Special Publication SJ2004-SP4

East-Central Florida Water Supply Planning Initiative Phase II Annual Report of Activities and Accomplishments 2003

St. Johns River Water Management District
Palatka, Florida

2003

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East-Central Florida
Water Supply Planning Initiative Phase II
Annual Report of Activities and Accomplishments
2003

Edited by

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St. Johns River Water Management District
Palatka, Florida

2003

EXECUTIVE SUMMARY

The east-central Florida area, which includes Brevard, Orange, Volusia and Seminole counties and portions of Lake, Marion, Polk, Sumter, Osceola and Flagler counties, has been the subject of a major water supply planning initiative since 2002. This initiative, the East-Central Florida Water Supply Planning Initiative (Initiative), is designed to assist local governments and water supply utilities in meeting future water supply needs, while protecting the water resources and related natural systems.

The 2000 St. Johns River Water Management District Water Supply Plan (DWSP) concluded that, in the near future, water supply needs in east-central Florida will not be able to be met by available fresh groundwater alone without likely incurring unacceptable environmental impacts to lakes, wetlands or springs, as well as unacceptable saltwater intrusion. Therefore, it is expected that meeting future water supply needs in east-central Florida will require a combination of fresh groundwater, other alternative sources and integrated water resource management techniques.

The Initiative resulted from two regionwide water summits held in early 2002 where local government officials, water supply utilities, and the St. Johns River, South Florida and Southwest Florida water management districts began working together to develop solutions to their collective future water supply issues. Orange County Chairman Richard T. Crotty hosted the summits.

Representatives from all ten counties in the east-central Florida area were invited to participate in Phase I of the Initiative, which focused on a dialogue process to identify key water supply issues, provide information and education on the issues, and identify regional and subregional strategies to address the issues. The Florida Conflict resolution Consortium managed the Phase I process. The Phase I process resulted in the East-Central Florida Water Agenda (Agenda), which identifies six key water supply issue areas, 17 recommendations and 32 strategies developed by the Initiative Phase I participants. The six issue areas identified in the Agenda are:

- Enhance intergovernmental coordination
- Develop new water supply
- Link land use planning and water supply planning
- Increase use of reclaimed water
- Enhance aquifer recharge using reclaimed water
- Increase water conservation

Phase II of the Initiative is designed to build upon the results of Phase I with the development of action plans and identification of specific projects to implement the Agenda recommendations and strategies. The St. Johns River Water Management District (District) is managing the Phase II effort in coordination with the South and Southwest Florida water management districts.

Initiative activities in 2003, which is the subject of this document (2003 Annual Report of Activities and Accomplishments for the East-Central Florida Water Supply Planning Initiative), were focused in six counties of the 10-county east-central Florida region — Volusia, Brevard,

Orange, Seminole, Lake and Osceola counties. Though Marion County was not included in the focus area, Marion County representatives were invited to participate in Initiative meetings.

Phase II Initiative activities during 2003 included efforts in each of the six issue areas identified in Phase I. However the primary focus was on developing new water supply. One of the goals of the Initiative is to expand and enhance the findings of DWSP, including further investigations of potential alternative water supply sources and identification of additional water supply development projects that could be implemented to develop these sources to help meet future water supply needs.

The 2003 Initiative Phase II process included many workshops with east-central Florida water supply utilities and local government elected officials for the exchange of information and ideas. One of the major goals of these workshops was to identify potential water supply development projects of interest to the local communities that could be incorporated into a 2004 interim update to DWSP. The following projects were identified for incorporation into a 2004 interim update to DWSP.

- St. Johns River
  - near SR 520/528
  - near SR 50
  - near Lake Monroe
  - near DeLand
  - near Lake George
- Taylor Creek Reservoir
- Lower Ocklawaha River
  - Putnam County
- Indian River
  - FP&L Cape Canaveral Power Plant
  - Reliant Power Plant
- Intracoastal Waterway
- Lake Apopka

Two additional potential water supply projects, which were discussed and evaluated during the 2003 Initiative process, are not recommended for incorporation into a 2004 interim update to DWSP — the lower Ocklawaha River in Marion County and Lake Harris in Lake County. The Marion County Commission requested additional evaluations be conducted on the lower Ocklawaha River in Marion County and that this project not be incorporated into a 2004 interim update to DWSP. The District plans to work cooperatively with Marion County to accomplish these evaluations in an expedited manner. The city of Leesburg, which was the only potential user associated with the Lake Harris supplemental reuse project, currently has no interest in developing Lake Harris as a source of supplemental supply for reclaimed water augmentation.

2003 Initiative activities in the remaining five issue areas included:

- Encouraging intergovernmental coordination through Initiative group meetings, one-on-one meetings with elected officials, presentations to related water resource organizations and heightened communications with the public and media

- Educating local government elected officials, planning staffs and water supply utilities on new requirements to develop a 10-year water supply facilities work plan
- Developing and implementing a "Potable Water Availability" worksheet that will help local governments in the comprehensive plan amendment process to identify water supply availability considering both infrastructure and permitted allocation under consumptive use permits
- Assisting ongoing efforts to develop and implement areawide reuse of reclaimed water plans
- Assisting ongoing efforts to evaluate the feasibility and benefits of enhanced recharge using reclaimed water
- Developing model landscape ordinance language to be used as a guideline for local communities

Recommendations for 2004 Initiative Phase II activities include developing countywide/intercounty water supply plans and partnerships between suppliers in each county, continuing on-going county/intercounty facilitation, amending DWSP to include potential projects identified during 2003, prioritizing potential projects, initiating feasibility investigations as appropriate, assisting local governments in development of water supply facilities work plans, assisting on-going efforts in development of areawide reuse plans and development of artificial recharge projects, and finalizing model landscape ordinance and initiating a pilot incentive program in Lake County.

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INTRODUCTION

WATER SUPPLY ISSUES

The Floridan aquifer currently provides almost all of east-central Florida's public water supply and a large part of the agricultural and other self-supply. The 2000 *District Water Supply Plan* (DWSP) (Vergara 2000) concluded that, in the near future, water supply needs in east-central Florida will not be able to be met by available fresh groundwater alone without likely incurring unacceptable environmental impacts to lakes, wetlands or springs, as well as unacceptable saltwater intrusion. Therefore, it is expected that meeting future water supply needs in east-central Florida will require a combination of fresh groundwater, other alternative sources and integrated water resource management techniques.

Water reuse and conservation measures alone are not likely to meet the water demands for economic development and projected growth in the area so alternative water supply sources and other management techniques must be developed and implemented. Because impacts of water withdrawals from the Floridan aquifer extend beyond local government boundaries, cooperation and coordination among local governments and water supply utilities are vital to a successful water supply planning process.

Several potential alternative water supply sources, as well as water supply development and water resource development projects, were identified in DWSP. Alternative water supply sources include:

- Brackish groundwater
- Surface water
- Seawater

Water supply development projects identified in DWSP include:

- Eastern I-4 Corridor Project
  - St. Johns River water supply facility component
  - Eastern Orange and Seminole counties regional reuse component
  - City of Apopka reuse component
- Strategic water conservation assistance project
- Strategic reclaimed water assistance project

Also, a total of 13 water resource development projects were identified in DWSP, including Facilitation of Regional Decision-Making Process. The East-Central Florida Water Supply Planning Initiative (Initiative) is a major part of the regional decision-making process, and this report presents potential water supply development projects identified by the process participants.

INITIATIVE BACKGROUND

The Initiative resulted from two regionwide water summits held in early 2002 where local government officials, water supply utilities, and the St. Johns River, South Florida and Southwest Florida water management districts began working together to develop solutions to

their collective future water supply issues. Orange County Chairman Richard T. Crotty hosted the summits.

The east-central Florida area includes Brevard, Orange, Volusia and Seminole counties and portions of Lake, Marion, Polk,[1] Sumter, Osceola and Flagler counties.

INITIATIVE GOAL

The goal of the Initiative is to develop an East-Central Florida Water Agenda and associated action plans to:

- Ensure that new sustainable water supplies are developed in ways that maximize benefits and minimize harm to natural resources
- Preserve the economic vitality of the region
- Draw linkages, as appropriate, to land use plans
- Identify cooperative, affordable and equitable solutions that minimize costs and avoid competition for remaining inexpensive water resources

INITIATIVE PHASE I — 2002

The Initiative process was designed to proceed in two phases. The Florida Conflict Resolution Consortium, a legislatively created statewide neutral resource, was retained to facilitate discussion among local governments and other stakeholders, and to oversee the process of developing objectives, recommendations and strategies to help meet future water supply needs in the region.

The Consortium was assisted by Jake Varn and Linda Shelley of Fowler, White, Boggs and Banker, P.A.

Phase I focused on a dialogue process to identify key water supply issues, provide information and education on the issues, and identify regional and subregional strategies to address the issues.

The 10-county east-central Florida region participated in the Phase I process — Brevard, Orange, Volusia and Seminole counties and portions of Lake, Marion, Polk, Sumter, Osceola and Flagler counties. The area was divided into five subregions.

The Phase I process included three regionwide meetings, 15 subregional meetings and more than 50 one-on-one meetings with elected officials and water supply utility representatives. The Phase I process resulted in the East-Central Florida Water Agenda (Agenda), which identifies six key water supply issue areas, 17 recommendations and 32 strategies developed by the Initiative participants (Appendix A).

The six issue areas identified in the Agenda are:

- Enhance intergovernmental coordination
- Develop new water supply

[1]As of July 1, 2003, the portion of the St. Johns River Water Management District that was in Polk County became part of the Southwest Florida Water Management District.

- Link land use planning and water supply planning
- Increase use of reclaimed water
- Enhance aquifer recharge using reclaimed water
- Increase water conservation

INITIATIVE PHASE II

Phase II of the Initiative is designed to build upon the results of Phase I with the development of action plans and identification of specific projects to implement the Agenda recommendations and strategies. Developing and implementing all action plans will be a multi-year effort. Phase II activities include continuing dialogue among local governments and water supply utilities in east-central Florida, identifying potential partnerships, prioritizing projects, identifying potential funding sources, developing legislative recommendations, clarifying roles and responsibilities for action plan implementation, and considering revisions to DWSP.

Because Phase II of the Initiative is more technically oriented than Phase I, the St. Johns River Water Management District (District) is managing the Phase II effort in coordination with the South and Southwest Florida water management districts. Jake Varn and Linda Shelley, of Fowler, White, Boggs and Banker, P.A., are facilitating the process. Phase II activities began in 2003. This report reflects 2003 Initiative Phase II activities and recommendations for activities in 2004.

ENHANCE INTERGOVERNMENTAL COORDINATION

OBJECTIVE

To improve intergovernmental coordination on water supply planning in east-central Florida, which is critical to effectively managing regional water resources.

AGENDA RECOMMENDATIONS AND STRATEGIES FOCUSED ON IN 2003

Continue regional and subregional forums.

1. The districts and the area local governments should commit to continuing a dialogue at subregional and regional level forums to increase understanding of impacts and identify opportunities for partnerships in developing new water supply for the east-central Florida region. These forums should be designed to promote consensus building and collaborative water supply planning and seek greater alignment of local governments in the east-central Florida area.

Build on existing association forums.

1. The Initiative should seek to build on existing forums for elected officials, city and county managers and others to discuss, debate and clarify water supply issues, build trust and secure funding for needed water supply partnerships.

2003 INITIATIVE ACTIVITES

Initiative activities in 2003 were focused in six counties of the 10-county east-central Florida region — Volusia, Brevard, Orange, Seminole, Lake and Osceola counties. To facilitate development of cooperative solutions, the six-county area was divided into four subregions (Appendix B).

- Volusia
- Brevard
- Northern Lake/Seminole/northern Orange (Marion County was invited to participate in this subregion)
- Southern Lake/southern Orange/Osceola/portion of Brevard

The new subregional structure was based on groundwater hydrology, existing water resource forums to assist in developing and implementing Phase II action plans, and potential water resource development/water supply development project partnerships.

Elected officials, water supply utilities and other interested parties from Volusia, Brevard, Lake, Orange, Seminole, Osceola and Marion counties were invited to a series of subregional and small-group meetings during the summer and fall of 2003.

Three subregional meetings were held for each subregion. The Volusia subregion met in association with the Volusian Water Alliance. The Brevard subregion met in association with the Brevard Water Supply Board. Small-group meetings were held for elected officials in Seminole County and Lake County. Small-group meetings also were held for the Brevard Water Supply

Board and representatives from Orange County, the city of Orlando and Orlando Utilities Commission (OUC). Minutes of the subregional meetings are in Appendix C.

The primary focus of the subregional and small-group meetings was on developing new water supplies and linking land use planning and water supply planning. Initiative activities associated with water conservation, reuse of reclaimed water and enhancing aquifer recharge with reclaimed water were reported to Initiative participants during these meetings.

Initiative and water supply issue information was provided to elected officials, water supply utilities, the public and the media through direct mail, the District's quarterly magazine — *StreamLines*, the District's monthly local government newsletter — *WaterWatch*, the Florida Chapter of American Planning Association newsletter, media interviews, and the District's Web site (*sjrwmd.com*).

Communication tools were developed to inform Initiative participants, the media and the public of water supply issues and Initiative activities. Tools included a project fact sheet, key points, a project Web site, an Agenda summary, an annual meeting schedule, a subregional map, and a database of elected officials, water supply utilities and other interested parties.

To encourage elected official participation in the 2003 Initiative Phase II activities, meetings were held with more than 50 local elected officials. Presentations to city/county commissions were given as needed or requested. More than 30 United States and state elected officials were kept informed of Initiative activities. Presentations were given as requested at more than 20 workshops, conferences and group meetings of various organizations interested in water supply issues. To improve communication and coordination among the various entities involved in water supply-related issues and to expand the reach of the Initiative to other groups, regular communications via District liaisons were established with the following organizations:

Harris Chain of Lakes Restoration Council
Lake County Water Authority
Lake County Environmental Protection Advisory Board
Lake County Chapter, Florida League of Cities
Lake County Water Resources Alliance
East-Central Florida Regional Planning Council
myregion.org
Tri-county League of Cities
Seminole Council of Governments
University of Central Florida
Central Florida Utility Council
Central Florida Water Conservation Committee
Volusian Water Alliance
Volusian Water Alliance Conservation Committee
Brevard Water Supply Board
Brevard Water Supply Board Conservation Committee
Space Coast League of Cities

DEVELOP NEW WATER SUPPLY

OBJECTIVE

To maximize the development of groundwater for reasonable-beneficial uses and develop alternative water sources to meet the needs of future reasonable-beneficial uses by the time the needs occur, in a manner that ensures that the uses will not result in unacceptable adverse impacts to water resources and related natural systems.

AGENDA RECOMMENDATIONS AND STRATEGIES FOCUSED ON IN 2003

Identify specific alternative water supply projects.

1. The water management districts should identify specific economically, environmentally and technically feasible alternative water supply projects that are adequate to supply projected water demands for the next 20 years. The cumulative impacts of these projects in combination with existing permitted water use, water conservation and reclaimed water projects should not result in unacceptable impacts to water resources and related natural systems.

2003 INITIATIVE ACTIVITIES

One of the goals of the Initiative is to expand and enhance the findings of DWSP, including further investigations of potential alternative water supply sources and identification of additional water supply development projects that could be implemented to develop these sources to help meet future east-central Florida water supply needs.

Potential water supply development projects were identified and evaluated by Initiative participants to help meet future water supply needs in east-central Florida. Conceptual planning level cost estimates were developed for each potential water supply project identified to provide an estimate of the capital and total costs of each potential project. The primary purpose of the cost estimates is to provide a consistent basis to compare the relative costs of the many alternatives available.

Potential Sources of Supply

Fresh Groundwater

Fresh groundwater is, and will continue to be, the primary water supply source in east-central Florida for the foreseeable future. It is reliable, of high quality and for the most part located within population centers, which reduces the cost of transport. It is the source of choice for most east-central Florida water supply utilities and will likely be developed to the maximum extent possible prior to development of more expensive alternative water supply sources.

District groundwater flow modeling currently estimates the developable fresh groundwater supply in the east-central Florida planning area to be about 670 million gallons per day (mgd) (SJRWMD and CH2M HILL 2000). This planning level estimate is based on existing water resource management practices and will vary somewhat depending upon the exact water supply withdrawal scenario analyzed. However, it represents the current best estimate of the total

fresh groundwater supply available within the east-central Florida area without incurring unacceptable environmental impacts.

Increasing the available supply of fresh groundwater may be technically feasible by increasing artificial recharge and/or avoiding or mitigating anticipated unacceptable impacts. The District and several water supply utilities are currently investigating some of these water resource management options.

Included among the 13 water resource development projects in DWSP are the following:

- Central Florida Aquifer Recharge Enhancement Program
- Wetland Augmentation Demonstration Program

The results of these cooperative, multi-sites, multi-year investigations will become available between 2006 (artificial recharge) and 2008 (wetlands augmentation) and will provide data and information needed to assess the feasibility of these water resource management techniques. The results will also be used to guide in the planning and design of aquifer recharge and wetlands augmentation systems if proven feasible.

Brackish Groundwater

Brackish groundwater was previously investigated during the development of DWSP, as reported in the east-central Florida work group report (SJRWMD and CH2M HILL 2000) and DWSP. It was found that large-scale regional development of brackish groundwater was unlikely for several reasons. First, withdrawing brackish groundwater from the aquifer induces similar environmental impacts as the withdrawal of fresh groundwater. That is, withdrawal of brackish groundwater will reduce aquifer potentiometric pressure, resulting in the lowering of surficial aquifer water levels and springflow reductions.

Also, because a waste concentrate is produced in the treatment process, the quantity withdrawn must be significantly greater than the demand to be met, resulting in even greater potentiometric pressure reductions. Typically, brackish groundwater withdrawals are 20 to 25 percent greater than the desired product water quantities. Finally, the required treatment is relatively costly and an acceptable concentrate management option must be identified for each brackish groundwater treatment plant.

For these reasons, it was concluded in DWSP that brackish groundwater was unlikely to play a major role in future east-central Florida water supply development. It is recognized that there will likely be utility-specific applications of small — to moderate-scale brackish groundwater development, but this source is unlikely to provide major alternative water supplies on a regional scale.

The District is currently working with the Orlando Utilities Commission (OUC) to determine the feasibility of developing brackish groundwater in the eastern Orange County area.

Surface Water

Surface water is potentially available from several sources in the east-central Florida area:

- St. Johns River
- Taylor Creek Reservoir

- Lower Ocklawaha River

St. Johns River — The main stem of the middle St. Johns River has recently been investigated by the District to establish minimum flows and levels (MFLs) (Robison 2003 and Mace 2003). Based on the results of this analysis, estimated developable water supply yield from the St. Johns River south of DeLand is approximately 175 mgd (annual average).

Although substantial quantities of water are available from the St. Johns River, the water quality is poor and treatment will be more complex than conventional surface water treatment, as well as relatively expensive. Because the river water exceeds drinking water standards for dissolved minerals, including total dissolved solids (TDS) and chlorides, during base flow and low flow conditions, membrane treatment will be required in addition to conventional surface water treatment. Also, significant transmission systems will be required to transport the treated water from the withdrawal and treatment point(s) to the demand centers.

