


## MEMORANDUM

**TO:** Honorable Mayor and City Council Members  
**FROM:** Paul Johnson – Public Works Director   
**DATE:** October 14, 2008  
**SUBJECT:** Alternative Water Source

**STRATEGIC PLAN TRACKING NO:** G-MA-3

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### PURPOSE

The purpose of this item is to update and inform the City Council as to the progress and potential partnering on the Yankee Lake Surface Water Treatment Plant project and other options. Also staff is presenting a draft agreement with southwest Volusia utilities for an evaluation of the St. Johns River Water Management District groundwater model and minimum flows and levels, reclaimed water retrofit analysis and water conservation analysis.

### BACKGROUND

The Saint Johns River Water Management District has mandated that we develop an alternative water source to supplement our current ground water withdrawals. Staff has been pursuing options for the development of this alternative water supply. The development of a plant at Yankee Lake with Seminole County and other interested utilities is one option along with a possible river plant near DeLand or obtaining water from the Coquina Coast Desalination project. SJRWMD has prepared an economic impact study that can be used to assist with the decision as to which alternative source will have the least impact on Orange City residents.

The Yankee Lake project is a two-phase project beginning with the construction of a river intake structure and a treatment plant designed for re-use augmentation. The first phase has been designed and is scheduled to be advertised for bids by spring of 2009. The second phase will address the potable water needs of all interested parties. Seminole County is looking for serious commitments in early 2009 so they can begin planning for the construction of phase II

The draft agreement is for a study of the calculations prepared by the SJRWMD that indicate the need for alternative water. Staff as well as the other stakeholders in Southwest Volusia County believe s there may be flawed information used to determine how much alternative water we may actually need. Additionally, we believe SJRWMD has not given adequate consideration of conservation and reuse water for reduction of the need of alternative supplies. While we do not believe these measures would eliminate the need for alternative sources, staff feels with everything considered we might see a reduction in the quantity we will need from alternative sources. The draft agreement has been reviewed by the City Attorney as well as staff.



Rate Impact Evaluation for West Volusia Utilities  
Orange City, Florida

AWS Input Sheet

Input Sheet

2. SJR - Yankee Lake Project Inputs

Line 2.A. SJR - Yankee Lake Capital Cost

- 1 Yankee Lake- Incremental Treatment Capacity Capital Cost
- 2 Yankee Lake- Conveyance and Storage Capital Cost
- 3 Gross Capital Cost of Yankee Lake Project

Phase	Fiscal Year Ending September 30					
	Base Year 2009	Year 1 2013	Year 5 2017	Year 10 2022	Year 20 2027	Year 25 2032
Phase II		Phase I	Phase II	Phase III	Phase IV	Phase V
	\$ 0.00	\$ 8.03	\$ 3.15	\$ 1.53	\$ 8.30	\$ 1.46

Capital (Plant Capacity) Cost per Gallon of Capacity  
Capital (Conveyance and Storage) Cost per Gallon of Capacity

- 4 Project Funding Sources
- 5 SJR WAD Funding (Grants)
- 6 Other Outside Funding
- 7 Orange Cit. Portion (Capital Cost - Yankee Lake)
- 8 Debt Insurance and/or Administrative Costs
- 9 Financing Assumptions
- 10 Annual Interest Rate
- 11 Term (Years)

Percentage of Gross Cost

<== If grants are expected it should be enter as a negative percentage  
<== If Other Outside funding is expected it should be enter as a negative percentage

2.B. SJR - Yankee Lake O&M Cost

- 10 O&M Yankee Lake Calculation
- 11 Total O&M Cost per Thousand Gallons
- 12 O&M Cost - Fixed Portion Cost
- 13 O&M Cost - Variable Portion Cost

Allocation Basis (%)	Cost Per Thousand Gallons
	<= Cost per Thousand Gallons on BASE YEAR. Model will escalate numbers based on inflation factor
	<= Cost per Thousand Gallons on BASE YEAR. Model will escalate numbers based on inflation factor
76.17%	1.95 <= Cost per Thousand Gallons on BASE YEAR. Model will escalate numbers based on inflation factor



**Rate Impact Evaluation for West Volusia Utilities**  
**Orange City, Florida**

AWS Input Sheet

Input Sheet

Page 2 of 4

**3. SJR - SR 44 Project Inputs**  
**3.A. SJR - SR 44 Capital Cost**

- 13 Capital SR 44 Cost per Gallon of Capacity
- 14 SR 44 - Incremental Treatment Capacity Capital Cost
- 15 SR 44 - Conveyance and Storage Capital Cost
- 16 Gross Capital Cost of SR 44 Project

**Project Funding Sources**

- 16 Gross Capital Cost of SR 44 Project
- 17 SJRWMD Funding (Grants)
- 18 Other Outside Funding
- 19 Portion Capital Cost - SR 44
- 19 Debt Insurance and/or Administrative Costs

- 20 Financing Assumptions
- 21 Annual Interest Rate
- 21 Term (Years)

