Zone 7 Water Agency
Serving the Livermore-Amador Valley

WATER QUALITY MANAGEMENT PROGRAM
2010 WATER QUALITY REPORT

This annual status report shows how Zone 7 Water Agency is meeting the water quality targets established by its Water Quality Management Program (WQMP). The WQMP provides the basis for identifying ways to meet anticipated future regulations, reduce public health risks, and improve the delivered water quality - especially its taste, odor, and hardness, by effectively managing water quality issues, guiding operations, upgrading or improving facilities, and providing new facilities when necessary.

WQMP WATER QUALITY TARGETS are internal goals that Zone 7 applies to specific constituents that affect potable and non-potable water quality. The majority of these targets are significantly more stringent than existing regulations. Some of these constituents have been identified as "key parameters of concern" based upon the concerns expressed by our customers, the levels found in our local drinking water supplies, and anticipated changes in regulations.

HOW ARE WE MEETING WQMP WATER QUALITY TARGETS? In 2010, Zone 7 met all of its primary drinking water standards and non-potable water quality targets. However, some of the water quality targets were not met consistently, including those for drinking water hardness, Total Dissolved Solids (TDS), chloride, and free ammonia. Zone 7 continued to work on and support operational and planning activities that help meet our water quality targets and ensure that the service area has a reliable water supply. In addition to ongoing internal agency planning, we also work closely with various organizations to protect source water locally and at the state level. Zone 7 currently applies powdered activated carbon (PAC) seasonally at Del Valle and Patterson Pass conventional treatment plants to assist in reducing levels of odor-causing compounds. The Mocho Groundwater Demineralization Plant was operated throughout 2010 to remove salt from the groundwater basin per the Salt Management Plan (SMP) while improving delivered water quality. TDS were reduced from approximately 600 to 1,150 milligrams per liter (mg/L) in the groundwater, to approximately 300 mg/L after reverse osmosis (RO) permeate was blended with bypassed groundwater. Similarly, water hardness was reduced from approximately 400 to 650 mg/L to approximately 230 mg/L after blending with bypassed groundwater. Two significant future water quality improvement projects are identified in Zone 7's Capital Improvement Program (CIP). Permanent Taste and Odor Treatment at Del Valle and Patterson Pass Water Treatment Plants will be scheduled based on funding availability; and the next phase of demineralization will be evaluated as part of the upcoming SMP update.

DEFINITIONS

***Maximum Contaminant Level (MCL)**: The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (Public Health Goals) or MCLGs (Maximum Contaminant Level Goals) as is economically and technologically feasible. Secondary MCLs are set for constituents having no health impacts, such as odor, taste, and appearance of drinking water.*

***Primary Drinking Water Standard:** MCLs and MRDLs (Maximum Residual Disinfectant Levels) for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.*

