APPENDIX 2AA

TRANSDUCER DATA

APPENDIX 2AA TABLE OF CONTENTS

APPENDIX 2AA LIST OF TABLES

1.0 TRANSDUCER DATA

In-Situ pressure transducers were installed in 20 observation wells and 2 surface water monitoring locations to collect water level data in the Units 6 & 7 plant area. Monitoring locations are shown in Figure 2.4.12-209.

In general the transducers were programmed to collect readings once an hour. However, the readings were collected every 5 minutes at some locations for parts of the second and third quarters (October 2008 to May 2009) of data collection. All transducer locations with the exception of SW-1 and SW-2 monitor groundwater levels. SW-1 and SW-2 monitor the surface water level in the cooling canals surrounding the site.

The monitoring well naming convention uses U/L notation to identify which zone the well is monitoring, the Key Largo Limestone is designated as the upper zone (U) and the Fort Thompson Formation is designated as the lower zone (L). For example, OW-606U is observation well 606 that monitors the upper zone.

Since the groundwater at the site is saline to hypersaline in composition, the density of the groundwater is a factor when evaluating hydrostatic loading or other head considerations. Specific conductance measurements were taken in February 2009, November 2009, January 2010, and June 2010 using a water quality meter and a flow-through cell. These measurements were used to make density corrections to water surface elevation calculations. These corrections employed the observed pressure and water density at each transducer to determine the water level in each well. Temperature measurements and calculated salinity values from formulae presented in Reference 1 were used to compute water density following the methodology outlined in Reference 2. A summary of the water densities calculated are presented on Tables 2AA-201, 2AA-202, 2AA-203, and 2AA-218. The average water density in the upper monitoring zone is 1.037 grams per cubic centimeter (64.7 pounds per cubic foot). The average water density in the lower monitoring zone is 1.034 grams per cubic centimeter (64.5 pounds per cubic foot).

The water densities were individually assigned based on specific conductance measurements taken at each location. Water level data collected prior to May 27, 2009 (start of the 4th Quarter data set) were assigned the water densities collected in February 2009. Fourth quarter data (late May to late August, 2009) were assigned the average of the water densities collected in February 2009 and November 2009. Fifth quarter data (late August 2009 to mid November 2009) were assigned the water densities collected in November 2009. Sixth quarter data

(mid November 2009 to early February 2010) were assigned the average of the densities collected in November 2009 and February 2010. Seventh quarter data (February 2010 to June 2010) were assigned the average of the densities collected in February 2010 and June 2010.

2.0 REFERENCE HEADS

The head observed in a well varies with pressure, elevation, and water density. Two points in an aquifer that have equal pressures and elevations but different water densities will have different heads (Reference 3 and Reference 4). As shown in Tables 2AA-201, 2AA-202, 2AA-203, and 2AA-218, the calculated densities for the monitoring locations vary. Because the observed head in each well is dependent on density which varies from well to well, reference heads were calculated for each well to provide density normalized head values. Reference heads are used to generate potentiometric surface contour maps and calculate horizontal gradients.

Reference heads are calculated from observed head and density in each well with the following equation (equation 12 from Reference 6):

$$h_r = z_r + \frac{\rho_i}{\rho_r}(h_i - z_i) - \frac{\rho_a}{\rho_r}(z_r - z_i) \quad (1)$$

where:

h_r is the reference head (length — meters or feet as long as consistent)

h_i is the observed head in the well/aquifer (length — meters or feet as long as consistent)

z_r is the reference elevation (length — meters or feet as long as consistent)

z_i is the well screen midpoint elevation (length — meters or feet as long as consistent)

ρ_i is the density of water in the well (kilograms per cubic meter)

ρ_r is the reference density (kilograms per cubic meter)

ρ_a is the average density between the measured point and the reference level (assumed to be equal to the measured point value for potentiometric surface map generation)

The reference elevation is the median of the upper zone screen midpoints (–21.65 feet North American Vertical Datum of 1988 [NAVD 88]) for the upper zone potentiometric surface maps and the median of the lower zone screen midpoints (–102.9 feet NAVD 88) for the lower zone surface potentiometric maps. The elevation of the center of the screened interval was employed as the elevation, z_i. A typical density for Biscayne Bay water was selected as the reference density. Salinity and temperature data have been collected monthly at 25 locations in Biscayne Bay by the South Florida Water Management District (SFWMD) since September 1993 (Reference 5). The median water temperature, 26.3°C, and median salinity, 34.3 Practical Salinity Units (PSU), from this data set were used to calculate a reference density, ρ_r of 1022.4 kilograms per cubic meter (1.022 grams per cubic centimeter or 63.8 pounds per cubic foot).

Tables 2AA-204 to 2AA-215 and Tables 2AA-219 and 2AA-220 provide a summary of the calculated reference heads for each of the potentiometric surface maps generated.

Onsite vertical hydraulic gradients were calculated using the environmental head approach from Reference 6. Environmental head is calculated as:

$$h_{e,i} = z_r + \frac{\rho_i}{\rho_r}(h_i - z_i) - \frac{\rho_a}{\rho_r}(z_r - z_i) \quad (2)$$

Where:

$h_{e,i}$ is the environmental head

ρ_a is the average density between the measured point and the reference level (lower well screen).

