

## MDWASD/SFWMD AGREEMENT - ITEM VI.a REVISED WATER DEMAND NUMBERS

### Background

Effective May 10, 2006, Miami-Dade County signed an Interim Water Consumptive Use Agreement (the AGREEMENT) with the South Florida Water Management District (SFWMD), which allowed the Miami-Dade Water and Sewer Department (MDWASD) to withdraw approximately 350 million gallons per day (mgd) from the Biscayne Aquifer, over the subsequent 18 months (to November, 2007, during which time the MDWASD is to complete the task set forth in AGREEMENT Table 1 of the AGREEMENT. Table Item VI.a of the AGREEMENT requires MDWASD to identify, within 270 days from the execution of the AGREEMENT, demands for raw water as necessary to develop the well field operational program. The enclosed Tables satisfy this requirement within the 270 day time frame (by February 5, 2007).

### Description

The enclosed Tables present the MDWASD projected annual water demand needs by current and proposed alternative water supply means and sources through 2030. The tables project water demands assuming that all current large users/wholesalers except the City of North Miami Beach (CNMB) remain in the MDWASD system through 2030. The tables encompass the 20 year WUP period and are described as follows:

<u>Table</u>	<u>Description</u>
A	Combined Biscayne Aquifer and AWS Water Demand Projections to meet AADD Finished Water Demand based on 155 gpcd
B	Actual Finished Water "GPCD" Projections accounting for finish water reduction due to water conservation and reuse to supplement potable irrigation
C	Combined Biscayne Aquifer and AWS Finished Water Demand and Raw Water Supply Projections using Actual projected "GPCD", the AWS supply projects and the estimated raw water to supply the various AWS projects
D	Combined Biscayne Aquifer and AWS Water Demand Projections with resulting annual contingency/surplus of AWS, exclusive of Coastal Wetland Rehydration AWS Credit (Note the data in Table D is also presented graphically).

### Other

As noted above, these tables are based on premise that all current wholesalers, except CNMB, remain as large users of the MDWASD system through 2030. Over the next few weeks CDM will evaluate scenarios that exclude the City of Hialeah and perhaps other wholesalers that drop out before 2030 from the population projections and consider options available to MDWASD based on these scenarios.

