration through Dyna sand filters. The water is then blended with reclaimed water from the wastewater plant and supplied for irrigation through the Regional Reclaimed/Surface Water Distribution system.

      This project proposes to take a portion of this augmentation water (approx 2 MGD), divert it to a reverse osmosis treatment system, storage, and pumping system, and then deliver this water to the existing potable water distribution system. The concentrate would be blended back with the reclaimed water and utilized for pubic access spray irrigation. This would result in a cost-effective, operating potable surface water plant and would provide demonstration of the feasibility for an ultimately larger, long-term facility. This demonstration system could also be used to address the pubic acceptance of an ultimate regional facility, and in the interim, supply 2 MGD of potable water for regional use with existing interconnects with the city of Lake Mary and Seminole County.
- Water Supply Source: St. Johns River
- Quantities:
    - Quantities of Water Proposed:
        - Long-term Average: 2 MGD
- Major Components: Reverse osmosis system, storage and pumping system
- Estimated Cost:
    - Total Cost: $6.75 Million
- Proposed Schedule:
    - Overall Start Date: 2006
- Current Project Status: Conceptual Phase

23. Sanford Airport Alternative Potable Water Plant

- Proposed By: Tri-Party
- Entities Served: Sanford, Lake Mary and Seminole County
- Project Purpose:
    - Description: Modeling completed as part of the North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study revealed significant rebound (3'-9') of shallow ground water levels, as depicted in Figure 6-22, near the Sanford Airport. Currently, no public supplies utilize the water in the vicinity of the airport. The city, through the airport authority, controls over 2,000 acres at the airport site. This project proposes that a new water plant be constructed on the airport site with a combination of shallow well field and brackish Floridan Wells supplying the new water plant. Concentrate will be blended with blended with reclaimed water for irrigation.
- Water Supply Source: Surface Water
- Major Components: Well field and water treatment plant
- Current Project Status: Conceptual Phase

CONTACTS

If there are any questions regarding specific identified projects, please contact the following person(s) from the specific entity that proposed the project.

LAST	FIRST	AFFILIATON	TELEPHONE	EMAIL
Peters	John	City of Altamonte Springs	407-571-8343	johnp@altamonte.org
Paster	Bruce	City of Lake Mary	407-333-8211 407-585-1450	bpaster@lakemaryfl.com
Wyatt	Bobby	City of Oviedo	407-977-6029	bwyatt@cityofoviedo.net
Marcous	Bill	City of Sanford Tri-Party	407-330-5649	marcousw@ci.sanford.fl.us

Lockcuff	Kip	City of Winter Springs	407-327-5989 321-377-4007	klockcuff@winterspringsfl.org
Westrick	J. Dennis	Seminole County	407-665-2003 407-665-2040	dwestrick@seminolecountyfl.gov

1. Renew Apricot, Phase I and II

September 7, 2005

SEMINOLE COUNTY WATER SUPPLY PLAN
READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.:	
Project Name:	RENEW APRICOT, Phase I and II
Location:	City of Altamonte Springs Regional Water Reclamation Facility
Description including key features:	Rather than discharge excess reclaimed water in the Little Wekiva River, the City of Altamonte Springs will transmit between up to 6 MGD of reclaimed water to Project ARROW in Apopka. The transmission facilities will be designed to convey up to 6 MGD with the additional 3 MGD coming from various sources. The Orlando Utilities Commission (OUC) will partner in this endeavor to provide additional water sources to meet the larger demands.
Municipal Jurisdiction/ Owner:	City of Altamonte Springs
Entities served:	City of Altamonte Springs, City of Apopka, and Orlando Utilities Commission (OUC)
Project magnitude and capacity:	Phase I: Six miles of 16 Inch Transmission Line with a capacity of 6MGD; Phase II: Upgrades to the Altamonte RWRF to improve reclaim water quality as required by Project ARROW in Apopka
Preliminary Opinion of Total Project Cost:	Phase I: $9.5 million Phase II: $4.0 million Total: $13.5 million
Preliminary Opinion of Probable Cost per gallon of water supplied:	$2.25/gallon
Proposed schedule:	
Planning	1st Q FY 05/06
Design	3rd Q FY 05/06
Construction	4th Q FY 05/06 through 1st Q FY 06/07
Project status:	Planning Phase
Order of magnitude cost estimate (include all cost through construction):	$13.5M
Comments/Other Information:	The City of Altamonte Springs will be submitting a more detailed project package directly to the SJRWMD by the end of September.

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

2. Alternative Potable Water Supply – Brackish Water Source

September 7, 2005

Seminole County Water Supply Plan

READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.:	
Project Name:	City of Oviedo: Alternative potable water supply – Brackish water source
Location:	Oviedo, FL West Mitchell Hammock Water Treatment Plant 250 West Mitchell Hammock Road Oviedo, FL 32765
Description including key features:	Develop brackish water wells for new potable water supply. Project includes raw water piping, membrane treatment system addition to WTP plus piping to carry concentrate water to City's AM Jones WTP to mix with reclaim water system and augment that supply.
Municipal Jurisdiction/ Owner:	City of Oviedo, which serves part of Seminole County (Black Hammock area as consecutive system).
Entities served:	Seminole County – interconnects with SE & SW WTPs and Alafaya Utilities as consecutive system
Project magnitude and capacity:	Potable supply needs projected from brackish water = 3.7 mgd to produce 2.8 mgd net potable water addition (assuming City retains existing CUP levels at 3.7 mgd).
Preliminary Opinion of Total Project Cost:	$11,800,000
Preliminary Opinion of Probable Cost per gallon of water supplied:	$4.21/gal for 3.7 mgd plant to produce 2.8 mgd net water increase.
Proposed schedule:	Project water supply needs per CUP permit application: November 2005
Planning	Coordinate CUP & Master Plan: Jan/Mar 2006; CIP mid-2006
Design	Wells testing/permits 2006/07; Prelim/Final Design 2008
Construction	Bidding/Construction: 2009
Project status:	CUP application and Master Plan water development. New WTP planned for membranes will be completed in November 2005.
Order of magnitude cost estimate (include all cost through construction):	Wells, testing, permitting, construction: $2,200,000 RW piping + Concentrate piping: 400,000 3.7 mgd NF/Low P Membrane treatment: 4,800,000 Design, Admin/Contingency: $4,400,000 Total: $11,800,000
Comments/Other Information:	City has cooperative agreement with Seminole County to develop reclaim water supply from the City of Orlando's Iron Bridge WR facility. Therefore, City is part of regional water supply plan for SE Seminole County for both potable and reclaim water. City does not have other potential future water supply source opportunities other than brackish groundwater.

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

3. Yankee Lake Regional Surface Water Facility

September 7, 2005

Seminole County Water Supply Plan
READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.:	
Project Name:	Yankee Lake Regional Surface Water Facility
Location:	Seminole County's Yankee Lake Site
Description including key features:	Construct and operate a surface water treatment plant to treat water from the St. Johns River. The water will be treated to reclaimed water standards. The treatment will include chemical coagulation, high-rate clarification, and high-level chlorine disinfection.
Municipal Jurisdiction/ Owner:	Seminole County
Entities served:	Seminole County northwest and northeast service areas with ability to serve current and future regional cooperators.
Project magnitude and capacity:	10 mgd treatment capacity with river intake infrastructure expandable to 20 mgd.
Preliminary Opinion of Total Project Cost:	$30M
Preliminary Opinion of Probable Cost per gallon of water supplied:	TBD
Proposed schedule:	
Planning	4th Q 2005
Design	2nd Q 2006
Construction	4th Q 2006
Project status:	Planning Phase
Order of magnitude cost estimate (include all cost through construction):	$30M
Comments/Other Information:	The County will be submitting a more detailed project package directly to the SJRWMD by the end of September.

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

4. Reclaimed Water Augmentation from Lake Jesup

ARCADIS
Infrastructure, environment, buildings

Seminole County Water Supply Plan

READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.	
Project Name:	**Reclaimed Water Augmentation from Lake Jesup**
Location:	**South shore of Lake Jesup, western property of Central winds Park**
Description including key features:	**Treatment, storage, and pumping of surface waters of Lake Jesup for reclaimed water augmentation and system expansion to reduce potable water demands** **Also considering using adjacent uncapped spring of approximately 0.7 MGD to augment.**
Municipal Jurisdiction/ Owner:	**City of Winter Springs**
Entities served:	**City of Winter Springs, with expansion capability to serve one or more entities surrounding Winter Springs through interlocals and/orinterconnects**
Project magnitude and capacity:	**Peak withdrawal of 3 MGD, to be augmented with 1.5 MGD from each of two WWTP's for a total supply of 6 MGD**
Preliminary Opinion of Total Project Cost:	**Treatment, Storage, and Pumping (TSP) - $5,000,000. Seven distribution phases of approximately 1,000 connections each at $1,000,000 per phase. TSP and 1st two phases to be undertaken initially - $7,000,000.**
Preliminary Opinion of Probable Cost per gallon of water supplied:	**$4/gal**
Proposed schedule:	
Planning	**CUP permit underway – to be submitted 10/1/05**
Design	**2006**
Construction	**2007-2010**
Project status:	**Permitting**
Order of magnitude cost estimate (include all costs through construction):	**$7,000,000 for TSP and Phases 1 & 2 of distribution expansion/retrofit. $5,000,000 to $7,000,000 to complete remaining phases through 2025**
Comments/ Other Information:	**Sent this project info to Lisa Parks of SJRWMD for inclusion in the district Water Supply Plan**

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

5. Sanford North WRF Augmentation / Reclaimed Water System improvements

Seminole County Water Supply Plan
Readily Identifiable Traditional and Alternative Water Supply Development Projects

Project Information Sheet

Project No.	1
Project Name	Sanford North WRF Augmentation / Reclaimed Water System Improvements
Location	
Description Including Key Features	Addition of the following improvements: augmentation chlorine contact chamber and associated piping and fittings; augmentation transfer pump station; Actiflow systems and associated piping and fittings; sodium hypochlorite system modifications and augmentation system sludge management system components
Municipal Jurisdiction/Owner	City of Sanford
Entities Served	Sanford, Lake Mary, Seminole County
Project Magnitude And Capacity	Increased reliability and water quality allowing the existing augmentation and wastewater systems to operate independently. If there is a wastewater plant upset the augmentation system will continue to operate. The project will also enable the plant to meet Class III Water Quality Standards.
Preliminary Opinion Of Total Project Cost	$6,120,225
Preliminary Opinion Of Probable Cost Per Gallon Of Water Supplied	$.82 / Gallon, Capital Cost (based on 7.3 MGD Augmentation System)
Proposed Schedule	
Planning	Complete
Design	2005
Construction	2006
Project Status	Design is underway for the first phase of the project which includes two 4 MGD Actiflo system. Grant funding in the amount of $100,000 has been provided for the project.
Order Of Magnitude Cost Estimate (Include All Costs Through Construction)	See attached table B-1 Attached
Comments/Other Information	Refer to Optimization Study for details.

Note: Please identify those projects that will or have been individually submitted to SJRWMD

6. Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System

7. Timacuan Golf Course Reclaimed Water Storage Pond

8. Greenwood Lakes Reclaimed Water System Improvements

9. Modification to Recharge Basins

Seminole County Water Supply Plan
Readily Identifiable Traditional and Alternative Water Supply Development Projects

Project Information Sheet

Project No.	2, 3, 4 and 5
Project Name	Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System; Timacuan Golf Course Reclaimed Water Storage Pond; Greenwood Lakes Reclaimed Water System Improvements; and Modification to Recharge Basins
Location	
Description Including Key Features	Conveyance and storage of reclaimed water in an existing 240 million gallon pond in the Mill Creek drainage basin and installation of a pumping station, screening system and disinfection facilities to recover the stored water and deliver it to the existing reclaimed water distribution system; Modification of an existing stormwater pond to construct a new 2.3 MG reclaimed water storage pond; New 1.75 MG reclaimed water ground storage tank and associated piping and fittings at Greenwood Lakes storage and repump facility; and Necessary appurtenances to allow for discharge of reclaimed / augmentation water into recharge basins
Municipal Jurisdiction/Owner	Sanford, Lake Mary, Seminole County
Entities Served	Sanford, Lake Mary, Seminole County
Project Magnitude And Capacity	
Preliminary Opinion Of Total Project Cost	$5,393,750
Preliminary Opinion Of Probable Cost Per Gallon Of Water Supplied	
Proposed Schedule	
Planning	Complete
Design	50% Complete
Construction	Two projects ready to proceed in 2005 and two projects ready to proceed in 2006.
Project Status	Partial grant funding has been received for each of these projects as shown in the cover letter attachment. Projects are proceeding.
Order Of Magnitude Cost Estimate (Include All Costs Through Construction)	See attached table B-2 through B4 Attached
Comments/Other	See Optimization Study for further details

Note: Please identify those projects that will or have been individually submitted to SJRWMD

10. New East Lake Mary Blvd Reclaimed Water Main

11. New Reclaimed Water Main from Sanford South WRC to Victoria Street

12. New Reclaimed Water Main from US 17-92 to SR 46

Seminole County Water Supply Plan
Readily Identifiable Traditional and Alternative Water Supply Development Projects

Project Information Sheet

Project No.	6, 7, 8
Project Name	New East Lake Mary Blvd Reclaimed Water Main; New Reclaimed Water Main from Sanford South WRC to Victoria St.; New Reclaimed Water Main from U.S. 17-92 to SR 46
Location	
Description Including Key Features	New reclaimed water main along East Lake Mary Blvd from Sanford South WRC to SR 46; New reclaimed water main extending west From Sanford South WRC around Sanford International Airport and tying into the existing main at the corner of Victoria St. And Willow Ave.; New reclaimed water main along Riverview Ave from the existing 20" reclaimed water main at U.S. 17-92 to the existing 16" reclaimed water main on SR 46
Municipal Jurisdiction/Owner	Sanford
Entities Served	Sanford, Lake Mary, Seminole County
Project Magnitude And Capacity	Increased system looping, reliability and capacity (2 MGD)
Preliminary Opinion Of Total Project Cost	$4,578,047
Preliminary Opinion Of Probable Cost Per Gallon Of Water Supplied	$2.29/Gallon Capital Cost
Proposed Schedule	
Planning	Complete
Design	Project 6 – 100% Projects 7 and 8 – FY 2006
Construction	Project 6 – 50% Projects 7 and 8 – FY 2006
Project Status	
Order Of Magnitude Cost Estimate (Include All Costs Through Construction)	See attached Tables B-5, B-6, B-7 and Figure C-1 Attached
Comments/Other Information	Refer to Optimization Study for Details

Note: Please identify those projects that will or have been individually submitted to SJRWMD

13. Timacuan Reclaimed Water Main Upgrade

Seminole County Water Supply Plan
Readily Identifiable Traditional and Alternative Water Supply Development Projects

Project Information Sheet

Project No.	9
Project Name	Timacuan Reclaimed Water Main Upgrade
Location	
Description Including Key Features	Reclaimed water main along Timacuan Boulevard from Rinehart Road to Mohegan Boulevard upgrade from 8" to 16"
Municipal Jurisdiction/Owner	City of Lake Mary
Entities Served	Lake Mary, Seminole County
Project Magnitude And Capacity	Increased system hydraulic capacity by 2.9 MGD
Preliminary Opinion Of Total Project Cost	$978,791
Preliminary Opinion Of Probable Cost Per Gallon Of Water Supplied	$.34/Gallon Capital Cost
Proposed Schedule	
Planning	Complete
Design	FY 2006
Construction	FY 2006
Project Status	
Order Of Magnitude Cost Estimate (Include All Costs Through Construction)	See Table B-8 and Figure C-1 Attached
Comments/Other Information	See Optimization Study for Details

Note: Please identify those projects that will or have been individually submitted to SJRWMD

14. Markham Woods Road Reclaimed Water Transmission Main

Seminole County Water Supply Plan
READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.	1782 01 (Tri-Party #10)
Project Name:	Markham Woods Road Reclaimed Water Transmission Main
Location:	Northwest Seminole County
Description including key features:	Construct ~40,000 feet of reclaimed water transmission main to serve reuse customers in a high irrigation area along Markham Woods Rd as recommended in the tri-party Optimization Plan
Municipal Jurisdiction/ Owner:	Tri-Party Reclaimed Water System - Seminole County Environmental Services Department
Entities served:	Tri-Party Reclaimed Water System
Project magnitude and capacity:	Capable of carrying future rated capacity of 3 MGD of reclaimed water
Preliminary Opinion of Total Project Cost:	$4,871,801
Preliminary Opinion of Probable Cost per gallon of water supplied:	$0.60/1000 gallons
Proposed schedule:	
Planning	Complete
Design	Complete
Construction	Imminent-2006 completion
Project status:	Out for bids, construction in 05/06.
Order of magnitude cost estimate (include all costs through construction):	$4,871,801
Comments/ Other Information:	Provides transmission for customer end use of multi- jurisdictional Tri-party source effluent and surface water plant augmented water
	Allows capability of users to move water between multi-jurisdictional Tri-party users
	Maximizes effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption of potable water in high use neighborhoods
	Transmits a large volume of reclaimed water that directly recharges into the WUCA - Water Use Caution Area
	Transmits wastewater effluent from Yankee Lake Wastewater Treatment Plant per requirement of facility permit
	Listed in the Tri-Party Optimization Study Dec. 2004 as projects # 10,11,12 in table 9-12

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

15. Yankee Lake Road Reclaimed Water Transmission Main

Seminole County Water Supply Plan
READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.	1812 01 (Tri-Party #11)
Project Name:	Yankee Lake Road Reclaimed Water Transmission Main
Location:	Yankee Lake Water Reclamation Facility
Description including key features:	Design and construct a reclaimed water transmission main on Yankee Lake Road from the Yankee Lake Water Reclamation Facility and future Yankee Lake Regional Surface Water Facility to SR46 as recommended in the Tri-Party Optimization Plan
Municipal Jurisdiction/ Owner:	Tri-Party Reclaimed Water System - Seminole County Environmental Services Department
Entities served:	Tri-Party Reclaimed Water System
Project magnitude and capacity:	Capable of carrying future rated capacity of 5 MGD of reclaimed water
Preliminary Opinion of Total Project Cost:	$1,600,000
Preliminary Opinion of Probable Cost per gallon of water supplied:	$0.60/1000 gallon
Proposed schedule:	
Planning	2005
Design	2005
Construction	2006
Project status:	Conceptual and preliminary design complete
Order of magnitude cost estimate (include all costs through construction):	$1,600,000
Comments/ Other Information:	Listed in the Tri-Party Optimization Study Dec. 2004 as project # 21 in table 9-12
	Provides reuse for reclaimed water from Yankee Lake Wastewater Treatment Plant per requirement of facility permit
	Reduces per capita consumption of potable water in high use areas
	Provides reuse water that directly recharges into the WUCA - Water Use Caution Area
	Provides displacement of current and future potable water demand

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

16. Heathrow Boulevard Reclaimed Water Transmission Main

Seminole County Water Supply Plan
READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.	2171 01 (Tri-Party #12)
Project Name:	Heathrow Boulevard Reclaimed Water Transmission Main
Location:	Northwest Unincorporated Seminole County
	Heathrow Residential Community
Description including key features:	Design and construct ~18,000 feet of reclaimed water transmission main on CR46A, Heathrow Blvd. and Bridgewater Drive as recommended in Tri-Party Optimization Plan
Municipal Jurisdiction/ Owner:	Tri-Party Reclaimed Water System - Seminole County Environmental Services Department
Entities served:	Tri-Party Reclaimed Water System
Project magnitude and capacity:	Capable of carrying future rated capacity of 2.5 MGD of reclaimed water
Preliminary Opinion of Total Project Cost:	$ 2, 076,779
Preliminary Opinion of Probable Cost per gallon of water supplied:	$0.60/1000 gallon
Proposed schedule:	
Planning	2005
Design	2006
Construction	2007
Project status:	Planning complete
Order of magnitude cost estimate (include all costs through construction):	$2,076,779
Comments/ Other Information:	Listed as project # 14 in the Tri-Party Reclaimed Water Optimization study Table 9-12
	Provides transmission for customer end use of multi- jurisdictional Tri-party source effluent and surface water plant augmented water
	Allows capability of users to move water between multi-jurisdictional Tri-party users
	Maximizes effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption of potable water in high use neighborhoods
	Transmits a large volume of reclaimed water that directly recharges into the WUCA - Water Use Caution Area
	Transmits wastewater effluent from Yankee Lake Wastewater Treatment Plant per requirement of facility permit

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

17. Orange Boulevard Reclaimed Water Transmission Main

Seminole County Water Supply Plan

READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.	2479 01 (Tri-Party #13)
Project Name:	Orange Boulevard Reclaimed Water Transmission Main
Location:	Northwest Seminole County
Description including key features:	Design and construct 7,050 ft of 12" reclaimed water main on Orange Blvd from Markham Rd to SR46. Reclaimed main to increase capacity and interconnectivity of Tri-Party reclaimed water system.
Municipal Jurisdiction/ Owner:	Tri-Party Reclaimed Water System - Seminole County Environmental Services Department
Entities served:	Tri-Party Reclaimed Water System
Project magnitude and capacity:	Transmission Capacity: 2,500,000 gpd
Preliminary Opinion of Total Project Cost:	$509,262
Preliminary Opinion of Probable Cost per gallon of water supplied:	$0.60/1000 gallons
Proposed schedule:	
Planning	Complete
Design	2005
Construction	2006
Project status:	Currently under design.
Order of magnitude cost estimate (include all costs through construction):	$509,262
Comments/ Other Information:	Provides transmission for customer end use of multi- jurisdictional Tri-party source effluent and surface water plant augmented water. Maximizes effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption potable water in high use neighborhoods.

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

18. Yankee Lake Reclaimed Water Storage and Re-pump Facility

Seminole County Water Supply Plan

READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.	2178 01 (Tri-Party #14)
Project Name:	Yankee Lake Reclaimed Water Storage and Re-pump Facility
Location:	Yankee Lake Water Reclamation Facility
Description including key features:	Design and construct a reclaimed water storage and re-pump facility at the Yankee Lake Water Reclamation Facility to provide more reliable reclaimed water capacity.
Municipal Jurisdiction/ Owner:	Tri-Party Reclaimed Water System - Seminole County Environmental Services Department
Entities served:	Tri-Party Reclaimed Water System
Project magnitude and capacity:	8 mgd Capacity
Preliminary Opinion of Total Project Cost:	$2,400,000
Preliminary Opinion of Probable Cost per gallon of water supplied:	$0.60/1000 gallon
Proposed schedule:	
Planning	2005
Design	2007
Construction	2007
Project status:	In planning stage
Order of magnitude cost estimate (include all costs through construction):	$2,400,000
Comments/ Other Information:	The design and construction of the Yankee Lake Reclaimed Water Storage and Re-pump Facility will allow for more reliable transmission of reclaimed water for customer end use
	Maximizes effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption potable water in high use neighborhoods

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

19. Greenwood Lakes Rapid Infiltration Basins Rehabilitation

Seminole County Water Supply Plan

READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.	2433 01 (Tri-Party #15)
Project Name:	Greenwood Lakes Rapid Infiltration Basins Rehabilitation
Location:	Northwest Seminole County
Description including key features:	Design and construct rehabilitation of the Greenwood Lakes Rapid Infiltration Basin site. Optimize aquifer recharge capacity of reclaimed water for existing basins. Assist with City of Sanford effluent disposal capacity displacement due to de-mucking of Lake Jesup
Municipal Jurisdiction/ Owner:	Tri-Party Reclaimed Water System - Seminole County Environmental Services Department
Entities served:	Tri-Party Reclaimed Water System
Project magnitude and capacity:	1 mgd
Preliminary Opinion of Total Project Cost:	$500,000
Preliminary Opinion of Probable Cost per gallon of water supplied:	$0.10/1000 gallons
Proposed schedule:	
Planning	2005
Design	2008
Construction	2008
Project status:	Conceptually planned
Order of magnitude cost estimate (include all costs through construction):	$500,000
Comments/ Other Information:	The Greenwood Lakes Rapid Infiltration Basins (RIBs) are utilized for groundwater recharge, reject disposal if reclaimed water does not meet public access reuse, and seasonal disposal when irrigation demands are less than WWTF flows. Rehabilitation will increase capacity back to original design flows.

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

20. Residential Reclaimed Water Retrofit – Phase I

Seminole County Water Supply Plan

READILY IDENTIFIABLE TRADITIONAL AND ALTERNATIVE WATER SUPPLY DEVELOPMENT PROJECTS

PROJECT INFORMATION SHEET

Project No.	2173 01 (Tri-Party #16)
Project Name:	Residential Reclaimed Water Retrofit – Phase 1
Location:	Northwest Seminole County
Description including key features:	Reclaim Retrofit in Heathrow Woods, Bristol Park, Chestnut Hill, East Camden and Magnolia Plantation. Estimated 1.09 MGD reclaimed water usage.
	Incorporates projects form Tri-party Reclaimed Water System Expansion and Optimization Study Dec. 3, 2004. Table 9-12 # 13 & 14
Municipal Jurisdiction/ Owner:	Tri-Party Reclaimed Water System - Seminole County Environmental Services Department
Entities served:	Tri-Party Reclaimed Water System
Project magnitude and capacity:	1.09 MGD reuse potential
Preliminary Opinion of Total Project Cost:	$4,819,477
Preliminary Opinion of Probable Cost per gallon of water supplied:	$0.97/1000 gallon
Proposed schedule:	
Planning	Complete
Design	90%
Construction	Pending
Project status:	90% Designed, construction in 2006
Order of magnitude cost estimate (include all costs through construction):	$4,819,477
Comments/ Other Information:	Provides for customer end use of multi- jurisdictional Tri-party source effluent and surface water plant augmented water as outlined in the Tri-Party Optimization Study
	Displacement of current and future potable water demand of up to 1.09 MGD
	Reduces per capita consumption of potable water in high use neighborhoods
	Provides a total daily volume of 1.09 MGD that directly recharges into the WUCA - Water Use Caution Area
	Provides reuse for wastewater effluent from Yankee Lake Wastewater Treatment Plant per requirement of facility permit

Note: Please identify those projects that will or have been individually submitted to SJRWMD.

21. Winter Springs Interconnect

Seminole County Water Supply Plan
Readily Identifiable Traditional and Alternative Water Supply Development Projects

Project Information Sheet

Project No.	17 and 18
Project Name	Altamonte Springs Interconnect and Winter Springs Interconnect
Location	
Description Including Key Features	16" reclaimed water main from Greenwood Lakes Wastewater Treatment Plant to Sanlando Utilities / Altamonte Springs Reclaimed System; 16" reclaimed water main from Seminole Community College to Winter Springs Water Reclamation Facility
Municipal Jurisdiction/Owner	Sanford / Seminole County
Entities Served	Sanlando Utilities / Altamonte Springs
Project Magnitude And Capacity	3.8 MGD
Preliminary Opinion Of Total Project Cost	$6,445,710
Preliminary Opinion Of Probable Cost Per Gallon Of Water Supplied	$1.7/Gallon Capital Cost
Proposed Schedule	
Planning	FY 2006
Design	FY 2006
Construction	FY 2007
Project Status	Conceptual
Order Of Magnitude Cost Estimate (Include All Costs Through Construction)	See Table 11-1 and 11-2 Attached
Comments/Other Information	See Optimization Study for Details

Note: Please identify those projects that will or have been individually submitted to SJRWMD

22. Sanford Potable Surface Water Plant Full Scale Demonstration

Seminole County Water Supply Plan
Readily Identifiable Traditional and Alternative Water Supply Development Projects

Project Information Sheet

Project No.	20
Project Name	Sanford Potable Surface Water Plant Full Scale Demonstration
Location	
Description Including Key Features	At the Sanford North Water Reclamation Facility, the existing surface water augmentation system has a capacity of 7.3 MGD. The augmentation system draws water from the St. Johns River and includes treatment through an Actiflo system followed by filtration through Dyna sand filters. The water is then blended with reclaimed water from the wastewater plant and supplied for irrigation through the Regional Reclaimed/Surface Water Distribution system. It is proposed to take a portion of this augmentation water (approx 2 MGD) and divert it to a reverse osmosis treatment system, storage and pumping system and then deliver this water to the existing potable water distribution system. The concentrate would be blended back with the reclaimed water and utilized for pubic access spray irrigation. This would result in a cost-effective, operating potable surface water plant and would provide demonstration of the feasibility for an ultimately larger, long-term facility. This demonstration system could also be used to address the pubic acceptance of an ultimate regional facility, and in the interim, supply 2 MGD of potable water for regional use with existing interconnects with the city of Lake Mary and Seminole County.
Municipal Jurisdiction/Owner	Sanford
Entities Served	Sanford, Seminole County, Lake Mary
Project Magnitude And Capacity	2 MGD
Preliminary Opinion Of Total Project Cost	$6,750,000
Preliminary Opinion Of Probable Cost Per Gallon Of Water Supplied	$3.38/gallon Capital Cost
Proposed Schedule	
Planning	FY 2006
Design	FY 2006
Construction	FY 2007
Project Status	Conceptual

Note: Please identify those projects that will or have been individually submitted to SJRWMD

Order Of Magnitude Cost Estimate (Include All Costs Through Construction)	
Comments/Other Information	

Note: Please identify those projects that will or have been individually submitted to SJRWMD

23. Sanford Airport Alternative Potable Water Plant

Seminole County Water Supply Plan
Readily Identifiable Traditional and Alternative Water Supply Development Projects

Project Information Sheet

Project No.	21
Project Name	Sanford Airport Alternative Potable Water Plant
Location	
Description Including Key Features	Modeling completed as part of the North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study revealed significant rebound (3'-9') of shallow ground water levels, as depicted in Figure 6-22, in the vicinity of the Sanford Airport. Currently, no public supplies utilize the water in the vicinity of the airport. The city, through the airport authority, controls over 2,000 acres at the airport site. It is proposed that a new water plant be constructed on the airport site with a combination of shallow wellfield and brackish Floridan Wells supplying the new water plant. Concentrate would be blended with blended with reclaimed water for irrigation. The attached Figure 1 shows that the proposed system layout
Municipal Jurisdiction/Owner	Sanford
Entities Served	Regional
Project Magnitude And Capacity	
Preliminary Opinion Of Total Project Cost	
Preliminary Opinion Of Probable Cost Per Gallon Of Water Supplied	
Proposed Schedule	No Schedule
Planning	
Design	
Construction	
Project Status	Conceptual
Order Of Magnitude Cost Estimate (Include All Costs Through Construction)	
Comments/Other Information	

Note: Please identify those projects that will or have been individually submitted to SJRWMD

Appendix G

Task F - Analysis and Recommendations; Evaluation of Existing Facilities and Alternatives Development

Task F: Compilation, Evaluation and Ranking of Alternative Water Supply Projects

DRAFT

Technical Memorandum

For The

Seminole County Water Supply Plan

By

ARCADIS USA, Inc.
4307 Vineland Road H-20
Orlando, Florida

January 2007

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Appendix

Appendix A: Recommended Action Plan for the Central Florida Coordination Area. A Cooperative Effort of the South Florida, Southwest Florida and St. Johns River Water Management Districts
Appendix B: Individual Cooperator Adjusted Deficits by Project
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Appendix D: ARC Reader and GIS Diskette

EXECUTIVE SUMMARY

Objectives

The Seminole County Water Supply Plan (Plan) objectives are to meet Cooperators' current and future water demands with traditional and alternative water sources while sustaining water quality and protecting wetland and aquatic systems. Task (F) of the Plan identifies preferred alternative water supply (AWS) projects, develops evaluation criteria, applies the criteria to projects, and ranks the alternative water supply projects.