Table 1. Status of Potable Water Quality Targets

Key Parameters of Concern	Water Quality Targets[1]	Target Currently Met	Requires Optimization	Requires Capital Investment	Supplemental Table/Figure
Appearance	Minimize air bubbles/cloudiness events[2]	✓			Table 2
Arsenic (µg/L)	<5	✓			Figure 1
Chloramines and Nitrification Prevention					
Total Disinfectant Residual (mg/L as Cl_2)	2.0 - 2.5 from water treatment plants (WTPs), wells will be operated to be as close to this target range as feasible	✓			Figure 6
Cl_2:NH_3-N	4:1 to 5:1	✓[3]			
Minimize odor	Chloraminate above pH 8.0 for WTPs	✓			
Free Ammonia Residual (mg/L as N)	<0.15 at retailer turnouts	NA[4]	✓		Figure 7
Nitrite (mg/L as N)	<0.02	NA[5]			
Consistency	Provide consistent chloramine residual at all wells and WTPs	✓	✓		Figure 6
Chloride (mg/L)	<100	✓[6]			Figure 3
Chromium VI, Cr^{6+}(µg/L)	<20 (pending potential regulations)	✓			Figure 2
Cryptosporidium	4-log removal, including multi-barrier control	✓			
Disinfection By-Products (DBPs)					
Maximum leaving WTP	Total Trihalomethanes (TTHMs) <64 µg/L	✓			Figure 8a
	Five Haloacetic acids (HAA5) <48 µg/L	✓			Figure 8b
Running Annual Average (RAA) of DBPs	TTHM <40 µg/L	NA[7]			
at Retailer Turnouts	HAA5 <30 µg/L	NA[7]			
N-Nitrosodimethylamine (NDMA) (ng/L)	<10 (pending potential regulations)	✓[8]			
Hardness (mg/L as $CaCO_3$)	<150	✓[9]	✓	✓	Figure 5
pH (Units)	non-corrosive	✓			
	pH leaving WTP at +/- 0.2 units of target	✓			
Radon (pCi/L)	<1000 (pending potential regulations)	✓[10]			
Taste and Odor (earthy/musty)					
Odor Threshold Concentrations					
2-Methylisoborneol (MIB)	9 ng/L	✓	✓	✓	
Geosmin	4 ng/L	✓	✓	✓	
Events[2]	No events	✓	✓	✓	Table 2
Total Dissolved Solids (TDS) (mg/L)	<500	✓[6]	✓	✓	Figure 4

[1] Targets are either at the secondary MCLs or 80% of the primary MCLs except for the key parameters of concern in the table above.

[2] An event is defined as when three or more similar complaints are received in a 7-day period. There were no events in 2010.

[3] Ratio is adjusted to meet target free ammonia residual at WTPs.

[4] Averages met target at supply sources. Retailer turnout monitoring was discontinued in 2010 because online or more frequent free ammonia monitoring is conducted at supply sources. Minimal change in free ammonia levels are expected during the short residence time to turnouts.

[5] Monitoring discontinued with Retailer consent in 2006 due to historical non-detect nitrite levels.

[6] Averages met target.

[7] No monitoring is conducted at Retailer turnouts because no significant changes are expected from treatment plant effluent levels.

[8] Treated surface water is monitored once a year for supplemental information. In 2010, NDMA was detected at 3 to 5 ng/L at surface WTPs.

[9] Averages met target for Cal Water Service Company-Livermore, City of Livermore, and Pleasanton.

[10] There are currently no regulatory monitoring requirements for radon. Being a new supply source, Chain of Lakes wells were monitored in 2010 and levels were below the target.

Units: Milligrams per liter (mg/L): a unit expressing the concentration of chemical constituent in solution as weight (milligram) of solute per unit volume (liter) of water; equivalent to one part per million.

Micrograms per liter (µg/L): equivalent to one part per billion.

Nanograms per liter (ng/L): equivalent to one part per trillion.

PicoCuries per liter (pCi/L): a measure of radioactivity.

Table 2. Retail Customer Water Quality Complaints Reported to Zone 7*

Parameter	Dublin San Ramon Services District (DSRSD)	City of Pleasanton	Cal Water Service Company - Livermore	City of Livermore	Totals
Chlorinous Odor					0
Earthy/Musty Taste & Odor	3	1		3	7
Colored/Murky				2	2
Turbidity/Suspended Solids					0
Salty Taste					0
Hardness		11	1	3	15
Cloudy Water					0
Others					0

* The complaints reported to Zone 7 by the end of each month are those deemed to be directly related to the Zone 7 water supply.