ρ_i is the density at the measured point

ρ_r is the reference density (kg/m^3) (assumed as Biscayne Bay water)

h_i is the observed water level

z_i is the screen midpoint elevation

The reference level (z_r) for each of the gradient calculations is the lower zone well screen midpoint elevation.

The gradient is calculated as :

$$\frac{\Delta h_{e,j}}{\Delta z} \quad (3)$$

Where: $\Delta z = z_2 - z_1$, the difference in the well screen midpoint elevations

3.0 DATA EVALUATION

During the data evaluation phase it became necessary to selectively eliminate some collected data as multiple transducers failed in the field and other transducers recorded data that were inconsistent with other nearby readings, erratic or significantly (>0.2 feet) different than manually collected water level readings during the same time period. Table 2AA-216 presents the time frames data that are judged to be acceptable for use.

Data from locations OW-721U and OW-802U appear to be erratic from the start of the data collection period compared to data from other monitoring locations. It was determined that the transducer vent tube was partially blocked. Repairs were made to the instrumentation at the OW-721U and OW-802U locations in February 2010; however, the data for OW-721U appear erratic after approximately April of 2010 and are judged to be not acceptable for use.

Monitoring locations OW-636U, OW-735L, OW-735U and OW-812L did not have functioning transducers at the time the manual water level measurements were taken at the end of the second quarter (February 2009) of data collection. Data from these locations were judged as acceptable for use if the data was consistent (i.e. similar variation in time and magnitude) with data from other monitoring locations that had small (< 0.2 feet) differences between the manually collected and transducer derived water level readings.

Data for OW-606L was initially rejected due to the small difference in the observed water levels between OW-606L and OW-606U. This small difference was in direct contrast with data collected from other paired locations which showed a much larger difference in water level between the upper and lower wells, with the lower wells having consistently higher observed water level elevations. Beginning with the third quarter (February 2009) of data collection, several other locations

(OW-735U/L, OW-621U/L and OW-721U/L) showed observed water level trends similar to those seen in the OW-606U/L well pair (i.e. a small difference between the upper and lower well water levels). Given this additional information, the OW-606L data has been judged as acceptable for use.

A downward shift in the OW-621L, OW-721L and OW-735L time series hydrographs occurred beginning approximately February 2009. This shift results in a reduction in the difference between the upper and lower observed water levels as compared to the previously collected data. This shift appears to be real as multiple manual measurements prior and subsequent to February 2009 were taken and confirm the pressure transducer derived water levels. The origin of the data shift is unclear. Drilling and well development activities in support of the aquifer pumping test were conducted during the February 2009 time period. These activities may have altered the subsurface conditions or integrity of some of the well seals or may be coincidental.

Table 2AA-217 presents the observed maximum and minimum recorded elevation for each monitoring location. Maximum and minimum values for each location are for the time frames presented in Table 2AA-216.

4.0 REFERENCES

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6. Post, V., H. Kooi, and C. Simmons, *Using Hydraulic Head Measurements in Variable-Density Ground Water Flow Analyses,* Ground Water Vol. 45, No. 6, 2007.

Table 2AA-201
Density Measurements Collected in February 2009

Location	Specific Conductance (milliSiemens per centimeter)	Salinity (PSU)	Temperature (°C)	Density (grams per cubic centimeter)
OW-606L	72.4	49.8	28.28	1.033
OW-606U	62.8	42.3	28.13	1.028
OW-621L	73.9	51.0	27.62	1.035
OW-621U	58.3	38.9	27.72	1.025
OW-636L	52.5	34.6	27.04	1.022
OW-636U	68.4	46.7	26.81	1.032
OW-706L	48.6	31.7	29.28	1.020
OW-706U	77.3	53.7	29.13	1.036
OW-721L	73.7	50.8	29.07	1.034
OW-721U	63.8	43.1	28.90	1.028
OW-735L	77.9	54.2	30.09	1.036
OW-735U	77.5	53.8	30.40	1.036
OW-802L	56.2	37.3	28.09	1.024
OW-802U	70.8	48.5	28.04	1.033
OW-805L	71.0	48.7	27.44	1.033
OW-805U	59.8	40.0	27.26	1.026
OW-809L	60.8	40.8	30.90	1.026
OW-809U	79.0	55.1	30.47	1.037
OW-812L	65.1	44.1	33.58	1.027
OW-812U	77.3	53.7	33.54	1.035
SW-1	92.7	66.4	23.53	1.048
SW-2	91.6	65.4	23.53	1.047

Table 2AA-202
Density Measurements Collected in November 2009

Location	Specific Conductance (milliSiemens per centimeter)	Salinity (PSU)	Temperature (°C)	Density (grams per cubic centimeter)
OW-606L	88.4	62.8	26.90	1.044
OW-606U	72.2	49.6	26.61	1.034
OW-621L	90.5	64.5	27.93	1.045
OW-621U	81.4	57.0	27.96	1.039
OW-636L	72.4	49.8	28.07	1.034
OW-636U	89.1	63.4	27.42	1.044
OW-706L	55.6	36.9	28.67	1.024
OW-706U	98.9	71.7	28.20	1.050
OW-721L	103.2	75.4	28.58	1.053
OW-721U	95.1	68.4	28.58	1.048
OW-735L	114.6	85.6	30.16	1.060
OW-735U	108.0	79.6	29.46	1.056
OW-802L	56.6	37.6	25.78	1.025
OW-802U	76.5	53.0	26.60	1.037
OW-805L	95.0	68.4	27.42	1.048
OW-805U	82.6	58.0	27.17	1.040
OW-809L	83.4	58.7	29.71	1.040
OW-809U	94.8	68.1	29.24	1.047
OW-812L	87.9	62.4	30.53	1.042
OW-812U	108.1	79.7	31.81	1.055
SW-1	111.2	82.5	23.44	1.060
SW-2	112.3	83.5	24.57	1.061

