

APPENDIX III

Trilinear Diagrams and Ion Balance Calculations

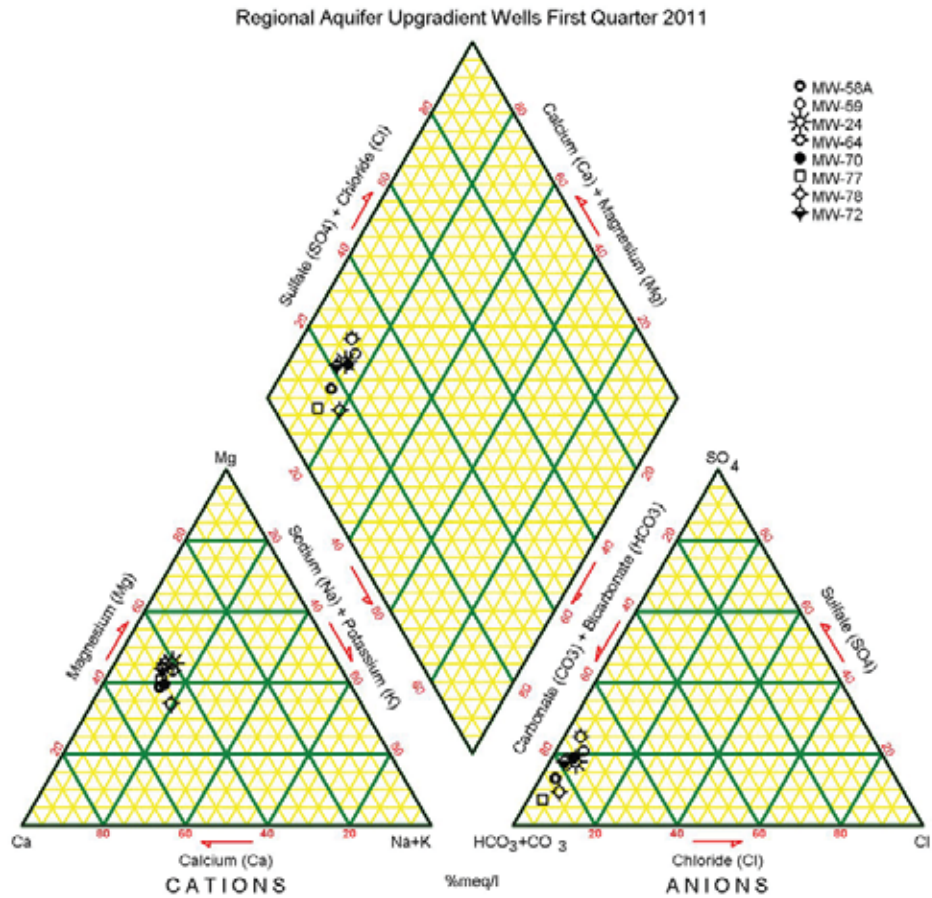
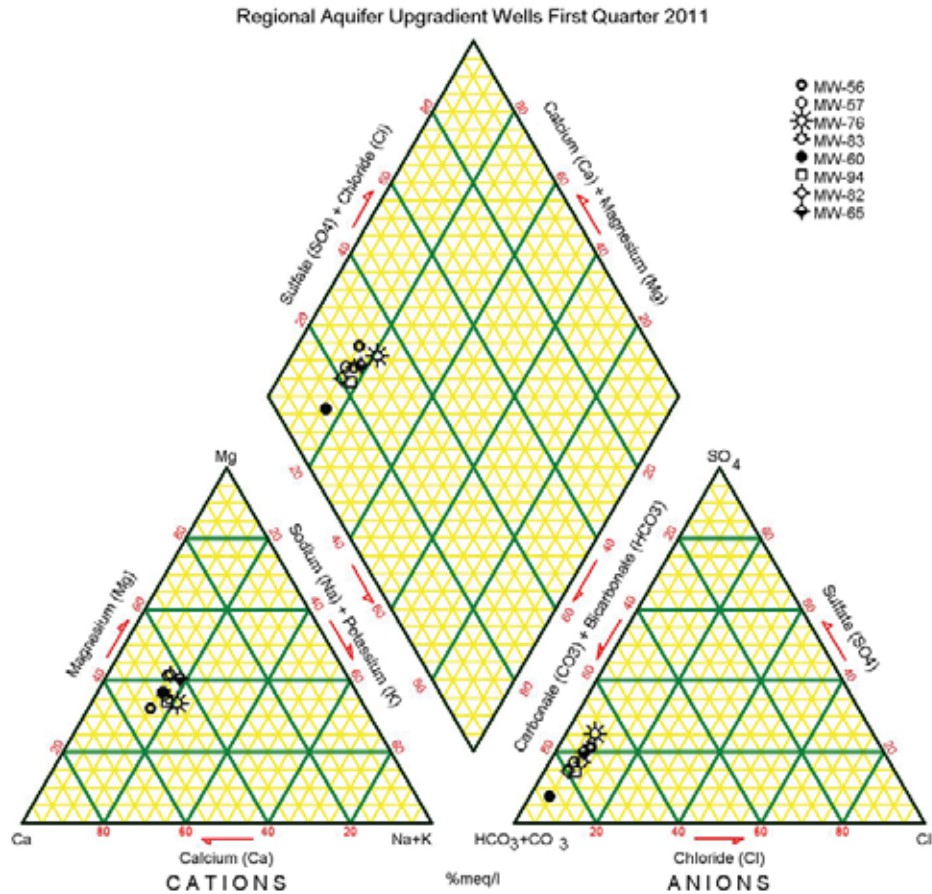
Regional Aquifer

North and West Perched Wells

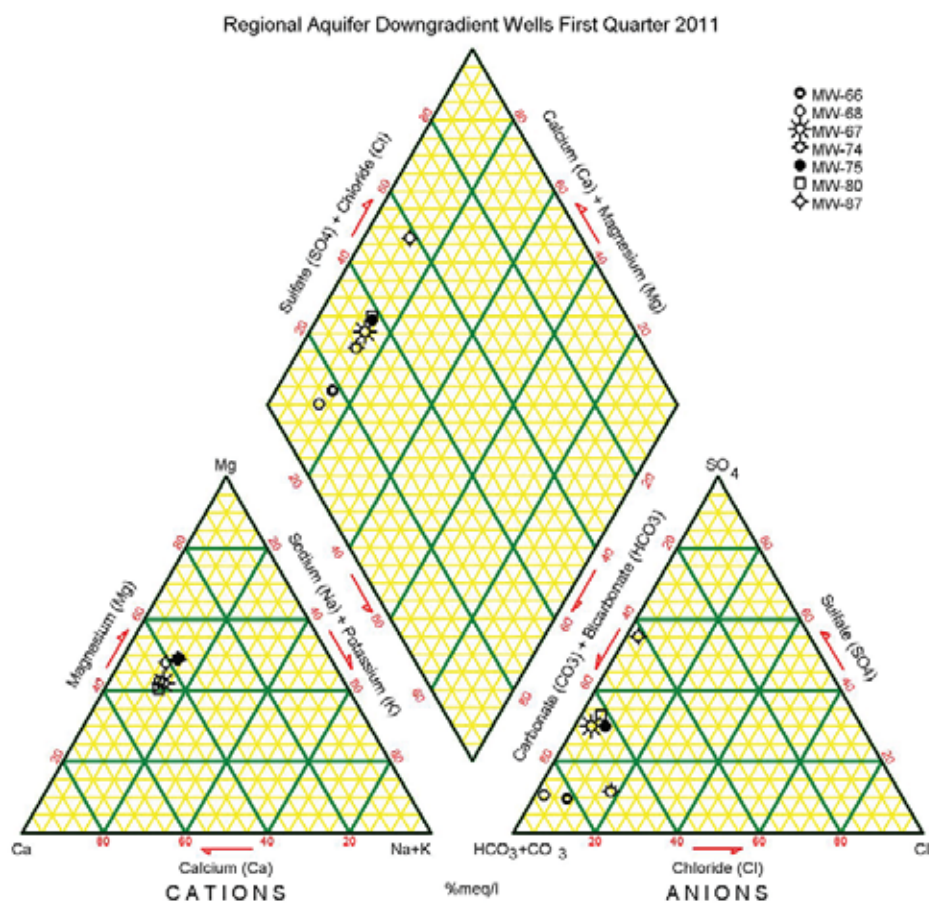
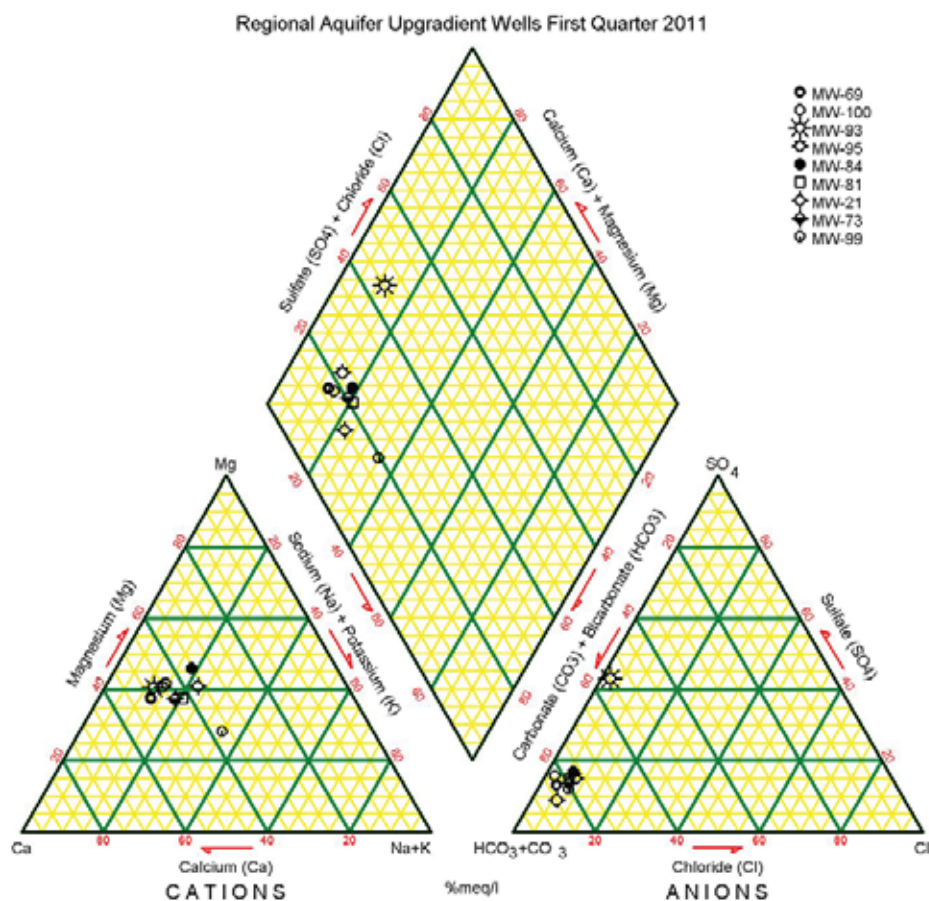
East Main Hill Perched Zone

South Solid Waste Area Perched Wells

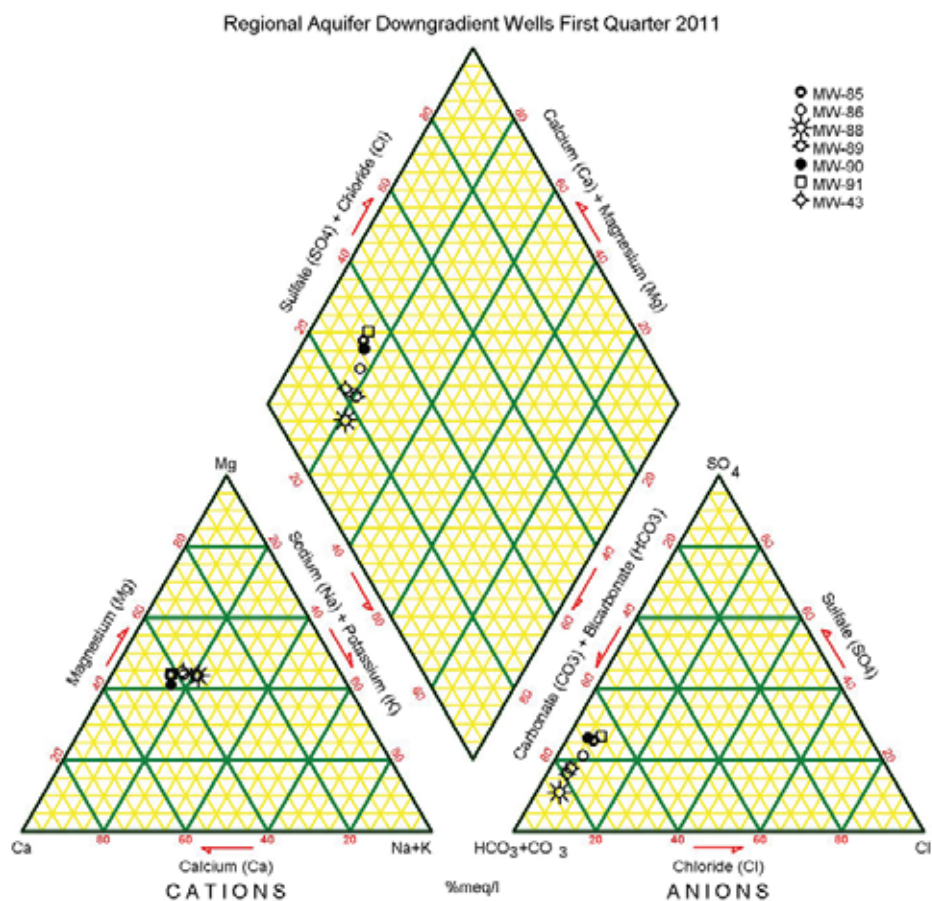
Trilinear Diagrams Regional Aquifer Wells 1st Quarter 2011



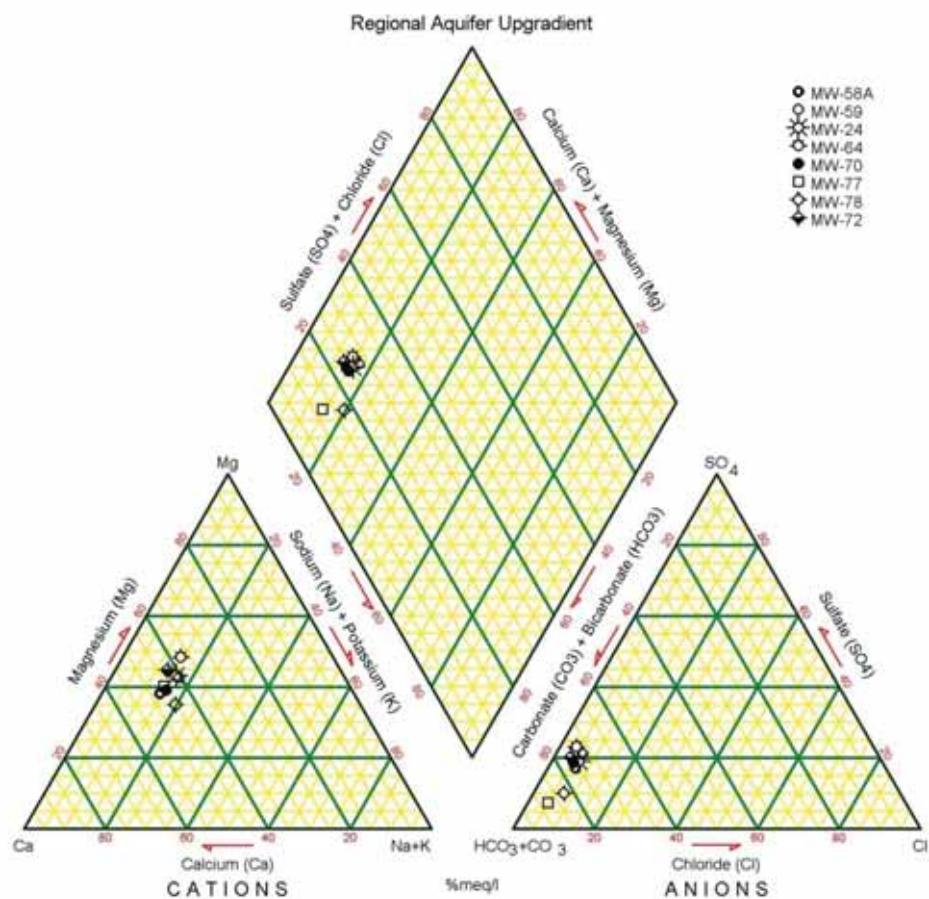
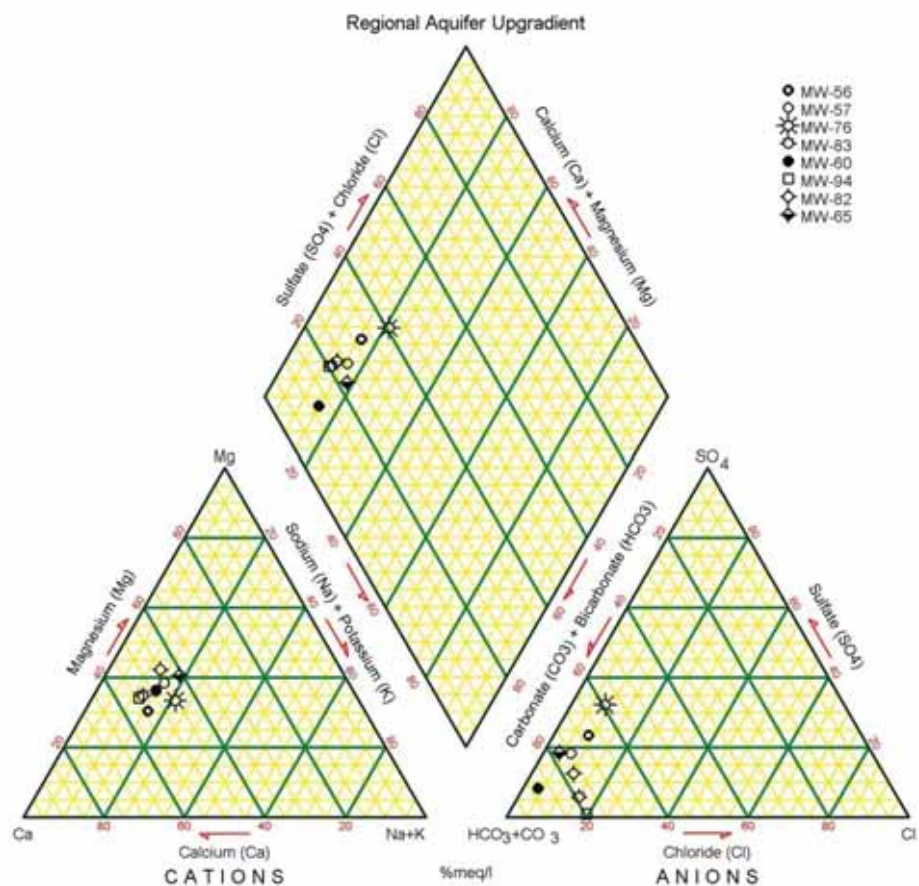
Trilinear Diagrams Regional Aquifer Wells 1st Quarter 2011



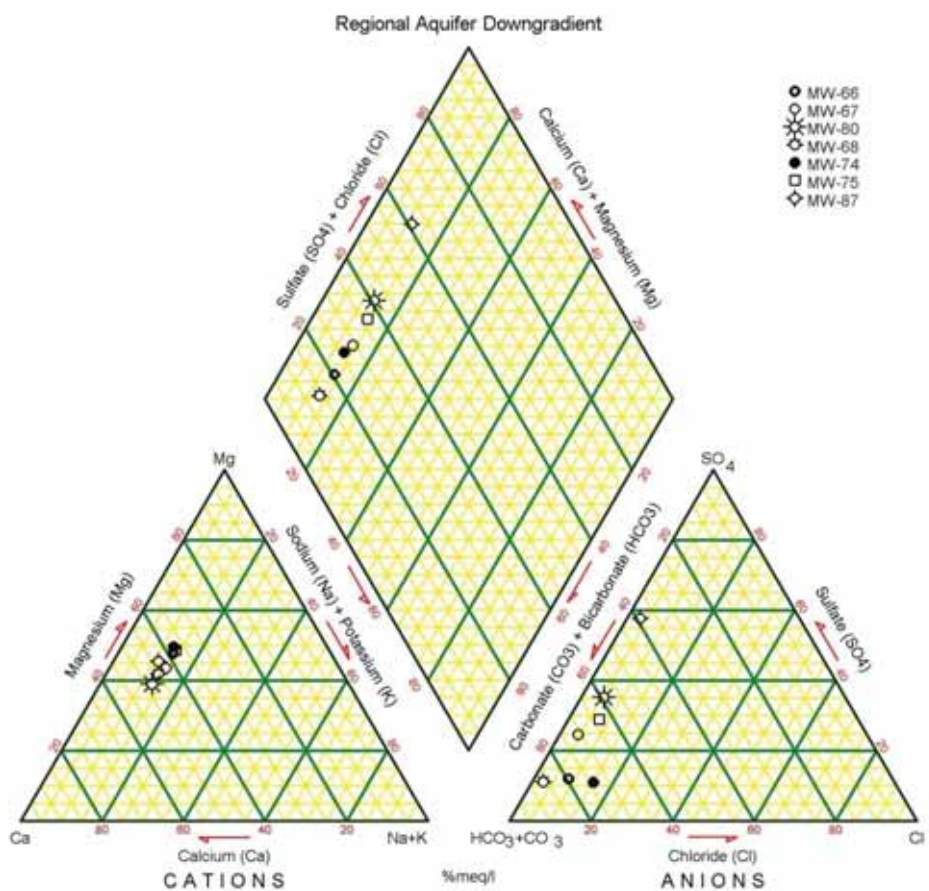
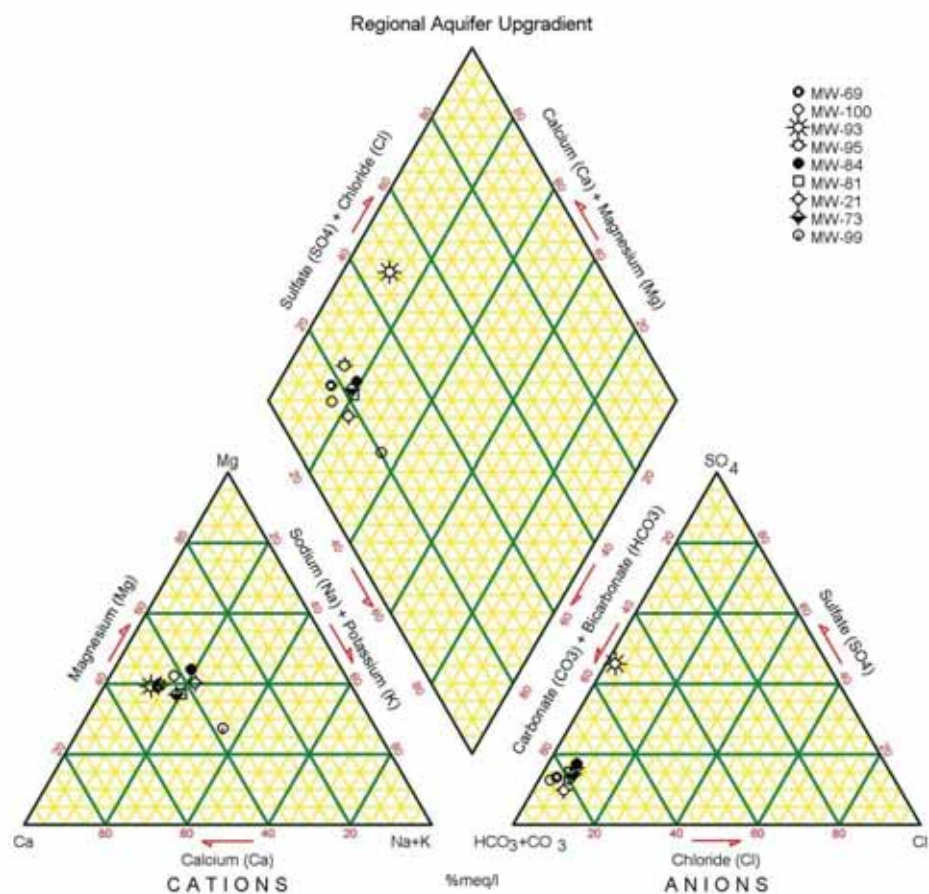
Trilinear Diagrams Regional Aquifer Wells 1st Quarter 2011