The District is nearing completion of the St. Johns River Water Supply Project, which includes the following components:

- Determining water quality and streamflow characteristics
- Establishing MFLs
- Identifying potential water treatment plant sites
- Evaluating water treatment and demineralization concentrate management options
- Projecting demand and costs

Based on information developed to date, the District has concluded that water from the St. Johns River can be successfully treated and delivered at a reasonable cost to the east-central Florida area. Sufficient information is available to move a potential project from this source into the design/permit/build process.

Taylor Creek Reservoir — Taylor Creek is a tributary to the St. Johns River with an existing reservoir originally built for flood control. Water quality in Taylor Creek Reservoir (TCR) is considerably better than in the main stem of the St. Johns River. TCR water is always fresh, and only conventional surface water treatment is required.

TCR has been developed as a water supply source by the city of Cocoa. The TCR water supply system includes withdrawal facilities, a conventional surface water treatment plant and treated water aquifer storage and recovery (ASR) wells. TCR currently provides about 10 mgd to the city of Cocoa and was designed for expansion to approximately 20 mgd.

Because of its proximity to the St. Johns River, it is possible to supplement TCR with water withdrawn from the St. Johns River to increase the system yield, while still requiring only conventional surface water treatment (CH2M HILL 2001a). This can be accomplished by diverting water from the river and to the reservoir during times when the river water is fresh and when storage volume is available within the reservoir. It is estimated that the water supply yield of TCR can be increased by an additional 15 mgd using the St. Johns River freshwater diversion option. Therefore, the total ultimate water supply yield of TCR is estimated to be about 35 mgd. This includes the existing 10 mgd currently developed, the planned expansion increment of 10 mgd and the additional 15 mgd that could be obtained by St. Johns River diversion. The TCR supply would require only conventional surface water treatment.

Because Taylor Creek is a tributary to the middle St. Johns River, the total potential yield (35 mgd) is included in the total estimated yield of the middle St. Johns River of 175 mgd.

Lower Ocklawaha River — The lower Ocklawaha River is that portion of the river below (north of) the Silver River and upstream of its confluence with the St. Johns River. It is located in Marion and Putnam counties. Marion County is conducting a comprehensive water needs and management study to identify long-term future requirements and strategies that Marion County can implement to meet future demands while protecting the water resources and related natural systems. Therefore, no potential projects using this source in Marion County have been identified at this time. One potential project has been identified in Putnam County.

The lower Ocklawaha River has several hydrologic characteristics favorable to water supply development. First, it is always fresh and will require only conventional surface water treatment. Therefore, treatment cost would be less than the cost of treating the St. Johns River. Also, because the lower Ocklawaha River receives flow from the Silver River, and therefore from Silver Springs, it is largely droughtproof. Historic discharge from Silver Springs has ranged from 348 mgd to 834 mgd and averages 530 mgd (Hall 1995). The lower Ocklawaha River receives additional flow from the upper Ocklawaha River, including the Harris chain of lakes located in Lake County.

The 1994 Florida Legislature directed the District to perform a lower Ocklawaha River water allocation study to develop recommendations concerning water use allocations between human consumptive needs and natural systems needs. The results of the study concluded that the potential water supply yield of the lower Ocklawaha River is at least 100 mgd (Hall 1995). For regional planning purposes, 100 mgd is considered the best available conservative estimate of the developable water supply yield of the lower Ocklawaha River. This value will be reviewed and adjusted as necessary based on additional evaluations that will be performed by the District to support development of MFLs for the lower Ocklawaha River. The District will make reasonable efforts to assure that MFLs are adopted prior to permitting any large-scale withdrawals from the river.

Seawater

Seawater provides an abundant potential water supply source. It is inherently reliable, and developable quantities are plentiful. However, for water supply purposes, water quality is very poor, requiring expensive and energy-intensive high-pressure reverse osmosis (RO) treatment. In addition, a large volume of high-strength concentrate will be produced, which must be managed in an environmentally acceptable manner.

Because of the considerable energy and concentrate management requirements, there are significant advantages to collocating seawater demineralization plants with existing power plants, particularly those equipped with high volume once-through cooling systems. Seawater demineralization facilities that are collocated with power plants with high volume once-through cooling systems can be provided with onsite power and with in-place intake and concentrate discharge facilities, greatly reducing the cost of construction of a stand-alone or noncollocated facility. In recognition of this cost advantage, the District has undertaken a study to identify likely seawater demineralization construction sites with emphasis on those collocated with power generation facilities.

The seawater demineralization study has identified three possible plant sites collocated with existing power plants in the east-central Florida area (R.W. Beck 2003). Two are located in Brevard County and one in Volusia County. The two Brevard County sites include once-through seawater cooling systems and could produce up to 30 mgd each. The Volusia County plant site does not offer the advantage of once-through cooling, but could produce up to 15 mgd (R.W. Beck 2003).

Seawater can provide significant quantities of water. However, treatment costs, especially for noncollocated facilities, will be greater than other alternative water supply sources. Additionally, concentrate management will be challenging and transport costs will be incurred. Transport costs may be moderate for coastal areas, but could be very significant for inland demand centers.

Source Characteristics

Once fresh groundwater supplies are developed to the fullest extent practical, development of the alternative sources will require consideration of many cost and noncost factors based on source characteristics and specific water supply project needs. These alternative source characteristics vary considerably in the east-central Florida area (Table 1). Choosing the best alternative water supply source for any specific application will depend on the relative importance of many economic as well as noneconomic factors, including the exact location and magnitude of the demands to be met.

Table 1. East-central Florida water supply source characteristics

Source	Characteristic				
	Estimated Total Water Supply Yield (mgd)	Water Quality	Reliability	Location	Transmission Requirements
Fresh groundwater	670	Very good	Very reliable	Within demand centers	None
St. Johns River	175	Poor	Reliable	Near demand centers	Moderate
Taylor Creek Reservoir	35 (included in St. Johns River total)	Good	Subject to drought (requires ASR)	Somewhat remote	Moderate
Lower Ocklawaha River	100	Good	Reliable	Remote	High
Seawater (collocated)	60	Very poor	Very reliable	Coastal	Moderate for coastal areas, high for inland areas
Seawater (noncollocated)	NA	Very poor	Very reliable	Coastal	Moderate for coastal areas, high for inland areas

East-Central Florida Potential Supply and Demand

Regardless of the sequence in which the available alternative water supply sources are developed in east-central Florida, it is likely that all will ultimately be developed and that demineralized seawater will also play a significant role in future east-central Florida water supply development.

Based on 1995 and projected 2025 water use data used in the District's east-central Florida regional groundwater model, withdrawals of water from the Floridan aquifer in the model domain (Figure 1) totaled 522 mgd in 1995 and would increase to about 830 mgd in 2025 if all projected increase in demand were to be met from the Floridan aquifer. Comparison of straight-line demand trends based on these values and estimated water supply quantities available from the potential sources considered in east-central Florida indicates that the identified sources other than noncollocated seawater will likely be used to currently identified sustainable limits soon after 2040 (Figure 2).

In general, currently available groundwater supplies should be fully developed by about 2010 unless significant measures are taken to mitigate, or otherwise avoid, unacceptable impacts. Developable surface water supplies, including the St. Johns River and the lower Ocklawaha River, and collocated seawater supplies should be sufficient to meet additional demands for approximately the next 30 years thereafter. Sometime soon after 2040, demineralized, noncollocated seawater may be the only remaining additional water supply source in east-central Florida.

Potential Water Supply Development Projects by Water Source

The 2003 Initiative Phase II process included many workshops with east-central Florida water supply utilities and local government elected officials for the exchange of information and ideas. One of the major goals of these workshops was to identify potential water supply development projects of interest to the local communities that could be incorporated into a 2004 interim update to DWSP. Eleven projects were identified for incorporation into a 2004 interim update to DWSP.

Two additional potential water supply projects, which were discussed and evaluated during the 2003 Initiative process, are not recommended for incorporation into a 2004 interim update to DWSP — the lower Ocklawaha River in Marion County and Lake Harris in Lake County. The Marion County Commission requested additional evaluations be conducted on the lower Ocklawaha River in Marion County and that this project not be incorporated into a 2004 interim update to DWSP. The District plans to work cooperatively with Marion County to accomplish these evaluations in an expedited manner. The city of Leesburg, which was the only potential user associated with the Lake Harris supplemental reuse project, currently has no interest in developing Lake Harris as a source of supplemental supply for reclaimed water augmentation.

The following 10 potential public supply projects and one supplemental reuse project were identified (Figure 3) during the 2003 Initiative Phase II process to be incorporated in a 2004 interim update to DWSP. All of the potential projects, with the exception of the Lake Apopka project, would provide additional public supply. Lake Apopka is a supplemental reclaimed water reuse project that would provide for increased beneficial use of existing and future reclaimed water for the city of Apopka.

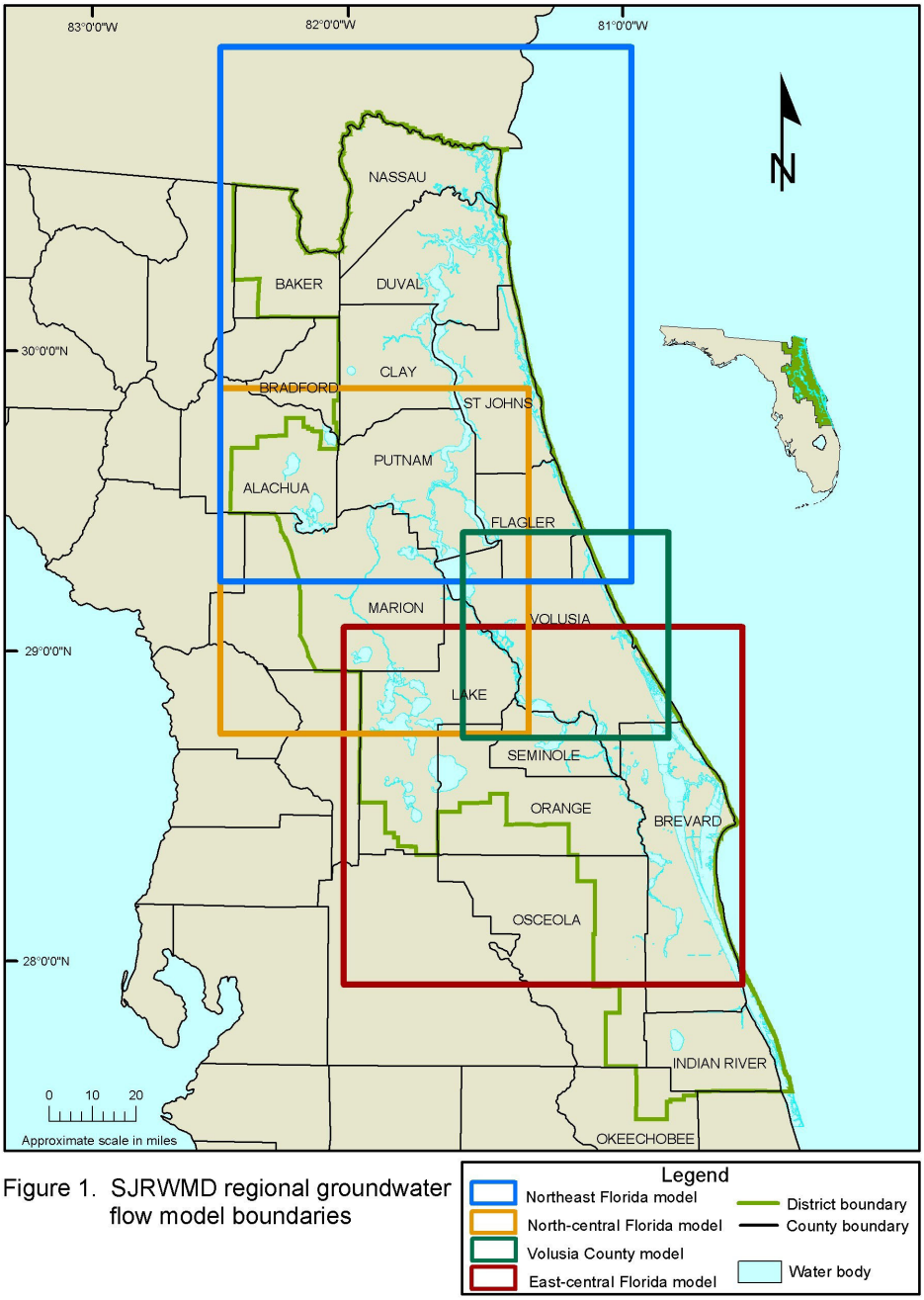


Figure 1. SJRWMD regional groundwater flow model boundaries

Figure 2.

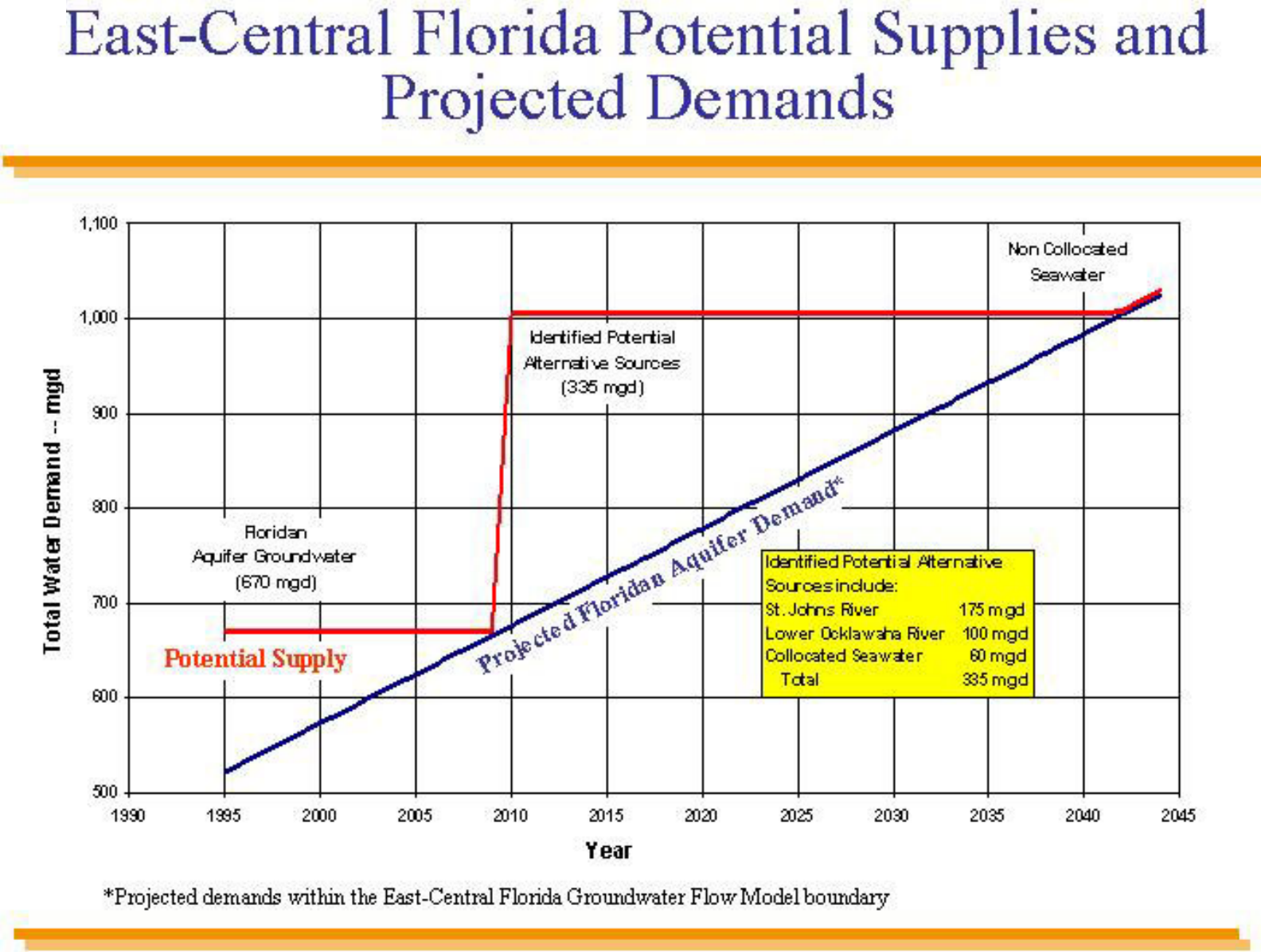
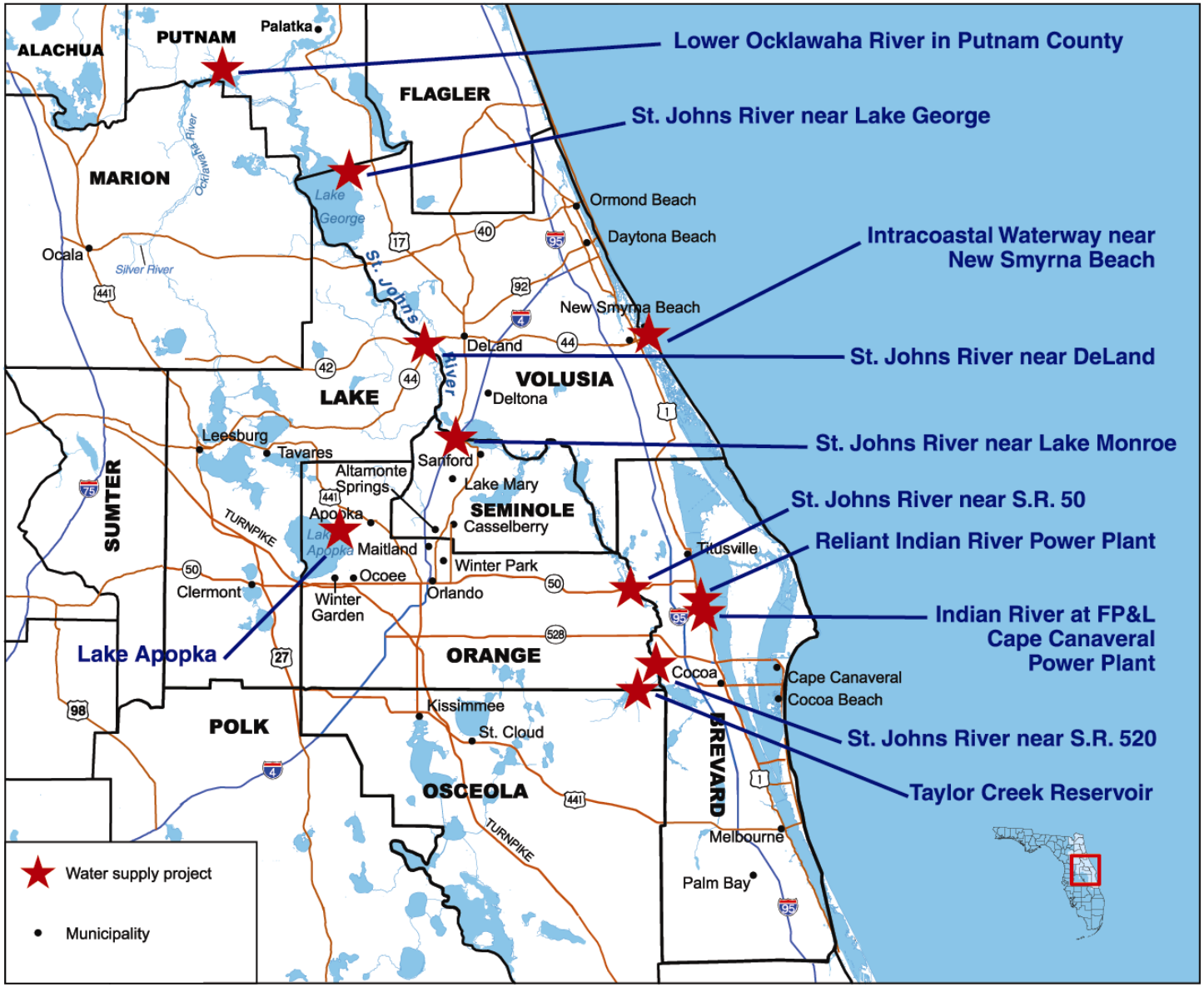

East-Central Florida Potential Supplies and Projected Demands
Total Water Demand -- mgd
1,100
1,000
900
800
700
600
500
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
Year
Non Collocated Seawater
Identified Potential Alternative Sources (335 mgd)
Floridan Aquifer Groundwater (670 mgd)
Potential Supply
Projected Floridan Aquifer Demand*
Identified Potential Alternative Sources include:
St. Johns River 175 mgd
Lower Ocklawaha River 100 mgd
Collocated Seawater 60 mgd
Total 335 mgd
*Projected demands within the East-Central Florida Groundwater Flow Model boundary

Figure 3. Approximate locations of potential alternative water supply projects identified as part of the East-Central Florida Water Supply Planning Initiative process



Identification of these potential projects is not intended as a guarantee that the projects would be permittable. Any project, selected to be implemented, would have to meet established District permitting criteria. Because many of the projects may require transfers of water across county boundaries, the specific criteria set forth in Section 373.223(3) *Florida Statutes* must be met.