Table 2AA-203
Density Measurements Collected in February 2010

Location	Specific Conductance (milliSiemens per centimeter)	Salinity (PSU)	Temperature (°C)	Density (grams per cubic centimeter)
OW-606L	79.6	55.6	26.92	1.038
OW-606U	68.8	47.0	27.11	1.032
OW-621L	78.8	54.9	27.56	1.038
OW-621U	64.1	43.3	27.57	1.029
OW-636L	58.6	39.1	27.97	1.025
OW-636U	69.5	47.5	27.91	1.032
OW-706L	53.5	35.3	27.14	1.023
OW-706U	80.1	56.0	25.42	1.039
OW-721L	81.0	56.7	27.39	1.039
OW-721U	71.2	48.8	27.31	1.033
OW-735L	89.7	63.9	28.97	1.044
OW-735U	91.6	65.4	30.00	1.045
OW-802L	54.5	36.0	27.86	1.023
OW-802U	73.4	50.6	28.16	1.034
OW-805L	77.6	53.9	27.44	1.037
OW-805U	69.5	47.5	27.68	1.032
OW-809L	72.0	49.5	28.51	1.033
OW-809U	85.7	60.5	26.98	1.042
OW-812L	70.9	48.6	30.55	1.032
OW-812U	96.0	69.2	32.37	1.047
SW-1	71.6	49.2	18.15	1.036
SW-2	72.0	49.5	18.54	1.036

Table 2AA-204
Reference Heads for June 29, 2008 Potentiometric Surface Map
(approximately 7am, high tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	6/29/08 6:34 AM	0.11	OW-606U	6/29/08 6:46 AM	-1.19
OW-621L	6/29/08 6:57 AM	0.80	OW-621U	6/29/08 6:47 AM	-0.99
OW-636L	6/29/08 7:17 AM	0.02	OW-636U	6/29/08 6:57 AM	-0.69
OW-706L	---	R	OW-706U	6/29/08 7:12 AM	-0.98
OW-721L	6/29/08 7:17 AM	1.95	OW-721U	---	ND
OW-735L	6/29/08 7:00 AM	2.19	OW-735U	6/29/08 6:54 AM	-1.20
OW-802L	6/29/08 7:15 AM	0.43	OW-802U	---	ND
OW-805L	6/29/08 7:30 AM	0.57	OW-805U	6/29/08 6:42 AM	-0.99
OW-809L	6/29/08 6:53 AM	0.57	OW-809U	6/29/08 7:14 AM	-1.12
OW-812L	6/29/08 7:25 AM	0.70	OW-812U	6/29/08 7:21 AM	-0.87

ND = No Data; R = Rejected Data

Table 2AA-205
Reference Heads for June 29, 2008 Potentiometric Surface Map
(approximately 2pm, low tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	6/29/08 1:34 PM	-0.17	OW-606U	6/29/08 1:46 PM	-1.48
OW-621L	6/29/08 1:57 PM	0.48	OW-621U	6/29/08 1:47 PM	-1.31
OW-636L	6/29/08 2:17 PM	-0.28	OW-636U	6/29/08 1:57 PM	-1.02
OW-706L	---	R	OW-706U	6/29/08 2:12 PM	-1.13
OW-721L	6/29/08 2:17 PM	1.76	OW-721U	---	ND
OW-735L	6/29/08 2:00 PM	2.07	OW-735U	6/29/08 1:54 PM	-1.32
OW-802L	6/29/08 2:15 PM	0.21	OW-802U	---	ND
OW-805L	6/29/08 2:30 PM	0.21	OW-805U	6/29/08 1:42 PM	-1.34
OW-809L	6/29/08 1:53 PM	0.50	OW-809U	6/29/08 2:14 PM	-1.20
OW-812L	6/29/08 2:25 PM	0.58	OW-812U	6/29/08 2:21 PM	-0.97

ND = No Data; R = Rejected Data

Table 2AA-206
Reference Heads for August 15, 2008 Potentiometric Surface Map
(approximately 10am, high tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	8/15/08 9:34 AM	0.33	OW-606U	8/15/08 9:46 AM	-0.86
OW-621L	8/15/08 9:57 AM	1.11	OW-621U	8/15/08 9:47 AM	-0.65
OW-636L	8/15/08 10:17 AM	0.35	OW-636U	8/15/08 9:57 AM	-0.35
OW-706L	---	R	OW-706U	8/15/08 10:12 AM	-0.70
OW-721L	8/15/08 10:17 AM	2.19	OW-721U	---	ND
OW-735L	8/15/08 10:00 AM	2.44	OW-735U	8/15/08 9:54 AM	-0.92
OW-802L	8/15/08 10:15 AM	0.72	OW-802U	---	ND
OW-805L	8/15/08 10:30 AM	0.83	OW-805U	8/15/08 9:42 AM	-0.65
OW-809L	8/15/08 9:53 AM	0.71	OW-809U	8/15/08 10:14 AM	-0.88
OW-812L	8/15/08 10:25 AM	0.94	OW-812U	8/15/08 10:21 AM	-0.63

