

UC WATER PERSPECTIVES

May 22, 2006

UC CONSUMPTIVE USE PERMIT

CONSUMPTIVE USE PERMIT MAX. WELLFIELD WITHDRAWALS			ACTUAL PLANT FLOWS			
Yr.	MGD	MGY	MGD	MGY	% PLANT CAPACITY USED	% CUP USED
2000	4.729	1,726	4.956	1,809	48	105
2001	4.800	1,752	4.630	1,690	45	96
2002	5.441	1,986	4.730	1,726	46	87
2003	5.529	2,018	4.830	1,763	47	87
2004	5.630	2,055	4.629	1,696	45	82
2005	5.17	1,887	4.423	1,614	43	86
2006	5.58	2,034				
2007	6.04	2,205				
2008	6.62	2,416				
2009	7.13	2,603				
2010	7.63	2,785				
2011	8.06	2,942				
2012	8.33	3,041				
2013	8.33	3,041				
2014	8.33	3,041				
2015	8.33	3,041				
2016	8.33	3,041				
2017	8.33	3,041				
2018	8.33	3,041				
2019	8.33	3,041				
2020	8.33	3,041				

Available water supply has been an increasing concern having been discussed at many workshops and meetings beginning in September, 2005 and continuing today. Growth and infrastructure studies have heightened the concern for future available water sources.

WAV Summary SJRWMD CUP Allocation Table

Table ES-1
Projected 2025 Water Supply Deficits^{1, 2, 3}

Utility	2025 Demand	2025 CUP Allocation	Deficit
Daytona Beach	20.54	16.16	4.38
Edgewater	3.43	2.48	0.95
Holly Hill	1.88	1.58	0.30
New Smyrna Beach	7.83	8.33	-0.50
Ormond Beach	10.33	8.96	1.37
Port Orange	9.02	8.97	0.05
East Summary	53.03	46.31	6.55
DeLand	7.96	6.57	1.39
Deltona	18.83	13.96	4.87
Orange City	3.21	2.42	0.79
Volusia County	13.29	4.75	8.54
West Summary	43.29	27.7	15.59
WAV Summary	96.32	74.01	22.14

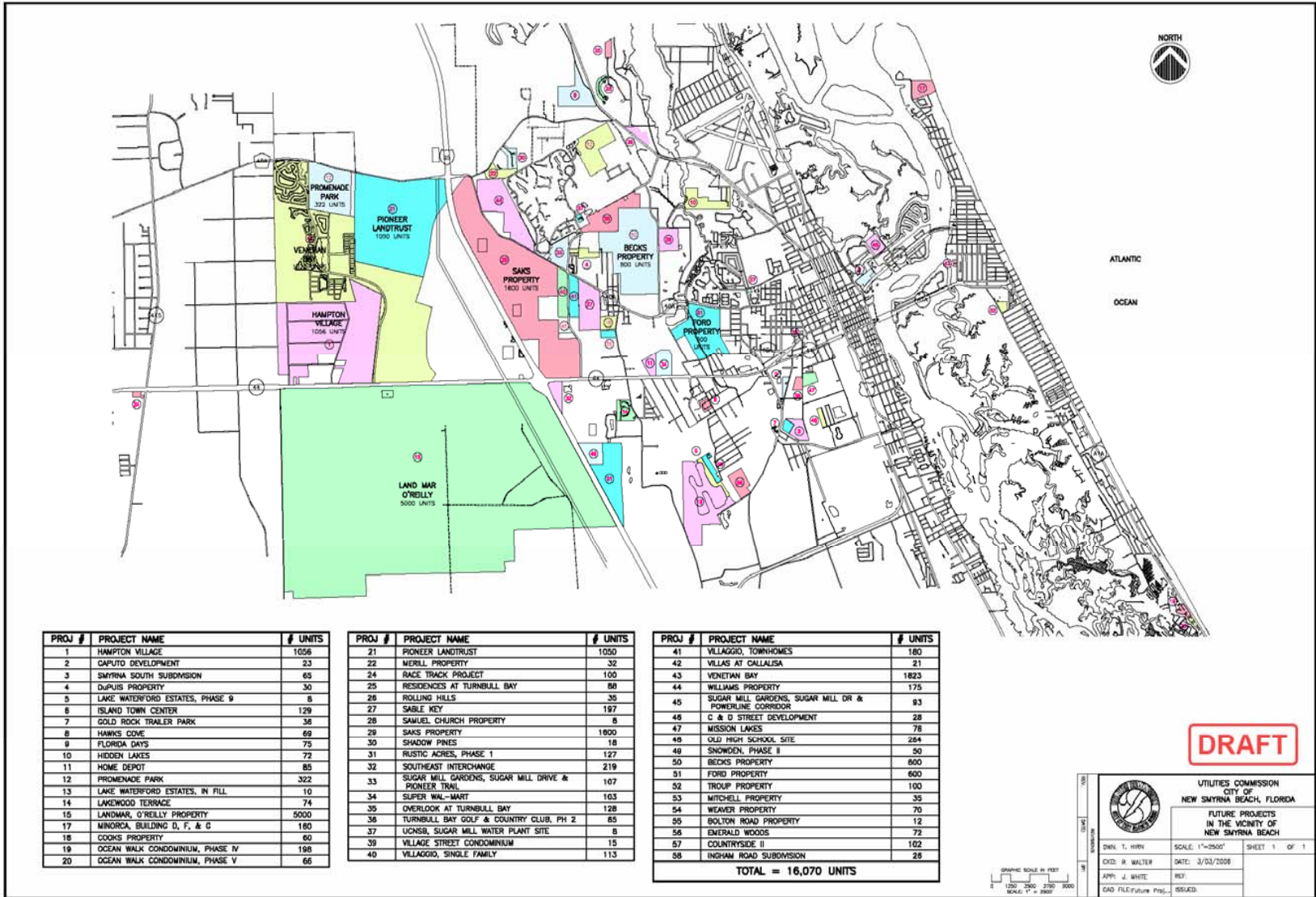
1. Includes 10% safety factor in demand.
2. CUP allocations effective as of January 2008.
3. CUP allocations carried forward to 2025 for those utilities whose CUP did not extend to 2025. The SJRWMD has indicated it is unlikely CUP allocations will increase in the future.