File: 6430-55760-059.RPT

Enclosure

**TABLE A (2/2/2007)**  
**Miami-Dade County Water and Sewer Department**  
**Average Annual Daily Demand (AADD) Finished Water (MGD)**  
**20 Year WUP Combined Biscayne Aquifer and AWS Water Demand Projection**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Year	Population Served*	Biscayne Aquifer Raw Water(a) (MGD)	Finished Water (gpcd)	AADD Finished Water(a),(b) (MGD)	Water Conservation(d)	Finished Water Gap (MGD)	Upper Floridan Aquifer (UFA) RO WTP(e) (MGD)	Finished Water Gap (MGD)	UFA Blending(f) (MGD)	Finished Water Gap (MGD)	Reuse/ Reclaimed Water(g) (MGD)	Finished Water Gap (MGD)	Alternative SDWWTP GWR(h) (MGD)	Finished Water SURPLUS(i) (MGD)
<b>TOTAL MDWASD WATER SYSTEM SERVICE AREA</b>														
2000	2,039,828	346.20	166.68	340.00										
2003	2,130,307	344.80	158.80	338.30										
2004	2,157,559	340.34	157.40	339.60										
2005	2,190,625	346.50	155.25	340.10										
2006**	2,200,000	347.30	154.91	340.80										
2007	2,250,944	0.00	155	348.90	1.11	6.98	0.0	6.98	7.4	-0.42	0.00	-0.42	0.00	0.42
2008	2,230,895	0.00	155	345.79	2.22	2.77	0.0	2.77	7.4	-4.63	0.00	-4.63	0.00	4.63
2009	2,260,476	0.00	155	350.37	3.45	6.13	0.0	6.13	12.2	-6.07	0.00	-6.07	0.00	6.07
2010	2,290,058	0.00	155	354.96	4.67	9.49	0.0	9.49	12.2	-2.71	3.00	-5.71	0.00	5.71
2011	2,319,639	0.00	155	359.54	5.90	12.84	10.0	2.84	12.2	-9.36	3.00	-12.36	0.00	12.36
2012	2,349,221	0.00	155	364.13	6.30	17.03	10.0	7.03	12.2	-5.17	3.00	-8.17	0.00	8.17
2013	2,378,803	0.00	155	368.71	6.69	21.22	10.0	11.22	12.2	-0.98	3.00	-3.98	0.00	3.98
2014	2,408,385	0.00	155	373.30	7.11	25.39	10.0	15.39	12.2	3.19	3.00	0.19	18.00	17.81
2015	2,438,819	0.00	155	378.02	7.50	29.72	10.0	19.72	12.2	7.52	4.00	3.52	18.00	14.48
2016	2,463,169	0.00	155	381.79	7.90	33.09	10.0	23.09	12.2	10.89	4.00	6.89	18.00	11.11
2017	2,487,519	0.00	155	385.57	8.27	36.50	10.0	26.50	12.2	14.30	4.00	10.30	18.00	7.70
2018	2,511,869	0.00	155	389.34	8.63	39.91	15.0	24.91	12.2	12.71	4.00	8.71	18.00	9.29
2019	2,536,219	0.00	155	393.11	9.01	43.30	15.0	28.30	12.2	16.10	4.00	12.10	18.00	5.90
2020	2,560,569	0.00	155	396.89	9.37	46.72	15.0	31.72	12.2	19.52	4.00	15.52	18.00	2.48
2021	2,584,918	0.00	155	400.66	9.74	50.12	15.0	35.12	12.2	22.92	4.00	18.92	38.00	19.08
2022	2,609,268	0.00	155	404.44	10.11	53.53	15.0	38.53	12.2	26.33	4.00	22.33	38.00	15.67
2023	2,633,618	0.00	155	408.21	10.48	56.93	15.0	41.93	12.2	29.73	4.00	25.73	38.00	12.27
2024	2,657,968	0.00	155	411.99	10.84	60.35	15.0	45.35	12.2	33.15	4.00	29.15	38.00	8.85
2025	2,682,318	0.00	155	415.76	11.21	63.75	15.0	48.75	12.2	36.55	4.00	32.55	38.00	5.45
2026	2,706,668	0.00	155	419.53	11.58	67.15	15.0	52.15	12.2	39.95	4.00	35.95	53.00	17.05
2027	2,731,018	0.00	155	423.31	11.95	70.56	15.0	55.56	12.2	43.36	4.00	39.36	53.00	13.64
2028	2,755,368	0.00	155	427.08	12.31	73.97	17.5	56.47	12.2	44.27	4.00	40.27	53.00	12.73
2029	2,779,718	0.00	155	430.86	12.68	77.37	17.5	59.87	12.2	47.67	4.00	43.67	53.00	9.33
2030	2,804,068	0.00	155	434.63	13.05	80.78	17.5	63.28	12.2	51.08	4.00	47.08	53.00	5.92

**Footnotes:**

\* Population projection associated with City of North Miami Beach (CNMB) extracted from 2006\*\* historical projections. Projections beyond 2008 exclude population from CNMB.

\*\* Average demands for 2006\*\* represent 12 months preceeding 4/1/2006.

a. Average demands from 2000 - 2005 represent actual usage taken from raw and finished water historical data. Average demands for 2006\*\* represent the 12 months preceeding 4/1/2006.

b. Finished Projections between 2010 and 2030 assume 155 gpcd total water system demand. North Miami Beach drops out in 2008. North Miami is included through 2030.

c. Not used.

d. WASD will be undertaking the 20-year water conservation plan and expects reductions in unaccounted for water (UFW). Water Conservation projections were taken from a Water Conservation Best Management Practices (BMP) Planning Spreadsheet prepared by Malcolm Pirnie, Inc. dated 1/23/2007. Values reflect projections as of 2/2/2007. Water conservation projections do not reflect water demand reductions presented by the "Unaccounted Water Loss Reduction Plan (February 2007)" prepared by Malcolm Pirnie, Inc. and currently under review by MDWASD.