Table 3. Status of Non-Potable Water Quality Targets

Key Parameters of Concern	Units	Maximum Applied Level/Targets	Average Targets	SBA***		
		Vineyards		Avg	Min	Max
Boron	mg/L	<1	<0.5	0.15	<0.10**	0.24
Chloride	mg/L	<200	<125	63	17	129
Emitter Clogging Potential	mEq/L as Ca+Mg****	3 to 4	3 to 4	2.0	1.2	3.3
Available Nitrogen from Nitrate	mg/L as N	-	<10 during summer	0.4	0.1	1.1
pH	---	-	<8.0	7.7	6.8	8.7
Sodium	mg/L	<200	<100	44	15	75
Total Dissolved Solids	mg/L	-	<650	239	111	371

** Boron's minimum reporting limit (MRL) is 0.10 mg/L.

*** SBA data is an average of monthly untreated water samples taken from the Del Valle WTP and the Patterson Pass WTP.

**** mg/L as Ca+Mg = milliequivalents per liter as calcium and magnesium.

Figure 1. Arsenic

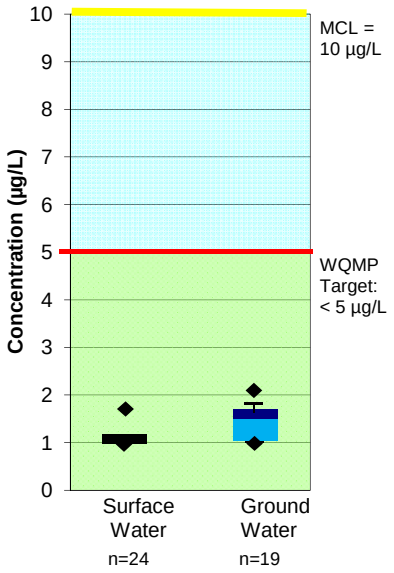