UC HISTORICAL REFERENCES

WATER PRODUCTION DATA COMPARISON

WASTEWATER AND REUSE DATA COMPARISON

FISCAL YEAR	MAX. DAILY FLOW (MGD)	AVERAGE DAILY FLOW (MGD)	TOTAL TREATED WATER PRODUCTION (MGY)	FLOW % CHANGE	AVERAGE # OF ACCOUNTS	# ACCOUNTS % CHANGE	TOTAL WASTEWATER FLOW (MGY)	TOTAL REUSE FLOW (MGY)
1996	6.181	4.298	1572.676	+8	16,486	+2	1016.240	208
1997	5.852	4.281	1562.055	-1	16,691	+1	897.650	343
1998	6.624	4.543	1658.734	+6	17,029	+2	908.660	430
1999	6.132	4.566	1667.354	+1	17,505	+2	1096.120	672
2000	7.064	4.817	1782.83	+6	17,835	+2	1203.430	610
2001	5.962	4.544	1658.42	-6	18,569	+3	1303.880	958
2002	6.624	4.730	1726.45	+4	19,521	+5	1428.700	1080
2003	7.197	4.779	1744.48	+1	19,978	+2	1357.220	782
2004	7.116	4.534	1660.32	-5	20,900	+5	1369.390	683
2005	6.07	4.43	1616.61	-3	22,261	+6	1273.810	832
				Avg.		3.00		



ATLANTIC
OCEAN

PROJ #	PROJECT NAME	# UNITS
1	HAMPTON VILLAGE	1056
2	CAPUTO DEVELOPMENT	23
3	SMYRNA SOUTH SUBDIVISION	65
4	DUPUIS PROPERTY	30
5	LAKE WATERFORD ESTATES, PHASE 9	8
6	ISLAND TOWN CENTER	129
7	GOLD ROCK TRAILER PARK	36
8	HAWKS COVE	69
9	FLORIDA DAYS	75
10	HIDDEN LAKES	72
11	HOME DEPOT	85
12	PROMENADE PARK	322
13	LAKE WATERFORD ESTATES, IN FILL	10
14	LAKEWOOD TERRACE	74
15	LANDMAR, O'REILLY PROPERTY	5000
17	MINORCA, BUILDING D, F, & G	180
18	COOKS PROPERTY	60
19	OCEAN WALK CONDOMINIUM, PHASE IV	198
20	OCEAN WALK CONDOMINIUM, PHASE V	66

PROJ #	PROJECT NAME	# UNITS
21	PIONEER LANDTRUST	1050
22	MERRILL PROPERTY	32
24	RACE TRACK PROJECT	100
25	RESIDENCES AT TURNBULL BAY	86
26	ROLLING HILLS	35
27	SABLE HCY	187
28	SAMUEL CHURCH PROPERTY	6
29	SAKS PROPERTY	1600
30	SHADOW PINES	18
31	RUSTIC ACRES, PHASE 1	127
32	SOUTHEAST INTERCHANGE	219
33	SUGAR MILL GARDENS, SUGAR MILL DRIVE & PIONEER TRAIL	107
34	SUPER WAL-MART	103
35	OVERLOOK AT TURNBULL BAY	128
36	TURNBULL BAY GOLF & COUNTRY CLUB, PH 2	85
37	UCNSB, SUGAR MILL WATER PLANT SITE	8
39	VILLAGE STREET CONDOMINIUM	15
40	VILLAGGIO, SINGLE FAMILY	113

PROJ #	PROJECT NAME	# UNITS
41	VILLAGGIO, TOWNHOMES	180
42	VILLAS AT CALLALISA	21
43	VENETIAN BAY	1823
44	WILLIAMS PROPERTY	175
45	SUGAR MILL GARDENS, SUGAR MILL DR & POWERLINE CORRIDOR	83
46	C & D STREET DEVELOPMENT	28
47	MISSION LAKES	78
48	OLD HIGH SCHOOL SITE	284
49	SNOWDON, PHASE II	50
50	BECKS PROPERTY	600
51	FORD PROPERTY	600
52	TROUP PROPERTY	100
53	MITCHELL PROPERTY	35
54	WEAVER PROPERTY	70
55	BOLTON ROAD PROPERTY	12
56	EMERALD WOODS	72
57	COUNTRYSIDE II	102
58	INGHAM ROAD SUBDIVISION	26