**3.B. SJR - SR 44 O&M Cost**

- 22 O&M SR 44 Calculation
- 22 Total O&M Cost per Thousand Gallons
- 23 O&M Cost - Fixed Portion Cost
- 24 O&M Cost - Variable Portion Cost

Base Year	Fiscal Year Ending September 30,				
	2009	2013	2017	2022	2027
Phase 0					
Phase I					
Phase II					
Phase III					
Phase IV					
Phase V					

Base Year	Year 1	Year 5	Year 10	Year 20	Year 25
2009					
Phase 0					
Phase I					
Phase II					
Phase III					
Phase IV					
Phase V					

Percentage of Gross Cost

100.00%  If grants are expected it should be enter as a negative percentage  
 If Other Outside funding is expected it should be enter as a negative percentage

Financing Assumptions

Annual Interest Rate

Allocation Base (%)

25.00% \$ 0.36 <= Cost per Thousand Gallons on BASE YEAR. Model will escalate numbers based on inflation factor

Capital (Plant Capacity) Cost per Gallon of Capacity  
 Capital (Conveyance and Storage) Cost per Gallon of Capacity

Notes



Input Sheet  
 Rate Impact Evaluation for West Volusia Utilities  
 Orange City, Florida  
 A/W/S Input Sheet

4. SJR - SR 46 Project Inputs

4.A. SJR - SR 46 Capital Cost

25 Capital SR 46 Cost per Gallon of Capacity  
 26 SR 46 - Instrumental Treatment Capacity Capital Cost  
 27 SR 46 - Conveyance and Storage Capital Cost  
 Gross Capital Cost of SR 46 Project

Fiscal Year Ending September 30,					
Base Year	Year 1	Year 5	Year 10	Year 20	Year 25
2009	2013	2017	2022	2027	2032
Phase 0	Phase I	Phase II	Phase III	Phase IV	Phase V
\$ 0.00	\$ 8.54	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00

Capital (Plant Capacity) Cost per Gallon of Capacity  
 Capital (Conveyance and Storage) Cost per Gallon of Capacity

28 Project Funding Sources  
 Gross Capital Cost of SR 46 Project  
 29 SJR/WAD Funding (Grants)  
 30 Other Outside Funding  
 Portion Capital Cost - SR 46

Percentage of Gross Cost	Notes
100.00%	<== If grants are expected it should be enter as a negative percentage <== If Other Outside funding is expected it should be enter as a negative percentage

31 Debt Insurance and/or Administrative Costs

32 Financing Assumptions  
 33 Annual Interest Rate  
 Term (Years)

Financing Assumptions
Annual Interest Rate
Term (Years)

4.B. SJR - SR 46 O&M Cost

34 O&M SR 46 Calculation  
 Total O&M Cost per Thousand Gallons  
 35 O&M Cost - Fixed Portion Cost  
 36 O&M Cost - Variable Portion Cost

Allocation Basis (%)	Cost Per Thousand Gallons	Notes
	< = Cost per Thousand Gallons on BASE YEAR. Model will escalate numbers based on inflation factor	
	< = Cost per Thousand Gallons on BASE YEAR. Model will escalate numbers based on inflation factor	
10.00%	< = Cost per Thousand Gallons on BASE YEAR. Model will escalate numbers based on inflation factor	



Rate Impact Evaluation for West Volusia Utilities  
Orange City, Florida

AWIS Input Sheet

5. SJR - Coquina Desal Project Inputs  
5.A. SJR - Coquina Desal Capital Cost

Base Year	Fiscal Year Ending September 30,					Notes
	2009	2013	2017	2022	2027	
Phase 0		Phase I	Phase II	Phase III	Phase IV	Phase V
	\$ 0.00	\$ 19.70	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00

Capital (Plant Capacity) Cost per Gallon of Capacity  
Capital (Conveyance and Storage) Cost per Gallon of Capacity

Percentage of Gross Cost  
 100.00%  
 <<= If grants are expected it should be enter as a negative percentage  
 <= If Other Outside funding is expected it should be enter as a negative percentage

Financing Assumptions  
 Annual Interest Rate  
 Term (Years)

Debt Issuance and/or Administrative Costs

Project Funding Sources  
 Gross Capital Cost of Coquina Desal Project  
 SJR/WMD Funding (Grants)  
 Other Outside Funding  
 Portion Capital Cost - Coquina Desal

Financing Assumptions  
 Annual Interest Rate  
 Term (Years)

5.B. SJR - Coquina Desal O&M Cost

O&M Coquina Desal Calculation  
 Total O&M Cost per Thousand Gallons  
 O&M Cost - Fixed Portion Cost  
 O&M Cost - Variable Portion Cost

Allocation Basis (%)  
 Coefficient Per Thousand Gallons  
 <= Cost per Thousand Gallons on BASE YEAR Model will escalate numbers based on inflation factor  
 <= Cost per Thousand Gallons on BASE YEAR Model will escalate numbers based on inflation factor  
 10.00% \$ 0.37 <= Cost per Thousand Gallons on BASE YEAR Model will escalate numbers based on inflation factor