e. New Upper Floridan Aquifer Reverse Osmosis (RO) Water Treatment Plant (WTP) (10.0 mgd Phase I by 2011); (5.0 MGD Phase II by 2018); (2.5 MGD Phase III by 2028).

f. Floridan Aquifer Blending at Alexander Orr Water Treatment Plant (assuming 4% of Finished Water Demand) (7.4 mgd) by 2007 including ASR (wet season). Hialeah/Preston Aquifer Blending Wellfield or equal (assumes 3% of Finished Water Demand) at Hialeah-Preston (4.8 mgd) by 2009.

g. Tentative Alternative Water Supply Reuse/Reclaimed Water Projects (exclusive of any BBCW rehydration AWS credits) by 2015 to replace existing finished water demand (gallon for gallon credit).

- |  |             |
|--|-------------|
| 1. Biscayne Landings/ North Miami Stadium/ North District WWTP and vicinity                  | 2.0 mgd +/- |
| 2. Key Biscayne/ Crandon Park/Virginia Key Redevelopments/Central District WWTP and vicinity | 1.0 mgd +/- |
| 3. SDWWTP Coastal Demonstration Plant Conversion to reuse/reclaimed water by 2015.           | 1.0 mgd +/- |
|  | 4.0 mgd +/- |

h. Groundwater Replenishment (GWR) from South District (Phase I=18.0 mgd by 2014; Phase II = 20.0 mgd by 2021; Phase III = 15.0 mgd by 2026)

i. Exclusive of Coastal Wetland Rehydration AWS Credits.

**TABLE B (2/2/2007)**  
**Miami-Dade County Water and Sewer Department**  
**Average Annual Daily Demand (AADD) Finished Water (MGD)**  
**20 Year WUP Actual Finished Water "GPCD" Projection**

1	2	3	4	5	6	7	8	9
Year	Population Served*	Finished Water (gpcd)	AADD Finished Water(a),(b) (MGD)	Water Conservation(d)	Finished Water Gap (MGD)	Reuse/ Reclaimed Water(g) (MGD)	Finished Water Gap (MGD)	Actual Finished Water GPCD
<b>TOTAL MDWASD WATER SYSTEM SERVICE AREA</b>								
2007	2,250,944	155	348.90	1.11	347.78	0.00	347.78	155
2008	2,230,895	155	345.79	2.22	343.57	0.00	343.57	154
2009	2,260,476	155	350.37	3.45	346.93	0.00	346.93	153
2010	2,290,058	155	354.96	4.67	350.29	3.00	347.29	152
2011	2,319,639	155	359.54	5.90	353.64	3.00	350.64	151
2012	2,349,221	155	364.13	6.30	357.83	3.00	354.83	151
2013	2,378,803	155	368.71	6.69	362.02	3.00	359.02	151
2014	2,408,385	155	373.30	7.11	366.19	3.00	363.19	151
2015	2,438,819	155	378.02	7.50	370.52	4.00	366.52	150
2016	2,463,169	155	381.79	7.90	373.89	4.00	369.89	150
2017	2,487,519	155	385.57	8.27	377.30	4.00	373.30	150
2018	2,511,869	155	389.34	8.63	380.71	4.00	376.71	150
2019	2,536,219	155	393.11	9.01	384.10	4.00	380.10	150
2020	2,560,569	155	396.89	9.37	387.52	4.00	383.52	150
2021	2,584,918	155	400.66	9.74	390.92	4.00	386.92	150
2022	2,609,268	155	404.44	10.11	394.33	4.00	390.33	150
2023	2,633,618	155	408.21	10.48	397.73	4.00	393.73	150
2024	2,657,968	155	411.99	10.84	401.15	4.00	397.15	149
2025	2,682,318	155	415.76	11.21	404.55	4.00	400.55	149
2026	2,706,668	155	419.53	11.58	407.95	4.00	403.95	149
2027	2,731,018	155	423.31	11.95	411.36	4.00	407.36	149
2028	2,755,368	155	427.08	12.31	414.77	4.00	410.77	149
2029	2,779,718	155	430.86	12.68	418.17	4.00	414.17	149
2030	2,804,068	155	434.63	13.05	421.58	4.00	417.58	149