TOTAL = 16,070 UNITS



DRAFT

UTILITIES COMMISSION
CITY OF
NEW SMYRNA BEACH, FLORIDA

FUTURE PROJECTS
IN THE VICINITY OF
NEW SMYRNA BEACH

DRAWN: T. HIRBY SCALE: 1"=2500' SHEET 1 OF 1
 CHECKED: B. WALTER DATE: 3/03/2008
 APP'D: J. WAITE
 CAD FILE: Future Proj.dwg ISSUED:

UC CUP Application Water Use Projection

TABLE 2
PROJECTED WATER USE

Next 16 Years	Past Population	Number of Units	Per Capita Usage (gpcd)	Household Avg. day (mgal)	Household Max. day (mgal)	Commercial/Industrial Avg. day (mgal)	Commercial/Industrial Max. day (mgal)	Irrigation (urban landscape or common areas) (mgal)(avg. day)	Irrigation (urban landscape or common areas) (mgal)(max day)	Water Utility (mgal)	Unaccounted for water (mgals)	Total Annual Avg. day (mgal)**	Total Annual Max day (mgal)***
2005	33,024	23,297	106	3.51	5.37	1.18	1.80	*	*	0.34	0.30	5.32	8.14
2006	34,951	24,729	105	3.68	5.62	1.23	1.89	*	*	0.36	0.31	5.58	8.54
2007	38,415	26,829	104	3.98	6.09	1.34	2.04	*	*	0.39	0.34	6.04	9.24
2008	42,796	29,688	102	4.36	6.67	1.46	2.24	*	*	0.42	0.37	6.62	10.12
2009	46,661	32,547	101	4.70	7.19	1.58	2.41	*	*	0.46	0.40	7.13	10.91
2010	50,476	35,406	100	5.03	7.69	1.69	2.58	*	*	0.49	0.43	7.63	11.68
2011	53,692	38,265	99	5.31	8.12	1.78	2.73	*	*	0.52	0.45	8.06	12.33
2012	56,764	39,030	98	5.58	8.53	1.87	2.87	*	*	0.54	0.47	8.47	12.95
2013	59,802	39,811	98	5.84	8.94	1.96	3.00	*	*	0.57	0.49	8.87	13.57
2014	62,836	40,607	97	6.11	9.35	2.05	3.14	*	*	0.59	0.52	9.27	14.18
2015	65,870	41,419	97	6.37	9.75	2.14	3.28	*	*	0.62	0.54	9.67	14.80
2016	66,930	42,248	97	6.47	9.89	2.17	3.32	*	*	0.63	0.55	9.81	15.02
2017	67,989	43,093	96	6.56	10.04	2.20	3.37	*	*	0.64	0.56	9.96	15.23
2018	69,048	43,954	96	6.65	10.18	2.24	3.42	*	*	0.65	0.56	10.10	15.45
2019	70,105	44,834	96	6.75	10.32	2.27	3.47	*	*	0.66	0.57	10.24	15.67
2020	71,162	45,730	96	6.84	10.47	2.30	3.52	*	*	0.66	0.58	10.38	15.89

* = Included in Household or Commercial/Industrial.