Background

Seminole County and surrounding areas are experiencing development and population growth that have led to increased demands on water resources and the related natural environment. The St. Johns River Water Management District (SJRWMD) predicts that within 20 years, traditional groundwater supplies will not be adequate to provide for future demands in many areas of east-central Florida, and that alternative sources will be required.

Seminole County and the municipalities of Altamonte Springs, Casselberry, Lake Mary, Longwood, Oviedo, Sanford and Winter Springs (Cooperators) have formed a coalition, in cooperation with the SJRWMD to prepare a Seminole County Water Supply Plan. ARCADIS was hired to prepare the Plan and coordinate with the Cooperators to ensure that future demands are met while preserving and protecting environmental resources.

Project Efforts

Two planning periods were considered for the Plan. The first period includes horizons 2005 to 2025, viewed on individual Cooperator and private utility basis. The second period includes horizons 2030, 2035, 2040, and 2045, viewed on a county basis.

Each Cooperator maintains at least one consumptive use permit (CUP) which allocates groundwater withdrawals for the permittee. SJRWMD has indicated that the existing CUP allocations held by the Cooperators would not likely be increased in the future. Therefore the future available "supply" is effectively limited to the CUP allocation. Based on recent SJRWMD proposed policies, the traditional sources will be limited to the 2013 demand of the permittee.

The difference or deficit for each Cooperator (2005 to 2025) and for the entire County (2026 to 2045) was calculated by subtracting the demand from supply. Table 1 shows the supply, water demand projections, and deficit (or difference) equals supply minus demand for 2005 to 2045 on a county-wide basis. Table 2 shows the supply, water demand projections, and difference on a Cooperator level for 2005 to 2025.

Table 1: Seminole County Characteristics Summary, mgd

Projection Date	Population	Supply (1)	Demand (2)	Demand Difference
2005	397,762	71	58	13
2010	435,544	75	73	3
2015	470,523	77	80	-3
2020	490,523	77	83	-6
2025	512,957	77	90	-13
2030	554,827	77	103	-26
2035	590,761	77	114	-37
2040	629,023	77	127	-50
2045	669,762	77	140	-63

Notes:
1. Supply is equal 2013 Demand
2. Demand is Cooperator provided projections through 2025 (blended data set).
3. 2030 - 2045 Demand is projected by linear forecast from the 2005 to 2025 data.

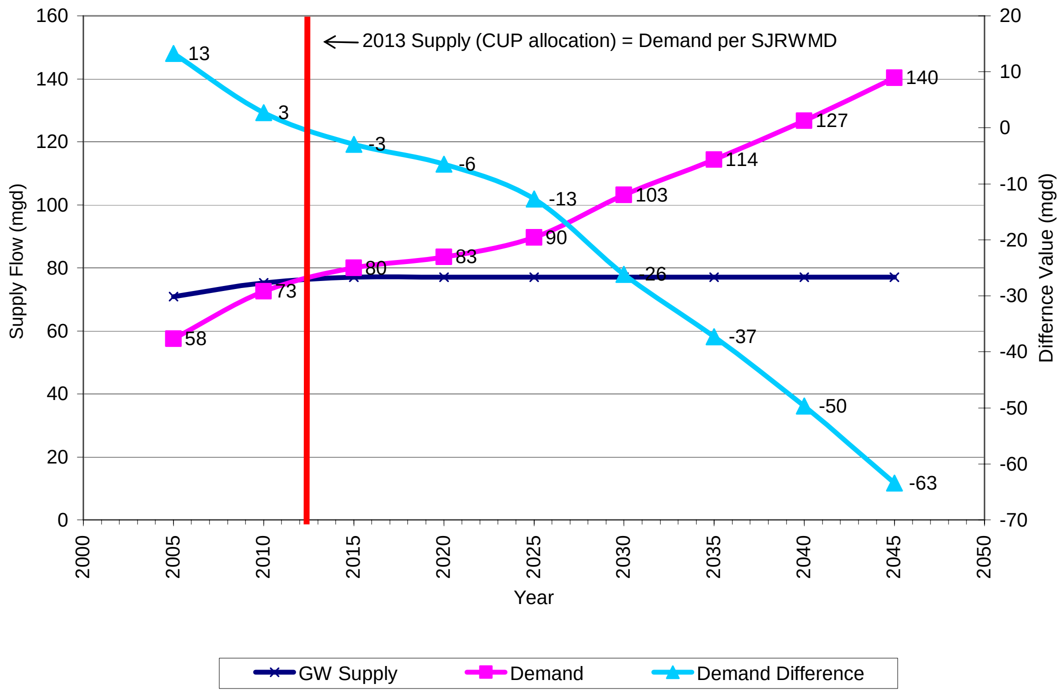
Table 2: Cooperator Water Characteristics Summary, mgd

Owner	2005			2010			2013			2015			2020			2025		
	Supply (1)	Demand (2)	Difference	Supply	Demand	Difference	Supply	Demand	Difference	Supply	Demand	Difference	Supply	Demand	Difference	Supply	Demand	Difference
COOPERATORS																		
City of Altamonte Springs*	7.30	5.37	1.93	7.80	8.63	-0.83	8.97	8.97	0.00	8.97	9.20	-0.23	8.97	9.62	-0.65	8.97	10.06	-1.09
City of Casselberry	6.42	4.84	1.58	6.62	5.43	1.19	5.53	5.53	0.00	5.53	5.59	-0.06	5.53	5.85	-0.32	5.53	6.11	-0.58
City of Lake Mary	4.50	3.47	1.03	4.90	4.00	0.90	4.12	4.12	0.00	4.12	4.20	-0.08	4.12	4.20	-0.08	4.12	4.20	-0.08
City of Longwood	2.52	1.94	0.58	2.54	2.43	0.11	2.44	2.44	0.00	2.44	2.44	0.00	2.44	2.47	-0.03	2.44	2.48	-0.04
City of Oviedo	4.12	3.88	0.2	4.27	4.8	-0.52	5.51	5.5	0.00	5.51	6.0	-0.48	5.51	6.8	-1.32	5.51	8.5	-2.99
City of Sanford	8.51	7.04	1.47	9.58	6.89	2.69	8.06	8.06	0.00	8.06	8.84	-0.78	8.06	9.49	-1.43	8.06	9.62	-1.56
City of Winter Springs	5.19	4.02	1.17	5.38	4.40	0.98	4.40	4.40	0.00	4.40	4.40	0.00	4.40	4.60	-0.20	4.40	4.60	-0.20
Seminole County - Northeast*	3.02	1.81	1.21	3.02	3.55	-0.53	3.58	3.58	0.00	3.58	3.60	-0.02	3.58	3.93	-0.35	3.58	4.29	-0.71
Seminole County - Northwest*	6.43	5.09	1.34	8.23	9.96	-1.73	10.89	10.89	0.00	10.89	11.51	-0.62	10.89	11.72	-0.83	10.89	11.93	-1.04
Seminole County - Southeast	9.15	9.00	0.15	9.15	11.20	-2.05	11.94	11.94	0.00	11.94	12.43	-0.49	11.94	12.67	-0.73	11.94	15.53	-3.59
Seminole County - Southwest*	1.48	1.16	0.32	1.48	1.40	0.08	1.44	1.44	0.00	1.44	1.46	-0.02	1.44	1.46	-0.02	1.44	1.46	-0.02
Seminole County - Apple Valley	0.52	0.50	0.02	0.64	0.62	0.02	0.67	0.67	0.00	0.67	0.70	-0.03	0.67	0.76	-0.09	0.67	0.81	-0.14
Seminole County - Druid Hills	0.13	0.10	0.03	0.13	0.11	0.02	0.11	0.11	0.00	0.11	0.11	0.00	0.11	0.11	0.00	0.11	0.11	0.00
Seminole County - Meredith Manor	0.35	0.22	0.13	0.35	0.33	0.02	0.33	0.33	0.00	0.33	0.33	0.00	0.33	0.34	-0.01	0.33	0.34	-0.01
PRIVATE UTILITES																		
Aqua Utilities	0.53	0.37	0.16	0.53	0.75	-0.22	0.85	0.85	0.00	0.85	0.91	-0.06	0.85	1.08	-0.23	0.85	1.22	-0.37
Palm Valley MHP	0.24	0.15	0.09	0.24	0.38	-0.14	0.42	0.42	0.00	0.42	0.44	-0.02	0.42	0.43	-0.01	0.42	0.44	-0.02
Utilities Inc - Sanlando Utilities	9.71	8.06	1.65	9.71	7.05	2.66	7.11	7.11	0.00	7.11	7.16	-0.04	7.11	7.26	-0.15	7.11	7.34	-0.23
Utilities Inc - Oakland Shores	0.10	0.08	0.02	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00
Utilities Inc - Revenna Park	0.12	0.08	0.04	0.12	0.10	0.02	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00
Utilities Inc - Weathersfield	0.37	0.31	0.06	0.37	0.37	0.00	0.37	0.37	0.00	0.37	0.37	0.00	0.37	0.37	0.00	0.37	0.37	0.00
Utilities Inc - Jansen S/D	0.10	0.06	0.04	0.10	0.07	0.03	0.07	0.07	0.00	0.07	0.07	0.00	0.07	0.07	0.00	0.07	0.07	0.00
TOTAL	**70.81**	**57.54**	**13.27**	**75.26**	**72.56**	**2.70**	76.99	**76.99**	**0.00**	**76.99**	**79.95**	**-2.95**	**76.99**	**83.46**	**-6.47**	**76.99**	**89.69**	**-12.70**

Notes:
* If 2025 year projection was not provided, SJRWMD 2025 projection was used.
1. Through 2010, Supply is equal to the existing CUP allocation. 2013 and beyond, Supply is equal to the Cooperator projected 2013 demand.
2. Cooperator projected demand, not historical data.

As shown in Figure 10 (as named in the complete Plan), the potable water demand in Seminole County is projected to increase steadily through the 40-year planning period to 2045. The Seminole County total indicates that the projected average day demand in 2025 is 89.7 mgd and 140.4 mgd in 2045. The projected water demand is expected to exceed the supply (existing CUP allocation) in 2013, as shown on Figure 10. In 2025, the demand is projected to exceed supply by 13.3 mgd and then by 64.3 mgd in 2045.

Figure 10: Seminole County Water Supply Summary (MGD)



Findings

As part of Task F, several workshops were attended by Cooperators and other Plan participants. The outcome of the workshops was a mutually agreed upon list of four alternative water supply projects for potable (drinking water) supply and 17 alternative water supply projects for non-potable supply purposes, excluding water conservation/demand reduction efforts. The project details and costs are summarized in this technical memorandum.

Two criteria were chosen by the Cooperators for evaluation of the alternative water supply projects. The evaluation criteria chosen are 1) Environmental Impact and 2) Cost.

The projects are presented in a table format to show how the Deficit (or Difference, Supply-Demand) could be satisfied by the selected projects on a Cooperator-basis for the planning horizons 2010 to 2025 for both potable and non-potable needs. A regional approach was taken when reviewing future needs from 2026 to 2045. The total capacity and adjusted capital costs for all projects combined are summarized below. Adjusted capital costs are costs minus anticipated funding dollars. (Projects 9a and 9b were not included in the total because they vary by intake location only from projects 10a and 10b.)

- Potable: Total Capacity = 36 mgd, ADF
  Total Adjusted Capital Cost = $158 Million
- Non-potable: Total Capacity = 57 mgd, ADF
  Total Adjusted Capital Cost = $103 Million

Based on workshop discussion, three project rankings were developed:

1. Environmental Impact
2. Cost
3. Total (Environmental Impact + Costs)

Table 6 presents each AWS project in ranked order for the environmental impact criterion. Table 7 presents each AWS project in ranked order for the cost criterion. The scores for environmental impact and cost are totaled and thereby ranked and shown on Table 8.

Suggested Cooperator Action Items

As water sources become limited or unavailable, regional planning will be required to satisfy the water supply needs of Florida. This is evidenced by the Central Florida Coordination Area (CFCA) Action Plan. The Cooperators have shown their ability to consider regional planning with the culmination of this Plan. To conduct regional planning and implementation efforts, new partnerships and vehicles of implementation may need to be developed. This Plan and the knowledge of the AWS project details, scoring outcome of the criteria points, and ranking (as presented in this TM) is a basis for the Cooperators to take the next step in the process of developing and implementing alternative water supply sources for future needs. At present, the following actions items are scheduled.

1. Gerald Chancellor and ARCADIS will present the Plan to Team A (City Managers) for their review and approval, February 2007.
2. Gerald Seeber presents the Plan to the Seminole joint County/City elected officials meeting in March 2007.

Other suggested milestones/schedules for Cooperator's consideration are:

- 2007 - Development of implementation strategies; and Partnership Evaluation and Potential Agreements
- 2007 to 2013 - Initiate Planning, Design, Permitting, and Construction as appropriate

Table 6: Summary of Project Rankings - Environmental

Project Number	Project	Sub-Project	Capacity (mgd)	Total Adjusted Capital Cost $M	Unit Production Cost ($/kgal)	Environmental Impacts Evaluation Score	Environmental Impacts Ranking
2a		Sanford North WRF Augmentation/Reclaimed Water System Improvements	7.3	$4.3	$0.21	34	1
2j		Greenwood Lakes Rapid Infiltration Basins Rehabilitation	1.0	$0.5	$0.09	34	2
2c		Orange Boulevard Reclaimed Water Transmission Main	2.5	$0.4	$0.03	32	3
2e		Timacuan Reclaimed Water Main Upgrade	2.9	$0.8	$0.05	32	4
2g		Residential Reclaimed Water Retrofit – Phase I	1.1	$3.8	$0.61	30	5
8	Oviedo Reclaimed Water Projects		1.5	$5.2	$0.60	30	6
2h		Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	$4.3	$0.42	30	7
2f		Heathrow Boulevard Reclaimed Water Transmission Main	2.5	$1.7	$0.12	26	8
6	Sanford Surface WTP on Lake Monroe - Potable		4.0	$8.3	$0.62	26	9
2b		Markham Woods Road Reclaimed Water Transmission Main	3.0	$3.9	$0.23	24	10
2i		Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	$5.1	$0.23	24	11
2d		New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46	2.0	$3.6	$0.31	21	12
10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage		5.0	$17.1	$0.87	23	13
10b	Surface WTP on St Johns River at Mullet Lake - Potable		7.0	$29.6	$1.27	23	14
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project		2.3	$4.7	$0.58	22	15
3	East Orange and Seminole Counties Regional Reuse Project		4.7	$14.8	$0.18	18	16
4	Altamonte Springs and Apopka Project RENEW APRICOT		6.0	$10.8	$0.36	18	17
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project		10.0	$22.0	$1.26	15	18
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable		25.0	$120.0	$3.05	15	19
9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage		5.0	$15.8	$0.82	15	20
9b	Surface WTP on St Johns River at SR46 - Potable		7.0	$29.1	$1.25	15	21

Note: Where evaluation scores are equal, projects are ranked alphabetically.

Table 7: Summary of Project Rankings - Cost

Project Number	Project	Sub-Project	Capacity (mgd)	Total Adjusted Capital Cost $M	Unit Production Cost ($/kgal)	Cost Evaluation Score	Cost Ranking
2a		Sanford North WRF Augmentation/Reclaimed Water System Improvements	7.3	$4.3	$0.21	14	1
2b		Markham Woods Road Reclaimed Water Transmission Main	3.0	$3.9	$0.23	14	2
2c		Orange Boulevard Reclaimed Water Transmission Main	2.5	$0.4	$0.03	14	3
2e		Timacuan Reclaimed Water Main Upgrade	2.9	$0.8	$0.05	14	4
2f		Heathrow Boulevard Reclaimed Water Transmission Main	2.5	$1.7	$0.12	14	5
2i		Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	$5.1	$0.23	14	6
2j		Greenwood Lakes Rapid Infiltration Basins Rehabilitation	1.0	$0.5	$0.09	14	7
3	East Orange and Seminole Counties Regional Reuse Project		4.7	$14.8	$0.18	14	8
2h		Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	$4.3	$0.42	11	9
4	Altamonte Springs and Apopka Project RENEW APRICOT		6.0	$10.8	$0.36	11	10
2d		New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46	2.0	$3.6	$0.31	8	11
2g		Residential Reclaimed Water Retrofit – Phase I	1.1	$3.8	$0.61	8	12
8	Oviedo Reclaimed Water Projects		1.5	$5.2	$0.60	8	13
6	Sanford Surface WTP on Lake Monroe - Potable		4.0	$8.3	$0.62	8	14
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project		2.3	$4.7	$0.58	8	15
10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage		5.0	$17.1	$0.87	7	16
9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage		5.0	$15.8	$0.82	7	17
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project		10.0	$22.0	$1.26	4	18
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable		25.0	$120.0	$3.05	4	19
9b	Surface WTP on St Johns River at SR46 - Potable		7.0	$29.1	$1.25	4	20
10b	Surface WTP on St Johns River at Mullet Lake - Potable		7.0	$29.6	$1.27	4	21

Note: Where evaluation scores are equal, projects are ranked alphabetically.

Table 8: Summary of Project Rankings - Total

Project Number	Project	Sub-Project	Capacity (mgd)	Total Adjusted Capital Cost $M	Unit Production Cost ($/kgal)	Environmental Impacts Evaluation Score	Environmental Impacts Ranking	Cost Evaluation Score	Cost Ranking	Total Evaluation Score	Total Ranking
2a		Sanford North WRF Augmentation/Reclaimed Water System Improvements	7.3	$4.3	$0.21	34	1	14	1	48	1
2j		Greenwood Lakes Rapid Infiltration Basins Rehabilitation	1.0	$0.5	$0.09	34	2	14	7	48	2
2c		Orange Boulevard Reclaimed Water Transmission Main	2.5	$0.4	$0.03	32	3	14	3	46	3
2e		Timacuan Reclaimed Water Main Upgrade	2.9	$0.8	$0.05	32	4	14	4	46	4
2h		Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	$4.3	$0.42	30	7	11	9	41	5
2f		Heathrow Boulevard Reclaimed Water Transmission Main	2.5	$1.7	$0.12	26	8	14	5	40	6
2b		Markham Woods Road Reclaimed Water Transmission Main	3.0	$3.9	$0.23	24	10	14	2	38	7
2g		Residential Reclaimed Water Retrofit – Phase I	1.1	$3.8	$0.61	30	5	8	12	38	8
2i		Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	$5.1	$0.23	24	11	14	6	38	9
8	Oviedo Reclaimed Water Projects		1.5	$5.2	$0.60	30	6	8	13	38	10
6	Sanford Surface WTP on Lake Monroe - Potable		4.0	$8.3	$0.62	26	9	8	14	34	11
2d		New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46	2.0	$3.6	$0.31	21	12	8	11	32	12
3	East Orange and Seminole Counties Regional Reuse Project		4.7	$14.8	$0.18	18	16	14	8	32	13
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project		2.3	$4.7	$0.58	22	15	8	15	30	14
10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage		5.0	$17.1	$0.87	23	13	7	16	30	15
4	Altamonte Springs and Apopka Project RENEW APRICOT		6.0	$10.8	$0.36	18	17	11	10	29	16
10b	Surface WTP on St Johns River at Mullet Lake - Potable		7.0	$29.6	$1.27	23	14	4	21	27	17
9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage		5.0	$15.8	$0.82	15	20	7	17	22	18
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project		10.0	$22.0	$1.26	15	18	4	18	19	19
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable		25.0	$120.0	$3.05	15	19	4	19	19	20
9b	Surface WTP on St Johns River at SR46 - Potable		7.0	$29.1	$1.25	15	21	4	20	19	21

Note: Where evaluation scores are equal, projects are ranked alphabetically.

It is important to remember that the ranking of the projects is subjective as the AWS projects do not serve the same geographical area. The ranking provides a guideline for further investigation and evaluation by the Cooperators. AWS project details are subject to change, based on funding availability, CIP plans, availability of willing partners, and other influencing factors.

INTRODUCTION

Background

Seminole County and surrounding areas are experiencing development and population growth that have led to increased demands on water resources and the related natural environment. The St. Johns River Water Management District (SJRWMD) predicts that within 20 years, traditional groundwater supplies will not be adequate to provide for future demands in many areas of east-central Florida, and that alternative sources will be required.

Seminole County and the municipalities of Altamonte Springs, Casselberry, Lake Mary, Longwood, Oviedo, Sanford and Winter Springs (Cooperators) have formed a coalition, are cooperating with the SJRWMD to prepare a Seminole County Water Supply Plan (Plan). ARCADIS was hired to prepare the Plan and coordinate with the Cooperators to ensure that future demands are met while preserving and protecting environmental resources.

Previous Plan task efforts included review of existing plans, data collection, review of water conservation and reuse programs, and development of flow projections. Involved in these efforts were workshops, development of technical memoranduma and a GIS database. This document represents the deliverable under "Task F: Compilation, Evaluation, and Ranking of Alternative Water Supply Projects."

Objective

The Seminole County Water Supply Plan (Plan) objectives are to meet Cooperators' current and future water demands with traditional and alternative water sources while sustaining water quality and protecting wetland and aquatic systems.

Scope of Services

As a part of Task F, ARCADIS facilitated a workshop on July 12, 2006, to review Cooperator-proposed projects and to help identify other traditional and alternative water supply development projects for further review. Evaluation criteria was also discussed and selected at the workshop. To identify preferred alternatives, ARCADIS performed an evaluation of potential traditional and alternative water supply development projects for future water supply.

At the workshop held on July 12, 2006, ARCADIS presented a list of suggested criteria for evaluation of the identified projects. The list of suggested criteria is as follows:

1. Resource Availability
2. Water Quality
3. Permittability

4. Environmental Impacts
5. Constructability
6. Cost
7. Customer Satisfaction
8. Multi-Jurisdictional

The Cooperators were requested to add or delete any criteria and to rank the criteria in order of importance. At the workshop and after subsequent discussions, the Cooperators agreed that the final list of project evaluation criteria is limited to two. In order of ranking these criteria are:

1. Environmental Impact
2. Cost

ARCADIS facilitated a second workshop on October 12, 2006 to review the evaluated projects. Cooperators provided comments at the workshop and in the following weeks. These comments were taken under consideration and the results are reflected in this technical memorandum.

EXISTING CONDITIONS FOR COOPERATORS

The primary water suppliers in Seminole County include public and private water utility systems. Figure 1 shows the present service area of each of the major water suppliers in the County. There are 46 reported potable water treatment facilities in Seminole County with a total permitted capacity of 152.72 million gallons per day (mgd) in 2005. There are 16 reported wastewater treatment facilities in Seminole County with a total permitted treatment capacity of 80.7 mgd in 2005.

Existing facility capacities, current and projected demands/flows, and storage capacities were summarized and provided in the Task E technical memorandum. At the time of writing the Task E technical memorandum, supply was designated as each facility's existing consumptive use permit (CUP). Since that time, SJRWMD has proposed a new policy concerning future CUP allocations. The new policy will affect the "supply" portion of a deficit (or difference) equals supply minus demand equation used to evaluate future needs. The effects of these changes are discussed in the Central Florida Coordination Area section and in Appendix A. For ease of review, the Cooperator system characteristic; projected water demand, supply, wastewater flow, and reuse quantities have been graphed and provided as Figures 2 to 9.

FUTURE NEEDS FOR COOPERATORS

Planning Period Development

As outlined in the revised Task E technical memorandum, two planning periods were considered for the Plan. The first period includes horizons 2005, 2010, 2015, 2020 and 2025, viewed on an individual Cooperator and private utility basis. The second period includes horizons 2030, 2035, 2040, and 2045, viewed on a county basis.

Two projection data sets were provided to ARCADIS. For the initial planning period, population and water demand projections were provided by SJRWMD and the Cooperators for the horizons 2005 to 2025. Portions of Seminole County and some private utilities did not provide self-generated data; and consequently SJRWMD water demand projection data were used to evaluate future needs. Included in the data are private utilities which comprise 11% of the total water demand for geographic Seminole County in the 2005 to 2025 period.

The population and water demand projection data set for 2005 to 2025 provided by SJRWMD was developed using a forecasting model developed for SJRWMD by GIS Associates, Inc. The model used various factors such as historical data and spatial considerations (non-developable land, inappropriate land uses, "build out" data, etc) to develop the 2005 to 2025 population and water demand projection data set. It is assumed that the Cooperators used similar information in their data set development as the projections in most cases are similar to the SJRWMD data set.

The Cooperators also requested that ARCADIS provide population and water demand data for horizons 2030, 2035, 2040 and 2045. A linear forecasting method was used to predict county-wide water demand. The basis for the forecasts was the blended data set (as discussed above) from 2005 to 2025, linearly extrapolated to 2045.

Central Florida Coordination Area (CFCA)

In September 2006, SJRWMD issued a memorandum titled "Recommended Action Plan for the Central Florida Coordination Area. A Cooperative Effort of the South Florida, Southwest Florida and St. Johns River Water Management Districts". This document is provided as Appendix A. The November SJRWMD WaterWatch publication summarized the CFCA efforts as follows:

> "In spring 2006, the executive directors of the three districts instructed their staffs to work together to develop a plan for better coordination and communication in the high-growth area of central Florida. This effort was necessitated by the frequency and complexity of issues in each of the districts related to the sustainability of groundwater resources to meet current and future demands. Decisions made by one district in an area often impact the two neighboring districts."

The three districts have developed an action plan to assure a coordinated and consistent approach throughout the Central Florida Coordination Area (CFCA), which includes Polk, Orange, Osceola and Seminole counties, southern Lake County, and the city of Cocoa's public supply service area in Brevard County. The plan for the CFCA requires alternative water supply (AWS) projects to be developed to meet allocation of groundwater beyond 2013-projected demands.

The CFCA action plan includes three elements — regulatory, water supply planning, and modeling and tools. In the short term, the regulatory plan

• Limits new groundwater allocations to a maximum needed to meet 2013 demands
• Provides opportunity for 20-year permit durations based on the 2013 allocation for those utilities committed to alternative water source projects by 2013

Over the long range, the plan will help develop consistent permitting criteria among the districts, as well as develop and implement a long-term water supply strategy for alternative water sources and for equitable allocation of any additional available groundwater."

As mentioned in the existing conditions section of this TM, supply was previously viewed equal to each facility's existing CUP. The CFCA action plan limits caps future CUP allocation to the respective facilities 2013 demand. The new policy affects the "supply" portion of a deficit (or difference) equals supply minus demand equation used to evaluate future needs in the Plan.

Evaluation of Deficits/Differences

The blended data set was used as the basis for the projected "demands". The difference or deficit for each Cooperator (2005 to 2025) and for the entire County (2026 to 2045) was calculated by subtracting the demand from supply, with the supply being the Cooperators' respective 2013 demand. Table 1 shows the supply, water demand projections, and difference (supply minus demand) for 2005 to 2045 on a county-wide basis. For each Cooperator water supply, water demand, and difference (supply minus demand) is summarized for 2005 to 2025 in Table 2.

As shown in Figure 10, the potable water demand in Seminole County is projected to increase steadily through the 40-year planning period to 2045. The Seminole County total demand indicates that the projected average day demand in 2025 is 89.7 mgd and 140.4 mgd in 2045. Based on the CFCA proposal, projected water demand will exceed the supply in 2014, as shown on Figure 10. In 2025, the demand is projected to exceed supply by 13.3 mgd and then by 63.4 mgd in 2045.

ALTERNATIVE WATER SUPPLY PROJECTS

Development of Alternative Water Supply Projects

Alternative water supply (AWS) projects were developed from input gathered from the Cooperators at workshops and meetings. Several of the projects were included in the 2005 District Water Supply Plan (DWSP). Some of the AWS projects were updated and/or combined and are included in the Plan.   The AWS projects have been geographically located and are shown on Figure 11.