ND = No Data; R = Rejected Data

Table 2AA-207
Reference Heads for August 15, 2008 Potentiometric Surface Map
(approximately 5pm, low tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	8/15/08 4:34 PM	-0.10	OW-606U	8/15/08 4:46 PM	-1.28
OW-621L	8/15/08 4:57 PM	0.67	OW-621U	8/15/08 4:47 PM	-1.10
OW-636L	8/15/08 5:17 PM	-0.05	OW-636U	8/15/08 4:57 PM	-0.80
OW-706L	---	R	OW-706U	8/15/08 5:12 PM	-0.99
OW-721L	8/15/08 5:17 PM	1.88	OW-721U	---	ND
OW-735L	8/15/08 5:00 PM	2.18	OW-735U	8/15/08 4:54 PM	-1.20
OW-802L	8/15/08 5:15 PM	0.38	OW-802U	---	ND
OW-805L	8/15/08 5:30 PM	0.41	OW-805U	8/15/08 4:42 PM	-1.13
OW-809L	8/15/08 4:53 PM	0.49	OW-809U	8/15/08 5:14 PM	-1.10
OW-812L	8/15/08 5:25 PM	0.71	OW-812U	8/15/08 5:21 PM	-0.86

ND = No Data; R = Rejected Data

Table 2AA-208
Reference Heads for October 5, 2008 Potentiometric Surface Map (approximately 1am, high tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	---	ND	OW-606U	10/5/08 12:46 AM	0.39
OW-621L	10/5/08 12:57 AM	2.33	OW-621U	10/5/08 12:47 AM	0.62
OW-636L	10/5/08 1:17 AM	1.48	OW-636U	10/5/08 12:57 AM	0.83
OW-706L	---	R	OW-706U	10/5/08 1:12 AM	0.55
OW-721L	10/5/08 1:17 AM	3.28	OW-721U	---	ND
OW-735L	10/5/08 1:00 AM	3.54	OW-735U	10/5/08 12:54 AM	0.41
OW-802L	10/5/08 1:00 AM	2.07	OW-802U	---	ND
OW-805L	10/5/08 12:36 AM	2.07	OW-805U	10/5/08 12:42 AM	0.56
OW-809L	10/5/08 12:53 AM	2.07	OW-809U	10/5/08 1:14 AM	0.56
OW-812L	---	ND	OW-812U	10/5/08 1:21 AM	0.78

ND = No Data; R = Rejected Data

Table 2AA-209
Reference Heads for October 5, 2008 Potentiometric Surface Map (approximately 8am, low tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	---	ND	OW-606U	10/5/08 7:46 AM	-0.05
OW-621L	10/5/08 7:57 AM	1.85	OW-621U	10/5/08 7:47 AM	0.15
OW-636L	10/5/08 8:17 AM	1.01	OW-636U	10/5/08 7:57 AM	0.35
OW-706L	---	R	OW-706U	10/5/08 8:12 AM	0.27
OW-721L	10/5/08 8:17 AM	2.96	OW-721U	---	ND
OW-735L	10/5/08 8:00 AM	3.33	OW-735U	10/5/08 7:54 AM	0.19
OW-802L	10/5/08 8:00 AM	1.70	OW-802U	---	ND
OW-805L	10/5/08 7:36 AM	1.56	OW-805U	10/5/08 7:42 AM	0.04
OW-809L	10/5/08 7:53 AM	1.91	OW-809U	10/5/08 8:14 AM	0.40
OW-812L	---	ND	OW-812U	10/5/08 8:21 AM	0.59

ND = No Data; R = Rejected Data

Table 2AA-210
Reference Heads for January 20, 2009 Potentiometric Surface Map
(approximately 7pm, high tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	1/20/09 7:05 PM	-1.28	OW-606U	1/20/09 7:16 PM	-2.38
OW-621L	1/20/09 6:48 PM	-0.31	OW-621U	1/20/09 6:43 PM	-2.19
OW-636L	1/20/09 6:32 PM	-1.19	OW-636U	---	ND
OW-706L	---	R	OW-706U	1/20/09 6:55 PM	-2.11
OW-721L	1/20/09 7:29 PM	0.58	OW-721U	---	ND
OW-735L	---	ND	OW-735U	---	ND
OW-802L	1/20/09 6:58 PM	-0.69	OW-802U	---	ND
OW-805L	1/20/09 7:05 PM	-0.67	OW-805U	1/20/09 7:17 PM	-2.16
OW-809L	1/20/09 7:28 PM	-0.89	OW-809U	1/20/09 6:34 PM	-2.37
OW-812L	---	ND	OW-812U	1/20/09 6:32 PM	-2.09