** = Requested allocation capped at 8.33 mgd.

*** = Requested allocation capped at 10.37 mgd.

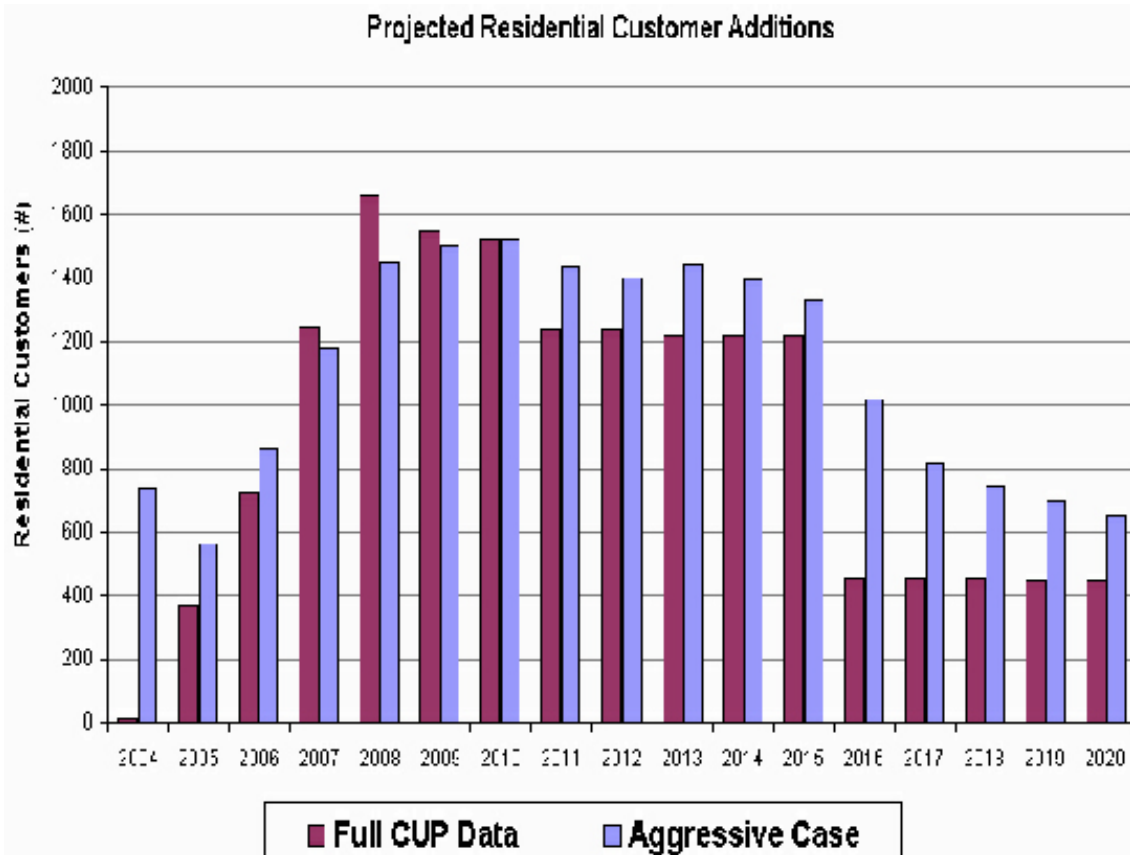
Form: 40C-2-1082-1; Effective 1-7-99

PS-5

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Is there enough water for the City of New Smyrna Beach?

Our only current source of potable water is the upper Floridan aquifer. With over 16,000 residential units already approved for construction and if overall (residential and commercial) growth rates average ~5% over the next 10 years in the UC service area, our CUP allowance (even with the new additional allocation) will be exceeded in 2011 or our CUP could be reduced due to persistent drought affecting the region. Based upon the foregoing, the UC's planning has presumed that the UC should have an alternative source of water and has budgeted \$43 million in the newly proposed CIP to begin to deliver water by 2011.



2005	No. of New Homes	No. of Condo Units	2006	No. of New Homes	No. of Condo Units
January	47	0	January	35	0
February	18	0	February	9	0
March	20	0	March	26	78
April	65	33	April	1	0
May	100	0	May		
June	127	0	June		
July	21	68	July		
August	22	0	August		
September	12	0	September		
October	31	0	October		
November	14	48	November		
December	14	0	December		
Year to Date	491	149	Year to Date	71	78

New UC Housing
Units 2005/2006

WAV Potential As A Water Provider

- **Portfolio 8** – A combination of a surface water plant at the St. Johns River and limited new fresh groundwater to supply the western deficit and a combination of brackish water RO and limited new fresh groundwater to supply the eastern deficit; and

Table ES-5 on page ES-17 of the WAV Master Plan shows no potential for additional water for our region of Volusia County until possibly 2020, which may come from the Central Wellfield. Note that these are standard fresh water wells and this approach is in conflict with Table ES-1 wherein there is the statement: “The SJRWMD has indicated it is unlikely CUP allocations will increase in the future.

**Table ES-5
Portfolio Phasing**

Component	Location	Total Component Size in MGD for MDF			
		2010	2015	2020	2025
Freshwater Wellfield	Central Volusia County	---	---	7	11
Surface Water Plant	St. Johns River	8	14	14	19
RO Plant	Northeast Volusia	---	2	3	5

Since 11 of the 35 MGD water source is slated to come from the Central Wellfield, on page ES-24 of the Master Plan Executive Summary, a meaningful caution is expressed:

It is important to note that reliance on optimization of existing wellfield pumping and the siting of new fresh groundwater wellfields to meet 2025 deficits is risky under the current regulatory framework. First, pumping associated with these alternatives is highly dependent on the benefit provided from Regional Aquifer Management Projects (RAMP) and Rapid Infiltration Basin (RIB) projects. Second, the SJRWMD has indicated that supply through 2025 via groundwater withdrawal is unlikely to be permitted. These alternatives are not currently consistent with the DWSP 2005.



Therefore, until the joint permit application is submitted to the SJRWMD and the regulatory staff review and comment on the plan, the predictability of withdrawal of any additional groundwater for water supply is highly speculative. However, discussions with SJRWMD staff have indicated that permitted withdrawals will be based on the sustainable yield of the Floridan Aquifer and being able to meet the environmental constraints identified by the SJRWMD.