**Rate Impact Evaluation for West Volusia Utilities  
Orange City, Florida**

**SJR - Yankee Lake Summary of Results**

Line No.	Description	Fiscal Year Ending September 30,										Notes	
		Base Year 2009	Year 1 2013	Year 5 2017	Year 10 2022	Year 20 2027	Year 25 2032	Year 30 2037	Year 35 2042	Year 40 2047	Year 45 2052		
<b>2.A. SJR - Yankee Lake Capital Cost</b>													
1	Capital Yankee Lake Cost per Gallon of Capacity												
2	Yankee Lake- Phase Incremental Plant Capacity Capital Cost	\$ 0.00	\$ 7.22	\$ 2.34	\$ 1.53	\$ 8.30	\$ 1.46						(Comes from AYS Input Sheet Line 1)
3	Yankee Lake- Conveyance Pumping and Storage Capital Cost	\$ 0.00	\$ 0.81	\$ 0.81	\$ 0.00	\$ 0.00	\$ 0.00						(Comes from AYS Input Sheet Line 2)
4	Gross Capital Cost of Yankee Lake Project	\$ 0.00	\$ 8.03	\$ 3.15	\$ 1.53	\$ 8.30	\$ 1.46						
5	Allocation to Orange City												
6	MCD Allocated	0.000	1.750	2.000	2.300	2.500	3.000						(Comes from General Input Sheet Line 5)
7	Yankee Lake- Phase Incremental Plant Capacity Capital Cost	\$ 0	\$ 12,640,688	\$ 586,050	\$ 459,120	\$ 1,660,813	\$ 730,100						(Comes from Incremental Capacity)
8	Yankee Lake- Conveyance and Storage Capital Cost	\$ 0	\$ 2,432,074	\$ 2,432,074	\$ 0	\$ 1,660,813	\$ 730,100						(Comes from Incremental Capacity)
9	Gross Capital Cost Allocated to Orange City	\$ 0	\$ 15,072,761	\$ 3,018,124	\$ 459,120	\$ 1,660,813	\$ 730,100						

BASE YEAR DOLLARS		SJR - Yankee Lake Capital Cost Allocated to Orange City										Total @	
		2009	2013	2017	2022	2027	2032	2037	2042	2047	2052	Year 25	
12	Debt Issuance and/or Administrative Costs	\$ 0	\$ 753,638	\$ 150,906	\$ 22,956	\$ 83,041	\$ 36,505						\$ 1,047,046
13	Net Capital Cost of Yankee Lake Project	\$ 0	\$ 15,826,399	\$ 3,169,030	\$ 482,076	\$ 1,743,854	\$ 766,605						\$ 21,987,964

Line	Description	Percentage of Gross Cost	Comes from									
			Input Sheet = Line 4	Input Sheet = Line 5	Input Sheet = Line 7	Input Sheet = Line 8	Input Sheet = Line 9	Input Sheet = Line 8	Input Sheet = Line 9	Input Sheet = Line 8	Input Sheet = Line 9	Input Sheet = Line 9
8	Project Funding Sources											
9	Gross Capital Cost of Yankee Lake Project	0.00%	\$ 0	\$ 15,072,761	\$ 3,018,124	\$ 459,120	\$ 1,660,813	\$ 730,100	\$ 0	\$ 0	\$ 0	\$ 20,940,918
10	Other Outside Funding	0.00%	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
11	Orange City Portion Capital Cost - Yankee Lake	100.00%	\$ 0	\$ 15,072,761	\$ 3,018,124	\$ 459,120	\$ 1,660,813	\$ 730,100	\$ 0	\$ 0	\$ 0	\$ 20,940,918

Line	Description	Annual Interest Rate Term (Years)	Financing Assumptions									
			5.00%	25	5.00%	25	5.00%	25	5.00%	25	5.00%	25
14	Amortized Capital Cost SJR - Yankee Lake Project		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
15	Phase I Amortized Capital Cost		\$ 0	\$ 1,122,922	\$ 1,122,922	\$ 0	\$ 1,122,922	\$ 1,122,922	\$ 0	\$ 1,122,922	\$ 1,122,922	\$ 0
16	Phase II Amortized Capital Cost		\$ 0	\$ 0	\$ 224,850	\$ 224,850	\$ 224,850	\$ 224,850	\$ 224,850	\$ 224,850	\$ 224,850	\$ 0
17	Phase III Amortized Capital Cost		\$ 0	\$ 0	\$ 0	\$ 34,204	\$ 34,204	\$ 34,204	\$ 34,204	\$ 34,204	\$ 34,204	\$ 0
18	Phase IV Amortized Capital Cost		\$ 0	\$ 0	\$ 0	\$ 0	\$ 123,731	\$ 123,731	\$ 123,731	\$ 123,731	\$ 123,731	\$ 0
19	Phase V Amortized Capital Cost		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 54,393	\$ 0
20	Cumulative Amortized Annual Capital Cost Yankee Lake		\$ 0	\$ 1,122,922	\$ 1,347,772	\$ 1,381,977	\$ 1,505,708	\$ 1,560,100	\$ 1,560,100	\$ 1,560,100	\$ 1,560,100	\$ 1,560,100