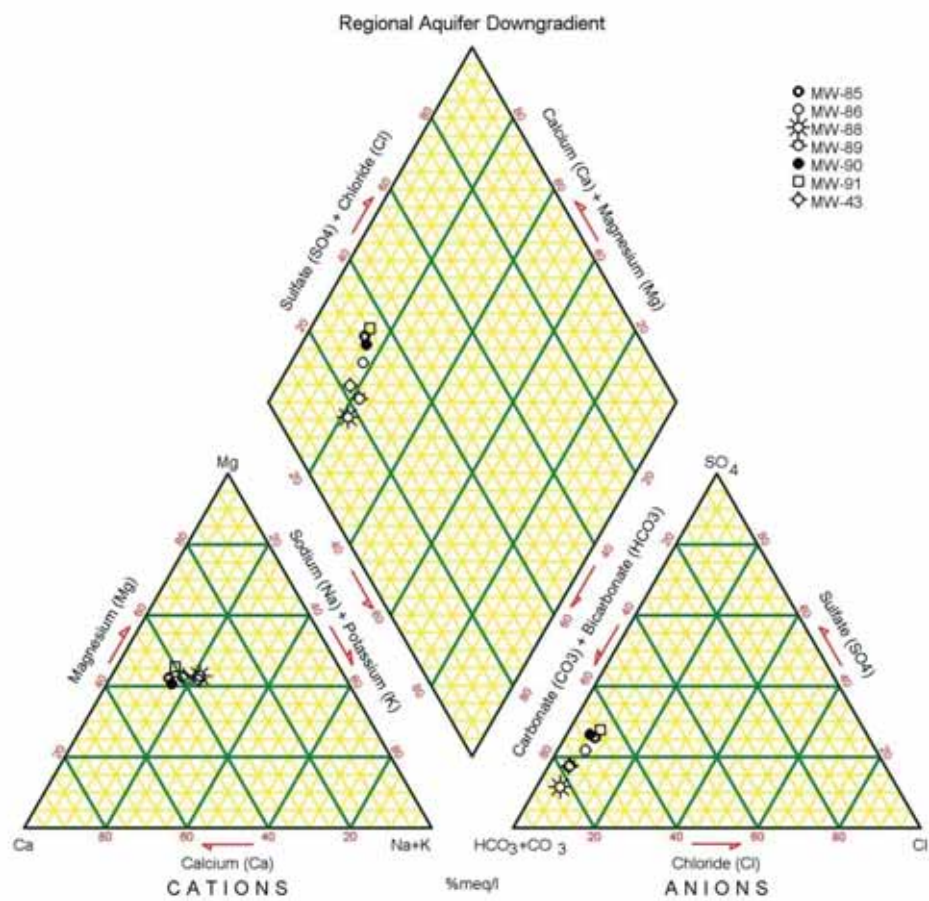
Trilinear Diagrams Regional Aquifer Wells 2nd Quarter 2011



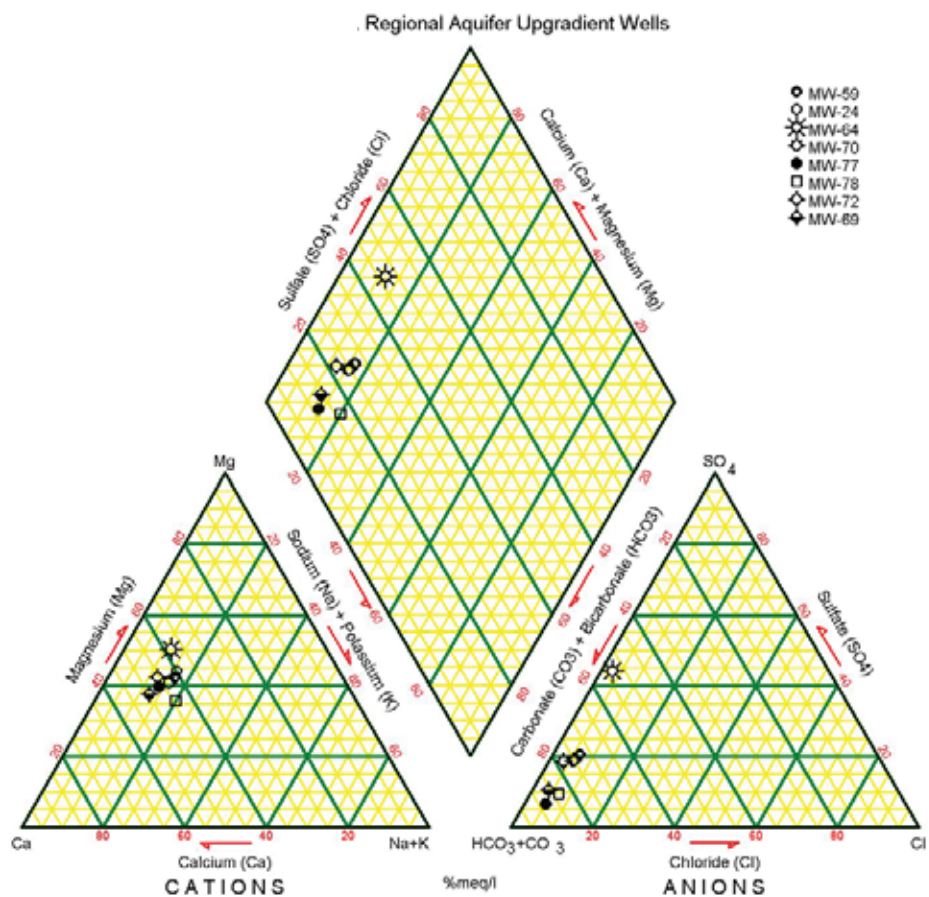
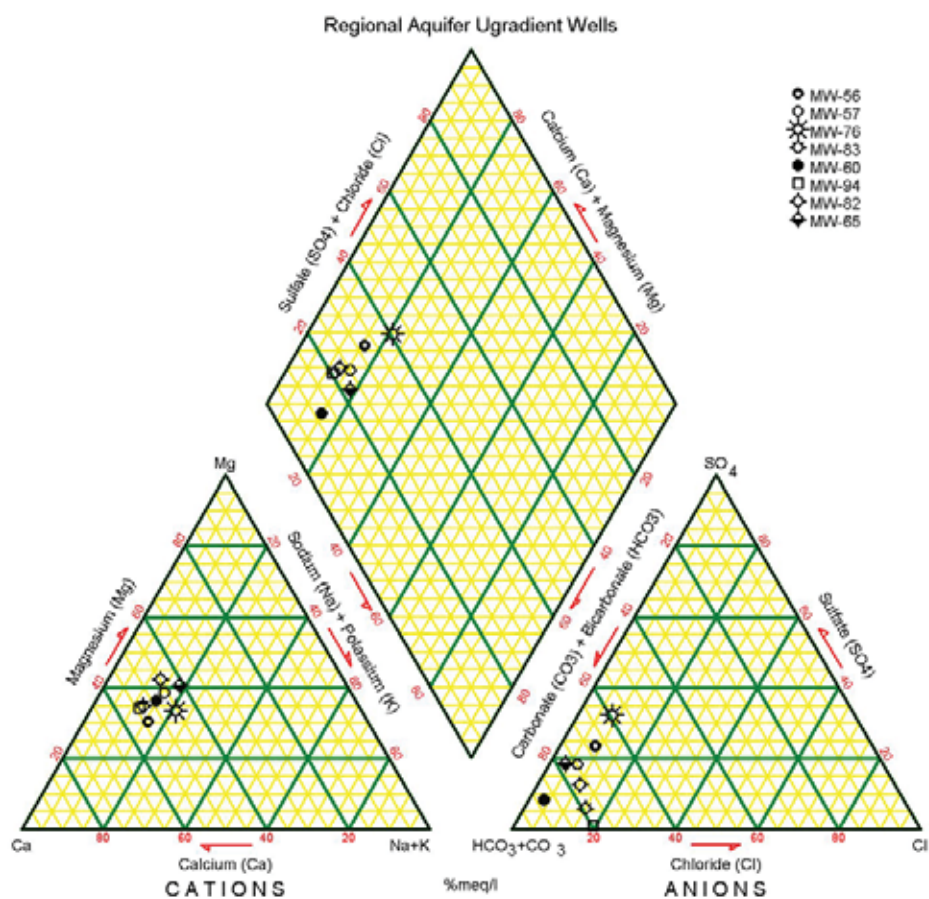
Trilinear Diagrams Regional Aquifer Wells 2nd Quarter 2011



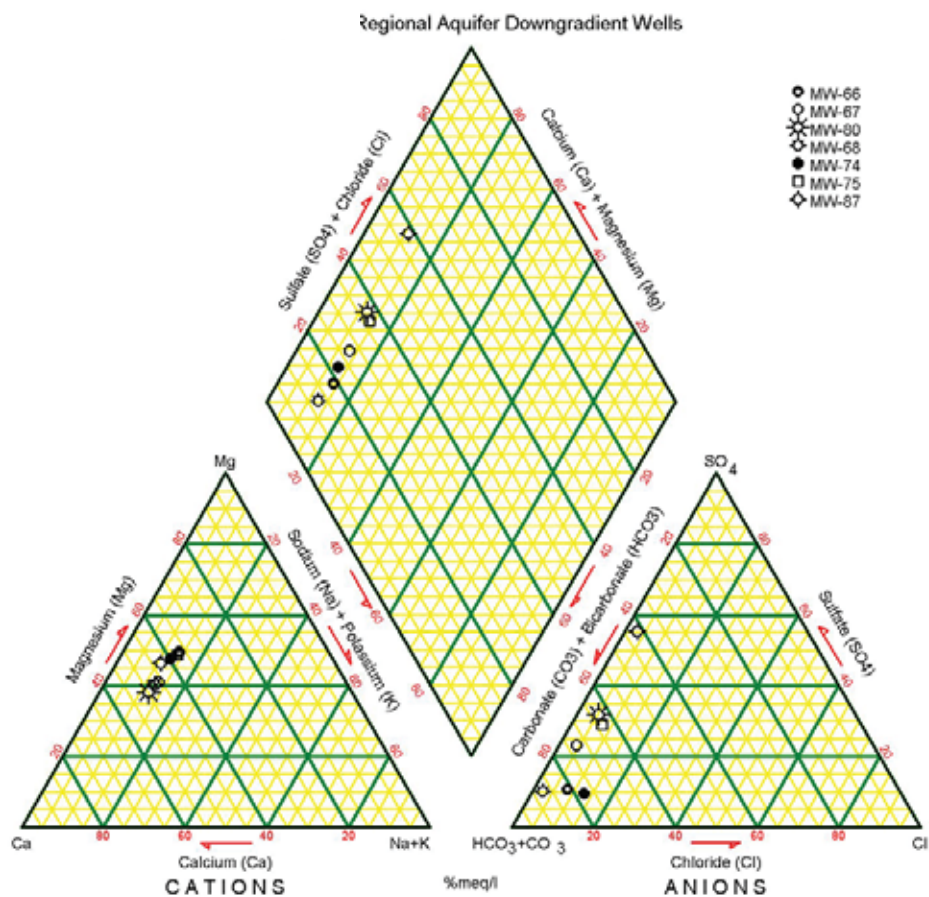
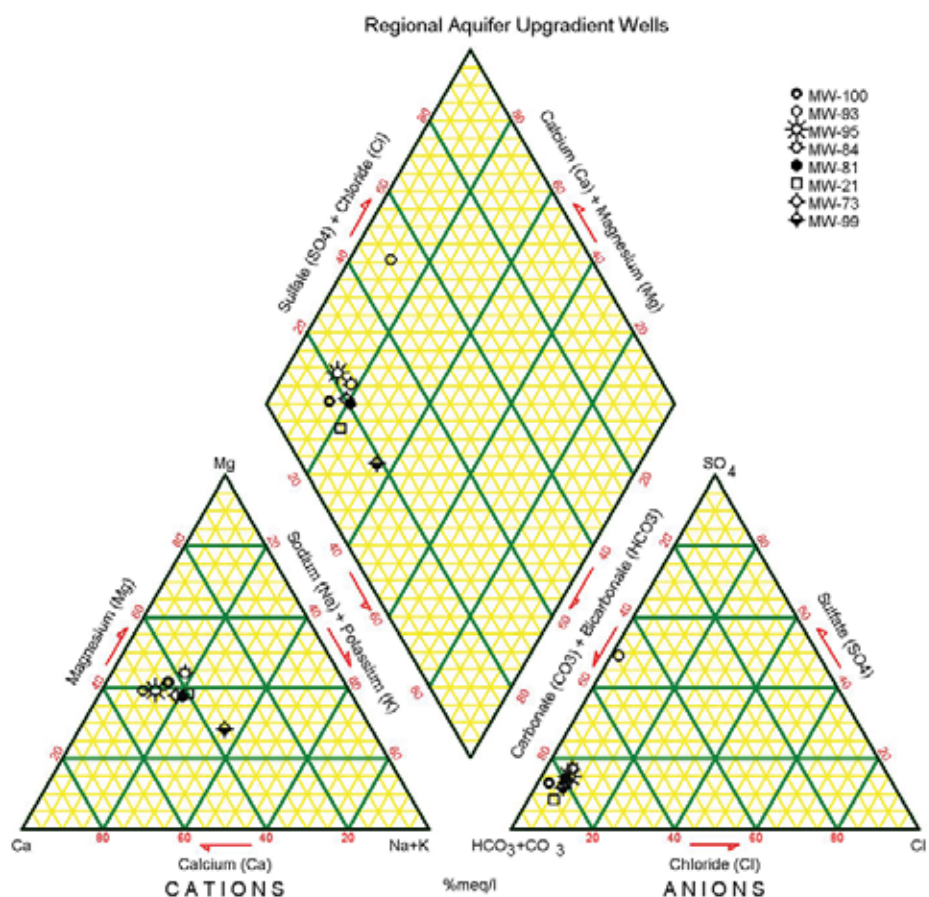
Trilinear Diagrams Regional Aquifer Wells 2nd Quarter 2011



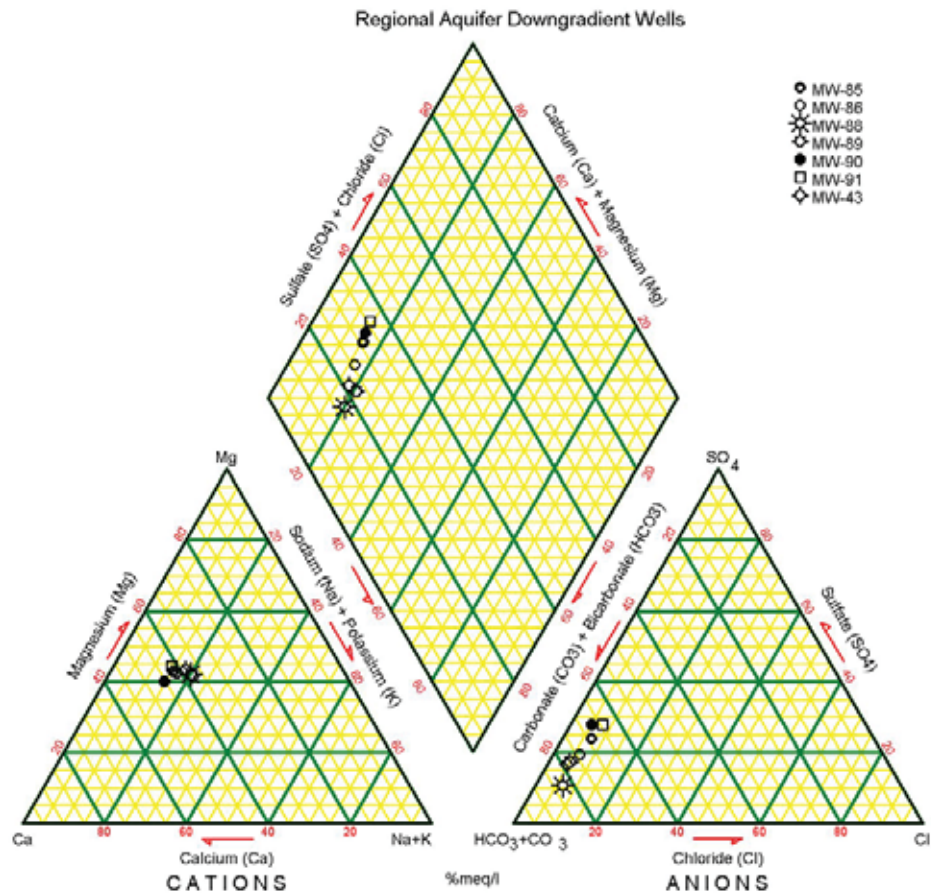
Trilinear Diagrams Regional Aquifer Wells 3rd Quarter 2011



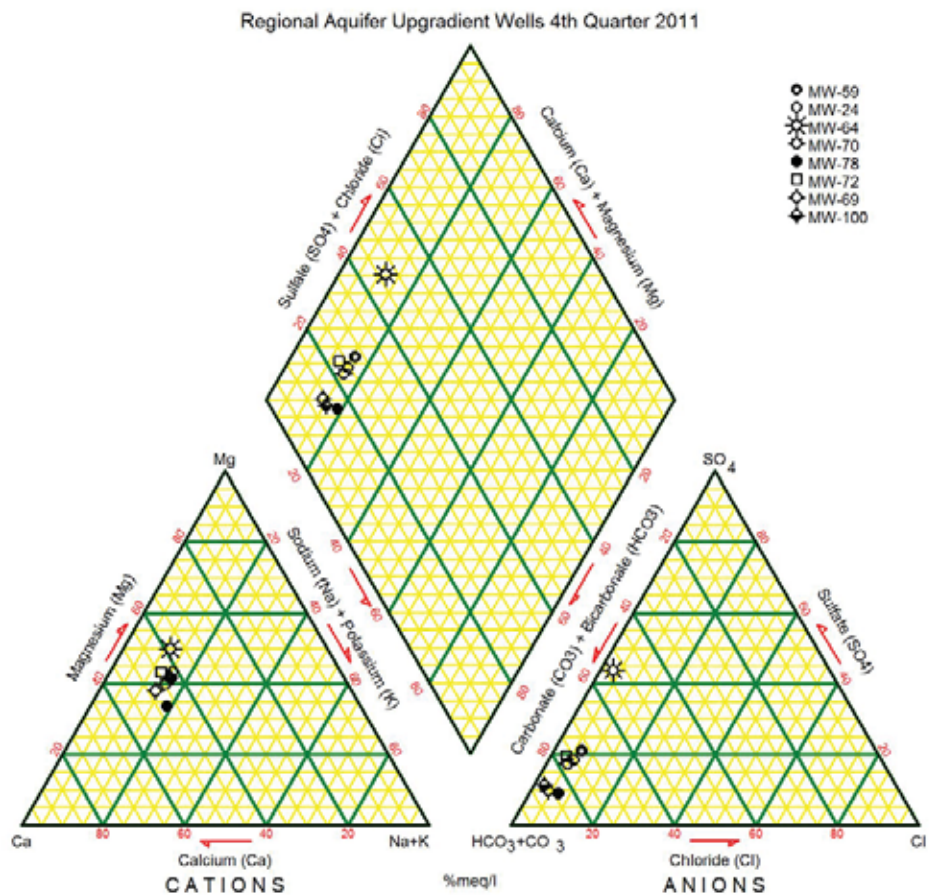
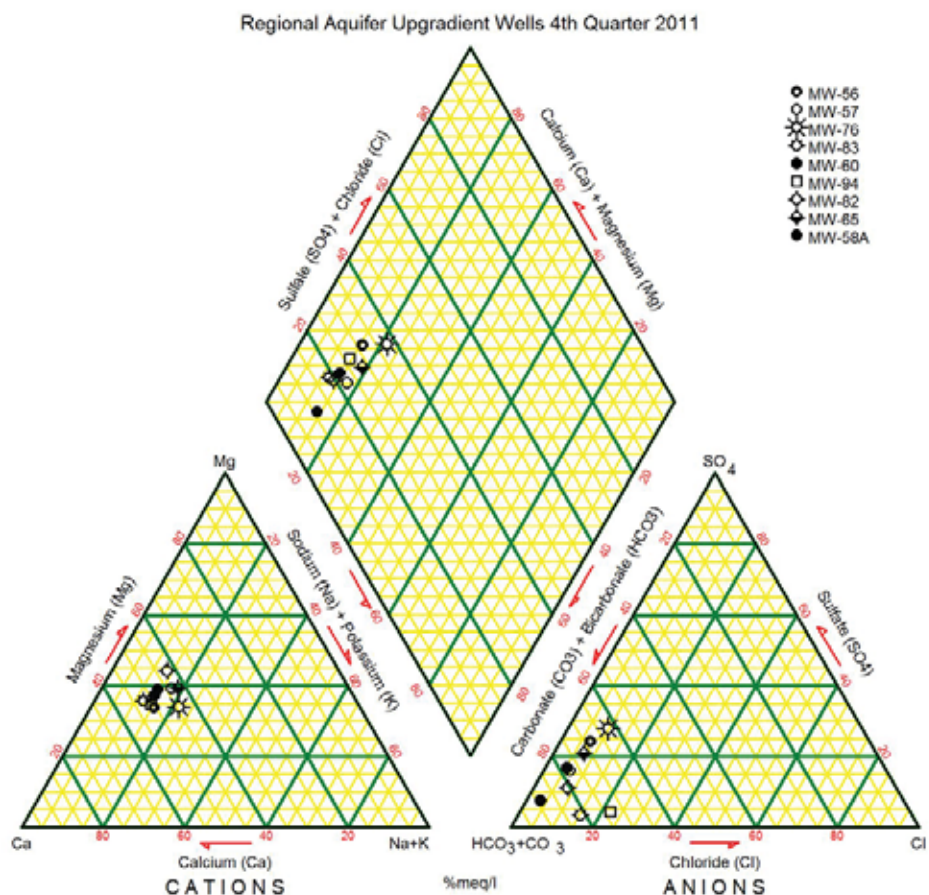
Trilinear Diagrams Regional Aquifer Wells 3rd Quarter 2011



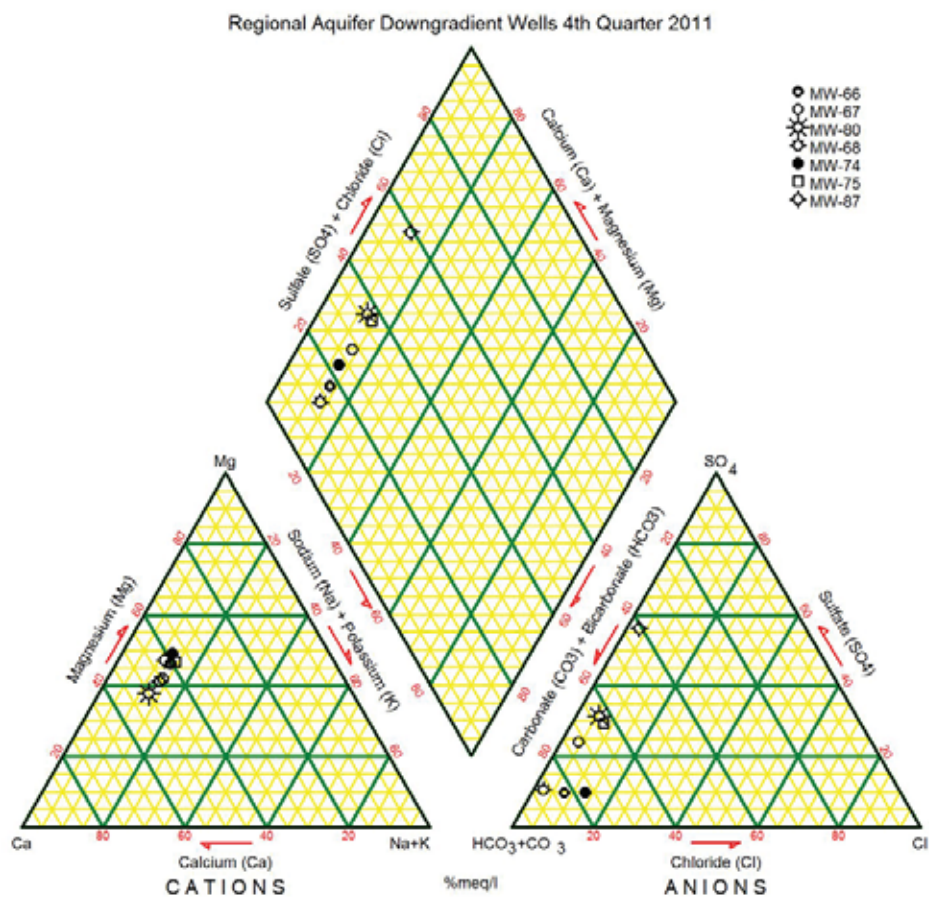
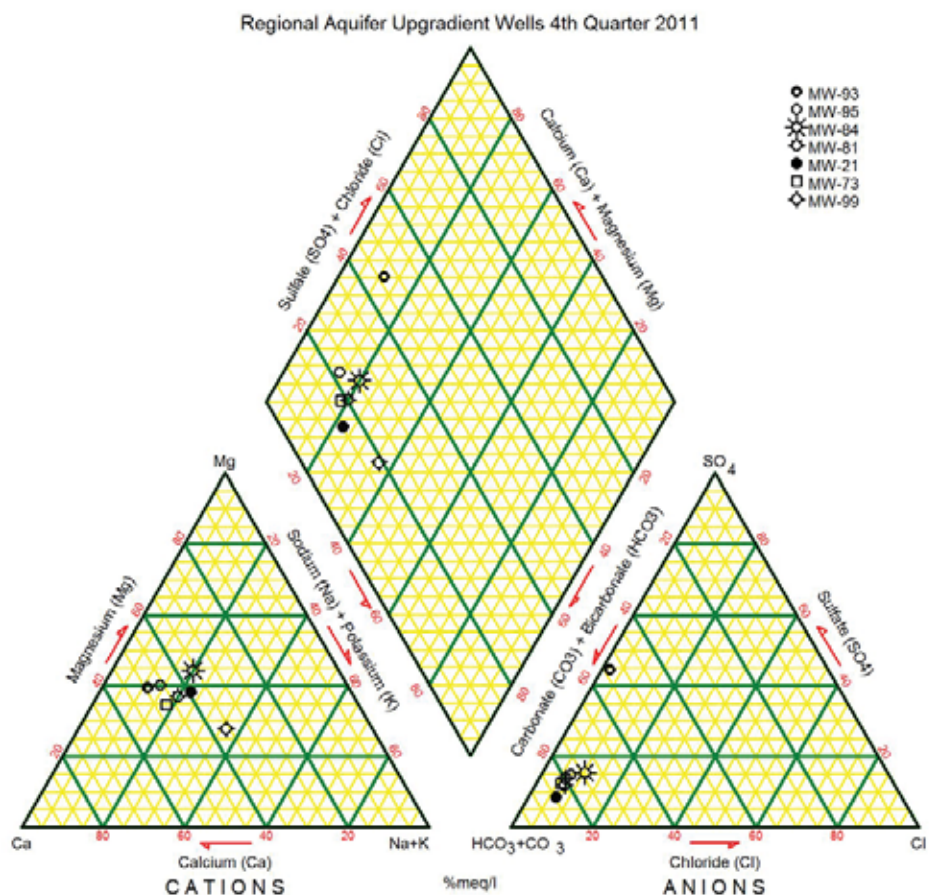
Trilinear Diagrams Regional Aquifer Wells 3rd Quarter 2011