ND = No Data; R = Rejected Data

Table 2AA-211
Reference Heads for January 21, 2009 Potentiometric Surface Map
(approximately 2am, low tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	1/21/09 2:05 AM	-1.89	OW-606U	1/21/09 2:16 AM	-3.00
OW-621L	1/21/09 1:48 AM	-0.94	OW-621U	1/21/09 1:43 AM	-2.83
OW-636L	1/21/09 1:32 AM	-1.72	OW-636U	---	ND
OW-706L	---	R	OW-706U	1/21/09 1:55 AM	-2.70
OW-721L	1/21/09 2:29 AM	-0.02	OW-721U	---	ND
OW-735L	---	ND	OW-735U	---	ND
OW-802L	1/21/09 1:58 AM	-1.37	OW-802U	---	ND
OW-805L	1/21/09 2:05 AM	-1.30	OW-805U	1/21/09 2:17 AM	-2.79
OW-809L	1/21/09 2:28 AM	-1.51	OW-809U	1/21/09 1:34 AM	-2.99
OW-812L	---	ND	OW-812U	1/21/09 1:32 AM	-2.73

ND = No Data; R = Rejected Data

Table 2AA-212
Reference Heads for July 15, 2009 Potentiometric Surface Map
(7am, high tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	7/15/09 7:00 AM	0.31	OW-606U	7/15/09 7:00 AM	-1.21
OW-621L	7/15/09 7:00 AM	0.48	OW-621U	7/15/09 7:00 AM	-1.02
OW-636L	7/15/09 7:00 AM	0.47	OW-636U	7/15/09 7:00 AM	-0.66
OW-706L	---	R	OW-706U	7/15/09 7:00 AM	-0.94
OW-721L	7/15/09 7:00 AM	1.05	OW-721U	---	R
OW-735L	7/15/09 7:00 AM	1.22	OW-735U	7/15/09 7:00 AM	-1.01
OW-802L	7/15/09 7:00 AM	0.16	OW-802U	---	R
OW-805L	7/15/09 7:00 AM	0.65	OW-805U	7/15/09 7:00 AM	-1.04
OW-809L	7/15/09 7:00 AM	0.86	OW-809U	7/15/09 7:00 AM	-1.23
OW-812L	7/15/09 7:00 AM	0.71	OW-812U	7/15/09 7:00 AM	-0.93

ND = No Data; R = Rejected Data

Table 2AA-213
Reference Heads for July 15, 2009 Potentiometric Surface Map
(2pm, low tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	7/15/09 2:00 PM	0.15	OW-606U	7/15/09 2:00 PM	-1.38
OW-621L	7/15/09 2:00 PM	0.31	OW-621U	7/15/09 2:00 PM	-1.18
OW-636L	7/15/09 2:00 PM	0.29	OW-636U	7/15/09 2:00 PM	-0.84
OW-706L	---	R	OW-706U	7/15/09 2:00 PM	-1.05
OW-721L	7/15/09 2:00 PM	0.92	OW-721U	---	R
OW-735L	7/15/09 2:00 PM	1.11	OW-735U	7/15/09 2:00 PM	-1.13
OW-802L	7/15/09 2:00 PM	0.02	OW-802U	---	R
OW-805L	7/15/09 2:00 PM	0.48	OW-805U	7/15/09 2:00 PM	-1.21
OW-809L	7/15/09 2:00 PM	0.77	OW-809U	7/15/09 2:00 PM	-1.33
OW-812L	7/15/09 2:00 PM	0.61	OW-812U	7/15/09 2:00 PM	-1.02

ND = No Data; R = Rejected Data

Table 2AA-214
Reference Heads for January 15, 2010 Potentiometric Surface Map (11am, high tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	1/15/09 11:00 AM	0.93	OW-606U	---	ND
OW-621L	1/15/09 11:00 AM	1.06	OW-621U	1/15/09 11:00 AM	-0.57
OW-636L	1/15/09 11:00 AM	1.00	OW-636U	1/15/09 11:00 AM	-0.39
OW-706L	1/15/09 11:00 AM	0.95	OW-706U	1/15/09 11:00 AM	-0.51
OW-721L	1/15/09 11:00 AM	1.49	OW-721U	---	R
OW-735L	1/15/09 11:00 AM	2.06	OW-735U	1/15/09 11:00 AM	-0.59
OW-802L	1/15/09 11:00 AM	0.46	OW-802U	---	R
OW-805L	1/15/09 11:00 AM	1.35	OW-805U	1/15/09 11:00 AM	-0.54
OW-809L	---	R	OW-809U	1/15/09 11:00 AM	-0.82
OW-812L	1/15/09 11:00 AM	1.27	OW-812U	1/15/09 11:00 AM	-0.45

ND = No Data; R = Rejected Data

Table 2AA-215
Reference Heads for January 15, 2010 Potentiometric Surface Map (6pm, low tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	1/15/09 6:00 PM	0.55	OW-606U	---	ND
OW-621L	1/15/09 6:00 PM	0.65	OW-621U	1/15/09 6:00 PM	-0.97
OW-636L	1/15/09 6:00 PM	0.66	OW-636U	1/15/09 6:00 PM	-0.76
OW-706L	1/15/09 6:00 PM	0.72	OW-706U	1/15/09 6:00 PM	-0.75
OW-721L	1/15/09 6:00 PM	1.22	OW-721U	---	R
OW-735L	1/15/09 6:00 PM	1.87	OW-735U	1/15/09 6:00 PM	-0.79
OW-802L	1/15/09 6:00 PM	0.14	OW-802U	---	R
OW-805L	1/15/09 6:00 PM	0.92	OW-805U	1/15/09 6:00 PM	-0.97
OW-809L	---	R	OW-809U	1/15/09 6:00 PM	-0.95
OW-812L	1/15/09 6:00 PM	1.10	OW-812U	1/15/09 6:00 PM	-0.60