List of Alternative Water Supply Projects

1 – Water Conservation/Demand Reduction
2 – North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study
    2a – Sanford North WRF Augmentation/Reclaimed Water System Improvements
    2b – Markham Woods Road Reclaimed Water Transmission Main
    2c –Orange Boulevard Reclaimed Water Transmission Main
    2d – New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46
    2e – Timacuan Reclaimed Water Main Upgrade
    2f – Heathrow Boulevard Reclaimed Water Transmission Main
    2g – Residential Reclaimed Water Retrofit – Phase I
    2h – Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins
    2i – Seminole County/Sanlando Utilities Interconnect with Altamonte Springs
    2j – Greenwood Lakes Rapid Infiltration Basins Rehabilitation
3 – Eastern Orange and Seminole Counties Regional Reuse Project
4 – Altamonte Springs and Apopka Project RENEW APRICOT
5 – Winter Springs Lake Jesup Reclaimed Water Augmentation Project
6 – Sanford Surface WTP on Lake Monroe - Potable
7a – Seminole County Yankee Lake Reclaimed Water System Augmentation Project
7b – Seminole County Yankee Lake Regional Surface Water Facility - Potable
8 – Oviedo Reclaimed Water Projects; Kingsbridge West Phase I & Lake Rogers; Big Oak, Twin Rivers Phase I and Alafaya Woods 17 & 18; Division Street Reclaimed Water Main; Twin Rivers Reclaimed Water Main
9a – Surface WTP on St Johns River at SR46 - Non-Potable with Storage
9b – Surface WTP on St Johns River at SR46 - Potable
10a – Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage
10b – Surface WTP on St Johns River at Mullet Lake - Potable

Development of Associated Costs of the Alternative Water Supply Projects

Costs were developed either by Cooperators or by ARCADIS. ARCADIS developed the costs based on the Cost Estimating and Economic Criteria for 2005 District Water Supply Plan, SJRWMD. The total capital cost is the sum of construction cost, non-construction capital cost, land cost, and land acquisition cost. The unit production cost is based on the equivalent annual cost divided by the annual water production and expressed in terms of dollars per 1,000 gallons. The equivalent annual cost accounts for total capital cost and operation and maintenance costs with facility operating at average day design capacity.

Once costs were developed for each AWS project, consideration was given to potential cost-sharing for capital costs under the SJRWMD Water Protection and Sustainability Program (WPSP). The current funding SJRWMD basis is:

- Up to 40% of capital costs for surface water projects providing new public supply potable needs
- Up to 30% of capital costs for surface water augmentation projects
- Up to 20% of capital costs for reclaimed water projects

It should be further recognized that SJRWMD is prioritizing most of the future projected funding to cost-share on multi-jurisdictional surface water projects that provide new water to meet potable water supply needs. Therefore, future funding for these types of projects has a higher degree of certainty. Future funding for reclaimed water projects is uncertain and is likely to be lower than the current 20%, if funds are available at all. For the Plan the 20, 30 and 40 % were used based solely on the water use type of the AWS project i.e., surface water potable, surface water non-potable and reclaimed water. Actual funding will likely differ. Capital cost, potential WPSP cost sharing, total adjusted capital cost, O&M cost, equivalent annual cost, and unit production cost were developed for each AWS project and are summarized in Table 3.

Description of Alternative Water Supply Projects

Each Cooperator strives to satisfy potable and non-potable demands. Total demand equals the addition of the two components (potable and non-potable). In most cases the Cooperators maintain a CUP for groundwater withdrawals. The Cities of Oviedo and Sanford also maintain Reuse CUPs which limit surface water withdrawals. In an effort to use the highest raw water quality for potable uses first, the demand was split into 40% for potable needs and 60% non-potable needs. The 40/60 split was developed using SRJWMD data as well as other sources. By using the split, each option could be allocated based on the water quality, with highest water quality satisfying the potable needs first. Each AWS project was viewed by what need it would satisfy, thus two scenarios were used, potable options and non-potable options.

POTABLE WATER

Project 1 – Water Conservation/Demand Reduction

Description: Each Cooperator currently has a water conservation/demand reduction plan in effect that includes one or more of the following potable and non-potable water conservation strategies:

- Conservation Rate Structure
- Meter Replacement Program
- Low Volume Plumbing Programs
- Audits
- Reuse Water Program
- Xeriscape™ Projects/Codes
- Rain Sensor Program
- Public Education/Outreach
- Mail Outs to High Consumption Water Customers
- Water Line Retrofits
- Automatic Meter Reading

These methods are currently in use throughout the County to reduce water demand and increase water conservation awareness. With further awareness and implementation of these conservation methods, it is assumed that Cooperators can achieve a greater overall reduction in the short term with diminishing achievements as conservation efforts become universal.

Project 2 – North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study

Projects 2a through 2j were included in the North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study, 2004. The Study was developed by the three parties (Sanford, Lake Mary, and Seminole County) and is often referred to as the Tri-Party Plan. As previously mentioned, in some cases projects 2a through 2j have been updated with new information, provided by the Cooperators as part of this project. Adjusted capital costs are total capital minus the potential WPSP cost sharing dollars.

The water augmentation and reclaimed water system AWS projects allow the capability of users to move water between multi-jurisdictional Tri-party users. This type of project will maximize displacement of current and future potable water demand to reduce per capita consumption of potable water in high use neighborhoods, thereby maximizing effectiveness of alternative water supplies.

Key elements of each AWS project have been developed and are summarized as follows:

Project 2a – Sanford North WRF Augmentation/Reclaimed Water System Improvements

- Potential Entities Served: Sanford, Lake Mary and Seminole County
- Description: The project includes the addition of the following improvements to the Sanford North WRF: augmentation, chlorine contact chamber and associated piping and fittings; augmentation transfer pump station; Actiflo systems and associated piping and fittings; sodium hypochlorite system modifications and augmentation system sludge management system components.
- Water Supply Source: Surface water, St. Johns River
- Potential Project Yield: 7.3 mgd
- Total Adjusted Capital Cost: $4.3 Million
- Unit Production Cost: $0.21/kgal

Project 2b – Markham Woods Road Reclaimed Water Transmission Main

- Potential Entities Served: Seminole County
- Description: The project includes construction of approximately 40,000 feet of reclaimed water transmission main to serve reuse customers in a high irrigation area along Markham Woods Road as recommended in Tri-Party Optimization Plan
- Water Supply Source: Reclaimed water
- Potential Project Yield: 3.0 mgd
- Total Adjusted Capital Cost: $3.9 Million
- Unit Production Cost: $0.23/kgal

Project 2c – Orange Boulevard Reclaimed Water Transmission Main

- Potential Entities Served: Sanford, Lake Mary and Seminole County
- Description: Design and construct approximately 7,000 feet of reclaimed water transmission main on Orange Blvd from Markham Road to SR 46. Reclaimed main to increase capacity and interconnectivity of Tri-Party reclaimed water system.
- Water Supply Source: Reclaimed water

- Potential Project Yield: 2.5 mgd
- Total Adjusted Capital Cost: $0.4 Million
- Unit Production Cost: $0.03/kgal

Project 2d – New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46

- Potential Entities Served: Sanford, Lake Mary and Seminole County
- Description: This project proposes a new reclaimed water main along East Lake Mary Blvd from Sanford South WRC to SR 46; a new reclaimed water main extending west from Sanford South WRC around Sanford International Airport and tying into the east main at the corner of Victoria Street and Willow Avenue; and a new reclaimed water main along Riverview Avenue from the existing 20-inch water main at US 17-92 to the existing 16-inch water main on SR 46.
- Water Supply Source: Reclaimed water
- Potential Project Yield: 2.0 mgd
- Total Adjusted Capital Cost: $3.6 Million
- Unit Production Cost: $0.31/kgal

Project 2e – Timacuan Reclaimed Water Main Upgrade

- Potential Entities Served: Sanford, Lake Mary and Seminole County
- Description: The project includes a reclaimed water main along Timacuan Blvd from Rinehart Rd to Mohegan Blvd upgrade from 8" to 16".
- Water Supply Source: Reclaimed water
- Potential Project Yield: 2.9 mgd
- Total Adjusted Capital Cost: $0.8 Million
- Unit Production Cost: $0.05/kgal

Project 2f – Heathrow Boulevard Reclaimed Water Transmission Main

- Potential Entities Served: Sanford, Lake Mary and Seminole County
- Description: Design and construct approximately 18,000 feet of reclaimed water transmission main on CR 46A, Heathrow Blvd and Bridgewater Drive as recommended in the Tri-Party Optimization Plan. This allows the capability of users to move water between multi-jurisdictional Tri-party users.
- Water Supply Source: Reclaimed water
- Potential Project Yield: 2.5 mgd
- Total Adjusted Capital Cost: $1.7 Million
- Unit Production Cost: $0.12/kgal

Project 2g – Residential Reclaimed Water Retrofit – Phase I

- Potential Entities Served: Sanford, Lake Mary and Seminole County
- Description: Construct a residential reclaimed water retrofit in Heathrow Woods, Bristol Park, Chestnut Hill, East Camden and Magnolia Plantation to directly offset approximately 1.09 mgd of potable water currently used for irrigation. This will provide reuse for reclaimed water from Yankee Lake Wastewater Treatment Plant.
- Water Supply Source: Reclaimed water
- Potential Project Yield: 1.09 mgd
- Total Adjusted Capital Cost: $3.8 Million
- Unit Production Cost: $0.61/kgal

Project 2h – Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins

- Entities Served: Sanford, Lake Mary and Seminole County
- Description: Conveyance and storage of reclaimed water in an existing 240 MG pond in the Mill Creek drainage basin; installation of a pumping station, screening system and disinfection facilities to recover the stored water and deliver it to the existing reclaimed water distribution system; modification of an existing stormwater pond to conduct a new 2.3 MG reclaimed water storage pond; installation of a new 1.75 MG reclaimed water ground storage tank and associated piping and fittings at Greenwood

Lakes storage and re-pump facility; installation of any necessary appurtenances to allow for discharge of reclaimed/augmentation water into recharge basins; and the ability to deliver an additional 1.8 mgd of reclaimed/surface water for recharge and irrigation, improve system reliability, and reduce wet weather surface water discharges to the St. Johns River.

- Water Supply Source: Reclaimed water
- Potential Project Yield: 1.8 mgd
- Total Adjusted Capital Cost: $4.3 Million
- Unit Production Cost: $0.42/kgal

Project 2i – Seminole County/Sanlando Utilities Interconnect with Altamonte Springs

- Potential Entities Served: Altamonte Springs, Sanford, Winter Springs, and Utilities Inc Sanlando Utilities.
- Description: Install 16-inch reclaimed water main from Greenwood Lakes Wastewater Treatment Plant to Sanlando Utilities/Altamonte Springs Reclaimed System; and install 16-inch reclaimed water main from Seminole Community College to Winter Springs Water Reclamation Facility.

  This AWS project allows multi-jurisdiction transfer and use of reclaimed water which reduces the consumption of ground or surface water sources.
- Water Supply Source: Reclaimed water
- Potential Project Yield: 3.8 mgd
- Total Adjusted Capital Cost: $5.1 Million
- Unit Production Cost: $0.23/kgal

Project 2j – Greenwood Lakes Rapid Infiltration Basins Rehabilitation

- Potential Entities Served: Sanford, Lake Mary and Seminole County
- Description: Design and construct rehabilitation of the Greenwood Lakes Rapid Infiltration Basin site. Optimize aquifer recharge capacity of reclaimed water for existing basins. Assist with City of Sanford effluent disposal capacity displacement due to de-mucking of Lake Jesup. Rehabilitation will increase capacity of WWTF back to original design flows.

  The infiltration basins will provide a benefit to regional groundwater by allowing aquifer recharge.

- Water Supply Source: Reclaimed water
- Potential Project Yield: 1.0 mgd
- Total Adjusted Capital Cost: $0.5 Million
- Unit Production Cost: $0.09/kgal

Project 3 – Eastern Orange and Seminole Counties Regional Reuse Project

- Potential Entities Served: Seminole County, Oviedo
- Description: This project was identified in the 2005 District Water Supply Plan (DWSP). This project will utilize reclaimed water from the Iron Bridge Regional Water Reclamation Facility (WRF). Seminole County currently has an agreement to accept 8.0 mgd of reclaimed water from Iron Bridge. Seminole County has agreements with the City of Oviedo to send 3.0 mgd of the allocated amount and with the University of Central Florida to send 3.3 mgd. The total cost was determined based on the total estimated project cost of $45 Million and the total flow for the Eastern Reuse project of 19.4 mgd which is $2.32/gallon. It was assumed that Seminole County would contribute the proportionate amount equal to the 8.0 mgd allocation.

  This AWS project allows multi-jurisdiction transfer and use of reclaimed water which reduces the consumption of ground or surface water sources.

- Water Supply Source: Reclaimed water
- Potential Project Yield: 4.7 mgd
- Total Adjusted Capital Cost: $14.8 Million
- Unit Production Cost: $0.18/kgal

Project 4 – Altamonte Springs and Apopka Project RENEW APRICOT

- Potential Entities Served: Altamonte Springs
- Description: The City of Altamonte Springs currently discharges excess reclaimed water from its Regional Reclamation Facility to the Little Wekiva River. The City is proposing to transmit up to 6 mgd of reclaimed water to Project ARROW in Apopka. Design of the transmission facilities will include the ability to convey up to 6 mgd with the additional 3 mgd coming from various sources. Phase I includes six miles of 16-inch transmission line with a capacity of 6 mgd. Phase II includes upgrades to the Altamonte RWRF to improve reclaimed water quality as required by Project ARROW in Apopka.

The reclaimed water previously sent to the Little Wekiva River will be help to satisfy the remaining water needs of Apopka and will provide regional benefits by reducing the ground and/or surface water withdrawals.

- Water Supply Source: Reclaimed Water
- Potential Project Yield: 6.0 mgd
- Total Adjusted Capital Cost: $10.8 Million
- Unit Production Cost: $0.4/kgal

Project 5 – Winter Springs Lake Jesup Reclaimed Water Augmentation Project

- Potential Entities Served: Casselberry, Longwood, Oviedo, Winter Springs, and Seminole County
- Description: Treatment, storage, and pumping of surface waters of Lake Jesup for reclaimed water augmentation and system expansion to reduce potable water demands. The City is also considering augmentation of an adjacent uncapped spring of approximately 0.7 mgd.
- Water Supply Source: Surface water, Lake Jesup
- Potential Project Yield: 2.25 mgd
- Total Adjusted Capital Cost: $4.7 Million
- Unit Production Cost: $0.58/kgal

Project 6 – Sanford Surface WTP on Lake Monroe - Potable

- Potential Entities Served: Sanford
- Description: The proposed augmentation system would draw water from the St. Johns River and would include treatment through an Actiflo system followed by filtration through Dynasand filters and chlorine disinfection.

  The water augmentation and reclaimed water system project will maximize the effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption of potable water in high use neighborhoods.
- Water Supply Source: Surface water, St. Johns River at Lake Monroe
- Potential Project Yield: 4.0 mgd
- Total Adjusted Capital Cost: $8.3 Million

- Unit Production Cost: $0.62/kgal

Project 7a – Seminole County Yankee Lake Reclaimed Water System Augmentation Project

- Potential Entities Served: Lake Mary, Sanford, Seminole County, and Sanlando Utilities

- Description: This project proposes construction of a 10 mgd surface water treatment plant to treat water to reclaimed water standards using the St. Johns River as a water source. The surface water will receive Actiflo treatment followed by chlorine disinfection.

  The water augmentation/reclaimed water system AWS project allow the capability of users to move water between multi-jurisdictional users. This type of project will maximize displacement of current and future potable water demand to reduce per capita consumption of potable water in high use neighborhoods, thereby maximizing effectiveness of alternative water supplies.

- Water Supply Source: Surface water, St. Johns River at Lake Monroe

- Potential Project Yield: 10.0 mgd Phase I and 15.0 mgd in Phase II

- Total Adjusted Capital Cost: $22 Million (Phase I)

- Unit Production Cost: $1.26/kgal (Phase I)

Project 7b – Seminole County Yankee Lake Regional Surface Water Facility - Potable

- Potential Entities Served: Sanford, Lake Mary, Longwood, Winter Springs, Seminole County, and Sanlando Utilities

- Description: Design and construct a potable water storage and re-pump facility at the Yankee Lake Water Reclamation Facility site location. This project proposes construction of a 25 mgd surface water treatment plant to treat water to potable water standards using the St. Johns River as a water source. The surface water will receive Actiflo treatment followed nanofiltration, reverse osmosis and UV disinfection.

  Surface water as source for potable water will reduce the demands on ground water supply.

- Water Supply Source: Surface Water, St Johns River at Lake Monroe

- Potential Project Yield: 25.0 mgd

- Total Adjusted Capital Cost: $120 Million

- Unit Production Cost: $3.05/kgal

Project 8 – Oviedo Reclaimed Water Projects

- Potential Entities Served: Oviedo

- Description: Installation of a new service main into Kingsbridge West Subdivision, scheduled for 2006; and installation of reclaimed water distribution system into Kingsbridge West Phase I and Lake Rogers, scheduled for 2007. Installation of reclaimed water distribution system into Big Oak, Twin Rivers Phase I and Alafaya Woods Phases 17 and 18. Installation of reclaimed water transmission main on Division St between Mitchell Hammock Road and CR 419; installation of reclaimed water transmission main north on Division St from CR 419; and install connection from north Division St to Lake Charm Country Estates and the Meadows.

  This type of project will maximize displacement of current and future potable water demand to reduce per capita consumption of potable water in high use neighborhoods, thereby maximizing effectiveness of alternative water supplies.

- Water Supply Source: Reclaimed water

- Potential Project Yield: 1.5 mgd

- Total Adjusted Capital Cost: $5.2 Million

- Unit Production Cost: $0.6/kgal

Project 9a– Surface WTP on St Johns River at SR46 - Non-Potable with Storage

- Potential Entities Served: Sanford, Seminole County, Oviedo, and Winter Springs, Volusia County

- Description: The project is proposed as a multi-jurisdictional potable and non-potable facility with a surface water source. A potential location of the facility is the Sanford’s Site 10, which is adjacent to SR46, the St Johns River and Lake Jessup. The intake structure would be located on the St Johns River at SR46. Membrane technology would be used to treat to potable water standards. The non-potable water needs would be served by a lesser degree of treatment that would satisfy non-potable water standards. A reservoir to provide non-potable water storage would be constructed.

  The reclaimed water augmentation AWS project allows the capability of users to move water between multi-jurisdictional users. The storage element of the project will allow the capture of fresh water during the rainy season for distribution during the dry season. This type of project will maximize displacement of current and future potable water demand to reduce per capita consumption of potable water, thereby maximizing effectiveness of alternative water supplies.

- Water Supply Source: Surface water, St Johns River

- Potential Project Yield: 5.0 mgd in Phase I and 10 mgd in Phase II

- Total Adjusted Capital Cost: $15.8 Million (Phase I)

- Unit Production Cost: $0.82/kgal (Phase I)

Project 9b– Surface WTP on St Johns River at SR46 - Potable

- Potential Entities Served: Sanford, Seminole County, Casselberry, Oviedo, Winter Springs, and Volusia County

- Description: The project will be a multi-jurisdictional potable and non-potable facility with a surface water source. A potential location of the facility is the Sanford's Site 10, which is adjacent to SR46, the St Johns River and Lake Jessup. The intake structure would be located on the St Johns River at SR46. Membrane technology would be used to treat to potable water standards.

  Surface water as source for potable water will reduce the demands on ground water supply.

- Water Supply Source: Surface water, St Johns River

- Potential Project Yield: 7.0 mgd in Phase I and 26 mgd in Phase II

- Total Adjusted Capital Cost: $29.1 Million (Phase I)

- Unit Production Cost: $1.25/kgal (Phase I)

Project 10a – Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage

- Potential Entities Served: Sanford, Seminole County, Oviedo, and Winter Springs, Volusia County

- Description: The project will be a multi-jurisdictional potable and non-potable facility with a surface water source. A potential location of the facility is the Sanford's Site 10, which is adjacent to SR46, the St Johns River and Lake Jessup. The intake structure would be located on the Mullet Lake. Membrane technology would be used to treat to potable water standards. The non-potable water needs would be served by a lesser degree of treatment that would satisfy non-potable water standards. A reservoir to provide non-potable water storage would be constructed.

The reclaimed water augmentation AWS project allows users to move water between multi-jurisdictional users. The storage element of the project will allow the capture of fresh water during the rainy season for distribution during the dry season. This type of project will maximize the effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption of potable water.

- Water Supply Source: Surface water, St Johns River
- Potential Project Yield: 5.0 mgd in Phase I and 10 mgd in Phase II
- Total Adjusted Capital Cost: $17.1 Million (Phase I)
- Unit Production Cost: $0.87/kgal (Phase I)

Project 10b – Surface WTP on St Johns River at Mullet Lake- Potable

- Potential Entities Served: Sanford, Seminole County, Casselberry, Oviedo, Winter Springs, and Volusia County
- Description: The project will be a multi-jurisdictional potable and non-potable facility with a surface water source. A potential location of the facility is the Sanford's Site 10, which is adjacent to SR46, the St Johns River and Lake Jessup. The intake structure would be located on the Mullet Lake. Membrane technology would be used to treat to potable water standards.

  Surface water as source for potable water will reduce the demands on ground water supply.
- Water Supply Source: Surface water, St Johns River
- Potential Project Yield: 7.0 mgd in Phase I and 26 mgd in Phase II
- Total Adjusted Capital Cost: $29.6 Million (Phase I)
- Unit Production Cost: $1.27/kgal (Phase I)

Alternative Water Supply Projects Satisfaction of Deficits and Schedule

As shown above in the project descriptions the AWS project vary in water source (potable and non-potable including reclaimed and irrigation quality). There is also an inherent difference in capacity ranging from 1.1 to 25.0 mgd. To effectively evaluate the significance, each project's capacity was divided by the deficit in 2025 and 2045 to calculate the percent of satisfaction. In this way, the "bang for the buck" effect of each AWS project can be considered. It was assumed that there is 100% replacement of potable water from reclaimed water sources, which is the SJRWMD goal for 2025. For example the following steps were used:

1. Project 6 has a capacity of 4 mgd.
2. The 2025 potable deficit is 5.1 mgd.
3. 4/5.1 = 79%.
4. Therefore Project 6 can satisfy 79% of the potable water deficit in 2025.

Another component to consider is the project schedule. In order to be consistent with the DWSP, the overall schedule is a series of several tasks.

- Partnering agreements
- Consultant selection
- Design/Permit/Bid
- Construction/Startup

A schedule is provided for each AWS project. The schedule is based on current knowledge and is subject to change. Table 4 summarizes the 2025 and 2045 percent-deficit satisfaction, as well as capacity, adjusted capital costs, unit costs ($/1000 gallon) and schedule.

To facilitate the Cooperators' review of the Plan, Table 5 was developed to show potential projects available to each Cooperator (based on geography and current partnering agreements) and how the AWS project would satisfy the developed deficits. The Individual Cooperator Adjusted Deficits by Project tables are provided in Appendix B.

ALTERNATIVE WATER SUPPLY PROJECT EVALUATION CRITERIA

As previously stated the Cooperators agreed that the final list of project evaluation criteria in order of ranking is:

1. Environmental Impact
2. Cost

The environmental impact criterion was developed with the aid of GIS mapping. Numerous databases were compiled from State and Federal sources in order to evaluate environmental impact. The GIS data and software to view the data (ArcReader) are provided on a disk in Appendix D. One copy of the disk is provided to each Cooperator. The GIS data is interactive and provides geographic locations of AWS project improvements at a street level, summary of provided data in an Adobe PDF format and other relevant data. Environmental impact considerations for the purpose of the Plan are:

a) Potential harm caused by the consumptive use to water bodies' minimum flow levels (MFLs). Three conditions applied:
    - Established MFL
    - Pending MFL
    - Absence of MFL

b) Presence of protected habitats (wetland and conservation areas) using:
    - FNAI Conservation Lands
    - Strategic Habitat Conservation Areas
    - National Wetlands Inventory

c) Proximity to conservation land, aquatic preserves, national/state parks using:
    - SJRWMD Springs
    - Outstanding Waters
    - Aquatic Preserve Boundaries
    - Florida State Parks

d) Existence of protected or economically important species (bald eagle, scrub jay, gopher tortoise, etc) using:
    - Eagle Nest Locations
    - FNAI Species Occurrence
    - Listed Species (FFWCC)
    - FDEP Ecological Boundaries

e) Consideration of cultural factors (Archeological and Historical sites) using:
    - Historical Structures
    - Indian Areas

Costs developed for each AWS project and were evaluated on two considerations:

- Units Costs, $/1000 gallons ($/kgal)
- O&M Cost, $Million/yr ($M/yr)

Criteria Weighting and Scoring

ARCADIS has applied a weighting factor to each criterion. The higher the cumulative score, the higher the rank. Rank was determined by multiplying the criteria score by a weighting factor. The following weighting factors (WF) indicated importance:

1) Most Important (WF=3)
2) Important (WF=2)
3) Marginal (WF=1)

Scoring was developed in ranges with a maximum score of 4 which is the preferred site characteristic. The environmental impact criterion consists of 5 parts. The WF and scoring methodology was applied as follows

a) MFLs with WF=3
   - 0 = Does not meet MFL
   - 1 = No MFL set
   - 2 = Pending MFL
   - 3 = Meets MFL
   - 4 = Not Applicable

b) Presence of protected habitats with WF=2
   - 1 = yes
   - 2 = no

c) Proximity to conservation land with WF=2
   - 0 = within conservation land
   - 1 = within 100 ft
   - 2 = within 500 ft
   - 3 = 500-1000 ft
   - 4 = >1000 ft

d) Existence of protected or economically important species with WF=3
   - 1 = yes
   - 2 = no

e) Consideration of cultural factors with WF=2
   - 1 = within 500 ft
   - 2 = >500 ft

The costs criterion consists of 2 parts. The WF and scoring methodology was applied as follows

a) Adjusted Capital Costs with WF=3
   - 1= > $1/kgal
   - 2 = $0.5-1/kgal
   - 3 =$0.25-0.5/kgal
   - 4 = <$0.25/kgal)

b) O&M Cost with WF=1
   - 1=> $0.5/kgal
   - 2 = $2-5/kgal

Each AWS project has a scoring sheet that summarizes the criteria, weighting factors, criteria score, weighted score (environmental impact and costs) and total score. Please refer to Appendix C.

ALTERNATIVE WATER SUPPLY PROJECT RANKINGS

Ranking of Preferred Alternative Water Supply Projects

Based on workshop discussion, three projects rankings were developed

1. Environmental Impact
2. Cost
3. Total (Environmental Impact + Costs)

Table 6 presents each AWS project in ranked order for the environmental impact criterion. Table 7 presents each AWS project in ranked order for the cost criterion. The scores for environmental impact and cost are summed and thereby ranked and shown on Table 8.

It is important to remember that the ranking of the projects is subjective as the AWS projects do not cover the same geographical area. The ranking provides a guideline for further investigation and evaluation by the Cooperators. AWS project details are subject to change, funding availability, CIP plans, availability of willing partners, etc.

SUGGESTED COOPERATOR ACTION ITEMS

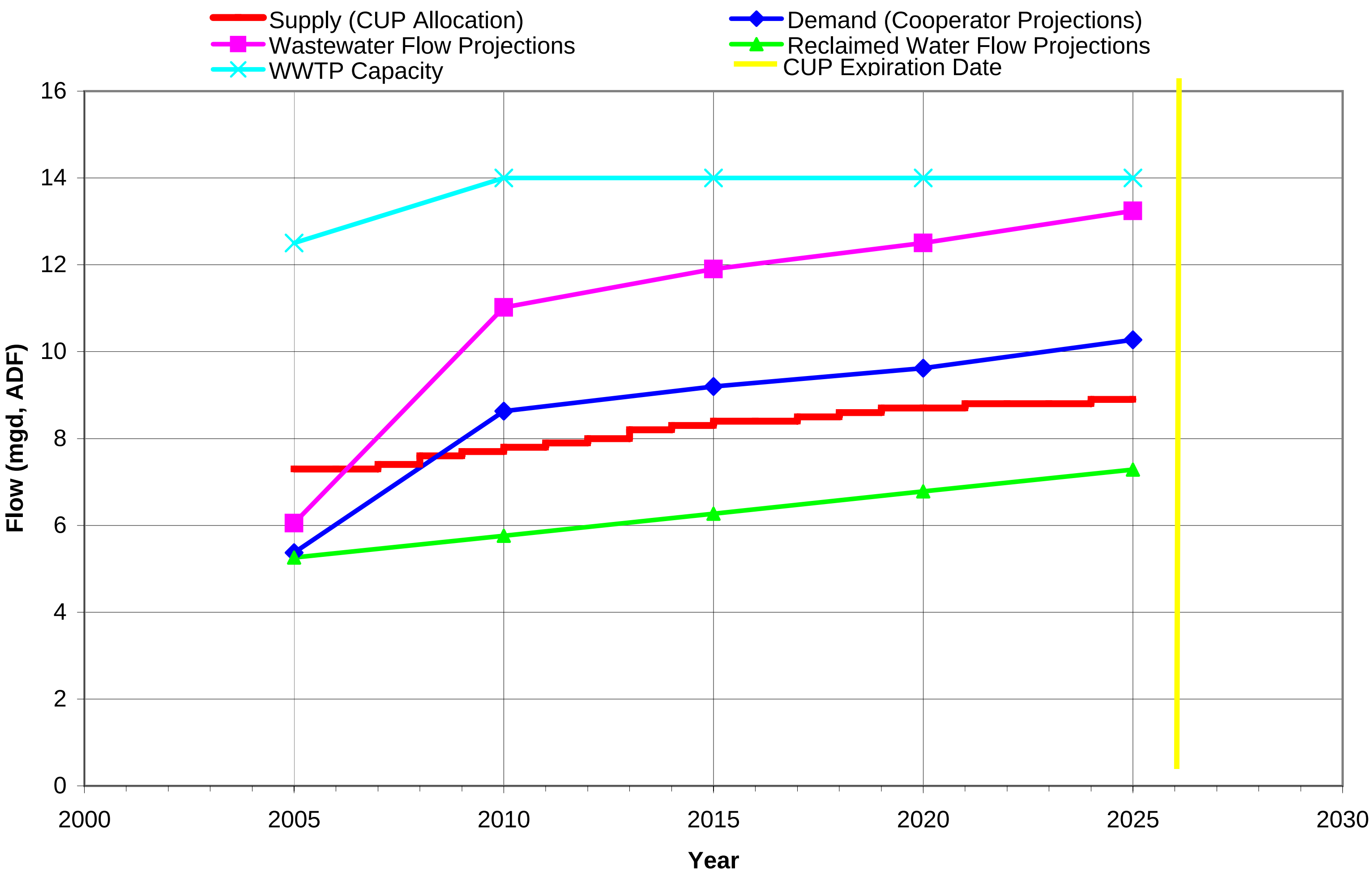
As water sources become limited or unavailable, regional planning will be required to satisfy the water supply needs of Florida. This is evidenced by the CFCA Action Plan. The Cooperators have shown their ability to consider regional planning with the culmination of this Plan. To conduct regional planning and implementation efforts, new partnerships and vehicles of implementation may need to be developed. This Plan and the knowledge of the AWS project details, scoring outcome of the criteria points, and ranking (as presented in this TM) is a basis for the Cooperators to take the next step in the process of developing and implementing alternative water supply sources for future needs. At present, the following actions items are scheduled.