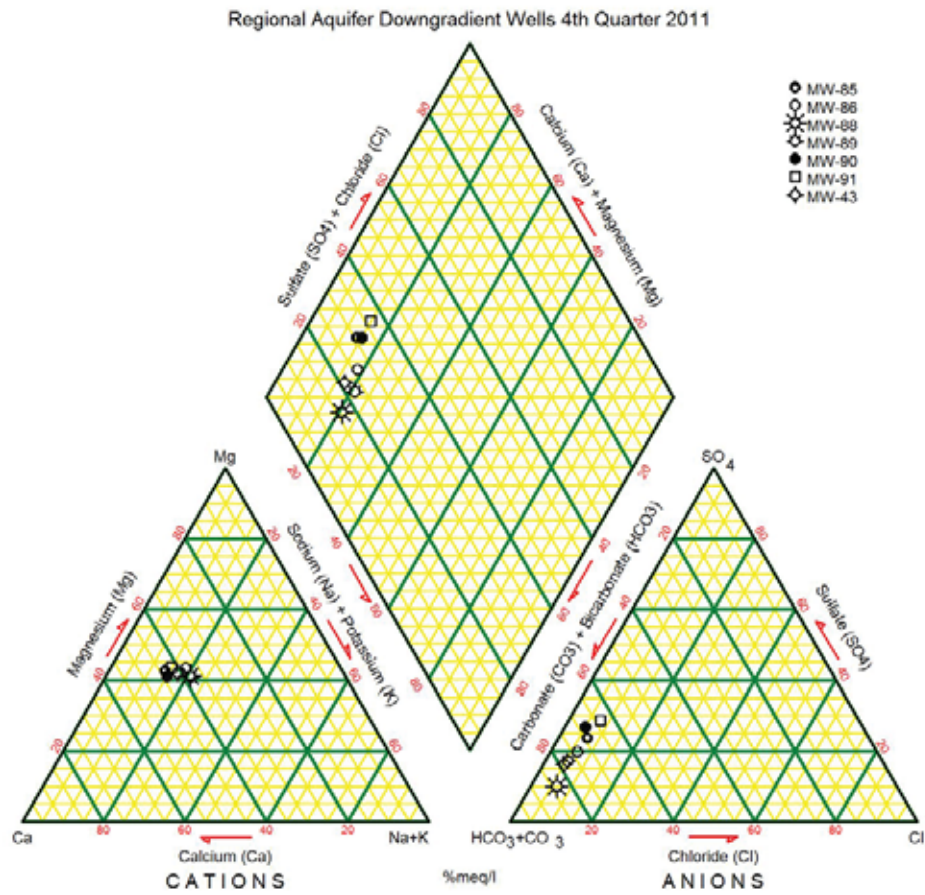
Trilinear Diagrams Regional Aquifer Wells 4th Quarter 2011



Trilinear Diagrams Regional Aquifer Wells 4th Quarter 2011



Trilinear Diagrams Regional Aquifer Wells 4th Quarter 2011



**Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-56	MW-57	MW-76	MW-83	MW-60	MW-94
Date	1/11/11	1/11/11	1/18/11	1/20/11	1/6/11	1/18/11
Cations	MW	MW	MW	MW	MW	MW
Calcium	40.1 2/14.5	52.3 16.4	36.7 15.4	47.1 15.4	47.1 15.4	47.5 14.1
	24.3 2/5.42	0.446	0.57437	0.62456	0.59905	0.50771
Magnesium	39.1 1/0.906	0.02317	1.7 0.901	0.02304	1.0 1.21	0.03095
Potassium	23.0 1/4.29	0.1866	13.5 5.84	0.025403	11.4 7.45	0.32406
Sodium	55.8 2/0.02	0.00064	0.0 9.63	0.34487	15.5 0.01	0.00018
Iron	54.9 2/0.0744	0.00271	0.2 0.25	0.0091	0.4 0.00	1.8E-05
Manganese	14.0 1/0.01	0.00036	0.0 0.0222	0.00158	0.1 0.01	0.00036
Ammonia-N						
Total Cations (meq/L)	1.4	2.2	1.7	1.7	1.6	1.5
Anions						
Alkalinity, Total	45.3	85	56.5	67.9	69.8	57.6
Carbonate	60.0 2/0.018	0.0006	0.0 0.0353	0.00118	0.1 0.0105	0.00035
Bicarbonate	61.0 1/55.23	0.90526	65.0 103.63	1.69857	76.8 68.91	1.12948
Chloride	35.5 1/3.62	0.10211	7.3 4.66	0.13144	5.9 4.19	0.11818
Nitrate-N	14.0 1/1.57	0.11209	8.0 0.01	0.00036	0.0 1.18	0.08424
Sulfate	96.1 2/13.1	0.27275	19.6 18.2	0.37894	17.1 20.2	0.42058
Total Anions (meq/L)	1.4	2.2	1.8	3.6	1.7	3.0
Total Ions (meq/L)	2.8	4.4	3.5	5.3	3.3	4.5
Cation/Anion Ratio	0.99	1.01	0.97	0.95	0.98	0.97
Percent Difference	-0.4	0.4	-1.6	-2.4	-1.3	-1.7
TRILINEAR DIAGRAM DATA						
sum (Ca, Mg, Na+K)	1.38	1.87	1.70	1.74	1.63	1.48
Calcium	52.46	43.71	45.26	47.10	47.24	47.53
Magnesium	32.33	41.49	33.83	35.95	36.83	34.29
Sodium + Potassium	15.21	14.80	20.91	16.95	15.94	18.18
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.28	2.21	1.67	1.81	1.59	1.48
Sulfate	21.297	17.146	25.206	17.127	7.504	14.504
Chloride	7.973	5.947	7.083	7.911	4.853	7.593
Bicarbonate + Carbonate	70.731	76.907	67.711	74.962	87.643	77.903

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-82			MW-58A			MW-59			MW-24			MW-64			MW-70				
Date	MW	n	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)			
Cations	40.1	2	16.3	0.81337	42.9	18.4	0.91816	45.4	13.8	0.68862	37.5	13.1	0.65369	37.4	24.2	1.20758	41.9	17.2	0.85828	45.4
Calcium	24.3	2	9.61	0.79078	41.7	9.24	0.76034	37.6	8.8	0.72413	39.4	8.95	0.73647	42.1	15.7	1.29192	44.8	9.09	0.74799	39.5
Magnesium	39.1	1	1.48	0.03785	2.0	1.16	0.02967	1.5	1.02	0.02609	1.4	0.783	0.02003	1.1	1.63	0.04169	1.4	1.41	0.03606	1.9
Potassium	23.0	1	5.83	0.25359	13.4	5.78	0.25142	12.4	5.23	0.22749	12.4	4.78	0.20792	11.9	7.14	0.31057	10.8	5.7	0.24794	13.1
Sodium	55.8	2	0.01	0.00018	0.0	1.22	0.04369	2.2	4.64	0.16617	9.0	3.43	0.12284	7.0	0.603	0.02159	0.7	0.01	0.00018	0.0
Iron	54.9	2	0.00	1.8E-05	0.0	0.383	0.01394	0.7	0.104	0.00379	0.2	0.127	0.00462	0.3	0.228	0.0083	0.3	0.028	0.00102	0.1
Manganese	14.0	1	0.01	0.00036	0.0	0.0628	0.00448	0.2	0.01	0.00036	0.0	0.0415	0.00296	0.2	0.0405	0.00289	0.1	0.01	0.00036	0.0
Ammonia-N																				
Total Cations (meq/L)				1.9			2.0			1.8			1.7			2.9			1.9	
Anions																				
Alkalinity, Total			77.4			112			62.6		74.2		111		76.8					
Carbonate	60.0	2	0.0315	0.00105	0.1	0.2493	0.00831	0.3	0.0484	0.00161	0.1	0.0644	0.00215	0.1	0.0783	0.00261	0.1	0.1456	0.00485	0.2
Bicarbonate	61.0	1	94.36	1.54672	76.9	136.13	2.23135	82.8	76.27	1.2502	72.3	90.39	1.48163	75.7	135.26	2.21705	71.0	93.40	1.53092	75.3
Chloride	35.5	1	4.01	0.11311	5.6	3.58	0.10098	3.7	4.12	0.11621	6.7	4.34	0.12242	6.3	4.45	0.12552	4.0	3.87	0.10916	5.4
Nitrate-N	14.0	1	0.901	0.06432	3.2	0.01	0.00036	0.0	0.01	0.00036	0.0	0.01	0.00036	0.0	0.02	0.00157	0.1	0.03	0.00207	0.1
Sulfate	96.1	2	13.7	0.28525	14.2	17	0.35395	13.1	17.3	0.3602	20.8	16.8	0.34979	17.9	37.3	0.77662	24.9	18.6	0.38727	19.0
Total Anions (meq/L)			2.0			2.7			1.7		3.6		2.0		3.7		3.1		2.0	
Total Ions (meq/L)			3.9			4.7			3.6		7.2		5.3		7.4		6.0		3.9	
Cation/Anion Ratio			0.94			0.75			1.06		2.0		0.89		2.2		0.92		1.93	
Percent Difference			-2.9			-14.3			3.0		-5.6		-5.6		-4.0		-4.0		-3.6	
TRUE/NEAR DIAGRAM DATA																				
sum (Ca, Mg, Na+K)			1.90			1.96			1.67			1.62			2.85			1.89		
Calcium			42.91			46.85			41.33			40.40			42.35			45.41		
Magnesium			41.72			38.80			43.46			45.51			45.30			39.57		
Sodium + Potassium			15.37			14.34			15.22			14.09			12.35			15.02		100.0
sum (SO ₄ , Cl, HCO ₃ +CO ₃)			1.95			2.69			1.73			1.96			3.12			2.03		
Sulfate			14.657			13.136			20.842			17.883			24.877			19.057		
Chloride			5.812			3.747			6.724			6.259			4.021			5.371		
Bicarbonate + Carbonate			79.531			83.117			72.433			75.858			71.102			75.572		

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-77			MW-72			MW-69			MW-100			MW-93			MW-95		
Date	1/18/11	1/18/11	1/18/11	1/11/11	1/27/11	1/19/11	1/20/11	1/19/11	1/20/11	1/19/11	1/20/11	1/19/11	1/20/11	1/19/11	1/20/11	1/19/11	1/20/11	
Cations	MW	n	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	
Calcium	40.1	2	28.3	1.41218	45.6	24.9	1.24251	42.5	26.9	1.34232	48.9	25.5	1.27246	42.8	34	1.69661	47.3	
Magnesium	24.3	2	15.3	1.259	40.7	15.1	1.24254	42.5	12.3	1.01214	36.8	14.7	1.20963	40.7	17.6	1.44826	40.3	
Potassium	39.1	1	1.62	0.04143	1.3	1.79	0.04578	1.6	1.62	0.04143	1.1	1.96	0.05013	1.7	1.55	0.03964	1.1	
Sodium	23.0	1	8.8	0.38278	12.4	7.04	0.30622	10.5	6.98	0.30361	11.1	8.44	0.36712	12.3	8.95	0.3893	10.8	
Iron	55.8	2	0.01	0.00018	0.0	2.06	0.07377	2.5	1.12	0.04011	1.5	1.83	0.06554	2.2	0.01	0.00018	0.0	
Manganese	54.9	2	0.0214	0.00078	0.0	0.269	0.00979	0.3	0.195	0.0071	0.3	0.21	0.00764	0.3	0.325	0.01183	0.3	
Ammonia-N	14.0	1	0.01	0.00036	0.0	0.02	0.00114	0.0	0.01	0.00086	0.0	0.01	0.00036	0.0	0.0586	0.00418	0.1	
Total Cations (meq/L)				3.1			2.9			2.7			3.0			3.6		
Anions																		
Alkalinity, Total			143			116			120			127			104		86.4	
Carbonate	60.0	2	0.0766	0.00255	0.1	0.1297	0.00432	0.1	0.2028	0.00676	0.2	0.0482	0.00161	0.1	0.0843	0.00281	0.1	
Bicarbonate	61.0	1	174.30	2.85702	87.6	141.26	2.31533	78.3	145.99	2.39288	82.6	154.84	2.53801	82.0	126.71	2.07688	54.7	
Chloride	35.5	1	4	0.11283	3.5	3.78	0.10662	3.6	4.08	0.11508	4.0	2.44	0.06882	2.2	2.9	0.0818	2.2	
Nitrate-N	14.0	1	0.824	0.05883	1.8	0.01	0.00036	0.0	0.01	0.00036	0.0	0.01	0.00036	0.0	0.01	0.00036	0.0	
Sulfate	96.1	2	11.1	0.23111	7.1	25.4	0.52885	17.9	18.3	0.38102	13.2	23.4	0.48721	15.7	78.6	1.63652	43.1	
Total Anions (meq/L)				3.3			3.0			2.9			3.1			3.8		
Total Ions (meq/L)				6.4			5.9			5.6			6.1			7.4		
Cation/Anion Ratio				0.95			0.99			0.95			0.96			0.95		
Percent Difference				-2.6			-0.6			-2.6			-2.0			-2.8		
TRILINEAR DIAGRAM DATA																		
sum (Ca, Mg, Na+K)			3.10			2.84			2.70			2.90			3.57		2.08	
Calcium			45.62			43.80			49.72			43.89			47.47		45.31	
Magnesium			40.67			43.80			37.49			41.72			40.52		40.72	
Sodium + Potassium			13.70			12.41			12.78			14.39			12.00		13.97	
sum (SO ₄ , Cl, HCO ₃ +CO ₃)			3.20			2.96			2.90			3.10			3.80		2.23	
Sulfate			7.214			17.896			13.158			15.738			43.089		14.915	
Chloride			3.522			3.608			3.974			2.223			2.154		7.729	
Bicarbonate + Carbonate			89.264			78.496			82.868			82.038			54.757		77.356	

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-84	MW-81	MW-21	MW-73	MW-99
Date	1/26/11	1/19/11	2/22/11	1/19/11	1/21/11
Cations	MW				
Calcium	40.1 2 10.5	35.5 10.6	41.9 9.91	34.4 12.5	43.8 8.85
Magnesium	24.3 2 8.24	45.9 5.75	37.5 6.74	38.6 6.45	37.3 4.12
Potassium	39.1 1 0.914	1.6 0.718	1.5 1.17	2.1 0.771	1.4 0.822
Sodium	23.0 1 5.77	0.25098	17.0 5.55	0.24141	19.1 6.34
Iron	55.8 2 0.01	0.00018	0.0 0.01	0.00018	0.0 0.04
Manganese	54.9 2 0.00346	0.00013	0.0 0.00	1.8E-05	0.0 0.0529
Ammonia-N	14.0 1 0.01	0.00036	0.0 0.01	0.00036	0.0 0.0402
Total Cations (meq/L)	1.5	1.3	1.4	1.4	1.2
Anions					
Alkalinity, Total	58.7	48.9	52.1	55.5	51.7
Carbonate	60.0 2 0.0322	0.00107	0.1 0.0415	0.00138	0.1 0.1493
Bicarbonate	61.0 1 71.55	1.17275	75.1 59.57	0.97647	72.3 63.26
Chloride	35.5 1 3.43	0.09675	6.2 2.74	0.07729	5.7 2.7
Nitrate-N	14.0 1 0.489	0.03491	2.2 1.56	0.11137	8.3 0.01
Sulfate	96.1 2 12.3	0.2561	16.4 8.8	0.18322	13.6 5.27
Total Anions (meq/L)	1.6	1.3	1.2	1.5	1.3
Total Ions (meq/L)	3.0	2.6	2.7	3.0	2.5
Cation/Anion Ratio	0.95	0.94	1.17	0.93	0.93
Percent Difference	-2.8	-3.3	7.9	-3.9	-3.4
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	1.48	1.26	1.35	1.42	1.20
Calcium	35.49	41.92	36.50	43.86	36.91
Magnesium	45.93	37.50	40.94	37.32	28.33
Sodium + Potassium	18.58	20.59	22.56	18.82	34.76
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.53	1.24	1.23	1.40	1.29
Sulfate	16.775	14.796	8.937	13.720	12.152
Chloride	6.337	6.241	6.203	6.788	7.397
Bicarbonate + Carbonate	76.888	78.963	84.860	79.492	80.451

**Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-66	MW-67	MW-80	MW-68	MW-74
Date	1/6/11	1/5/11	1/26/11	1/27/11	1/21/11
Cations	MW				
Calcium	40.1 2 21.5 mg/L 1.07285 meq/L 37.0 27.2 % (meq)	1.35729 meq/L 44.2 23.4 % (meq)	1.16766 meq/L 45.3 29 % (meq)	1.44711 meq/L 43.8 22.1 % (meq)	1.10279 meq/L 36.8 22.1 % (meq)
Magnesium	24.3 2 17.3 mg/L 0.0353 meq/L 12.7 8.63 % (meq)	1.29192 meq/L 42.1 12.4 % (meq)	1.02037 meq/L 39.6 16.6 % (meq)	1.36597 meq/L 41.3 17.4 % (meq)	1.4318 meq/L 47.7 17.4 % (meq)
Potassium	39.1 1 1.38 mg/L 0.37538 meq/L 12.2 6.73 % (meq)	0.04067 meq/L 1.3 1.46 % (meq)	0.03734 meq/L 1.4 1.61 % (meq)	0.04118 meq/L 1.2 1.77 % (meq)	0.04527 meq/L 1.5 1.77 % (meq)
Sodium	23.0 1 8.49 mg/L 0.36929 meq/L 12.2 6.73 % (meq)	0.37538 meq/L 12.2 6.73 % (meq)	0.29274 meq/L 11.4 8.3 % (meq)	0.36103 meq/L 10.9 8.23 % (meq)	0.35799 meq/L 11.9 8.23 % (meq)
Iron	55.8 2 0.0 mg/L 0.00018 meq/L 0.0 0.0 % (meq)	0.00133 meq/L 0.0 1.4 % (meq)	0.05014 meq/L 0.0 0.254 % (meq)	0.08129 meq/L 0.0 0.244 % (meq)	0.05623 meq/L 1.9 0.244 % (meq)
Manganese	54.9 2 0.0 mg/L 1.8E-05 meq/L 0.0 0.0 % (meq)	0.00145 meq/L 0.0 0.0 % (meq)	0.00925 meq/L 0.0 0.0 % (meq)	0.00888 meq/L 0.0 0.0 % (meq)	0.00477 meq/L 0.2 0.0 % (meq)
Ammonia-N	14.0 1 0.0 mg/L 0.00036 meq/L 0.0 0.0 % (meq)	0.00036 meq/L 0.0 0.0 % (meq)	0.00036 meq/L 0.0 0.0 % (meq)	0.00129 meq/L 0.0 0.0 % (meq)	0.00036 meq/L 0.0 0.0 % (meq)
Total Cations (meq/L)	2.9	3.1	2.6	3.3	3.0
Anions					
Alkalinity, Total	119 mg/L 78.8 % (meq)	0.00213 meq/L 83.4 % (meq)	0.00365 meq/L 83.4 % (meq)	0.00548 meq/L 147 % (meq)	0.00335 meq/L 171 % (meq)
Carbonate	60.0 2 0.1082 meq/L 0.00361 meq/L 0.1 0.0638 % (meq)	0.00213 meq/L 64.7 101.53 % (meq)	0.00365 meq/L 61.9 179.01 % (meq)	0.00548 meq/L 87.1 293.408 % (meq)	0.00335 meq/L 70.3 208.42 % (meq)
Bicarbonate	61.0 1 144.96 meq/L 2.37604 meq/L 80.9 8.2 % (meq)	1.57363 meq/L 4.1 4.61 % (meq)	1.6641 meq/L 4.8 0.13003 % (meq)	2.93408 meq/L 2.3 31.1 % (meq)	3.41614 meq/L 0.87722 % (meq)
Chloride	35.5 1 8.59 mg/L 0.24229 meq/L 1.2 0.56 % (meq)	0.09844 meq/L 1.6 0.00036 % (meq)	0.13003 meq/L 0.0 0.00036 % (meq)	0.07588 meq/L 0.0 0.00036 % (meq)	0.87722 meq/L 0.0 0.00036 % (meq)
Nitrate-N	14.0 1 0.51 mg/L 0.03641 meq/L 9.5 34.4 % (meq)	0.03998 meq/L 29.5 42.7 % (meq)	0.00036 meq/L 33.1 17 % (meq)	0.00036 meq/L 10.5 27 % (meq)	0.00036 meq/L 0.56216 % (meq)
Sulfate	96.1 2 13.4 mg/L 0.279 meq/L 9.5 34.4 % (meq)	0.71624 meq/L 2.4 5.5 % (meq)	0.88905 meq/L 2.7 5.3 % (meq)	0.35395 meq/L 3.4 6.7 % (meq)	0.56216 meq/L 4.9 7.9 % (meq)
Total Anions (meq/L)	2.9	5.5	2.7	3.4	4.9
Total Ions (meq/L)	5.8	8.6	5.3	6.7	7.9
Cation/Anion Ratio	0.99	1.26	0.96	0.98	0.62
Percent Difference	-0.6	11.6	-2.1	-0.9	-23.7
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	2.90	3.07	2.52	3.22	2.94
Calcium	36.98	44.28	46.37	45.01	37.54
Magnesium	49.07	42.15	40.52	42.48	48.74
Sodium + Potassium	13.95	13.57	13.11	12.51	13.73
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.90	2.39	2.69	3.37	4.86
Sulfate	9.618	29.963	33.089	10.505	11.570
Chloride	8.352	4.118	4.840	2.252	18.054
Bicarbonate + Carbonate	82.030	65.919	62.071	87.243	70.376

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-75	MW-87	MW-85	MW-86	MW-88
Date	1/21/11	1/21/11	1/26/11	1/20/11	1/20/11
Cations	MW				
Calcium	40.1 2 22 mg/L	36.7 23.2 mg/L	39.7 20.8 mg/L	41.8 13.5 mg/L	37.9 8.57 mg/L
	1.0978 meq/L	1.65669 meq/L	1.03792 meq/L	0.67365 meq/L	0.42764 meq/L
	36.7 23.6 % (meq)	46.6 13.2 % (meq)	43.7 9.38 % (meq)	43.5 6.45 % (meq)	35.1 35.1 % (meq)
Magnesium	24.3 2 17.4 mg/L	1.94199 mg/L	1.0862 mg/L	0.77186 mg/L	0.53075 mg/L
	1.4318 meq/L	0.05448 meq/L	0.03504 meq/L	0.0312 meq/L	0.02046 meq/L
	47.9 23.6 % (meq)	1.3 1.37 % (meq)	1.4 1.22 % (meq)	1.8 0.8 % (meq)	0.02046 % (meq)
Potassium	39.1 1 1.76 mg/L	0.40583 mg/L	0.32449 mg/L	0.27838 mg/L	0.23837 mg/L
	0.35625 meq/L	9.7 7.46 % (meq)	13.1 6.4 % (meq)	15.7 5.48 % (meq)	19.6 19.6 % (meq)
Sodium	23.0 1 8.19 mg/L	1.9 2.71 mg/L	0.0 0.00018 mg/L	0.0153 mg/L	0.0 0.00018 mg/L
	0.05587 meq/L	0.09705 meq/L	0.0 1.8E-05 meq/L	0.00056 meq/L	0.0 1.8E-05 meq/L
Iron	55.8 2 1.56 mg/L	0.0115 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L
	0.00473 meq/L	0.3 0.3 % (meq)	0.0 1.8E-05 meq/L	0.0 0.00056 meq/L	0.0 1.8E-05 meq/L
Manganese	54.9 2 0.13 mg/L	0.00093 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L
	0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L
Ammonia-N	14.0 1 0.0 mg/L	0.00093 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L
	0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L	0.0 0.00036 meq/L
Total Cations (meq/L)	3.0	4.2	2.5	1.8	1.2
Anions					
Alkalinity, Total	96.1 mg/L	89.9 mg/L	88.8 mg/L	66.7 mg/L	53.2 mg/L
Carbonate	60.0 2 0.0894 meq/L	0.00298 meq/L	0.0 0.0401 meq/L	0.00263 meq/L	0.1 0.0349 meq/L
	0.1 0.0401 meq/L	0.00134 meq/L	0.0 0.0789 meq/L	0.00116 meq/L	0.1 0.0506 meq/L
	62.4 109.60 % (meq)	41.8 108.18 % (meq)	67.5 81.30 % (meq)	72.2 64.80 % (meq)	80.9 64.80 % (meq)
Bicarbonate	61.0 1 117.06 meq/L	1.91873 meq/L	1.7731 meq/L	1.33264 meq/L	1.06215 meq/L
	0.23101 meq/L	0.12411 meq/L	0.1729 meq/L	0.11536 meq/L	0.07221 meq/L
	7.5 4.4 % (meq)	2.9 6.13 % (meq)	6.6 4.09 % (meq)	6.3 2.56 % (meq)	0.07221 % (meq)
Chloride	35.5 1 8.19 mg/L	0.00036 meq/L	0.0 0.113 meq/L	0.00503 meq/L	0.3 0.513 meq/L
	0.00036 meq/L	0.0 0.113 meq/L	0.000807 meq/L	0.00503 meq/L	0.03662 meq/L
Nitrate-N	14.0 1 0.0 mg/L	0.00036 meq/L	0.0 0.113 meq/L	0.00503 meq/L	0.3 0.513 meq/L
	0.00036 meq/L	0.0 0.113 meq/L	0.000807 meq/L	0.00503 meq/L	0.03662 meq/L
Sulfate	96.1 2 44.2 meq/L	0.92028 meq/L	2.37358 meq/L	0.67043 meq/L	21.2 6.7 meq/L
	29.9 11.4 % (meq)	55.3 32.2 % (meq)	25.5 18.8 % (meq)	0.39143 meq/L	0.1395 meq/L
Total Anions (meq/L)	3.1	4.3	2.6	1.8	1.3
Total Ions (meq/L)	6.1	8.5	5.1	3.6	2.5
Cation/Anion Ratio	0.97	0.97	0.95	0.96	0.93
Percent Difference	-1.3	-1.5	-2.8	-2	-3.7
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	2.93	4.06	2.48	1.76	1.22
Calcium	37.46	40.82	41.79	38.38	35.13
Magnesium	48.85	47.84	43.73	43.98	43.60
Sodium + Potassium	13.69	11.34	14.48	17.64	21.26
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	3.07	4.30	2.62	1.84	1.28
Sulfate	29.947	55.258	25.598	21.267	10.936
Chloride	7.517	2.889	6.602	6.268	5.661
Bicarbonate + Carbonate	62.535	41.852	67.800	72.466	83.403

Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-89	MW-90	MW-91	MW-43
Date	1/10/11	1/4/11	1/4/11	1/14/11
Cations	MW	MW	MW	MW
Calcium	40.1 2 13.3	35.0 16.9	41.8 20.9	40.1 12.5
Magnesium	24.3 2 9.84	0.80642	1.11088	0.72989
Potassium	39.1 1 1.44	0.03657	0.04297	0.03351
Sodium	23.0 1 7.94	0.2736	0.31971	0.24098
Iron	55.8 2 0.756	0.02707	0.0727	0.03535
Manganese	54.9 2 0.257	0.00936	0.0087	0.00754
Ammonia-N	14.0 1 0.0234	0.00167	0.00079	0.00166
Total Cations (meq/L)	1.9	2.0	2.6	1.7
Anions				
Alkalinity, Total	77.5	70.5	84.6	70.5
Carbonate	60.0 2 0.1115	0.00372	0.2	0.0884
Bicarbonate	61.0 1 94.32	1.54605	77.1	85.83
Chloride	35.5 1 3.56	0.10041	5.0	3.66
Nitrate-N	14.0 1 0.0	0.00036	0.0	0.0
Sulfate	96.1 2 17	0.35395	17.7	25.9
Total Anions (meq/L)	2.0	2.1	2.6	1.8
Total Ions (meq/L)	3.9	4.1	5.2	3.5
Cation/Anion Ratio	0.94	0.98	1.00	0.94
Percent Difference	-2.8	-0.9	0.1	-3.3
TRILINEAR DIAGRAM DATA				
sum (Ca, Mg, Na+K)	1.86	1.96	2.52	1.63
Calcium	35.77	43.03	41.44	38.31
Magnesium	43.64	41.15	44.14	44.83
Sodium + Potassium	20.60	15.83	14.41	16.86
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.00	2.05	2.59	1.79
Sulfate	17.661	26.276	26.762	16.199
Chloride	5.010	5.030	7.937	4.894
Bicarbonate + Carbonate	77.328	68.694	65.301	78.907
	100.0	100.0	100.0	100.0

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-56	MW-57	MW-76	MW-83	MW-60
Date	4/8/11	4/8/11	4/25/11	4/28/11	4/25/11
Cations	MW				
Calcium	n mg/L	mg/L	mg/L	mg/L	mg/L
	40.1 2 15.3	0.76347	53.7 19.0	0.9481	39.2 14.8
Magnesium	24.3 2 5.3	0.43201	30.4 9.7	0.80066	33.1 6.6
Potassium	39.1 1 1.0	0.02468	1.7 1.0	0.0245	1.0 1.3
Sodium	23.0 1 4.6	0.19922	14.0 7.0	0.30318	12.5 7.1
Iron	55.8 2 0.01	0.00036	0.0 9.30	0.33305	13.8 0.01
Manganese	54.9 2 0.06	0.00234	0.2 0.27	0.00972	0.4 0.00
Ammonia-N	14.0 1 0.01	0.00071	0.1 0.02	0.00162	0.1 0.01
Total Cations (meq/L)	1.4	2.4	1.6	2.9	2.0
Anions					
Alkalinity, Total	44	74	47	119	88
Carbonate	60.0 2 0.0136	0.00045	0.0 0.0208	0.00069	0.0 0.0103
Bicarbonate	61.0 1 53.90	0.88341	64.1 89.99	1.47509	74.7 57.56
Chloride	35.5 1 4.0	0.11283	8.2 4.8	0.13539	6.9 4.7
Nitrate-N	14.0 1 1.05	0.07496	5.4 0.01	0.00071	0.0 1.19
Sulfate	96.1 2 14.7	0.30607	22.2 17.4	0.36228	18.4 24.6
Total Anions (meq/L)	1.4	2.0	1.7	3.0	2.1
Total Ions (meq/L)	2.8	4.4	3.3	5.9	4.0
Cation/Anion Ratio	1.03	1.23	0.97	0.96	0.93
Percent Difference	1.6	10.2	-1.5	-1.8	-3.6
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	1.42	2.08	1.62	2.90	1.95
Calcium	53.79	45.66	45.51	52.79	48.86
Magnesium	30.44	38.56	33.47	34.88	36.32
Sodium + Potassium	15.77	15.78	21.03	12.34	14.82
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.30	1.97	1.59	3.01	1.99
Sulfate	23.494	18.358	32.224	5.820	8.332
Chloride	8.661	6.861	8.394	15.093	3.720
Bicarbonate + Carbonate	67.846	74.782	59.382	79.088	87.948

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-94	MW-82	MW-65	MW-58A	MW-59
Date	4/28/11	4/28/11	4/22/11	5/2/11	4/18/11
Cations	MW				
Calcium	40.1 2 40.4	2.01597	54.1 23.6	1.17764	44.8
Magnesium	24.3 2 15.5	1.27546	34.2 13.5	1.11088	42.3
Potassium	39.1 1 2.5	0.06471	1.7 1.8	0.04527	1.7
Sodium	23.0 1 8.5	0.3706	9.9 6.7	0.29274	11.1
Iron	55.8 2 0.01	0.00036	0.0 0.01	0.00036	0.0
Manganese	54.9 2 0.00	0.00011	0.0 0.00	3.6E-05	0.0
Ammonia-N	14.0 1 0.01	0.00071	0.0 0.01	0.00071	0.0
Total Cations (meq/L)	3.7	2.6	1.5	1.8	1.8
Anions					
Alkalinity, Total	150	100	51	73	61
Carbonate	60.0 2 0.0582	0.00194	0.1 0.0329	0.0011	0.0
Bicarbonate	61.0 1 182.88	2.99761	79.6 121.45	1.9906	75.4
Chloride	35.5 1 25.8	0.72772	19.3 9.5	0.26824	10.2
Nitrate-N	14.0 1 0.01	0.00071	0.0 0.77	0.05504	2.1
Sulfate	96.1 2 1.9	0.03852	1.0 15.6	0.32481	12.3
Total Anions (meq/L)	3.8	2.6	1.3	1.9	1.7
Total Ions (meq/L)	7.5	5.3	2.9	3.7	3.5
Cation/Anion Ratio	0.99	1.00	1.15	0.93	1.06
Percent Difference	-0.5	-0.2	7.0	-3.8	3.0
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	3.73	2.63	1.36	1.71	1.63
Calcium	54.09	44.84	40.85	47.50	40.52
Magnesium	34.22	42.29	40.72	38.16	42.67
Sodium + Potassium	11.68	12.87	18.43	14.34	16.81
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	3.77	2.58	1.32	1.90	1.68
Sulfate	1.023	12.566	18.548	17.167	21.061
Chloride	19.325	10.378	3.854	6.695	6.596
Bicarbonate + Carbonate	79.653	77.056	77.598	76.138	72.343

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-24	MW-64	MW-70	MW-77	MW-78
Date	4/25/11	4/15/11	4/22/11	5/9/11	4/27/11
Cations	MW				
Calcium	40.1	37.8	36.8	45.4	45.5
Magnesium	24.3	18.4	16.9	26.3	14.5
Potassium	39.1	1.7	0.0388	1.16026	0.56038
Sodium	23.0	0.0422	1.7	0.04041	0.05397
Iron	55.8	0.30927	12.4	13.2	0.26055
Manganese	54.9	0.01672	0.7	0.01	0.00036
Ammonia-N	14.0	0.01121	0.4	0.01	3.6E-05
Total Cations (meq/L)	1.8	2.5	1.9	2.9	1.6
Anions					
Alkalinity, Total	67	83	72	121	67
Carbonate	60.0	0.00134	0.1	0.00254	0.00035
Bicarbonate	61.0	1.65041	72.7	2.4171	1.34344
Chloride	35.5	0.09111	4.0	0.13595	0.12157
Nitrate-N	14.0	0.00107	0.0	0.06333	0.06718
Sulfate	96.1	0.52469	23.1	0.20321	0.16407
Total Anions (meq/L)	1.8	2.3	1.9	2.8	1.7
Total Ions (meq/L)	3.6	4.8	3.8	5.7	3.3
Cation/Anion Ratio	1.01	1.10	0.97	1.02	0.94
Percent Difference	0.6	4.7	-1.3	1.1	-2.9
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	1.68	2.46	1.85	2.88	1.60
Calcium	41.06	37.28	45.48	45.52	45.27
Magnesium	43.18	48.45	39.19	40.24	35.06
Sodium + Potassium	15.76	14.27	15.33	14.24	19.68
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.80	2.27	1.90	2.76	1.63
Sulfate	19.103	23.139	18.714	7.366	10.069
Chloride	6.619	4.018	5.501	4.928	7.461
Bicarbonate + Carbonate	74.278	72.843	75.785	87.706	82.470

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID Date	MW-72 4/21/11	MW-69 4/21/11	MW-100 5/3/11	MW-93 4/29/11	MW-95 4/28/11
Cations	MW				
Calcium	40.1 2 24.0	1.1976 41.2 26.7	1.24251 46.9 24.9	1.79641 36.0 17.5	0.94311 48.9 18.9
Magnesium	24.3 2 15.4	1.26723 43.6 13.3	1.25077 38.5 15.2	1.44003 41.4 17.5	0.80313 39.2 9.8
Potassium	39.1 1 1.9	0.04732 1.6 1.8	0.05576 1.6 2.2	0.04118 1.8 1.6	0.03248 1.1 1.3
Sodium	23.0 1 7.2	0.31449 10.8 7.5	0.40888 11.4 9.4	0.3793 13.5 8.7	0.24489 10.3 5.6
Iron	55.8 2 1.85	0.06625 2.3 1.01	0.05408 1.3 1.51	0.00036 1.8 0.01	0.00036 0.0 0.01
Manganese	54.9 2 0.28	0.01027 0.4 0.21	0.00819 0.3 0.23	0.01143 0.3 0.31	0.00473 0.3 0.13
Ammonia-N	14.0 1 0.02	0.00156 0.1 0.01	0.00071 0.0 0.01	0.00505 0.0 0.07	0.00176 0.1 0.02
Total Cations (meq/L)	2.9	2.8	3.0	3.7	2.0
Anions					
Alkalinity, Total	105	119	117	98	78
Carbonate	60.0 2 0.0741	0.00247 0.1 0.1636	0.00545 0.2 0.0321	0.0024 0.0 0.0721	0.00479 0.1 0.1436
Bicarbonate	61.0 1 127.95	2.09721 75.6 144.85	2.33858 82.3 142.67	1.9473 84.5 118.80	1.54498 52.0 94.26
Chloride	35.5 1 3.9	0.11057 4.0 4.0	0.07757 3.9 2.8	0.08208 2.8 2.9	0.15006 2.2 5.3
Nitrate-N	14.0 1 0.01	0.00071 0.0 0.01	0.00071 0.0 0.01	0.00071 0.0 0.01	0.00071 0.0 0.01
Sulfate	96.1 2 27.0	0.56216 20.3 18.7	0.34979 13.5 16.8	1.71356 12.6 82.3	0.32689 45.7 15.7
Total Anions (meq/L)	2.8	2.9	2.8	3.7	2.0
Total Ions (meq/L)	5.7	5.7	5.8	7.4	4.1
Cation/Anion Ratio	1.05	0.99	1.09	0.98	1.00
Percent Difference	2.3	-0.7	4.4	-1.0	0.1
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	2.83	2.80	2.96	3.66	2.02
Calcium	42.37	47.64	42.01	49.12	46.61
Magnesium	44.83	39.13	42.29	39.38	39.69
Sodium + Potassium	12.80	13.23	15.71	11.50	13.71
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.77	2.88	2.77	3.75	2.03
Sulfate	20.277	13.507	12.641	45.752	16.129
Chloride	3.988	3.943	2.803	2.192	7.404
Bicarbonate + Carbonate	75.735	82.550	84.555	52.057	76.467

Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-84	MW-81	MW-21	MW-73	MW-99
Date	4/27/11	4/27/11	4/19/11	4/25/11	4/26/11
Cations	MW	MW	MW	MW	MW
Calcium	40.1 2 10.4	36.8 10.7	42.7 9.1	12.2 0.60878	8.8 0.43812
Magnesium	24.3 2 7.6	0.62209	44.1 5.7	0.4855	3.9 0.32092
Potassium	39.1 1 1.1	0.02737	1.9 0.8	0.02839	0.9 0.02322
Sodium	23.0 1 5.5	0.24011	17.0 5.3	0.23054	8.9 0.38756
Iron	55.8 2 0.01	0.00036	0.0 0.01	0.00036	0.04 0.00125
Manganese	54.9 2 0.00	0.00011	0.0 0.00	3.6E-05	0.05 0.00189
Ammonia-N	14.0 1 0.01	0.00071	0.1 0.01	0.00071	0.05 0.00326
Total Cations (meq/L)	1.4	1.3	1.3	1.4	1.2
Anions					
Alkalinity, Total	53	47	43	52	49
Carbonate	60.0 2 0.0327	0.00109	0.1 0.0295	0.00098	0.00098
Bicarbonate	61.0 1 64.84	1.06275	74.1 57.16	0.93688	71.8 51.97
Chloride	35.5 1 3.5	0.09844	6.9 2.8	0.07898	6.1 2.8
Nitrate-N	14.0 1 0.40	0.02834	2.0 1.52	0.10852	8.3 0.01
Sulfate	96.1 2 11.7	0.2436	17.0 8.6	0.17885	13.7 4.9
Total Anions (meq/L)	1.4	1.3	1.0	1.5	1.2
Total Ions (meq/L)	2.8	2.6	2.3	2.9	2.4
Cation/Anion Ratio	0.98	0.96	1.23	0.93	0.95
Percent Difference	-0.9	-2.1	10.4	-3.5	-2.7
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	1.41	1.25	1.20	1.38	1.17
Calcium	36.84	42.73	37.83	44.13	37.45
Magnesium	44.17	37.21	40.31	37.04	27.43
Sodium + Potassium	18.99	20.07	21.86	18.84	35.12
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.41	1.20	1.03	1.34	1.24
Sulfate	17.327	14.958	9.812	14.406	13.040
Chloride	7.002	6.605	7.561	7.638	7.294
Bicarbonate + Carbonate	75.671	78.437	82.627	77.956	79.667

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-66	MW-67	MW-80	MW-68	MW-74
Date	4/28/11	4/18/11	4/25/11	5/3/11	4/20/11
Cations	MW	MW	MW	MW	MW
Calcium	40.1 2	20.9 1	25.1 1	23.8 1	29.0 1
Magnesium	24.3 2	15.6 1	11.7 0	16.3 1	27.2 2
Potassium	39.1 1	1.4 0	1.6 0	1.8 0	2.2 0
Sodium	23.0 1	7.6 0	6.3 0	8.5 0	12.0 0
Iron	55.8 2	0.0 0	1.6 0	0.36755	1.7 0
Manganese	54.9 2	0.0 0	0.00947	0.2 0	0.1 0
Ammonia-N	14.0 1	0.0 0	0.00086	0.0 0	0.0 0
Total Cations (meq/L)	2.7	3.0	2.5	3.3	4.6
Anions					
Alkalinity, Total	110	100	80.5	131	163
Carbonate	60.0 2	0.0871	0.00321	0.1137	0.0873
Bicarbonate	61.0 1	134.02	1.60654	159.59	198.68
Chloride	35.5 1	8.3 0	5.3 0	2.9 0	23.5 0
Nitrate-N	14.0 1	0.5 0	0.00071	0.0 0	0.3 0
Sulfate	96.1 2	16.1 0	46.1 0	16.3 0	23.4 0
Total Anions (meq/L)	2.8	2.9	2.7	3.0	4.4
Total Ions (meq/L)	5.5	5.8	5.3	6.3	9.0
Cation/Anion Ratio	0.96	1.03	0.93	1.08	1.03
Percent Difference	-2.0	1.5	-3.6	3.7	1.6
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	2.69	2.95	2.47	3.20	4.51
Calcium	38.75	42.51	48.17	45.20	37.59
Magnesium	47.70	43.56	39.05	41.90	49.59
Sodium + Potassium	13.56	13.93	12.78	12.90	12.81
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.77	2.82	2.72	3.04	4.41
Sulfate	12.112	24.698	35.304	11.161	11.049
Chloride	8.408	4.494	5.488	2.690	15.032
Bicarbonate + Carbonate	79.480	70.808	59.208	86.149	73.919

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-75	MW-87	MW-85	MW-86	MW-88
Date	4/20/11	4/26/11	4/27/11	4/26/11	4/27/11
Cations	MW	MW	MW	MW	MW
Calcium	40.1 2	21.1 1	21.1 1	13.2 0	8.5 0
Magnesium	24.3 2	16.6 1	12.3 1	8.6 0	6.3 0
Potassium	39.1 1	1.7 0	1.5 0	1.3 0	0.9 0
Sodium	23.0 1	7.8 0	7.0 0	6.0 0	5.5 0
Iron	55.8 2	1.4 0	0.0 0	0.4 0	0.0 0
Manganese	54.9 2	0.1 0	0.0 0	0.0 0	0.0 0
Ammonia-N	14.0 1	0.0 0	0.0 0	0.0 0	0.0 0
Total Cations (meq/L)	2.9	3.9	2.4	1.7	1.2
Anions					
Alkalinity, Total	95.2	80.4	84.3	61.4	49.9
Carbonate	60.0 2	0.0522 0.00174	0.0451 0.0015	0.0386 0.00129	0.0533 0.00178
Bicarbonate	61.0 1	116.04 1.90197	102.75 1.68424	74.83 1.22653	60.77 0.99607
Chloride	35.5 1	8.0 0.22593	6.5 0.18391	4.1 0.11649	2.5 0.06939
Nitrate-N	14.0 1	0.0 0.00071	0.1 0.008	0.1 0.00626	0.5 0.03691
Sulfate	96.1 2	41.8 0.87031	30.8 0.64128	18.2 0.37894	6.7 0.14033
Total Anions (meq/L)	3.0	4.1	2.5	1.7	1.2
Total Ions (meq/L)	5.9	8.0	4.9	3.4	2.5
Cation/Anion Ratio	0.95	0.96	0.95	0.97	0.97
Percent Difference	-2.4	-2.3	-2.7	-2	-1.6
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	2.80	3.82	2.39	1.65	1.20
Calcium	37.54	43.41	43.26	39.83	35.37
Magnesium	48.71	45.49	42.39	42.54	42.96
Sodium + Potassium	13.75	11.10	14.35	17.63	21.67
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	3.00	4.11	2.51	1.72	1.21
Sulfate	29.011	57.728	25.540	21.990	11.621
Chloride	7.531	3.169	7.324	6.760	5.746
Bicarbonate + Carbonate	63.458	39.103	67.136	71.250	82.633

Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-89	MW-90	MW-91	MW-43
Date	4/27/11	4/22/11	4/19/11	4/14/11
Cations	MW	MW	MW	MW
Calcium	40.1 2	13.1 2	13.1 2	13.1 2
Magnesium	24.3 2	9.2 2	9.2 2	9.2 2
Potassium	39.1 1	1.6 2	1.6 2	1.6 2
Sodium	23.0 1	8.2 2	8.2 2	8.2 2
Iron	55.8 2	0.7 2	0.7 2	0.7 2
Manganese	54.9 2	0.3 2	0.3 2	0.3 2
Ammonia-N	14.0 1	0.0 2	0.0 2	0.0 2
Total Cations (meq/L)	1.8	1.8	2.5	1.7
Anions				
Alkalinity, Total	74.1	63.8	87.6	63.8
Carbonate	60.0 2	0.1091 2	0.1091 2	0.1091 2
Bicarbonate	61.0 1	90.18 1	90.18 1	90.18 1
Chloride	35.5 1	3.5 2	3.5 2	3.5 2
Nitrate-N	14.0 1	0.0 2	0.0 2	0.0 2
Sulfate	96.1 2	16.3 2	16.3 2	16.3 2
Total Anions (meq/L)	1.9	1.9	2.7	1.6
Total Ions (meq/L)	3.8	3.7	5.2	3.4
Cation/Anion Ratio	0.96	0.96	0.92	1.04
Percent Difference	-2.1	-1.8	-4.0	2.0
TRILINEAR DIAGRAM DATA				
sum (Ca, Mg, Na+K)	1.80	1.76	2.41	1.67
Calcium	36.22	43.40	40.15	39.41
Magnesium	41.90	40.70	45.39	42.83
Sodium + Potassium	21.88	15.90	14.47	17.75
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.92	1.88	2.70	1.64
Sulfate	17.680	26.375	27.640	17.354
Chloride	5.128	5.720	7.583	5.028
Bicarbonate + Carbonate	77.192	67.905	64.777	77.618
	100.0	100.0	100.0	100.0

Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-56	MW-57	MW-76	MW-83	MW-60	MW-94
Date	7/6/11	7/11/11	7/14/11	7/25/11	7/25/11	7/26/11
Cations	MW					
Calcium	40.1 215.3	52.9 16.7	0.63872	43.7 35.1	53.8 18.0	49.0 20.9
Magnesium	24.3 25.3	0.43942	0.49537	1.1438	0.67229	36.7 8.5
Potassium	39.1 10.9	0.02312	0.02609	1.8 2.4	0.03095	1.7 1.8
Sodium	23.0 15.0	0.21531	0.29926	0.29404	0.23141	12.6 5.6
Iron	55.8 20.01	0.00036	0.00036	0.00036	0.00057	0.00072
Manganese	54.9 20.06	0.00217	3.6E-05	0.00253	3.7E-05	0.00044
Ammonia-N	14.0 10.01	0.00071	0.00071	0.00071	0.00071	0.00648
Total Cations (meq/L)	1.4	2.3	1.5	3.3	1.8	2.0
Anions						
Alkalinity, Total	51	81	53	144	93	87
Carbonate	60.0 20.0222	0.00074	0.00194	0.00019	0.00155	0.00346
Bicarbonate	61.0 162.30	1.0211	1.61911	1.05565	2.87802	1.86656
Chloride	35.5 13.9	0.11057	0.17413	0.17347	0.54156	0.0708
Nitrate-N	14.0 10.65	0.04626	0.00071	0.00348	0.00071	0.0138
Sulfate	96.1 216.1	0.33522	22.1 17.3	0.29149	18.7 8.1	0.15282
Total Anions (meq/L)	1.5	2.1	1.6	3.6	2.2	2.3
Total Ions (meq/L)	3.0	4.4	3.0	6.8	4.0	4.3
Cation/Anion Ratio	0.95	1.07	0.94	0.91	0.84	0.90
Percent Difference	-2.3	3.5	-3.1	-4.9	-8.9	-5.3
TRILINEAR DIAGRAM DATA						
sum (Ca, Mg, Na+K)	1.44	1.92	1.46	3.25	1.83	2.03
Calcium	52.97	43.34	43.76	53.90	49.01	51.38
Magnesium	30.49	40.48	33.94	35.20	36.68	34.38
Sodium + Potassium	16.54	16.18	22.29	10.90	14.31	14.24
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.47	2.12	1.52	3.59	2.09	2.25
Sulfate	22.841	16.958	19.167	4.693	7.308	5.250
Chloride	7.534	6.786	11.406	15.087	3.385	17.156
Bicarbonate + Carbonate	69.626	76.256	69.427	80.220	89.307	77.594

Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-82			MW-65			MW-58A			MW-59			MW-24			MW-64							
Date	MW	n	mg/L	7/21/11	mg/L	meq/L	% (meq)	7/12/11	mg/L	meq/L	% (meq)	7/8/11	mg/L	meq/L	% (meq)	7/14/11	mg/L	meq/L	% (meq)	7/18/11	mg/L	meq/L	% (meq)
Cations																							
Calcium	40.1	2	22.1	1.10279	44.8	11.8	0.58882	37.4	16.0	0.7984	44.5	13.3	0.66367	37.4	12.6	0.62874	36.9	26.9	1.34232	37.9			
Magnesium	24.3	2	12.5	1.02859	41.8	6.9	0.56367	35.8	8.3	0.68546	38.2	8.3	0.68546	38.6	8.5	0.69615	40.9	21.5	1.76918	49.9			
Potassium	39.1	1	1.6	0.04169	1.7	1.0	0.02432	1.5	0.9	0.02371	1.3	1.0	0.02478	1.4	0.8	0.02084	1.2	1.8	0.04706	1.3			
Sodium	23.0	1	6.6	0.28752	11.7	5.3	0.22923	14.6	5.3	0.23228	12.9	5.5	0.24011	13.5	5.3	0.23054	13.5	8.2	0.35842	10.1			
Iron	55.8	2	0.01	0.00036	0.0	4.43	0.15865	10.1	1.02	0.03653	2.0	4.33	0.15507	8.7	3.35	0.11997	7.0	0.42	0.01493	0.4			
Manganese	54.9	2	0.00	3.6E-05	0.0	0.19	0.00699	0.4	0.37	0.01351	0.8	0.11	0.00397	0.2	0.13	0.00481	0.3	0.32	0.0115	0.3			
Ammonia-N	14.0	1	0.01	0.00071	0.0	0.01	0.00071	0.0	0.07	0.00493	0.3	0.01	0.00071	0.0	0.04	0.00283	0.2	0.03	0.00248	0.1			
Total Cations (meq/L)				2.5			1.6			1.8			1.8			1.7			3.5				
Anions																							
Alkalinity, Total			101			54			74		63			65		95							
Carbonate	60.0	2	0.042	0.0014	0.1	0.023	0.00077	0.0	0.0952	0.00317	0.2	0.0261	0.00087	0.1	0.0271	0.0009	0.1	0.0406	0.00135	0.0			
Bicarbonate	61.0	1	123.13	2.0183	78.4	65.96	1.08107	69.8	90.33	1.4806	77.6	76.56	1.25494	72.7	79.37	1.3009	74.9	116.31	1.90636	53.0			
Chloride	35.5	1	7.2	0.2028	7.9	5.0	0.14216	9.2	3.5	0.09788	5.1	4.0	0.11367	6.6	3.8	0.10634	6.1	3.5	0.09872	2.7			
Nitrate-N	14.0	1	0.80	0.05704	2.2	0.01	0.00071	0.0	0.01	0.00071	0.0	0.01	0.00071	0.0	0.01	0.00071	0.0	0.06	0.00403	0.1			
Sulfate	96.1	2	14.2	0.29566	11.5	15.6	0.32481	21.0	15.6	0.32481	17.0	17.1	0.35604	20.6	15.8	0.32897	18.9	76.2	1.58655	44.1			
Total Anions (meq/L)				2.6			1.5			1.9			1.7			3.4			3.6				
Total Ions (meq/L)				5.0			3.1			3.7			3.5			7.1			7.1				
Cation/Anion Ratio				0.96			1.01			0.94			1.03			0.98			0.99				
Percent Difference				-2.3			0.7			-3.0			1.4			-1.0			-0.7				
TRILINEAR DIAGRAM DATA																							
sum (Ca, Mg, Na+K)				2.46			1.41			1.74			1.61			1.58			3.52				
Calcium				44.82			41.88			45.89			41.12			39.89			38.17				
Magnesium				41.80			40.09			39.40			42.47			44.16			50.30				
Sodium + Potassium				13.38			18.03			14.71			16.41			15.95			11.53				
																			100.0				
sum (SO ₄ , Cl, HCO ₃ +CO ₃)				2.52			1.55			1.91			1.73			1.74			3.59				
Sulfate				11.741			20.971			17.037			20.634			18.938			44.157				
Chloride				8.054			9.179			5.134			6.588			6.122			2.748				
Bicarbonate + Carbonate				80.205			69.850			77.829			72.779			74.941			53.096				

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-70			MW-77			MW-78			MW-72			MW-69			MW-100		
Date	MW	n	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	
Cations	40.1	216.4	0.81836	43.5	23.9	1.19261	46.4	14.1	0.70339	44.4	23.1	1.15269	44.1	26.7	1.33234	49.1	25.7	
Calcium	24.3	29.3	0.76774	40.8	12.4	1.02037	39.7	6.9	0.56614	35.7	13.1	1.07797	41.2	12.2	1.00391	37.0	15.0	
Magnesium	39.1	11.4	0.03555	1.9	1.4	0.03683	1.4	2.0	0.05064	3.2	1.7	0.0445	1.7	1.6	0.04195	1.5	2.0	
Potassium	23.0	16.0	0.26012	13.8	7.4	0.32058	12.5	6.1	0.26447	16.7	6.1	0.26447	10.1	6.7	0.29317	10.8	9.2	
Sodium	55.8	20.01	0.00036	0.0	0.01	0.00036	0.0	0.01	0.00036	0.0	1.80	0.06446	2.5	1.00	0.03581	1.3	1.48	
Iron	54.9	20.00	0.00016	0.0	0.02	0.00055	0.0	0.00	3.6E-05	0.0	0.27	0.00972	0.4	0.21	0.0075	0.3	0.22	
Manganese	14.0	10.01	0.00071	0.0	0.01	0.00071	0.0	0.01	0.00071	0.0	0.02	0.00114	0.0	0.01	0.00093	0.0	0.01	
Ammonia-N																		
Total Cations (meq/L)	1.9			2.6			1.6			2.6			2.7			3.0		
Anions																		
Alkalinity, Total	76			120			69			116			124			121		
Carbonate	60.0	20.0996	0.00332	0.2	0.06	0.002	0.1	0.0106	0.00035	0.0	0.065	0.00217	0.1	0.1451	0.00484	0.2	0.0348	
Bicarbonate	61.0	192.40	1.51445	75.1	146.28	2.39764	86.0	83.79	1.37344	80.4	141.39	2.31748	77.7	150.98	2.47479	85.3	147.55	
Chloride	35.5	14.2	0.11734	5.8	5.0	0.14131	5.1	4.1	0.11424	6.7	3.8	0.10662	3.6	4.1	0.11536	4.0	2.8	
Nitrate-N	14.0	10.03	0.00228	0.1	0.96	0.06825	2.4	0.90	0.06454	3.8	0.01	0.00071	0.0	0.01	0.00071	0.0	0.01	
Sulfate	96.1	218.2	0.37894	18.8	8.6	0.17906	6.4	7.5	0.15553	9.1	26.7	0.55592	18.6	14.6	0.30398	10.5	18.1	
Total Anions (meq/L)	2.0			2.8			1.7			3.0			2.9			2.9		
Total Ions (meq/L)	3.9			5.4			3.3			5.6			5.6			5.9		
Cation/Anion Ratio	0.93			0.92			0.93			0.88			0.94			1.05		
Percent Difference	-3.4			-4.0			-3.7			-6.6			-3.3			2.6		
TRILINEAR DIAGRAM DATA																		
sum (Ca, Mg, Na+K)	1.88			2.57			1.58			2.54			2.67			2.97		
Calcium	43.49			46.40			44.40			45.39			49.87			43.23		
Magnesium	40.80			39.70			35.72			42.45			37.58			41.61		
Sodium + Potassium	15.71			13.90			19.88			12.17			12.54			15.16		
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.01			2.72			1.64			2.98			2.90			2.87		
Sulfate	18.815			6.583			9.463			18.641			10.486			13.111		
Chloride	5.826			5.195			6.951			3.575			3.979			2.708		
Bicarbonate + Carbonate	75.359			88.222			83.586			77.784			85.535			84.180		

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-93	MW-95	MW-84	MW-81	MW-21	MW-73
Date	7/29/11	7/26/11	7/27/11	7/12/11	8/1/11	7/14/11
Cations	MW					
Calcium	40.1	40.1	40.1	40.1	40.1	40.1
Magnesium	24.3	24.3	24.3	24.3	24.3	24.3
Potassium	39.1	39.1	39.1	39.1	39.1	39.1
Sodium	23.0	23.0	23.0	23.0	23.0	23.0
Iron	55.8	55.8	55.8	55.8	55.8	55.8
Manganese	54.9	54.9	54.9	54.9	54.9	54.9
Ammonia-N	14.0	14.0	14.0	14.0	14.0	14.0
Total Cations (meq/L)	3.7	2.0	1.4	1.2	1.2	1.4
Anions						
Alkalinity, Total	105	85	57	50	53	56
Carbonate	60.0	60.0	60.0	60.0	60.0	60.0
Bicarbonate	61.0	61.0	61.0	61.0	61.0	61.0
Chloride	35.5	35.5	35.5	35.5	35.5	35.5
Nitrate-N	14.0	14.0	14.0	14.0	14.0	14.0
Sulfate	96.1	96.1	96.1	96.1	96.1	96.1
Total Anions (meq/L)	4.3	2.2	1.5	1.4	1.2	1.5
Total Ions (meq/L)	8.0	4.2	2.9	2.6	2.5	2.9
Cation/Anion Ratio	0.86	0.90	0.92	0.86	1.00	0.90
Percent Difference	-7.5	-5.1	-3.9	-7.4	0.0	-5.4
TRILINEAR DIAGRAM DATA						
sum (Ca, Mg, Na+K)	3.67	1.97	1.40	1.19	1.18	1.37
Calcium	50.50	47.45	37.83	41.69	40.00	43.23
Magnesium	39.28	39.38	44.13	37.63	38.34	37.80
Sodium + Potassium	10.23	13.17	18.04	20.67	21.66	18.97
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	4.28	2.18	1.49	1.27	1.24	1.39
Sulfate	49.135	14.882	16.922	14.399	8.385	13.315
Chloride	1.806	6.966	6.517	6.191	6.258	6.883
Bicarbonate + Carbonate	49.059	78.153	76.561	79.410	85.357	79.801

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-99
Date	7/15/11
Cations	
Calcium	40.1 2 8.5 0.42615 35.8
Magnesium	24.3 2 4.1 0.33573 28.2
Potassium	39.1 1 0.8 0.01959 1.6
Sodium	23.0 1 9.2 0.40192 33.8
Iron	55.8 2 0.01 0.00036 0.0
Manganese	54.9 2 0.05 0.00197 0.2
Ammonia-N	14.0 1 0.05 0.0035 0.3
Total Cations (meq/L)	1.2
Anions	
Alkalinity, Total	52
Carbonate	60.0 2 0.1072 0.00357 0.3
Bicarbonate	61.0 1 62.73 1.02827 80.9
Chloride	35.5 1 3.1 0.08631 6.8
Nitrate-N	14.0 1 0.03 0.00228 0.2
Sulfate	96.1 2 7.2 0.15053 11.8
Total Anions (meq/L)	1.3
Total Ions (meq/L)	2.5
Cation/Anion Ratio	0.94
Percent Difference	-3.3
TRILINEAR DIAGRAM DATA	
sum (Ca, Mg, Na+K)	1.18
Calcium	36.01
Magnesium	28.37
Sodium + Potassium	35.62
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.27
Sulfate	11.865
Chloride	6.803
Bicarbonate + Carbonate	81.331

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-66	MW-67	MW-80	MW-68	MW-74
Date	7/12/11	7/20/11	7/25/11	7/22/11	7/15/11
Cations	MW	MW	MW	MW	MW
Calcium	40.1 2	19.5 2	0.97305	36.6	28.2 1.40719
Magnesium	24.3 2	16.0 1.3166	49.5	15.3	1.259
Potassium	39.1 1	1.2 0.03044	1.1	1.5	0.03862
Sodium	23.0 1	7.8 0.33711	12.7	8.4	0.36321
Iron	55.8 2	0.0 0.00036	0.0	0.1	0.00362
Manganese	54.9 2	0.0 3.6E-05	0.0	0.1	0.00315
Ammonia-N	14.0 1	0.0 0.00071	0.0	0.0	0.00071
Total Cations (meq/L)	2.7	3.1	2.5	3.3	4.7
Anions					
Alkalinity, Total	117	111	85	142	186
Carbonate	60.0 2	0.0475 0.00158	0.1	0.0652 0.00217	0.1
Bicarbonate	61.0 1	142.64 2.33806	79.9	135.29 2.21749	71.5
Chloride	35.5 1	8.4 0.23778	8.1	4.6 0.1289	4.2
Nitrate-N	14.0 1	0.5 0.03884	1.3	0.6 0.04262	1.4
Sulfate	96.1 2	14.8 0.30815	10.5	34.1 0.70999	22.9
Total Anions (meq/L)	2.9	3.1	5.2	3.3	4.8
Total Ions (meq/L)	5.6	6.2	7.7	6.6	9.6
Cation/Anion Ratio	0.91	0.99	0.92	1.02	0.98
Percent Difference	-4.8	-0.4	-4.0	0.8	-0.8
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	2.66	3.07	2.43	3.24	4.70
Calcium	36.62	45.87	49.81	47.12	39.70
Magnesium	49.55	41.04	38.20	40.37	47.61
Sodium + Potassium	13.83	13.10	11.99	12.51	12.70
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.89	3.06	2.70	3.25	4.79
Sulfate	10.679	23.213	31.879	10.121	9.513
Chloride	8.240	4.215	5.258	2.517	12.888
Bicarbonate + Carbonate	81.081	72.572	62.863	87.362	77.599

Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-75	MW-87	MW-85	MW-86	MW-88
Date	7/15/11	7/15/11	7/6/11	7/27/11	7/26/11
Cations	MW	MW	MW	MW	MW
Calcium	40.1 2	36.3 1	21.0 1	13.4 0	8.7 0
Magnesium	24.3 2	23.9 1	1.07797 42.9	0.66866 40.7	0.48632 42.1
Potassium	39.1 1	2.1 0.05269 1.2	1.3 0.03376 1.3	8.5 0.69533 42.3	5.9 0.02281 2.0
Sodium	23.0 1	9.4 0.40931 9.4	8.1 0.35277 14.0	5.6 0.24141 14.7	4.8 0.20879 18.1
Iron	55.8 2	3.1 0.10923 2.5	0.0 0.00036 0.0	0.2 0.00867 0.5	0.0 0.00036 0.0
Manganese	54.9 2	0.4 0.01383 0.3	0.0 3.6E-05 0.0	0.0 0.00022 0.0	0.0 3.6E-05 0.0
Ammonia-N	14.0 1	0.0 0.00173 0.0	0.0 0.00071 0.0	0.0 0.00071 0.0	0.0 0.00071 0.1
Total Cations (meq/L)	3.0	4.4	2.5	1.6	1.2
Anions					
Alkalinity, Total	96.4	87.6	88.7	64.9	51.2
Carbonate	60.0 2	0.027 0.0009 0.0	0.0386 0.00129 0.0	0.0264 0.00088 0.0	0.0287 0.00096 0.1
Bicarbonate	61.0 1	117.48 1.92564 63.4	106.82 1.75084 41.6	79.12 1.29693 73.1	62.41 1.02289 80.1
Chloride	35.5 1	8.2 0.23016 7.6	4.5 0.12636 3.0	6.4 0.1808 7.0	2.9 0.08293 6.5
Nitrate-N	14.0 1	0.0 0.00071 0.0	0.1 0.00864 0.3	0.4 0.02549 1.4	0.5 0.03912 3.1
Sulfate	96.1 2	42.2 0.87864 28.9	112.0 2.33193 55.4	29.6 0.6163 23.9	16.3 0.33938 19.1
Total Anions (meq/L)	3.0	4.2	2.6	1.8	1.3
Total Ions (meq/L)	6.0	8.6	5.1	3.4	2.4
Cation/Anion Ratio	0.98	1.04	0.97	0.93	0.90
Percent Difference	-0.9	1.8	-1.3	-4	-5.0
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	2.92	4.24	2.51	1.64	1.15
Calcium	37.54	42.72	41.71	40.89	37.79
Magnesium	48.68	46.38	42.91	42.53	42.14
Sodium + Potassium	13.78	10.90	15.38	16.58	20.07
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	3.04	4.21	2.57	1.75	1.24
Sulfate	28.936	55.390	23.973	19.402	10.641
Chloride	7.580	3.002	7.033	6.402	6.695
Bicarbonate + Carbonate	63.484	41.609	68.994	74.196	82.664

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-89					MW-90					MW-91					MW-43				
Date	7/26/11					7/27/11					7/20/11					8/1/11				
Cations	MW	n	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)			
Calcium	40.1	2	13.2	0.65868	36.9	16.5	0.82335	44.1	21.0	1.0479	39.6	12.8	0.63872	37.5	8.8	0.43372	37.5			
Magnesium	24.3	2	8.8	0.72742	40.8	8.8	0.72742	39.0	13.7	1.12734	42.5	8.8	0.72331	42.4	1.4	0.03453	2.0			
Potassium	39.1	1	1.5	0.03811	2.1	1.4	0.0353	1.9	1.6	0.04195	1.6	1.4	0.03453	2.0	6.1	0.26534	15.6			
Sodium	23.0	1	7.4	0.32362	18.1	5.3	0.23054	12.3	7.3	0.3184	12.0	3.9	0.16341	2.0	0.9	0.03341	2.0			
Iron	55.8	2	0.7	0.02604	1.5	1.1	0.03904	2.1	2.9	0.10314	3.9	0.3	0.00856	0.5	0.2	0.00856	0.5			
Manganese	54.9	2	0.3	0.00917	0.5	0.3	0.01041	0.6	0.2	0.00896	0.3	0.2	0.00856	0.5	0.0	0.00156	0.1			
Ammonia-N	14.0	1	0.0	0.00143	0.1	0.0	0.00129	0.1	0.0	0.00184	0.1	0.0	0.00156	0.1	0.0	0.00156	0.1			
Total Cations (meq/L)				1.8			1.9			2.6			1.7							
Anions																				
Alkalinity, Total			76.1			69.5			85.4			69.7								
Carbonate	60.0	2	0.0537	0.00179	0.1	0.0491	0.00164	0.1	0.0457	0.00152	0.1	0.0619	0.00206	0.1	84.91	1.39173	78.4			
Bicarbonate	61.0	1	92.73	1.51998	77.5	84.69	1.38816	66.9	104.10	1.70622	64.2	84.91	1.39173	78.4	3.0	0.08518	4.8			
Chloride	35.5	1	3.5	0.09957	5.1	3.8	0.10634	5.1	7.3	0.20534	7.7	3.0	0.08518	4.8	0.0	0.00071	0.0			
Nitrate-N	14.0	1	0.0	0.00071	0.0	0.0	0.00071	0.0	0.0	0.00164	0.1	0.0	0.00071	0.0	0.0	0.00071	0.0			
Sulfate	96.1	2	16.3	0.33938	17.3	27.7	0.57674	27.8	35.6	0.74122	27.9	14.2	0.29566	16.7	14.2	0.29566	16.7			
Total Anions (meq/L)				2.0			2.1			2.7			1.8							
Total Ions (meq/L)				3.7			3.9			5.3			3.5							
Cation/Anion Ratio				0.91			0.90			1.00			0.96							
Percent Difference				-4.7			-5.2			-0.1			-2.0							
TRILINEAR DIAGRAM DATA																				
sum (Ca, Mg, Na+K)			1.75			1.82			2.54			1.66								
Calcium			37.69			45.32			41.33			38.43								
Magnesium			41.62			40.04			44.46			43.52								
Sodium + Potassium			20.70			14.63			14.21			18.04								
						100.0			100.0			100.0								
sum (SO ₄ , Cl, HCO ₃ +CO ₃)			1.96			2.07			2.65			1.77								
Sulfate			17.309			27.823			27.925			16.660								
Chloride			5.078			5.130			7.736			4.800								
Bicarbonate + Carbonate			77.613			67.047			64.339			78.540								
						100.0			100.0			100.0								

Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-56	MW-57	MW-76	MW-83	MW-60	MW-94
Date	10/6/11	10/12/11	10/11/11	10/26/11	10/4/11	10/26/11
Cations	MW					
Calcium	40.1 215.7 mg/L	50.5 17.5 mg/L	37.0 14.1 mg/L	44.4 31.9 mg/L	52.3 21.5 mg/L	50.9 mg/L
	0.78343 meq/L	0.87325 meq/L	0.70359 meq/L	1.59182 meq/L	1.07285 meq/L	1.02794 meq/L
Magnesium	24.3 26.4 mg/L	33.7 9.6 mg/L	33.4 6.6 mg/L	35.7 10.8 mg/L	39.0 8.5 mg/L	34.6 mg/L
	0.52335 meq/L	0.78914 meq/L	0.53981 meq/L	1.0862 meq/L	0.88871 meq/L	0.69944 meq/L
Potassium	39.1 11.2 mg/L	1.9 1.0 mg/L	0.02583 mg/L	1.1 1.2 mg/L	0.03018 mg/L	1.9 1.7 mg/L
	0.02941 meq/L	0.02583 meq/L	0.03018 meq/L	0.06369 meq/L	0.03402 meq/L	0.0422 meq/L
Sodium	23.0 1.49 mg/L	0.21183 mg/L	13.6 7.3 mg/L	0.3184 mg/L	13.5 7.1 mg/L	0.30361 mg/L
	0.00133 meq/L	0.3184 meq/L	0.31057 meq/L	0.30361 meq/L	0.28143 meq/L	0.25055 meq/L
Iron	55.8 210.04 mg/L	0.1 9.64 mg/L	0.00018 mg/L	0.00018 mg/L	0.00018 mg/L	0.00018 mg/L
	0.00306 meq/L	0.00983 meq/L	1.8E-05 meq/L	4.8E-05 meq/L	1.8E-05 meq/L	1.8E-05 meq/L
Manganese	54.9 210.08 mg/L	0.2 0.27 mg/L	0.00306 meq/L	0.00306 meq/L	0.00306 meq/L	0.00306 meq/L
	0.00036 meq/L	0.00153 meq/L	0.00036 meq/L	0.00036 meq/L	0.00036 meq/L	0.00036 meq/L
Ammonia-N	14.0 10.01 mg/L	0.0 0.02 mg/L	0.1 0.01 mg/L	0.0 0.01 mg/L	0.0 0.01 mg/L	0.0 0.01 mg/L
	0.00036 meq/L	0.00153 meq/L	0.00036 meq/L	0.00036 meq/L	0.00036 meq/L	0.00036 meq/L
Total Cations (meq/L)	1.6	2.4	1.6	3.0	2.3	2.0
Anions						
Alkalinity, Total	58 mg/L	88 mg/L	52 mg/L	143 mg/L	96 mg/L	82 mg/L
Carbonate	60.0 210.0301 mg/L	0.001 meq/L	0.1 0.0298 mg/L	0.00099 meq/L	0.0 0.0057 mg/L	0.00019 meq/L
	0.001 meq/L	0.00099 meq/L	0.00019 meq/L	0.00019 meq/L	0.00019 meq/L	0.00019 meq/L
Bicarbonate	61.0 170.09 mg/L	1.14882 meq/L	68.3 107.42 mg/L	1.76074 meq/L	77.5 63.06 mg/L	1.03366 meq/L
	0.12242 meq/L	0.14498 meq/L	0.16416 meq/L	0.16416 meq/L	0.16416 meq/L	0.16416 meq/L
Chloride	35.5 14.3 mg/L	0.00207 meq/L	0.1 0.01 mg/L	0.00036 meq/L	0.0 0.75 mg/L	0.05354 meq/L
	0.00207 meq/L	0.00036 meq/L	0.00036 meq/L	0.00036 meq/L	0.00036 meq/L	0.00036 meq/L
Nitrate-N	14.0 10.03 mg/L	0.40809 meq/L	24.3 17.5 mg/L	0.36436 meq/L	16.0 22.2 mg/L	0.46222 meq/L
	0.40809 meq/L	0.36436 meq/L	0.46222 meq/L	0.46222 meq/L	0.46222 meq/L	0.46222 meq/L
Sulfate	96.1 219.6 mg/L	1.7 meq/L	3.2 meq/L	2.3 meq/L	1.7 meq/L	3.3 meq/L
	0.40809 meq/L	0.36436 meq/L	0.46222 meq/L	0.46222 meq/L	0.46222 meq/L	0.46222 meq/L
Total Anions (meq/L)	1.7	4.6	3.3	6.6	4.5	4.3
Total Ions (meq/L)	3.2	7.0	4.9	9.6	6.8	6.3
Cation/Anion Ratio	0.92	1.04	0.92	0.86	1.01	0.90
Percent Difference	-4.0	2.0	-3.9	-7.3	0.4	-5.2
TRILINEAR DIAGRAM DATA						
sum (Ca, Mg, Na+K)	1.55	2.01	1.58	3.05	2.28	2.02
Calcium	50.61	43.52	44.41	52.27	47.12	50.88
Magnesium	33.81	39.33	34.08	35.67	39.03	34.62
Sodium + Potassium	15.58	17.15	21.51	12.06	13.85	14.49
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.68	2.27	1.66	3.52	2.16	2.24
Sulfate	24.286	16.044	27.841	3.454	7.496	4.332
Chloride	7.285	6.384	9.888	15.306	3.485	22.212
Bicarbonate + Carbonate	68.429	77.573	62.271	81.240	89.019	73.456