- St. Johns River
  - Near SR 520/528
  - Near SR 50
  - Near Lake Monroe
  - Near DeLand
  - Near Lake George
- Taylor Creek Reservoir
- Lower Ocklawaha River
  - Putnam County
- Indian River
  - FP&L Cape Canaveral Power Plant
  - Reliant Power Plant
- Intracoastal Waterway
- Lake Apopka

In several cases, multiple options have been considered at the various project locations. These options address selected combinations of water supply demands to be met and potential service areas.

Table 2 presents a summary of the east-central Florida public supply projects identified as part of the 2003 Initiative Phase II process. The projects are identified by source and the selected options are further identified by potential service area and water supply system capacity. A complete set of conceptual planning level cost estimates is also included. Cost estimates reported include capital cost in million dollars, operations and maintenance (O&M) cost in million dollars per year and unit production cost in dollars per 1,000 gallons of water produced.

The estimated costs represent year 2003 cost for a complete water supply system, including construction cost, non-construction capital costs and land and right-of-way costs, and are reported for both the treatment component and for the transmission component of each project. Appendix D presents a more detailed discussion of the cost-estimating and economic criteria used in the development of the conceptual planning level costs estimates.

Project Descriptions

The public supply projects are defined at the conceptual planning level and include few, if any, site-specific considerations. However, each represents a complete water supply option, including withdrawal, treatment, storage and transmission facilities as needed. In each case, the potential water supply project will provide the target average day flow as well a maximum day flow 50 percent greater than the average day flow.

Table 2. Summary of potential public water supply projects, quantities and estimated costs, in east-central Florida

Water Supply Source	Project Location	Potential Service Area	System Capacity (mgd)		Water Supply System Component	Capital Cost ($M)	O&M Cost ($M/yr)	Unit Production Cost ($/1,000 gallons)
			Average Day Flow	Maximum Day Flow				
St. Johns River	Near SR 520 / 528	Orlando Utilities Commission	20	30	Treatment	$134	$6.93	$2.44
					Transmission	$55	$0.63	$0.59
					Total	**$189**	**$7.56**	**$3.03**
	Near SR 50	Titusville/northern Brevard County	10	15	Treatment	$72	$3.49	$2.55
					Transmission	$19	$0.32	$0.45
					Total	**$91**	**$3.81**	**$3.00**
	Near Lake Monroe	Seminole and Volusia counties	50	75	Treatment	$306	$17.15	$2.30
					Transmission	$151	$1.56	$0.63
					Total	**$457**	**$18.71**	**$2.93**
		Seminole County only	30	45	Treatment	$193	$10.35	$2.38
					Transmission	$46	$0.94	$0.36
					Total	**$238**	**$11.29**	**$2.74**
		Volusia County only	20	30	Treatment	$134	$6.93	$2.44
					Transmission	$83	$0.63	$0.83
					Total	**$217**	**$7.56**	**$3.27**
		Western Volusia County only	9.6	14.4	Treatment	$69	$3.36	$2.56
					Transmission	$15	$0.31	$0.38
					Total	**$84**	**$3.67**	**$2.94**

Table 2—*continued*

Water Supply Source	Project Location	Potential Service Area	System Capacity (mgd)		Water Supply System Component	Capital Cost ($M)	O&M Cost ($M/yr)	Unit Production Cost ($/1,000 gallons)
			Average Day Flow	Maximum Day Flow				
St. Johns River	Near Lake Monroe	Portions of Volusia, Seminole, Orange and Lake counties -- serving nearest demand centers first	10	15	Treatment	$72	$3.5	$2.55
					Transmission	$9	$0.3	$0.25
					Total	**$81**	**$3.8**	**$2.80**
			50	75	Treatment	$306	$17.2	$2.30
					Transmission	$66	$1.6	$0.33
					Total	**$372**	**$18.8**	**$2.63**
			100	150	Treatment	$571	$34.0	$2.20
					Transmission	$143	$3.2	$0.35
					Total	**$714**	**$37.2**	**$2.55**
	Near DeLand	Volusia County only	20	30	Treatment	$134	$6.93	$2.44
					Transmission	$76	$0.63	$0.78
					Total	**$210**	**$7.56**	**$3.22**
		Portions of Volusia, Seminole, Orange and Lake counties -- serving nearest demand centers first	10	15	Treatment	$72	$3.5	$2.55
					Transmission	$33	$0.30	$0.70
					Total	**$105**	**$3.8**	**$3.25**
			50	75	Treatment	$306	$17.2	$2.30
					Transmission	$141	$1.6	$0.61
					Total	**$447**	**$18.8**	**$2.91**
			100	150	Treatment	$571	$34.0	$2.20
					Transmission	$300	$3.2	$0.64
					Total	**$871**	**$37.2**	**$2.84**
	Near Lake George	Palm Coast and Volusia County	33	49.5	Treatment	$210	$11.37	$2.36
					Transmission	$176	$1.03	$1.05
					Total	**$386**	**$12.40**	**$3.41**

Table 2—*continued*

Water Supply Source	Project Location	Potential Service Area	System Capacity (mgd)		Water Supply System Component	Capital Cost ($M)	O&M Cost ($M/yr)	Unit Production Cost ($/1,000 gallons)
			Average Day Flow	Maximum Day Flow				
Taylor Creek Reservoir	Near Cocoa	Cocoa planned expansion	10	15	Treatment	$14	$1.90	$0.82
					Transmission	$41	$0.30	$0.84
					Total	**$55**	**$2.20**	**$1.66**
		Cocoa/Titusville/ east Orange County	25	37.5	Treatment	$73	$5.20	$1.14
					Transmission	$61	$0.80	$0.54
					Total	**$134**	**$6.00**	**$1.68**
Lower Ocklawaha River	Putnam County	East Palatka/Volusia County	21.5	32.25	Treatment	$76	$4.77	$1.35
					Transmission	$179	$0.68	$1.59
					Total	**$255**	**$5.45**	**$2.94**
Indian River	FP&L Cape Canaveral Power Plant	Northern Brevard/eastern Orange counties	10	15	Treatment	$77	$4.70	$3.00
					Transmission	$13	$0.30	$0.33
					Total	**$90**	**$5.00**	**$3.33**
			20	30	Treatment	$144	$8.70	$2.81
					Transmission	$36	$0.70	$0.42
					Total	**$180**	**$9.40**	**$3.23**
			30	45	Treatment	$208	$12.60	$2.71
					Transmission	$66	$1.00	$0.49
					Total	**$274**	**$13.60**	**$3.20**

Table 2—*continued*

Water Supply Source	Project Location	Potential Service Area	System Capacity (mgd)		Water Supply System Component	Capital Cost ($M)	O&M Cost ($M/yr)	Unit Production Cost ($/1,000 gallons)
			Average Day Flow	Maximum Day Flow				
Indian River	Reliant Power Plant	Northern Brevard/eastern Orange counties	10	15	Treatment	$74	$4.20	$2.82
					Transmission	$16	$0.30	$0.38
					Total	**$90**	**$4.50**	**$3.20**
			20	30	Treatment	$139	$7.70	$2.63
					Transmission	$38	$0.70	$0.44
					Total	**$177**	**$8.40**	**$3.07**
			30	45	Treatment	$202	$11.10	$2.54
					Transmission	$66	$1.00	$0.49
					Total	**$268**	**$12.10**	**$3.28**
Intracoastal Waterway	Near New Smyrna Beach	Coastal Volusia County	5	7.5	Treatment	$66	$2.90	$4.32
					Transmission	$17	$0.20	$0.74
					Total	**$83**	**$3.10**	**$5.06**
			10	15	Treatment	$97	$4.90	$3.46
					Transmission	$24	$0.30	$0.53
					Total	**$121**	**$5.20**	**$3.99**
			15	22.5	Treatment	$131	$7.10	$3.17
					Transmission	$28	$0.50	$0.44
					Total	**$159**	**$7.60**	**$3.61**

All costs are estimated at the conceptual planning level of accuracy, based on assumption and cost-estimating criteria presented in Appendix D. Actual individual project costs, based on detailed planning and design or other cost-estimating criteria, will vary. These order-of-magnitude cost estimates have been prepared for relative comparisons among the potential projects.

Transmission facilities are provided to transport the treated water from the point of treatment to the demand service areas for final distribution to individual customers. In all cases, the transmission system include: piping, right-of-way, pumping stations, residual disinfection and ground storage tanks.

St. Johns River — As currently envisioned, the potential St. Johns River projects would include a raw water intake and off-line storage reservoir, conventional surface water treatment, membrane treatment and ozone treatment. Treated water ASR would also be provided for system reliability and peaking capacity.

Taylor Creek Reservoir — The potential TCR water supply system expansion to 35 mgd average day flow would require diversion facilities to transport raw water from the St. Johns River to TCR as well as additional treatment facilities. Raw river water would be diverted for both water supply and for augmentation of Taylor Creek to avoid any adverse impacts to the Taylor Creek floodplain. Diversion facilities would include a raw water pumping station and a pipeline.

Only conventional surface water treatment and ozone treatment would be required because only freshwater would be diverted from the St. Johns River. Treated water ASR would also be provided for seasonal storage and peaking capacity.

Lower Ocklawaha River — The potential lower Ocklawaha River project in Putnam County would require raw water diversion facilities, conventional surface water treatment and ozone treatment. Because of the reliable baseflow, storage would not be required.

Seawater Demineralization — The three potential seawater demineralization projects are collocated with a power generation facility. These will require an intake structure and a complete high pressure reverse osmosis seawater treatment plant. Two of the three potential project sites (FP&L Cape Canaveral and Reliant Energy) have existing once-through seawater cooling systems that will provide both inflow to the treatment plant and concentrate disposal.

The third plant site, located at the Swoope generating facility in New Smyrna Beach, does not have an existing seawater cooling system, and a dedicated raw water withdrawal and concentrate disposal outfall would need to be constructed in addition to the treatment plant.

Each of the seawater demineralization treatment plants would also include a treated water ASR system for seasonal storage and peaking capacity.

Lake Apopka — The final potential project is the Lake Apopka reuse augmentation project. The purpose of this project would be to supplement the city of Apopka reclaimed water reuse system with water withdrawn from Lake Apopka and treated to reuse standards. Water would only be withdrawn from the lake during peak irrigation periods to supplement available reclaimed water. The development of supplemental water will assist in achieving full beneficial irrigation use of available reclaimed water.

Withdrawal of water from Lake Apopka for supplemental reuse was investigated previously (CH2M HILL 2001b), including the assessment of facility requirements and

development of conceptual planning level cost estimates. It was concluded that a 3.5-mgd diversion, treatment and transport system would be required in 2020 to achieve full irrigation utilization of reclaimed water produced by the city of Apopka. Because this supplemental system would only be used seven months of the year, only 1.0 mgd would be diverted from Lake Apopka on an average annual basis (CH2M HILL 2001b). Estimated costs for this project are reported in Table 3. Assuming that the required facilities have an overall economic life of 30 years, the estimated unit production cost of the supplemental reuse system is approximately $1.84 per 1,000 gallons.

References for developing new water supplies are in Appendix E.

Table 3. Estimated cost of city of Apopka Lake Apopka supplemental reuse system

Project Component	Estimated Costs	
	Capital - — $M	O&M - — $/year
Intake	$1.10	$25,000
Transmission	$1.99	—
Treatment	$4.77	$77,100
Total	**$7.86**	**$102,100**

LINK LAND USE PLANNING AND WATER SUPPLY PLANNING

OBJECTIVE

To improve the linkages between water supply planning and land use planning in order to effectively address future water supply planning needs in east-central Florida.

AGENDA RECOMMENDATIONS AND STRATEGIES FOCUSED ON IN 2003

Develop recommended approaches.

1. Local governments and water management districts should jointly develop and disseminate recommended approaches for implementing the requirement that local governments consider the water management districts' regional water supply plans in their comprehensive plans.

2003 INITIATIVE ACTIVITIES

Water Supply Facilities Work Plans

The 2002 Legislature expanded the local government comprehensive plan requirements to strengthen coordination of water supply planning and local land use planning. One of the most significant new requirements is a 10-year water supply facilities work plan. The work plan must project a local government's water supply needs for at least a 10-year period, identify and prioritize the water supply facilities and sources of water that will be needed to meet those needs, and include in the local government's five-year schedule of capital improvements the capital improvements identified as needed for the first five years.

Local governments with responsibility for all, or a portion of, their water supply facilities and located within a priority water resource caution area must prepare and adopt a 10-year water supply facilities work plan by January 1, 2005. About 55 local governments within the District have a due date of January 1, 2005. About 50 of these local governments are in the east-central Florida area. Local governments located outside of a priority water resource caution area with responsibility for all, or a portion of, their water supply facilities, must adopt a 10-year water supply facilities work plan when adopting amendments based on the next evaluation and appraisal report regarding their comprehensive plan.

To support local governments in meeting these requirements, the District worked with the city of Cocoa to develop one of the five model water supply facilities work plans in the state. The Department of Community Affairs (DCA) funded the development of one model plan in each of the five water management districts. The models can be used by local governments as guides for the development of their work plans. District staff presented what was learned from the Cocoa experience at a statewide growth management workshop in Tallahassee sponsored by DCA.

To educate local government planning staffs and water supply utilities on the new requirements, six workshops were conducted in east-central Florida in association with the Initiative. Workshop presentations were developed in collaboration with the South Florida Water Management District and DCA.

The presentations provided the following to local governments:

- A point of contact for assistance at the St. Johns and South Florida water management districts
- Information regarding the scope of the water management districts' review of comprehensive plan amendments
- Information regarding the basic approach for completing a water supply facilities work plan, including required content, description of tasks, and a schedule for completion of tasks to meet the deadline for adopting amendments to integrate the work plan into the comprehensive plan

As a result of the workshops, more local government planners are participating in Initiative activities and improving communication and coordination with water supply utilities. Local governments have been made aware of the schedule and requirements for completing water supply facilities work plans. District staff are providing assistance to local governments in the development of their water supply facilities work plans.

Comprehensive Plan Amendments

To meet the objective of improving the linkage between land use planning and water supply planning, local government decision makers need to consider current consumptive use permit information and resource limits in relation to approval of land use changes. To achieve this objective, Initiative participants assisted the District in developing a "Potable Water Availability" worksheet (Figure 4) for local governments to include as supporting data and analysis for future land use changes in comprehensive plan amendment submittal packages.

Worksheet development and implementation activities included:

- Testing draft worksheets on comprehensive plan submittals
- Soliciting comments on draft worksheets from local governments, water management districts, DCA, and the Florida Department of Environmental Protection (FDEP)
- Making a final product available on the District's Web site (*sjrwmd.com*)
- Encouraging local governments to complete the worksheet when a proposed comprehensive plan amendment submittal package does not include appropriate water supply data and analysis
- Helping local governments complete the worksheet

The "Potable Water Availability" worksheet helps local governments in the comprehensive plan amendment process to identify water supply availability considering both infrastructure and permitted allocation under consumptive use permits. The worksheet also provides the St. Johns and South Florida water management districts and DCA with information needed to evaluate proposed amendments.

Information regarding the comprehensive plan amendment review process and development of water supply facilities work plans is available to local governments on the District's Web site (*sjrwmd.com*).

Figure 4

St. Johns River Water Management District Potable Water Availability Worksheet

This worksheet is for use by local governments submitting comprehensive plan amendments to determine the availability of potable water resources to serve proposed development. Instructions and St. Johns River Water Management District (SJRWMD) staff contact information are attached.