1. Gerald Chancellor and ARCADIS will present the Plan to Team A (City Managers) for their review and approval, February 2007.
2. Gerald Seeber presents the Plan to the Seminole joint County/City elected officials meeting in March 2007.

Other suggested milestones/schedules for Cooperator's consideration are:

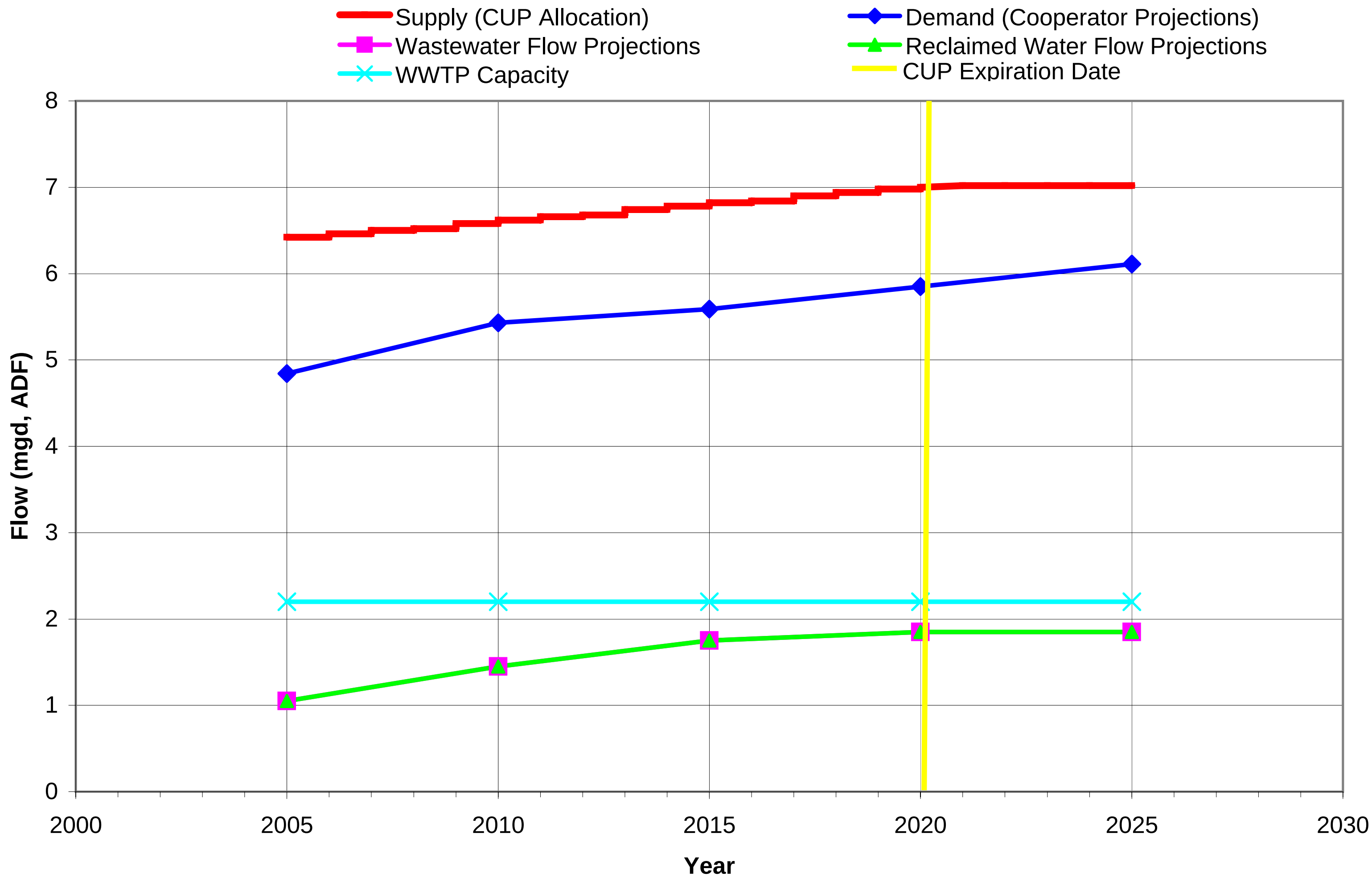
- 2007 - Development of implementation strategies; and Partnership Evaluation and Potential Agreements
- 2007 to 2013 - Initiate Planning, Design, Permitting, and Construction as appropriate

Figure 2: City of Altamonte Springs - Summary of Projections



*If the groundwater allocations are restricted in 2013 as indicated by the Action Plan for the Central Florida Coordination Area (CFCA), the Supply (CUP) is subject to change.

Figure 3: City of Casselberry - Summary of Projections



*If the groundwater allocations are restricted in 2013 as indicated by the Action Plan for the Central Florida Coordination Area (CFCA), the Supply (CUP) is subject to change.

SEMINOLE COUNTY WATER SUPPLY PLAN

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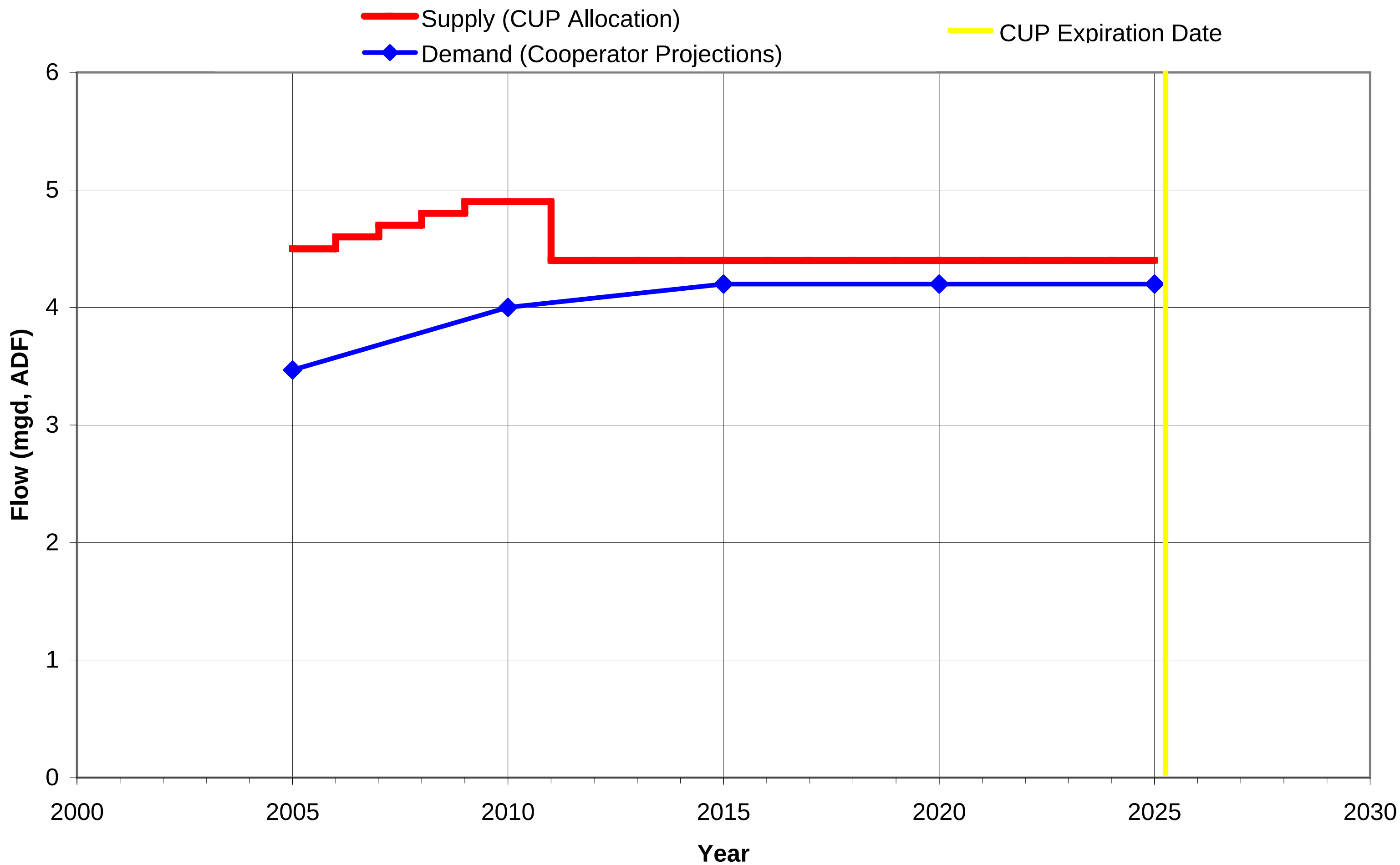
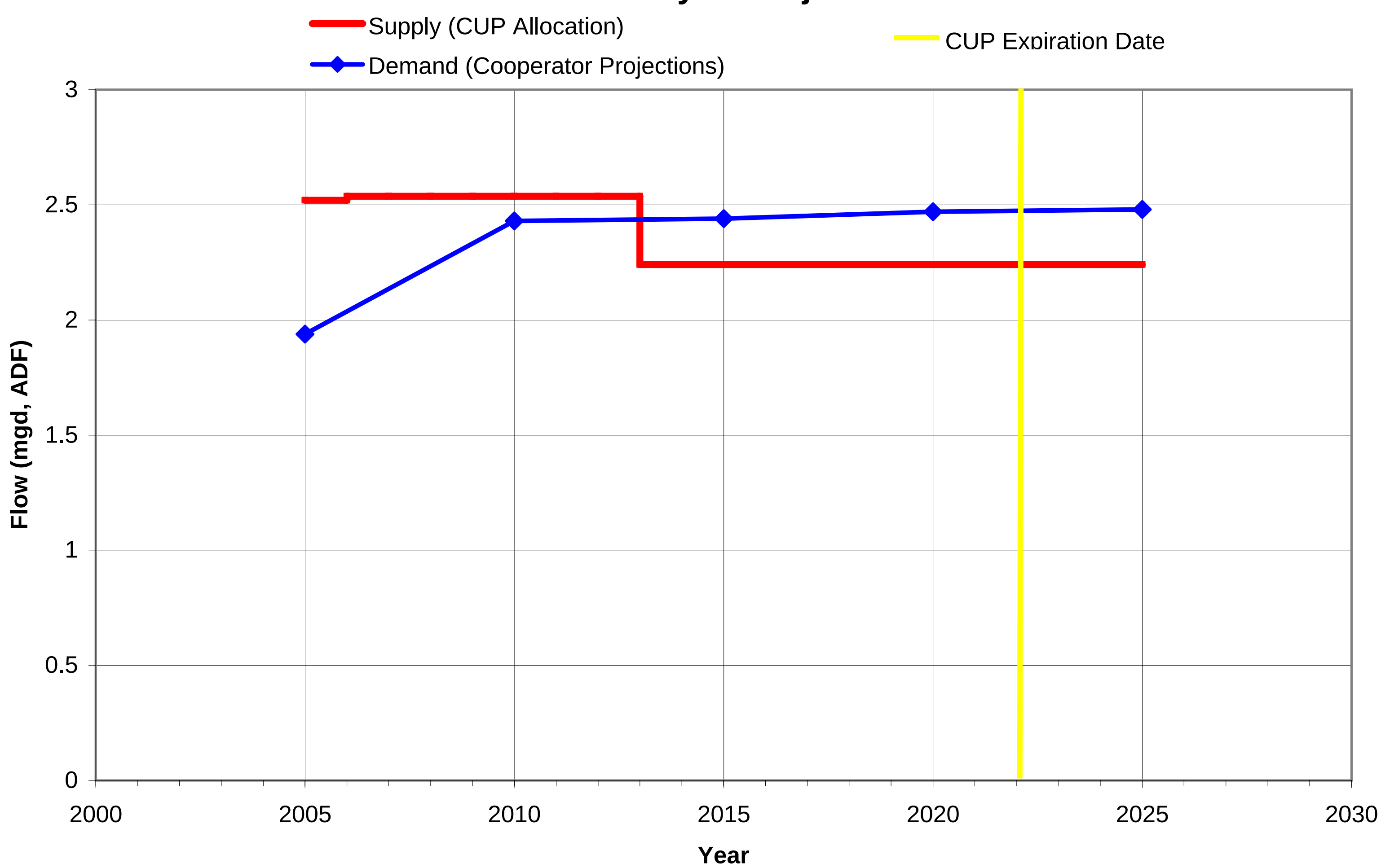
Figure 4: City of Lake Mary - Summary of Projections



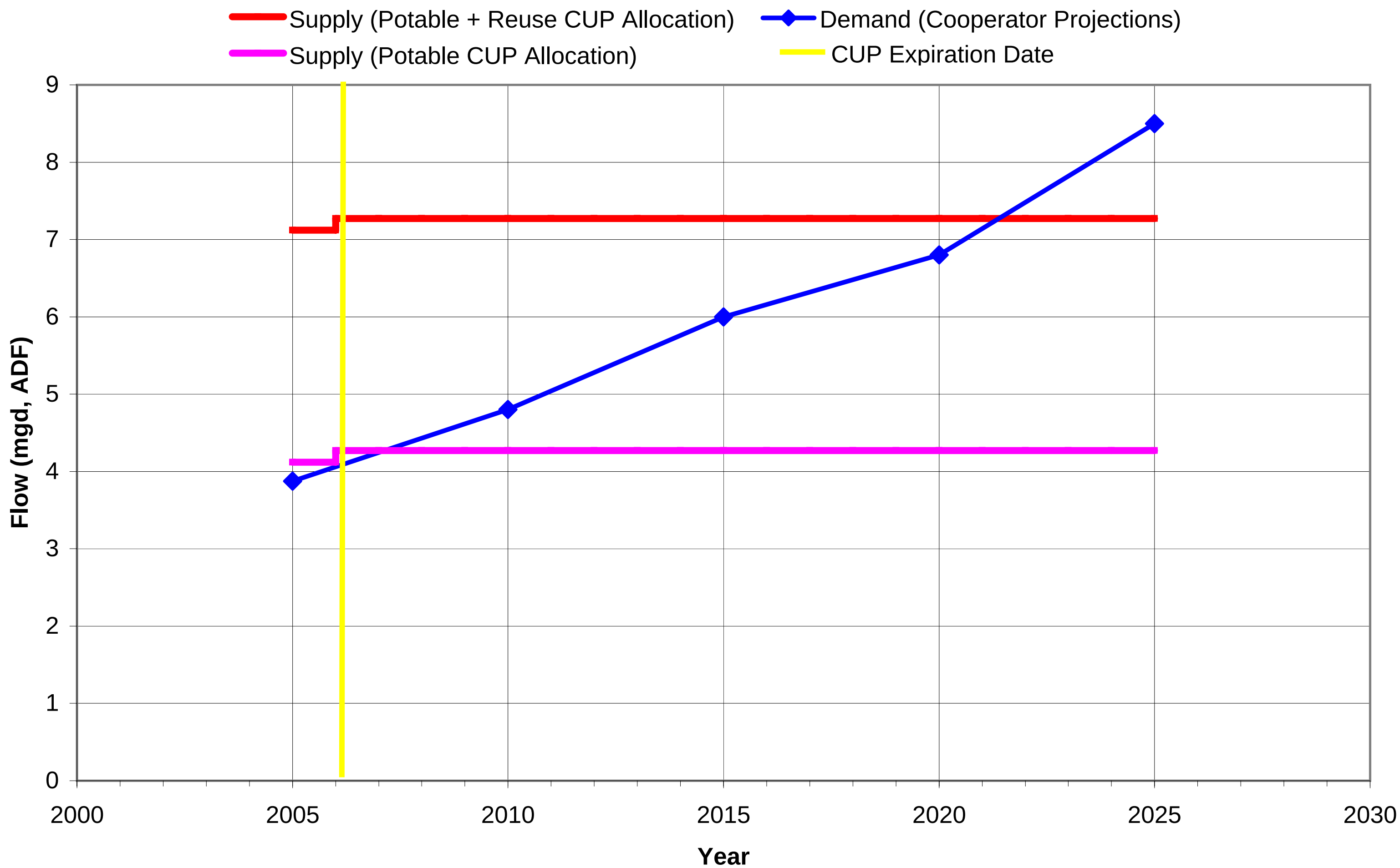
*If the groundwater allocations are restricted in 2013 as indicated by the Action Plan for the Central Florida Coordination Area (CFCA), the Supply (CUP) is subject to change.

Figure 5: City of Longwood - Summary of Projections

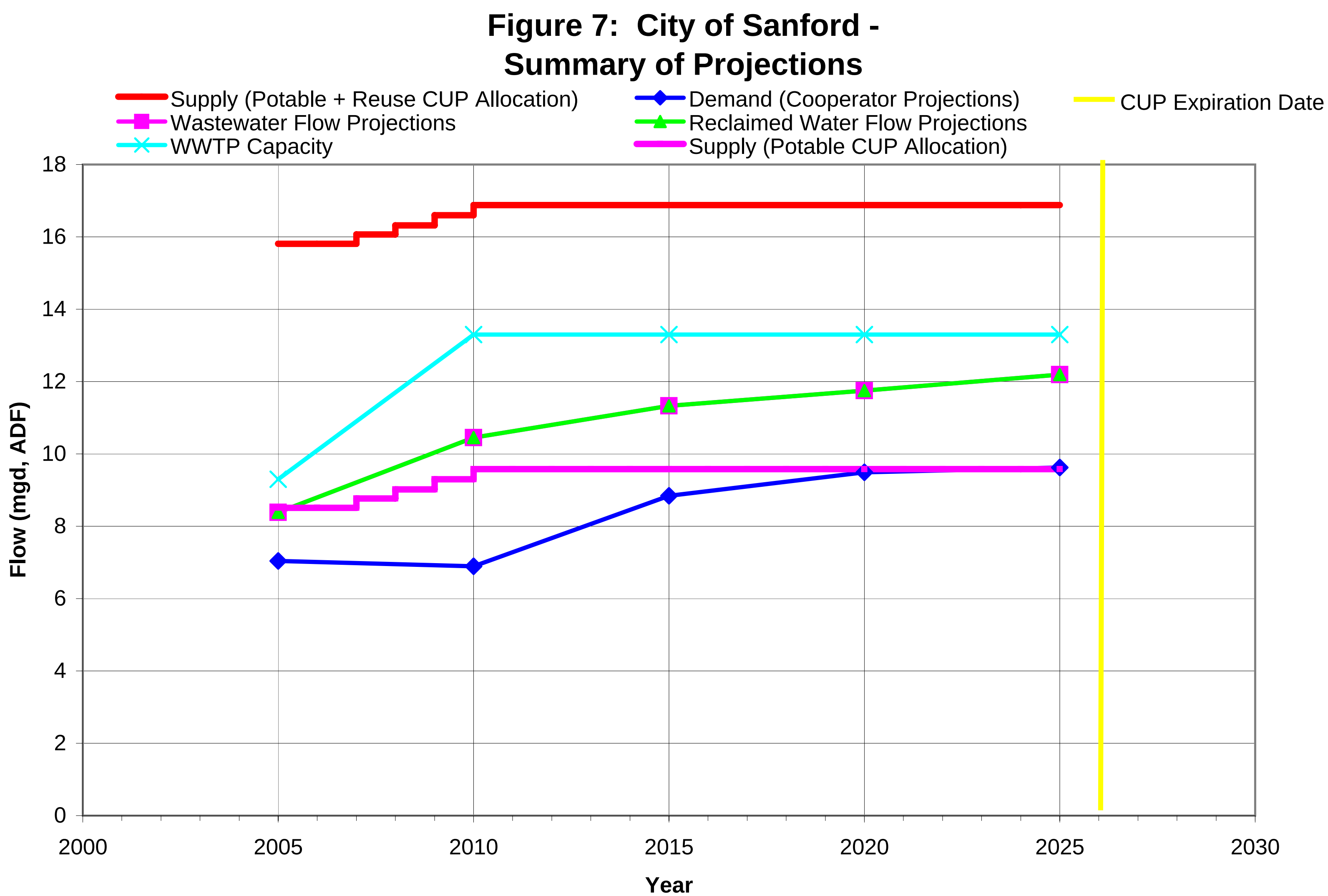


*If the groundwater allocations are restricted in 2013 as indicated by the Action Plan for the Central Florida Coordination Area (CFCA), the Supply (CUP) is subject to change.

Figure 6: City of Oviedo - Summary of Projections



*If the groundwater allocations are restricted in 2013 as indicated by the Action Plan for the Central Florida Coordination Area (CFCA), the Supply (CUP) is subject to change.



*If the groundwater allocations are restricted in 2013 as indicated by the Action Plan for the Central Florida Coordination Area (CFCA), the Supply (CUP) is subject to change.

SEMINOLE COUNTY WATER SUPPLY PLAN

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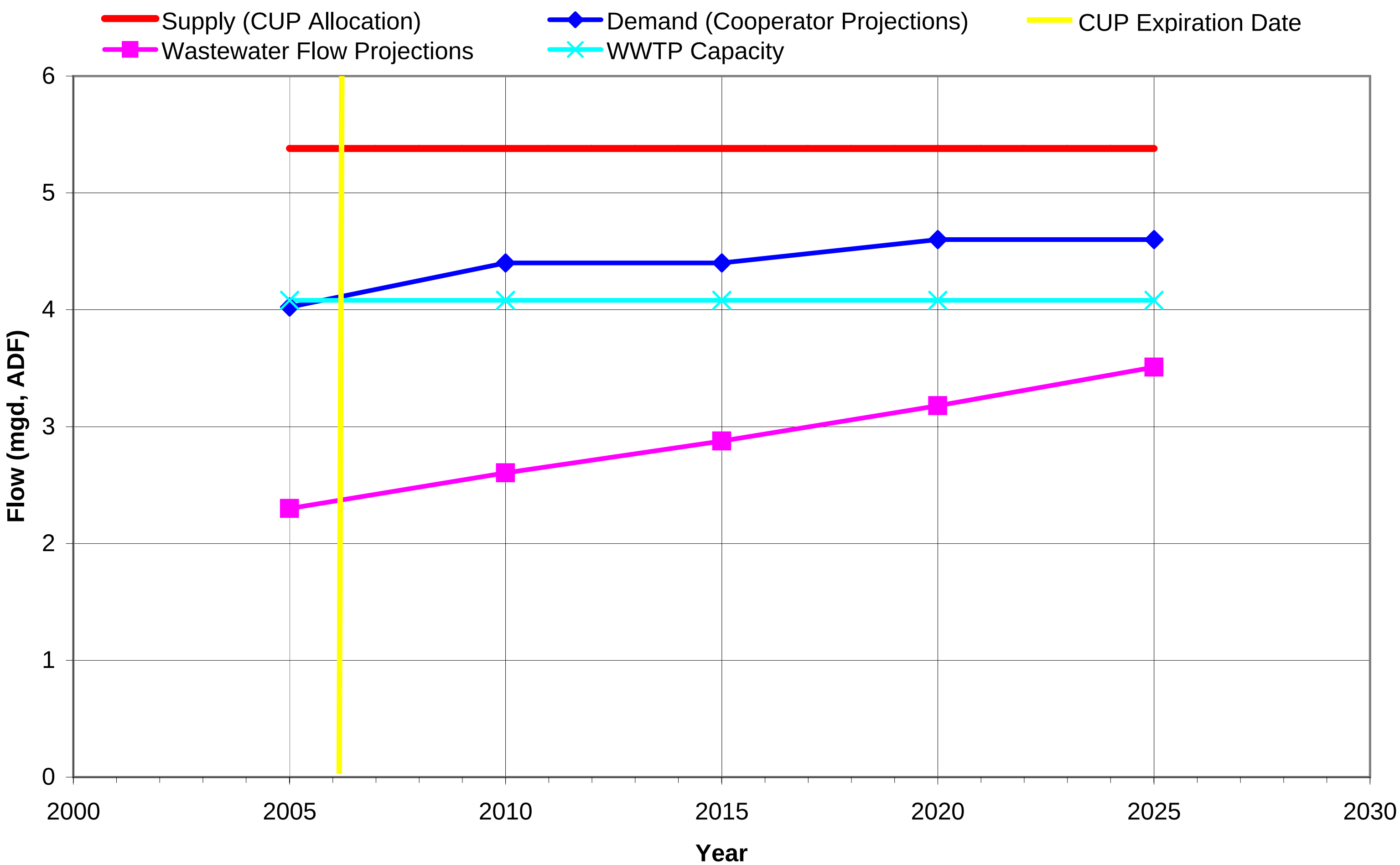
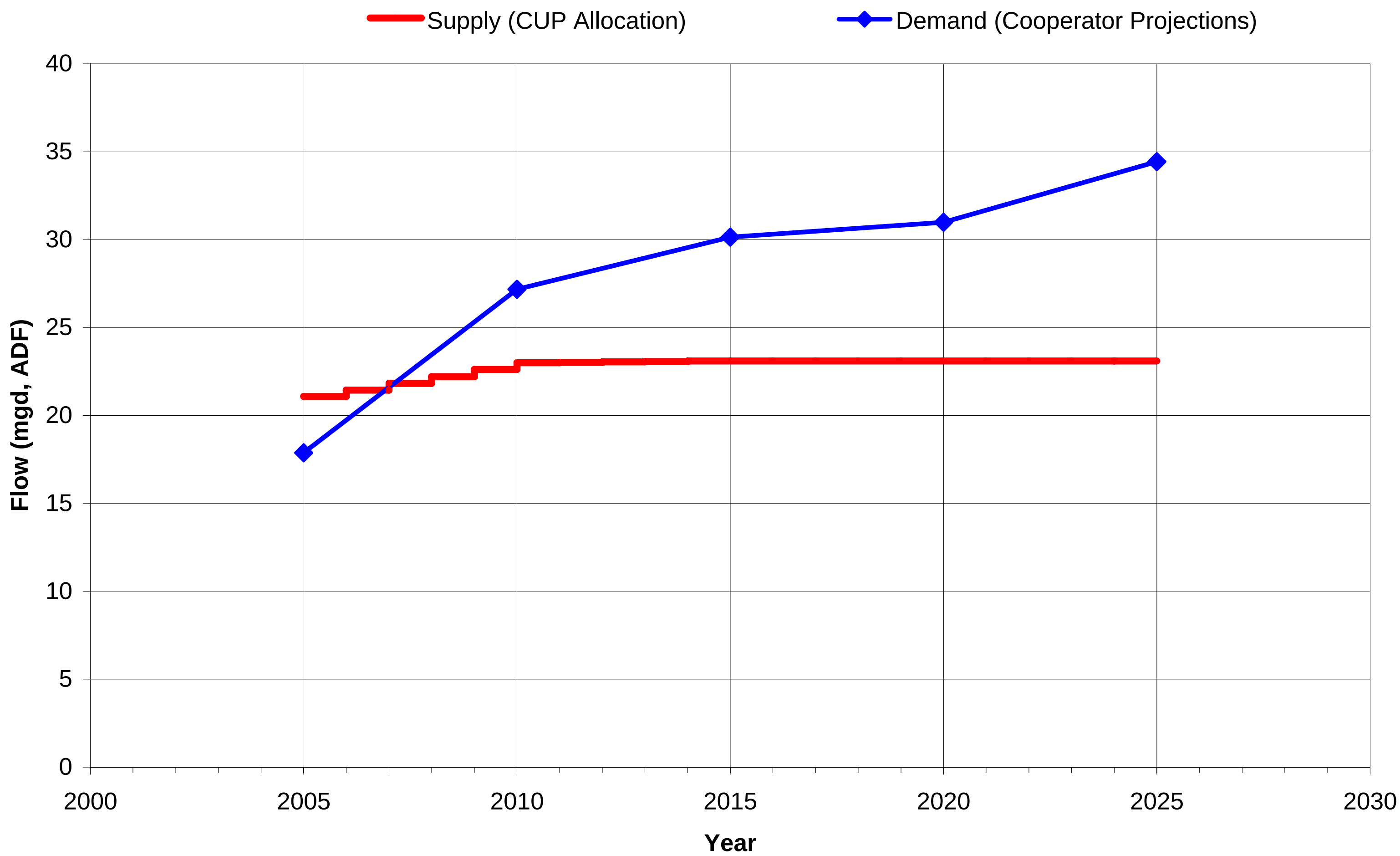
Figure 8: City of Winter Springs - Summary of Projections



*If the groundwater allocations are restricted in 2013 as indicated by the Action Plan for the Central Florida Coordination Area (CFCA), the Supply (CUP) is subject to change.

