EAST BAY
MUNICIPAL UTILITY DISTRICT

March 1, 2011

Mr. Michael Rochette
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: East Bay Municipal Utility District Bayside Groundwater Project, 2010 Annual Report, Order No. R2-2007-0038

Dear Mr. Rochette:

In accordance with the General Waste Discharge Requirements of Order No. R2-2007-0038, this submittal is the 2010 annual self monitoring report for East Bay Municipal Utility District's (EBMUD's) Bayside Groundwater Project.

EBMUD performed an extraction test at the Bayside facility that lasted from August 4, 2010 to September 29, 2010. No chemicals were added during the process. Raw groundwater was extracted from the Bayside well and then pumped directly into the onsite stormdrain. Discharges of extracted groundwater directly to local receiving waters are under the purview of the Regional Water Quality Control Board's (RWQCB's) Dewatering General Permit (DGP; Order No. R2-2007-0033-0009). The extracted water quality monitoring results were submitted to Mr. Farhad Azimzadeh of your office under a separate cover on November 10, 2010.

In total, approximately 113 million gallons of water were extracted and discharged over 57 days. Tables 1 to 3 summarize the injection and extraction volume data.

The Self Monitoring and Reporting Program (SMP) of Order No. R2-2007-0038 requires EBMUD to schedule and conduct a phased approach for groundwater quality monitoring. The SMP requires EBMUD to begin groundwater level and quality monitoring three months prior to initiating operation and continue for one additional year after operation ceases. Table 3 of the SMP tabulates monitoring well groups for phased monitoring. Monitoring is required to begin with Group 1 wells (Bayside Well, MW-2s, MW-2D[1], and MW-4). The monitoring of Group 1 wells is to be conducted on an annual basis until the expanding injected waterfront reaches MW-4.

In December 2010, annual water quality sampling was conducted and samples were analyzed in accordance with Table 4 of the SMP. EBMUD retained Environmental Sampling Services (ESS) to collect water quality samples at the Bayside Well, MW-2S, MW-2I and MW-4. A peristaltic pump with dedicated lengths of tubing was used to purge and sample the wells. Purge water discharges were disposed of on permeable ground adjacent to the wells. No surface water discharges occurred.

Sampling was completed according to the following procedure:

1. Disinfect all equipment including water level sounder, pump, and tubing with a dilute bleach solution[2].
2. Measure static water level within each well and calculate the three-well volume[3] of the well required for purging as per USEPA groundwater sampling protocol.

[1] "MW-2D" is actually "MW-2I".
[2] In the case of the Bayside Well, samples were collected simply by activating the pump in the extraction mode.

3. Purge the well and collect the samples.
4. Measure field water quality data[4] and collect samples in sample containers with appropriate preservatives as per relevant USEPA sampling protocols for individual constituents.
5. Transport samples to EBMUD's state certified laboratory in a cooler for further analyses, under chain of custody.

Table 4 contains construction details for all available wells in the groundwater monitoring system[5]. Table 5 contains groundwater elevation and depth to groundwater data. Table 6 summarizes general groundwater quality data; Table 7 summarizes sampling results for standard minerals; Table 8 summarizes haloacetic acids data; and Table 9 summarizes results for trihalomethanes. Tables 10 and 11 summarize vertical gradient calculations. Appendix A contains the original lab reports including the analytical methods used and associated method detection limits and minimum levels of quantitation.

Figure 1 shows the groundwater level monitoring network and Figure 2 shows the groundwater quality monitoring network. Pressure transducers have been installed in all of the wells listed in Table 4, in addition to the Bayside Well. These transducers measure water level and temperature at a minimum of 30-minute intervals. Figures 3 and 4 present the groundwater level contour maps for August 3 and December 25, 2010, respectively. Figures 5 to 17 present the 2010 groundwater level trends for the monitoring wells.

The high chloride concentrations from MW-2S, a shallow well screened from 40 to 60 feet below grade, are consistent with historic high chloride concentrations observed in the local shallow zone. Results for TTHMs and HAAs were well below the permit limits of 80 µg/L and 60 µg/L, respectively. No exceedances of water quality limits in the order were observed.