1. General Information

Date: _____

Contact name:_____ **Phone:**_____ **E-mail:**_____

Local government:_____

Potable water supplier:_____

2. Infrastructure Information

Water treatment plant permit number: _____ **Permitting agency:** _____

Permitted capacity of the water treatment plant(s):_____**million gallons a day (mgd)**

Total design capacity of the water treatment plant(s): _____**mgd**

Are distribution lines available to serve the property? Yes ☐ No ☐

If not, indicate how and when the lines will be provided: _____

_____

Are reuse distribution lines available to serve the property? Yes ☐ No ☐

If not, indicate if, how and when the lines will be provided: _____

_____

3. SJRWMD Consumptive Use Permit (CUP) Information

CUP number: _____ **Expiration date:** _____

Total CUP duration (years): _____

CUP allocation in last year of permit: _____

Current status of CUP: **In compliance ☐** **Not in compliance ☐**

Allocations to other local governments: _____

Reserved capacity: _____

4. Consumptive Use Analysis **Designate mgd ☐ or mgy ☐**

A. Current year CUP allocation: _____

B. Consumption in the previous calendar year: _____

C. Reserved capacity ☐ or growth projection ☐ (check the one used): _____

D. Projected consumption by proposed comprehensive plan amendment areas _____

E. Amount available for all other future uses (A – B – C – D = E): **0.00**

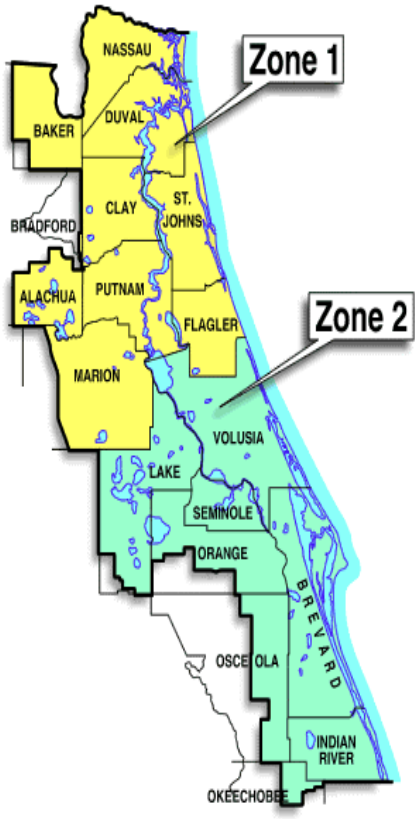
If the amount in E is zero or a negative number, explain how potable water will be made available for future uses: _____

_____

This worksheet is available electronically at *http://www.sjrwmd.com/programs/outreach/local_gov/*

Figure 4

Worksheet Contacts



Zone 1: Alachua, Baker, Bradford, Clay, Duval, Flagler, Marion, Nassau, Putnam, and St. Johns counties:

Geoffrey Sample

Home office: Palatka headquarters
Office mailing address: 4049 Reid Street, Palatka, FL 32177
Office telephone numbers: (386) 329-4436, Suncom 860-4436
Office fax number: (386) 329-4103
Office e-mail address: gsample@sjrwmd.com

Zone 2: Brevard, Indian River, Lake, Okeechobee, Orange, Osceola, Seminole, and Volusia counties:

Peter Brown

Home office: Palatka headquarters
Office mailing address: 4049 Reid Street, Palatka, FL 32177
Office telephone numbers: (386) 329-4311, Suncom 860-4311
Office fax number: (386) 329-4103
Office e-mail address: pbrown@sjrwmd.com

Worksheet Instructions

1. General Information

Date: Enter worksheet completion date.
Contact name: Enter the contact information for the person who prepared the worksheet.
Local government: Enter your city or county.
Potable water supplier: If there are different suppliers for any proposed amendment areas, use additional work sheets.

2. Infrastructure Information

Permitted capacity of the water treatment plant: Obtain from the utility.
Distribution lines: Indicate if distribution lines are available to serve the property. If not available, indicate who will fund the improvements and when the improvements will be completed.
Reuse distribution lines: Indicate if reuse distribution lines are available to serve the property. If not available, indicate if they will be provided. If the lines are to be provided, indicate who will fund the improvements and when the improvements will be completed.

3. SJRWMD Consumptive Use Permit (CUP) Information

CUP information: Obtain from the utility.
Allocations to other local governments: If the supplier provides water to other local governments, enter the names of the other local governments and the supply allocation for each.
Reserved capacity: Enter the amount of potable water capacity currently encumbered for developments that are approved but not yet constructed. This could be the amount reserved under your concurrency management system, but may include other encumbrances.

Figure 4

4. Consumptive Use Analysis

Designate mgd or mgy: Indicate which unit of measure is used. The figures may be cited in units of either million gallons per year (mgy) or million gallons per day (mgd), but you must be consistent throughout the worksheet.

A. Current-year CUP allocation: Provide the annual groundwater withdrawal allowed under the SJRWMD-issued CUP for the current calendar year. If you receive water from another local government, enter the allocation established by agreement or by the secondary user CUP issued by SJRWMD. It is important to consider the duration of the CUP and the CUP allocation in the last year of permit. If your CUP allocation is less in the final-year than in the current year, consider using the final year figure as a more conservative approach for planning purposes.

B. Consumption in the previous calendar year: This figure may be taken from the EN-50 forms (SJRWMD), from FDEP monthly operating reports, or from other acceptable documentation. Cite your source.

C. Reserved capacity or growth projection: Enter an amount based on your reserved capacity or growth projection. Check which alternative you selected. Attach the calculation for the alternative selected.

Reserved capacity: Enter the amount of potable water capacity currently encumbered for developments that are approved but not yet constructed. This could be the amount reserved under your concurrency management system, but may include other encumbrances. If your supplier provides water to other local governments, add the amount of the previous year's allocation that was not used.

Growth projection: Enter the water use attributable to this year's growth and cite your data source(s). Sources for growth projections include the comprehensive land use plan, the CUP, the most current SJRWMD water supply assessment, or the utility's water supply plan. If your supplier provides water to other local governments, include the amount of the previous year's allocation that was not used.

D. Projected consumption: Attach a description of formulas, including figures and assumptions, used to derive this figure. This worksheet may be used to analyze individual amendments or multiple amendments. If using a single worksheet for multiple amendments, include the projected consumption for all amendments. If using more than one worksheet, provide a separate summary sheet with the cumulative total for all worksheets. The projected consumption should be based on new growth attributable to the proposed amendment. If the proposed change is due to annexation, it is presumed to be new growth unless there are data and analysis that identify the annexation as existing development or as part of the growth projection entered on line C. If the annexation is presumed to be new growth, the projected consumption should be calculated based on the maximum development potential of the amendment area. If the proposed change is not due to annexation or is due to an annexation determined to be accounted for in the growth projection, calculate the difference in projected consumption based on the difference between the maximum development potential under the current designation and the proposed designation.

E. Amount available for all other future uses: This line automatically calculates the amount available for all other future uses by subtracting lines B, C and D from A.

If the amount in line E is zero or a negative number, explain how potable water will be made available for future development. For example a reuse system may be coming on-line that will reduce per capita consumption of potable water.

INCREASE USE OF RECLAIMED WATER

OBJECTIVE

To optimize the use of reclaimed water for the purpose of increasing the amount of water available for reasonable-beneficial use to the extent economically, environmentally and technically feasible.

AGENDA RECOMMENDATIONS AND STRATEGIES FOCUSED ON IN 2003

Develop areawide reuse plans.

1. Areawide reuse plans that describe specific projects that would maximize the amount of water available for use in a multi-supplier region and/or would sustain or offset harm to natural systems should be developed and implemented cooperatively by groups of public supply utilities, the water management districts, FDEP, local governments and major self-supply user groups.
2. Projects described in these plans should be designed to optimize the use of existing and projected available reclaimed water to supplement the amount of groundwater and public supply system water available for use regionally rather than merely providing a means of disposal for the reclaimed water. These plans should be prepared on at least a scale that includes multiple suppliers.

Provide incentives for development and implementation of areawide reuse plans.

1. The water management districts should use their regulatory authority and/or offer appropriate incentives (such as long-term permits), including financial assistance, to support development of areawide nonpotable reuse plans and to expedite the implementation of areawide reuse plans.
2. FDEP's implementation of its wastewater treatment facility permitting program should be consistent with areawide reuse plans.

Seek additional funding to equitably distribute costs.

1. Implementation of specific projects described in the areawide reuse plans should primarily be the financial responsibility of the reclaimed water supplier(s)/users associated with each project. However, to the extent that implementation of these plans would result in inequitable distribution of costs among reclaimed water suppliers/users and others benefiting from plan implementation, the water management districts and project sponsors should seek local, state, federal and district funds, or assist in establishing other revenue streams to reduce the inequities.

2003 INITIATIVE ACTIVITIES

Because efforts were already under way to address the use of reclaimed water prior to the Initiative, ongoing efforts were continued and reported to Initiative participants.

Ongoing Efforts

Meetings between potential reuse project partners were held over the last year for the following regional reuse projects:

- Northwest Cities Reuse Interconnect Project (Apopka, Ocoee and Winter Garden)
- Western Orange Reuse Plan (Orange County, Apopka, Winter Garden, Ocoee, Orlando and Orlando Utilities Commission [OUC])
- Brevard County Barrier Island Reuse Plan (Patrick Air Force Base [AFB], Cocoa Beach, Brevard County and Satellite Beach)
- North Seminole Regional Reclaimed Water Optimization Study (Sanford, Lake Mary and Seminole County)

Another plan, the City of Orlando Eastern Orange and Seminole Reuse Project (Orlando, Orange and Seminole counties, Oviedo and the University of Central Florida) was already under design and in the permitting process prior to the Initiative. In addition, local governments in Volusia County have developed reclaimed water projects as part of the Regional Aquifer Management Project (RAMP).

Northwest Cities Reuse Interconnect Project — Monthly progress meetings on interconnect facilities engineering designs were held between the cities of Apopka and Winter Garden. Final engineering plans are complete and are awaiting possible cost-share funding to become available from the District. Previously, the District contributed $28,382 to evaluate the use of recharge ponds as part of the proposed regional reuse system.

Western Orange Reuse Plan — A meeting between the potential partners was held on July 9, 2003. That meeting resulted in a decision to continue the development of the plan. Development of the Western Orange Reuse Plan draft scope of work was paid for and managed by the District. A draft scope of work has been prepared and is ready for review by the participants. The project planning is temporarily on hold, pending the outcome of an administrative challenge to the District's intended agency action to issue a consumptive use permit to OUC.

Brevard County Barrier Island Reuse Plan — The first study to evaluate the various options for delivering reclaimed water to the barrier island area of Brevard County was completed in September 2003 and another study is being considered to further evaluate the options. The Brevard County Barrier Island Reuse Plan evaluation was paid for and managed by the District.

North Seminole Regional Reclaimed Water Optimization Study — The North Seminole Regional Reclaimed Water Optimization Study agreement among Seminole County, the city of Sanford and the city of Lake Mary has been executed, and the first meeting between the partners was held on October 22, 2003. The city of Sanford is the lead partner and as such, was awarded a 50 percent cost-share match in an amount up to $50,000 from the District to evaluate an expansion of its reclaimed water and surface water augmentation systems. The study

will result in a regional plan for expanded use of reclaimed water, including augmentation from the St. Johns River. The study will be completed by July 2004.

A determination was sought as to whether Florida Forever funds could be use for storage, augmentation and recharge of reclaimed water. It has been determined that Florida Forever money can be used for storage, augmentation and recharge of reclaimed water. Approximately $4.3 million of Florida Forever funding has been awarded to Volusia area reclaimed water projects.

Funding for developing 50 mgd of reclaimed water in east-central Florida was included in the State and Tribal Assistance Grant (STAG) federal funding requests for FY 2003–2004 and FY 2004–2005. A total of $11.783 in cost-share funding through STAG is being sought for the City of Orlando Eastern Orange and Seminole Reuse Project.

The amount of STAG funding for FY 2003–2004 from Congress is still undetermined at this time. From prior year requests, the City of Orlando Eastern Orange and Seminole Reuse Project has received $3.125 million from STAG.

Appendix F comprises a summary of regional reclaimed water projects.

ENHANCE AQUIFER RECHARGE USING RECLAIMED WATER

OBJECTIVE

As part of an overall reuse strategy, recharging the aquifer through surface application of reclaimed water, especially in high recharge areas, during wet periods when the opportunities for more direct reuse are decreased, should be given priority consideration and should be undertaken to the extent that it is economically, environmentally and technically feasible.

AGENDA RECOMMENDATIONS AND STRATEGIES FOCUSED ON IN 2003

Coordinate regulatory policies and programs.

1. The St. Johns River, South Florida and South West Florida water management districts and FDEP should ensure that their regulatory policies regarding recharge and water quality in the east-central Florida region are applied in a manner which will maximize aquifer recharge, when aquifer recharge is a more appropriate use of the reclaimed water than other beneficial uses.
2. The St. Johns River, South Florida and Southwest Florida water management districts should conduct regional impact evaluation scenarios and provide information to local governments for their use in determining the best uses of high recharge areas in the 10-county east-central Florida region.

Seek areawide support for studying recharge opportunities.

1. The Central Florida Aquifer Recharge Enhancement Phase II (CFARE 2) study currently under way in Orange County should be expanded through cooperative efforts and greater support to cover the east-central Florida region.

2003 INITIATIVE ACTIVITIES

Because efforts were already under way to address enhancing aquifer recharge using reclaimed water prior to the Initiative, ongoing efforts were continued and reported to Initiative participants.

Ongoing Efforts

A teleconference with David York, FDEP Reuse Coordinator, and District staff was held on March 21, 2003, to discuss the water quality issues related to recharge with reclaimed water. Discussions also took place in the February 26, 2003, meeting of the Statewide Reuse Coordinating Committee. Members include all the water management districts, FDEP, the Department of Agriculture and Consumer Services, the Department of Health and the Public Services Commission.

The Statewide Reuse Coordinating Committee met over the past year to develop a report to promote the reuse of reclaimed water to the public and to local governments. The report, titled *Water Reuse for Florida: Strategies for Effective Use of Reclaimed Water*, is designed to be a reference guide for water reuse. Recommendation 7 of the report is to encourage groundwater recharge and indirect potable reuse.

The feasibility and benefits of enhanced recharge using reclaimed water were previously established in *Technical Feasibility of Artificial Recharge of Reclaimed Wastewater and Its Hydrologic Impacts on the Regional Ground Water System* (Rabbani and Munch 1998). As a followup, additional work is under way to review the effects of the Conserv II reclaimed water project on groundwater systems. The Conserv II recharge analysis should be completed by December 2003. Afterwards, the decision will be made on what further studies are needed to investigate the effects of recharge with reclaimed water. At that time, the steps to coordinate with other water management districts and FDEP will be determined.

Aquifer recharge with reclaimed water was included in an optimization analysis for the OUC consumptive use permit application review process to determine the best use of reclaimed water to prevent unacceptable impacts due to groundwater withdrawals. Some benefits were observed in the computer model runs using reclaimed water both to offset groundwater pumping and for indirect aquifer recharge through rapid infiltration basins.

As part of their areawide reuse planning, the city of Sanford, Seminole County and the city of Lake Mary have initiated a study to evaluate optimization of their reuse systems, including the consideration of recharge-type projects. The study should be finished by July 2004. This study, the North Seminole Regional Reclaimed Water Optimization study, is described in the use of reclaimed water section of this document.

A surface water/groundwater model for the portion of the east-central Florida area encompassing the Little Wekiva River and Gee and Soldiers Creek basins is being prepared at the direction of the District and should be completed by April 2004.

The CFARE 2 team, consisting of Orange County, the St. Johns and South Florida water management districts, FDEP and PB Water, has met more than 35 times to identify potential projects, to discuss land availability for fast-track projects, and to discuss the development of a benefit ranking index methodology to select projects for aquifer recharge, including ones that will use reclaimed water, to implement in the east-central Florida area. Two projects utilizing enhanced aquifer recharge with reclaimed water — city of Ocoee and Reedy Creek Utilities — have been identified by the CFARE 2 team in the east-central Florida region.

Conclusions resulting from the CFARE 2 research, as well as other studies and permit reviews, are summarized below.

- Benefits can be realized through recharge with reclaimed water, but it is highly site-specific and the same benefits cannot be achieved with every project.
- It is important to use good site-specific modeling and data to determine what benefits can be derived.
- The benefit derived from a specific reclaimed water project greatly depends on the goal of the reclaimed water project.
- To quantify the benefits, it is important to first determine whether the project's purpose is to preserve potable water, to offset unacceptable impacts or some other objective.

INCREASE WATER CONSERVATION

OBJECTIVE

To conserve potable and reclaimed water to the extent economically, environmentally and technically feasible as a means of reducing water demands, thus maximizing the amount of water available for reasonable-beneficial uses.

AGENDA RECOMMENDATIONS AND STRATEGIES FOCUSED ON IN 2003

Adopt landscape ordinances.

1. Landscape ordinances that require appropriate and affordable water saving practices in residential and commercial developments should be adopted and enforced by local governments.
2. The water management districts, in coordination with local governments, home builder associations, landscape architects, landscape contractors and other appropriate parties, should coordinate and fund the development of model ordinances for consideration by local governments.

2003 INITIATIVE ACTIVITIES

The initial focus for water conservation Phase II activities was on developing model landscape ordinance language to be used as a guideline for local communities. Initiative participants and other stakeholders were invited to participate on a committee to develop the model landscape ordinance language.

The committee had three all-day meetings in July, August and September. Because there was great interest in this process, the original 20-member committee grew to about 35. The large number of participants created both the necessity and opportunity to break out work groups to focus on different parts of the model landscape document. Four work groups developed recommended language for specific topic areas: Landscape Design, Irrigation, Preservation and Site Clearing, and Implementation.

When the committee finalizes its recommendations, the District will incorporate selected recommendations appropriate to its purview and authority into its model ordinance. In the interest of statewide consistency, the District's model landscape ordinance will be based on a model proposed by FDEP.

In recognition of the need to customize the model to local conditions, the District also will produce and make available a compilation of all recommendations from this committee so they may be considered by local governments, regardless of whether they are incorporated into the District model. A draft of the model ordinance is expected to be available for review and comment by January 2004.

RECOMMENDATIONS FOR 2004 PHASE II INITIATIVE ACTIVITIES

ENHANCE INTERGOVERNMENTAL COORDINATION

- Discontinue the subregional approach.
- Include the following counties in 2004 Initiative activities: Volusia, Brevard, Orange, Seminole, Osceola, Lake and Marion
- Focus on developing countywide water supply plans and partnerships between suppliers in each county.
  - Develop countywide water supply plans; include potential partnerships.
    - Support Marion County effort and others as identified.
  - Assure compatibility of countywide plans.
- Focus on developing intercounty water supply plans and partnerships.
  - Identify opportunities for intercounty cooperation.
  - Develop plans for intercounty partnerships.
- Continue ongoing county-level facilitation.
  - Conduct Lake County governance study.
  - Conduct Seminole County facilitation process.
  - Support Water Authority of Volusia.
- Continue ongoing intercounty facilitation.
  - Continue Brevard Water Supply Board/ Orange/OUC/Orlando facilitation.
  - Continue Water Authority of Volusia/Seminole County facilitation.
- Continue to educate local government, state and federal elected officials, and the public on water supply issues and potential solutions.
  - Conduct one-on-one meetings as needed.
  - Give presentations/workshops to councils/commissions.
  - Maintain Initiative Web site.
  - Provide Initiative information via StreamLines, WaterWatch and news releases.
- Continue to coordinate Initiative activities with the South and Southwest Florida water management districts, FDEP and DCA.
- Continue to use existing water resource, planning and business organizations to improve communications and coordination, such as the following:
  - Harris Chain of Lakes Restoration Council
  - Lake County Water Authority
  - Lake County Environmental Protection Advisory Board
  - Lake County Chapter, Florida League of Cities
  - East-central Florida Regional Planning Council
  - myregion.org
  - Tri-county League of Cities
  - Seminole Council of Governments
  - University of Central Florida
  - Central Florida Utility Council
  - Water Authority of Volusia

  - Brevard Water Supply Board
  - Space Coast League of Cities
- Improve communications with the business community concerning water supply issues and potential solutions by identifying and contacting organizations to present information on Initiative activities. Potential organizations could include chambers of commerce, economic development councils, builders' associations and realtors' groups.
- Prepare funding request packages for programs and projects developed through the Phase II process.

DEVELOP NEW WATER SUPPLY

- Incorporate projects listed in Table 2 in a 2004 interim update to DWSP.
- Prioritize the identified potential projects based on the need to move forward with advanced feasibility investigations.
- Develop scopes of work and schedules for feasibility investigations.
- Complete investigation on OUC's brackish groundwater proposed alternative source option.
- Evaluate other water supply projects as appropriate.
- Continue to support the Water Authority of Volusia (WAV).
  - Provide technical support to direct WAV's engineering effort.
  - Provide funding support for development of master facility plan and decision support system for integrated wellfield management.