Rate Impact Evaluation for West Valencia Utilities  
Orange City, Florida

SJR - Yankee Lake Summary of Results

Capital Cost Allocated to Orange City

2009	2013	2017	2022	2027	2032	Total @	
						Year 25	Notes
Phase 0	Phase I	Phase II	Phase III	Phase IV	Phase V		
N/A	1.126	1.267	1.469	1.702	1.974		Calculated from General Input Sheet Line 14
0	\$ 17,812,752	\$ 4,014,432	\$ 707,945	\$ 2,968,795	\$ 1,512,961	\$ 27,016,884	

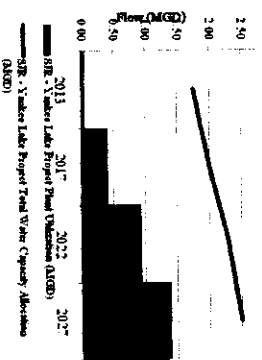
2009	2013	2017	2022	2027	2032
0	\$ 1,263,858	0	0	0	0
0	\$ 1,263,858	1,263,858	1,263,858	1,263,858	1,263,858
0	0	\$ 284,834	284,834	284,834	284,834
0	0	0	\$ 50,230	50,230	50,230
0	0	0	0	\$ 210,643	210,643
0	0	0	0	0	107,348
0	\$ 1,263,858	\$ 1,348,692	\$ 1,598,923	\$ 1,809,366	\$ 1,916,914
0	\$ 1,263,858	\$ 1,348,692	\$ 1,598,923	\$ 1,809,366	\$ 1,916,914

Plant Utilization During Forecast Period

2009	2013	2017	2022	2027	2032
0.000	0.045	0.406	0.930	1.384	1.970
0.000	1.750	2.000	2.300	2.500	3.000
N/A	2.59%	20.29%	40.43%	55.34%	65.68%

Notes

Water Capacity and Production (MG/D)



2009	2013	2017	2022	2027	2032	Allocation Basis (%)	Cost Per Thousand Gallons	O&M Y Yanke Lake Calculation	
								2009	2013
0.61	0.61	0.61	0.61	0.61	0.61	23.83%	\$ 0.61	\$ 0.61	\$ 0.61
0	\$ 389,638	\$ 445,300	\$ 512,095	\$ 556,635	\$ 667,950		\$ 0.61	\$ 0.61	\$ 0.61
1.95	1.95	1.95	1.95	1.95	1.95	76.17%	\$ 1.95	\$ 1.95	\$ 1.95
0	\$ 32,264	\$ 288,796	\$ 661,860	\$ 984,714	\$ 1,402,462		\$ 1.95	\$ 1.95	\$ 1.95
0	\$ 421,901	\$ 734,096	\$ 1,173,955	\$ 1,541,339	\$ 2,070,412		\$ 1.95	\$ 1.95	\$ 1.95
N/A	\$ 101,89	\$ 15,41	\$ 8,17	\$ 6,64	\$ 5,54		\$ 0	\$ 0	\$ 0

Calculated from General Input Sheet Line 19

2009	2013	2017	2022	2027	2032
N/A	1.126	1.267	1.469	1.702	1.974
0.61	\$ 0.69	\$ 0.77	\$ 0.90	\$ 1.04	\$ 1.20
1.95	\$ 2.19	\$ 2.47	\$ 2.86	\$ 3.32	\$ 3.85
0	\$ 662,800	\$ 1,070,955	\$ 1,789,387	\$ 2,624,027	\$ 3,866,429
N/A	\$ 116,45	\$ 17,69	\$ 9,98	\$ 8,78	\$ 8,04

October 1, 2008

Scott Mays, P.E.  
County of Volusia  
123 West Indiana Avenue  
Deland, FL 32721

***VOLUSIA COUNTY TASK ASSIGNMENT  
TRANSIENT GROUNDWATER MODEL REVISION  
AND RELATED GROUNDWATER OPTIMIZATION ACTIVITIES***

Dear Scott,

We are pleased to offer the following as our proposal the referenced project.

The ENGINEER's Scope of Work will include the following:

**I. PURPOSE**

The St. Johns River Water Management District (District) has projected that groundwater pumping by the Cities of DeLand, Deltona, and Orange City, and the County of Volusia (West Volusia Suppliers) will, in the near future, exceed the capacity of the groundwater supply in west Volusia, and that the West Volusia Suppliers need to pursue one or more alternative source(s) of water supply. District staff believes that the most cost effective source of supplemental water supply is treated surface water from the St. Johns River. Previous work by others has projected the cost of alternative potable water supply from the St. Johns River to be approximately five times the cost of supplying groundwater. It is the purpose of this task assignment to demonstrate that available groundwater is beneficially utilized to the maximum extent possible.

It is in the best interest of the West Volusia Suppliers to revise the District's groundwater model to more accurately reflect the interrelation between the surficial and upper Floridan aquifer. Converting the model from a 'steady state' model to a 'transient' flow model and refining the model grid/features is the most effective means of accomplishing this goal.