Groundwater elevation contour maps were prepared to represent subsurface conditions on August 3 and December 25, before and after the extraction test that occurred from August 4 to September 29. On both occasions, the deep aquifer was flowing in a southwesterly direction in the immediate area surrounding the Bayside project site. The gradient was 0.0003 ft/ft in both cases. Water levels at MW-1 were used to also represent conditions at the Bayside Well due to its proximity to the Bayside Well and the fact that it is screened at the same depth.

Vertical gradients were calculated for the three nested wells at MW-5 for January 25 and December 25 (see Tables 10 and 11). The direction of flow was downward in each case.

Figures 5 through 17 show the typical pattern of higher groundwater levels in the deep aquifer during the winter/spring than fall/summer prevailed. Wells as far away from the Bayside Well as MW-10D registered effects of the extraction that occurred in August and September with a corresponding decrease in water levels. The water levels in all cases quickly recovered upon ceasing the extraction operation. MW-1, MW-2S, MW-2I,

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[3] Only one and a half and one casing volumes of water were purged from MW-2I and MW-4, respectively, due to time constraints as a result of the fact that the pump was only producing approximately 0.5 gpm. However, the pumping was equivalent to a micro-purging process because of minimal disturbance to the water in the wells and minimal water level fluctuations. Water samples were not collected until all monitored field water quality parameters had stabilized. The resultant samples were therefore considered representative of the formation water, and the results were consistent with those from previous years.

[4] Measured field WQ parameters included pH, specific conductance, temperature, and color. Chlorine residual was also measured immediately prior to sample collection.

[5] Not all of the wells in Table 4 are required to be monitored according to Order No. R2-2007-0038.

MW-3, and MW-4 also displayed a temporary decline in water levels on December 8 that corresponded to the end-of-the-year groundwater sampling event.

A few aberrations in water levels were observed in some of the wells and they were considered anomalies. For example, MW-2S water levels displayed a decreasing trend in early to mid-August, seemingly corresponding to the extraction ongoing at that time, but then abruptly recovered on August 19. The extraction that occurred in August and September was continuous without interruptions and did not end until September 29. One potential explanation is that the decreasing trend observed in early to mid-August was not real and a result of transducer malfunction, which also contributed to a data gap that existed from January 20 to August 11. Another anomaly observed was an almost 4-ft fluctuation in elevation on August 3 at MW-5I. This occurred prior to the two-month long extraction with no apparent explanation.

Lastly, according to Figure 16, MW-10I exhibited artesian conditions in October with the water level reaching as high as 15.96 ft above mean sea level (amsl), while the top of the casing is at 11.76 ft amsl. Yet, this well was never observed to be flowing and no injection took place in all of 2010. 0.04 inch of rain did fall on October 17 in this area, but that was not enough to explain this significant rise in groundwater level.

In addition to MW-2S mentioned above, transducer malfunction also contributed to data gaps for MW-2I, MW-3, MW-5S, and MW-10I.

The extent of injected water was not evaluated because no injection occurred in 2010 while over 113 million gallons of water was extracted.

EBMUD will continue to monitor injection and extraction of groundwater in accordance with all associated regulatory permits in 2011.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact me at (510) 287-0345 or Derek Lee, Senior Environmental Health and Safety Specialist, at (510) 287-1086.