LINK LAND USE PLANNING AND WATER SUPPLY PLANNING

- Continue to educate local governments about, provide support for, and assist in coordinating the development of their water supply facilities work plans.
  - Develop a fact sheet that provides basic information regarding the schedule and requirements for completing the work plans, and distribute the fact sheet to all local government elected officials and administrators.
  - Develop a "how-to guide" for local governments to use when drafting their work plans, and distribute the guide to local government planning officials.
  - Add the fact sheet, the "how-to guide" and other relevant materials and links to the District's comprehensive plan amendment and work plan Web page.
  - Maintain a high level of coordination among local governments, the water management districts, FDEP and DCA during the development and review of the work plans.
- Continue to educate local governments about and encourage the use of the District's "Potable Water Availability" worksheet when submitting comprehensive plan amendments.
  - Distribute the worksheet to all local governments.
  - Continue to recommend that local governments complete the worksheet when a proposed comprehensive plan amendment submittal package does not include appropriate water supply data and analysis.
  - Continue to assist local governments in completing worksheets.
  - Continue to seek comments on the usefulness of the worksheet from local governments, water management districts, FDEP and DCA, and make revisions if necessary to facilitate its use.
- Continue to include city/county planners in Initiative activities.

INCREASE USE OF RECLAIMED WATER

- Provide assistance to and monitor the progress of regional reuse projects, including:
  - Northwest Cities Reuse Interconnect Project
  - Western Orange Reuse Plan
  - Brevard Barrier Island Reuse Project (Patrick AFB south housing)
  - North Seminole Regional Reclaimed Water Optimization Study
  - City of Orlando Eastern Orange and Seminole Reuse Project
  - Volusia area reclaimed water projects (RAMP)
- Provide assistance to and monitor the plans of utilities to augment reclaimed water systems with alternative water supplies.
- Evaluate the effectiveness of restrictions, water conservation-type rate structures, and other methods used to encourage the public to conserve when using reclaimed water.
- Continue to seek funding for regional reuse projects through the federal STAG program, the Florida Forever program and the District's Alternative Water Supply Cost-Share program.
- Continue to work with local governments to reduce per capita water use where feasible and to encourage projects that reduce groundwater withdrawals.

ENHANCE AQUIFER RECHARGE USING RECLAIMED WATER

- Report on the results of the Conserv II project analysis and develop the next steps for coordination between the water management districts and FDEP.
- Provide assistance to and monitor the progress of the CFARE 2 project.
- Identify nationwide reuse research projects focused on the use of reclaimed water for recharge.

INCREASE WATER CONSERVATION

- Continue with ongoing regulatory/permitting and incentive programs.
- Finalize District model landscape ordinance and initiate pilot incentive program in Lake County.
- Encourage local government and water supply utility participation in coordinated water conservation public awareness programs.
- Assess the amount of reduction in water demand that can be reasonably expected through specific conservation programs and practices, including cost effectiveness assessment and identification of water conservation programs to fit the conditions of geographic areas.

APPENDIX A

East-Central Florida Water Agenda
Issue Areas, Recommendations and Strategies
November 2002

Issue area: Enhance intergovernmental coordination

Objective: To Improve intergovernmental coordination on water supply planning in east-central Florida, which is critical to effectively managing regional water resources.

Recommendations and strategies

Continue regional and subregional forums

1. The districts and the area local governments should commit to continuing a dialogue at subregional and regional level forums to increase understanding of impacts and identify opportunities for partnerships in developing new water supply for the east-central Florida region. These forums should be designed to promote consensus building and collaborative water supply planning and seek greater alignment of local governments in the east-central Florida area.

Build on existing association forums

1. The Initiative should seek to build on existing forums for elected officials, city and county managers and others to discuss, debate and clarify water supply issues, build trust and secure funding for needed water supply partnerships.

Issue area: Develop new water supply

Objective: To maximize the development of groundwater for reasonable-beneficial uses and develop alternative water sources to meet the needs of future reasonable-beneficial uses by the time the needs occur, in a manner that ensures that the uses will not result in unacceptable adverse impacts to water resources and related natural systems.

Recommendations and strategies

Identify specific alternative water supply projects

1. The water management districts should identify specific economically, environmentally and technically feasible alternative water supply projects that are adequate to supply projected water demands for the next 20 years. The cumulative impacts of these projects in combination with existing permitted water use, water conservation and reclaimed water projects should not result in unacceptable impacts to water resources and related natural systems.
2. Assessment of the cumulative impacts of these projects should be based on best available information.

3. These specific projects should be identified in the regional water supply plans prepared by the water management districts. Projects contained in the regional water supply plan will receive priority in district, state and federal funding requests.

Seek alternative funding to equitably distribute costs

1. The primary source of funding for implementation of new alternative water supply projects should be the water suppliers/users. However, to the extent that implementation of these plans would result in inequitable distribution of costs among water suppliers and others benefiting from project implementation, the water management districts and project sponsors should seek local, state, federal and District funds, or assist in establishing other revenue streams to reduce the funding inequities.

Provide incentives for alternative water supply projects

1. The water management districts should use their regulatory authority and/or offer appropriate incentives, including financial assistance, to expedite the implementation of alternative water supply projects.
2. Water management districts should assist interested local governments in creating locally controlled organizations that will provide a cost-effective mechanism to develop alternative water supply projects identified in the regional water supply plan.

Issue area: Link land use planning and water supply planning

Objective: To improve the linkages between water supply planning and land use planning in order to effectively address future water supply planning needs in east-central Florida.

Recommendations and strategies

Develop recommended approaches

1. Local governments and water management districts should jointly develop and disseminate recommended approaches for implementing the requirement that local governments consider the water management districts' regional water supply plans in their comprehensive plans.

Coordinate planning schedules

1. The schedule for updates to the regional water supply plans needs to be coordinated with the Evaluation and Appraisal Report schedule for local governments.

Issue area: Increase use of reclaimed water

Objective: To optimize the use of reclaimed water for the purpose of increasing the amount of water available for reasonable-beneficial use to the extent economically, environmentally and technically feasible.

Recommendations and strategies

Develop areawide reuse plans

1. Areawide reuse plans that describe specific projects that would maximize the amount of water available for use in a multi-supplier region and/or would sustain or offset harm to natural systems should be developed and implemented cooperatively by groups of public supply utilities, the water management districts, FDEP, local governments and major self-supply user groups.
2. Projects described in these plans should be designed to optimize the use of existing and projected available reclaimed water to supplement the amount of groundwater and public supply system water available for use regionally rather than merely providing a means of disposal for the reclaimed water. These plans should be prepared on at least a scale that includes multiple suppliers.
3. The local governments in each county should determine whether the water management district, or a designated local government or other wastewater treatment provider should take the lead in coordinating the development of these plans.
4. These plans should become part of the regional water supply plans prepared by the water management districts. Projects contained in the regional water supply plan will receive priority in district, state and federal funding requests.

Provide incentives for development and implementation of areawide reuse plans

1. The water management districts should use their regulatory authority and/or offer appropriate incentives (such as long-term permits), including financial assistance, to support development of areawide non-potable reuse plans and to expedite the implementation of areawide reuse plans.
2. FDEP's implementation of its wastewater treatment facility permitting program should be consistent with areawide reuse plans.

Seek additional funding to equitably distribute costs

1. Implementation of specific projects described in the areawide reuse plans should primarily be the financial responsibility of the reclaimed water supplier(s)/users associated with each project. However, to the extent that implementation of these plans would result in inequitable distribution of costs among reclaimed water suppliers/users and others benefiting from plan implementation, the water management districts and project sponsors should seek local, state, federal and district funds, or assist in establishing other revenue streams to reduce the inequities.

Issue area: Enhance aquifer recharge using reclaimed water

Objective: As part of an overall reuse strategy, recharging the aquifer through surface application of reclaimed water, especially in high recharge areas during wet periods when the opportunities for more direct reuse are decreased, should be given priority consideration and should be undertaken to the extent that is economically, environmentally and technically feasible.

Recommendations and strategies

Coordinate regulatory policies and programs

1. St. Johns River, South Florida and South West Florida water management districts and FDEP should ensure that their regulatory policies regarding recharge and water quality in the east-central Florida region are applied in a manner which will maximize aquifer recharge, when aquifer recharge is a more appropriate use of the reclaimed water than other beneficial uses.
2. St. Johns River, South Florida and South West Florida water management districts should conduct regional impact evaluation scenarios and provide information to local governments for their use in determining the best uses of high recharge areas in the 10-county east-central Florida region.

Seek areawide support for studying recharge opportunities

1. The Central Florida Aquifer Recharge Enhancement Phase II (CFARE 2) study currently under way in Orange County should be expanded through cooperative efforts and greater support to cover the east-central Florida region.

Provide education on enhanced recharge as part of the overall reuse strategy

1. Educate elected officials and the public on existing aquifer recharge opportunities and challenges.

Issue area: Increase water conservation

Objective: To conserve potable and reclaimed water to the extent economically, environmentally and technically feasible as a means of reducing water demands thus maximizing the amount of water available for reasonable-beneficial uses.

Recommendations and strategies

Implement water conservation practices

1. The water management districts should continue to require the implementation of potable and reclaimed water conservation practices through their consumptive use permitting programs. Implementation of these practices should be funded by the water suppliers and their ratepayers, with assistance from the water management districts.
2. Water management districts should provide regulatory and financial incentives to local governments that implement applicable water conservation measures identified in the FDEP Water Conservation Initiative.
3. In order to promote equal treatment of all water users, water management districts should develop standards for residential water users for both interior and exterior use. Regulatory and financial incentives should be made available to local governments that achieve these standards.

4. FDEP should require the implementation of reclaimed water conservation practices through its wastewater treatment facility permitting program.

Adopt landscape ordinances

1. Landscape ordinances that require appropriate and affordable water saving practices in residential and commercial developments should be adopted and enforced by local governments.
2. The water management districts, in coordination with local governments, home builder associations, landscape architects, landscape contractors and other appropriate parties, should coordinate and fund the development of model ordinances for consideration by local governments.
3. The water management districts should use their regulatory authority and/or offer appropriate incentives, including financial assistance, to expedite the implementation of such ordinances.
4. The water management districts should also seek authorization for additional incentives for adoption of appropriate landscape ordinances, including priority in funding for state land acquisition programs such as the Florida Communities Trust Program.

Coordinate water conservation programs

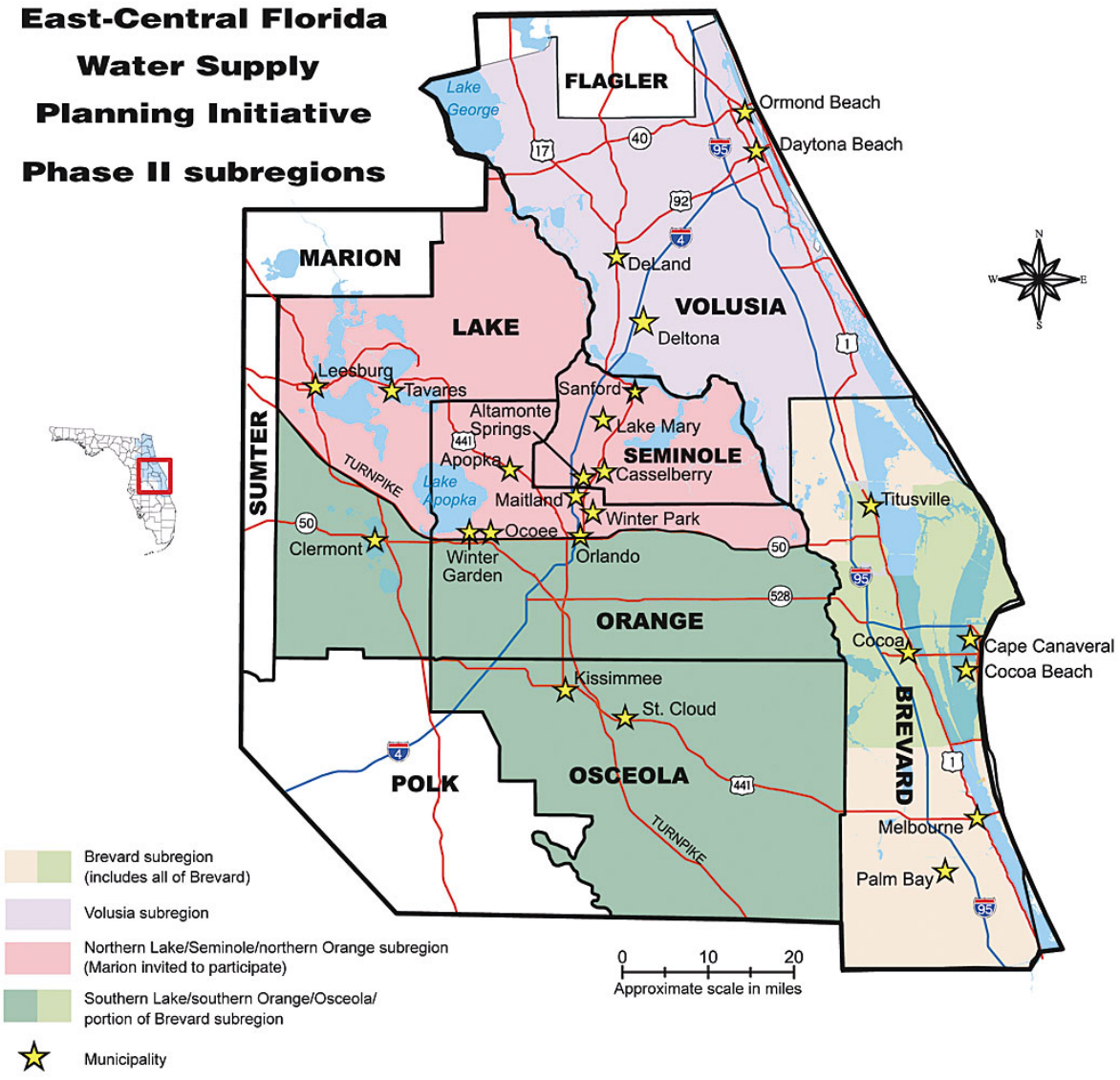
1. Public supply utilities should participate in the water management districts' coordinated water conservation public education programs (and other areawide conservation programs) in order to minimize the confusion caused by multiple and mixed messages, improve efficiency of water use and reduce total costs.
2. The water management districts should continue to offer appropriate incentives, including financial assistance, to encourage and expedite participation in cooperative regional programs.

Determine conservation effectiveness and perform cost-effectiveness analysis for conservation programs and practices

1. The water management districts should work with FDEP and water suppliers/users to make an assessment of the amount of reduction in water demand that can be reasonably expected through specific conservation programs and practices and disseminate this information to the general public and public water suppliers. Analysis of unnecessary and wasteful uses of existing water sources should also be calculated along with the costs of implementing programs to reduce the unnecessary and wasteful use. This should be a cooperative effort among the water management districts, FDEP and water suppliers/users with the water management district(s) taking the lead.

APPENDIX B

2003 Phase II Subregional Map



Appendix C

2003 Phase II Subregional Meeting Summaries

East-Central Florida Water Supply Planning Initiative Phase II
Hosted by: St. Johns River Water Management District
Facilitated by: Jake Varn, Fowler, White, Boggs, Banker, P.A.

Round 1 Meeting Summary

Subregion: all of Volusia County
Held in association with the Volusian Water Alliance
June 17, 2003, 9:00 a.m. to 12:00 p.m.
VOTRAN, Conference Room
950 Big Tree Road
South Daytona, Florida

Subregion: southern Lake/southern Orange/Osceola/portion of Brevard
June 26, 2003, 9:00 a.m. to 12:00 p.m.
Winter Park Civic Center, 1050 West Morse Blvd.
Winter Park, Florida 32789

Subregion: northern Lake/Seminole /northern Orange
June 26, 2003, 1:30 a.m. to 4:30 p.m.
Winter Park Civic Center, 1050 West Morse Blvd.
Winter Park, Florida 32789

Subregion: all of Brevard County
Held in association with the Brevard Water Supply Board
July 11, 2003, 9:00 a.m. to 12:00 p.m.
Brevard County Government Center, 2725 Judge Fran Jamieson Way
Building C, 3rd Floor, Suite 313
Viera, Florida 32940

Attendance: approximately 115 people

Background

The East-Central Florida Water Supply Planning Initiative (ECFWSPI) is a project designed to bring together local governments and water supply utilities in east-central Florida whose future groundwater withdrawals have the potential to impact one another and who also have the potential to partner on possible solutions. Projects identified during Phase II of the Initiative will be used to update the St. Johns River Water Management District's (SJRWMD) Water Supply

Plan. The focus of the Phase II meetings will be on the six key water supply issues identified during the Phase I process, which are listed below:

Key Water Supply Issues

1. Develop new water supplies
2. Use of reclaimed water
3. Enhance aquifer recharge using reclaimed water
4. Increase water conservation
5. Link land use and water supply planning
6. Enhance intergovernmental coordination

Each subregion has three scheduled meetings to be held in 2003 as part of Phase II of the Initiative. The agenda for the first meeting dealt with new water supplies, reuse of reclaimed water, and conservation. The primary objective of this meeting was to discuss new water supply projects not associated with groundwater, since groundwater is limited and other sources must be identified in order to have a sustainable supply.

The link between land use and water supply planning will be discussed in the second round of meetings and therefore land planners were encouraged to attend. The State Legislature passed a bill in 2002, which will strengthen the link between Comprehensive Plans and Regional Water Supply Plans. It was emphasized that Comprehensive Plans will be more closely linked to Water Supply Plans in the near future.

Proposed Water Supply Projects

Ms. Barbara Vergara, Division Director of Resource Management, Div. of Water Supply Management, SJRWMD, presented information on seven potential water supply projects, which are listed below. Types of information included: potential source, treatment requirements, storage, potential customers and planning level costs.

Potential Water Supply Projects

- Surface water supply
  - St. Johns River near Lake Monroe
  - St. Johns River near Deland
  - Lower Ocklawaha River
  - Taylor Creek Reservoir
- Seawater demineralization
  - Intracoastal Waterway near New Smyrna Beach
  - Indian River at FP&L Cape Canaveral Power Plant
  - Reliant Indian River Power Plant

Ms. Vergara said the SJRWMD has studied many options and stated they are willing to look at other options if there is an expressed interest. Following the presentation of the projects, participants were encouraged to asked questions and to provide their thoughts on the projects.

At each of the subregion meetings, questions were raised concerning why certain areas were or were not indicated as potential customers for each project. Ms. Vergara indicated that an area had to be assumed for the purposes of calculating transmission costs. Subsequently, people wanted to know how those costs were derived. In response, the SJRWMD offered to provide additional information on how the transmission costs were calculated during upcoming Phase II meetings.

Ms. Vergara said the SJRWMD has studied many options for water supply projects and stated they are willing to look at other options that may be suggested, if there is an expressed interest. Following the presentation of the projects, participants were encouraged to ask questions and to provide their thoughts on the projects.

Questions/Comments from the Volusia County subregion

Question: Is there migration from aquifer storage and recovery (ASR) wells that will reduce the cost of transporting water within the County?