Additional elements of the proposal include: Conceptual planning and modeling for new wellfield areas, modeling artificial aquifer recharge, Blue Spring monitoring plan development, Blue Spring habitat evaluation, reclaimed water retrofit analysis and a conservation analysis. The purpose of all tasks is to evaluate and present options which can reduce the amount of alternative potable water supply needed in the future.

The scope is defined as follows:

**Task A. Regional Groundwater Model Revision and Update**

The ENGINEER will engage a subconsultant, Andreyev Engineering, Inc., to complete the work defined under Task 1 of the scope as detailed on Attachment 'A'. The Engineer will assist the subconsultant and coordinate approval of the model revision through St. John's River Water Mgt.

District (SJRWMD). The work generally consists of refining, revision, upgrade and re-calibration of the latest District's regional groundwater flow model and converting the model from steady state to transient.

**Task B. Conceptual Planning and Modeling for New Wellfield Areas**

Utilize the revised, updated and recalibrated model to locate and model groundwater withdrawal from the Floridan aquifer in the eastern portion of the study area. Estimate the safe yield withdrawal of groundwater within the identified available properties and determine the approximate number, depth and size of wells needed for these areas. Evaluate feasibility of drilling wells on these sites and provide an estimate of cost associated with implementation.

**Task C. Conceptual Planning and Modeling for Artificial Aquifer Recharge**

Identify available properties owned by or accessible to the County and the Cities that can be used for artificial aquifer recharge. Artificial aquifer recharge can be applied in a form of recharge basins, exfiltration trenches, subsurface drip irrigation, spray fields, lake augmentation, wetland hydration, drainage way modification, and direct injection of water into the aquifer.

**Task D. Blue Springs Monitoring Plan Development**

As part of the on-going efforts to establish the effects of groundwater withdrawal on the discharge rates at Blue Springs, it is imperative to develop an effective monitoring plan that can be implemented to collect the necessary scientific data needed to determine the net effect of groundwater withdrawal on the discharge rates of the spring.

The proposed approach for the development and implementation of an effective monitoring plan for Blue Springs is to capitalize on the long term data of potentiometric levels collected by the USGS and the District. This analysis will allow determination of incremental impacts created by the withdrawal of groundwater for potable uses, irrigation uses and other uses. This approach will allow for a scientifically defensible method to establish the true effects of groundwater withdrawal on the spring flow rates and the true potential future impacts from proposed withdrawals.

**Task E. Blue Spring Habitat Assessment**

An allowance is established to engage a qualified biologist to provide an independent, technical review of the SJRWMD publication # SJ2007-SP17, "Analysis of Blue Spring Discharge Data to Determine a Minimum Flow Regime". The purpose of the review is to determine if the manatee habitat related assumptions used to establish the MFL are appropriate

**Task F. Reclaimed Water Retrofit and Conservation Analysis**

Several utilities within the County currently provide metered reclaimed water to residential customers for irrigation of outdoor landscaping. Billing records show that residential customers that use reclaimed water for irrigation, on average, use one half to two thirds less potable water than residential customers that use potable water for in-home use and irrigation. The planning level analyses will examine the feasibility and costs of various levels of retrofit, to include reclaimed water storage and supplementation from other sources such as storm water, interconnects and the St. Johns River. These planning level costs will be compared to the cost of alternative potable water supply.

Provide an analysis of water conservation efforts that can further reduce the amount of alternative potable water supply needed in the future, quantify the potable water reductions and provide the associated costs.

## **II. ENGINEER'S SERVICES**

The ENGINEER shall perform the following tasks, upon authorization by the County.:

### **Task A. Regional Groundwater Model Revision and Update**

The ENGINEER will engage a subconsultant, Andreyev Engineering, Inc., to complete the work defined under Task 1 of the scope as detailed on Attachment 'A'. The work includes the following:

- coordinate approval of the model revision through St. John's River Water Mgt. District (SJRWMD).
- refine, revise, upgrade and re-calibrate the latest District's regional groundwater flow model and convert the model from steady state to transient.
- collect the data to be entered into the new transient model. The model will then be executed to assess its accuracy to simulate actual field conditions. Once the model is converted to a transient model and recalibrated to multiple time periods of variable aquifer stresses, the model will be significantly improved over the current steady state model.

### **Task B. Conceptual Planning and Modeling for New Wellfield Areas**

The ENGINEER will engage a subconsultant, Andreyev Engineering, Inc., to complete the work defined under Task 2 of the scope as detailed on Attachment 'A'. The work includes the following:

- utilize the revised, updated and recalibrated model to locate and model groundwater withdrawal from the Floridan aquifer in the eastern portion of the study area.
- estimate the safe yield withdrawal of groundwater within the identified available properties and determine the approximate number, depth and size of wells needed for these areas.
- evaluate feasibility of drilling wells on these sites and provide an estimate of cost associated with its implementation and prepare a report summarizing the findings.