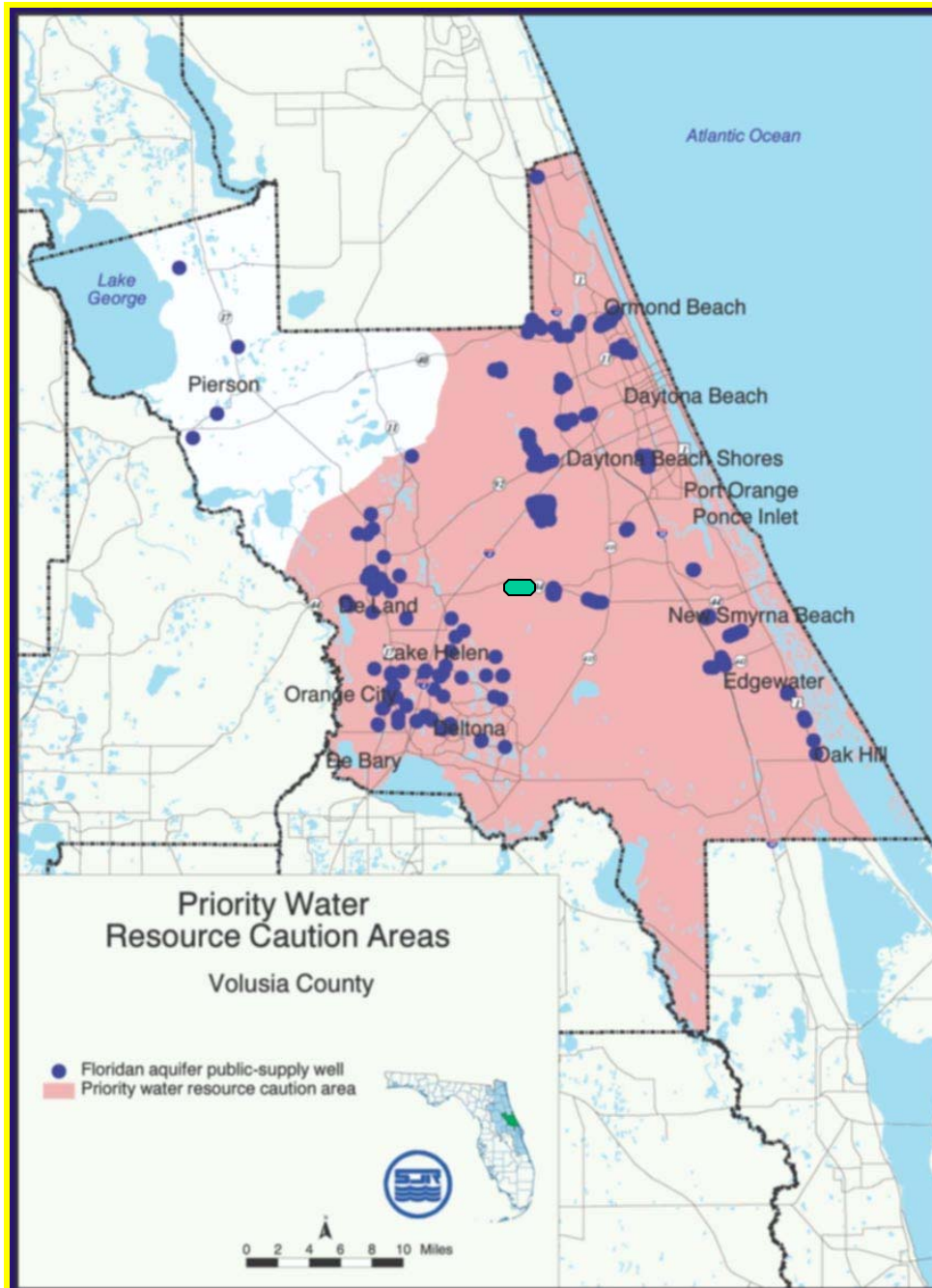
**Table ES-6
Project Capital Cost Summary by On-Line Date**

Facility	2010	2015	2020	2025	Total
St. Johns River Surface WTP	\$83.6 M	\$19.1 M	---	\$16.9 M	\$119.6 M
Northeast Volusia HPRO WTP	\$0 M	\$26.6 M	\$10.1M	\$15.4 M	\$52.1 M
Central Volusia WTP	---	---	\$85.1M	\$12.9 M	\$98.0 M
Totals	\$83.6 M	\$45.7 M	\$95.2 M	\$45.2 M	\$269.7 M

Potential Raw Water Interconnects are listed, but not specified. Costs for these Interconnects are individual member's responsibility.

**Table ES-4
Final Four Portfolio Components**

		Portfolio 2	Portfolio 6	Portfolio 8	Portfolio 9	
Water Conservation	Conservation (20% Effectiveness)	X	X	X	X	
New Source Development	SJR Surface Water Plant	Supply Western Deficit	X (100%)		X (65%)	X (100%)
	Regional GWTP	Supply WAV Deficit				
		Supply Eastern Deficit				
	Brackish RO Expansion	Supply Western Deficit		X (65%)		
		Supply Eastern Deficit	X (100%)		X (35%)	
	Seawater Desalination Plant	Supply WAV Deficit				
		Supply Eastern Deficit		X (100%)		X (100%)
	New Freshwater Wellfields 	Supply Western Deficit		X (35%)	X (35%)	
Supply Eastern Deficit				X (65%)		
Interconnects 	East Finished Water Interconnects	X	X	X	X	
	West Finished Water Interconnects	X	X	X	X	
	→ East Raw Water Interconnects	X	X	X	X	
	West Raw Water Interconnects	X	X	X	X	
Reclaimed System Augmentation/ Aquifer Recharge	Rima Ridge RAMP	X	X	X	X	
	Surface Water Controls	X	X	X	X	
	Lake Dias Outfall	X	X	X	X	
	Division Ave. Borrow Pits	X	X	X	X	
	DeLand Ridge RAMP	X	X	X	X	



Due to greater than normal rainfall predicted over the next 20 years, the Priority Water Resource Caution Area has recently been rescinded for the New Smyrna Beach area