Sincerely,

John H. Schroeter, P.E.
Manager of Environmental Compliance

Figure 1 – Groundwater Level Monitoring Well Network

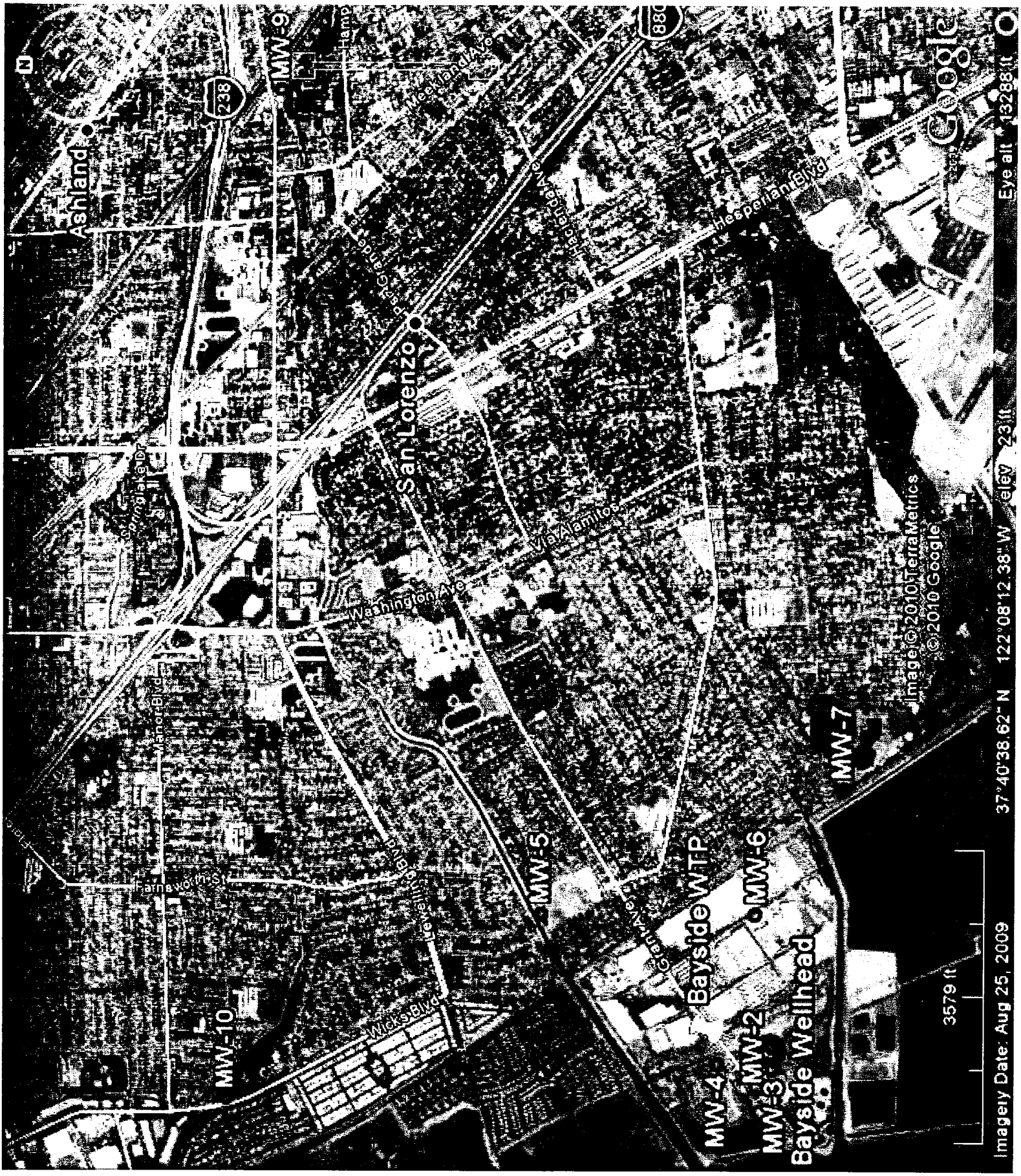
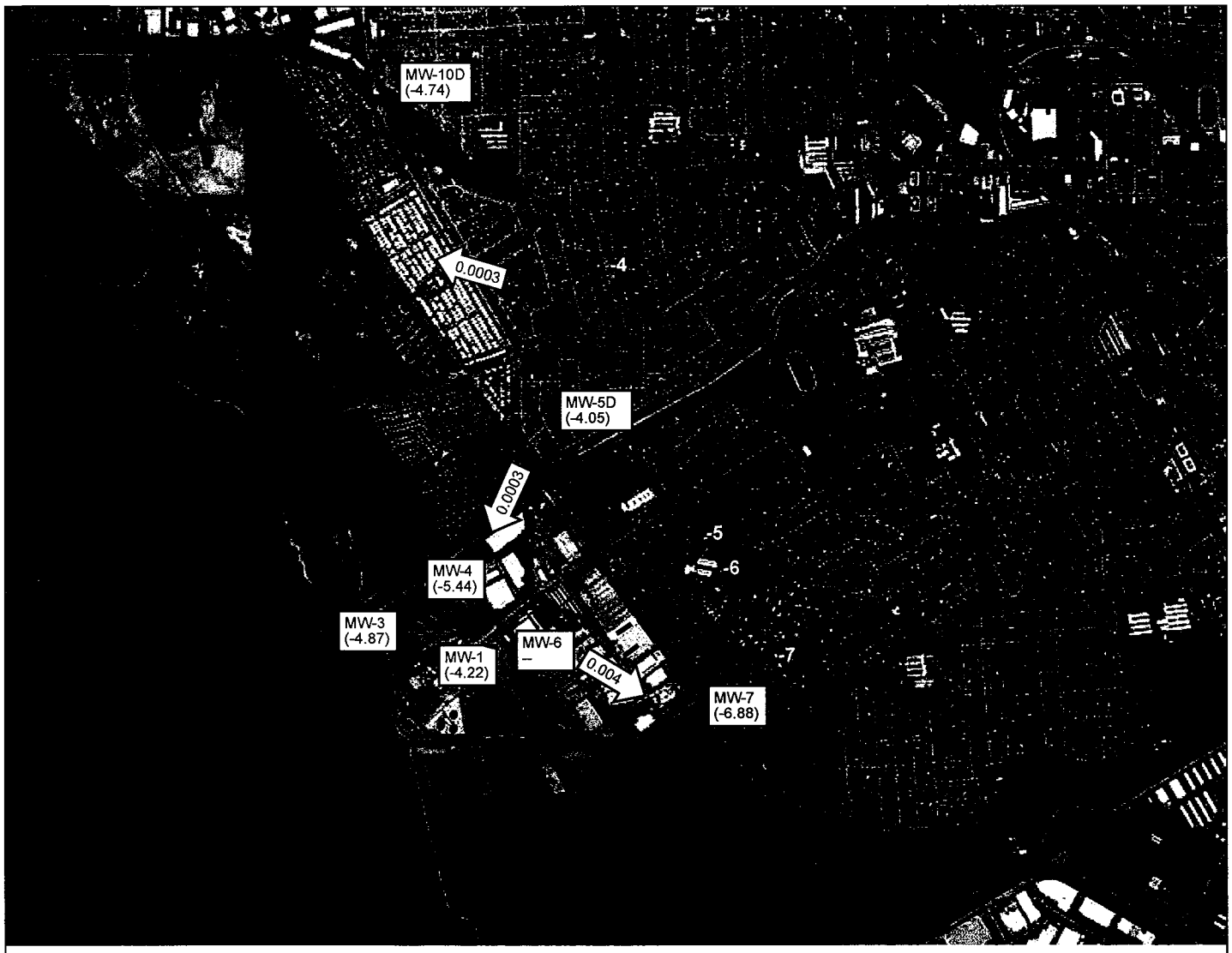