Answer: Migration will not reduce transmission costs. The intent is to keep water local; the same well injects and recovers the water.

Question: Is ASR a proven way to store water locally? How much tank storage would be needed vs. ASR and what is the cost impact?

Answer: There is currently no local use of ASR. The testing to find the answers to these questions is being conducted. SJRWMD will estimate costs for above ground storage and present them in upcoming meetings during Phase II.

Question: Is it feasible for Volusia to partner with Brevard to develop desalinization projects at the power plants in Brevard County?

Answer: The economy of scale for transmission is not favorable.

Question: Where did these projects come from?

Answer: The projects are the result of Phase I of the ECFWSPI and several years of investigations.

Question: What positives were present in the Tampa Bay Water experience that can be applied here and what about a design/build/operate contract with creative financing?

Answer: The next meeting will address creative financing options.

Question: Is there a duplication of effort, since the Volusia Water Alliance has been working on water supply projects and now the SJRWMD is proposing these projects for water supply?

Answer: SJRWMD is not proposing to implement the projects. They have identified feasible water supply projects that local governments can implement. SJRWMD is a regulatory agency, not a supplier, as being both would be a conflict of interest.

Question: Concerning the Deland river water project, why does the service area on the conceptual project leave out Seminole and Orange counties? Why are the transmission costs different?

Answer: Service areas were conceptualized for the purpose of defining an area for cost estimating. Other service area scenarios could be performed.

Question: Is there a potential problem with desalinization projects impacting manatees? A desalinization plant will not generate heated water, but will generate brine that needs disposal?

Answer: None of the projects will be easy to permit, but they are feasible. There are no easy answers to the water supply problems facing East-Central Florida.

Comment: The size of the New Smyrna Beach desalinization project should have a larger service area to include all of Volusia County.

Response: The District will determine the costs for that option and present them in an upcoming meeting during Phase II.

Comment: Lake George should be considered as a plant location.

Response: The District will determine the costs for that option and present them in an upcoming meeting during Phase II.

Question: Is ASR considered only at the treatment facility?

Answer: It could be anywhere in the service area.

Question: How do you contain ASR water?

Answer: The different types of water have different densities, which tends to keep the fresh water isolated and contained.

Question: Could Volusia use Brevard County power plant water? Has there been any commitment?

Answer: Ms. Vergara stated that no one has made a firm commitment.

Question: How do you arrive at the amount of water available from St Johns River?

Answer: The SJRWMD uses years of flow data and water quality information along with statistics.

Questions/Comments from the southern Lake/southern Orange/Osceola/portion of Brevard subregion

Comment: Clarification was requested concerning the total capacity of multiple plants on the St. Johns River.

Response: 175 mgd is the maximum amount of water available from the river between the headwaters and Deland, based on a Minimum Flows and Levels (MFLs) study recently finalized and that amount would be divided among the projects. Work has been performed to establish

MFLs, which allows greater accuracy in predicting availability. MFLs for the St. Johns River will go to the Governing Board for approval, and then proceed to rulemaking later this year.

Comment: The SJRWMD stated that 107 MGD is the total allowable withdrawal from the Ocklawaha River downstream of the confluence with the Silver River in Marion County, based on technical analysis that is very similar to MFLs. There are currently no MFLs established, however, for the Ocklawaha River.

Comment: An official with the city of Kissimmee said they were performing studies to evaluate using surface water to supplement reclaimed water and aquifer recharge. They would like to see non-potable needs (in particular agriculture) switch to using alternative non-potable supplies.

Comment: An official with the Orlando Utilities Commission (OUC) said they are looking to use the St. Johns River and desalinization, and possibly blend the two sources, to meet future demands. They indicated that the Taylor Creek Reservoir and the two co-located desalinization projects were of interest. They indicated they did not believe a plant further north would be a viable option for them. OUC asked if the SJRWMD could determine the costs associated with a treatment plant on the St. Johns River near State Road 520. They also acknowledged the need for partnerships.

Response: The SJRWMD agreed to determine the costs associated with the suggested option and present them in an upcoming meeting during Phase II of the Initiative.

Comment: An official with Orange County said that they felt the projects presented were not feasible because the cost to implement the proposed projects was quite high and the demand would soon exceed the capacity. They would like to see projects that meet demand for the next 20 to 25 years.

Comment: Mr. Jake Varn said that south Lake County is growing rapidly and they are the furthest from the proposed water supply sources. Therefore, it is especially important for them to begin to develop their plans for future water supplies.

Comment: An official with Orange County indicated they and the city of Orlando, along with other subregional entities, have been working on conceptual plans involving using surface water such as storm water, and are a few months away from finishing their plans. *Response*: A representative from the South Florida Water Management District (SFWMD) encouraged them to share information so their plan could be incorporated into the SFWMD's updated Regional Water Supply Plan.

Comment: An official with the city of Kissimmee said that a new organization, the Tohopekaliga Water Authority, has been formed between Osceola County and the city of Kissimmee. The city of St. Cloud may also join. They will consider new water sources for non-potable use, from storm water and surface waters in the Kissimmee River Basin, with possible focus on Shingle Creek.

Response: Mr. Varn complimented this action and encouraged them to have their plan incorporated into the SFWMD's Regional Water Supply Plan.

Questions/Comments from the northern Lake/Seminole /northern Orange subregion

Comment: Seminole County showed interest in constructing a plant on the St. Johns River and indicated they are interested in finding a partner to share the costs. In particular, Seminole County referenced Volusia County as possible partner. Seminole County indicated that they need more water now, with or without a partner. They voiced concerns about having a customer base for a plant on the St. Johns River that may not want to pay for expensive surface water if they thought they could get enough less expensive groundwater.

Response: Mr. Varn said that was exactly why they would need an intergovernmental agreement, such as the one being drafted in Volusia County. The SJRWMD agreed to estimate the costs associated with a plant on the St. Johns River to serve both Seminole County and Volusia County.

Question: Mr. Varn asked if the cities in Seminole County would be interested in participating.

Answer: An official from Seminole County said he thought the cities would be interested and that the County would be willing to encourage them to do so.

Comment: Mr. Varn explained that water suppliers in Volusia County, through their initiatives in forming a new countywide intergovernmental organization, will soon begin the process of identifying a specific project that will allow them to meet their future water supply needs. He also explained their unitary rate concept and how each of the water producers will continue to operate their own treatment facilities, but will abide by a regional plan for better aquifer management.

Question: An official with Seminole County asked if a plant located on the west end of Lake Jessup to serve Seminole County had been considered.

Answer: The SJRWMD indicated it had been considered and the costs were virtually the same as those for the Lake Monroe plant.

Question: An official from Apopka asked if the SJRWMD could determine the costs associated with using Lake Apopka as a source for reuse augmentation and aquifer recharge.

Answer: The SJRWMD agreed to determine the costs and present them in an upcoming meeting during Phase II.

Comment: An official from Lake County said they were interested in the Ocklawaha River project. Also, they asked if bringing desalinization water to Lake County via the Hwy 50 corridor would be feasible.

Response: Bringing desalinized water down Hwy 50 to Lake County would not be feasible at this time because it would go past other users who need the water and the cost of that pipeline would be prohibitive.

Question: An official with the city of Sanford asked if the SJRWMD could determine the cost of treating water from the Lake Monroe to a lesser degree for reuse augmentation.

Answer: The SJRWMD agreed to estimate the costs and present them in an upcoming meeting during Phase II.

Questions/Comments from the Brevard County subregion

Question: Has the District contacted the environmental regulatory agencies regarding the brine disposal for 60 mgd of water treatment?

Answer: The SJRWMD indicated they had not.

Comment: It was suggested that combining the discharges from the two desalinization projects could ease permitting given the concern about concentrate management. Also, it was suggested that the increase in the temperature of the finished water due the treatment process could be a problem. The Tampa Bay Water desalinization project was given as an example, but in their case the distribution system is large, which allows the water to cool before customers receive it.

Question: How does the SJRWMD know the demand will exceed the supply capacities identified in the year 2027?

Answer: The calculation is based on the growth projections and associated demand versus the amount available.

Question: Does the salt content of the water affect the cost of treated water?

Answer: Yes, the New Smyrna Beach project is an example where the costs are higher due to the higher salinity.

Question: Is ASR feasible in a saline aquifer?

Answer: Yes, the difference in densities of the waters keeps the fresh water isolated, although there are some losses due to mixing.

Question: Would wells owned by others affect the ASR?

Answer: No, the wells would have to be very close to influence the pocket of stored water.

Question: Is the difference in cost between those presented for seawater projects and those for future supply, that were reported to be $1 to $2 higher, due the salinity of the water?

Answer: No, the difference is mainly due to disposal costs. The SJRWMD is partnering with the National Oceanic and Atmospheric Administration (NOAA) to find ocean outfall locations closer to shore.

Comments by SJRWMD

The role of the Water Management Districts, according to *Florida Statutes*, is to act as regulators and planning bodies. The local governments are responsible for funding and developing water supply projects. However, the SJRWMD is willing to help local governments find funding and to provide some funding themselves for projects that have been identified through planning, and that have been incorporated into the SJRWMD's Regional Water Supply Plan. Therefore, it is advantageous for groups to identify the sources they are interested in and begin moving forward towards implementation. Intergovernmental coordination and sharing information is critical in solving the water supply issues.

Reuse of Reclaimed Water

At the subregional meetings held on June 26, 2003, the SJRWMD presented an overview of areawide reuse and enhanced aquifer recharge projects currently under way. These projects include:

- City of Orlando Eastern Regional Reclaimed Water Distribution Project
- Western Orange County Reuse Plan
- The North Seminole Regional Reclaimed Water and Surface Water Augmentation System Expansion and Optimization Project
- Regional Aquifer Management Plan (RAMP)
- The NW Cities Regional Reuse Partnership Project
- SFWMD Reclaimed Water Master Plan
- Central Florida Area Recharge Enhancement — Phase II

The SJRWMD indicated that the projected amount of reclaimed water available for the year 2025 is not significantly more than what was projected for 2020 and the amount of available reclaimed water is not nearly enough to solve the water supply issues facing East-Central Florida.

Water Conservation

At the subregional meetings held on June 26, 2003, the SJRWMD presented an overview of current efforts under way to increase water conservation efforts. The initial focus for Phase II of the Initiative for water conservation will be on developing a model landscape ordinance language as guidelines for local communities. A secondary focus will be determining the effectiveness and cost-effectiveness of various conservation practices.

The SJRWMD invited stakeholders to participate on a committee to help develop model landscape ordinance language. The committee will meet July–Sept., with final ordinance language to be developed by Nov. 2003.

East-Central Florida Water Supply Planning Initiative Phase II
Hosted by: St. Johns River Water Management District
Facilitated by: Jake Varn and Linda Shelly; Fowler, White, Boggs, Banker, P.A.

Round 2 Meeting Summary

Subregion: all of Volusia County
Held in association with the Volusian Water Alliance
July 15, 2003, 9:30 a.m. to 12:30 p.m.
Performing Arts Center Studio
399 N. U.S. 1
Ormond, Florida

Subregion: southern Lake/southern Orange/Osceola/portion of Brevard
July 31, 2003, 9:00 a.m. to 12:00 p.m.
Winter Park Civic Center, 1050 West Morse Blvd.
Winter Park, Florida 32789

Subregion: northern Lake/Seminole /northern Orange
July 31, 2003, 1:30 a.m. to 4:30 p.m.
Winter Park Civic Center, 1050 West Morse Blvd.
Winter Park, Florida 32789

Subregion: all of Brevard County
Held in association with the Brevard Water Supply Board
August 1, 2003, 10:00 a.m. to 1:00 p.m.
Brevard County Government Center
2725 Judge Fran Jamieson Way
Building C, 3rd Floor, Suite 313
Viera, Florida 32940

Attendance: approximately 160 people

Background

The agenda for Phase II of the East-Central Florida Water Supply Planning Initiative (ECFWSPI) covers the six key water supply issues identified during the Phase I process listed below:

Key Water Supply Issues

1. Develop new water supplies
2. Use of reclaimed water
3. Enhance aquifer recharge using reclaimed water
4. Increase water conservation awareness
5. Link land use and water supply planning
6. Enhance intergovernmental coordination

Each subregion has three scheduled meetings to be held in 2003 as part of Phase II. In the first round of meetings, which were held on June 17, June 26, and July 11, the primary focus was on new water supplies. Also covered were reuse of reclaimed water and conservation. During the second round of meetings, as summarized below, the link between land use and water supply planning was discussed. Additional evaluations of water supply project alternatives were also presented in response to requests received during the first round meetings.

Additional Evaluations of Water Supply Project Alternatives

Barbara Vergara, Division Director of Resource Management, Div. of Water Supply Management, SJRWMD, briefly mentioned seven potential water supply projects listed below. Information on the source, treatment requirements, storage, potential customers and planning level costs for those projects was presented in the first round of Phase II meetings.

Potential Water Supply Projects

- Surface water supply
  - St. Johns River near Lake Monroe
  - St. Johns River near Deland
  - Lower Ocklawaha River
  - Taylor Creek Reservoir
- Seawater demineralization
  - Intracoastal Waterway near New Smyrna Beach
  - Indian River at FP&L Cape Canaveral Power Plant
  - Reliant Indian River power Plant

At each of the first round subregion meetings, the local governments and utilities were encouraged to ask for additional evaluations of water supply project alternatives that were of interest to them. Planning level costs for the following project alternatives were presented in response to those requests. Information on how the costs were calculated was provided in response to questions raised in round one meetings.

Additional evaluations for the Volusia County subregion

1. Developing 20 million gallons per day (mgd) from Lake Monroe for Volusia only
2. Developing 20 mgd from the St. Johns River near De Land for Volusia only
3. Developing 50 mgd from Lake Monroe, for just Volusia and Seminole
4. Seawater demineralization from Intracoastal Waterway near New Smyrna for Volusia county-wide
5. Lower Ocklawaha River for Volusia only

Additional evaluations for the southern Lake/southern Orange/Osceola/portion of Brevard subregion

1. Developing 25 mgd from the St. Johns River near SR 520 for Orlando Utilities Commission

Additional evaluations for the northern Lake/Seminole /northern Orange subregion

1. Developing 50 mgd from Lake Monroe, for just Volusia and Seminole
2. Lake Apopka supplemental reuse
3. Lake Harris supplemental reuse
4. St Johns River partial treatment for non-potable use

Additional evaluations for the Brevard County subregion

1. Development of 60 mgd from one desalinization facility rather than two
2. Water supply vs. time (how long will the cheap water last?)
3. Water from Reliant Energy to Titusville and eastern Volusia County

Project delivery methods

At each of the subregion meetings except for Brevard, Jerry Salsano with SJRWMD discussed several construction contract options;

- Design/Bid/Build (DBB)
- Design/Build (DB)
- Design/Build/Operate (DBO)
- Design/Build/Own/Operate/Transfer (DBOOT)

Under DBB, the owner develops all financing and assumes all risks. Under DBOOT, the owner commits to a unit price and the contractor assumes all risks. The facility is then transferred to the owner after 30 years. This method can result in a 20–30 % savings. The methods were compared to the Tampa Bay Water experience for their desalinization project.

Link Between Land Use and Water Supply Planning

Mr. Jeff Cole with SJRWMD and Mr. Walker Banning with the Department of Community Affairs (DCA) presented information on how recent changes have linked land use and water supply planning. In 1997, the State Legislature required the WMD's to perform water supply assessments to identify water sources to meet the demands of the next 20 years. The WMD's were also to develop regional water supply plans for the regions that do not have sufficient sources. In 2002, a bond between the DCA and the WMD's was created when Senate Bill 1906 linked local government's Comprehensive Plans to the WMD's Regional Water Supply Plans.

Comprehensive Plans must now be amended to include Water Supply Facility Work Plans (Work Plans) that identify the capacity of the water supply source for at least the next 10 years. Previously, Comprehensive Plans included the capacity of the infrastructure for water supply without regard to the capacity of the source. The legislation passed in 2002 requires the local government's Work Plans to consider the WMD's Regional Water Supply Plans and the WMD's will now be working with the DCA to review the plan amendments.

Local governments are encouraged to provide Work Plans that project further than 10 years into the future. Preferably, the Work Plans would be consistent with the period of time covered by the WMD's Regional Water Supply Plan, which is currently the year 2020 and will be 2025 following the update next spring.

For those local governments in Priority Water Supply Resource Caution Areas (Caution Areas) who have responsibility for water supply facilities in their jurisdiction, Comprehensive Plans must be amended to include the Water Supply Facility Work Plan and adopted by January 1, 2005. Local governments in Caution Areas who do not have water supply responsibilities must submit a letter to DCA by January 1, 2005 explaining who supplies their water and how their water supplier plans to meet their water supply needs. All other local governments must meet the Work Plan requirement as part of their Evaluation and Appraisal Report (EAR) process.

The resources available to help planners prepare Work Plans include "white paper" guidelines published in 2002. Also, the DCA and WMD's worked with five local governments to prepare their Work Plans in advance of the deadline to serve as examples for others to use when drafting Work Plans. The references mentioned above are available on the DCA's web site at *www.dca.state.fl.us*. The SJRWMD is developing information sheets to address the focus for review and the data and analysis expected from the local governments to support the amendments. It is important for local governments to communicate and coordinate with the WMD early in the process in order to be efficient in preparing an acceptable Work Plan.

Questions/Comments from the Subregion Meetings

Volusia subregion

Question: Which of the proposed projects would be the easiest project to obtain a permit?

Answer: That it is dependant on many issues.

Comment: SJRWMD indicated that they would review previous brackish water development programs and come back with other brackish water concepts.

Question: Is SJRWMD looking at river water to supply non-potable water needs such as agriculture and industry?

Answer: Yes, SJRWMD is looking into that potential.

Question: Did the costs of the projects presented include Operation and Maintenance (O&M) costs?

Answer: Yes, O&M was considered.

Comment: SJRWMD indicated they would consider other small desalination plants other than the New Smyrna Beach Utilities Commission W.E. Swoope power generating station.

Comment: It was suggested that SJRWMD should consider DBOOT for any new plant to decrease the demand on groundwater, and then use groundwater only as a backup supply.

Question: Will SJRWMD look at a development's impact on water if the county has issued a County Development Order?

Answer: No, most of that type of review is done as a Development of Regional Impact.

Southern Lake/southern Orange/Osceola/portion of Brevard subregion

Question: If a local government relies on private wells, is January 1' 2005 the deadline for having Work Plan adopted.

Answer: No, just need to provide a letter on who provides their water.

Question: How will WMD's and DCA be able to review all the Work Plans?

Answer: Hire staff and stagger deadlines to spread them out.

Question: Can governments submit Work Plans with groundwater for next 20 years (only groundwater)?

Answer: Yes, but probably would not be approved by SJRWMD.

Question: When will additional fresh ground water no longer be available (new permitted withdrawal)?

Answer: Planning level projection is 2006-2007.

Question: In the case of partial treatment from the St Johns River for non-potable use, is the chloride level of the water a problem?

Answer: It could be, at times, for recharge.

Question: How would using partially treated water for non-potable demands affect permit capacities for groundwater use?

Answer: It would be case specific.

Question: What will happen if more than one party wants to use a water source?

Answer: Again, it would be case specific, but the process would at least identify such situations.