Figure 2. Total Chromium

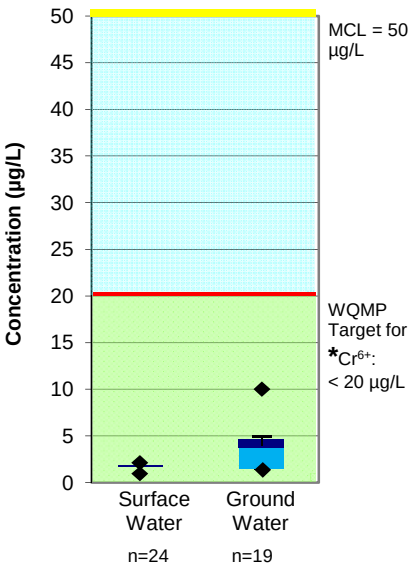


Figure 3. Chloride

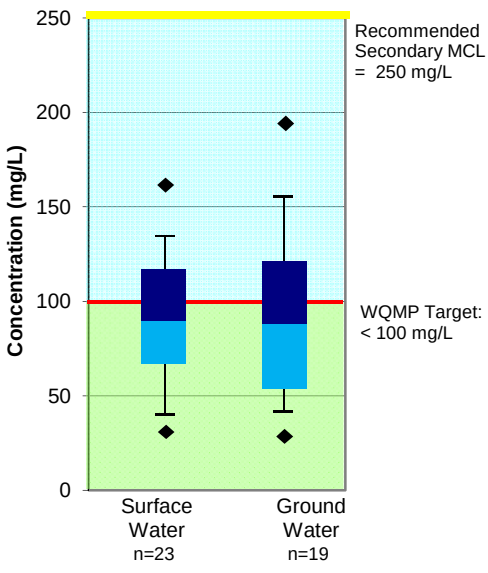


Figure 4. Total Dissolved Solids (TDS), *****
Retailer Turnout Samples

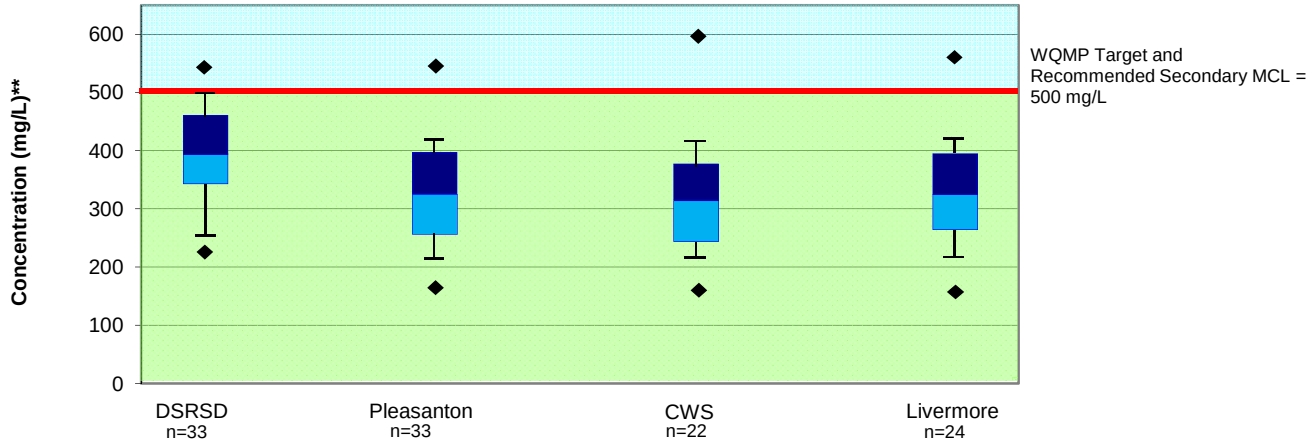
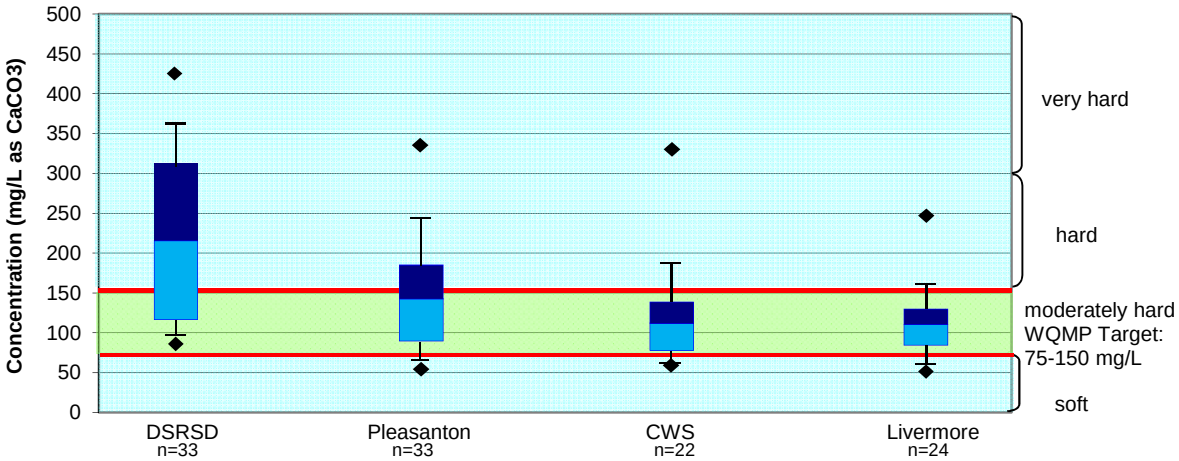


Figure 5. Total Hardness***
Retailer Turnout Samples



* Most Chromium in Zone 7 groundwater is Cr^{6+}.

** TDS values are estimated from monthly electrical conductivity measurements.

*** Sampling at DSRSD turnout #4 was discontinued in June 2010 due to frequent low flow. The Arroyo Vista turnout and the Vasco Pipeline at UPRR turnout were added to DSRSD and Livermore calculations, respectively, to better reflect the sampling regimen in Zone 7s monthly Delivered Water Quality Report.