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Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-82			MW-65			MW-58A			MW-59			MW-24			MW-64		
Date	10/4/11			10/12/11			10/20/11			10/26/11			10/24/11			10/10/11		
Cations	MW	n	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	
Calcium	40.1	2	21.1	1.05289	42.2	12.1	0.60379	37.7	18.2	0.90818	47.3	12.8	0.63872	38.7	12.6	0.62874	38.1	
Magnesium	24.3	2	13.4	1.10265	44.2	6.9	0.56861	35.5	8.4	0.69451	36.2	7.6	0.62621	38.0	8.1	0.66406	40.2	
Potassium	39.1	1	1.7	0.04399	1.8	1.0	0.0254	1.6	1.1	0.02839	1.5	0.9	0.02397	1.5	0.8	0.02051	1.2	
Sodium	23.0	1	6.8	0.29448	11.8	5.6	0.24315	15.2	5.3	0.23228	12.1	4.9	0.21357	12.9	5.0	0.21531	13.0	
Iron	55.8	2	0.01	0.00018	0.0	4.25	0.1522	9.5	1.08	0.03868	2.0	3.99	0.14289	8.7	3.25	0.11639	7.0	
Manganese	54.9	2	0.00	1.8E-05	0.0	0.19	0.00706	0.4	0.38	0.01372	0.7	0.10	0.0036	0.2	0.12	0.00422	0.3	
Ammonia-N	14.0	1	0.01	0.00036	0.0	0.01	0.00036	0.0	0.08	0.00542	0.3	0.01	0.00036	0.0	0.04	0.00294	0.2	
Total Cations (meq/L)	2.5			1.6			1.9			1.6			1.7			3.2		
Anions	98			55			76			62			65			91		
Alkalinity, Total	60.0			2			0.0446			0.00149			0.1			0.0476		
Carbonate	61.0			1			119.23			1.95422			78.2			67.29		
Bicarbonate	35.5			1			7.2			0.20337			8.1			4.0		
Chloride	14.0			1			0.96			0.06825			2.7			0.01		
Nitrate-N	96.1			2			13.0			0.27067			10.8			15.5		
Sulfate	2.5			1.5			2.0			3.9			1.7			3.4		
Total Anions (meq/L)	5.0			3.1			3.9			2.0			3.4			1.7		
Total Ions (meq/L)	1.00			1.04			0.98			0.96			0.95			0.92		
Cation/Anion Ratio	-0.1			1.9			-0.9			-2.0			-2.3			-4.2		
Percent Difference																		
TRILINEAR DIAGRAM DATA																		
sum (Ca, Mg, Na+K)	2.49			1.44			1.86			1.50			1.53			3.12		
Calcium	42.22			41.90			48.74			42.51			41.13			38.55		
Magnesium	44.21			39.46			37.27			41.68			43.44			49.85		
Sodium + Potassium	13.57			18.64			13.99			15.81			15.43			11.61		
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.43			1.54			1.95			1.72			1.73			3.43		
Sulfate	11.140			20.949			16.728			21.094			18.409			43.854		
Chloride	8.370			7.397			5.297			6.717			6.129			3.119		
Bicarbonate + Carbonate	80.490			71.654			77.975			72.189			75.462			53.028		

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-70			MW-78			MW-72			MW-69			MW-100			MW-93					
Date	10/10/11	10/10/11	10/10/11	10/10/11	10/10/11	10/10/11	10/10/11	10/10/11	10/10/11	10/10/11	10/10/11	10/6/11	10/6/11	10/6/11	10/24/11	10/24/11					
Cations	MW	n	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)				
Calcium	40.1	2	17.6	0.87824	44.8	15.7	0.78343	47.5	24.2	1.20758	42.8	27.5	1.37226	47.3	23.6	1.17764	41.8	35.8	1.78643	49.1	24.1
Magnesium	24.3	2	9.5	0.78173	39.8	6.8	0.55544	33.7	14.4	1.18494	42.0	13.2	1.0862	37.5	14.0	1.15203	40.8	17.4	1.4318	39.3	14.3
Potassium	39.1	1	1.5	0.03862	2.0	2.1	0.05294	3.2	1.8	0.04527	1.6	1.7	0.04348	1.5	2.0	0.04987	1.8	1.5	0.0376	1.0	0.37
Sodium	23.0	1	6.0	0.26273	13.4	5.9	0.2562	15.5	6.8	0.29622	10.5	8.1	0.35146	12.1	8.7	0.3793	13.4	8.5	0.36973	10.2	8.5
Iron	55.8	2	0.01	0.00018	0.0	0.01	0.00018	0.0	2.14	0.07664	2.7	1.04	0.03724	1.3	1.50	0.05372	1.9	0.01	0.00018	0.0	0.01
Manganese	54.9	2	0.00	1.8E-05	0.0	0.00	1.8E-05	0.0	0.27	0.00968	0.3	0.19	0.00703	0.2	0.21	0.00768	0.3	0.28	0.01027	0.3	0.28
Ammonia-N	14.0	1	0.01	0.00036	0.0	0.01	0.00036	0.0	0.01	0.00079	0.0	0.02	0.00114	0.0	0.01	0.00036	0.0	0.05	0.00381	0.1	0.05
Total Cations (meq/L)	2.0			1.6			2.8			2.9			2.8			3.6					
Anions																					
Alkalinity, Total	82			69			117			126			126			110					
Carbonate	60.0	2	0.1048	0.00349	0.2	0.0173	0.00058	0.0	0.0845	0.00282	0.1	0.2805	0.00935	0.3	0.0323	0.00108	0.0	0.1047	0.00349	0.1	0.1047
Bicarbonate	61.0	1	99.46	1.63026	77.1	84.39	1.38321	80.7	142.57	2.33683	76.6	153.15	2.51027	85.6	153.65	2.51854	86.1	133.99	2.19618	53.4	133.99
Chloride	35.5	1	3.9	0.11113	5.3	4.1	0.11677	6.8	4.0	0.11339	3.7	4.4	0.12383	4.2	2.6	0.07305	2.5	2.8	0.07926	1.9	2.8
Nitrate-N	14.0	1	0.03	0.00228	0.1	0.90	0.06397	3.7	0.01	0.00036	0.0	0.01	0.00036	0.0	0.01	0.00036	0.0	0.01	0.00036	0.0	0.01
Sulfate	96.1	2	17.6	0.36645	17.3	7.2	0.14991	8.7	28.7	0.59756	19.6	13.8	0.28733	9.8	15.9	0.33105	11.3	88.1	1.83432	44.6	88.1
Total Anions (meq/L)	2.1			1.7			3.1			2.9			2.9			2.9					
Total Ions (meq/L)	4.1			3.4			5.9			5.8			5.7			7.8					
Cation/Anion Ratio	0.93			0.96			0.92			0.99			0.96			0.88					
Percent Difference	-3.7			-2.0			-3.9			-0.6			-1.8			-6.1					
TRILINEAR DIAGRAM DATA																					
sum (Ca, Mg, Na+K)	1.96			1.65			2.73			2.85			2.76			3.63					
Calcium	44.78			47.54			44.17			48.09			42.69			49.27					
Magnesium	39.86			33.70			43.34			38.07			41.76			39.49					
Sodium + Potassium	15.36			18.76			12.49			13.84			15.56			11.23					
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.11			1.65			3.05			2.93			2.92			4.11					
Sulfate	17.356			9.083			19.588			9.804			11.323			44.595					
Chloride	5.264			7.075			3.717			4.225			2.499			1.927					
Bicarbonate + Carbonate	77.380			83.842			76.695			85.971			86.178			53.478					

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-95	MW-84	MW-81	MW-21	MW-73	MW-99
Date	10/11/11	10/12/11	10/28/11	10/13/11	10/13/11	10/14/11
Cations	MW					
Calcium	40.1	45.8	44.2	43.2	13.5	9.1
Magnesium	24.3	0.64102	0.44435	36.9	6.0	4.3
Potassium	39.1	0.02634	0.01732	1.4	0.9	0.9
Sodium	23.0	0.26273	0.2214	18.4	5.5	10.0
Iron	55.8	0.00018	0.00018	0.0	0.01	0.04
Manganese	54.9	7.9E-05	1.8E-05	0.0	0.00	0.07
Ammonia-N	14.0	0.00036	0.00036	0.0	0.01	0.06
Total Cations (meq/L)	2.0	1.4	1.2	1.3	1.4	1.3
Anions						
Alkalinity, Total	86	58	50	53	57	52
Carbonate	60.0	0.00086	0.0011	0.1	0.0145	0.01569
Bicarbonate	61.0	1.15896	1.00275	73.3	69.02	63.49
Chloride	35.5	0.1619	0.08095	5.9	3.0	3.3
Nitrate-N	14.0	0.03655	0.10852	7.9	1.59	0.03
Sulfate	96.1	0.24152	0.17385	0.10744	8.2	7.4
Total Anions (meq/L)	2.2	1.6	1.4	1.3	1.5	1.3
Total Ions (meq/L)	4.2	3.0	2.6	2.5	2.9	2.6
Cation/Anion Ratio	0.91	0.91	0.88	1.02	0.95	0.98
Percent Difference	-4.6	-4.9	-6.4	0.8	-2.4	-1.0
TRILINEAR DIAGRAM DATA						
sum (Ca, Mg, Na+K)	2.01	1.45	1.20	1.21	1.43	1.26
Calcium	45.92	35.81	43.17	39.29	47.12	35.89
Magnesium	40.19	44.24	36.97	38.25	34.70	27.80
Sodium + Potassium	13.89	19.95	19.86	22.47	18.18	36.31
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.21	1.56	1.26	1.25	1.39	1.29
Sulfate	14.957	15.450	13.813	8.568	12.357	11.924
Chloride	7.162	10.357	6.432	6.748	6.021	7.138
Bicarbonate + Carbonate	77.881	74.193	79.756	84.683	81.622	80.938

Ion Balance Calculations **Cedar Hills Landfill Regional Aquifer GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-99			
Date				
Cations	MW	n	mg/L	meq/L
Calcium	40.1	2	9.1	0.45509
Magnesium	24.3	2	4.3	0.35631
Potassium	39.1	1	0.9	0.02253
Sodium	23.0	1	9.8	0.42758
Iron	55.8	2	0.03	0.00115
Manganese	54.9	2	0.08	0.0028
Ammonia-N	14.0	1	0.07	0.00505
Total Cations (meq/L)				1.3
Anions				
Alkalinity, Total			49	
Carbonate	60.0	2	0.1467	0.00489
Bicarbonate	61.0	1	59.36	0.97296
Chloride	35.5	1	3.1	0.08857
Nitrate-N	14.0	1	0.08	0.00542
Sulfate	96.1	2	7.6	0.15886
Total Anions (meq/L)				1.2
Total Ions (meq/L)				2.5
Cation/Anion Ratio				1.03
Percent Difference				1.6
TRILINEAR DIAGRAM DATA				
sum (Ca, Mg, Na+K)			1.26	
Calcium			36.08	
Magnesium			28.24	
Sodium + Potassium			35.68	
sum (SO ₄ , Cl, HCO ₃ +CO ₃)			1.23	
Sulfate			12.965	
Chloride			7.228	
Bicarbonate + Carbonate			79.806	

Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-66			MW-67			MW-80			MW-68			MW-74			MW-74		
Date	10/17/11			10/6/11			10/21/11			10/7/11			10/14/11			12/9/11		
Cations	MW	n	mg/L	meq/L	%meq	mg/L	meq/L	%meq	mg/L	meq/L	%meq	mg/L	meq/L	%meq	mg/L	meq/L	%meq	
Calcium	40.1	2	23.0	1.1477	40.4	26.0	1.29741	44.3	26.4	1.31737	48.7	27.2	1.35729	44.8	37.4	1.86627	38.1	
Magnesium	24.3	2	16.0	1.3166	46.3	14.9	1.22609	41.9	12.1	0.99568	36.8	14.9	1.22609	40.4	29.0	2.38634	48.7	
Potassium	39.1	1	1.3	0.03402	1.2	1.6	0.0399	1.4	1.6	0.04092	1.5	1.7	0.04374	1.4	2.1	0.05346	1.1	
Sodium	23.0	1	7.9	0.34363	12.1	8.3	0.35929	12.3	6.5	0.2823	10.4	8.0	0.34885	11.5	12.7	0.55242	11.3	
Iron	55.8	2	0.0	0.00018	0.0	0.1	0.00251	0.1	1.6	0.05837	2.2	1.4	0.0487	1.6	1.2	0.04297	0.9	
Manganese	54.9	2	0.0	1.8E-05	0.0	0.1	0.00205	0.1	0.3	0.01005	0.4	0.2	0.00703	0.2	0.1	0.0023	0.0	
Ammonia-N	14.0	1	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00086	0.0	0.0	0.00036	0.0	0.0	0.00036	0.0	
Total Cations (meq/L)				2.8			2.9			2.7			3.0			4.9		
Anions																		
Alkalinity, Total			120			112			87.4			141			190		188	
Carbonate	60.0	2	0.0847	0.00282	0.1	0.0614	0.00205	0.1	0.0631	0.0021	0.1	0.0887	0.00296	0.1	0.1937	0.00646	0.1	
Bicarbonate	61.0	1	146.23	2.39682	81.1	136.52	2.23762	70.5	106.50	1.74563	62.9	171.84	2.81662	86.9	231.41	3.79297	76.6	
Chloride	35.5	1	8.2	0.23214	7.9	4.7	0.13116	4.1	5.5	0.15626	5.6	2.9	0.0818	2.5	22.7	0.64028	12.9	
Nitrate-N	14.0	1	0.6	0.04077	1.4	0.6	0.04626	1.5	0.0	0.00036	0.0	0.0	0.00036	0.0	0.4	0.02784	0.6	
Sulfate	96.1	2	13.6	0.28316	9.6	36.3	0.7558	23.8	41.8	0.87031	31.4	16.3	0.33938	10.5	23.3	0.48513	9.8	
Total Anions (meq/L)				3.0			3.2			2.8			3.2			5.0		
Total Ions (meq/L)				5.8			6.1			5.5			6.3			9.9		
Cation/Anion Ratio				0.96			0.92			0.98			0.94			0.99		
Percent Difference				-2.0			-4.0			-1.3			-3.3			-0.5		
TRILINEAR DIAGRAM DATA																		
sum (Ca, Mg, Na+K)			2.84				2.92			2.64			2.98			4.86		
Calcium			40.38				44.39			49.97			45.61			38.41		
Magnesium			46.33				41.95			37.77			41.20			49.12		
Sodium + Potassium			13.29				13.66			12.26			13.19			12.47		
sum (SO ₄ , Cl, HCO ₃ +CO ₃)			2.91				3.13			2.77			3.24			4.92		
Sulfate			9.714				24.173			31.370			10.472			9.851		
Chloride			7.964				4.195			5.633			2.524			13.001		
Bicarbonate + Carbonate			82.322				71.632			62.997			87.004			77.148		

Ion Balance Calculations
Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

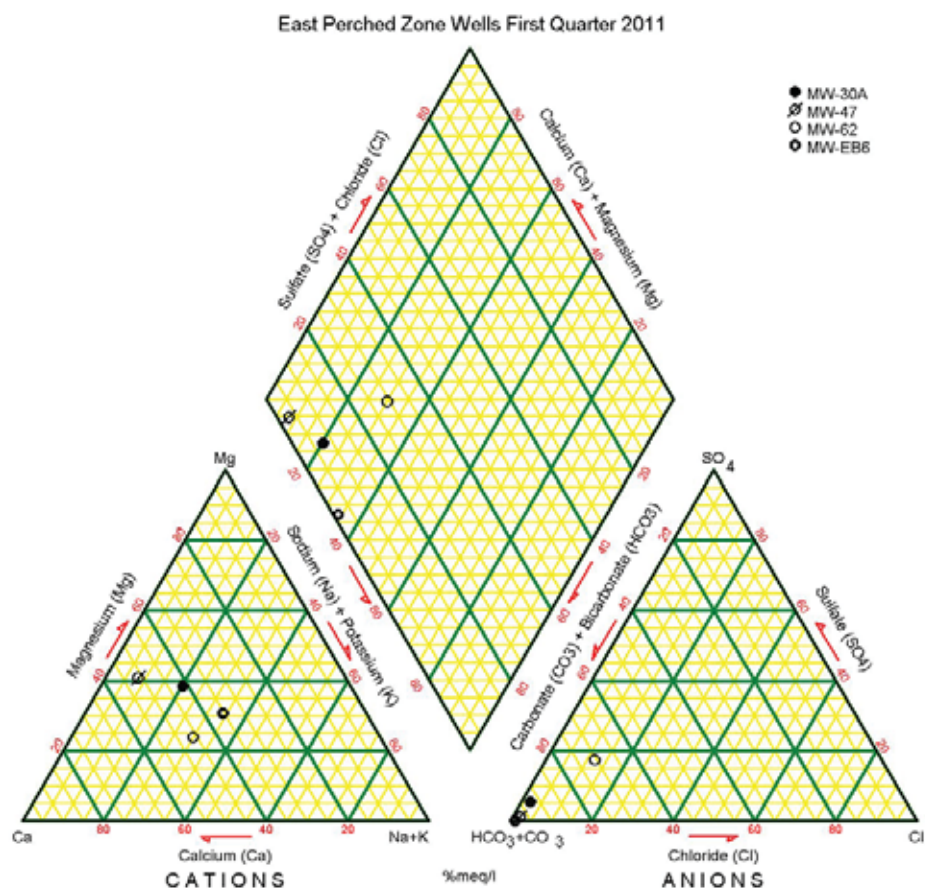
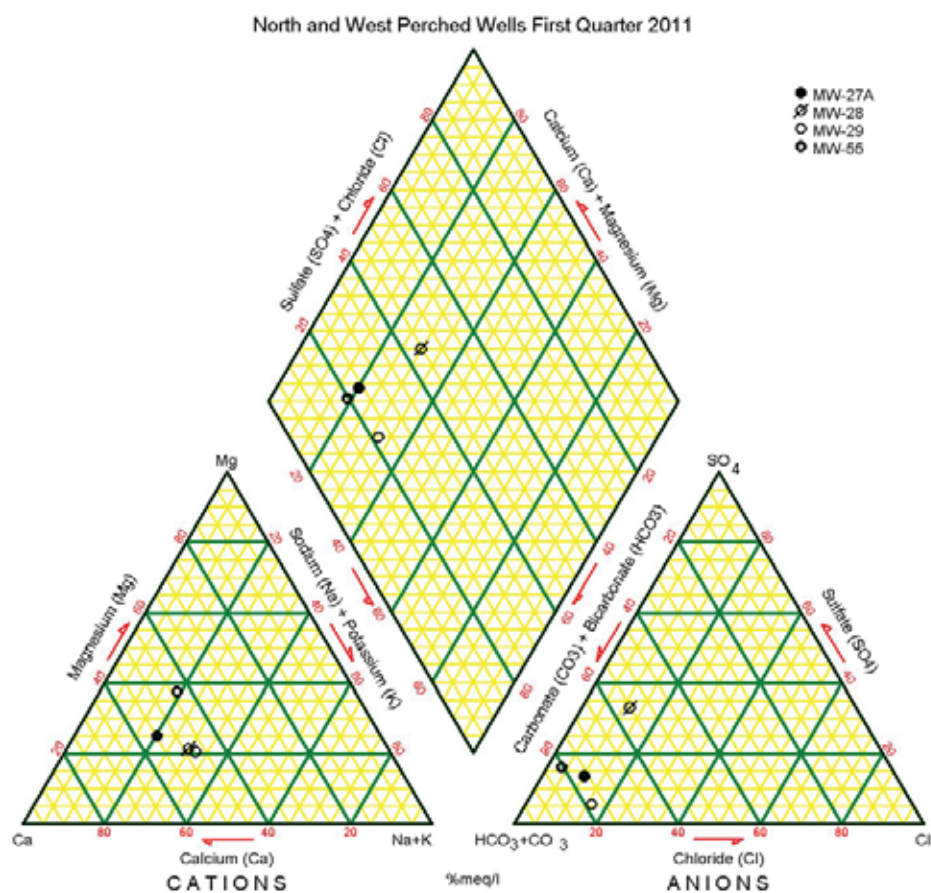
Site ID	MW-75			MW-87			MW-85			MW-86																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Date	10/14/11			12/5/11			10/14/11			10/28/11			10/13/11																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Cations	MW	n	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Calcium	40.1	2	23.2	1.15768	38.1	21.8	1.08782	35.5	35.5	1.77146	40.1	35.4	1.76647	39.3	21.3	1.06287	43.6	13.4	0.66866	37.9	9.2	0.75705	42.9	1.7	0.03069	16.7	0.7	0.01171	0.0	0.00031	0.0	0.00036	0.0	0.00036	1.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Magnesium	24.3	2	16.9	1.39066	45.8	18.2	1.49763	48.9	24.6	2.02427	45.8	25.7	2.11479	47.1	12.6	1.03682	42.5	1.3	0.03223	1.3	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Potassium	39.1	1	1.8	0.04553	1.5	1.9	0.04757	1.6	2.2	0.05576	1.3	2.2	0.05499	1.2	1.2	0.03223	42.5	1.3	0.03223	1.3	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Sodium	23.0	1	8.7	0.3793	12.5	8.6	0.37234	12.2	10.0	0.43454	9.8	9.8	0.42758	9.5	7.0	0.30535	12.5	1.3	0.03223	1.3	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2	0.03069	1.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Iron	55.8	2	1.7	0.05909	1.9	1.5	0.05443	1.8	3.2	0.11496	2.6	3.2	0.11317	2.5	0.0	0.00018	0.0	0.0	0.00018	0.0	0.3	0.01171	0.3	0.01171	0.3	0.01171	0.3	0.01171	0.3	0.01171	0.3	0.01171	0.3	0.01171	0.3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Manganese	54.9	2	0.1	0.00451	0.1	0.1	0.00433	0.1	0.4	0.01318	0.3	0.3	0.01249	0.3	0.0	1.8E-05	0.0	0.0	1.8E-05	0.0	0.0	0.00031	0.0	0.0	0.00031	0.0	0.0	0.00031	0.0	0.0	0.00031	0.0	0.0	0.00031	0.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Ammonia-N	14.0	1	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00086	0.0	0.0	0.00093	0.0	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00036	0.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Total Cations (meq/L)				3.0			3.1			4.4			4.5			2.4			1.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Alkalinity, Total			97.1			94.1			88.4			85.2			94.1			66.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Carbonate		2	0.0734	0.00245	0.1	0.0516	0.00172	0.1	0.0385	0.00128	0.0	0.0354	0.00118	0.0	0.0695	0.00232	0.1	0.0341	0.00114	0.1	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Bicarbonate		1	118.31	1.93926	62.8	114.70	1.88	66.5	107.77	1.76645	40.7	103.87	1.70256	39.5	114.66	1.8794	69.0	81.18	1.33066	0.1	0.1	0.03066	0.1	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1	0.03066	0.1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Chloride		1	8.5	0.24032	7.8	2.0	0.05641	2.0	4.7	0.13342	3.1	5.3	0.14865	3.4	6.8	0.19209	7.1	4.2	0.11875	0.3	4.2	0.11875	0.3	4.2	0.11875	0.3	4.2	0.11875	0.3	4.2	0.11875	0.3	4.2	0.11875	0.3	4.2	0.11875																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Nitrate-N		1	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00079	0.0	0.0	0.00036	0.0	0.1	0.00928	0.3	0.3	0.01885	0.3	0.3	0.01885	0.3	0.3	0.01885	0.3	0.3	0.01885	0.3	0.3	0.01885	0.3	0.3	0.01885	0.3	0.3	0.01885																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Sulfate		2	43.4	0.90362	29.3	42.6	0.88697	31.4	117.0	2.43604	56.2	118.0	2.45686	57.0	30.8	0.64128	23.5	17.2	0.35812	19.6	19.6	0.35812	19.6	19.6	0.35812	19.6	19.6	0.35812	19.6	19.6	0.35812	19.6	19.6	0.35812	19.6	19.6	0.35812																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Total Anions (meq/L)				3.1			2.8			4.3			4.3			2.7			1.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Total Ions (meq/L)				6.1			5.9			8.8			8.8			5.2			3.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Cation/Anion Ratio				0.98			1.08			1.02			1.04			0.89			0.96																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Percent Difference				-0.8			4.1			1			2.1			-5.6			-1.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Ion Balance Calculations Cedar Hills Landfill Regional Aquifer GW Monitoring Wells

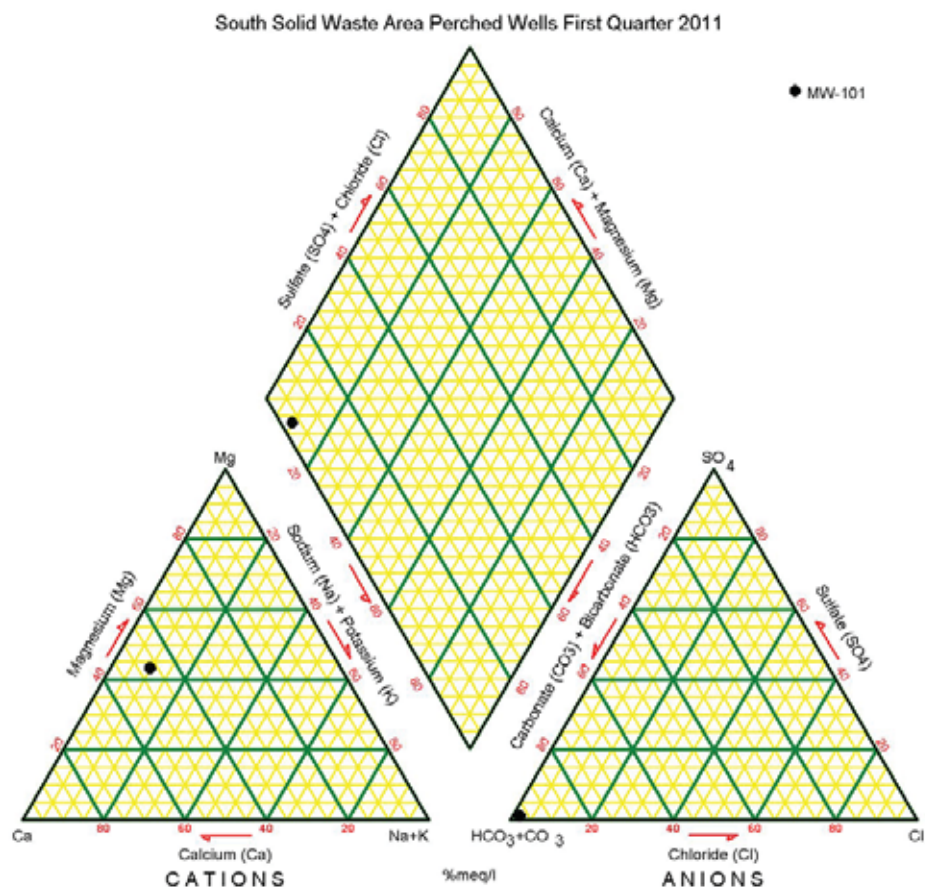
Data Collected from January 1, 2011 to December 31, 2011