ND = No Data; R = Rejected Data

Table 2AA-216
Data Acceptable for Use

Location	1st & 2nd Qtr	3rd Qtr	4th Qtr	5th Qtr	6th Qtr	7th Qtr
OW-606L	6-4-08 @12:34 to 8-17-08 @13:34, 10-15-08 @ 8:10 to 2-4-09 @ 8:05	2-12-09 @ 16:09 to 5-27-09@13:09 with the exception of the following dates: 3-2-09, 3-5-09, 3-16-09, 3-17-09, 3-20-09, 3-21-09 (pumping test activities)	5-27-09 @ 15:00 to 8-26-09@13:00	8-26-09 @ 15:00 to 11-10-09 @ 9:40	11-18-09 @ 11:00 to 2-8-10 @ 13:00	2-16-10 @ 18:00 to 6-22-10 @ 15:00
OW-606U	6-4-08 @ 12:46 to 8-17-08 @11:46, 9-25-08 @ 13:46 to 2-4-09 @ 8:16	2-12-09 @ 15:50 to 5-27-09 @ 12:50 with the exception of the following dates: 3-11-09, 3-13-09 3-16-09, 3-17-09 and 3-20-09 (pumping test activities)	5-27-09 @ 15:00 to 8-26-09@13:00	8-26-09 @ 14:00 to 11-10-09 @ 9:00	no data - transducer failed	2-16-10 @ 18:00 to 6-22-10 @ 15:00
OW-621L	6-9-08 @ 10:57 to 1-30-09 @ 14:48	2-12-09 @ 14:48 to 5-27-09 @ 11:48	5-27-09 @ 13:00 to 8-25-09 @ 13:00	8-25-09 @ 14:00 to 11-10-09 @ 10:00	11-18-09 @ 11:00 to 2-8-10 @ 13:00	2-16-10 @ 17:00 to 6-22-10 @ 16:00
OW-621U	6-9-08 @ 10:47 to 8-17-08 @ 13:47, 9-25-08 @ 0:47 to 1-30-09 @ 14:43	2-12-09 @ 14:59 to 5-27-09 @ 11:59	5-27-09 @ 13:00 to 8-25-09 @ 13:00	8-25-09 @ 15:00 to 11-10-09 @ 10:00	11-18-09 @ 12:00 to 2-8-10 @ 13:00	2-16-10 @ 17:00 to 6-22-10 @ 17:00
OW-636L	6-25-08 @ 16:17 to 1-29-09 @ 12:32	3-26-09 @ 1:04 pm to 5-28-09 @ 9:04 am	5-28-09 @ 10:00 to 8-26-09 @ 8:00	8-26-09 @ 9:00 to 11-10-09 @ 15:00	11-19-09 @ 15:00 to 2-8-10 @ 9:00	2-17-10 @ 9:00 to 6-24-10 @ 12:00
OW-636U	6-10-08 @ 9:57 to 12-6-09 @ 18:42	2-6-09 @ 17:21 to 5-28-09 @ 8:57	5-28-09 @ 10:00 to 8-26-09 @ 9:00	no data - transducer failed	11-19-09 @ 15:00 to 2-12-10 @ 10:00	2-17-10 @ 9:00 to 6-24-10 @ 13:00
OW-706L	reject all data, large delta with manual measurement	2-21-09 @ 00:04 to 5-27-09 @ 14:22 the following dates data were impacted by pumping test activities and are not included: 2-12-09 to 2-20-09, 2-23-09, 2-24-09, 2-28-09, 3-4-09 and 3-7-09	reject all data, could not connect to logger in field, failed post-cal at lab	8-27-09 @ 14:00 to 11-10-09 @ 13:00	11-18-09 @ 13:00 to 2-8-10 @ 14:00	2-16-10 @ 18:00 to 6-22-10 @ 15:00
OW-706U	6-5-08 @ 14:12 to 2-3-09 @ 11:55	2-6-09 @ 18:01 to 5-27-09 @ 15:17, with the exception of the following dates: 2-12-09 to 2-20-09, 2-23-09, 2-24-09, 2-28-09, 3-4-09 and 3-7-09 (pumping test activities)	5-27-09 @ 17:00 to 8-26-09 @ 14:00	8-26-09 @ 15:00 to 11-10-09 @ 14:00	11-18-09 @ 12:00 to 2-8-10 @ 14:00	2-16-10 @ 18:00 to 6-22-10 @ 15:00
OW-721L	6-6-08 @9:17 to 1-30-09 @ 15:29	2-6-09 @ 14:01 to 5-27-09 @ 12:34, with the exception of the following dates: 2-12-09 to 2-20-09, 2-23-09, 2-24-09, 2-28-09, 3-4-09 and 3-7-09 (pumping test activities)	5-27-09 @ 14:00 to 8-25-09 @ 14:00	8-25-09 @ 15:00 to 11-11-09 @ 10:00	11-18-09 @ 12:00 to 2-8-10 @ 14:00	2-16-10 @ 17:00 to 6-22-10 @ 16:00