**Footnotes:**

\* Projections beyond 2008 exclude population from City of North Miami Beach (CNMB).

a. Not used

b. Finished Projections between 2010 and 2030 assume 155 gpcd total water system demand. North Miami Beach drops out in 2008. North Miami is included through 2030.

c. Not used.

d. WASD will be undertaking the 20-year water conservation plan and look at ways for reducing unaccounted for water (ufw). Water Conservation projections were taken from a Water Conservation Best Management Practices (BMP) Planning Spreadsheet prepared by Malcolm Pirnie, Inc. dated 1/23/2007. Values reflect projections as of 2/2/2007. Water conservation projections do not reflect water demand reductions presented by the "Unaccounted Water Loss Reduction Plan (February 2007)" prepared by Malcolm Pirnie, Inc. and currently under review by MDWASD.

e. Not used.

f. Not used

g. Tentative Alternative Water Supply Reuse/Reclaimed Water Projects (exclusive of any BBCW rehydration AWS credits) by 2015 to replace existing finished water demand (gallon for gallon credit)

- |   |                    |
|---|--------------------|
| 1. Biscayne Landings/ North Miami Stadium/ North District WWTP and vicinity         | 2.0 mgd +/-        |
| 2. Key Biscayne/ Crandon Park/Virginia Key Redevelopments/Central District WWTP and | 1.0 mgd +/-        |
| 3. SDWWTP Coastal Demonstration Plant Conversion to reuse/reclaimed water by 2015   | 1.0 mgd +/-        |
| <b>Total (est.)</b>   | <b>4.0 mgd +/-</b> |

TABLE C (2/2/2007)  
 Miami-Dade County Water and Sewer Department  
 Average Annual Daily Demand (AADD) Finished Water (MGD)  
 20 Year WUP Combined Biscayne Aquifer and AWS Finished Water Demand and Raw Water Supply Projection

1	2	3	4	5	6	7	8	9	10	11	12
PROJECTIONS				FINISHED WATER SUPPLY BY SOURCE						RAW WATER BY SOURCE	
Year	Population Served*	Actual Finished Water(a) (gpcd)	Finished Water Demand (MGD)	Biscayne Aquifer Base 2006** Finished Water Allocation(c) (MGD)	Upper Floridan Aquifer (UFA) Blending(f) (MGD)	UFA RO WTP(e) (MGD)	Groundwater Replenished Biscayne Aquifer(h) (MGD)	AADD Finished Water Supply Available	Finished Water SURPLUS(i) (MGD)	Biscayne Aquifer (MGD)	Upper Floridan Aquifer (MGD)
<b>TOTAL MDWASD WATER SYSTEM SERVICE AREA</b>											
2007	2,250,944	155	347.78	340.80	7.40	0.00	0.00	348.20	0.42	347.80	7.62
2008	2,230,895	154	343.57	340.80	7.40	0.00	0.00	348.20	4.63	347.80	7.62
2009	2,260,476	153	346.93	340.80	12.20	0.00	0.00	353.00	6.07	347.80	12.42
2010	2,290,058	152	347.29	340.80	12.20	0.00	0.00	353.00	5.71	347.80	12.42
2011	2,319,639	151	350.64	340.80	12.20	10.00	0.00	363.00	12.36	347.80	25.76
2012	2,349,221	151	354.83	340.80	12.20	10.00	0.00	363.00	8.17	347.80	25.76
2013	2,378,803	151	359.02	340.80	12.20	10.00	0.00	363.00	3.98	347.80	25.76
2014	2,408,385	151	363.19	340.80	12.20	10.00	18.00	381.00	17.81	370.30	25.76
2015	2,438,819	150	366.52	340.80	12.20	10.00	18.00	381.00	14.48	370.30	25.76
2016	2,463,169	150	369.89	340.80	12.20	10.00	18.00	381.00	11.11	370.30	25.76
2017	2,487,519	150	373.30	340.80	12.20	10.00	18.00	381.00	7.70	370.30	25.76
2018	2,511,869	150	376.71	340.80	12.20	15.00	18.00	386.00	9.29	370.30	32.42
2019	2,536,219	150	380.10	340.80	12.20	15.00	18.00	386.00	5.90	370.30	32.42
2020	2,560,569	150	383.52	340.80	12.20	15.00	18.00	386.00	2.48	370.30	32.42
2021	2,584,918	150	386.92	340.80	12.20	15.00	38.00	406.00	19.08	390.90	32.42
2022	2,609,268	150	390.33	340.80	12.20	15.00	38.00	406.00	15.67	390.90	32.42
2023	2,633,618	150	393.73	340.80	12.20	15.00	38.00	406.00	12.27	390.90	32.42
2024	2,657,968	149	396.04	340.80	12.20	15.00	38.00	406.00	9.96	406.35	32.42
2025	2,682,318	149	400.55	340.80	12.20	15.00	38.00	406.00	5.45	390.90	32.42
2026	2,706,668	149	403.95	340.80	12.20	15.00	53.00	421.00	17.05	406.35	32.42
2027	2,731,018	149	407.36	340.80	12.20	15.00	53.00	421.00	13.64	406.35	32.42
2028	2,755,368	149	410.77	340.80	12.20	17.50	53.00	423.50	12.73	406.35	35.76
2029	2,779,718	149	414.17	340.80	12.20	17.50	53.00	423.50	9.33	406.35	35.76
2030	2,804,068	149	417.58	340.80	12.20	17.50	53.00	423.50	5.92	406.35	35.76