■ Proposed WAV Central Well Field

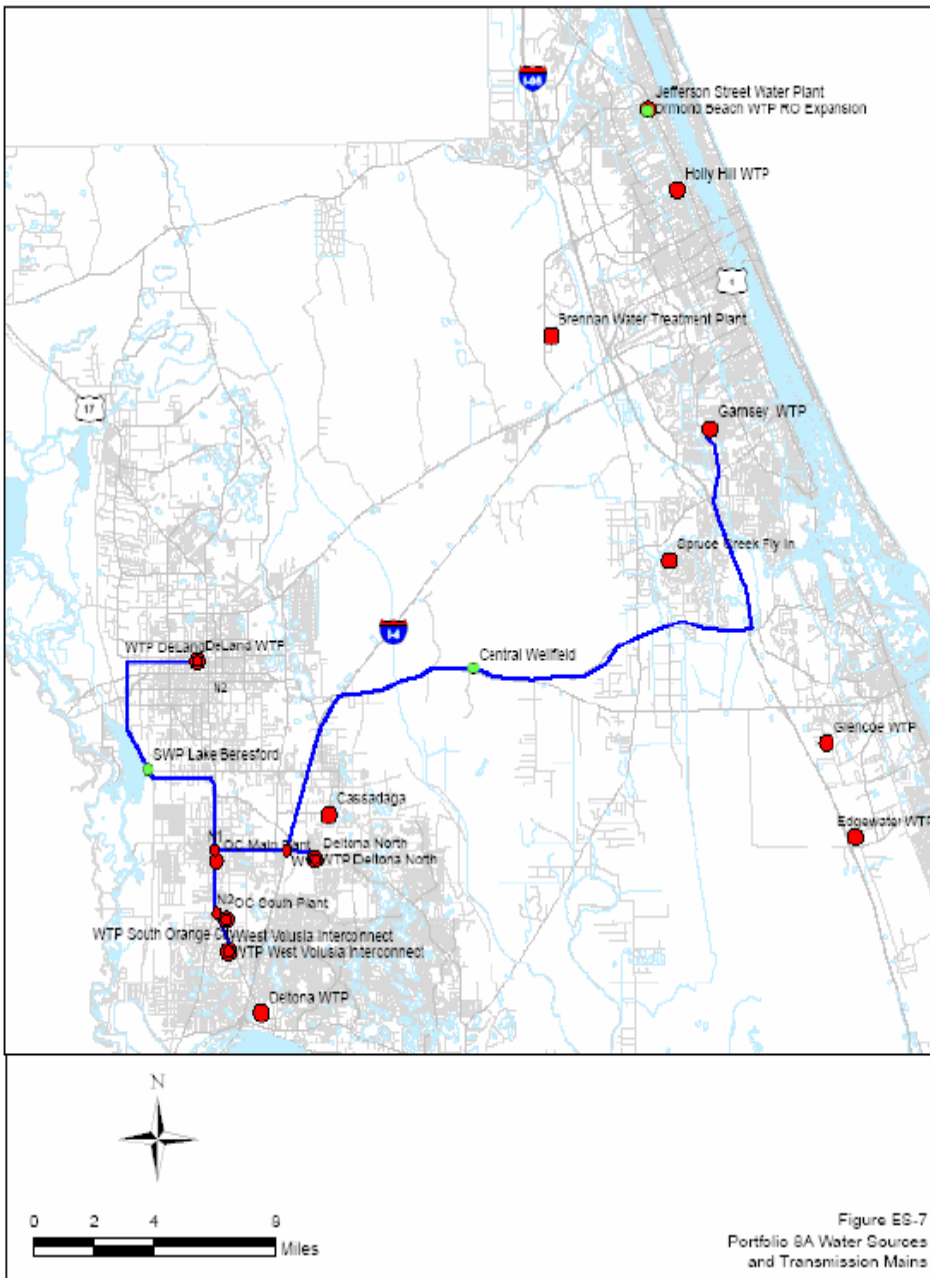
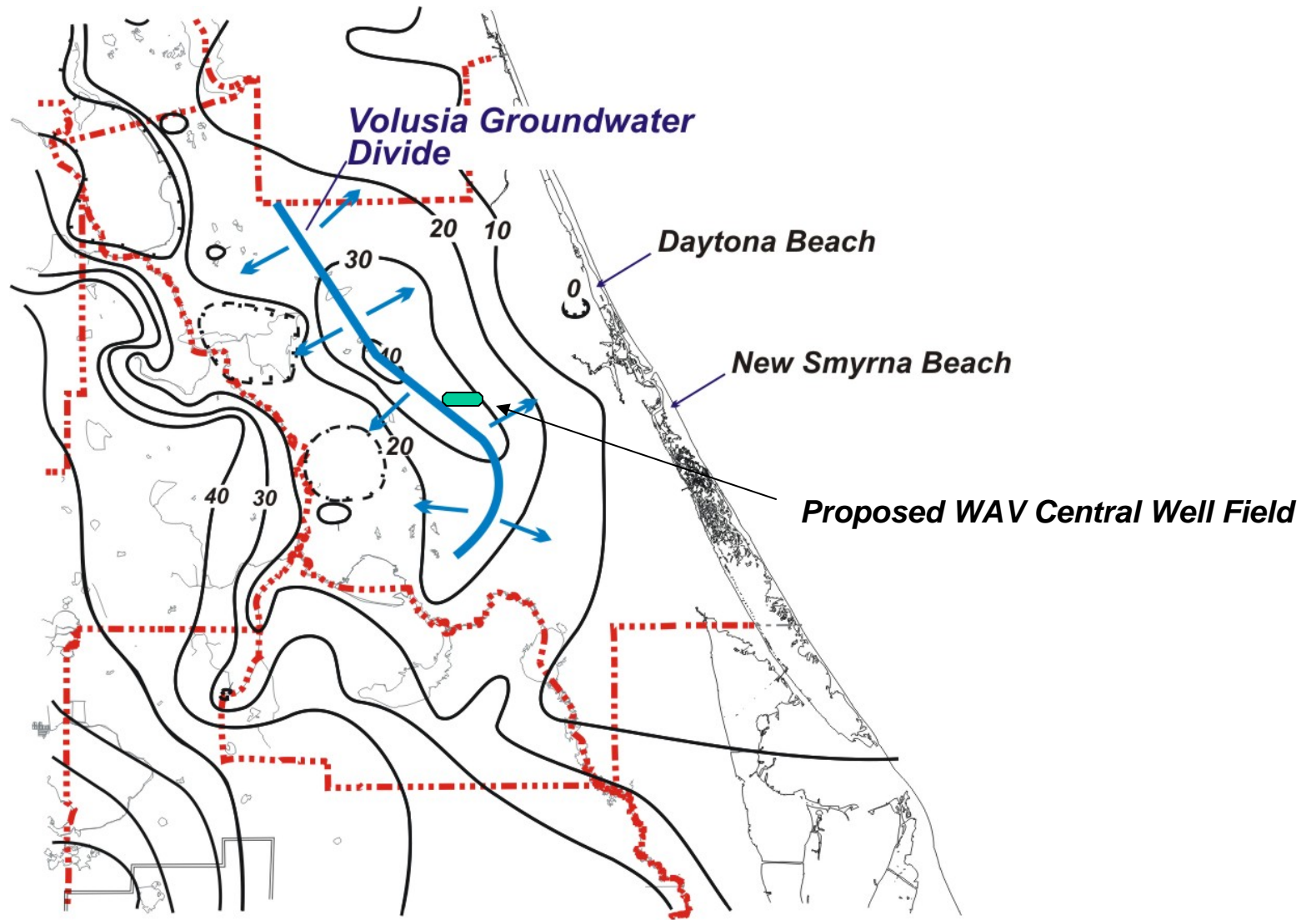