OW-721U	reject all - kinked vent tube	reject all - kinked vent tube	reject all - kinked vent tube	reject all - kinked vent tube	reject all - kinked vent tube	2-16-10 @ 17:00 to 4-30-10 @ 23:00 data after 4-30-10 become erratic
OW-735L	6-9-08 @ 13:00 to 10-9-08 @ 12:00	2-12-09 @ 16:30 to 5-27-09 @ 15:30	5-27-09 @ 17:00 to 8-26-09 @ 15:00	no data - transducer failed	11-19-09 @ 14:00 to 2-8-10 @ 14:00	2-16-10 @ 19:00 to 6-23-10 @ 11:00
OW-735U	6-9-08 @12:54 to 12-21 @ 1:09	2-12-09 @ 16:44 to 5-27-09 @ 15:45	5-27-09 @ 17:00 to 8-26-09 @ 15:00	8-26-09 @ 16:00 to 11-10-09 @ 14:00	11-19-09 @ 14:00 to 2-8-10 @ 14:00	2-16-10 @ 19:00 to 6-23-10 @ 11:00
OW-802L	6-6-08 @ 12:15 to 2-3-09 @ 9:58	2-6-09 @ 12:46 to 5-27-09 @ 8:37	5-27-09 @10:00 to 8-25-09 @ 10:00	8-25-09 @ 11:00 to 11-10-09 @ 12:00	11-14-09 @ 11:00 to 2-8-10 @ 11:00	2-16-10 @ 14:00 to 6-23-10 @ 9:00
OW-802U	reject all - kinked vent tube	reject all - kinked vent tube	reject all - kinked vent tube	reject all - kinked vent tube	reject all - kinked vent tube	2-16-10 @ 14:00 to 6-23-10 @ 9:00
OW-805L	6-10-08 @ 8:30 to 8-17-08 @ 12:30, 9-24-08 @ 8:36 to 1-30-09 @ 14:05	3-26-09 @13:40 to 5-28-09 @ 9:40	5-28-09 @ 11:00 to 8-26-09 @ 11:00	8-26-09 @ 12:00 to 11-16-09 @ 8:00	11-16-09 @ 11:00 to 2-8-10 @ 12:00	2-16-10 @ 16:00 to 6-23-10 @ 15:00
OW-805U	6-10-08 @ 8:42 to 1-30-09 @ 14:17	2-12-09 @ 15:26 to 5-28-09 @ 9:26	5-28-09 @ 11:00 to 8-26-09 @ 11:00	8-26-09 @ 12:00 to 11-16-09 @ 10:00	11-16-09 @ 12:00 to 2-8-10 @ 12:00	2-16-10 @ 16:00 to 6-23-10 @ 16:00
OW-809L	6-5-08 @ 10:53 to 1-30-09 @ 15:28	2-12-09 @ 12:37 to 5-27-09 @ 9:37	5-27-09 @ 11:00 to 8-25-09 @ 11:00	no data - transducer failed	reject all data, large delta with manual measurement	2-16-10 @ 15:00 to 6-23-10 @ 10:00
OW-809U	6-5-08 @ 9:14 to 2-4-09 @ 12:34	2-12-09 @ 12:49 to 5-27-09 @ 9:49	5-27-09 @ 11:00 to 8-25-09 @ 11:00	8-25-09 @ 12:00 to 11-10-09 @ 13:00	11-19-09 @ 14:00 to 2-8-10 @ 11:00	2-16-10 @ 15:00 to 6-23-10 @ 10:00
OW-812L	6-6-08 @ 13:25 to 9-22-08 @ 7:25	2/6/2009 @ 13:22 to 5-27-09 @ 9:22	5-27-09 @ 11:00 to 8-25-09 @ 10:00	8-25-09 @ 12:00 to 11-9-09 @ 14:00	11-14-09 @ 14:00 to 2-9-10 @ 11:00	2-16-10 @ 14:00 to 6-23-10 @ 10:00
OW-812U	6-6-08 @ 13:21 to 1-30-09 @15:32	2-12-09 @ 13:32 to 5-27-09 @ 8:32	5-27-09 @ 10:00 to 8-25-09 @ 10:00	8-25-09 @ 11:00 to 11-10-09 @ 12:00	11-14-09 @ 14:00 to 2-8-10 @ 11:00	2-16-10 @ 14:00 to 6-23-10 @ 9:00
SW-1	reject all data, large delta with manual measurement	2-6-09 @ 16:38 to 5-28-09 @ 10:07	5-28-09 @ 12:00 to 8-26-09 @ 10:00	8-26-09 @ 11:00 to 11-17-09 @ 11:00	11-17-09 @ 12:00 to 2-8-10 @ 9:00	2-17-10 @ 11:00 to 6-24-10 @ 8:00
SW-2	6-9-08 @ 7:30 to 1-30-09 @ 16:09	2-6-09 @ 16:06 to 5-28-09 @ 9:06	5-28-09 @ 10:00 to 8-26-09 @ 9:00	8-26-09 @ 10:00 to 11-17-09 @ 12:00	11-17-09 @ 13:00 to 2-8-10 @ 9:00	2-17-10 @ 11:00 to 6-24-10 @ 10:00