Figure 9: Seminole County Utilities
Summary of Projections



*If the groundwater allocations are restricted in 2013 as indicated by the Action Plan for the Central Florida Coordination Area (CFCA), the Supply (CUP) is subject to change.

Figure 10: Seminole County Water Supply Summary (MGD)

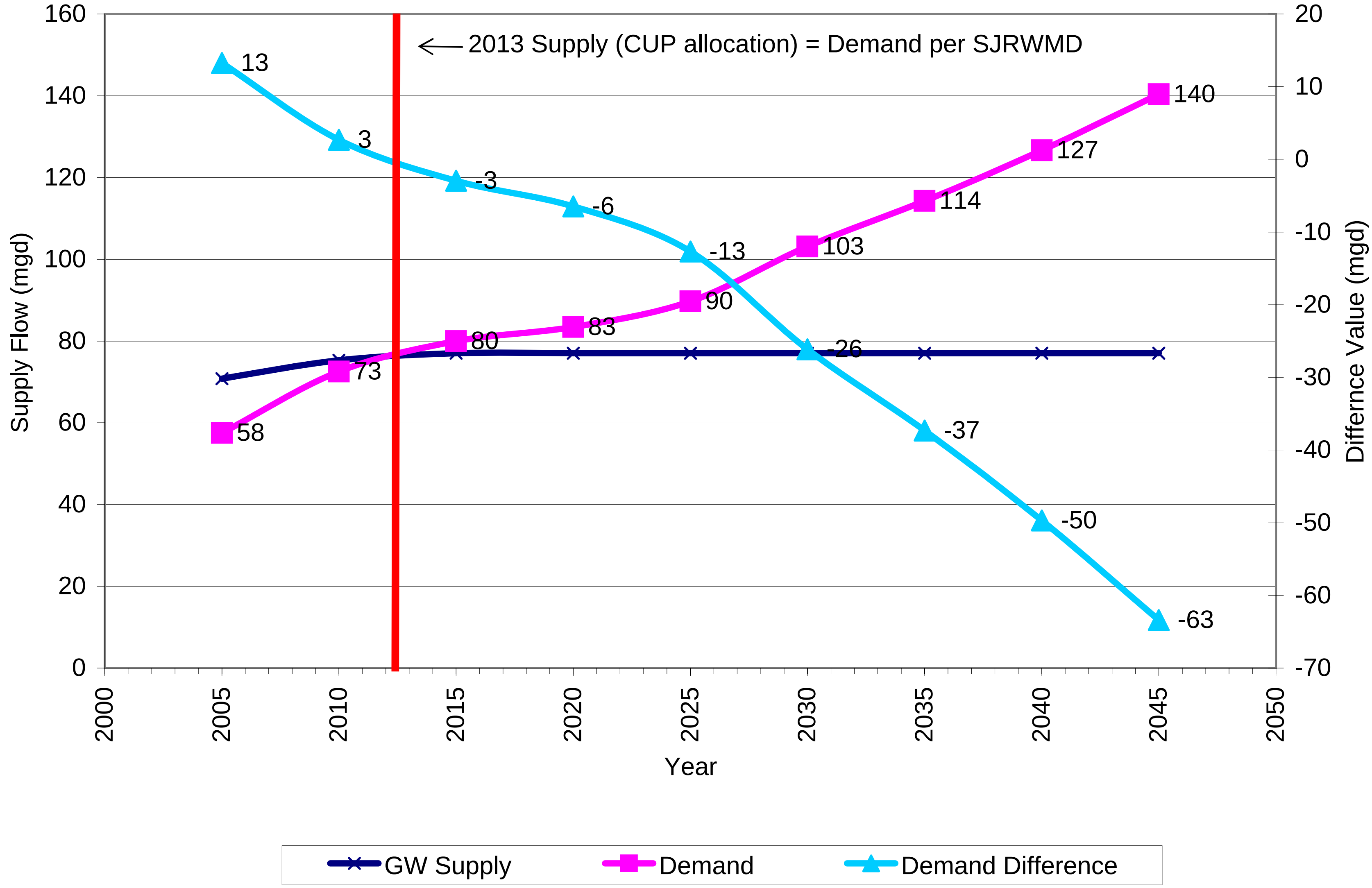


Table 1: Seminole County Characteristics Summary, mgd

Projection Date	Population	Supply (1)	Demand (2)	Demand Difference
2005	397,762	71	58	13
2010	435,544	75	73	3
2015	470,523	77	80	-3
2020	490,523	77	83	-6
2025	512,957	77	90	-13
2030	554,827	77	103	-26
2035	590,761	77	114	-37
2040	629,023	77	127	-50
2045	669,762	77	140	-63

Notes:
1. Supply is equal 2013 Demand
2. Demand is Cooperator provided projections through 2025 (blended data set).
3. 2030 - 2045 Demand is projected by linear forecast from the 2005 to 2025 data

Table 2: Cooperator Water Characteristics Summary, mgd

Owner	2005			2010			2013			2015			2020			2025		
	Supply [1]	Demand [2]	Difference	Supply	Demand	Difference	Supply	Demand	Difference	Supply	Demand	Difference	Supply	Demand	Difference	Supply	Demand	Difference
COOPERATORS																		
City of Altamonte Springs*	7.30	5.37	1.93	7.80	8.63	-0.83	8.97	8.97	0.00	8.97	9.20	-0.23	8.97	9.62	-0.65	8.97	10.06	-1.09
City of Casselberry	6.42	4.84	1.58	6.62	5.43	1.19	5.53	5.53	0.00	5.53	5.59	-0.06	5.53	5.85	-0.32	5.53	6.11	-0.58
City of Lake Mary	4.50	3.47	1.03	4.90	4.00	0.90	4.12	4.12	0.00	4.12	4.20	-0.08	4.12	4.20	-0.08	4.12	4.20	-0.08
City of Longwood	2.52	1.94	0.58	2.54	2.43	0.11	2.44	2.44	0.00	2.44	2.44	0.00	2.44	2.47	-0.03	2.44	2.48	-0.04
City of Oviedo	4.12	3.88	0.2	4.27	4.8	-0.52	5.51	5.5	0.00	5.51	6.0	-0.48	5.51	6.8	-1.32	5.51	8.5	-2.99
City of Sanford	8.51	7.04	1.47	9.58	6.89	2.69	8.06	8.06	0.00	8.06	8.84	-0.78	8.06	9.49	-1.43	8.06	9.62	-1.56
City of Winter Springs	5.19	4.02	1.17	5.38	4.40	0.98	4.40	4.40	0.00	4.40	4.40	0.00	4.40	4.60	-0.20	4.40	4.60	-0.20
Seminole County - Northeast*	3.02	1.81	1.21	3.02	3.55	-0.53	3.58	3.58	0.00	3.58	3.60	-0.02	3.58	3.93	-0.35	3.58	4.29	-0.71
Seminole County - Northwest*	6.43	5.09	1.34	8.23	9.96	-1.73	10.89	10.89	0.00	10.89	11.51	-0.62	10.89	11.72	-0.83	10.89	11.93	-1.04
Seminole County - Southeast	9.15	9.00	0.15	9.15	11.20	-2.05	11.94	11.94	0.00	11.94	12.43	-0.49	11.94	12.67	-0.73	11.94	15.53	-3.59
Seminole County - Southwest*	1.48	1.16	0.32	1.48	1.40	0.08	1.44	1.44	0.00	1.44	1.46	-0.02	1.44	1.46	-0.02	1.44	1.46	-0.02
Seminole County - Apple Valley	0.52	0.50	0.02	0.64	0.62	0.02	0.67	0.67	0.00	0.67	0.70	-0.03	0.67	0.76	-0.09	0.67	0.81	-0.14
Seminole County - Druid Hills	0.13	0.10	0.03	0.13	0.11	0.02	0.11	0.11	0.00	0.11	0.11	0.00	0.11	0.11	0.00	0.11	0.11	0.00
Seminole County - Meredith Manor	0.35	0.22	0.13	0.35	0.33	0.02	0.33	0.33	0.00	0.33	0.33	0.00	0.33	0.34	-0.01	0.33	0.34	-0.01
PRIVATE UTILITES																		
Aqua Utilities	0.53	0.37	0.16	0.53	0.75	-0.22	0.85	0.85	0.00	0.85	0.91	-0.06	0.85	1.08	-0.23	0.85	1.22	-0.37
Palm Valley MHP	0.24	0.15	0.09	0.24	0.38	-0.14	0.42	0.42	0.00	0.42	0.44	-0.02	0.42	0.43	-0.01	0.42	0.44	-0.02
Utilities Inc - Sanlando Utilities	9.71	8.06	1.65	9.71	7.05	2.66	7.11	7.11	0.00	7.11	7.16	-0.04	7.11	7.26	-0.15	7.11	7.34	-0.23
Utilities Inc - Oakland Shores	0.10	0.08	0.02	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00
Utilities Inc - Revenna Park	0.12	0.08	0.04	0.12	0.10	0.02	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00	0.10	0.10	0.00
Utilities Inc - Weathersfield	0.37	0.31	0.06	0.37	0.37	0.00	0.37	0.37	0.00	0.37	0.37	0.00	0.37	0.37	0.00	0.37	0.37	0.00
Utilities Inc - Jansen S/D	0.10	0.06	0.04	0.10	0.07	0.03	0.07	0.07	0.00	0.07	0.07	0.00	0.07	0.07	0.00	0.07	0.07	0.00
TOTAL	**70.81**	**57.54**	**13.27**	**75.26**	**72.56**	**2.70**	76.99	**76.99**	**0.00**	**76.99**	**79.95**	**-2.95**	**76.99**	**83.46**	**-6.47**	**76.99**	**89.69**	**-12.70**

Notes:

* If 2025 year projection was not provided, SJRWMD 2025 projection was used.

1. Through 2010, Supply is equal to the existing CUP allocation. 2013 and beyond, Supply is equal to the Cooperator projected 2013 demand.
2. Cooperator projected demand, not historical data.

Table 3: AWS Project Summary

Project Number	Project	Sub-Project	Capacity (mgd, ADF)	Total Capital Cost $M	Potential WPSP Cost Sharing (1)	Total Adjusted Capital Cost $M (2)	O&M Cost $M (3)	Equivalent Annual Cost	Unit Production Cost ($/kgal) (4)
1	Water Conservation/Demand Reduction								
2a		Sanford North WRF Augmentation/Reclaimed Water System Improvements	7.3	6.1	30%	4.3	0.28	0.562	0.21
2b		Markham Woods Road Reclaimed Water Transmission Main	3.0	4.9	20%	3.9		0.248	0.23
2c		Orange Boulevard Reclaimed Water Transmission Main	2.5	0.5	20%	0.4		0.025	0.03
2d		New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46	2.0	4.5	20%	3.6		0.228	0.31
2e		Timacuan Reclaimed Water Main Upgrade	2.9	1.0	20%	0.8		0.051	0.05
2f		Heathrow Boulevard Reclaimed Water Transmission Main	2.5	2.1	20%	1.7		0.106	0.12
2g		Residential Reclaimed Water Retrofit – Phase I	1.1	4.8	20%	3.8		0.243	0.61
2h		Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	5.4	20%	4.3		0.274	0.42
2i		Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	6.4	20%	5.1		0.324	0.23
2j		Greenwood Lakes Rapid Infiltration Basins Rehabilitation	1.0	0.5	0%	0.5		0.032	0.09
3	East Orange and Seminole Counties Regional Reuse Project		20.0	18.5	20%	14.8	0.36	1.302	0.18
4	Altamonte Springs and Apopka Project RENEW APRICOT		6.0	13.5	20%	10.8	0.20	0.880	0.40
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project		2.3	6.7	30%	4.7	0.15	0.477	0.58
6	Sanford Surface WTP on Lake Monroe - Potable		4.0	13.8	40%	8.3	0.37	0.911	0.62
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project		10.0	31.4	30%	22.0	3.16	4.604	1.26
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable		25.0	200.0	40%	120.0	19.89	27.808	3.05
8	Oviedo Reclaimed Water Projects		1.5	6.5	20%	5.2		0.329	0.60
9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage		5.0	22.5	30%	15.8	0.46	1.495	0.82
9b	Surface WTP on St Johns River at SR46 - Potable		7.0	48.5	40%	29.1	1.28	3.197	1.25
10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage		5.0	24.4	30%	17.1	0.46	1.583	0.87
10b	Surface WTP on St Johns River at Mullet Lake - Potable		7.0	49.4	40%	29.6	1.28	3.233	1.27

1. Potential available Water Protection and Sustainability Program (WPSP) cost-sharing for capital costs, SJRWMD.
2. Cost including WPSP cost-sharing.
3. Where blank, O&M costs are not applicable.
4. Based on equivalent annual cost.

Table 4: AWS Project Cost, Percent Deficit Satisfaction, and Scheduling Summary

Project Number	Project Name	Capacity (mgd, ADF)	Unit Production Cost ($/kgal)	Total Adjusted Capital Cost ($M)	2025 % of Difference	2045 % of Difference	Major Activity	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-2030	2031-2035	2036-2040	2041-2045
Potable Projects																																
Total Potable Difference					**5.1**	**25.4**																										
6	Sanford Surface WTP on Lake Monroe - Potable *Serving Sanford only.	4	0.62	8.3	79%	16%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable *Serving Seminole County Northeast and Northwest service areas, Sanford and Lake Mary. *Other potential partners include Volusia and Lake County.	25	3.05	120.0	492%	99%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
9b [1]	Surface WTP on St Johns River at SR46 - Potable *Serving Oviedo, Winter Springs, and Seminole County Southeast. *Other potential partners include Volusia County.	Phase I: 7 Phase II: 26	1.25	29.1	138%	103%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
10b [1]	Surface WTP on St Johns River at Mullet Lake - Potable *Serving Oviedo, Winter Springs, and Seminole County Southeast. *Other potential partners include Volusia County.	Phase I: 7 Phase II: 26	1.27	29.6	138%	103%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
Project Number	**Project Name**	**Capacity (mgd, ADF)**	**Unit Production Cost ($/kgal)**	**Total Adjusted Capital Cost ($M)**	**2025 % of Difference**	**2045 % of Difference**	**Major Activity**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026-2030**	**2031-2035**	**2036-2040**	**2041-2045**
Non-Potable Projects																																
Total Non-Potable Difference					**7.6**	**38.0**																										
2a	Sanford North WRF Augmentation/Reclaimed Water System Improvements *Serving Lake Mary, Sanford, Seminole County Northeast and Northwest.	7.3	0.21	4.3	96%	19%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
2b	Markham Woods Road Reclaimed Water Transmission Main *Serving Seminole County Northwest.	3	0.23	3.9	39%	8%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
2c	Orange Boulevard Reclaimed Water Transmission Main *Serving Sanford, Seminole County Northwest, and Lake Mary.	2.5	0.03	0.4	33%	7%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
2d	New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46 *Serving Sanford.	2	0.31	3.6	26%	5%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
2e	Timacuan Reclaimed Water Main Upgrade *Serving Lake Mary, Sanford, Seminole County Northwest.	2.9	0.05	0.8	38%	8%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									

Project Number	Project Name	Capacity (mgd, ADF)	Unit Production Cost ($/kgal)	Total Adjusted Capital Cost ($M)	2025 % of Difference	2045 % of Difference	Major Activity	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-2030	2031-2035	2036-2040	2041-2045
2f	Heathrow Boulevard Reclaimed Water Transmission Main *Serving Seminole County Northwest.	2.5	0.12	1.7	33%	7%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
2g	Residential Reclaimed Water Retrofit – Phase I *Serving Seminole County Northwest.	1.1	0.61	3.8	14%	3%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
2h	Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins *Serving Lake Mary, Sanford, Seminole County Northeast and Northwest.	1.8	0.42	4.3	24%	5%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
2i	Seminole County/Sanlando Utilities Interconnect with Altamonte Springs *Altamonte Springs, Sanford, Winter Springs, Utilities Inc-Sanlando.	3.8	0.23	5.1	50%	10%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
2j	Greenwood Lakes Rapid Infiltration Basins Rehabilitation	1.0	0.09	0.5	13%	3%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
3	East Orange and Seminole Counties Regional Reuse Project *Serving Oviedo (3 mgd) and Seminole County Southeast (1.7 mgd). Remainder of capacity serving outside Seminole County.	4.7 (20 Total)	0.18	14.8	62%	12%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
4	Altamonte Springs and Apopka Project RENEW APRICOT	6	0.36	10.8	79%	16%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project *Serving Winter Springs.	2.25	0.58	4.7	30%	6%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project *Serving Lake Mary, Sanford, Seminole County Northeast and Northwest.	Phase I: 10 Phase II: 15	1.26	22.0	131%	39%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
8	Oviedo Reclaimed Water Projects *Serving Oviedo.	1.5	0.60	5.2	20%	4%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
9a (2)	Surface WTP on St Johns River at SR46 - Non-Potable with Storage *Serving Casselberry, Winter Springs, and Oviedo. *Other potential partners include Volusia County.	Phase I: 5 Phase II: 10	0.82	15.8	66%	26%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									
10a (2)	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage *Serving Casselberry, Winter Springs, and Oviedo. *Other potential partners include Volusia County.	Phase I: 5 Phase II: 10	0.87	17.1	66%	26%	Partnering Agreement(s))																									
							Consultant Selection																									
							Planning																									
							Design/Permit/Bid																									
							Construction/Start Up																									

1. Either Project 9b or 10b will be selected. Projects only vary by the intake location.
2. Either Project 9a or 10a will be selected. Projects only vary by the intake location.

Table 5: AWS Project - Detailed Deficit Satisfaction

Potable Projects

				Difference						Project Allocation						Project Adjusted Difference					
Project Number	**Project Name**	**Capacity (mgd, ADF)**	**Potential Partners**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**
6	Sanford Surface WTP on Lake Monroe - Potable	4	Sanford	0.59	1.08	-0.09	-0.57	-0.62	-2.80	-	-	4.00	4.00	4.00	4.00	0.59	1.08	3.91	3.43	3.38	1.20
	*Serving Sanford only.		**Total**	**0.59**	**1.08**	**-0.09**	**-0.57**	**-0.62**	**-2.80**	**0.00**	**0.00**	**4.00**	**4.00**	**4.00**	**4.00**	**0.59**	**1.08**	**3.91**	**3.43**	**3.38**	**1.20**
7b	Seminole County Yankee Lake Regional Surface Water	25	Lake Mary	0.41	0.36	-0.03	-0.03	-0.03	-0.98	-	-	6.25	6.25	6.25	6.25	0.41	0.36	6.22	6.22	6.22	5.27
	Facility - Potable		Sanford	0.59	1.08	-0.31	-0.57	-0.62	-2.80	-	-	6.25	6.25	6.25	6.25	0.59	1.08	5.94	5.68	5.63	3.45
	*Serving Seminole County Northeast and Northwest service		Seminole County NE	0.48	-0.21	-0.01	-0.14	-0.28	-1.25	-	-	6.25	6.25	6.25	6.25	0.48	-0.21	6.24	6.11	5.97	5.00
	areas, Sanford and Lake Mary.		Seminole County NW	0.54	-0.69	-0.25	-0.33	-0.42	-3.12	-	-	6.25	6.25	6.25	6.25	0.54	-0.69	6.00	5.92	5.83	3.13
	*Other potential partners include Volusia and Lake County.		**Total**	**2.02**	**0.53**	**-0.60**	**-1.08**	**-1.33**	**-7.17**	**0.00**	**0.00**	**18.75**	**18.75**	**18.75**	**18.75**	**2.02**	**0.53**	**24.40**	**23.92**	**23.64**	**16.85**
9b [1]	Surface WTP on St Johns River at SR46 - Potable	Phase I:	Oviedo	0.08	-0.21	-0.19	-0.53	-1.20	-3.12	-	-	3.00	3.00	3.00	9.00	0.08	-0.21	2.81	2.47	1.80	5.88
	*Serving Oviedo, Winter Springs, and Seminole County	7	Winter Springs	0.47	0.39	0.00	-0.08	-0.08	-1.12	-	-	0.20	0.20	0.20	2.00	0.47	0.39	0.20	0.12	0.12	0.88
	Southeast.	Phase II:	Seminole County SE	0.06	-0.82	-0.20	-0.29	-1.44	-4.95	-	-	3.80	3.80	3.80	13.50	0.06	-0.82	3.60	3.51	2.36	8.55
			Casselberry	0.63	0.48	-0.02	-0.13	-0.23	-1.62	-	-	0.00	0.00	0.00	1.50	0.63	0.48	-0.02	-0.13	-0.23	-0.12
	*Other potential partners include Volusia County.	26	**Total**	**0.61**	**-0.64**	**-0.39**	**-0.90**	**-2.71**	**-9.19**	**0.00**	**0.00**	**7.00**	**7.00**	**7.00**	**26.00**	**1.24**	**-0.16**	**6.59**	**5.97**	**4.06**	**15.20**
10b [1]	Surface WTP on St Johns River at Mullet Lake - Potable	Phase I:	Oviedo	0.08	-0.21	-0.19	-0.53	-1.20	-3.12	-	-	3.00	3.00	3.00	9.00	0.08	-0.21	2.81	2.47	1.80	5.88
		7	Winter Springs	0.47	0.39	0.00	-0.08	-0.08	-1.12	-	-	0.20	0.20	0.20	2.00	0.47	0.39	0.20	0.12	0.12	0.88
		Phase II:	Seminole County SE	0.06	-0.82	-0.20	-0.29	-1.44	-4.95	-	-	3.80	3.80	3.80	13.50	0.06	-0.82	3.60	3.51	2.36	8.55
			Casselberry	0.63	0.48	-0.02	-0.13	-0.23	-1.62	-	-	0.00	0.00	0.00	1.50	0.63	0.48	-0.02	-0.13	-0.23	-0.12
	*Other potential partners include Volusia County.	26	**Total**	**0.61**	**-0.64**	**-0.39**	**-0.90**	**-2.71**	**-9.19**	**0.00**	**0.00**	**7.00**	**7.00**	**7.00**	**26.00**	**1.24**	**-0.16**	**6.59**	**5.97**	**4.06**	**15.20**

Non-Potable Projects

				Difference						Project Allocation						Project Adjusted Difference					
Project Number	**Project Name**	**Capacity (mgd, ADF)**	**Potential Partners**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**
2a	Sanford North WRF Augmentation/Reclaimed Water	7.3	Lake Mary	0.62	0.54	-0.05	-0.05	-0.05	-1.47	-	1.83	1.83	1.83	1.83	1.83	0.62	2.37	1.78	1.78	1.78	0.35
	System Improvements		Sanford	0.88	1.61	-0.47	-0.86	-0.94	-4.20	-	1.83	1.83	1.83	1.83	1.83	0.88	3.44	1.36	0.97	0.89	-2.37
			Seminole County NE	0.73	-0.32	-0.01	-0.21	-0.43	-1.88	-	1.83	1.83	1.83	1.83	1.83	0.73	1.51	1.82	1.62	1.40	-0.06
			Seminole County NW	0.80	-1.04	-0.37	-0.50	-0.63	-4.67	-	1.83	1.83	1.83	1.83	1.83	0.80	0.79	1.46	1.33	1.20	-2.85
			Total	**3.03**	**0.80**	**-0.90**	**-1.61**	**-2.04**	**-12.23**	**0.00**	**7.32**	**7.32**	**7.32**	**7.30**	**7.30**	**3.03**	**8.12**	**6.42**	**5.71**	**5.26**	**-4.93**
2b	Markham Woods Road Reclaimed Water Transmission	3	Seminole County NW	0.80	-1.04	-0.37	-0.50	-0.63	-4.67	-	3.00	3.00	3.00	3.00	3.00	0.80	1.96	2.63	2.50	2.37	-1.67
	Main		**Total**	**0.80**	**-1.04**	**-0.37**	**-0.50**	**-0.63**	**-23.45**	**0.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**0.80**	**1.96**	**2.63**	**2.50**	**2.37**	**-1.67**
2c	Orange Boulevard Reclaimed Water Transmission Main	2.5	Sanford	0.88	1.61	-0.47	-0.86	-0.94	-4.20	-	0.83	0.83	0.83	0.83	0.83	0.88	2.44	0.36	-0.03	-0.10	-3.37
			Seminole County NW	0.80	-1.04	-0.37	-0.50	-0.63	-4.67	-	0.83	0.83	0.83	0.83	0.83	0.80	-0.21	0.46	0.33	0.21	-3.84
			Lake Mary	0.62	0.54	-0.05	-0.05	-0.05	-1.47	-	0.83	0.83	0.83	0.83	0.83	0.62	1.37	0.78	0.78	0.79	-0.64
			Total	**2.30**	**1.12**	**-0.89**	**-1.40**	**-1.61**	**-10.34**	**0.00**	**2.49**	**2.49**	**2.49**	**2.50**	**2.50**	**2.30**	**3.61**	**1.60**	**1.09**	**0.89**	**-7.84**
2d	New East Lake Mary Blvd Reclaimed Water Main, New	2	Sanford	0.88	1.61	-0.47	-0.86	-0.94	-4.20	-	2.00	2.00	2.00	2.00	2.00	0.88	3.61	1.53	1.14	1.06	-2.20
	Reclaimed Water Main from Sanford South WRC to Victoria		**Total**	**0.88**	**1.61**	**-0.47**	**-0.86**	**-0.94**	**-4.20**	**0.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**0.88**	**3.61**	**1.53**	**1.14**	**1.06**	**-2.20**
	St, New Reclaimed Water Main from US 17-92 to SR 46																				