Site ID	MW-88	MW-89	MW-90	MW-91	MW-43
Date	10/19/11	10/19/11	10/25/11	10/12/11	10/18/11
Cations	MW	MW	MW	MW	MW
Calcium	40.1 2	9.0 2	0.4486 38.1	14.4 0.71856 37.4	15.7 0.78343 42.8
Magnesium	24.3 2	5.9 0.48385 41.1	9.4 0.76939 40.0	8.9 0.72989 39.8	13.6 1.11911 41.7
Potassium	39.1 1	0.8 0.02148 1.8	1.6 0.03964 2.1	1.2 0.03146 1.7	1.7 0.04399 1.6
Sodium	23.0 1	5.1 0.22227 18.9	8.2 0.35625 18.5	5.5 0.23793 13.0	7.8 0.33885 12.6
Iron	55.8 2	0.0 0.00018 0.0	0.8 0.02786 1.4	1.1 0.03904 2.1	2.6 0.09275 3.5
Manganese	54.9 2	0.0 1.8E-05 0.0	0.3 0.00954 0.5	0.2 0.00885 0.5	0.3 0.00976 0.4
Ammonia-N	14.0 1	0.0 0.00036 0.0	0.0 0.00151 0.1	0.0 0.00121 0.1	0.1 0.00396 0.1
Total Cations (meq/L)	1.2	1.9	1.8	2.7	1.7
Anions					
Alkalinity, Total	52.6	77	69.5	84.6	70.6
Carbonate	60.0 2	0.091 0.00303 0.2	0.1243 0.00414 0.2	0.0693 0.00231 0.1	0.04854 0.00162 0.1
Bicarbonate	61.0 1	63.99 1.04881 81.0	93.69 1.53562 77.2	84.65 1.38748 68.0	103.11 1.69013 63.5
Chloride	35.5 1	2.9 0.08095 6.3	3.9 0.10859 5.5	3.7 0.10493 5.1	7.4 0.20788 7.8
Nitrate-N	14.0 1	0.5 0.03662 2.8	0.0 0.00036 0.0	0.0 0.00036 0.0	0.0 0.002 0.1
Sulfate	96.1 2	6.0 0.12513 9.7	16.3 0.33938 17.1	26.2 0.54551 26.7	36.5 0.75996 28.6
Total Anions (meq/L)	1.3	2.0	2.0	2.7	1.8
Total Ions (meq/L)	2.5	3.9	3.9	5.3	3.5
Cation/Anion Ratio	0.91	0.97	0.90	1.01	0.96
Percent Difference	-4.8	-1.7	-5.4	0.4	-2.1
TRILINEAR DIAGRAM DATA					
sum (Ca, Mg, Na+K)	1.18	1.88	1.78	2.57	1.68
Calcium	38.14	38.14	43.95	41.67	40.81
Magnesium	41.14	40.84	40.94	43.46	41.95
Sodium + Potassium	20.72	21.01	15.11	14.87	17.24
	100.0	100.0			
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.26	1.99	2.04	2.66	1.79
Sulfate	9.948	17.074	26.738	28.574	16.140
Chloride	6.435	5.463	5.143	7.816	5.128
Bicarbonate + Carbonate	83.617	77.463	68.120	63.609	78.732
	100.0	100.0			

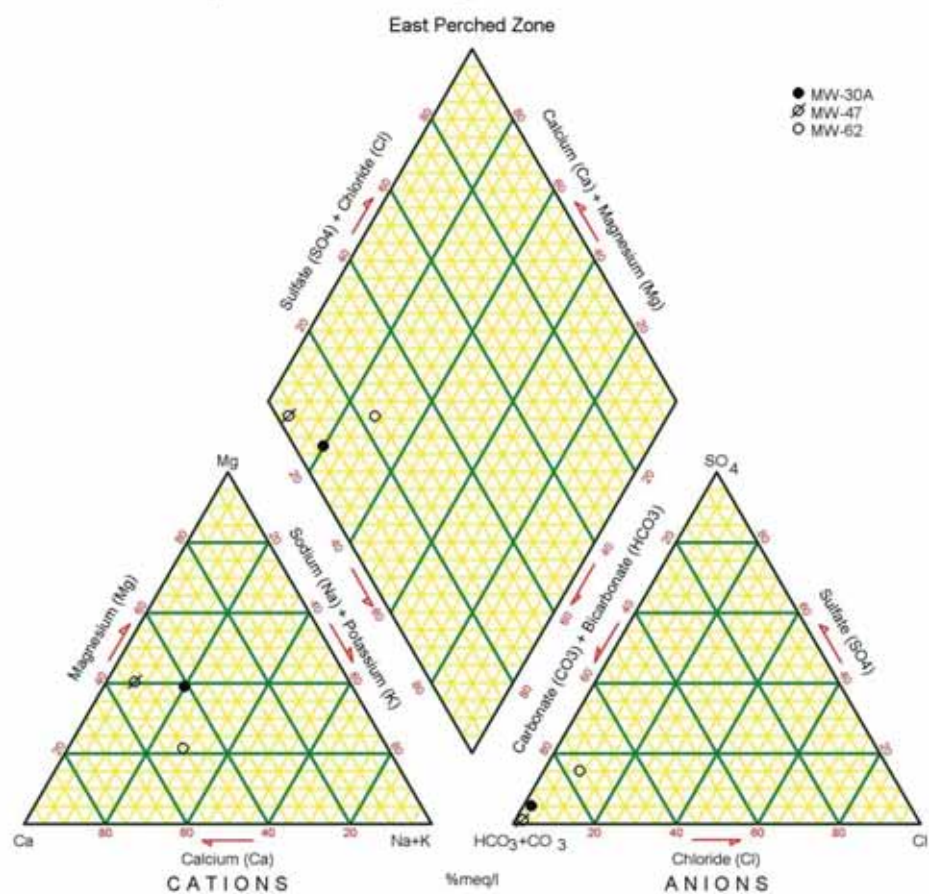
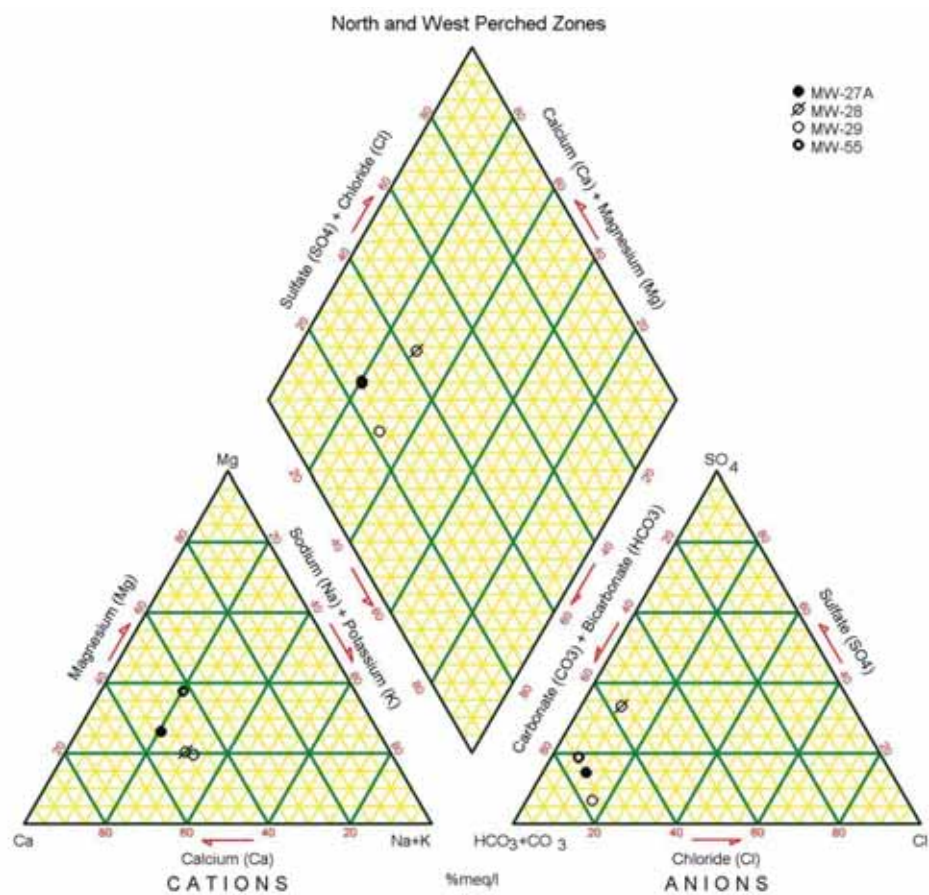
Trilinear Diagrams Perched Zone Wells 1st Quarter 2011



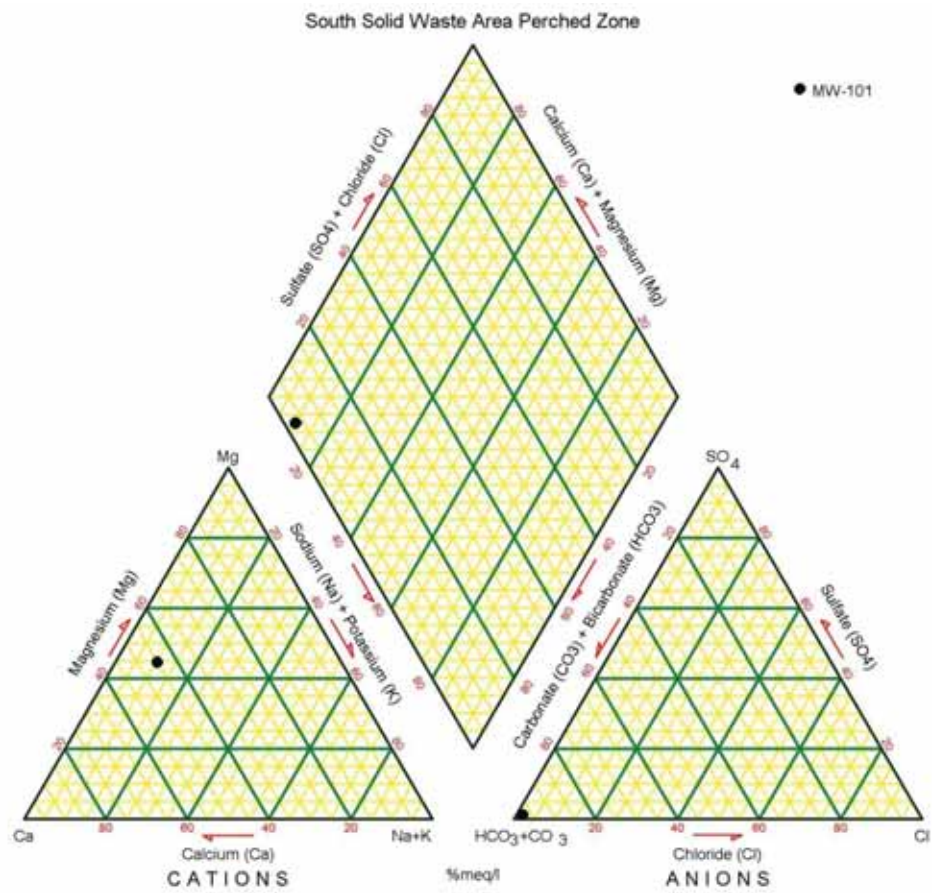
Trilinear Diagrams Perched Zone Wells 1st Quarter 2011



Trilinear Diagrams Perched Zone Wells 2nd Quarter 2011



Trilinear Diagrams Perched Zone Wells 2nd Quarter 2011



Trilinear Diagrams Perched Zone Wells 3rd Quarter 2011

Figure 3a. North and West Perched Zone Wells

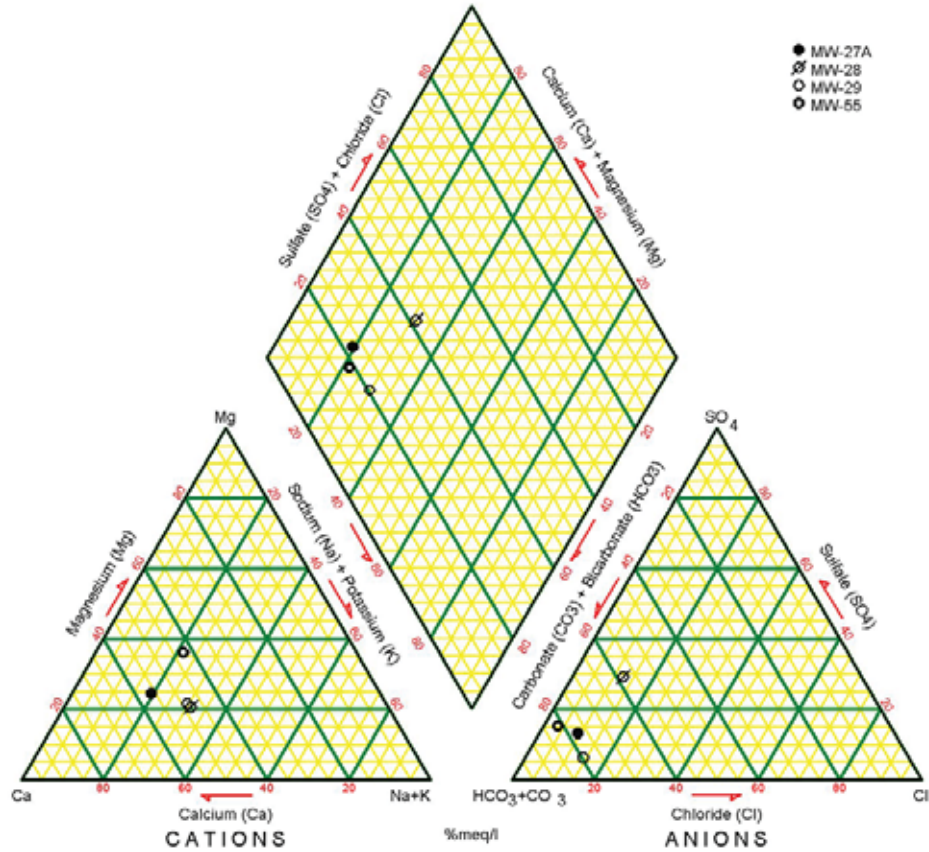
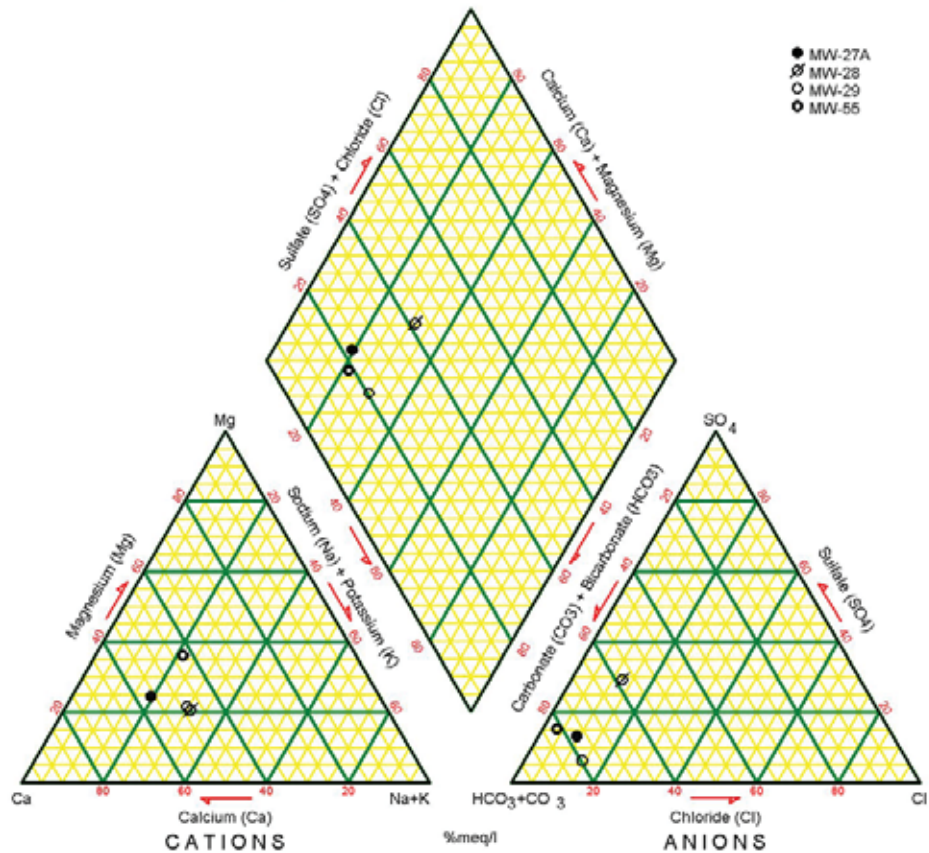
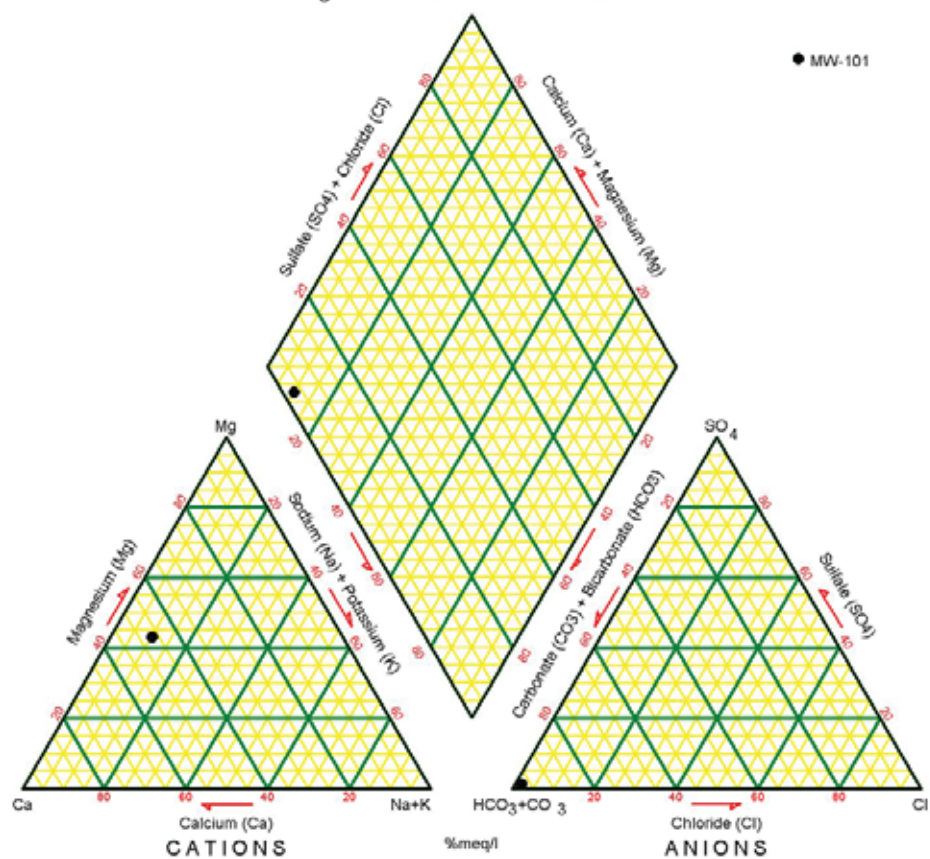


Figure 3a. North and West Perched Zone Wells

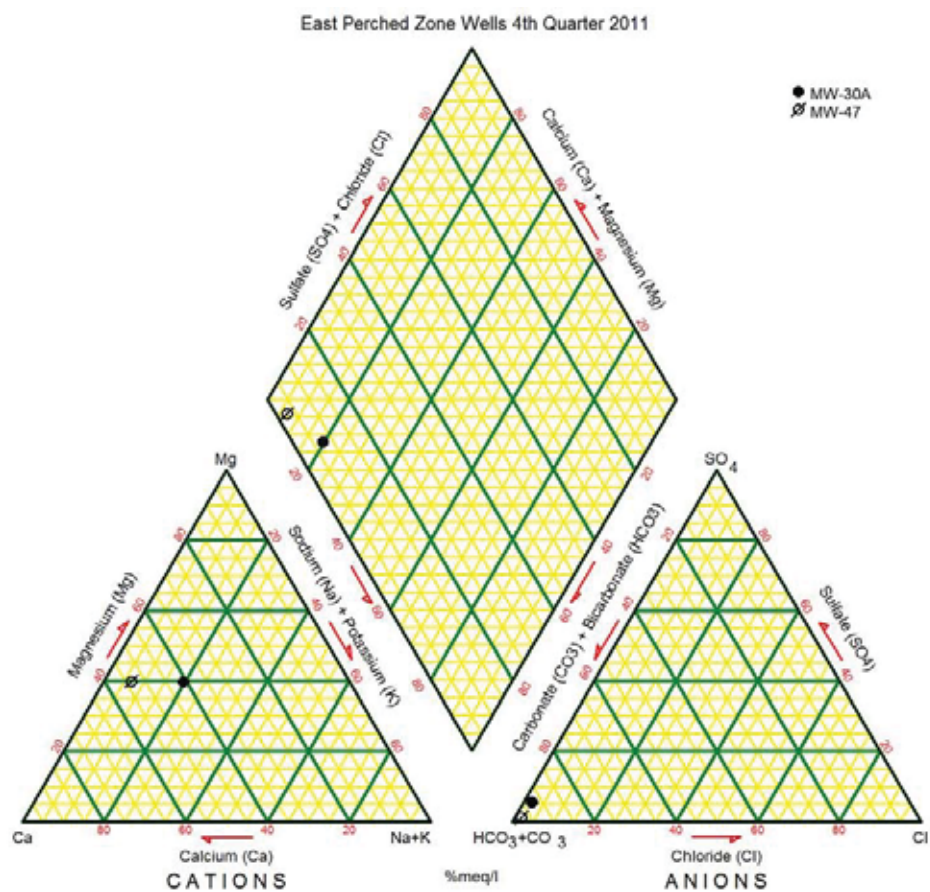
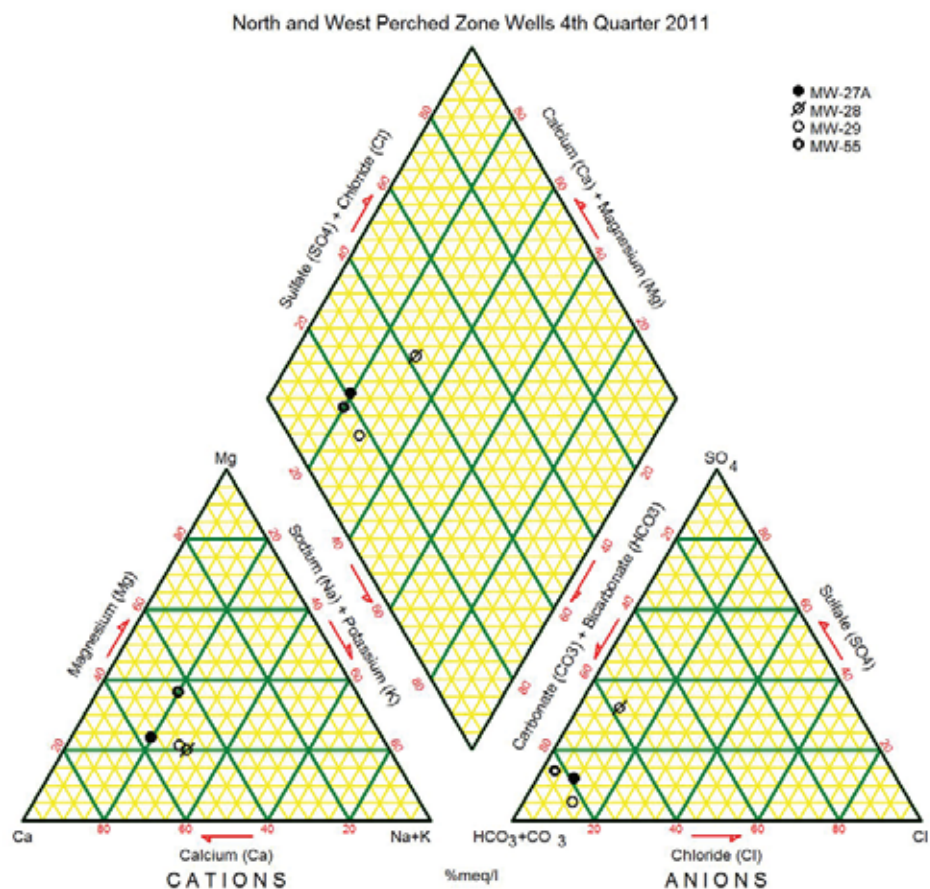