Table 2AA-217
Maximum and Minimum Recorded Water Level Elevations

Well	Maximum Elevation[(a)] (feet NAVD 88)	Minimum Elevation[(a)] (feet NAVD 88)	Well	Maximum Elevation[(a)] (feet NAVD 88)	Minimum Elevation[(a)] (feet NAVD 88)
OW-606L	0.20	-3.06	OW-606U	0.27	-3.24
OW-621L	1.05	-2.81	OW-621U	0.56	-3.00
OW-636L	1.52	-1.75	OW-636U	0.62	-2.60
OW-706L	2.04	-1.01	OW-706U	0.25	-3.09
OW-721L	2.09	-2.56	OW-721U	-0.92	-2.21
OW-735L	2.15	-2.85	OW-735U	0.12	-2.96
OW-802L	1.91	-1.73	OW-802U	-0.93	-2.29
OW-805L	0.99	-2.59	OW-805U	0.48	-2.99
OW-809L	1.70	-2.01	OW-809U	0.24	-3.42
OW-812L	1.17	-2.12	OW-812U	0.51	-3.12
SW-1	-0.22	-3.76	SW-2	-0.26	-3.90

(a) Recorded water level elevations are observed levels in each well. These elevations have not been adjusted to reference heads.

Table 2AA-218
Density Measurements Collected in June 2010

Location	Specific Conductance (milliSiemens per centimeter)	Salinity (PSU)	Temperature (°C)	Density (grams per cubic centimeter)
OW-606L	77.2	53.6	28.83	1.036
OW-606U	72.1	49.6	29.22	1.033
OW-621L	74.5	51.5	29.17	1.034
OW-621U	61.6	41.4	28.94	1.027
OW-636L	59.6	39.9	29.11	1.026
OW-636U	66.8	45.4	28.13	1.030
OW-706L	52.3	34.4	29.73	1.021
OW-706U	80.7	56.4	30.53	1.038
OW-721L	76.8	53.3	29.90	1.036
OW-721U	68.7	46.9	29.33	1.031
OW-735L	82.4	57.8	31.10	1.039
OW-735U	82.4	57.8	31.74	1.038
OW-802L	56.7	37.7	28.69	1.024
OW-802U	74.0	51.1	28.76	1.034
OW-805L	73.6	50.8	28.50	1.034
OW-805U	71.9	49.4	28.32	1.033
OW-809L	67.0	45.6	31.04	1.029
OW-809U	81.0	56.7	31.05	1.038
OW-812L	65.3	44.3	31.90	1.028
OW-812U	78.7	54.8	33.77	1.035
SW-1	97.8	70.7	32.47	1.048
SW-2	93.9	67.4	30.37	1.046

Table 2AA-219
Reference Heads for June 15, 2010 Potentiometric Surface Map
(2am, high tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	6/15/10 2:00 AM	0.39	OW-606U	6/15/10 2:00 AM	-0.89
OW-621L	6/15/10 2:00 AM	0.42	OW-621U	6/15/10 2:00 AM	-0.85
OW-636L	6/15/10 2:00 AM	0.63	OW-636U	6/15/10 2:00 AM	-0.61
OW-706L	6/15/10 2:00 AM	0.67	OW-706U	6/15/10 2:00 AM	-0.86
OW-721L	6/15/10 2:00 AM	0.55	OW-721U	—	R
OW-735L	6/15/10 2:00 AM	0.79	OW-735U	6/15/10 2:00 AM	-0.93
OW-802L	6/15/10 2:00 AM	0.30	OW-802U	6/15/10 2:00 AM	-0.96
OW-805L	6/15/10 2:00 AM	0.65	OW-805U	6/15/10 2:00 AM	-0.75
OW-809L	6/15/10 2:00 AM	0.71	OW-809U	6/15/10 2:00 AM	-1.14
OW-812L	6/15/10 2:00 AM	0.26	OW-812U	6/15/10 2:00 AM	-0.95

R = Rejected Data

Table 2AA-220
Reference Heads for June 15, 2010 Potentiometric Surface Map
(9am, low tide)

Well	Date/Time	Reference Head (feet NAVD 88)	Well	Date/Time	Reference Head (feet NAVD 88)
OW-606L	6/15/10 9:00 AM	0.07	OW-606U	6/15/10 9:00 AM	-1.20
OW-621L	6/15/10 9:00 AM	0.08	OW-621U	6/15/10 9:00 AM	-1.17
OW-636L	6/15/10 9:00 AM	0.29	OW-636U	6/15/10 9:00 AM	-0.97
OW-706L	6/15/10 9:00 AM	0.50	OW-706U	6/15/10 9:00 AM	-1.03
OW-721L	6/15/10 9:00 AM	0.34	OW-721U	—	R
OW-735L	6/15/10 9:00 AM	0.65	OW-735U	6/15/10 9:00 AM	-1.09
OW-802L	6/15/10 9:00 AM	0.07	OW-802U	6/15/10 9:00 AM	-1.19
OW-805L	6/15/10 9:00 AM	0.28	OW-805U	6/15/10 9:00 AM	-1.11
OW-809L	6/15/10 9:00 AM	0.64	OW-809U	6/15/10 9:00 AM	-1.20
OW-812L	6/15/10 9:00 AM	0.16	OW-812U	6/15/10 9:00 AM	-1.02

R = Rejected Data