**Footnotes:**

\* Projections beyond 2008 exclude population from City of North Miami Beach (CNMB).

\*\* Average demands for 2006\*\* represent 12 months preceeding 4/1/2006.

a. As projected in Table Five

b. Not used

c. The 340.8 MGD of finished water base allocation equates to 347.3 MGD of Biscayne Aquifer raw water withdrawal for the 12 months prior to April 1, 2006.

d. Not used

e. UFA Raw Water = Finished Water/0.75

f. UFA Blending

1. Hialeah - Preston: 1:1 Raw Water:Finished Water

2. Alex - Orr: 1.03:1 Raw Water: Finished Water

g. Tentative Alternative Water Supply Reuse/Reclaimed Water Projects to replace existing finished water demand (gallon for gallon credit).

h. South Miami Heights: Biscayne Aquifer Raw Water = Finished Water/0.80

Alex - Orr: Biscayne Aquifer Raw Water = Finished Water x 1.03

i. Exclusive of Coastal Wetlands Rehydration AWS Credit

**TABLE D (2/2/2007)**  
**Miami-Dade County Water and Sewer Department**  
**Average Annual Daily Demand (AADD) Finished Water (MGD)**  
**20 Year WUP Combined Biscayne Aquifer and AWS Water Demand Projection**

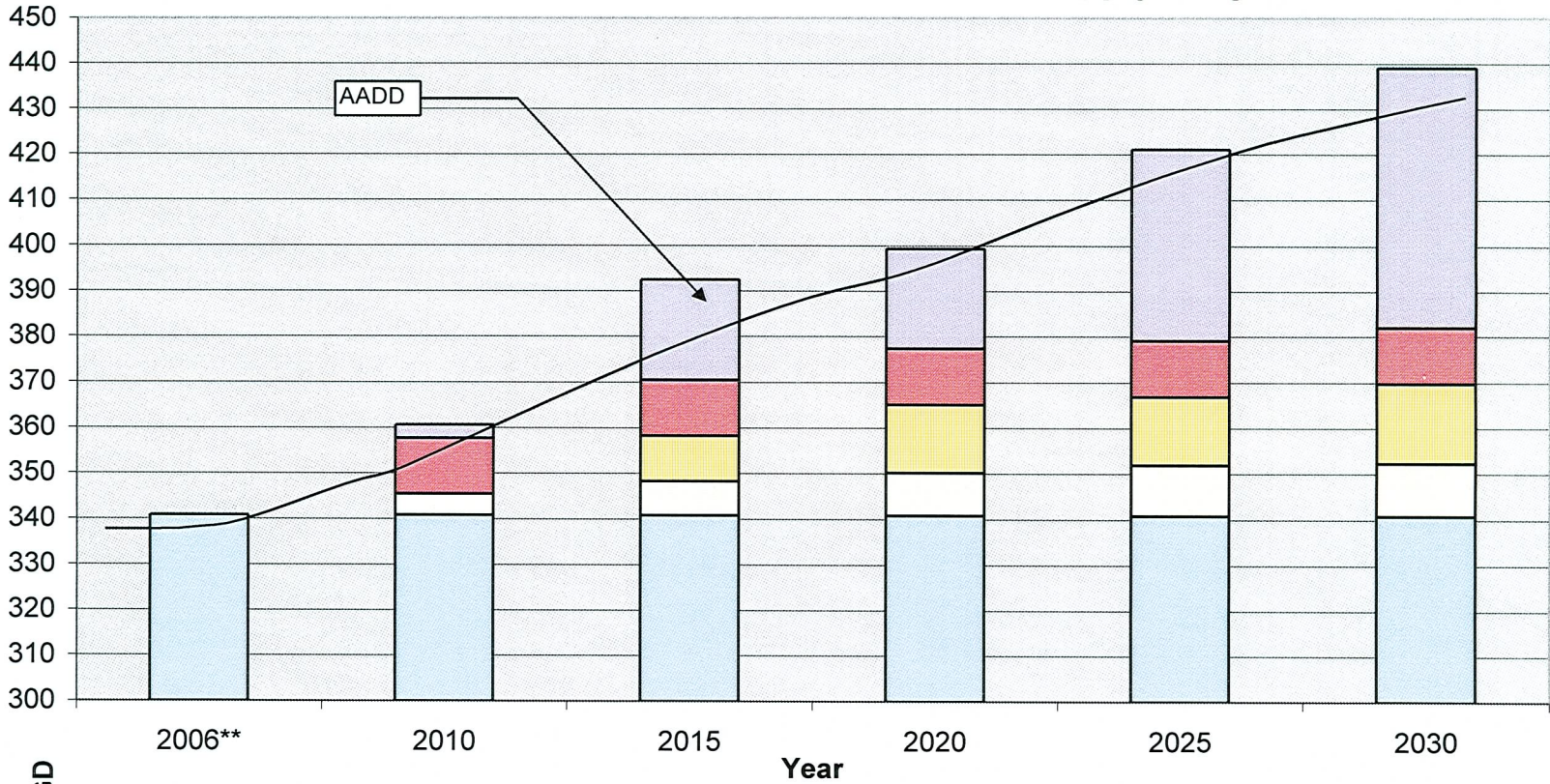
1	2	3	4	5	6	7	8	9
Year	AADD Finished Water(a),(b) (MGD)	Biscayne Aquifer Base Finished Water Allocation (c) (MGD)	Water Conservation(d)	Upper Floridan Aquifer RO WTP (e) (MGD)	UFA Blending(f) (MGD)	Reuse/ Reclaimed Water(g) (MGD)	Totals	Contingency/ Surplus(h)