HOW TO READ WATER QUALITY TARGET GRAPHS

- Each bar on the chart represents the range of measurements for various constituents monitored during 2010.
- The junction of the light blue and dark blue bars represent the average values over the year. The span of the light and dark blue bars represents the 75th and 25th percentile values of the data set. The "error bars" represent the 90th and 10th percentile values, and the black diamonds represent the data set outliers.
- WQMP water quality targets or ranges are highlighted in green, with the red line indicating the maximum and/or minimum value.
- Any applicable Maximum Contaminant Level (MCL) set by state and federal water quality regulations are highlighted by the yellow bar at the top of each chart.
- "n" represents the number of samples analyzed.

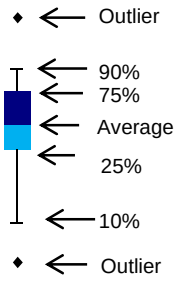


Figure 6. Total Residual Chlorine*
Production Facility Effluent Samples

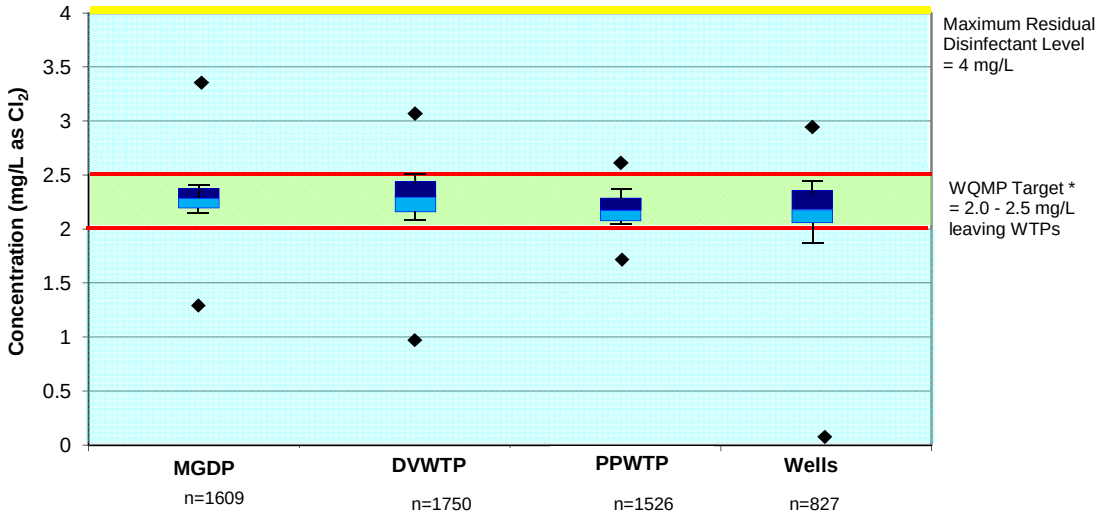
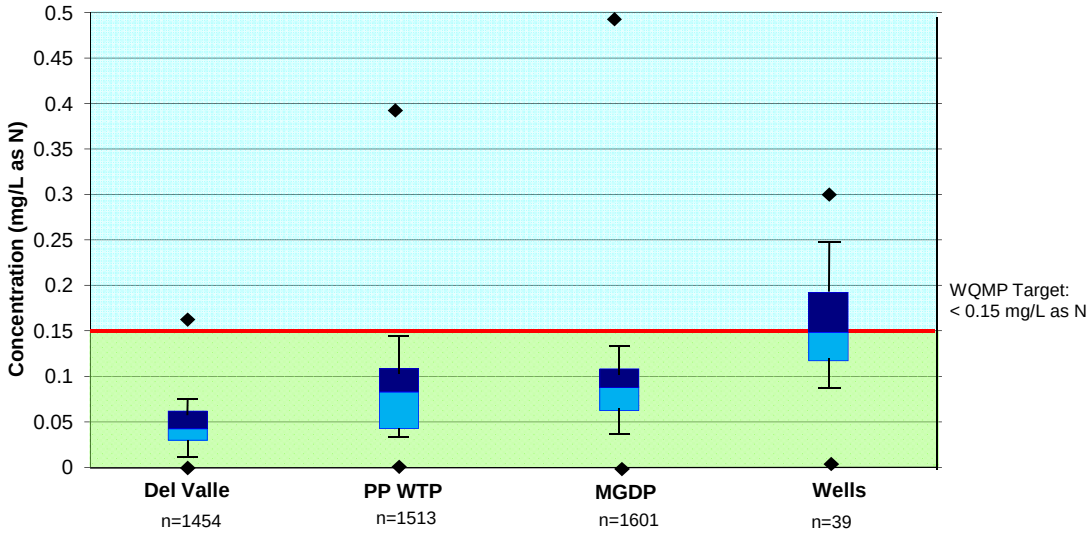