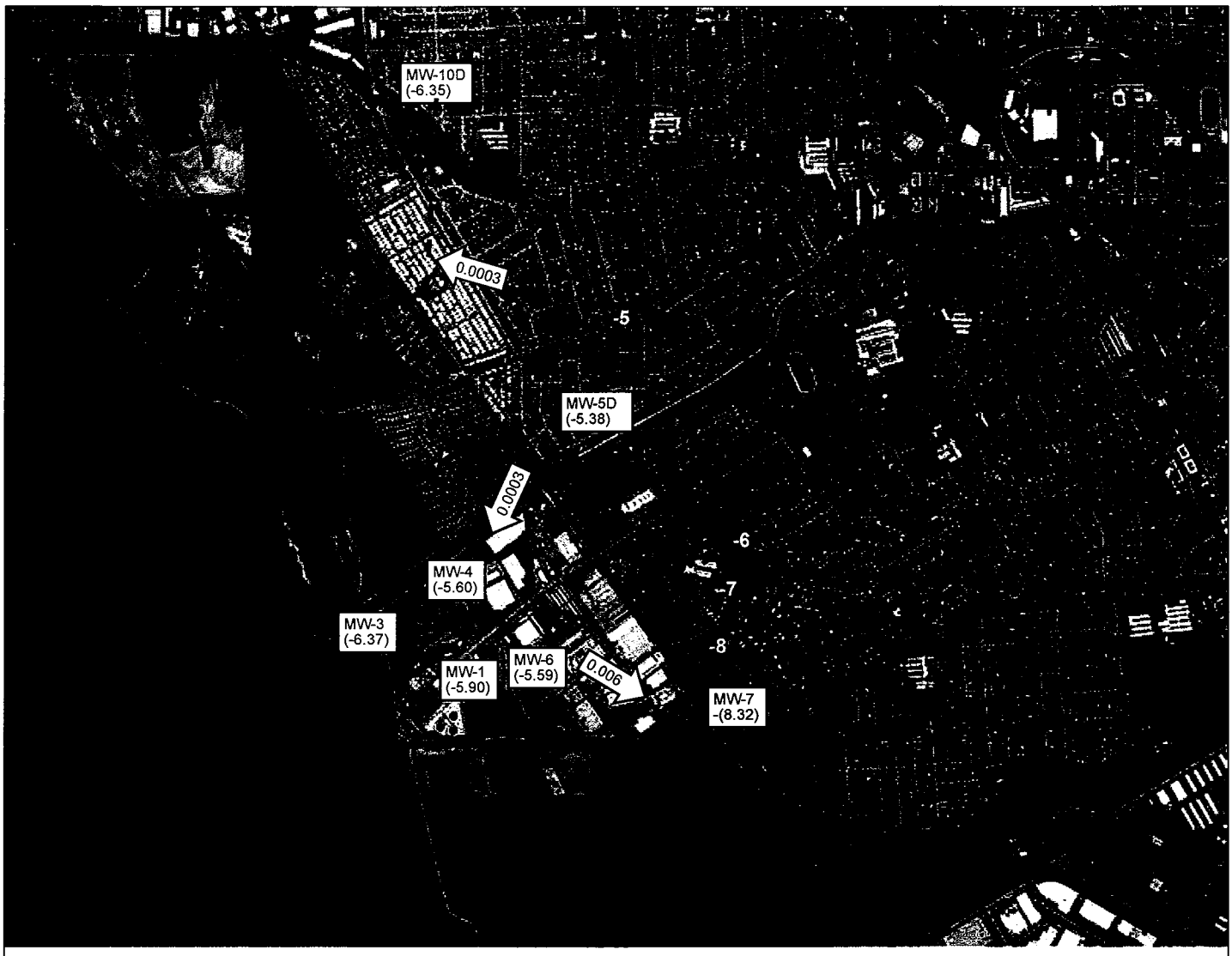
Figure 2 – Groundwater Quality Monitoring Well Network



LEGEND

⊕	Groundwater monitoring well
(-3.24)	Groundwater elevation in feet below mean sea level (measured August 3, 2010)
-3.0	Groundwater elevation contour in feet below mean sea level (contour interval: 1.0 feet)
0.0003	Calculated groundwater gradient direction and magnitude in foot per foot

URS	26817754.2008	GROUNDWATER ELEVATION CONTOUR MAP August 3, 2010	Figure 3
	EBMUD		



LEGEND

- Groundwater monitoring well
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- -3.0 Groundwater elevation contour in feet below mean sea level (contour interval: 1.0 feet)
- 0.0003 Calculated groundwater gradient direction and magnitude in foot per foot

URS	26817754.2008	GROUNDWATER ELEVATION CONTOUR MAP (December 25, 2010)	Figure 4
	EBMUD		