<b>TOTAL MDWASD WATER SYSTEM SERVICE AREA</b>								
2006**	340.80	340.80						
2007	348.90	340.80	1.11	0.0	7.4	0.0	349.31	0.42
2008	345.79	340.80	2.22	0.0	7.4	0.0	350.42	4.63
2009	350.37	340.80	3.45	0.0	12.2	0.0	356.45	6.07
2010	354.96	340.80	4.67	0.0	12.2	3.0	360.67	5.71
2011	359.54	340.80	5.90	10.0	12.2	3.0	371.90	12.36
2012	364.13	340.80	6.30	10.0	12.2	3.0	372.30	8.17
2013	368.71	340.80	6.69	10.0	12.2	3.0	372.69	3.98
2014	373.30	340.80	7.11	10.0	12.2	21.0	391.11	17.81
2015	378.02	340.80	7.50	10.0	12.2	22.0	392.50	14.48
2016	381.79	340.80	7.90	10.0	12.2	22.0	392.90	11.11
2017	385.57	340.80	8.27	10.0	12.2	22.0	393.27	7.70
2018	389.34	340.80	8.63	15.0	12.2	22.0	398.63	9.29
2019	393.11	340.80	9.01	15.0	12.2	22.0	399.01	5.90
2020	396.89	340.80	9.37	15.0	12.2	22.0	399.37	2.48
2021	400.66	340.80	9.74	15.0	12.2	42.0	419.74	19.08
2022	404.44	340.80	10.11	15.0	12.2	42.0	420.11	15.67
2023	408.21	340.80	10.48	15.0	12.2	42.0	420.48	12.27
2024	411.99	340.80	10.84	15.0	12.2	42.0	420.84	8.85
2025	415.76	340.80	11.21	15.0	12.2	42.0	421.21	5.45
2026	419.53	340.80	11.58	15.0	12.2	57.0	436.58	17.05
2027	423.31	340.80	11.95	15.0	12.2	57.0	436.95	13.64
2028	427.08	340.80	12.31	17.5	12.2	57.0	439.81	12.73
2029	430.86	340.80	12.68	17.5	12.2	57.0	440.18	9.33
2030	434.63	340.80	13.05	17.5	12.2	57.0	440.55	5.92