### **Task C. Conceptual Planning and Modeling for Artificial Aquifer Recharge**

The ENGINEER will engage a subconsultant, Andreyev Engineering, Inc., to complete the work defined under Task 3 of the scope as detailed on Attachment 'A'. The work includes the following:

- identify available properties owned by or accessible to the County and the Cities that can be used for artificial aquifer recharge.
- Model each area to determine the amount of recharge, its beneficial effect on aquifer recharge balance and its net effect on spring flows.
- Prepare a report summarizing the work with regional base plans identifying the area of aquifer recharge, tables that itemize the aquifer recharge type and amount for each site, conceptual design of the recharge systems and recommendations for their implementation.

### **Task D. Blue Springs Monitoring Plan Development**

Engage a subconsultant, Andreyev Engineering, Inc., to complete the work defined under Task 4 of the scope as detailed on Attachment 'A'. The work includes the following:

- Prepare the plan for collection of necessary scientific data needed to determine the net effect of groundwater withdrawal on the discharge rates of the spring.
- This analysis will allow determination of incremental impacts created by the withdrawal of groundwater for potable uses, irrigation uses and other uses.
- develop a scientifically defensible method to establish the true effects of groundwater withdrawal on the spring flow rates and the true potential future impacts from proposed withdrawals.
- scope of work for this task is limited to the development of a spring-aquifer interaction monitoring plan with detailed description of monitoring methodology, data collection schedule, monitoring well installation specifications, data reduction and a methodology for data utilization to develop the correlative model of aquifer withdrawal and spring flow rates.

#### **Task E. Blue Spring Habitat Assessment**

Engage a qualified biologist to provide an independent, technical review of the SJRWMD publication # SJ2007-SP17, "Analysis of Blue Spring Discharge Data to Determine a Minimum Flow Regime". The purpose of the review is to determine if the manatee habitat related assumptions used to establish the MFL are appropriate. The primary variables to be reviewed are manatee population projections and useable warm water length (UWWL) within the Blue Spring Run. The biological sub-consultant will be selected by technical representatives from the West Volusia Suppliers (WVS). A technical memorandum will be prepared which: identifies the subject variables, clarifies anomalies or inconsistencies and offers specific conclusions/recommendations. Result of both technical memorandums will be presented to the West Volusia Suppliers in separate workshop forums.

#### **TASK F - Reclaimed Water Retrofit and Conservation Analyses**

##### **Reclaimed Water Retrofit Analysis**

- Evaluate and confirm each Supplier's projected water demands through 2050.
- Gather existing data from utilities County wide that meter reclaimed water usage for individual customers. Develop general usage estimates for potable water usage by customers that irrigate with reclaimed water, and usage estimates for potable water usage by customers that do not have access to reclaimed water for irrigation.
- Develop planning level estimates of construction costs, measured in \$/ERU, to retrofit and supply residential neighborhoods with reclaimed water.
- Develop planning level costs to provide reclaimed water to 25% of the West Volusia Suppliers' utility customers; and the resultant reduction of potable water usage. Planning level costs need to include costs for interconnection of the West Volusia Suppliers' reclaimed water transmission systems, reclaimed water storage and the costs for augmentation water if needed.
- Develop planning level costs to provide reclaimed water to 50% of the West Volusia Suppliers' utility customers; and the resultant reduction of potable water usage.
- Develop planning level costs to provide reclaimed water to 75% of the West Volusia Suppliers' utility customers; and the resultant reduction of potable water usage.

- Develop planning level costs to provide reclaimed water to 100% of the West Volusia Suppliers' utility customers; and the resultant reduction of potable water usage.
- Provide a comparison of the costs identified in the items listed above, to the cost of alternative potable water supply from the St. Johns River. The ENGINEER shall use the costs previously established for alternative potable water supply for the proposed Yankee Lake Facility.
- Provide an analysis of the feasibility of providing reclaimed water for irrigation demands at the various levels of service described in the items listed above.

**Conservation Analysis**

- Develop planning level costs and an estimated reduction in potable water usage for 5 specific water conservation measures that can be implemented by customers and/or utilities, including reductions in irrigation.
- The conservation analysis may consider the following measures, other measures may also be considered:
  - a) Enforcement of existing irrigation codes
  - b) Metering for all non-potable uses
  - c) Permitting programs for irrigation systems
  - d) Sensitivity of Water Rates vs. Consumption
  - e) Purchasing lawns, i.e. customer cash incentives for no irrigation

Existing documentation from SJRWMD and other sources will be utilized to the maximum extent possible to develop cost estimates and demand reductions.

- A theoretical 'minimum' per capita consumption rate will be established and used as a baseline to compare the cost effectiveness of various options.

**III. PROGRESS MEETINGS**

The ENGINEER shall schedule meetings with representatives of the West Volusia Suppliers as deemed necessary by County staff. An allowance for meetings is included in the fee schedule. Professional fees for attendance at meetings will be billed against the established allowance in accordance with the attached fee schedule.

**IV. SCHEDULE**

The following schedule is proposed for each of the tasks:

Task A	9 months
Task B	6 months
Task C	6 months
Task D	3 months
Task E	6 months
Task F	6 months

It is the County's preference to have the ability to authorize the tasks, or groups of tasks, independently. Some of the tasks may be performed concurrently. The total time to complete all tasks shall not exceed 24 months.