Figure ES-7
Portfolio 8A Water Sources
and Transmission Mains

The Central Wellfield is a few miles west of the UC's most western existing well as seen on page ES-16 of the WAV Master Plan in Figure ES-7. **There are no indicated interconnections to the UC with this transmission pipeline, which may be constructed coincident when the WAV Central Wellfield is nearing operation in 2020.** The location of this large capacity WAV Central well field is very near the Volusia Groundwater Divide, which separates groundwater flows and recharge areas between eastern and western Volusia County. Based upon the existence of this divide, it appears that the WAV Surface Water Plant and WAV Ormond RO Plant would not benefit eastern Volusia cities and would not provide additional capability for water withdrawal for eastern Volusia cities as previously presented by WAV. Additionally, the proposed WAV well field presumes additional withdrawal capacity of 11 MGD. Whether this proposed WAV central wellfield will adversely affect the UC's existing wellfield is unknown, **the UC should presume that, due to the anticipated large capacity withdrawal rate, the effect would be adverse to southeastern Volusia cities.**

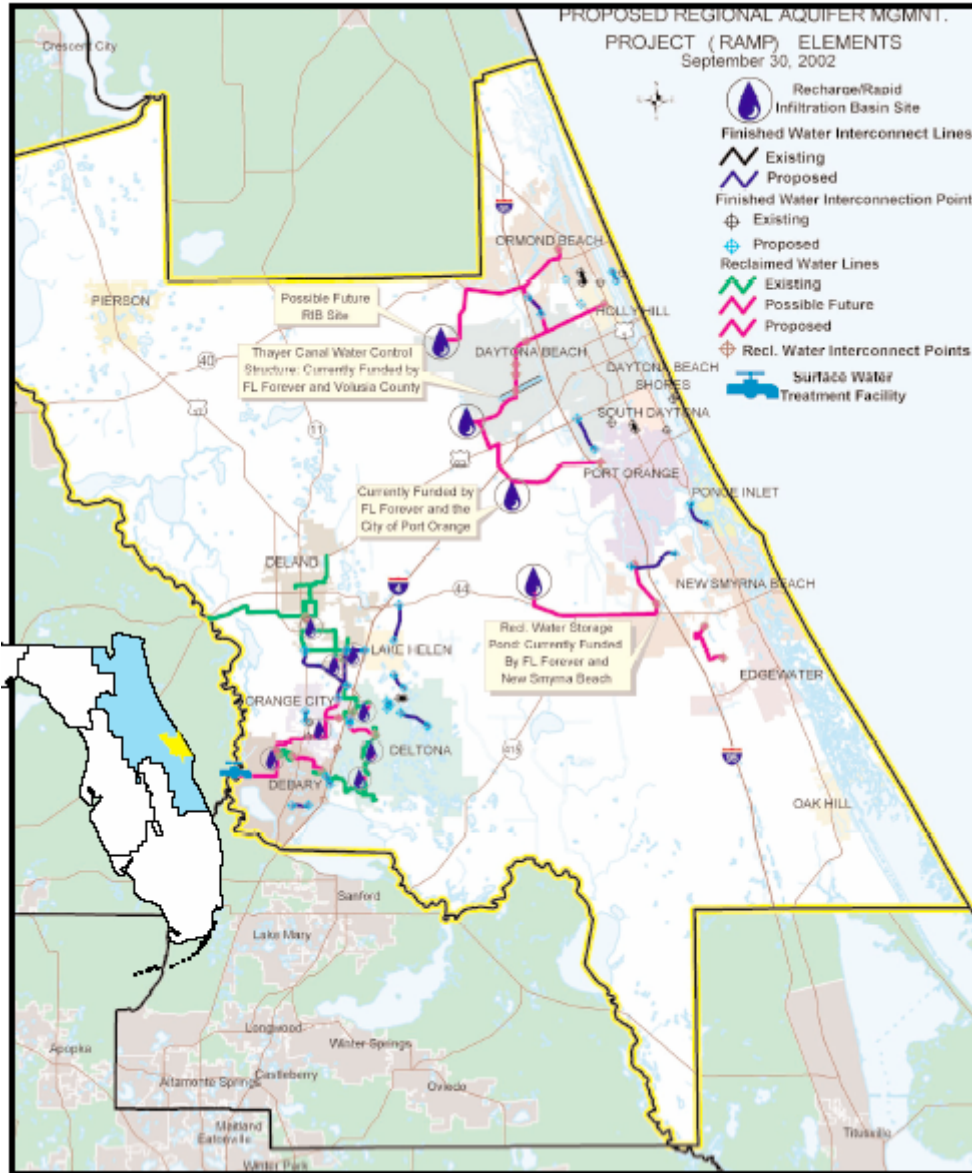


Groundwater Flow Direction 

Contour interval is 10 feet
After Kinnaman (2006)

0  20 miles

Source: Thomas M. Missimer, Ph.D., P.G.
Missimer Groundwater Science, Inc.



TAKE AWAYS

- **The current water use by the City of New Smyrna Beach from the upper part of the Floridan Aquifer System does not impact the flow of water from Volusia Blue Spring.**
- **There is a groundwater divide between eastern and western Volusia County that clearly separates the impacts of those areas into their respective groundwater basins.**

Source: Thomas M. Missimer, Ph.D., P.G.
Missimer Groundwater Science, Inc.

Generation Strategy 2007-2016 *

- Improve transmission reliability employing a 230 kV source.
- Secure local or grid contract for additional (20MW) base load power or equity ownership of base load in low risk, low cost plant.
- Secure additional (40 MW) intermediate contracts, 7 X 16 strips short-term, for flexible schedule or seasonal non-firm load.
- Secure additional multi-unit, multi-fuel local peaking and intermediate contract-hedge power (50MW) or joint ownership facility and replacing (20MW) of existing units with new fuel efficient heavy duty simple cycle turbine or lean-burn, low emission reciprocating engines.
- Secure up to (80MW) of local renewable and/or water co-product generation that can load-follow and be classed as firm-dispatch through local private ownership with a UC purchase option or partnership generation contract with the intention to replace or complement intermediate contracts based on generation dispatch capability.
- Sell excess as available.

* ~2016 Outcome: Base load- 40MW, Intermediate flexible contracts- 40-80MW, Peaking-- 100MW, Renewable-- 80MW.

WATER SUPPLY STRATEGIES 2007-2016

- Enhance conservation through policy, education, conservation devices, developer-builder options, and rate structure.