Question: How much is available from St. Johns River and how far from the river to Apopka?

Answer: 175 MGD and do not know distance.

Northern Lake/Seminole/northern Orange subregion

Question: Are the Work Plan amendments exempt from the two-year cycle?

Answer: No.

Question: What changes will be made to SJRWMD Regional Water Supply Plan?

Answer: The seven water supply projects presented in Phase II of the Initiative will be added as well as the additional five requested by the Initiative participants. The updated version will be available next April.

Question: What must be in Work Plan by rule?

Answer: DCA is not in rule making position.

Question: Developers want comprehensive plan with water supply plans, but Lake County is not a water provider, so do they do prepare Water Supply Facilities Work Plan?

Answer: Lake County must include a letter stating what the water providers are doing to ensure capacity and supply.

Question: How will Work Plans be coordinated with WMD Regional Water Supply Plan (RWSP) when it is always changing?

Answer: Be assured that the 7 projects will be in RWSP.

Question: What if a project is submitted that is not one of the 7?

Answer: It would probably be a small project and with proper data to justify, it would be approved.

Question: Will SJRWMD actually cut back on allowable groundwater withdrawals even if a local government will not have enough water to meet demands?

Answer: Yes, although little more groundwater withdrawal than identified maybe allowed if the local government has a plan to develop other supplies to reduce groundwater.

Question: Did SJRWMD look at brackish groundwater?

Answer: Small plants (5-10 mgd) could possibly be feasible and could be permitted.

Question: What is total capacity available from Lake Apopka?

Answer: That information is available in letter report dated May 2001.

Question: Could others pump more groundwater if some pumped less by using reuse supplementation?

Answer: Yes, if they have an integration plan to work together and have interconnects in the piping systems.

Question: There are no Minimum Flows and Levels for the Harris Chain of Lakes and residents will object to the projects on those lakes.

Answer: The projects would go through a permitting process that would review the impacts on the Lakes, but groundwater is so limited that other sources have to be developed.

Question: What about security with all eggs in one basket (large plants)?

Answer: The security has been raised and is noted.

Question: Do the different WMD's collaborate in the water supply planning effort?

Answer: Yes, other WMDs are kept informed of each other's efforts (Memorandum of Understanding).

Brevard subregion

Question: Did the Brevard planners coordinate with SJRWMD in preparing their Work Plan?

Answer: They did, but it was later in the process. Therefore, it would have been better to do it earlier in the planning process.

Question: Are there any fees charged by the WMD for review of Work Plans.

Answer: There is no WMD review fee.

Question: Would a CUP application be delayed if a Work Plan has not been submitted?

Answer: No, but they are very interrelated and Comprehensive Plan amendments for land use would not be approved.

Question: W. Melbourne wanted to know about their Work Plan requirements.

Answer: Melbourne does a Work Plan that allows an amount and that needs to be consistent in W. Melbourne.

Question: Palm Shores, with a population of approx. 821 people, wanted to know about their Work Plan requirements.

Answer: Same as West Melbourne.

Question: After January 2005, when do the Work Plans get submitted again? Is it related to 2027 date?

Answer: No.

Question: Does a Work Plan have to include wastewater treatment facilities with reclaimed systems and those without reclaimed?

Answer: DCA will answer that question later.

Question: Will limits of Caution Areas change?

Answer: Not in Brevard County, but they will in other areas.

Question: Is there any advantage to a 60 mgd seawater plant at one site in lieu of the two 30 mgd plants proposed?

Answer: No advantage.

Question: The SJRWMD has said that after 2027, the only source left will be the Atlantic Ocean. Where did the 2027 date come from?

Answer: That is when projected demands will exceed the identified capacities. Refer to timeline graph of supply vs demand.

Question: How were demand projections calculated? A percentage of growth?

Answer: Demand projections were taken from the SJRWMD's Water Supply Plan 2020. The timeline graph was drawn using 2 points and a straight line between them.

Comment: Titusville expressed interest in the possibility of partnering with OUC to develop the plant on the St. Johns River SR 520.

Comment: It seems logical that more reclaimed water will become available for reuse as potable use increases.

Comment: Concern was expressed that the salinity at the co-location plants could increase due to lack of flow.

East-Central Florida Water Supply Planning Initiative Phase II

Hosted by: St. Johns River Water Management District
Facilitated by: Jake Varn; Fowler, White, Boggs, Banker, P.A.

Round 3 Meeting Summary

Subregion: all of Volusia County
Held in association with the Volusian Water Alliance
August 19, 2003, 9:30 a.m. to 12:30 p.m.
VOTRAN, 950 Big Tree Road
South Daytona, Florida 32119

Subregion: all of Brevard County
Held in association with the Brevard Water Supply Board
October 10, 2003, 10:00 a.m. to 1:00 p.m.
Claude H. Dyal Water Treatment Plant
28400 State Road 520
Christmas, Florida 32709

Subregion: southern Lake/southern Orange/Osceola/portion of Brevard
October 16, 2003, 9:00 a.m. to 12:00 p.m.
Winter Park Civic Center, 1050 West Morse Blvd.
Winter Park, Florida 32789

Subregion: northern Lake/Seminole /northern Orange
October 16, 2003, 1:30 a.m. to 4:30 p.m.
Winter Park Civic Center, 1050 West Morse Blvd.
Winter Park, Florida 32789

Attendance: approximately 130 people

Background

The agenda for Phase II of the East-Central Florida Water Supply Planning Initiative (ECFWSPI) covered the key water supply issues identified during the Phase I process.

Each subregion had three scheduled meetings to be held in 2003 as part of Phase II of the Initiative. In the first round of meetings, which were held on June 17, June 26, and July 11, the primary focus was on new water supplies. Also covered were reuse of reclaimed water and conservation. During the second round of meetings, which were held on July 15, July 31, and August 1, the primary focus was on the link between land use and water supply planning. Also discussed during the second round meetings were additional evaluations of water supply project alternatives performed by the Water Management District (WMD) in response to requests received during the first round meetings.

The focus in the third round of meetings was tailored for each subregion based on their particular needs and feedback received during the two previous meetings. A common theme in the agenda was summarizing the proposed projects for additional supply and updating the status of other initiatives related to the key issues. The agenda for each of the round three subregional meetings is summarized below.

Volusia Subregion: The agenda included additions to the proposed alternative water supply projects, a status update on the Regional Aquifer Management Project (RAMP), and development of landscape ordinances.

Brevard Subregion: The agenda included a report on the Technical Committee Meeting held on September 26, 2003 and recommendations for moving forward.

Southern Lake/Southern Orange/Osceola/portion of Brevard Subregion and Northern Lake/Seminole /Northern Orange Subregion: The agenda included intergovernmental coordination, summary of proposed project list for the Water Supply Plan, status reports on reclaimed water, conservation, linking land use and water supply planning and next steps.

Volusia Subregion Meeting Summary

Additional Evaluations of Water Supply Project Alternatives
Barbara Vergara, SJRWMD, briefly mentioned the original seven potential water supply projects for east-central Florida that were presented in the Round 1 meeting and the five new additions to the list (shown below). The new projects were added as the result of requests received during the Round 1 and 2 subregional meetings.

New Water Supply Projects

- Surface water supply
  - St. Johns River near Lake George
  - St. Johns River near S.R. 50
  - St. Johns River near S.R. 520
- Non-potable supply (supplemental reuse)
  - Lake Apopka
  - Lake Harris

Planning level costs for the project alternatives listed below were presented in response to requests received during or since the Round 2 meeting in Volusia County. Ron Wycoff of CH2MHill, on behalf of the SJRWMD, presented the information to the group. It was explained that the costs had been prepared for comparison purposes and details were provided on how the costs were calculated.

Costs for the projects were compared to the costs previously presented for 20 mgd from St. Johns River (SJR) at Lake Monroe serving Volusia County. Comparison was made between a 20 mgd plant and a 50 mgd plant on the SJR at Lake Monroe to demonstrate the economy of scale.

Additional Evaluations

- Surface water supply and seawater demineralization
  - 33 mgd St. Johns River @ Lake George serving Palm Coast and Volusia County
  - 14 mgd from the Reliant Power Plant site to Titusville and Volusia County coastal communities
  - Seawater desalinization serving Volusia County coastal communities; with SJR near Lake Monroe serving west Volusia County

Barbara Vergara commented that all additional evaluations will go into a comprehensive report for the ECFWSPI. Not all project variations will be included in the SJRWMD Water Supply Plan because funding for the projects could become tied to the certain details, thus restricting flexibility.

Regional Aquifer Management Project (RAMP) Update
Brad Blais of Quentin L. Hampton & Assoc. presented information on the background, status, and recommendations for the RAMP initiatives in Volusia County. By definition a RAMP project is any project, or initiative, in Volusia County that increases the sustainable quantity of fresh groundwater able to be withdrawn from existing and proposed sources, without creating adverse environmental impacts.

RAMP projects are intended to meet 50% of the projected deficit for Volusia County in the year 2020. The types of projects included are listed below:

- Water System Interconnections
- Integrated Wellfield Monitoring/Operation
- Aquifer Recharge Enhancement and Wetland Augmentation
- Reclaimed Water Storage and Augmentation
- Surface Water Discharge Controls
- Agricultural Trade-Offs

Model Landscape Ordinance
SJRWMD is developing a model landscape ordinance to assist local governments in developing an ordinance specific to their location. Ultimately it is up to local governments to develop, adopt, and enforce landscape ordinances that meet their specific needs.

Brevard County Subregion Meeting Summary

Technical Committee Meeting Report
Jake Varn gave an overview of the meeting that was held on September 26, 2003 with representatives from utilities in Brevard and Orange counties. The purpose of the meeting was to share information, and discuss/identify opportunities for local governments to work together to develop future water supplies.

Each utility that attended the Sept. 26 meeting shared information on their water supply needs and plans for future supply. Mr. Varn stated that Titusville had indicated they have a need for additional supply and have expressed interest in the St. Johns River at S.R. 50 project and are

also interested finding a partner(s). Cocoa has a Consumptive Use Permit (CUP) pending for continued use of groundwater from its wellfield in eastern Orange County and plans to increase withdrawals as necessary from Taylor Creek.

Orlando Utilities Commission (OUC) and Orange County Utilities (OCU) had each indicated that they plan to meet their needs in part through continued use of groundwater for the next 20 years. OUC had presented a strategy that involves conservation and increased use of reclaimed water and also presented contingency plans for alternative sources, should they become necessary, including brackish groundwater from the Florida Aquifer at their Stanton Energy Center, surface water from the St. Johns River at SR 50 or farther south, Taylor Creek Reservoir through an agreement with Cocoa, and the Indian River Lagoon at the Reliant Energy Center.

OCU had indicated they plan to develop additional supply from groundwater sources by implementing projects that will offset projected unacceptable impacts, but specific projects were not identified. The reported strategy involves the interconnection of reuse transmission lines that aid in the use of reclaimed water. OCU had also indicated they plan to spend $25-$30 million over the next 5 years to build reclaimed water transmission mains including an east-west pipeline from west Orange County to Narcoossee Road. The SJRWMD had expressed concern over this strategy because it was inconsistent with their evaluations of the potential impacts.

Mr. Varn reported that one of the benefits of the meeting was OUC learning of OCU's plans for an east-west reclaimed water transmission main. OUC had been unaware of the plan and thought it could be beneficial to them.

Recommendations For Moving Forward

The following recommendations were presented by Mr. Varn.

- Technical staff or consultants from SJRWMD/OCU/OUC who are responsible for modeling impacts of additional groundwater withdrawals should meet to discuss/identify differences and resolve them.
- Technical committee members should meet again to discuss who is interested in certain water supply projects and who would benefit from partnering.

Mr. Varn also suggested that the elected officials ask their planners for a status update on their Comprehensive Plan amendment to include a Water Supply Facility Work Plan. Unless efforts are already under way, it will be difficult to meet the deadline for adopting the amendment.

Barbara Vergara, SJRWMD, asked for feedback on what the role the District should play in moving forward. She emphasized the importance of the SJRWMD being able to focus its efforts and resources on projects that are of interest to local governments. Each of the projects included in the District's Water Supply Plan will require District's time and funding for continued development. In order for the SJRWMD to be most effective in supporting local government efforts to develop future water supply sources, projects without interest should be removed from the list.

There was a consensus among the local governments and utilities present that the technical committee should meet again as soon as possible to discuss the modeling issues. Given the pending legal action concerning OUC's CUP, Wayne Rich and Tom Dradge were asked to

schedule the meeting. Also, it was agreed that the technical committee would discuss the water supply projects that have been identified and prioritize them in terms of the amount of interest in each. A meeting to discuss the outcomes of the proposed technical committee meeting was tentatively scheduled for January 23, 2004 at the Cocoa Civic Center, if available.

Southern Lake/Southern Orange/Osceola/Portion of Brevard Subregion and Northern Lake/Seminole /Northern Orange Subregion Meeting Summary

Intergovernmental Coordination
Jake Varn mentioned some of the outcomes of the Brevard/OCU/OUC meeting. He reported on some of the plans shared by the groups attending that meeting and commented on how the exchange of such information can benefit those involved.

Summary of Proposed Projects
Barbara Vergara, SJRWMD, presented a summary of the potential new water supply projects that have been identified to date (see list below). Only projects that have generated sufficient interest were included and it is those projects that will be incorporated into the SJRWMD Water Supply Plan (WSP). With that in mind, Ms. Vergara encouraged local governments and utilities to notify the SJRWMD if there is a project that they would like to see added to the list.

Potential New Water Sources

- Surface Water Supply Projects
  Public supply
  - St. Johns River near Lake Monroe
  - St. Johns River near Deland
  - St. Johns River near Lake George
  - St. Johns River near S.R. 50
  - St. Johns River near S.R. 520/528
  - Taylor Creek Reservoir Expansion
  - Lower Ocklawaha River

  Non-potable supply (supplemental reuse)
  - Lake Apopka
- Seawater Projects
  - Intracoastal Waterway near New Smyrna Beach
  - Indian River at FP&L Cape Canaveral Power Plant
  - Indian River at Reliant Energy Indian River Power Plant

Through recent efforts establishing Minimum Flows and Levels (MFLs) for the St. Johns River, it has been determined that 150 mgd will be available from the river on a continuous basis. This is significant because it will eliminate the need for the large volume of storage (ASR) that would otherwise be necessary to meet demands.

A water source characteristics table ranking the sources based water quality, reliability, location relative to population centers, and transmission requirements was presented. Also presented was

a table showing the cumulative amount of water that would be available as the projects are implemented in the order of ranking.

Ms. Vergara indicated that OUC and SJRWMD are currently evaluating a brackish water wellfield at the Stanton Energy Center, which could potentially be added to the list of projects in the WSP. A non-potable supply project at Lake Harris was removed from the list due to lack of interest.

Reclaimed Water

Elizabeth Thomas, SJRWMD, gave a presentation on the status of the following reclaimed water initiatives.

- Areawide Reuse Projects
  - Sanford, South Seminole, and Lake Mary
  - Brevard County barrier islands
  - Western Orange Reuse Plan
  - Northwest Cities Reuse
  - Water Authority of Volusia
- Enhanced Recharge Using Reclaimed Water
  - Central Florida Area Recharge Enhancement (CFARE)
  - SJRWMD studies including Conserv II Recharge Analysis and Surface Water/Groundwater Model for L. Wekiva River and Gee & Soldiers Creek basins
- Areawide Reuse Funding Update
  - Regional Reuse Planning — $100,000 for FY 03-04
  - Alternative Water Supply Cost Share Program — $1,000,000 for FY 03-04
  - Florida Forever — funding available. Volusia will receive approx. $4.3 million
- Conservation Rate Structures For Reclaimed Water Use
  - Currently, only a few cities are using conservation rates structures
  - Rates vary from zero to $37.61 for 10,000 gallons. Avg. is $10.88
  - Data will be collected and evaluated next year to determine the effectiveness of conservation rate structures
- Impact Of Reuse In Offsetting Potable Water
  - Impact is project specific

Conservation

Don Brandes, SJRWMD, presented information on the status of the efforts to increase water conservation.

- Implement Water Conservation Practices
  - WMDs to continue to require conservation through consumptive use permitting
  - WMDs provide regulatory and financial incentives to local governments
  - WMDs to develop standards for residential use
- Adopt Landscape Ordinances
  - WMDs to develop model landscape ordinances for local governments to adopt and enforce.
  - Development is underway and participation is expanding
  - Funding has been set aside for a pilot to determine effectiveness
  - WMDs seeking priority in state funding for additional incentives

- Coordinate Water Conservation Programs
  - Public supply utilities participate in WMDs education and conservation programs.
  - WMDs continue to offer incentives, including financial, for participation in regional programs
- Determine Cost-Effectiveness of Conservation Programs and Practices
  - SJRWMD has a consultant to perform a study

Linking Land Use and Water Supply Planning

Peter Brown, SJRWMD, presented information on the status of the efforts to link water supply and land use planning. Future Land Use Map amendments are reviewed by the SJRWMD. Their review will now focus on water availability and will consider CUP allocations, as well as the capacity of infrastructure. SJRWMD has developed a worksheet that will help local governments in preparing their amendments.

Comprehensive Plans must be amended to include Water Supply Facility Work Plans and adopted by January 1, 2005, if located in a Priority Water Resource Caution Area (Caution Area) and if responsible for water supply facilities. A list of local governments in east-central Florida with the January 1, 2005 deadline was provided.

Local governments in Caution Areas who do not have water supply responsibilities must submit a letter to Department of Community Affairs (DCA) by January 1, 2005 explaining who supplies their water and how their water supplier plans to meet their water supply needs. All other local governments with water supply responsibilities must meet the Work Plan requirement as part of their Evaluation and Appraisal Report (EAR) process.

The SJRWMD is preparing a "how to notebook" that will be available on their web site in about a month to help in preparing Work Plans.

Next Steps

The actions that the SJRWMD has planned for the future were discussed, including a time line and the steps involved in getting the District's Water Supply Plan amended by April 2004. In order to advance the implementation of projects, the SJRWMD plans include;

- Prioritize projects
- Develop scopes and schedules for feasibility investigations
- Implement feasibility investigations
- Continue to support the Water Authority of Volusia project initiative.

The Initiative efforts to date have focused mainly on the needs of the subregions with east-central Florida. The District indicated that they believe it is now time to focus more on addressing the issues of individual counties in a unique manner that is specific to their needs.

Questions/Comments From the Subregion Meetings

Volusia Subregion

Question: Concerning a treatment plant on the St Johns River, could the costs be reduced if ASR were not required?
Answer: Yes, 10-15% reduction.

Question: Is the unit cost of water at 10 mgd, higher than it is for a 20 mgd facility?
Answer: Yes, but only if the capacity for the 20 mgd facility is utilized.

Question: It seems 20 mgd is the capacity in the cost estimates, but the 2020 shortage is 10 mgd. Has something changed?
Answer: 20 mgd was total shortage (10 mgd was from RAMP & 10 mgd from new supply), but the intent was to be conservative.

Comment: A Volusia Water Alliance official stated that he did not want the group to loose site of conservation goals and plans to save 10 mgd through RAMP initiatives.
Reply: SJRWMD will include projects for 10, 20, and 30 mgd in their Water Supply Plan for 2025.