## V. COMPENSATION

Payment for all services will be in accordance with the Standard Contract for Engineering Services. QLH fees include 10% administrative overhead charges applied to subconsultant charges. A copy of the QLH fee schedule is attached as Attachment B. If sales tax becomes due on professional services the County shall reimburse QLH for the additional sales tax cost. Total compensation for all services, materials, supplies and any other items or requirements necessary to complete the work described herein shall NOT EXCEED \$ 256,060. This amount being further broken down as follows:

<b>Task A.</b>	<b><u>Regional Groundwater Model Revision and Update</u></b>	
	1. Sub-Consultant Fees	\$ 74,000
	2. QLH Fees and charges	<u>\$ 10,000</u>
	Sub-total	\$ 84,000
<b>Task B.</b>	<b><u>Conceptual Planning and Modeling for New Wellfield Areas</u></b>	
	1. Sub-Consultant Fees	\$ 32,000
	2. QLH Fees and charges	<u>\$ 6,000</u>
	Sub-total	\$ 38,000
<b>Task C.</b>	<b><u>Conceptual Planning and Modeling for Artificial Aquifer Recharge</u></b>	
	1. Sub-consultant Fees	\$ 38,500
	2. QLH Fees and charges	<u>\$ 4,000</u>
	Sub-total	\$ 42,500
<b>Task D.</b>	<b><u>Blue Springs Monitoring Plan Development</u></b>	
	1. Sub-consultant Fees	\$ 18,500
	2. QLH Fees and Charges	<u>\$ 2,000</u>
	Sub-total	\$ 20,500
<b>Task E.</b>	<b><u>Blue Spring Habitat Assessment</u></b>	
	1. Sub-consultant Fees	\$ 25,000
	2. QLH Fees and charges	<u>\$ 2,500</u>
	Sub-total	\$ 27,500
<b>Task F.</b>	<b><u>Reclaimed Water Retrofit and Conservation Analysis</u></b>	
	1. Report Preparation and interim reviews	\$ 28,560
<b>Allowances.</b>	<b><u>Allowances for Tasks A - F</u></b>	
	1. Meetings and Presentations	\$ 10,000
	2. Printing	<u>\$ 5,000</u>
	Sub-total	\$ 15,000
	<b>Total Tasks A - F, and Allowances</b>	<b>\$ 256,060</b>

Thank you for this opportunity to continue to be of service. If you have additional questions, or required further assistance, please do not hesitate to call.

Respectfully,  
QUENTIN L. HAMPTON ASSOCIATES, INC.

Brad T. Blais, P.E.  
Vice President

Mark A. Hampton, P.E.  
President

BTB/MAH:el

**AGREEMENT BETWEEN THE  
CITY OF DeLAND,  
CITY OF DELTONA,  
CITY OF ORANGE CITY, AND  
COUNTY OF VOLUSIA  
FOR AN INITIAL EVALUATION OF THE DISTRICT GROUNDWATER  
MODEL AND MFL'S, RECLAIMED WATER RETROFIT ANALYSIS AND  
WATER CONSERVATION ANALYSIS**

This Agreement is made and entered into by and between the City of DeLand (DeLand), the City of Deltona (Deltona), the City of Orange City (Orange City), and the County of Volusia (Volusia), collectively referred to herein as (Suppliers).

**WITNESSETH:**

WHEREAS, the St. Johns River Water Management District (District) has projected that groundwater pumping by the Suppliers will, in the near future, exceed the capacity of the groundwater supply in west Volusia County area, and that the Suppliers will therefore need to pursue one or more alternative sources of water supply, and

WHEREAS, cost estimates prepared by the District and others indicate the cost of providing potable water from an alternative water source will likely be five times the cost to provide potable water from groundwater sources, and

WHEREAS, the suppliers desire to jointly contract with an engineering firm to perform a preliminary evaluation of the District's mathematical groundwater model and the minimum flow and level (MFL) established for Blue Spring, and prepare a report quantifying costs associated with reclaimed water retrofit and implementation of various conservation efforts with the goal of reducing the quantity of alternative water supply ultimately needed, and

WHEREAS, the Suppliers have agreed on a Consultant to perform the above work.

NOW, THEREFORE, in consideration of the foregoing premises, which are hereby made a part of this Agreement, and the mutual covenants, terms and conditions contained herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Suppliers, each intending to be legally bound, agree to the following:

## **1. SCOPE OF WORK**

The Suppliers shall contract with consultant (Consultant), to be selected by the Suppliers, to conduct a preliminary evaluation of the District's mathematical groundwater model and the MFL established for Blue Spring. The general purpose of this preliminary evaluation will be to determine whether, in the Consultant's opinion, the District's methodology and conclusions are subject to dispute and the basis therefor. The Consultant shall prepare a report which will accomplish the objectives generally set forth in the Scope of Work attached hereto as Exhibit A.