- On existing UC property, develop drought tolerant alternate source employing non-potable/potable sources (up to 5mgd) employing surficial wells and/or multiple deep saline aquifer wells for withdrawal and/or injection to supply non-potable pond storage or potable supply piped to Glencoe.
- Secure up to (5mgd) of local water co-product generation, local private ownership with a UC purchase option or local partnership contract.
- Enhance local interconnection plans to include remote status and operation.
- Incorporate emergency potable water processing capability.

WAV PROS AND CONS FOR PROVIDING WATER TO THE UC/NSB

- Long-term, the resources of a larger organization specializing in water production and treatment should be an advantage.
- Although larger is better for central electrical generation projects, there does not seem to be the same economy of scale with large scale water projects.
- WAV is likely to obtain better funding, grants, and bonding rates even though unproven in the marketplace.
- There is no institutional knowledge to implement the plan. Plans are always about execution.
- Despite claims that the aquifer is relieved by the proposed SJR plants, the recharge of the aquifer is actually split into east and west. It also appears that the proposed CW plant will help western Volusia and that the Central Wellfield will stress the east Volusia aquifer, if approved.
- The proposed transmission main has the potential to provide raw water in 2020, which will require disinfectant, mineralizing, filtering, and mixing with well-based water supplies.
- WAV does not appear capable of meeting 2011-2012 time frame or be flexible to adjust to short-term notice.
- WAV funding costs are likely to exceed local solution costs with no equity ownership, 40 years of mandatory pass-through payments and bonding restrictions, and other obligations, notwithstanding UC Charter issues.

UC PROS AND CONS FOR PROVIDING WATER FOR NSB

- There is institutional knowledge to execute plans in providing well-based water and treatment.
- There is no internal knowledge or experience for the technologies expected to be employed. Although proven technologies are expected, risk will be greater than experienced previously. Additional regulatory oversight and scrutiny is expected.
- The strategy anticipates modular, flexible, and right-sized units for UC requirements and production costs are expected to be similar to other alternative water sources, which will require disinfectant, mineralizing, filtering, and mixing with well-based water supplies.
- Assets are owned and controlled by the citizens of NSB.
- UC funding is very limited although grants and bond rates should be favorable.
- Available funds for the water plan are competing with investment needed for existing infrastructure and growth-related temporary investment.
- Potential to partner with a private or other public firm and combine water and power needs into a the same project.
- Since the water need is growth-driven, the pace can be adjusted or stopped.