Question: Will each project include full treatment for potable?
Answer: Yes.

Question: Why not describe an agricultural supply project?
Answer: The plan is to describe these projects for potable supply, but they can be used for agricultural or re-use augmentation to increase the availability of groundwater for potable supply.

Question: Explain the significance of projects being included in SRJWMD Water Supply Plan.
Answer: Projects get priority for state or federal funding.

Question: Has funding been identified for a surface water supply project on the St. Johns River?
Answer: SJRWMD has indicated through its funding position paper that it will contribute up to10-15% and will help in applying for state or federal funds.

Question: An official with a utility in Volusia County asked if a series of smaller seawater plants would be more cost effective than larger plants? Larger capacity treatment plants mean bigger pipes, larger valves, higher transmission costs, etc. and so economy of scale may not be there.
Answer: Generally larger facilities are more cost effective per thousand gallons produced and co-location makes costs even lower.

Question: Does the “list” of projects mean only those will get funding?
Answer: No, the list is to help you decide what you want to do. But, it will be more difficult for SJRWMD to assist in funding a project that is not on the list.

Question: Is there a limit to withdrawal from seawater?
Answer: Only limited by the ability to dispose of the brine.

Question: Has SJRWMD considered treating reclaimed for potable?
Answer: No, it is not consider a viable option at this time.

Question: A Volusia planner asked how they were supposed to determine what their five year capital improvement plan (CIP) for water supply will look like?
Answer: The member government's CIPs for water supply will be coordinated with the Water Authority of Volusia CIP.

Brevard Subregion
Comment: SJRWMD encouraged everyone to provide feedback on what role the District should play in moving forward.

Comment: An official from Brevard County suggested that the Brevard Water Supply Board/OCU/OUC Technical Committee prioritize the proposed water supply projects based on the interests of that group. The official did not want to see projects taken off of the list because that would limit their options for the future.

Southern Lake/Southern Orange/Osceola/ portion of Brevard Subregion
Question: Does the 150 mgd allowable withdrawal from the St. Johns River include upstream withdrawals?
Answer: Yes.

Question: Will the SJRWMD WSP discuss funding?
Answer: Yes.

Question: What is the budget for water supply project feasibility investigations?
Answer: It has not been established yet.

Comment: OUC stated that the potential supply from brackish wells at the Stanton Energy Center would be available to other users.

Question: OUC asked if the collocation power companies had been contacted and if so, were they willing to cooperate in the implementation of water supply projects?
Answer: Yes, they have been contacted and they are willing to participate.

Question: What is being done in terms of aquifer recharge.
Answer: It is one of the six key issues identified in Phase 1 of the initiative. Project is already underway. CFARE will be in the SJRWMD WSP.

Comment: Need to be able to supplement reclaimed water to meet peak demands.

Question: Are there any rate studies for bulk reclaimed users?
Answer: OCU has a rate structure that you may wish to look at.

Question: Have the 5 model Work Plans been approved?
Answer: No, only the Work Plan for Cocoa has been approved.

Question: Is the preferred format for Work Plans the same for SFWMD and SJRWMD?
Answer: Yes, the two WMDs have been coordinating on that issue.

Comment: SJRWMD asked for feedback on what role they should play in developing new water supplies.
Response: OUC said that the SJRWMD has done a good job so far in facilitating and that they need to continue in that role. Without the SJRWMD in that role, local governments will not move forward.

Northern Lake/Seminole/Northern Orange Subregion
Question: Why is the Ocklawaha project still on the list?
Answer: SJRWMD is meeting with Marion County to discuss the issue. Marion County may not be the only potential user of the Ocklawaha River.

Comment: SJRWMD invited Seminole County to share their plans for future water supply with the group.
Response: Bob Adolphe, Seminole County Environmental Services, stated that they have plans for 5 mgd of brackish ground water and 15 mgd of surface water from the St. Johns River. The facilities for both new supplies would be located on the County's Northwest WWTP (Yankee Lakes) site. The project is intended to serve as a regional supply facility for potential partners in Seminole, Volusia, and Lake counties. No agreements with others had been reached at that time.

Question: In reference to local governments and utilities in the region, one person asked, "How do we share costs for implementing alternative water supply projects."
Answer: That depends on who the "we" is, but the unitary rate concept used by the new Water Authority of Volusia would be one way.

Question: How can the SJRWMD facilitate the process to get partners in cost sharing arrangements?
Answer: The WMD has identified the projects and can facilitate dialog between the groups, but cannot push local governments into action.

Comment: SJRWMD is willing to help in funding up to 15% of the project costs.

Question: How do individuals work together when they have separate CUPs?
Answer: CUPs can be consolidated as planned in Volusia County.

Question: What percent of reclaimed is reused?
Answer: Around 50% can be demonstrated, but some say their usage is higher. In any event, there is no significant amount of additional reclaimed water available to offset potable demands.

Question: What percentage use fresh groundwater (potable) to augment reuse demands?

Answer: No numbers are available, but some do it and it is beneficial overall.

Question: What does conservation funding help to pay for?
Answer: Incentives for local governments, programs, and consultants.

Question: Water use per capita seems to be increasing. How does that factor into the Water Supply assessment?
Answer: The WMDs look at what the local governments say their demands are and evaluate that amount in comparison to the availability of the supply from the source they identify.

Comment: A new trend in development is to provide in-ground irrigation systems, which is one reason water use per capita is increasing in some areas.

Question: Is the requirement for a Work Plan more of a DCA issue or is it a water issue with the WMD? What has to be done to satisfy the requirement?
Answer: It is both, so coordination is required. The WMD reviews the Work Plans. SJRWMD will have a "How To" guide in about a month on their web site.

Question: In reference to the time line presented for amendments to Comp Plans, what happens between Jan. '04 and March '04?
Answer: WMD will evaluate Work Plans based on their population demand projections and water supply sources identified.

Comment: Seminole County stated they would have their Work Plan ready for preliminary review by the end of 2003.

Question: In reference to Comp Plan amendments and Work Plans, how will the District treat private utilities?
Answer: They are not a local government, so they do not have to submit anything to DCA or WMDs, but they must tell local governments how they plan to meet the demands.

APPENDIX D

East-Central Florida Water Supply Planning Initiative Cost-Estimating Criteria

This appendix documents the cost-estimating definitions and criteria used in the preparation of conceptual planning-level cost estimates for the potential new water supply projects identified in the East-Central Florida Water Supply Planning Initiative (Initiative). The purpose of these criteria is to provide a consistent basis for the comparison of relative costs among the individual potential projects.

Definitions

The following definitions were used in the Initiative potential projects.

Construction Cost

The construction cost is the total amount expected to be paid to a qualified contractor to build the required facilities at peak design capacity.

Non-construction Capital Cost

Non-construction capital cost is an allowance for construction contingency, engineering design, permitting and administration associated with the constructed facilities.

Land Cost

The market value of the land required to implement the water supply option.

Land Acquisition Cost

The estimated cost of acquiring the required land, exclusive of the land cost.

Total Capital Cost

Total capital cost is the sum of construction cost, non-construction capital cost, land cost, and land acquisition cost.

Operation and Maintenance Cost

The estimated annual cost of operating and maintaining the water supply project when operated at average day capacity.

Equivalent Annual Cost

Total annual life cycle cost of the water supply project based on facilities service life and time value of money. Equivalent Annual Cost, expressed in dollars per year, accounts for Total Capital Cost and O&M costs with facility operating at average day design capacity.

Unit Production Cost

Equivalent Annual Cost divided by annual water production. The Unit Production Cost is expressed in terms of dollars per 1,000 gallons produced.

Criteria

The following cost estimating and economic criteria were used in the Initiative potential projects.

Peak Flow Ratio

Capital cost of water supply facilities is based on maximum installed capacity designed to accommodate peak or maximum daily flow (MDF) requirements. O&M costs and annual water production are based on the average daily flow (ADF) produced. The peak flow ratio (MDF/ADF), for an individual water supply system, depends on the demand characteristics of the service area. For public supply systems, the peak ratio is generally at least 1.25 for large systems and can be greater than 2.0 for small systems.

Because the peak flow ratio varies by individual service area and many different individual and combined service areas may be encountered in east-central Florida, a typical value of 1.50 was chosen for all cost calculations.

Cost Index

Engineering News Record (ENR) publishes a Construction Cost Index (CCI) that can be used to adjust the cost basis of a given construction project for past and future times. The cost estimates prepared for the potential Initiative projects are expressed in April 2003 dollars, with a corresponding ENRCCI value of 6635.

Non-construction Capital Cost

For the Initiative potential projects, non-construction capital cost is equal to 45% of the planning level estimated construction cost. This includes a 20 percent allowance for construction contingency and a 25 percent allowance for engineering design, permitting, and administration.

Land Cost

Unit land cost ($/acre) for each land parcel is based upon land use classification and size as supplied by St. Johns River Water Management District (District) land acquisition staff for the 2000 *District Water Supply Plan* (DWSP). General land use classifications include urban, suburban, and rural. Size is based on acreage, where small refers to parcels 50 acres or less in size and large refers to parcels greater than 50 acres in size. Exhibit 1 provides the unit land cost matrix for parcels used in the Initiative potential projects.

Exhibit 1

Unit Land Cost for Parcels

Cost Estimating and Economic Evaluation Criteria

Land Use Classification	Parcel Size	
	Small (< or = 50 acres) ($/acre)	Large (> 50 acres) ($/acre)
Urban	$ 100,000	N/A
Suburban	$ 20,000	$ 10,000
Rural	$ 5,000	$ 3,000

Unit land costs ($/ft^2) for pipeline corridors vary based on the land use classification and whether or not the parcel is adjacent to public right of way (ROW) or in an undeveloped (new) area, and whether an easement or full ROW is required. Exhibit 2 provides the unit cost matrix for pipeline corridors used in the Initiative potential projects.

Exhibit 2

Unit Land Cost for Pipeline Corridors

Cost Estimating and Economic Evaluation Criteria

Land Use Classification	Adjacent to Public ROW		New Area	
	Easement ($/ft2)	ROW ($/ft2)	Easement ($/ft2)	ROW ($/ft2)
Urban	$ 4.00	$ 6.00	$ 3.00	$ 5.00
Suburban	$ 1.50	$ 3.00	$ 1.00	$ 2.00
Rural	$ 0.75	$ 1.00	$ 0.50	$ 0.75

Land Acquisition Cost

Land acquisition cost estimates used in District water supply planning applications vary as a function of condemnation requirements, as follows:

- 12 percent of land value for known non-condemnation parcels
- 25 percent of land value for know condemnation parcels
- 18 percent of land value where condemnation status is unknown

In all cases, for the Initiative potential projects, condemnation status was unknown and therefore a value of 18 percent was applied.

Interest Rate

The District recently conducted an analysis of the potential financial impacts of alternative water supply development. This analysis, conducted by Burton and Associates, produced a final report titled *Financial Impact of Alternative Water Supply*. The financial impacts analysis project employed an interest rate of 6 percent per year in all water rates calculations. In order to maintain

compatibility among the Initiative activities, an interest rate of 6 percent was used in all potential Initiative projects' equivalent annual and unit production cost calculations.

Economic Life of Facilities

The economic service life of facilities used in the Initiative potential projects is the same as the criteria adopted for DWSP. Exhibit 3 provides the economic service life, in years based on component type. These values were used in all annual cost and unit production cost calculations.

In all cases, land is considered a permanent resource and therefore has an infinite service life.

Exhibit 3

Economic Service Life

Cost Estimating and Economic Evaluation Criteria

Component Type	Service Life (years)
Water conveyance structures (pipelines, collection and distribution systems)	40
Other structures (buildings, tankage, site improvements, etc.)	35
Wells	30
Process and auxiliary equipment (treatment equipment, pumps, motors, mechanical equipment, etc.)	20
Reverse osmosis membranes	5

The non-construction capital costs associated with a given project, or major project component, were also distributed in proportion to expected service life of the project. For example, if a given project, or major project component, has an economic service life of 20 years then the non-construction capital cost for that project, or major project component, also has an economic service life of 20 years.

APPENDIX E

REFERENCES FOR DEVELOPING NEW WATER SUPPLIES

CH2M HILL. 2001a. Evaluation of selected conceptual water supply development options for the city of Cocoa. Draft letter report prepared for St. Johns River Water Management District. Gainesville, Fla.

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APPENDIX F

Summary of Regional Reclaimed Water Projects

- Northwest Cities Reuse Interconnect Project
- Western Orange Reuse Plan
- Brevard Barrier Island Reuse Project (Patrick AFB south housing)
- North Seminole Regional Reclaimed Water Optimization Study
- City of Orlando, Eastern Orange and Seminole Reuse Project
- Volusia area reclaimed water projects (RAMP)

Northwest Cities Reuse Interconnect Project

Geographic location — Western Orange County area

Description — Cooperative effort to interconnect reclaimed water systems between the cities of Apopka, Winter Garden, and Ocoee with the ultimate goal of fully utilizing all of the available reclaimed water for beneficial reuse. The potential exists for interconnecting with the Conserv II project and with the Orange County reclaimed water system. The initial phase, which includes storage, pumping, and transmission for an interconnect with Winter Garden for public access reuse, has been designed and is ready for construction, awaiting cost-share funding. This project will possibly be integrated into the Western Orange Reuse Plan. Phase 2 includes recharge/ wet weather storage ponds plus possible interconnect with Ocoee. Previous city of Apopka reclaimed water projects have received cost-share funding from the U.S. Environmental Protection Agency (EPA). The St. Johns River Water Management District (SJRWMD) cost-shared the Phase 2 feasibility study. City of Ocoee has received a $50,000 cost-share award from the SJRWMD Alternative Water Supply Construction Cost-Share Program (AWSCCSP) for a facility to connect to a Conserv II transmission line in order to utilize additional reclaimed water from that system. This project is included in the State and Tribal Assistance Grant (STAG) application for the East-Central Florida Integrated Water Resources Project.

Amount of reclaimed water — 20 million gallons per day (mgd)

Cost estimate — $13.9 million

Potential partners — Cities of Apopka, Winter Garden, and Ocoee, and Orange County. Since Conserv II is a city of Orlando/Orange County cooperative project, city of Orlando may be a potential partner as well.

Western Orange Reuse Plan

Geographic location — Western Orange County area

Description — As part of a regional planning effort for reclaimed water systems, SJRWMD is coordinating this project with local governments and utilities. The objective is to develop a comprehensive plan for the Western Orange County region that will include public access reuse and aquifer recharge of reclaimed water from all of the partners. One meeting between the

potential partners was held on July 9, 2003, with a resulting consensus to continue the process. A draft scope of work has been developed. Project planning is temporarily on hold due to a challenge of SJRWMD's intended agency action for issuance of a consumptive use permit to the Orlando Utilities Commission. This project is being coordinated with the SJRWMD Central Florida Aquifer Recharge Program and the Northwest Cities Reuse Interconnect Project. This project is included in the STAG application for the East-Central Florida Integrated Water Resources Project.

Amount of reclaimed water — conceptually estimated at 50 mgd

Cost estimate — $57 million

Potential partners — SJRWMD and Orange County, Orlando Utilities Commission, city of Orlando, city of Apopka, city of Winter Garden, city of Ocoee, and possibly others as the planning progresses.

Brevard Barrier Island Reuse Project (Patrick AFB south housing)

Geographic location — Brevard County barrier island region from Cape Canaveral to Melbourne Beach.

Description — This is a proposed project to interconnect reclaimed water from the Brevard County beaches' plant, the Patrick AFB south housing area, Cocoa Beach, Satellite Beach, and any other cities as appropriate along the transmission line route. An initial feasibility study funded by SJRWMD has been completed and a follow-up study is being considered. Source of the reclaimed water will be the Brevard County south beaches wastewater facility. The potential customers are the cities and Patrick AFB south housing redevelopment in the region between Cape Canaveral and Melbourne Beach.

Amount of reclaimed water — conceptually estimated at 6 mgd

Cost estimate — to be determined

Potential partners — Brevard County, Cocoa Beach, Patrick AFB, the south housing developers, Satellite Beach, Melbourne Beach, Cape Canaveral, Port Canaveral, Indian Harbour Beach, Melbourne, and Indialantic.

North Seminole Regional Reclaimed Water Optimization Study

Geographic location — Northern Seminole County

Description — The city of Sanford, Seminole County, and the city of Lake Mary have entered into an agreement to maximize the use of alternative water supplies, including reclaimed water. In a previous phase of the project, they have interconnected their systems and used the St. Johns River to augment their reclaimed water systems for public access reuse. This previous phase was partially cost-share funded by EPA and SJRWMD AWSCCSP.

In the current phase, SJRWMD is cost-sharing a plan to optimize the use of reclaimed water by including aquifer recharge, further integrating their reuse systems and increasing the surface water augmentation. This project is included in the STAG application for the East-Central Florida Integrated Water Resources Project.

Amount of reclaimed water — to be determined

Cost estimate — to be determined

Potential partners — Cities of Sanford and Lake Mary, and Seminole County

City of Orlando, Eastern Orange and Seminole Reuse Project

Geographic location — South and eastern Orange and Seminole counties, including areas of Orlando.

Description — Cooperative project between the city of Orlando and various utilities in eastern Orange and Seminole counties, including the University of Central Florida (UCF). The source of reclaimed water is treated wastewater from the Iron Bridge Water Reclamation Facility, and in the future, additional wastewater from the Water Conserv I Reclamation Facility service area diverted to Iron Bridge. Another possible source for reclaimed water is the Orange County Eastern Service Area Water Reclamation Facility. Potential customers are Seminole County, Stanton Energy Center, city of Oviedo, Conserv I reuse customers, UCF, Park Manor, Orange County, Alafaya Woods, city of Orlando. Facilities would consist of an upgrade in wastewater treatment system at Iron Bridge with storage, pumping, and transmission facilities. Design and permitting are currently under way. $3.125 million in federal STAG funds have been appropriated for this project.

Amount of reclaimed water — 20.3 mgd

Cost estimate — $45.3 million

Potential partners — Seminole County, Stanton Energy Center, city of Oviedo, Conserv I reuse customers, UCF, Park Manor, Orange County, Alafaya Woods, and city of Orlando

Volusia area reclaimed water projects (RAMP)

Geographic location — Volusia County

Description — Part of the Volusia area Regional Aquifer Management Project (RAMP). Reclaimed water will be from the member utilities of the Water Authority of Volusia (WAV). Projects will include public access reuse, wet weather storage and recharge systems, transmission facilities, and upgrades to treatment plants. Current projects under construction include the Port Orange Reclaimed Water Reservoir, New Smyrna Beach Utilities Commission Borrow Pit Reclaimed Water Storage Pond, DeLand Reclaimed Water Storage Tank and Reservoir, and Volusia County Reclaimed Water Storage Tank. Future projects are being considered. A need exists for integrating projects to work more as a regional system. Some projects are currently receiving cost-share funds through Florida Forever and the Alternative Water Supply Construction Cost-Share Program (AWSCCSP). These projects are included in the STAG application for the Volusia County Integrated Water Resources Project.

Amount of reclaimed water — 255 million gallons of storage

Cost estimate — $8.6 million

Potential partners — Water Authority of Volusia members