Figure 7. Free Ammonia*,**
Production Facility Effluent Samples



* Unless otherwise stated, data is based on every 4-hour online values.

** Daily free ammonia grab sampling was implemented in October 2010 for any operating wells. Due to system demand driven variables, consistent free ammonia monitoring at wells is a challenge.

Figure 8a. Total Trihalomethanes (TTHMs)*,
Production Facility Effluent Samples**

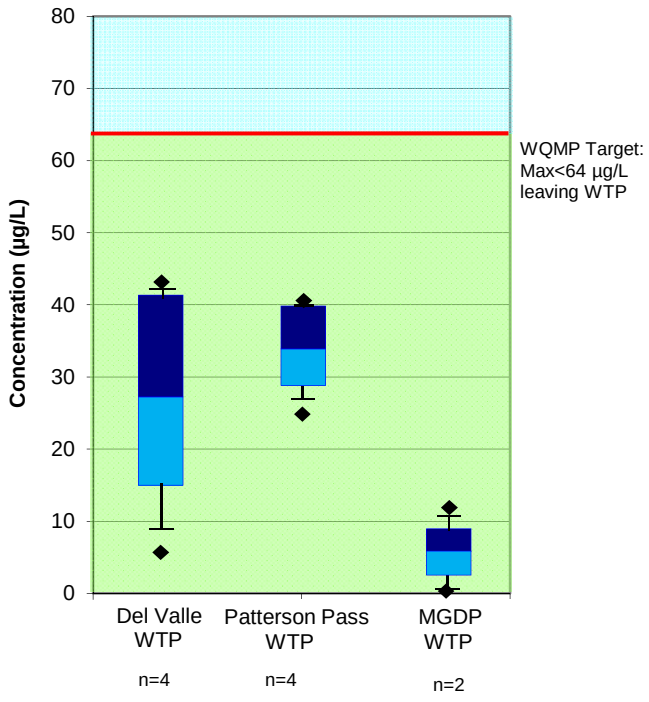


Figure 8b. Five Haloacetic Acids (HAA5)*,
Production Facility Effluent Samples**

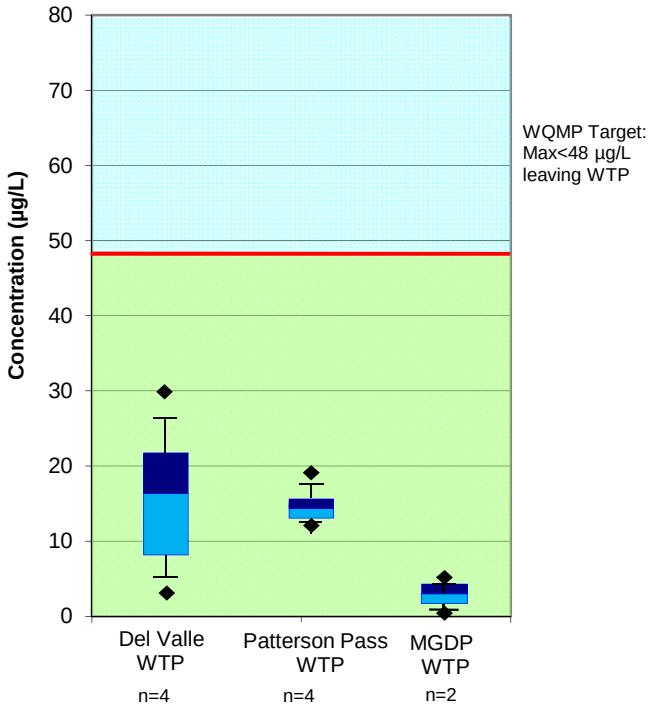