**Footnotes:**

- a. Average annual daily demands of finished water for 2006\*\* represent the 12 months preceeding 4/1/2006 per proposed SFWMD Rule and equate to 347.8 MGD of Biscayne Aquifer raw water withdrawal.
- b. Finished AADD Projections between 2010 and 2030 assume 155 gpcd total water system demand. North Miami Beach drops out in 2008. Hialeah and North Miami are included through 2030.
- c. Finished water base allocation of 340.8 MGD equates to 347.3 MGD of Biscayne Aquifer raw water withdrawal.
- d. WASD will be undertaking the 20-year water conservation plan and expects reductions in unaccounted for water (UFW). Water Conservation projections were taken from a Water Conservation Best Management Practices (BMP) Planning Spreadsheet prepared by Malcolm Pirnie, Inc. dated 1/23/2007. Values reflect projections as of 2/2/2007. Water conservation projections do not reflect water demand reductions presented by the "Unaccounted Water Loss Reduction Plan (February 2007)" prepared by Malcolm Pirnie, Inc. and currently under review by MDWASD.
- e. New Upper Floridan Aquifer RO WTP (10.0 mgd Phase I by 2011); (5.0 MGD Phase II by 2018); (2.5 MGD Phase III by 2028).
- f. Floridan Aquifer Blending at Alexander Orr Water Treatment Plant (assuming 4% of Finished Water Demand) (7.4 mgd) by 2007 including ASR (wet season). Hialeah/Preston Floridan Aquifer Blending Wellfield (or equal) (assumes 3% of Finished Water Demand) (4.8 mgd) by 2009.
- g. Tentative Alternative Water Supply Reuse/Reclaimed Water Projects (exclusive of any BBCW rehydration AWS credits) by 2015 to replace existing finished water demand (gallon for gallon credit).
- |  |                     |
|--|---------------------|
| 1. Biscayne Landings/ North Miami Stadium/ North District WWTP and vicinity  | 2.0 mgd +/-         |
| 2. Key Biscayne/ Crandon Park/Virginia Key Redevelopments/Central District WWTP and vicinity   | 1.0 mgd +/-         |
| 3. SDWWTP Coastal Demonstration Plant Conversion to Reuse/Reclaimed Water by 2015  | 1.0 mgd +/-         |
| 4. Groundwater Replenishment (GWR) from South District (Phase I=18.0 mgd by 2014; Phase II = 20.0 mgd by 2021; Phase III = 15.0 mgd by 2026) | 53.0 mgd +/-        |
| <b>Total (est.)</b>  | <b>57.0 mgd +/-</b> |
- h. Exclusive of Coastal Welland Rehydration AWS Credits.



## MDWASD Finished Water Demand and Water Supply Projections



MGD

- Base Biscayne Aquifer Allocation
  - Water Conservation
  - Upper Floridan Aquifer RO WTP
  - Upper Floridan Aquifer Blending
  - Reuse/Reclaimed Water
- AADD = Annual Average Daily Demand