## **2. GOVERNANCE AND MANAGEMENT**

(a) Any decisions which are necessary for the proper day to day administration of the work being performed by the Consultant shall be made by collective decisions of the Suppliers. Each of the Suppliers shall appoint one representative who shall be the person authorized to communicate on behalf of the respective Supplier on issues relevant to this Agreement. In the event that a dispute arises regarding the administration of this Agreement and/or the contract with Consultant, then the representatives of the Suppliers shall vote on the issue in dispute, and such vote shall be binding upon all Suppliers. In the unlikely event of a tie vote, then the Suppliers agree first to enter into mediation. If no agreement is reached following mediation, then the Suppliers will enter into binding arbitration.

(b) Volusia County shall serve as a project administrator (Project Administrator), and shall have overall administrative responsibility for implementing the terms of this Agreement. Under the direction of the Suppliers' representatives, the Project Administrator shall be responsible for implementing and overseeing the contract between the Suppliers and the Consultant. The Project Administrator shall have the responsibility of scheduling the kick-off and progress meetings with the Consultant, scheduling meetings of the Suppliers' representatives when necessary, keeping the Suppliers informed of the progress of the Consultant's work and other developments related to the work contemplated by this Agreement, and for such other administrative tasks necessitated by this Agreement and the contract between the Suppliers and the Consultant.

## **3. FUNDING**

(a) The Suppliers will pay the amounts set forth below as payment for the work to be performed by the Consultant:

Supplier	2007 Usage (mgd)	Percentage of Total	Equal Share 1/2 of Cost	Pro Rata Share of 1/2 Cost	Total Share
DeLand	6.8	27.3%	\$32,007.50	\$34,964.02	<b>\$66,971.52</b>
Deltona	12.8	51.4%	\$32,007.50	\$65,814.62	<b>\$97,822.12</b>
Orange City	1.7	6.8%	\$32,007.50	\$8,741.00	<b>\$40,748.50</b>
Volusia Co.	3.6	14.5%	\$32,007.50	\$18,510.36	<b>\$50,517.86</b>
Total	24.9	100.0%	\$128,030.00	\$128,030.00	<b>\$256,060.00</b>

(b) All contributions made by the Suppliers pursuant to this Agreement shall be paid to Volusia County **[supplier employing the project administrator]** in care of the Project Administrator. Within thirty (30) days of the execution of a contract with the Consultant, each Supplier shall remit one-third (1/3) of its contribution, as set forth in Section 3(a) above of the estimated cost. Thereafter, the Suppliers shall remit an additional 1/3 share within thirty (30) days following notification from the Project Administrator that the Consultant has reached 60% completion of its work, and the final 1/3 share within thirty (30) days following notification from the Project Administrator that the Consultant has completed its work. All amounts payable by the Suppliers pursuant to this Agreement are subject to appropriation of said funds by the governing body of the respective supplier.

(c) Changes in the negotiated Scope of Work that will cause the Consultant's charges to increase must be unanimously approved by the Suppliers, and the Project Administrator shall not authorize the Consultant to undertake such additional or different work until he receives written notification from each Supplier that it has authorized payment of the additional funds. Any additional amounts charged by the Consultant will be paid by the Suppliers **on a pro-rata basis using the same percentages of consumption as set forth in Section 3(a) of this Agreement/equally.**

#### 4. TERMS, AMENDMENT, TERMINATION

The term of this Agreement shall commence upon its execution by all Suppliers, and shall remain in effect until completion of the deliverables set forth in the Scope of Work.

**5. AGREEMENT NOT A JOINT VENTURE**

This Agreement is not intended to create a joint venture amongst the parties hereto, and in no event shall any party to this Agreement be responsible for the acts of any other party, or such other party's employees, agents or representatives.

**6. OWNERSHIP OF DOCUMENTS**

Ownership and copyright to all reports and all accompanying data (in all formats) produced pursuant to this Agreement shall be vested in each of the Suppliers. **Any source documents or any other documents or materials developed, secured or used in the performance of this Agreement shall be considered property of the Party from which such documents or materials originated.**

**7. ENTIRE AGREEMENT**

This Agreement, including exhibits, constitutes the entire agreement among the parties hereto pertaining to the subject matter hereof, and there are no warranties, representations or other agreements in connection with the subject matter hereof, except as specifically set forth herein.

IN WITNESS WHEREOF, the following authorized representatives of the Suppliers have executed this Agreement on the date signed by each.

City of DeLand

By: \_\_\_\_\_  
Attest: \_\_\_\_\_  
Date: \_\_\_\_\_

Approved by:  
\_\_\_\_\_

City of Deltona

By: \_\_\_\_\_  
Attest: \_\_\_\_\_  
Date: \_\_\_\_\_

Approved by:  
\_\_\_\_\_

City of Orange City

By: \_\_\_\_\_

Attest: \_\_\_\_\_

Date: \_\_\_\_\_

Approved by:

\_\_\_\_\_

County of Volusia

By: \_\_\_\_\_

Attest: \_\_\_\_\_

Date: \_\_\_\_\_

Approved by:

\_\_\_\_\_