				Difference						Project Allocation						Project Adjusted Difference					
Project Number	**Project Name**	**Capacity (mgd, ADF)**	**Potential Partners**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**	**2005**	**2010**	**2015**	**2020**	**2025**	**2045**
2e	Timacuan Reclaimed Water Main Upgrade	2.9	Lake Mary	0.62	0.54	-0.05	-0.05	-0.05	-1.47	-	0.97	0.97	0.97	0.97	0.97	0.62	1.51	0.92	0.92	0.92	-0.51
			Sanford	0.88	1.61	-0.47	-0.86	-0.94	-4.20	-	0.97	0.97	0.97	0.97	0.97	0.88	2.58	0.50	0.11	0.03	-3.23
			Seminole county NW	0.80	-1.04	-0.37	-0.50	-0.63	-4.67	-	0.97	0.97	0.97	0.97	0.97	0.80	-0.07	0.60	0.47	0.34	-3.71
			Total	**2.30**	**1.12**	**-0.89**	**-1.40**	**-1.61**	**-10.34**	**0.00**	**2.91**	**2.91**	**2.91**	**2.90**	**2.90**	**2.30**	**4.03**	**2.02**	**1.51**	**1.29**	**-7.44**
2f	Heathrow Boulevard Reclaimed Water Transmission Main	2.5	Seminole County NW	0.80	-1.04	-0.37	-0.50	-0.63	-4.67	-	2.50	2.50	2.50	2.50	2.50	0.80	1.46	2.13	2.00	1.87	-2.17
			Total	**0.80**	**-1.04**	**-0.37**	**-0.50**	**-0.63**	**-4.67**	**0.00**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**0.80**	**1.46**	**2.13**	**2.00**	**1.87**	**-2.17**
2g	Residential Reclaimed Water Retrofit – Phase I	1.1	Seminole County NW	0.80	-1.04	-0.37	-0.50	-0.63	-4.67	-	1.10	1.10	1.10	1.10	1.10	0.80	0.06	0.73	0.60	0.47	-3.57
			Total	**0.80**	**-1.04**	**-0.37**	**-0.50**	**-0.63**	**-4.67**	**0.00**	**1.10**	**1.10**	**1.10**	**1.10**	**1.10**	**0.80**	**0.06**	**0.73**	**0.60**	**0.47**	**-3.57**
2h	Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	Lake Mary	0.62	0.54	-0.05	-0.05	-0.05	-1.47	-	0.45	0.45	0.45	0.45	0.45	0.62	0.99	0.40	0.40	0.40	-1.02
			Sanford	0.88	1.61	-0.47	-0.86	-0.94	-4.20	-	0.45	0.45	0.45	0.45	0.45	0.88	2.06	-0.02	-0.41	-0.49	-3.75
			Seminole County NE	0.73	-0.32	-0.01	-0.21	-0.43	-1.88	-	0.45	0.45	0.45	0.45	0.45	0.73	0.13	0.44	0.24	0.02	-1.43
			Seminole County NW	0.80	-1.04	-0.37	-0.50	-0.63	-4.67	-	0.45	0.45	0.45	0.45	0.45	0.80	-0.59	0.08	-0.05	-0.18	-4.22
			Total	**3.03**	**0.80**	**-0.90**	**-1.61**	**-2.04**	**-12.23**	**0.00**	**1.80**	**1.80**	**1.80**	**1.80**	**1.80**	**3.03**	**2.60**	**0.90**	**0.19**	**-0.24**	**-10.43**
2i	Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	Altamonte Springs	1.16	-0.50	-0.14	-0.39	-0.65	-4.06	-	0.95	0.95	0.95	0.95	0.95	1.16	0.45	0.81	0.56	0.30	-3.11
			Sanford	0.88	1.61	-0.47	-0.86	-0.94	-4.20	-	0.95	0.95	0.95	0.95	0.95	0.88	2.56	0.48	0.09	0.01	-3.25
			Winter Springs	0.70	0.59	0.00	-0.12	-0.12	-1.68	-	0.95	0.95	0.95	0.95	0.95	0.70	1.54	0.95	0.83	0.83	-0.73
			Utilities Inc-Sanlando	0.99	1.60	-0.02	-0.09	-0.14	-2.63	-	0.95	0.95	0.95	0.95	0.95	0.99	2.55	0.93	0.86	0.81	-1.68
			Total	**3.73**	**3.30**	**-0.63**	**-1.46**	**-1.85**	**-12.57**	**0.00**	**3.80**	**3.80**	**3.80**	**3.80**	**3.80**	**3.73**	**7.10**	**3.17**	**2.34**	**1.95**	**-8.77**
3	East Orange and Seminole Counties Regional Reuse Project	4.7	Oviedo	0.12	-0.31	-0.29	-0.79	-1.79	-4.68	-	3.00	3.00	3.00	3.00	3.00	0.12	2.69	2.71	2.21	1.21	-1.68
			Seminole County SE	0.09	-1.23	-0.29	-0.44	-2.16	-7.42	-	1.70	1.70	1.70	1.70	1.70	0.09	0.47	1.41	1.26	-0.46	-5.72
	*Serving Oviedo (3 mgd) and Seminole County Southeast (1.7 mgd). Remainder of capacity serving outside Seminole County.	(20 Total)	**Total**	**0.21**	**-1.54**	**-0.58**	**-1.23**	**-3.95**	**-12.10**	**0.00**	**4.70**	**4.70**	**4.70**	**4.70**	**4.70**	**0.21**	**3.16**	**4.12**	**3.47**	**0.75**	**-7.40**
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project	2.25	Winter Springs	0.70	0.59	0.00	-0.12	-0.12	-1.68	-	-	2.25	2.25	2.25	2.25	0.70	0.59	2.25	2.13	2.13	0.57
			Total	**0.70**	**0.59**	**0.00**	**-0.12**	**-0.12**	**-1.68**	**0.00**	**0.00**	**2.25**	**2.25**	**2.25**	**2.25**	**0.70**	**0.59**	**2.25**	**2.13**	**2.13**	**0.57**
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project	Phase I:	Lake Mary	0.62	0.54	-0.05	-0.05	-0.05	-1.47	-	2.50	2.50	2.50	2.50	2.50	0.62	3.04	2.45	2.45	2.45	1.03
		10	Sanford	0.88	1.61	-0.47	-0.86	-0.94	-4.20	-	2.50	2.50	2.50	2.50	2.50	0.88	4.11	2.03	1.64	1.56	-1.70
		Phase II:	Seminole County NE	0.73	-0.32	-0.01	-0.21	-0.43	-1.88	-	2.50	2.50	2.50	2.50	2.50	0.73	2.18	2.49	2.29	2.07	0.62
		15	Seminole County NW	0.80	-1.04	-0.37	-0.50	-0.63	-4.67	-	2.50	2.50	2.50	2.50	2.50	0.80	1.46	2.13	2.00	1.87	-2.17
			Total	**3.03**	**0.80**	**-0.90**	**-1.61**	**-2.04**	**-12.23**	**0.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**3.03**	**10.80**	**9.10**	**8.39**	**7.96**	**-2.23**
8	Oviedo Reclaimed Water Projects	1.5	Oviedo	0.12	-0.31	-0.29	-0.79	-1.79	-4.68	-	1.50	1.50	1.50	1.50	1.50	0.12	1.19	1.21	0.71	-0.29	-3.18
			Total	**0.12**	**-0.31**	**-0.29**	**-0.79**	**-1.79**	**-4.68**	**0.00**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**0.12**	**1.19**	**1.21**	**0.71**	**-0.29**	**-3.18**
9a (2)	Surface WTP on St Johns River at SR46 - Non-Potable with Storage	Phase I:	Casselberry	0.95	0.71	-0.04	-0.19	-0.35	-2.42	-	-	0.50	0.50	0.50	2.50	0.95	0.71	0.46	0.31	0.15	0.08
		5	Winter Springs	0.70	0.59	0.00	-0.12	-0.12	-1.68	-	-	2.50	2.50	2.50	2.50	0.70	0.59	2.50	2.38	2.38	0.82
	*Other potential partners include Volusia County.	Phase II:	Oviedo	0.12	-0.31	-0.29	-0.79	-1.79	-4.68	-	-	2.00	2.00	2.00	5.00	0.12	-0.31	1.71	1.21	0.21	0.32
		10	**Total**	**1.77**	**0.99**	**-0.32**	**-1.10**	**-2.26**	**-8.78**	**0.00**	**0.00**	**5.00**	**5.00**	**5.00**	**10.00**	**1.77**	**0.99**	**4.68**	**3.90**	**2.74**	**1.22**
10a (2)	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage	Phase I:	Casselberry	0.95	0.71	-0.04	-0.19	-0.35	-2.42	-	-	0.50	0.50	0.50	2.50	0.95	0.71	0.46	0.31	0.15	0.08
		5	Winter Springs	0.70	0.59	0.00	-0.12	-0.12	-1.68	-	-	2.50	2.50	2.50	2.50	0.70	0.59	2.50	2.38	2.38	0.82
	*Other potential partners include Volusia County.	Phase II:	Oviedo	0.12	-0.31	-0.29	-0.79	-1.79	-4.68	-	-	2.00	2.00	2.00	5.00	0.12	-0.31	1.71	1.21	0.21	0.32
		10	**Total**	**1.77**	**0.99**	**-0.32**	**-1.10**	**-2.26**	**-8.78**	**0.00**	**0.00**	**5.00**	**5.00**	**5.00**	**10.00**	**1.77**	**0.99**	**4.68**	**3.90**	**2.74**	**1.22**

1. Either Project 9b or 10b will be selected. Projects only vary by the intake location.
2. Either Project 9a or 10a will be selected. Projects only vary by the intake location.
Projects 2j and 4 were removed because they do not provide any additional potable or non-potable capacity to the Cooperators.

Table 6: Summary of Project Rankings - Environmental

Project Number	Project	Sub-Project	Capacity (mgd)	Total Adjusted Capital Cost $M	Unit Production Cost ($/kgal)	Environmental Impacts Evaluation Score	Environmental Impacts Ranking
2a		Sanford North WRF Augmentation/Reclaimed Water System Improvements	7.3	$4.3	$0.21	34	1
2j		Greenwood Lakes Rapid Infiltration Basins Rehabilitation	1.0	$0.5	$0.09	34	2
2c		Orange Boulevard Reclaimed Water Transmission Main	2.5	$0.4	$0.03	32	3
2e		Timacuan Reclaimed Water Main Upgrade	2.9	$0.8	$0.05	32	4
2g		Residential Reclaimed Water Retrofit – Phase I	1.1	$3.8	$0.61	30	5
8	Oviedo Reclaimed Water Projects		1.5	$5.2	$0.60	30	6
2h		Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	$4.3	$0.42	30	7
2f		Heathrow Boulevard Reclaimed Water Transmission Main	2.5	$1.7	$0.12	26	8
6	Sanford Surface WTP on Lake Monroe - Potable		4.0	$8.3	$0.62	26	9
2b		Markham Woods Road Reclaimed Water Transmission Main	3.0	$3.9	$0.23	24	10
2i		Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	$5.1	$0.23	24	11
2d		New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46	2.0	$3.6	$0.31	21	12
10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage		5.0	$17.1	$0.87	23	13
10b	Surface WTP on St Johns River at Mullet Lake - Potable		7.0	$29.6	$1.27	23	14
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project		2.3	$4.7	$0.58	22	15
3	East Orange and Seminole Counties Regional Reuse Project		4.7	$14.8	$0.18	18	16
4	Altamonte Springs and Apopka Project RENEW APRICOT		6.0	$10.8	$0.36	18	17
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project		10.0	$22.0	$1.26	15	18
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable		25.0	$120.0	$3.05	15	19
9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage		5.0	$15.8	$0.82	15	20
9b	Surface WTP on St Johns River at SR46 - Potable		7.0	$29.1	$1.25	15	21

Note: Where evaluation scores are equal, projects are ranked alphabetically.

Table 7: Summary of Project Rankings - Cost

Project Number	Project	Sub-Project	Capacity (mgd)	Total Adjusted Capital Cost $M	Unit Production Cost ($/kgal)	Cost Evaluation Score	Cost Ranking
2a		Sanford North WRF Augmentation/Reclaimed Water System Improvements	7.3	$4.3	$0.21	14	1
2b		Markham Woods Road Reclaimed Water Transmission Main	3.0	$3.9	$0.23	14	2
2c		Orange Boulevard Reclaimed Water Transmission Main	2.5	$0.4	$0.03	14	3
2e		Timacuan Reclaimed Water Main Upgrade	2.9	$0.8	$0.05	14	4
2f		Heathrow Boulevard Reclaimed Water Transmission Main	2.5	$1.7	$0.12	14	5
2i		Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	$5.1	$0.23	14	6
2j		Greenwood Lakes Rapid Infiltration Basins Rehabilitation	1.0	$0.5	$0.09	14	7
3	East Orange and Seminole Counties Regional Reuse Project		4.7	$14.8	$0.18	14	8
2h		Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	$4.3	$0.42	11	9
4	Altamonte Springs and Apopka Project RENEW APRICOT		6.0	$10.8	$0.36	11	10
2d		New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46	2.0	$3.6	$0.31	8	11
2g		Residential Reclaimed Water Retrofit – Phase I	1.1	$3.8	$0.61	8	12
8	Oviedo Reclaimed Water Projects		1.5	$5.2	$0.60	8	13
6	Sanford Surface WTP on Lake Monroe - Potable		4.0	$8.3	$0.62	8	14
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project		2.3	$4.7	$0.58	8	15
10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage		5.0	$17.1	$0.87	7	16
9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage		5.0	$15.8	$0.82	7	17
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project		10.0	$22.0	$1.26	4	18
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable		25.0	$120.0	$3.05	4	19
9b	Surface WTP on St Johns River at SR46 - Potable		7.0	$29.1	$1.25	4	20
10b	Surface WTP on St Johns River at Mullet Lake - Potable		7.0	$29.6	$1.27	4	21

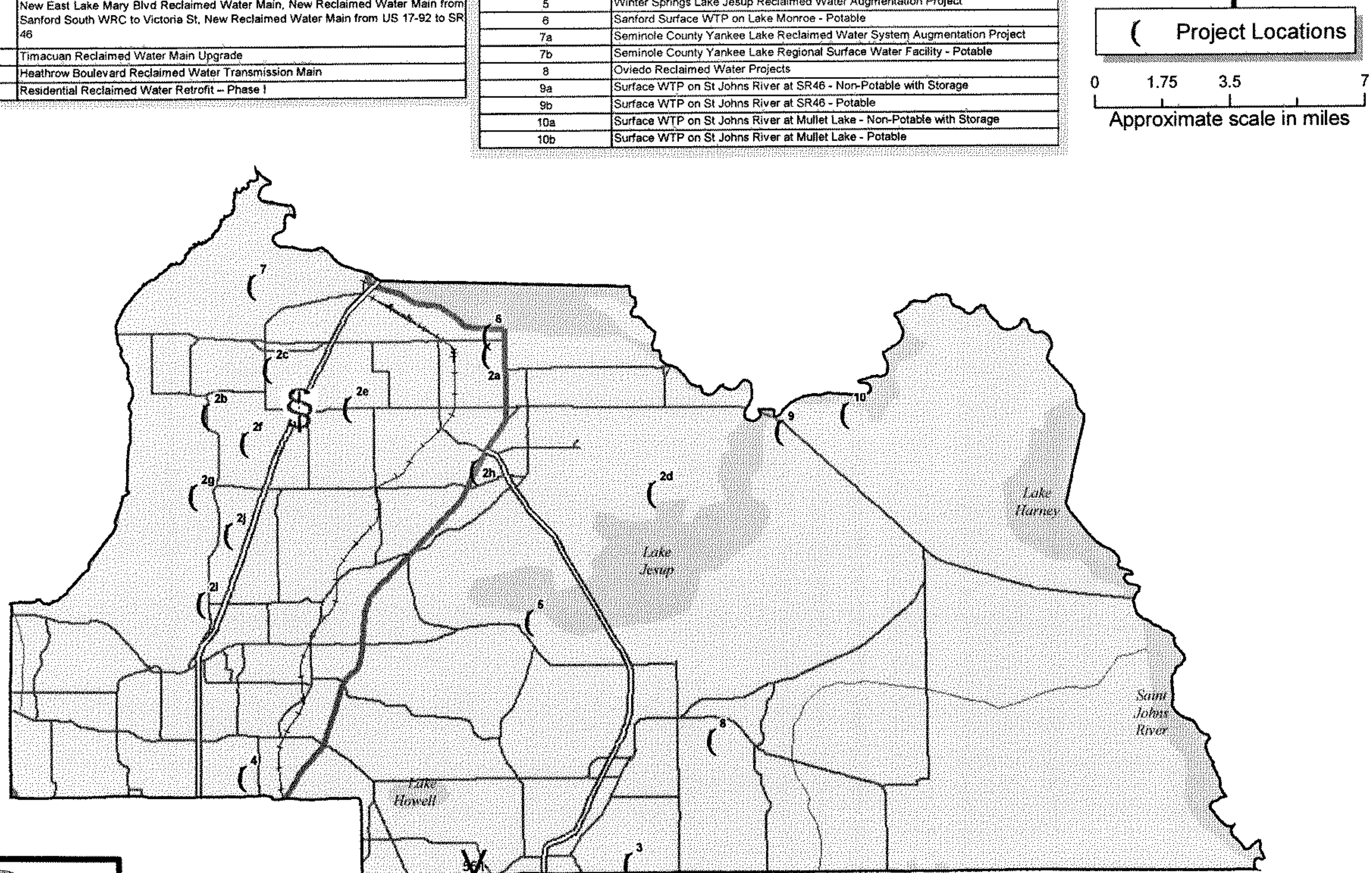
Note: Where evaluation scores are equal, projects are ranked alphabetically.

Table 8: Summary of Project Rankings - Total

Project Number	Project	Sub-Project	Capacity (mgd)	Total Adjusted Capital Cost $M	Unit Production Cost ($/kgal)	Environmental Impacts Evaluation Score	Environmental Impacts Ranking	Cost Evaluation Score	Cost Ranking	Total Evaluation Score	Total Ranking
2a		Sanford North WRF Augmentation/Reclaimed Water System Improvements	7.3	$4.3	$0.21	34	1	14	1	48	1
2j		Greenwood Lakes Rapid Infiltration Basins Rehabilitation	1.0	$0.5	$0.09	34	2	14	7	48	2
2c		Orange Boulevard Reclaimed Water Transmission Main	2.5	$0.4	$0.03	32	3	14	3	46	3
2e		Timacuan Reclaimed Water Main Upgrade	2.9	$0.8	$0.05	32	4	14	4	46	4
2h		Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins	1.8	$4.3	$0.42	30	7	11	9	41	5
2f		Heathrow Boulevard Reclaimed Water Transmission Main	2.5	$1.7	$0.12	26	8	14	5	40	6
2b		Markham Woods Road Reclaimed Water Transmission Main	3.0	$3.9	$0.23	24	10	14	2	38	7
2g		Residential Reclaimed Water Retrofit – Phase I	1.1	$3.8	$0.61	30	5	8	12	38	8
2i		Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	3.8	$5.1	$0.23	24	11	14	6	38	9
8	Oviedo Reclaimed Water Projects		1.5	$5.2	$0.60	30	6	8	13	38	10
6	Sanford Surface WTP on Lake Monroe - Potable		4.0	$8.3	$0.62	26	9	8	14	34	11
2d		New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46	2.0	$3.6	$0.31	21	12	8	11	32	12
3	East Orange and Seminole Counties Regional Reuse Project		4.7	$14.8	$0.18	18	16	14	8	32	13
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project		2.3	$4.7	$0.58	22	15	8	15	30	14
10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage		5.0	$17.1	$0.87	23	13	7	16	30	15
4	Altamonte Springs and Apopka Project RENEW APRICOT		6.0	$10.8	$0.36	18	17	11	10	29	16
10b	Surface WTP on St Johns River at Mullet Lake - Potable		7.0	$29.6	$1.27	23	14	4	21	27	17
9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage		5.0	$15.8	$0.82	15	20	7	17	22	18
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project		10.0	$22.0	$1.26	15	18	4	18	19	19
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable		25.0	$120.0	$3.05	15	19	4	19	19	20
9b	Surface WTP on St Johns River at SR46 - Potable		7.0	$29.1	$1.25	15	21	4	20	19	21

Note: Where evaluation scores are equal, projects are ranked alphabetically.

Option #	Project Name
1	Water Conservation/Demand Reduction
2	North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study
2a	Sanford North WRF Augmentation / Reclaimed Water System Improvements
2b	Markham Woods Road Reclaimed Water Transmission Main
2c	Orange Boulevard Reclaimed Water Transmission Main
2d	New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46
2e	Timacuan Reclaimed Water Main Upgrade
2f	Heathrow Boulevard Reclaimed Water Transmission Main
2g	Residential Reclaimed Water Retrofit – Phase I
2h	Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins
2i	Seminole County/Sanlando Utilities Interconnect with Altamonte Springs
2j	Greenwood Lakes Rapid Infiltration Basins Rehabilitation
3	East Orange and Seminole Counties Regional Reuse Project
4	Altamonte Springs and Apopka Project RENEW APRICOT
5	Winter Springs Lake Jesup Reclaimed Water Augmentation Project
6	Sanford Surface WTP on Lake Monroe - Potable
7a	Seminole County Yankee Lake Reclaimed Water System Augmentation Project
7b	Seminole County Yankee Lake Regional Surface Water Facility - Potable
8	Oviedo Reclaimed Water Projects
9a	Surface WTP on St Johns River at SR46 - Non-Potable with Storage
9b	Surface WTP on St Johns River at SR46 - Potable
10a	Surface WTP on St Johns River at Mullet Lake - Non-Potable with Storage
10b	Surface WTP on St Johns River at Mullet Lake - Potable



ARCADIS
Infrastructure, environment, buildings

Figure 11: Seminole County Water Supply Project Locations

Seminole County Water Supply Plan

APPENDIX A

Recommended Action Plan for the Central Florida Coordination Area. A Cooperative Effort of the South Florida, Southwest Florida and St. Johns River Water Management Districts

Recommended
Action Plan
for the
Central Florida Coordination Area

A Cooperative Effort of the South Florida, Southwest Florida and St. Johns River Water Management Districts

September 18, 2006

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Executive Summary

Conclusions

The districts have each concluded—through detailed water supply planning and individual permit actions—that the growth in public water supply (PWS) over the next 20 years in central Florida from traditional groundwater sources is not sustainable. Recent water supply plan updates, permitting experience, and the increasing frequency that measures implemented by permit condition are required to avoid or mitigate unacceptable levels of harm, all confirm that if traditional groundwater sources continue to be developed to meet growing PWS demands in the area, harm to the water resources (rivers, streams, lakes, wetlands and aquifer quality) will occur.

In general, the districts have jointly concluded that the availability of sustainable quantities of groundwater in central Florida is insufficient on a regional basis to meet future demands and there is an immediate need to develop and implement alternatives water supply (AWS) projects in addition to continued aggressive conservation and reuse of reclaimed water. The time necessary to implement AWS projects will necessitate allocation of groundwater consistent with 2013 projected demands. Beyond the 2013 level of demand, AWS sources must be developed to meet future demands. In some instances, specific conditions may require allocations from traditional groundwater be less than 2013 demand or require specific actions be taken to avoid or mitigate harm that would occur from the 2013 demand at a specific location. In other areas, specific conditions may allow slightly increased allocation. But, the conclusion is clear, within the next 5 to 6 years PWS utilities in central Florida must be prepared to move to alternative water supplies as a critical component of meeting future demands.

The districts are committed to refining the tools necessary to improve the best estimate of the limits on sustainable groundwater and reevaluate these conclusions as these tools and data become available. The districts are also committed to a continuing assessment of all potential AWS sources, including but not limited to, the St. Johns River and Kissimmee River systems in order to help meet future demands. As a general proposition, permits issued in the interim will be conditioned to reflect the 2013 limit on traditional groundwater resources and the uncertainty in projecting potential harm to the water resources.

Goals and Objectives

The districts have developed this Action Plan to assure a coordinated and consistent approach in the Central Florida Coordination Area (CFCA), including the City of Cocoa's public supply service area in Brevard County; all of Polk, Orange, Osceola and Seminole counties; and southern Lake County. Staff work groups developed consensus action plans in three key functional areas: regulatory, planning, and computer modeling and tools. Each has more detailed information, including specific tasks and schedules, later in this document. The work group goals and objectives are as follows.

- **Regulatory**

Goal: To avoid competition and to prevent harm to the water resources in the CFCA, permitting of PWS should result in a consistent and equitable outcome and create incentives for the expedited development of required AWSs.

Objective 1: Until the long-term approach is implemented (Objective 2), implement an interim approach to permit allocations and conditions for PWS in the CFCA to achieve the work plan goal over the short term.

Objective 2: Develop and implement a long-term approach to PWS system permit allocations and conditions to achieve the work plan goal over the long term.

- **Planning**

Goal: To identify AWS development projects and implementation strategies that will assure the availability of sustainable water supplies to meet projected public supply needs in a timely manner through 2025 in the CFCA.

Objective 1: Identify the need for AWS projects.

Objective 2: Develop a list of already identified AWS development project options that could reasonably provide water to public supply utilities with identified unmet needs.

Objective 3: Evaluate combinations of projects from the list developed under Objective 2 and any other AWS development project options that may be feasible to meet the projected needs.

Objective 4: Develop draft implementation strategies using traditional and AWS development projects identified in Objectives 2 and 3, including funding strategies that associate public supply utilities with AWS development projects.

Objective 5: Solicit local government and other stakeholder input, participation and buy-in.

Objective 6: Update each of the districts' respective regional water supply plans to include the recommended AWS development projects. Such projects will then be eligible for potential funding from appropriate districts, including potential funding from the State Water Protection and Sustainability Trust Fund. The districts will seek to have these utility-selected strategies become part of the local government comprehensive plan subject to appropriate Florida Department of Environmental Protection (FDEP) and Department of Community Affairs (DCA) review.

Objective 7: Develop a Memorandum of Understanding among the three districts to reflect continued central Florida coordination. Incorporate appropriate elements of the Guiding Principles and Mutual Understandings when completed.

- **Computer Modeling and Tools**

Goal: To ensure that the best available hydrologic modeling, statistical, and analytical tools are available for use to quantify sustainable groundwater and surface water availability in the CFCA in support of regulatory actions, regional water supply planning, and implementation of alternative water source projects; and to assist in developing a data-sharing strategy to ensure these tools will be updated in a consistent manner.

Objective 1: Identify and determine the primary tools to be used to support current permitting and water supply planning programs in central Florida.

Objective 2: Use existing primary tools to assist the permitting group in completing a short-term preliminary assessment of hydrologic conditions in the CFCA area to address the effects of currently allocated and future water uses in the CFCA.

Objective 3: Complete development of the tools needed to address water resource issues in the CFCA that cross regional-scale model boundaries for future decision-making purposes.

Objective 4: Organize and coordinate a data-sharing system that will ensure future consistency among the tools as they become updated.

Objective 5: Organize and initiate a communication process with the permitting and planning work groups to ensure consistency in model application.

Background

In the spring of 2006, the Executive Directors of the St. Johns River Water Management District (SJRWMD), South Florida Water Management District (SFWMD) and Southwest Florida Water Management District (SWFWMD) directed staff to develop better mechanisms for formal coordination and communication in the area of central Florida where the boundaries of the districts come together. This effort was initiated because of the increasing frequency and complexity of issues in each district related to the sustainability of traditional groundwater resources to meet current and future demands and the simple fact that actions in one district can impact water resources and water users throughout the area. Throughout the summer, the Executive Directors began the development of a set of guiding principles and mutual understandings to establish the policy framework to guide the future efforts of the districts. The Guiding Principles and Mutual Understandings are included in the following section. These policy framework efforts culminated in midsummer with a discussion with senior staff involved in regulation, water supply planning, development of computer modeling and other tools. The staffs were challenged to prepare an action plan to implement the policy framework established by the Executive Directors over a 24-month period and beyond.

The effort to create this Action Plan was organized into three primary work groups, representing key functional areas: regulation, planning, and computer modeling and tools. A fourth team to focus on a strategy for outreach to potential stakeholders will be developed after this action plan is approved.

The CFCA is identified in Figure 1. The area is based on the utility service areas in the central Florida areas where the boundaries of the districts come together.

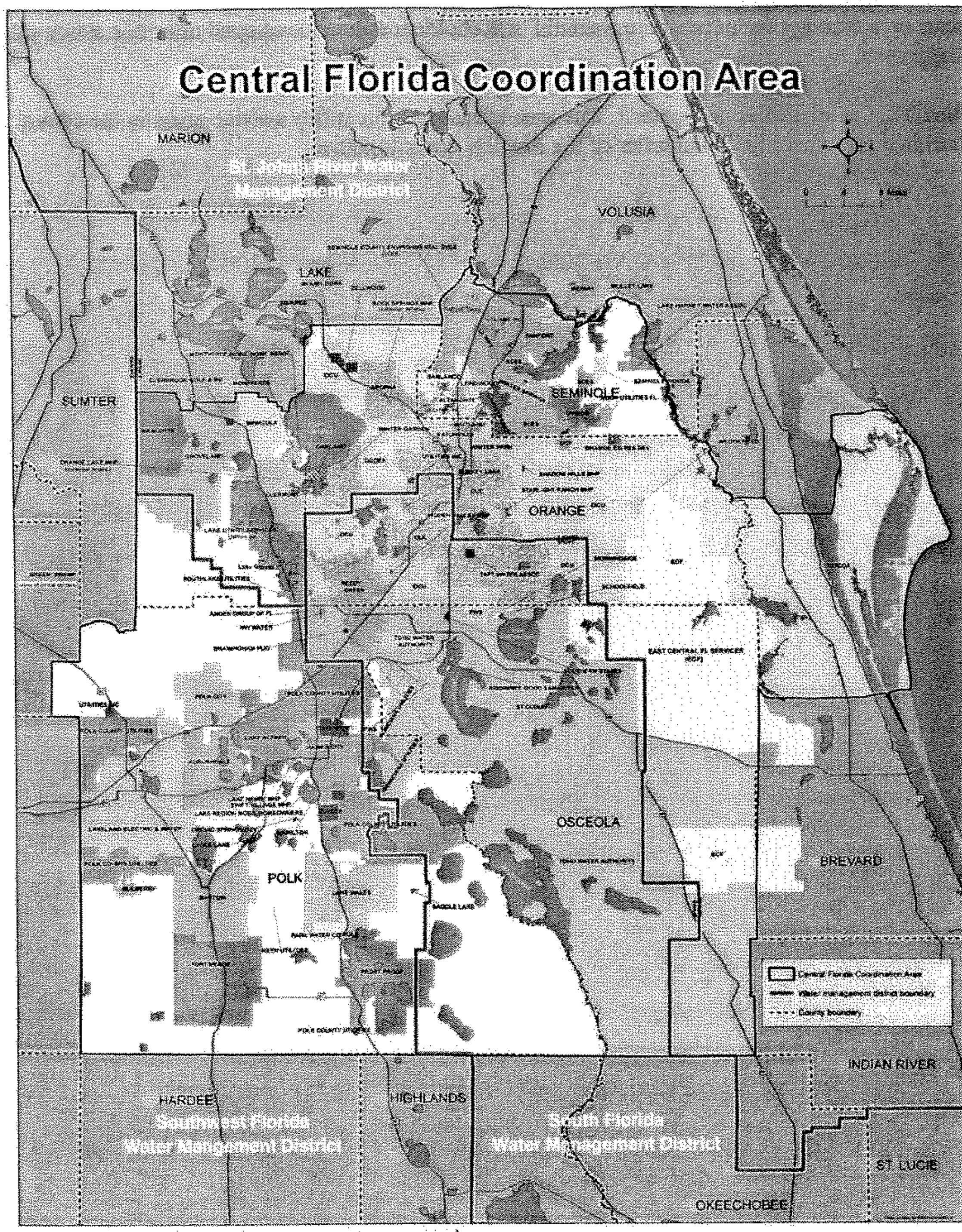


Figure 1. Central Florida Coordination Area (CFCA)

Guiding Principles and Mutual Understandings

SJRWMD, SFWMD and SWFWMD (the parties) agree to the following guiding principles and expressions of mutual understanding concerning short- and long-term development of PWS in the central Florida region, including southern Lake, Orange, Osceola, Seminole and Polk Counties and the City of Cocoa service area. The parties believe establishing these guiding principles and expressions of mutual understanding will enable them to resolve water resource issues, thereby allowing for timely and equitable transition to AWS sources. These guiding principles and expressions of mutual understanding include:

1. A significant increase in PWS demand in central Florida is anticipated.

2. The water management districts in their respective regional water supply plans have concluded there will be insufficient groundwater supplies to satisfy this entire demand.

3. The parties recognize that groundwater models inherently contain uncertainties, making it difficult to precisely quantify how much groundwater is available in the region for use without causing harm.

4. As another complication, utility plans and growth rates frequently change, making it difficult to assess potential impacts. The parties recognize the importance of developing a comprehensive plan for the development of AWS and traditional sources in central Florida.

5. The parties would like to optimize use of sustainable quantities of traditional groundwater sources, without causing harmful saltwater intrusion or land subsidence, interference with existing legal uses of water, or harmful impacts to such water resources as wetlands, spring flows, and lakes, or violation of minimum flows and levels. The parties believe the development of traditional sources will not be sufficient to meet future demands and that it will take time to implement AWS. Thus it is appropriate to immediately develop AWS for use in combination with traditional sources.

6. The parties recognize the need to expeditiously develop AWS projects, including projects that develop new sources, in addition to the use of reclaimed water.

7. The parties recognize that both short-term and long-term actions will be necessary to achieve sustainable water supplies to meet growing demands.

8. The parties would like to achieve equitable allocations of the remaining available groundwater among users in central Florida to meet new water demands and to implement AWS projects in a timely manner.