**Figure 9a. Retailer Distribution System
Quarterly Running Annual Averages for
Total Trihalomethanes (TTHMs)**

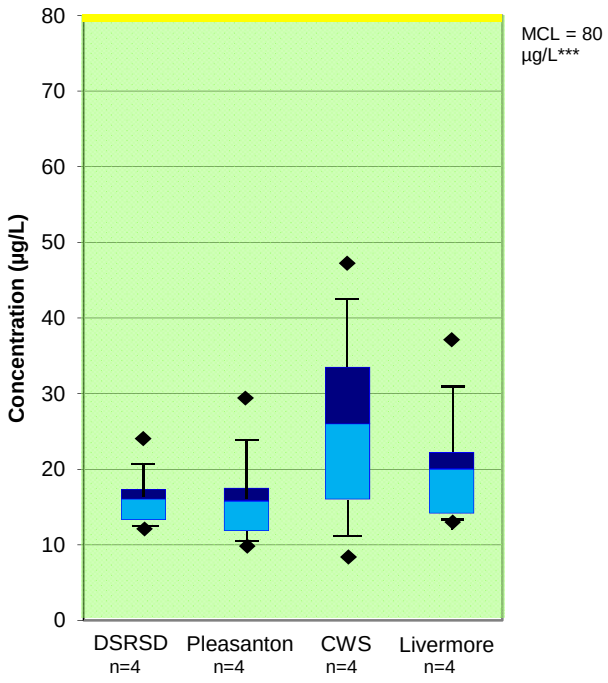
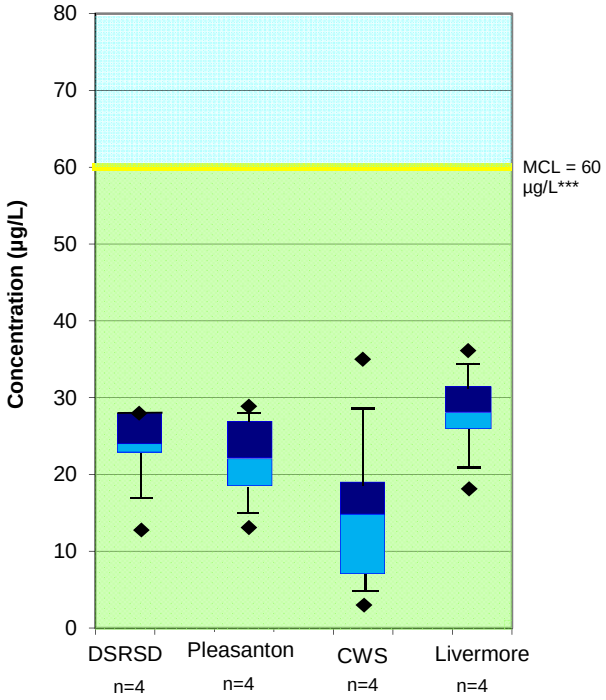


**Figure 9b. Retailer Distribution System
Quarterly Running Annual Averages for
Five Haloacetic Acids (HAA5)**



* There is no MCL for TTHMs/HAA5 leaving WTP.

** No monitoring is conducted at the wells where minimal TTHMs/HAA5 are expected due to low organic content of the groundwater supply.

*** Retailer MCL compliance for TTHMs/HAA5 is determined by system-wide running annual average of quarterly samples.