9. The commitment by an applicant to develop an AWS project is likely to result in a longer permit duration for groundwater withdrawals, recognizing that should unanticipated impacts occur, groundwater withdrawals can be reduced and replaced with additional use from the AWS project.

10. The parties believe it is necessary to expeditiously develop AWS projects; however, this does not, necessarily, foreclose the ability to request additional groundwater allocations as the AWS projects are brought to fruition.

11. Until AWS projects are implemented, the parties recognize there may be a need to address several critical interests. These interests include the desire to: (1) allocate amounts of water that will not cause harm, (2) make and have equitable and sufficient allocations of water to satisfy short-term demands, and (3) require AWS development projects to help meet the future long-term needs of the entire central Florida region.

12. Many water supply utilities have consumptive use permit applications pending before one or more of the party water management districts.

13. The parties recognize that one of the steps to successfully achieving timely and cost-effective solutions for PWS is for the parties not to challenge administrative action on pending consumptive use permit applications sought by other entities.

14. The parties agree to the following actions for the timely development of a long-term, regional solution for central Florida's water supply needs. The parties' goal for this effort is to develop specific plans for development of AWS projects to meet the needs of the central Florida region through 2026. The parties envision this process will be accomplished in 24 months; however, the parties also recognize that it may be necessary to extend the time frame to accomplish this goal.

a. Use of Best Available Information and Groundwater Modeling and Analytical Tools

The parties agree to rely upon use of the best available information and groundwater modeling, statistical and analytical tools to quantify groundwater availability to support regulatory actions, regional water supply planning, and implementation of AWS projects. As additional information and enhanced modeling, statistical and analytical tools become available, these will be used to improve the precision of estimating impacts.

b. AWS Projects

i. The parties will work together to select the AWS projects and to establish a proposed schedule for AWS project development that the water utilities will implement to meet their additional water supply needs over the next 20 years. The selection and schedule should be accomplished as soon as possible and in no later than 18 months.
ii. The parties, through their planning and funding efforts, intend to assist the water utilities in central Florida in this effort. Many such projects have already been identified in existing regional water supply plans. This effort will be directly supported with funding from the Water Protection and Sustainability Program.
iii. The parties, in collaboration with the water utilities in central Florida, will focus initial efforts on the following AWS development projects: St. Johns River/Taylor Creek Reservoir Project and the Upper Kissimmee Watershed. The SFWMD, with the assistance of SJRWMD, SWFWMD and water utilities, will identify quantities of water

available for storage and recharge options associated with PWS use of water from the Upper Kissimmee Watershed and will implement the same expeditiously.

c. Authorizations for groundwater allocations for water utilities implementing AWS projects

i. The parties agree that water utilities in central Florida which develop specific AWS projects to meet their new demands beyond the near term (approximately next 5 years) should have the opportunity to seek and obtain authorizations to withdraw groundwater that include both specific requirements to develop the AWS project(s) and new groundwater allocations to fulfill their water supply needs until these projects are online. The districts intend to issue long duration permits consistent with District rules; however, authorizations to withdraw new groundwater may need to shift to AWS.

ii. The districts will work toward issuance of these authorizations by utilizing all available regulatory tools including variances and/or agreements.

iii. These authorizations will be conditioned to include water conservation and water use efficiency; monitoring and reporting of water use, water conservation activities, and water resource data necessary to address potential impacts associated with such use; schedules, milestones, and progress reports for the development of AWS; compliance reporting; and avoidance/mitigation of harmful impacts, if any occur as a result of groundwater withdrawals.

d. Open and Transparent Process: The parties will collaborate with one another in an open and transparent process.

e. These guiding principles and mutual understandings do not constitute agency action on any specific permit application. Nothing in this agreement binds SFWMD, SWFWMD and SJRWMD to make any specific future permit decision.

Individual Work Group Action Plans

Regulatory Work Group

Goal: In order to avoid competition and to prevent harm to the water resources in the CFCA, permitting of PWS should result in a consistent and equitable outcome and create incentives for the expedited development of required AWSs.

Objective 1: Until the long-term approach is implemented (Objective 2), implement an interim approach to permit allocations and conditions for PWS in the CFCA to achieve the work plan goal over the short term.

Task 1A: Process pending and new applications for (PWS) utilities in the CFCA consistent with the structure provided in Task IA, IB, and IC below. (Initiate immediately for pending applications with the goal of agency action by the end of 2007.Ongoing for new applications.)

1. PWS utilities that propose to develop specific AWS project(s) to meet their demands beyond 2013 will have the opportunity to seek authorization to withdraw groundwater above current demands up to their 2013 demand, provided they avoid or mitigate adverse impacts. Permit allocations from traditional groundwater sources will be limited to the amounts necessary to meet 2013 demands with allocations for demands greater than 2013 demands to be met by AWS. If permits include a plan to implement AWS by 2013 to meet future demands, the duration can be up to 20 years with periodic reviews (e.g., 5-year compliance reviews). If permits do not include a plan to implement AWS to meet future demands, the permit duration will be limited to the period for which reasonable assurances can be provided, but not to exceed 2013.

2. Permits issued from now through 2013 will include an allocation no more than that corresponding to 2013 use. For example, a permit issued in 2010 may be for 20 years, but will be capped at the 2013 allocation with subsequent water demands to be met by AWS projects.

3. Some lakes and wetlands are expected to require specific avoidance and/or mitigation measures by the permit applicants who contribute to observed or projected adverse impacts at such specific locations. Permits will be contingent on implementing sufficient avoidance and/or mitigation to prevent adverse impacts.

4. To address uncertainty, all allocations are subject to reduction if adverse impacts are observed or projected to occur based on updated modeling tools and additional data collection.

5. For all permittees except those described in Task IB, permits will include specific conditions with scheduled milestones on the development of AWS projects by 2013.

6. In the event that the permittee establishes that it has exercised due diligence to meet the permit milestone requirements for AWS project development, but water from the project is not yet available in 2013, requests for interim allocations for additional groundwater will be considered when needed. Such interim allocations will be eliminated, or otherwise addressed based on the outcome of Objective 2 tasks, when the water from the AWS project is available.

7. All permits issued with durations beyond 2013 shall be subject to periodic reviews for the purpose of assessing continued compliance with the conditions of issuance.

Task 1B: For PWSs that are projected to have only an insignificant increase in demand for additional groundwater beyond their 2013 demand, or do not have feasible AWS options to meet demands beyond their 2013 demand, develop a consistent approach to determine the requirements that will be imposed. (Initiate immediately and complete as soon as possible, based on the timetable in CFCA Planning Work plan to identify AWS projects for each PWS.)

Task 1C: Agree on standardized conditions for PWS permits, to address the following: (Complete by January 2007.)

1. Requirement to mitigate for existing harm due to current withdrawals
2. Requirement to implement measures to avoid or mitigate anticipated harm due to proposed withdrawals
3. Requirement to mitigate for unanticipated harm should it occur
4. Requirement for monitoring, analysis and reporting for district review
5. Requirement for periodic reporting (e.g., 5-year compliance reporting)
6. Requirement for AWS development and use, or use of AWS projects available from others, by:
    a. PWS with a specific AWS project selected
    b. PWS without a specific AWS project selected
7. Potential modification of permit allocations and conditions
8. Permittee noncompliance with allocations or permit conditions

Task 1D: South Florida Water Management District (SFWMD), Southwest Florida Water Management District (SWFWMD), and St. Johns River Water Management District (SJRWMD) staff will recommend the initiation of rulemaking to address PWS permit durations in the CFCA, as described in Task 1A. (Initiate rulemaking by the end of 2006.)

Task 1E. Develop a new Internet portal that allows easy identification of the status of PWS utility permits within the CFCA; facilitates access to data and information, and improves communication between staff. (Complete enhancements by January 2007 and maintain them thereafter.)

Specific actions: A Web portal has already been set up and is now functioning to assist in the current effort by providing a place to access documents. This portal will be significantly expanded to include:

1. A consistent and accurate set of permit data regarding PWS existing permits and pending applications. Data set will include information such as permit number, county, permittee/applicant, date issued or pending, permit expiration, requested increase in allocation, maximum permitted allocation, maximum allocation requested, year corresponding to maximum allocation, estimated 2013 demand, and information on permit conditions.

2. Identification of pending PWS applications on geographic information system (GIS) interface, with link to each district permitting database for complete permit application file. This would replace current practice of notification of pending application.

3. Identification of existing PWS permits via GIS interface, with key data on permit duration, allocations, monitoring and AWS requirements, and link to each district's permitting database for complete permit file.

4. Links to current groundwater and surface water modeling tools

5. Links to hydrologic data collected by permit applicants and each district

Note: Live link to permit data for SJRWMD is available today and similar links for SFWMD and SWFWMD are scheduled by the end of the year. If the additional live links are not available at the time of implementation, tabular summary information with essential data will be generated from existing nightly data downloads used in the existing interdistrict e-permitting portal (www.floridawaterpermits.com).

Objective 2: Develop and implement a long-term approach to PWS system permit allocations and conditions to achieve the work plan goal over the long term.

Task 2A: Assist the CFCA Tools Work Group in completion of ongoing model development (including any additional model improvements needed to complete the detailed assessment) and other data collection needed to make detailed investigations of impacts due to existing and proposed withdrawals in the CFCA. (Ongoing. Complete by the end of 2008, subject to Tools Work Plan.)

Task 2B: Develop consistent permitting criteria related to impact evaluation in CFCA (Ongoing. Complete by the end of 2008.)

1. Identify key criteria that will set constraints on groundwater development in CFCA. Identify all rule criteria of importance in establishing the long-term sustainable groundwater availability by location throughout the CFCA, such as minimum flows and levels (MFLs), wetland impact criteria, saline water intrusion, etc.

2. Jointly develop consistent implementation approach: District regulatory staff will review and propose consistent review criteria and assessment methods for each key criteria.

3. Conduct rulemaking to revise regulatory criteria as needed to implement the consistency initiative in Task IIB.2, above. These consistent criteria will be used in interpreting results of all assessment tools for the CFCA.

Task 2C: Conduct detailed assessment to estimate sustainable withdrawals by general location throughout the CFCA, based on updated modeling tools and regulatory criteria (Start when updated tools are available. Complete by early 2009.)

Task 2D: Develop and implement a long-term water supply strategy for AWS and for allocation of available groundwater. (Begin in late 2008. Complete by the end of 2009, including outreach.)

1. Identify annual increase of groundwater demands for each utility in region (include utility interconnect numbers).
2. Use demand data from above to develop model entry to provide to modeling group. SFWMD will take the lead in the transient model runs to share with SJRWMD and SWFWMD for joint interpretation.
3. Incorporate AWS alternatives to determine water supply work strategy to build into individual permits.
4. Determine a detailed method for equitable allocation of remaining groundwater or a plan for cutting back if harm is determined to occur from permitted withdrawals.
5. Draft equitable allocation approach and conduct workshops for stakeholder input.
6. Conduct rulemaking as needed to implement long-term water supply strategy for CFCA.

Planning Work Group

Goal: To identify AWS development projects and implementation strategies that will assure the availability of sustainable water supplies to meet projected public supply needs in a timely manner through 2025 in the CFCA.

Objective 1: Identify the need for AWS projects.

> Task 1A: Identify demand projections for all public water utilities and other categories of water use within the study area (including demand, timing and location). (Complete by September 30, 2006.)
>
> Task 1B: Identify amount of future demands to be met by alternative water supplies (e.g., unmet by traditional groundwater) for each utility or other new water use. (Complete by September 30, 2006.)
>
> Task 1C: SFWMD, SJRWMD and SWFWMD will identify this information for utilities in their respective districts based on best available data. For those utilities with service areas that extend into two or more water management districts and for other water uses that cross district boundaries, the applicable districts will jointly develop this information. (Complete by September 30, 2006.)

Objective 2: Develop list of already identified AWS development project options that could reasonably provide water to public supply utilities with identified unmet needs.

> Task 2A: SFWMD, SJRWMD and SWFWMD will all contribute to this list. (Complete by October 31, 2006.)
>
> Task 2B: Project list will include project name, planning level description of source, location, components, quantity, treatment requirements, estimated time of new water availability and cost information. (Complete by October 31, 2006.)

Objective 3: Evaluate combinations of projects from the list developed under Objective 2 and any other AWS development project options that may be feasible to meet the projected needs. (Complete by October 31, 2006.)

Objective 4: Develop draft implementation strategies using traditional and AWS development projects identified in Objectives 2 and 3, including funding strategies that associate public supply utilities with AWS development projects.

> Task 4A: Such strategies will be based upon the technical, economic and environmental feasibility of each project. (Complete by December 31, 2006.)
>
> Task 4B: To the extent reasonable, water supply development projects will be recommended as sources to supply utilities located in the water management district

within which the supply is located; however, projects that entail interdistrict transport will be considered in light of any applicable statutory provisions. (Complete by December 31, 2006.)

Objective 5: Solicit local government and other stakeholder input, participation and buy-in.

Task 5A: Meet with individual utilities, groups of utilities and other stakeholders as necessary to assess the implementation potential of the draft strategies or other project options identified by utilities or other stakeholders that are deemed feasible. (Initiate no later than January 1, 2007, and complete by December 31, 2007.)

Task 5B: Document those water supply project options that have been mutually agreed upon by the districts and involved local governments and other stakeholders. Such documentation will include, for each participant, the water supply needs unmet by traditional sources to be met by the project. The documentation will also identify the lead district for further investigation and development of each supply option, which is anticipated to be the district within which the supply source is located. (Initiate no later than January 1, 2007, and complete by December 31, 2007.)

Objective 6: Update each of the district's respective regional water supply plans to include the recommended AWS development projects. Such projects will then be eligible for potential funding from appropriate districts, including potential funding from the State Water Protection and Sustainability Trust Fund. The districts will seek to have these utility selected strategies become part of the local government comprehensive plan subject to appropriate FDEP and DCA review. (Complete as necessary.)

Objective 7: Develop a Memorandum of Understanding among the three districts to reflect continued central Florida coordination. Incorporate appropriate elements of the Guiding Principles and Mutual Understandings when completed. (To be determined.)

Computer Modeling and Tools Work Group

Goal: To ensure that the best available hydrologic modeling, statistical, and analytical tools are available for use to quantify sustainable groundwater and surface water availability in the CFCA region in support of regulatory actions, regional water supply planning, and implementation of alternative water source projects; and to assist in developing a data-sharing strategy to ensure these tools will be updated in a consistent manner.

Objective 1: Identify and determine the primary tools to be used to support current permitting and water-supply planning programs in central Florida.

Task 1A: Review the available regional and subregional scale groundwater and surface water modeling tools that exist within the CFCA area. (Complete by September 2006.)

Task 1B: Inventory the primary tools currently available for application to the permitting and planning programs. (Complete by September 2006.)

Task 1C: Inventory the primary tools that will be used in the next 24 months for application to the permitting and planning programs. (Complete by September 2006.)

Task 1D: Identify significant differences between primary tools. (Complete by November 2006.)

Task 1E: Recommend a procedure to apply primary tools for application to the permitting and planning programs. (Complete by November 2006.)

Task 1F: Finalize the identified primary tools currently in development, including the peer review process. (Complete by December 2007.)

Objective 2: Use existing primary tools to assist the permitting group in completing a short-term preliminary assessment of hydrologic conditions in the CFCA area to address the effects of currently allocated and future water uses in the CFCA.

Task 2A: Join with the permitting and planning groups to develop water use data sets of currently allocated, 2013, and future water uses. (Complete by November 2006.)

Task 2B: Use the currently available East-Central Florida Transient (ECFT) model to simulate aquifer level changes as a result of this water use. (Complete by December 2006.)

Task 2C: Use available tools to provide an analysis of water resource trends in the CFCA. (Complete by January 2007.)

Task 2D: Provide these results to permitting group of each district for joint interpretation. (Complete by January 2007.)

Objective 3: Complete development of the tools needed to address water resource issues in the CFCA that cross regional-scale model boundaries for future decision-making purposes.

Task 3A: Compare in detail the regional-scale groundwater modeling tools that overlap within central Florida. (Complete by November 2006.)

Task 3B: Develop a mutually acceptable process for applying multiple models to address a variety of water resource issues that extend beyond individual district boundaries. (Complete by July 2007.)

Task 3C: Compare how existing tools are used by each district for permitting and planning applications. (Complete by December 2007.)

Task 3D: Develop a consensus, in conjunction with the permitting and planning groups, regarding a consistent application approach for each tool. (Complete by November 2008.)

Task 3E: Use all available tools, in addition to the ECFT model, to provide an assessment of hydrologic conditions and identify areas of critical concern within the CFCA. (Complete by November 2008.)

Objective 4: Organize and coordinate a data-sharing system that will ensure future consistency among the tools as they become updated.

Task 4A: Inventory the data needs common to the modeling tools. (Complete by February 2007.)

Task 4B: Develop and implement a data collection, evaluation and sharing process among SFWMD, SJRWMD, and SWFWMD. (Complete by February 2007.) Example data types/issues to be included:

1. Water use
2. GIS layers (topography, land use, etc.)
3. Hydrogeologic data
4. Monitoring networks

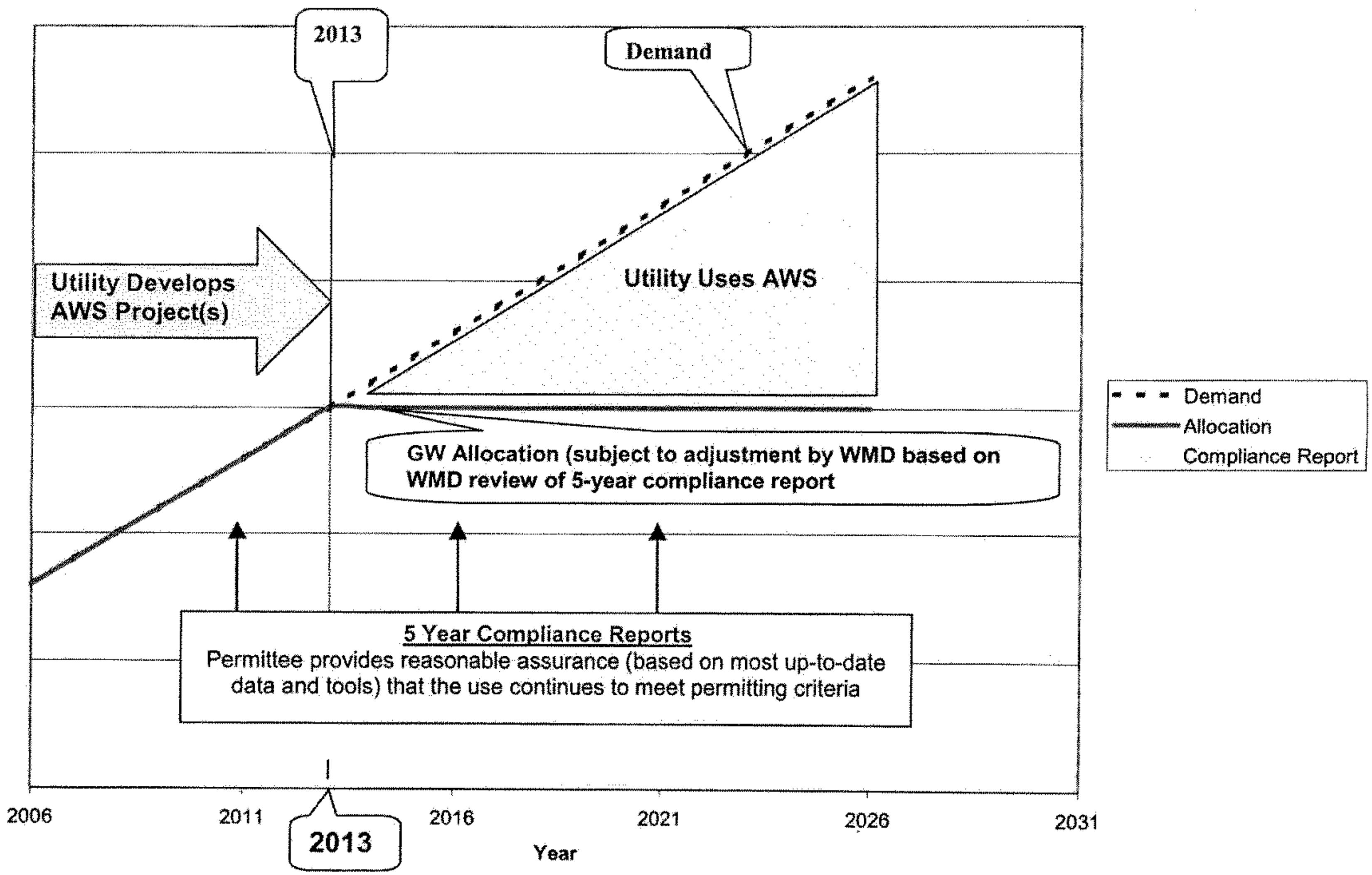
Task 4C: Develop a planning document to develop a common and/or seamless approach to sharing critical regulatory and planning data between districts. This document would be the basis to obtain program funding in the following fiscal year (FY) 2008 by each district to implement the plan. (Complete by March 2007.)

Objective 5: Organize and initiate a communication process with the permitting and planning work groups to ensure consistency in model application.

Task 5A: Identify critical linkages between the work plans developed by the modeling tools, planning, and permitting work groups. (Complete by July 2007.)

Task 5B: Develop and implement a strategy to coordinate modeling efforts among the districts' modeling staffs and to receive feedback from the planning and permitting staffs regarding specific modeling questions. (Complete by December 2007.)

CFCA Regulatory Work Plan Permit Framework for 20-year permit



Note: 2013 Allocation Limit Constant Regardless of Permit Issuance date

APPENDIX B

Individual Cooperator Adjusted Deficits by Project

Altamonte Springs	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	*1.38*	*0.83*	*0.27*	*-0.28*	*-0.83*	*-0.23*	*-0.65*	*-1.09*	*-6.77*
1 - Water Conservation/Demand Reduction (10% of Demand)	0.60	0.67	0.73	0.80	0.86	0.92	0.96	1.01	1.57
Potable									
7b - Seminole County Yankee Lake Regional Surface Water Facility						P[4]	P	P	P
Potable Subtotal	0.60	0.67	0.73	0.80	0.86	0.92	0.96	1.01	1.57
Adjusted Deficit[1]	*1.98*	*1.49*	*1.01*	*0.52*	*0.03*	*0.69*	*0.31*	*-0.08*	*-5.20*
Non-Potable									
2i - Seminole County/Sanlando Utilities Interconnect with Altamonte Springs					0.95	0.95	0.95	0.95	0.95
Non-Potable Subtotal	0.00	0.00	0.00	0.00	0.95	0.95	0.95	0.95	0.95
40% Match	0.00	0.00	0.00	0.00	0.38	0.38	0.38	0.38	0.38
Total Adjusted Deficit[1,3]	*1.98*	*1.49*	*1.01*	*0.52*	*0.41*	*1.07*	*0.69*	*0.30*	*-4.82*

Note: 1 = Positive value indicates a surplus, Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range i.e. -0.23 mgd = 2015 deficit.

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

4 = Project has potential benefit by partnering with host entity.

Casselberry	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	1.50	1.42	1.34	1.27	1.19	-0.06	-0.32	-0.58	-4.04
1 - Water Conservation/Demand Reduction (10% of Demand)	0.50	0.51	0.52	0.53	0.54	0.56	0.59	0.61	0.96
Potable									
9b - Surface WTP on St Johns River at SR46 - Potable						P[4]	P	P	1.5
10b - Surface WTP on St Johns River at Mullet Lake - Potable						P	P	P	P
Potable Subtotal	0.50	0.51	0.52	0.53	0.54	0.56	0.59	0.61	2.46
Adjusted Deficit[1]	2.00	1.93	1.86	1.80	1.73	0.50	0.26	0.03	-1.58
Non-Potable									
5 - Winter Springs Lake Jesup Reclaimed Water Augmentation		P	P	P	P	P	P	P	P
9a - Surface WTP on St Johns River at SR46 - Non Potable with Storage						0.5	0.5	0.5	2.5
10a - Surface WTP on St Johns River at Mullet Lake - Non Potable with Storage						0.5	0.5	0.5	2.5
Non-Potable Subtotal	0	0	0	0	0	1	1	1	5
40% Match	0	0	0	0	0	0	0	0	2
Total Adjusted Deficit[1,3]	*2.00*	*1.93*	*1.86*	*1.80*	*1.73*	*0.90*	*0.66*	*0.43*	*0.42*

Note: 1 = Positive value indicates a surplus, Negative values indicated a deficit or need.
2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).
3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

Lake Mary	Year / Range of Year								
	2006	**2007**	**2008**	**2009**	**2010**	**2011 - 2015[2]**	**2016 - 2020**	**2021 - 2025**	**2026-2045**
Difference (Supply-Demand) ==>	1.01	0.98	0.95	0.93	0.90	-0.08	-0.08	-0.08	-2.45
1 - Water Conservation/Demand Reduction (10% of Demand)	0.36	0.37	0.38	0.39	0.40	0.42	0.42	0.42	0.66
Potable									
7b - Seminole County Yankee Lake Regional Surface Water Facility						6.25	6.25	6.25	6.25
Potable Subtotal	0.36	0.37	0.38	0.39	0.40	6.67	6.67	6.67	6.91
Adjusted Deficit[1]	1.36	1.35	1.33	1.32	1.30	6.59	6.59	6.59	4.45
Non-Potable									
2a - Sanford North WRF Augmentation/Reclaimed Water System Improvements		1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
2c - Orange Blvd Reclaimed Water Transmission Main		0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
2e - Timacuan Reclaimed Water Main Upgrade		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
2h - Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
7a - Seminole County Yankee Lake Reclaimed Water System Augmentation Project				2.50	2.50	2.50	2.50	2.50	5.00
Non-Potable Subtotal	0.00	4.08	4.08	6.58	6.58	6.58	6.58	6.58	9.08
40% Match	0.00	1.63	1.63	2.63	2.63	2.63	2.63	2.63	3.63
Total Adjusted Deficit[1,3]	*1.36*	*2.98*	*2.96*	*3.95*	*3.93*	*9.22*	*9.22*	*9.22*	*8.08*

Note: 1 = Positive value indicates a surplus, Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

Longwood	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	0.49	0.39	0.30	0.20	0.11	0.00	-0.03	-0.04	-1.45
1 - Water Conservation/Demand Reduction (10% of Demand)	0.20	0.21	0.22	0.23	0.24	0.24	0.25	0.25	0.39
Potable									
7b - Seminole County Yankee Lake Regional Surface Water Facility				P[4]	P	P	P	P	P
Potable Subtotal	0.20	0.21	0.22	0.23	0.24	0.24	0.25	0.25	0.39
Adjusted Deficit[1]	0.69	0.61	0.52	0.44	0.35	0.24	0.21	0.20	-1.06
Non-Potable									
7a - Seminole County Yankee Lake Reclaimed Water System Augmentation Project						P	P	P	P
Non-Potable Subtotal	0	0	0	0	0	0	0	0	0
40% Match	0	0	0	0	0	0	0	0	0
Total Adjusted Deficit[1,3]	*0.69*	*0.61*	*0.52*	*0.44*	*0.35*	*0.24*	*0.21*	*0.20*	*-1.06*

Note: 1 = Positive value indicates a surplus,Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

4 = Project has potential benefit by partnering with host entity.

Oviedo	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	0.09	-0.06	-0.21	-0.37	-0.52	-0.48	-1.32	-2.99	-7.79
1 - Water Conservation/Demand Reduction (10% of Demand)	0.41	0.42	0.44	0.46	0.48	0.60	0.68	0.85	1.33
Potable									
9b - Surface WTP on St Johns River at SR46 - Potable						3.00	3.00	3.00	9.00
Adjusted Deficit [1]	0.41	0.42	0.44	0.46	0.48	3.60	3.68	3.85	10.33
Non-Potable									
3 - East Orange and Seminole Counties Regional Reuse Project			3.00	3.00	3.00	3.00	3.00	3.00	3.00
8 - Oviedo Reclaimed Water Projects			1.50	1.50	1.50	1.50	1.50	1.50	1.50
9a - Surface WTP on St Johns River at SR46 - Non Potable with Storage						2.00	2.00	2.00	5.00
Non-Potable Subtotal	0.00	0.00	4.50	4.50	4.50	6.50	6.50	6.50	9.50
40% Match	0.00	0.00	1.80	1.80	1.80	2.60	2.60	2.60	3.80
Total Adjusted Deficit [1,3]	*0.00*	*0.00*	*1.80*	*1.80*	*1.80*	*2.60*	*2.60*	*2.60*	*3.80*

Note: 1 = Positive value indicates a surplus,Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

Sanford	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	1.71	1.96	2.20	2.45	2.69	-0.78	-1.43	-1.56	-7.00
1 - Water Conservation/Demand Reduction (10% of Demand)	0.70	0.70	0.70	0.69	0.69	0.88	0.95	0.96	1.51
Potable									
6 - Sanford Surface WTP on Lake Monroe - Potabl						4.00	4.00	4.00	4.00
7b - Seminole County Yankee Lake Regional Surface Wate Facility						6.25	6.25	6.25	6.25
Potable Subtota	0.70	0.70	0.70	0.69	0.69	11.13	11.20	11.21	11.76
Adjusted Deficit[1]	2.42	2.66	2.90	3.14	3.38	10.35	9.77	9.65	4.76
Non-Potable									
2a - Sanford North WRF Augmentation/Reclaimed Water System Improvements		1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
2c - Orange Blvd Reclaimed Water Transmission Mai		0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
2d - New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
2e - Timacuan Reclaimed Water Main Upgrad		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
2h - Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
2i - Seminole County/Sanlando Utilities Interconnect wit Altamonte Springs					0.95	0.95	0.95	0.95	0.95
7a - Seminole County Yankee Lake Reclaimed Water Syster Augmentation Project				2.50	2.50	2.50	2.50	2.50	2.50
Non-Potable Subtotal	0.00	6.08	6.08	8.58	9.53	9.53	9.53	9.53	9.53
40% Match	0.00	2.43	2.43	3.43	3.81	3.81	3.81	3.81	3.81
Total Adjusted Deficit[1,3]	*2.42*	*5.09*	*5.33*	*6.57*	*7.19*	*14.16*	*13.58*	*13.46*	*8.57*

Note: 1 = Positive value indicates a surplus, Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

Winter Springs	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	1.13	1.09	1.05	1.02	0.98	0.00	-0.20	-0.20	-2.80
1 - Water Conservation/Demand Reduction (10% of Demand)	0.41	0.42	0.42	0.43	0.44	0.44	0.46	0.46	0.72
Potable									
9b - Surface WTP on St Johns River at SR46 - Potable [4]						0.20	0.20	0.20	2.00
Potable Subtotal	0.41	0.42	0.42	0.43	0.44	0.64	0.66	0.66	2.72
Adjusted Deficit [1]	1.54	1.51	1.48	1.45	1.42	0.64	0.46	0.46	-0.08
Non-Potable									
2i - Seminole County/Sanlando Utilities Interconnect with Altamonte Springs					0.95	0.95	0.95	0.95	0.95
5 - Winter Springs Lake Jesup Reclaimed Water Augmentation						2.25	2.25	2.25	2.25
9a - Surface WTP on St Johns River at SR46 - Non Potable with Storage						2.50	2.50	2.50	2.50
Non-Potable Subtotal	0.00	0.00	0.00	0.00	0.95	5.70	5.70	5.70	5.70
40% Match	0.00	0.00	0.00	0.00	0.38	2.28	2.28	2.28	2.28
Total Adjusted Deficit [1,3]	*1.54*	*1.51*	*1.48*	*1.45*	*1.80*	*2.92*	*2.74*	*2.74*	*2.20*

Note: 1 = Positive value indicates a surplus,Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

4 = 9b and 10b vary only by intake location

SCU - Northeast	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	0.86	0.52	0.17	-0.18	-0.53	-0.02	-0.35	-0.71	-3.13
1 - Water Conservation/Demand Reduction (10% of Demand)	0.22	0.25	0.29	0.32	0.36	0.36	0.39	0.43	0.67
Potable									
7b - Seminole County Yankee Lake Regional Surface Water Facility						6.25	6.25	6.25	6.25
Potable Subtotal	0.22	0.25	0.29	0.32	0.36	6.61	6.64	6.68	6.92
Adjusted Deficit[1]	1.08	0.77	0.45	0.14	-0.18	6.59	6.29	5.97	3.79
Non-Potable									
2a - Sanford North WRF Augmentation/Reclaimed Water System Improvements		1.825	1.825	1.825	1.825	1.825	1.825	1.825	1.825
2h - Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
7a - Seminole County Yankee Lake Reclaimed Water System Augmentation Project				2.50	2.50	2.50	2.50	2.50	2.50
Non-Potable Subtotal	0.00	2.28	2.28	4.78	4.78	4.78	4.78	4.78	4.78
40% Match	0.00	0.91	0.91	1.91	1.91	1.91	1.91	1.91	1.91
Total Adjusted Deficit[1,3]	*1.08*	*1.68*	*1.36*	*2.05*	*1.74*	*8.50*	*8.20*	*7.88*	*5.70*

Note: 1 = Positive value indicates a surplus, Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

SCU - Northwest	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015 [2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	0.73	0.11	-0.50	-1.12	-1.73	-0.62	-0.83	-1.04	-7.79
1 - Water Conservation/Demand Reduction (10% of Demand)	0.61	0.70	0.80	0.90	1.00	1.15	1.17	1.19	1.87
Potable									
7b - Seminole County Yankee Lake Regional Surface Water Facility						6.25	6.25	6.25	6.25
Potable Subtotal	0.61	0.70	0.80	0.90	1.00	7.40	7.42	7.44	8.12
Adjusted Deficit [1]	1.33	0.82	0.30	-0.22	-0.73	6.78	6.59	6.40	0.33
Non-Potable									
2a - Sanford North WRF Augmentation/Reclaimed Water System Improvements		1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
2b - Markham Woods Road Reclaimed Water Transmission Main		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2c - Orange Blvd Reclaimed Water Transmission Main		0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
2e - Timacuan Reclaimed Water Main Upgrade		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
2f - Heathrow Blvd Reclaimed Water Transmission Main			2.50	2.50	2.50	2.50	2.50	2.50	2.50
2g - Residential Reclaimed Water Retrofit Phase I		1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
2h - Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements, Modification to Recharge Basins		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
7a - Seminole County Yankee Lake Reclaimed Water System Augmentation Project				2.50	2.50	2.50	2.50	2.50	2.50
Non-Potable Subtotal	0.00	8.18	10.68	13.18	13.18	13.18	13.18	13.18	13.18
40% Match	0.00	3.27	4.27	5.27	5.27	5.27	5.27	5.27	5.27
Total Adjusted Deficit [1,3]	*1.33*	*4.09*	*4.57*	*5.05*	*4.54*	*12.05*	*11.86*	*11.67*	*5.60*

Note: 1 = Positive value indicates a surplus, Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

SCU - Southeast	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	-0.29	-0.73	-1.17	-1.61	-2.05	-0.49	-0.73	-3.59	-12.37
1 - Water Conservation/Demand Reduction (10% of Demand)	0.94	0.99	1.03	1.08	1.12	1.24	1.27	1.55	2.43
Potable									
9b - Surface WTP on St Johns River at SR46 - Potable						3.80	3.80	3.80	13.50
Potable Subtotal	0.94	0.99	1.03	1.08	1.12	5.04	5.07	5.35	15.93
Adjusted Deficit [1]	0.65	0.26	-0.14	-0.53	-0.93	4.55	4.34	1.76	3.56
Non-Potable									
3 - East Orange and Seminole Counties Regional Reuse Project			1.70	1.70	1.70	1.70	1.70	1.70	1.70
Non-Potable Subtotal	0.00	0.00	1.70	1.70	1.70	1.70	1.70	1.70	1.70
40% Match	0.00	0.00	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Total Adjusted Deficit [1,3]	*0.65*	*0.26*	*0.54*	*0.15*	*-0.25*	*5.23*	*5.02*	*2.44*	*4.24*

Note: 1 = Positive value indicates a surplus,Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

SCU - Southwest	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	0.27	0.23	0.18	0.13	0.08	-0.02	-0.02	-0.02	-0.85
Option 1 (10% of Demand)	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.15	0.23
1 - Water Conservation/Demand Reduction (10% of Demand)									
7b - Seminole County Yankee Lake Regional Surface Water Facility						P[4]	P	P	P
Potable Subtotal	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.15	0.23
Adjusted Deficit[1]	0.15	0.10	0.05	-0.01	-0.06	-0.17	-0.17	-0.17	-1.08
Non-Potable									
7a - Seminole County Yankee Lake Reclaimed Water System Augmentation Project				P	P	P	P	P	P
Non-Potable Subtotal	0	0	0	0	0	0	0	0	0
40% Match	0	0	0	0	0	0	0	0	0
Total Adjusted Deficit[1,3]	*0.15*	*0.10*	*0.05*	*-0.01*	*-0.06*	*-0.17*	*-0.17*	*-0.17*	*-1.08*

Note: 1 = Positive value indicates a surplus,Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range (2015).

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

4 = Project has potential benefit by partnering with host entity.

Utilities Inc. - Sanlando	Year / Range of Year								
	2006	2007	2008	2009	2010	2011 - 2015[2]	2016 - 2020	2021 - 2025	2026-2045
Difference (Supply-Demand) ==>	*1.85*	*2.05*	*2.26*	*2.46*	*2.66*	*-0.04*	*-0.04*	*-0.23*	*-4.38*
1 - Water Conservation/Demand Reduction (10% of Demand)	0.79	0.77	0.75	0.73	0.71	0.72	0.73	0.73	1.15
Potable									
7b - Seminole County Yankee Lake Regional Surface Water Facility						P[4]	P	P	P
Potable Subtotal	0.79	0.77	0.75	0.73	0.71	0.72	0.73	0.73	1.15
Adjusted Deficit (deficit-potable)[1]	*2.64*	*2.82*	*3.00*	*3.18*	*3.37*	*0.67*	*0.68*	*0.50*	*-3.23*
Non-Potable									
2i - Seminole County/Sanlando Utilities Interconnect with Altamonte Springs					0.95	0.95	0.95	0.95	0.95
Non-Potable Subtotal	0.00	0.00	0.00	0.00	0.95	0.95	0.95	0.95	0.95
40% Match	0.00	0.00	0.00	0.00	0.38	0.38	0.38	0.38	0.38
Total Adjusted Deficit[1,3]	*2.64*	*2.82*	*3.00*	*3.18*	*3.75*	*1.05*	*1.06*	*0.88*	*-2.85*

Note: 1 = Positive value indicates a surplus,Negative values indicated a deficit or need.

2 = (2011 - 2015) indicated the range of years for improvement, the deficit shown is associated with the last year in the range i.e. -0.23 mgd = 2015 deficit.

3 =Total Adjusted Deficit = Deficit- potable - 40% of non potable

4 = Project has potential benefit by partnering with host entity.

APPENDIX C

Project Scoring Sheets

Project:			***Project Number:***
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: Sanford North WRF Augmentation/Reclaimed Water System Improvements			**2a**
Project Yield: 7.3 mgd			
Description: The project includes the addition of the following improvements to the Sanford North WRF: augmentation, chlorine contact chamber and associated piping and fittings; augmentation transfer pump station; Actiflo systems and associated piping and fittings; sodium hypochlorite system modifications and augmentation system sludge management system components.			
Criteria	**Weighting Factor**	**Criteria Score**	**Weighted Score**
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = Meets MFL, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) None present.	2	2	4
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) None within 1000 ft. NW Seminole Cty Conservation Land within 1675 ft.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) Historical Structure within 1300 ft. Private Residence at 1012 W 3rd St.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	4	12
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			34
COSTS SUBTOTAL			14
TOTAL SCORE			48

Project:	***Project Number:***
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: Markham Woods Road Reclaimed Water Transmission Main	2b

Project Yield:

3.0 mgd

Description:

The project includes construction of approximately 40,000 feet of reclaimed water transmission main to serve reuse customers in a high irrigation area along Markham Woods Road as recommended in Tri-Party Optimization Plan

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Within wetlands and strategic habitat conservation area.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Within Wekiva Springs State Park. Within outstanding Florida waters boundary.	2	0	0
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) FNAI conservation lands within 230 ft. Within Wekiva Springs State Park.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	4	12
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			24
COSTS SUBTOTAL			14
TOTAL SCORE			38

Criteria	Weighting Factor	Criteria Score	Weighted Score
Project: North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: Orange Boulevard Reclaimed Water Transmission Main			**Project Number:** 2c
Project Yield: 2.5 mgd			
Description: Design and construct approximately 7,000 feet of reclaimed water transmission main on Orange Blvd from Markham Road to SR 46. Reclaimed main to increase capacity and interconnectivity of Tri-Party reclaimed water system.			
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) None present.	2	2	4
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) None present.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) Archaelogical site within 200 ft.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) Orange Blvd commercial within 2200 ft.	2	1	2
2 ***Costs***			
a. **Unit Production Cost** (1 = > \$1/kgal, 2 = \$0.5-1/kgal, 3 = \$0.25-0.5/kgal, 4 = <\$0.25/kgal)	3	4	12
b. **O&M Cost** (1 = > \$0.5 M/yr, 2 = < \$0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			32
COSTS SUBTOTAL			14
TOTAL SCORE			46

Project:			**Project Number:**
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: New East Lake Mary Blvd Reclaimed Water Main, New Reclaimed Water Main from Sanford South WRC to Victoria St, New Reclaimed Water Main from US 17-92 to SR 46			**2d**
Project Yield: 2.0 mgd			
Description: This project proposes a new reclaimed water main along East Lake Mary Blvd from Sanford South WRC to SR 46; a new reclaimed water main extending west from Sanford South WRC around Sanford International Airport and tying into the east main at the corner of Victoria Street and Willow Avenue; and a new reclaimed water main along Riverview Avenue from the existing 20" water main at US 17-92 to the existing 16" water main on SR 46.			
Criteria	**Weighting Factor**	**Criteria Score**	**Weighted Score**
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Wetlands present.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Lake Jesup conservation area within 100 ft.	2	1	2
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) Bald Eagle at Kentucky St. and Beardall Ave.	3	1	3
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) Historical sites within 500 ft.	2	1	2
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	3	9
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			21
COSTS SUBTOTAL			11
TOTAL SCORE			32

Project:			***Project Number:***
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: Timacuan Reclaimed Water Main Upgrade			**2e**
Project Yield: 2.9 mgd			
Description: The project includes a reclaimed water main along Timacuan Blvd from Rinehart Rd to Mohegan Blvd upgrade from 8" to 16".			

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Wetlands present.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) None present.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft)	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	4	12
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			32
COSTS SUBTOTAL			14
TOTAL SCORE			46

Project:			***Project Number:***
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: Heathrow Boulevard Reclaimed Water Transmission Main			**2f**
Project Yield: 2.5 mgd			
Description: Design and construct approximately 18,000 feet of reclaimed water transmission main on CR 46A, Heathrow Blvd and Bridgewater Drive as recommended in the Tri-Party Optimization Plan. This allows the capability of users to move water between multi-jurisdictional Tri-party users. This project will maximize the effectiveness of alternative water supplies and displacement of current and future potable water demand to reduce per capita consumption of potable water in high use neighborhoods. This transmits a large volume of reclaimed water that directly recharges into the Water Use Caution Area.			

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Within strategic habitat and wetlands.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Adjacent to Wekiva River buffer conservation area. State park within 4400 ft Aquatic preserve and outstanding Florida waters within 1000 ft.	2	1	2
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	4	12
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			26
COSTS SUBTOTAL			14
TOTAL SCORE			40

Project:	***Project Number:***
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: Residential Reclaimed Water Retrofit – Phase I	**2g**
Project Yield: 1.09 mgd	
Description: Construct a residential reclaimed water retrofit in Heathrow Woods, Bristol Park, Chestnut Hill, East Camden and Magnolia Plantation to directly offset approximately 1.09 MGD of potable water currently used for irrigation. This will provide reuse for wastewater effluent from Yankee Lake Wastewater Treatment Plant	

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 *Environmental Impact*			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Within protected habitat (wetland).	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) State Park within 650 ft. Aquatic preserve and outstanding Florida waters within 1800 ft.	2	3	6
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) Archaelogical site within 40 ft.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 *Costs*			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	2	6
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			30
COSTS SUBTOTAL			8
TOTAL SCORE			38

Project:	***Project Number:***
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: **Mill Creek Reclaimed Water Storage Pond Filtration & Pumping System, Timacuan Golf Course Reclaimed Water Storage Pond, Greenwood Lakes Reclaimed Water System Improvements,**	**2h**

Project Yield:

1.8 mgd

Description:

Conveyance and storage of reclaimed water in an existing 240 MG pond in the Mill Creek drainage basin; installation of a pumping station, screening system and disinfection facilities to recover the stored water and deliver it to the existing reclaimed water distribution system; modification of an existing stormwater pond to conduct a new 2.3 MG reclaimed water storage pond; installation of a new 1.75 MG reclaimed water ground storage tank and associated piping and fittings at Greenwood Lakes storage and re-pump facility; Installation of any necessary appurtenances to allow for discharge of reclaimed/augmentation water into recharge basins; and the ability to deliver an additional 1.8 MGD of reclaimed/surface water for recharge and irrigation, improve system reliability, and reduce wet weather surface water discharges to the St. Johns River.

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Timacuan - within wetland. Mill Creek storage pond - wetlands present.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) None present.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) Cultural within 500 ft.	2	1	2
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	3	9
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			30
COSTS SUBTOTAL			11
TOTAL SCORE			41

Project:	**Project Number:**
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: Seminole County/Sanlando Utilities Interconnect with Altamonte Springs	2i

Project Yield:
3.8 mgd

Description:
Install 16" reclaimed water main from Greenwood Lakes Wastewater Treatment Plant to Sanlando Utilities/Altamonte Springs Reclaimed System; and install 16" reclaimed water main from Seminole Community College to Winter Springs Water Reclamation Facility.

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Wetlands present. Within strategic habitat	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Within conservation land with springs present. Within outstanding Florida waters. Aquatic preserves are withing 100 ft of project site.	2	0	0
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	4	12
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			24
COSTS SUBTOTAL			14
TOTAL SCORE			38

Project:	***Project Number:***
North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Study: Greenwood Lakes Rapid Infiltration Basins Rehabilitation	**2j**

Project Yield:

1.0 mgd

Description:

Design and construct rehabilitation of the Greenwood Lakes Rapid Infiltration Basin site. Optimize aquifer recharge capacity of reclaimed water for existing basins. Assist with City of Sanford effluent disposal capacity displacement due to de-mucking of Lake Jesup. Rehabilitation will increase capacity of WWTF back to original design flows.

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) None present.	2	2	4
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) None present.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	4	12
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			34
COSTS SUBTOTAL			14
TOTAL SCORE			48

Project:	***Project Number:***
East Orange and Seminole Counties Regional Reuse Project	3

Project Yield:
4.7 mgd

Description:
This project was identified in the 2005 District Water Supply Plan (DWSP). This project will utilize reclaimed water from the Iron Bridge Regional Water Reclamation Facility (WRF). Seminole County currently has an agreement to accept 8.0 mgd of reclaimed water from Iron Bridge. Seminole County has agreements with the City of Oviedo to send them 3.0 mgd of the allocated amount and with the University of Central Florida to send them 3.3 mgd. The total cost was determined based on the total estimated project cost of $45 Million and the total flow for the Eastern Reuse project of 19.4 mgd which is $2.32/gallon. It was assumed that Seminole County would contribute the proportionate amount equal to the 8.0 mgd allocation.

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no)	2		0
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft)	2		0
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft)	2		0
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	4	12
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			18
COSTS SUBTOTAL			14
TOTAL SCORE			32

Project:	**Project Number:**
Altamonte Springs and Apopka Project RENEW APRICOT	**4**

Project Yield:

6.0 mgd

Description:

The City of Altamonte Springs currently discharges excess reclaimed water from their Regional Reclamation Facility to the Little Wekiva River. The City is proposing to transmit up to 6 MGD of reclaimed water to Project ARROW in Apopka. Design of the transmission facilities will include the ability to convey up to 6 MGD with the additional 3 MGD coming from various sources. Phase I includes six miles of 16-inch transmission line with a capacity of 6 MGD. Phase II includes upgrades to the Altamonte RWRF to improve reclaim water quality as required by Project ARROW in Apopka.

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no)	2		0
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft)	2		0
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft)	2		0
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	3	9
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			18
COSTS SUBTOTAL			11
TOTAL SCORE			29

Project:			***Project Number:***
Winter Springs Lake Jesup Reclaimed Water Augmentation Project			**5**
Project Yield: 2.25 mgd			
Description: Treatment, storage, and pumping of surface waters of Lake Jesup for reclaimed water augmentation and system expansion to reduce potable water demands. The City is also considering augmentation of an adjacent uncapped spring of approximately 0.7 MGD.			
Criteria	**Weighting Factor**	**Criteria Score**	**Weighted Score**
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = Meets MFL, 4 = Not Applicable) No existing MFL.	3	1	3
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) None present.	2	2	4
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) None present.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) Within archaelogical site.	3	1	3
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	2	6
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			22
COSTS SUBTOTAL			8
TOTAL SCORE			30

Project:	***Project Number:***
Sanford Surface WTP on Lake Monroe - Potable	**6**

Project Yield:
4.0 mgd

Description:
This project was identified in the 2005 District Water Supply Plan (DWSP). This project will utilize reclaimed water from the Iron Bridge Regional Water Reclamation Facility (WRF). Seminole County currently has an agreement to accept 8.0 mgd of reclaimed water from Iron Bridge. Seminole County has agreements with the City of Oviedo to send them 3.0 mgd of the allocated amount and with the University of Central Florida to send them 3.3 mgd. The total cost was determined based on the total estimated project cost of $45 Million and the total flow for the Eastern Reuse project of 19.4 mgd which is $2.32/gallon. It was assumed that Seminole County would contribute the proportionate amount equal to the 8.0 mgd allocation.

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Pending MFL.	3	2	6
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) None present.	2	2	4
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) None present.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) None present.	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) Historic structures within 500 ft. of site.	2	1	2
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	2	6
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			26
COSTS SUBTOTAL			8
TOTAL SCORE			34

Project:			***Project Number:***
Seminole Yankee Lake Reclaimed Water System Augmentation Project			7a
Project Yield: 10 mgd			
Description: This project proposes construction of a 10 MGD surface water treatment plant to treat water to reclaimed water standards using the St. Johns River as a water source. The treatment will include chemical coagulation, high-rate clarification, and high-level chlorine disinfection. Design and construct a reclaimed water storage and re-pump facility at the Yankee Lake Water Reclamation Facility to provide more reliable reclaimed water capacity. Design and construct a reclaimed water transmission main on Yankee Lake Rd from the Yankee Lake Water Reclamation Facility and future Yankee Lake Regional Surface Water facility to SR 46 as recommended in Tri-Party Optimization Plan.			
Criteria	**Weighting Factor**	**Criteria Score**	**Weighted Score**
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) MFL pending.	3	2	6
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Plant not within wetlands, piping for plant within wetlands.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Intake within Black Bear Wilderness area and aquatic preserve. Lower Wekiva Springs State Park within 500 ft of site. Outstanding Florida water within 1000 ft of site.	2	0	0
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) Plant within Black Bear Wilderness area.	3	1	3
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	1	3
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	1	1
ENVIRONMENTAL IMPACT SUBTOTAL			15
COSTS SUBTOTAL			4
TOTAL SCORE			19

Project:	***Project Number:***
Seminole Yankee Lake Regional Surface Water Facility - Potable	**7b**

Project Yield:
25 mgd

Description:
This project has the potential to be a multi-jurisdictional potable facility with a surface water source. It is located adjacent to the existing Yankee Lake WWTF. The intake structure is located northeast of the facility on the St Johns River. The proposed project yield is 25 mgd and estimated to be completed in 2011.

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 *Environmental Impact*			
a. MFLs (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) MFL pending.	3	2	6
b. Presence of Protected Habitat (wetlands) (1 = yes, 2 = no) Plant not within wetlands, piping for plant within wetlands.	2	1	2
c. Proximity of Conservation Land, Aquatic Preserves, National/State Park (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Intake within Black Bear Wilderness area and aquatic preserve. Lower Wekiva Springs State Park within 500 ft of site. Outstanding Florida water within 1000 ft of site.	2	0	0
d. Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake (1 = yes, 2 = no) Plant within Black Bear Wilderness area.	3	1	3
e. Cultural (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 *Costs*			
a. Unit Production Cost (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	1	3
b. O&M Cost (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	1	1
ENVIRONMENTAL IMPACT SUBTOTAL			15
COSTS SUBTOTAL			4
TOTAL SCORE			19

Project:			***Project Number:***
Oviedo Reclaimed Water Projects			**8**
Project Yield:			
1.5 mgd			
Description: This project will include Installation of a new service main into Kingsbridge West Subdivision, scheduled for 2006; and installation of reclaimed water distribution system into Kingsbridge West phase I and Lake Rogers, scheduled for 2007. Installation of reclaimed water distribution system into Big Oak, Twin Rivers Phase I and Alafaya Woods Phases 17 and 18. Installation of reclaimed water transmission main on Division Street between Mitchell Hammock Road and CR 419; installation of reclaimed water transmission main north on Division St from CR 419; and install connection from north Division St to Lake Charm Country Estates and the Meadows. Installation of reclaimed water distribusion system into Twin Rivers.			
Criteria	**Weighting Factor**	**Criteria Score**	**Weighted Score**
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable.	3	4	12
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) None present.	2	2	4
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Project within 275 ft of Twin Rivers 2 preserve. Project within 500 ft of outstanding waters.	2	2	4
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no)	3	2	6
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	2	6
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	2	2
ENVIRONMENTAL IMPACT SUBTOTAL			30
COSTS SUBTOTAL			8
TOTAL SCORE			38

Project: Surface WTP on St Johns River at SR 46 - Non-Potable with Storage			***Project Number:*** 9a
Project Yield: 10 mgd			
Description: The project will be a multi-jurisdictional non-potable facility with a surface water source. A potential location of the facility is the City of Sanford's Site 10, which is adjacent to SR46, the St Johns River and Lake Jesup. The intake structure would be located on the St Johns River at SR46. Membrane technology would be used to treat to non-potable water standards. A reservoir to provide non-potable water storage would be constructed.			
Criteria	**Weighting Factor**	**Criteria Score**	**Weighted Score**
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) Not Applicable.	3	2	6
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Intake and piping to plant within wetlands.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Intake within Lake Monroe conservation area. Pipeline within 1500 ft of Black Hammock Wilderness conservation area.	2	0	0
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) Piping within 100 ft of Little Big Econ State Forest. CR426 within 100 ft of outstanding Florida waters. Bald Eagle location within close proximity of project site.	3	1	3
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	2	6
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	1	1
ENVIRONMENTAL IMPACT SUBTOTAL			15
COSTS SUBTOTAL			7
TOTAL SCORE			22

Project:			***Project Number:***
Surface WTP on St Johns River at SR 46 - Potable			**9b**
Project Yield: 10.5 mgd			
Description: The project will be a multi-jurisdictional potable facility with a surface water source. A potential location of the facility is the City of Sanford's Site 10, which is adjacent to SR46, the St Johns River and Lake Jesup. The intake structure would be located on the St Johns River at SR46. Membrane technology would be used to treat to potable water standards.			
Criteria	**Weighting Factor**	**Criteria Score**	**Weighted Score**
1 *Environmental Impact*			
a. MFLs (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) MFL pending.	3	2	6
b. Presence of Protected Habitat (wetlands) (1 = yes, 2 = no) Intake and piping to plant within wetlands.	2	1	2
c. Proximity of Conservation Land, Aquatic Preserves, National/State Park (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Intake within Lake Monroe conservation area. Pipeline within 1500 ft of Black Hammock Wilderness conservation area.	2	0	0
d. Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake (1 = yes, 2 = no) Piping within 100 ft of Little Big Econ State Forest. CR426 within 100 ft of outstanding Florida waters. Bald Eagle location within close proximity of project site.	3	1	3
e. Cultural (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 *Costs*			
a. Unit Production Cost (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	1	3
b. O&M Cost (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	1	1
ENVIRONMENTAL IMPACT SUBTOTAL			15
COSTS SUBTOTAL			4
TOTAL SCORE			19

Project:			***Project Number:***
Surface WTP on St Johns River at SR Mullet Lake - Non-Potable with Storage			**10a**
Project Yield: 10 mgd			
Description: The project will be a multi-jurisdictional non-potable facility with a surface water source. A potential location of the facility is the City of Sanford's Site 10, which is adjacent to SR46, the St Johns River and Lake Jesup. The intake structure would be located on the St Johns River at Mullet Lake. Membrane technology would be used to treat to non-potable water standards. A reservoir to provide non-potable water storage would be constructed.			

Criteria	Weighting Factor	Criteria Score	Weighted Score
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) MFL pending.	3	2	6
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Plant intake through strategic habitat conservation area. Plant piping within wetlands.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Pipeline is within 1500 ft of Black Hammock Wilderness conservation land.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) Piping is within 100 ft of Little Big Econ State Forest. SR426 is within 100 ft of outstanding Florida waters. Bald Eagle location within close proximity of project site.	3	1	3
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	2	6
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	1	1
ENVIRONMENTAL IMPACT SUBTOTAL			23
COSTS SUBTOTAL			7
TOTAL SCORE			30

Project:			***Project Number:***
Surface WTP on St Johns River at SR Mullet Lake - Potable			**10b**
Project Yield: 10.5 mgd			
Description: The project will be a multi-jurisdictional potable facility with a surface water source. A potential location of the facility is the City of Sanford's Site 10, which is adjacent to SR46, the St Johns River and Lake Jesup. The intake structure would be located on the St Johns River at Mullet Lake. Membrane technology would be used to treat to potable water standards.			
Criteria	**Weighting Factor**	**Criteria Score**	**Weighted Score**
1 ***Environmental Impact***			
a. **MFLs** (0 = Does not meet MFL, 1 = No MFL set, 2 = Pending MFL, 3 = MFL set, 4 = Not Applicable) MFL pending.	3	2	6
b. **Presence of Protected Habitat (wetlands)** (1 = yes, 2 = no) Plant intake through strategic habitat conservation area. Plant piping within wetlands.	2	1	2
c. **Proximity of Conservation Land, Aquatic Preserves, National/State Park** (0 = within conservation land, 1 = within 100 ft, 2 = within 500 ft, 3 = 500-1000 ft, 4 = >1000 ft) Pipeline is within 1500 ft of Black Hammock Wilderness conservation land.	2	4	8
d. **Existence of Protected or Economically Important Species (as identified in the Florida Natural Area Inventory) within site, service lines or intake** (1 = yes, 2 = no) Piping is within 100 ft of Little Big Econ State Forest. SR426 is within 100 ft of outstanding Florida waters. Bald Eagle location within close proximity of project site.	3	1	3
e. **Cultural** (1 = within 500 ft, 2 = >500 ft) None present.	2	2	4
2 ***Costs***			
a. **Unit Production Cost** (1 = > $1/kgal, 2 = $0.5-1/kgal, 3 = $0.25-0.5/kgal, 4 = <$0.25/kgal)	3	1	3
b. **O&M Cost** (1 = > $0.5 M/yr, 2 = < $0.5 M/yr)	1	1	1
ENVIRONMENTAL IMPACT SUBTOTAL			23
COSTS SUBTOTAL			4
TOTAL SCORE			27