Trilinear Diagrams Perched Zone Wells 3rd Quarter 2011

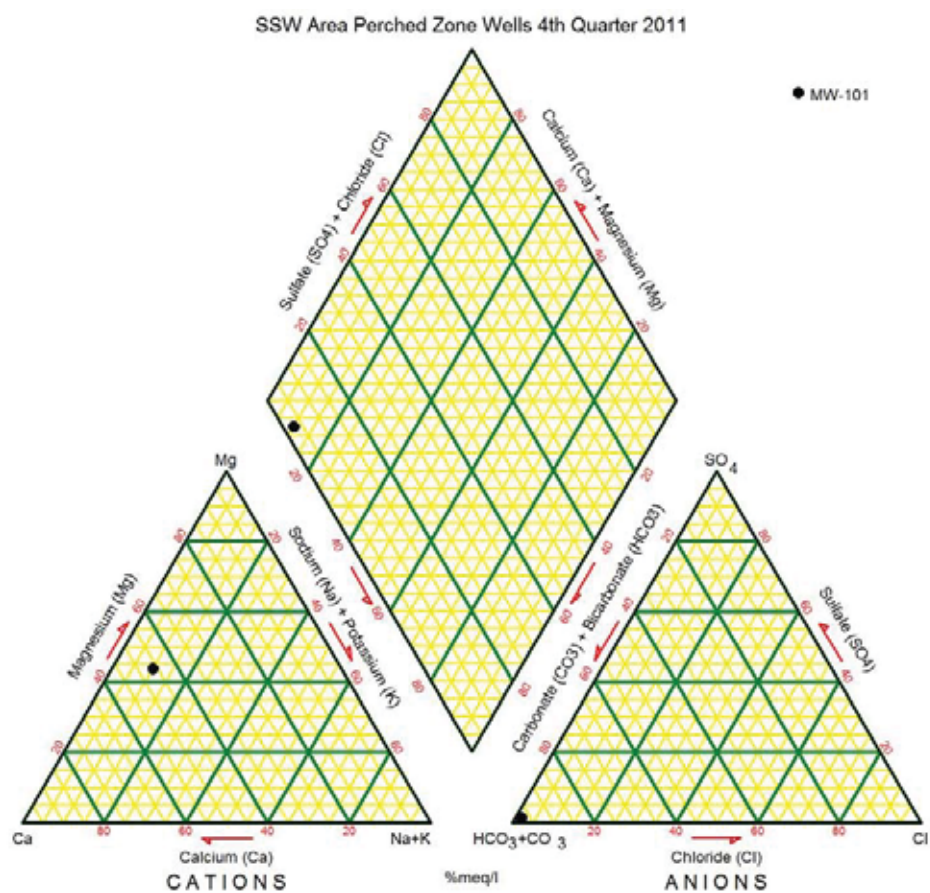
Figure 3c. SSWA Perched Zone Wells



Trilinear Diagrams Perched Zone Wells 4th Quarter 2011



Trilinear Diagrams Perched Zone Wells 4th Quarter 2011



Ion Balance Calculations Cedar Hills Landfill Perched Zones GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

North and West Perched Wells												
Site ID	MW-27A			MW-28			MW-29			MW-55		
Date	1/4/11	1/7/11	1/7/11	1/7/11	1/10/11							
Cations	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)
Calcium	40.1	1.11776	54.3	10.2	0.50898	48.8	7.35	0.36677	47.5	12	0.5988	43.0
Magnesium	24.3	0.51265	24.9	2.71	0.223	21.4	1.93	0.15882	20.6	6.28	0.51677	37.1
Potassium	39.1	0.09975	4.8	1.12	0.02865	2.7	0.613	0.01568	2.0	1.72	0.04399	3.2
Sodium	23.0	0.31492	15.3	6.48	0.28186	27.0	5.3	0.23054	29.8	4.97	0.21618	15.5
Iron	55.8	0.00018	0.0	0.0	0.00018	0.0	0.0	0.00018	0.0	0.229	0.0082	0.6
Manganese	54.9	0.00205	0.1	0.00197	7.2E-05	0.0	0.0	1.8E-05	0.0	0.14	0.0051	0.4
Ammonia-N	14.0	0.155	0.5	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0571	0.00408	0.3
Total Cations (meq/L)	2.1			1.0				0.8			1.4	
Anions												
Alkalinity, Total	82.2			28			26.1			62.8		
Carbonate	60.0	0.4571	0.01524	0.7	0.00099	3.3E-05	0.00036	0.00012	0.0	0.2479	0.00826	0.5
Bicarbonate	61.0	1.9935	1.62852	75.1	34.16	0.55988	53.3	31.83	0.5218	67.2	76.11	1.24755
Chloride	35.5	1.799	0.22537	10.4	4.19	0.11818	11.3	3.8	0.10718	13.8	1.94	0.05472
Nitrate-N	14.0	0.0905	0.00646	0.3	0.511	0.03648	3.5	1.54	0.10995	14.2	0.0	0.00036
Sulfate	96.1	2.141	0.29357	13.5	16.1	0.33522	31.9	1.79	0.03727	4.8	12.1	0.25193
Total Anions (meq/L)	2.2			1.0				0.8			1.6	
Total Ions (meq/L)	4.2			2.1				1.5			3.0	
Cation/Anion Ratio	0.95			0.99				0.99			0.89	
Percent Difference	-2.6			-0.3				-0.3			-5.7	
TRILINEAR DIAGRAM DATA												
sum (Ca, Mg, Na+K)	2.05			1.04				0.77			1.38	
Calcium	54.7			48.8				47.5			43.5	
Magnesium	25.1			21.4				20.6			37.6	
Sodium + Potassium	20.3			29.8				31.9			18.9	
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.16			1.01				0.67			1.56	
Sulfate	13.6			33.1				5.6			16.1	
Chloride	10.4			11.7				16.1			3.5	
Bicarbonate + Carbonate	76.0			55.3				78.3			80.4	

Ion Balance Calculations **Cedar Hills Landfill Perched Zones GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	Date	East Perched Zone				SSWA	
		MW-30A	MW-47	MW-EB6	MW-101		
Cations		1/10/11	1/7/11	1/10/11	1/24/11		
Calcium	MW n	mg/L	mg/L	mg/L	mg/L		
	2	30.2	117.0	12.4	77.3	3.85729	46.4
		1.50699	5.83832	0.61876	28.4		
Magnesium	2	17	56.7	6.54	43.4	3.57128	43.0
		1.39889	4.66571	0.53816	24.7		
Potassium	1	1.93	0.13709	0.04911	2.3	0.09003	1.1
		0.04936	0.79601	0.54807	25.2	0.71771	8.6
Sodium	1	15.9	18.3	12.6	16.5	0.00895	0.1
		0.69161	0.01404	0.30369	14.0	0.06189	0.7
Iron	2	0.0	0.392	0.4	1.7	0.00107	0.0
		0.00018	0.05133	0.02588	1.2		
Manganese	2	0.0	0.059	1.29	0.0		
		1.8E-05	0.00421	0.0921	4.2		
Ammonia-N	1	0.0					
		0.00036					
Total Cations (meq/L)		3.6	11.5	2.2	8.3		
Anions							
Alkalinity, Total		178	607	94.5	437		
Carbonate	2	0.03016	0.01011	0.0051	0.00606	0.1	
		0.00101	0.1	0.01529	0.1817		
Bicarbonate	1	217.10	12.1281	1.88921	8.73263	97.0	
		3.55846	96.9	115.26	98.7		
Chloride	1	3.09	0.23129	0.02321	1.2	0.1526	1.7
		0.08716	1.8	0.823	5.41		
Nitrate-N	1	0.55	0.00036	0.00036	0.0	0.00036	0.0
		0.03927	0.0	0.00036	0.0		
Sulfate	2	9.99	5.672	0.13992	5.24	0.1091	1.2
		0.208	1.1	0.00104	0.1		
Total Anions (meq/L)		3.9	12.5	1.9	9.0		
Total Ions (meq/L)		7.5	24.0	4.1	17.3		
Cation/Anion Ratio		0.94	0.92	1.14	0.92		
Percent Difference		-3.3	-4.2	6.4	-4		
TRILINEAR DIAGRAM DATA							
sum (Ca, Mg, Na+K)		3.65	11.44	1.75	8.24	46.83	
Calcium		41.3	51.0	35.28	43.36	43.36	
Magnesium		38.4	40.8	30.68	9.81	9.81	
Sodium + Potassium		20.3	8.2	34.04			
sum (SO ₄ , Cl, HCO ₃ +CO ₃)		3.85	12.51	1.91	9.00	1.2	
Sulfate		5.4	1.1	0.1	1.7	1.7	
Chloride		2.3	1.8	1.2	97.1	97.1	
Bicarbonate + Carbonate		92.3	97.0	98.7			

Ion Balance Calculations **Cedar Hills Landfill Perched Zones GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

North and West Perched Wells															
Site ID	MW-27A						MW-28			MW-29			MW-55		
Date	MW	n	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	
Cations	40.1	2	20.8	1.03792	52.9	10.5	0.52395	50.1	6.2	0.30988	48.4	11.7	0.58383	41.6	
Calcium	24.3	2	6.2	0.51101	26.0	2.6	0.21395	20.4	1.5	0.1259	19.7	6.4	0.52417	37.3	
Magnesium	39.1	1	3.8	0.09617	4.9	1.0	0.02634	2.5	0.5	0.01281	2.0	1.8	0.04655	3.3	
Potassium	23.0	1	7.0	0.30492	15.5	6.5	0.28099	26.9	4.4	0.19008	29.7	5.4	0.23445	16.7	
Sodium	55.8	2	0.0	0.00036	0.0	0.0	0.00036	0.0	0.0	0.00036	0.1	0.2	0.0063	0.4	
Iron	54.9	2	0.0	0.00133	0.1	0.0	5.1E-05	0.0	0.0	3.6E-05	0.0	0.1	0.00528	0.4	
Manganese	14.0	1	0.2	0.01121	0.6	0.0	0.00071	0.1	0.0	0.00071	0.1	0.1	0.00386	0.3	
Ammonia-N															
Total Cations (meq/L)	2.0						1.0			0.6			1.4		
Anions															
Alkalinity, Total	73							28.1				22	58.6		
Carbonate	60.0	2	0.33053	0.01102	0.6	0.00064	2.1E-05	0.0	0.00241	8E-05	0.0	0.20164	0.00672	0.4	
Bicarbonate	61.0	1	88.39	1.44876	74.0	34.28	0.56189	55.8	26.84	0.43985	67.2	71.08	1.1651	74.0	
Chloride	35.5	1	7.4	0.20788	10.6	3.5	0.09759	9.7	3.3	0.09167	14.0	3.7	0.10408	6.6	
Nitrate-N	14.0	1	0.1	0.00522	0.3	0.2	0.01642	1.6	1.2	0.08496	13.0	0.0	0.00071	0.0	
Sulfate	96.1	2	13.7	0.28525	14.6	15.9	0.33105	32.9	1.8	0.0381	5.8	14.3	0.29774	18.9	
Total Anions (meq/L)	2.0						1.0			0.7			1.6		
Total Ions (meq/L)	3.9						2.1			1.3			3.0		
Cation/Anion Ratio	1.00						1.04			0.98			0.89		
Percent Difference	0.1						1.9			-1.1			-5.7		
TRILINEAR DIAGRAM DATA															
sum (Ca, Mg, Na+K)	1.95						1.05			0.64			1.39		
Calcium	53.2						50.1			48.5			42.0		
Magnesium	26.2						20.5			19.7			37.7		
Sodium + Potassium	20.6						29.4			31.8			20.2		
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	1.95						0.99			0.57			1.57		
Sulfate	14.6						33.4			6.7			18.9		
Chloride	10.6						9.9			16.1			6.6		
Bicarbonate + Carbonate	74.7						56.7			77.2			74.5		

Ion Balance Calculations **Cedar Hills Landfill Perched Zones GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	East Perched Zone						SSWA					
	Date	MW-30A			MW-47			MW-101				
Cations	MW	n	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)	mg/L	meq/L	%(meq)	
Calcium	40.1	2	29.2	1.45709	41.0	128.0	6.38723	52.2	72.9	3.63772	44.6	
Magnesium	24.3	2	16.9	1.39066	39.1	59.6	4.90434	40.1	43.9	3.61243	44.3	
Potassium	39.1	1	1.9	0.04885	1.4	4.6	0.11637	1.0	3.5	0.08952	1.1	
Sodium	23.0	1	15.1	0.65681	18.5	17.0	0.73946	6.0	17.0	0.73946	9.1	
Iron	55.8	2	0.0	0.00039	0.0	0.4	0.01518	0.1	0.4	0.01314	0.2	
Manganese	54.9	2	0.0	3.6E-05	0.0	1.6	0.0597	0.5	1.5	0.05606	0.7	
Ammonia-N	14.0	1	0.0	0.00071	0.0	0.0	0.00316	0.0	0.0	0.00114	0.0	
Total Cations (meq/L)			3.6			12.2			8.1			
Anions												
Alkalinity, Total	175			597			434					
Carbonate	60.0	2	0.01959	0.00065	0.0	0.26597	0.00887	0.1	0.30631	0.01021	0.1	
Bicarbonate	61.0	1	213.46	3.49882	91.7	727.80	11.9293	97.0	528.86	8.66848	97.1	
Chloride	35.5	1	2.5	0.06995	1.8	7.8	0.2186	1.8	4.8	0.13426	1.5	
Nitrate-N	14.0	1	0.7	0.04998	1.3	0.0	0.00071	0.0	0.0	0.00071	0.0	
Sulfate	96.1	2	9.5	0.1978	5.2	6.9	0.14325	1.2	5.6	0.11556	1.3	
Total Anions (meq/L)			3.8			12.3			8.9			
Total Ions (meq/L)			7.4			24.5			17.1			
Cation/Anion Ratio			0.93			0.99			0.91			
Percent Difference			-3.6			-0.3			-5			
TRILINEAR DIAGRAM DATA												
sum (Ca, Mg, Na+K)			3.55			12.15			8.08			
Calcium			41.0			52.6			45.03			
Magnesium			39.1			40.4			44.71			
Sodium + Potassium			19.9			7.0			10.26			
sum (SO ₄ , Cl, HCO ₃ +CO ₃)			3.77			12.30			8.93			
Sulfate			5.3			1.2			1.3			
Chloride			1.9			1.8			1.5			
Bicarbonate + Carbonate			92.9			97.1			97.2			

Ion Balance Calculations **Cedar Hills Landfill Perched Zones GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

North and West Perched Wells															
Site ID	MW-27A						MW-28			MW-29			MW-55		
Date	MW	n	mg/L	meq/L	%(meq)		7/7/11	meq/L	%(meq)	mg/L	meq/L	%(meq)	7/5/11	meq/L	%(meq)
Calcium	40.1	2	20.5	1.02295	55.5	8.5	0.42615	48.2	6.5	0.32585	48.6	12.2	0.60878	41.9	
Magnesium	24.3	2	5.5	0.44847	24.3	2.2	0.18186	20.6	1.8	0.14483	21.6	6.3	0.51759	35.6	
Potassium	39.1	1	3.7	0.09514	5.2	0.9	0.02284	2.6	0.5	0.01228	1.8	1.7	0.04246	2.9	
Sodium	23.0	1	6.0	0.25925	14.1	5.8	0.25185	28.5	4.3	0.18704	27.9	6.1	0.26664	18.4	
Iron	55.8	2	0.0	0.00036	0.0	0.0	0.00086	0.1	0.0	0.00036	0.1	0.2	0.00831	0.6	
Manganese	54.9	2	0.1	0.00272	0.1	0.0	0.00018	0.0	0.0	3.6E-05	0.0	0.2	0.0059	0.4	
Ammonia-N	14.0	1	0.2	0.01356	0.7	0.0	0.00071	0.1	0.0	0.00071	0.1	0.0	0.00329	0.2	
Total Cations (meq/L)	1.8						0.9			0.7			1.5		
Anions															
Alkalinity, Total	82						28.6			25.6			63.6		
Carbonate	60.0	2	0.2894	0.00965	0.5	0.00057	1.9E-05	0.0	0.0015	5E-05	0.0	0.22391	0.00746	0.5	
Bicarbonate	61.0	1	99.70	1.63411	77.0	34.89	0.57189	57.7	31.23	0.51187	66.2	77.14	1.26435	80.8	
Chloride	35.5	1	7.1	0.19885	9.4	4.3	0.12213	12.3	3.3	0.09195	11.9	1.9	0.05359	3.4	
Nitrate-N	14.0	1	0.0	0.00071	0.0	0.1	0.00978	1.0	1.8	0.12922	16.7	0.0	0.00071	0.0	
Sulfate	96.1	2	13.4	0.279	13.1	13.8	0.28733	29.0	1.9	0.03977	5.1	11.5	0.23944	15.3	
Total Anions (meq/L)	2.1						1.0			0.8			1.6		
Total Ions (meq/L)	4.0						1.9			1.4			3.0		
Cation/Anion Ratio	0.87						0.89			0.87			0.93		
Percent Difference	-7.1						-5.7			-7.0			-3.7		
TRILINEAR DIAGRAM DATA															
sum (Ca, Mg, Na+K)	1.83						0.88			0.67			1.44		
Calcium	56.0						48.3			48.6			42.4		
Magnesium	24.6						20.6			21.6			36.1		
Sodium + Potassium	19.4						31.1			29.7			21.5		
sum (SO ₄ , Cl, HCO ₃ +CO ₃)	2.12						0.98			0.64			1.56		
Sulfate	13.2						29.3			6.2			15.3		
Chloride	9.4						12.4			14.3			3.4		
Bicarbonate + Carbonate	77.5						58.3			79.5			81.3		

Ion Balance Calculations **Cedar Hills Landfill Perched Zones GW Monitoring Wells**

Data Collected from January 1, 2011 to December 31, 2011

Site ID	East Perched Zone						SSWA					
	Date	MW	n	7/11/11	7/5/11	7/21/11						
Cations				mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)
Calcium		40.1	2	32.6	1.62675	42.5	129.0	6.43713	51.6	72.2	3.60279	46.3
Magnesium		24.3	2	18.3	1.50586	39.4	61.0	5.01954	40.2	40.3	3.31619	42.7
Potassium		39.1	1	1.8	0.04706	1.2	5.2	0.13274	1.1	3.4	0.0867	1.1
Sodium		23.0	1	14.8	0.64376	16.8	18.3	0.79601	6.4	16.1	0.70031	9.0
Iron		55.8	2	0.0	0.00036	0.0	0.3	0.01092	0.1	0.4	0.01368	0.2
Manganese		54.9	2	0.0	3.6E-05	0.0	2.2	0.08082	0.6	1.5	0.05351	0.7
Ammonia-N		14.0	1	0.0	0.00071	0.0	0.1	0.00526	0.0	0.0	0.00129	0.0
Total Cations (meq/L)				3.8				12.5				7.8
Anions												
Alkalinity, Total				194			630				417	
Carbonate		60.0	2	0.02172	0.00072	0.0	0.29389	0.0098	0.1	0.32267	0.01076	0.1
Bicarbonate		61.0	1	236.64	3.87869	92.7	768.00	12.5883	97.2	508.08	8.32799	97.0
Chloride		35.5	1	2.4	0.06685	1.6	7.5	0.21268	1.6	4.7	0.1337	1.6
Nitrate-N		14.0	1	0.5	0.03477	0.8	0.0	0.00071	0.0	0.0	0.00071	0.0
Sulfate		96.1	2	9.8	0.203	4.9	6.7	0.13846	1.1	5.2	0.1091	1.3
Total Anions (meq/L)				4.2				12.9				8.6
Total Ions (meq/L)				8.0				25.4				16.4
Cation/Anion Ratio				0.91				0.96				0.91
Percent Difference				-4.5				-1.8				-5
TRILINEAR DIAGRAM DATA												
sum (Ca, Mg, Na+K)				3.82				12.39			7.71	
Calcium				42.5				52.0			46.75	
Magnesium				39.4				40.5			43.03	
Sodium + Potassium				18.1				7.5			10.21	
sum (SO ₄ , Cl, HCO ₃ +CO ₃)				4.15				12.95			8.58	
Sulfate				4.9				1.1			1.3	
Chloride				1.6				1.6			1.6	
Bicarbonate + Carbonate				93.5				97.3			97.2	

Ion Balance Calculations Cedar Hills Landfill Perched Zones GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

North and West Perched Wells														
Site ID														
Date	MW-27A 10/17/2011				MW-28 10/25/2011				MW-29 10/25/2011				MW-55 10/24/2011	
Cations	MW	n	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)
Calcium	40.1	2	22.9	1.14271	56.3	9.0	0.4511	49.6	7.4	0.37026	50.8	12.1	0.60379	42.9
Magnesium	24.3	2	5.8	0.47891	23.6	2.2	0.1835	20.2	1.9	0.15635	21.4	6.2	0.50689	36.0
Potassium	39.1	1	3.7	0.0954	4.7	0.9	0.0231	2.5	0.5	0.01279	1.8	1.6	0.04118	2.9
Sodium	23.0	1	6.8	0.29752	14.7	5.8	0.25142	27.6	4.4	0.18921	25.9	5.4	0.23445	16.7
Iron	55.8	2	0.0	0.00018	0.0	0.0	0.00018	0.0	0.0	0.00018	0.0	0.3	0.00992	0.7
Manganese	54.9	2	0.1	0.00243	0.1	0.0	1.8E-05	0.0	0.0	1.8E-05	0.0	0.1	0.00535	0.4
Ammonia-N	14.0	1	0.2	0.01371	0.7	0.0	0.00036	0.0	0.0	0.00036	0.0	0.1	0.0049	0.3
Total Cations (meq/L)				2.0			0.9			0.7			1.4	
Anions														
Alkalinity, Total			83			29.4			31.1			67.7		
Carbonate	60.0	2	0.41326	0.01378	0.7	0.00107	3.6E-05	0.0	0.00296	9.9E-05	0.0	0.16145	0.00538	0.3
Bicarbonate	61.0	1	100.79	1.65198	78.2	35.87	0.58788	57.4	37.94	0.62181	69.5	82.27	1.34841	82.2
Chloride	35.5	1	6.8	0.19067	9.0	3.7	0.10324	10.1	3.2	0.09026	10.1	1.9	0.05331	3.2
Nitrate-N	14.0	1	0.0	0.00304	0.1	0.1	0.00683	0.7	2.0	0.14279	16.0	0.0	0.00036	0.0
Sulfate	96.1	2	12.2	0.25401	12.0	15.7	0.32689	31.9	1.9	0.03956	4.4	11.2	0.23319	14.2
Total Anions (meq/L)				2.1			1.0			0.9			1.6	
Total Ions (meq/L)				4.1			1.9			1.6			3.0	
Cation/Anion Ratio				0.96			0.89			0.82			0.86	
Percent Difference				-2.0			-6.0			-10.2			-7.7	
TRILINEAR DIAGRAM DATA														
sum (Ca, Mg, Na+K)				2.01			0.91			0.73			1.39	
Calcium				56.7			49.6			50.8			43.6	
Magnesium				23.8			20.2			21.5			36.6	
Sodium + Potassium				19.5			30.2			27.7			19.9	
sum (SO ₄ , Cl, HCO ₃ +CO ₃)				2.11			1.02			0.75			1.64	
Sulfate				12.0			32.1			5.3			14.2	
Chloride				9.0			10.1			12.0			3.3	
Bicarbonate + Carbonate				78.9			57.7			82.7			82.5	

Ion Balance Calculations
Cedar Hills Landfill Perched Zones GW Monitoring Wells

Data Collected from January 1, 2011 to December 31, 2011

Site ID Date	East Perched Zone						SSWA					
	MW-30A 10/14/2011			MW-47 10/17/2011			MW-101 10/28/2011					
Cations	MW	n	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	mg/L	meq/L	% (meq)	
Calcium	40.1	2	31.9	1.59182	40.8	137.0	6.83633	53.2	65.3	3.25848	45.8	
Magnesium	24.3	2	18.8	1.54701	39.6	61.7	5.07714	39.5	37.4	3.07756	43.2	
Potassium	39.1	1	1.9	0.04783	1.2	5.1	0.13095	1.0	3.1	0.08031	1.1	
Sodium	23.0	1	16.5	0.71771	18.4	17.1	0.74381	5.8	14.7	0.63941	9.0	
Iron	55.8	2	0.0	0.00018	0.0	0.1	0.00217	0.0	0.3	0.01103	0.2	
Manganese	54.9	2	0.0	1.8E-05	0.0	1.7	0.06334	0.5	1.3	0.04878	0.7	
Ammonia-N	14.0	1	0.0	0.00036	0.0	0.1	0.00487	0.0	0.0	0.00121	0.0	
Total Cations (meq/L)				3.9			12.9			7.1		
Anions												
Alkalinity, Total			188			660			418			
Carbonate	60.0	2	0.02973	0.00099	0.0	0.52258	0.01742	0.1	0.29502	0.00983	0.1	
Bicarbonate	61.0	1	229.30	3.75844	91.9	804.14	13.1806	97.1	509.36	8.34891	97.1	
Chloride	35.5	1	2.9	0.08039	2.0	7.9	0.22227	1.6	4.6	0.12834	1.5	
Nitrate-N	14.0	1	0.3	0.02349	0.6	0.0	0.00036	0.0	0.0	0.00036	0.0	
Sulfate	96.1	2	10.8	0.22487	5.5	7.2	0.14887	1.1	5.3	0.11056	1.3	
Total Anions (meq/L)				4.1			13.6			8.6		
Total Ions (meq/L)				8.0			26.4			15.7		
Cation/Anion Ratio				0.96			0.95			0.83		
Percent Difference				-2.3			-2.7			-9		
TRILINEAR DIAGRAM DATA												
sum (Ca, Mg, Na+K)				3.90			12.79			7.06		
Calcium				40.8			53.5			46.18		
Magnesium				39.6			39.7			43.62		
Sodium + Potassium				19.6			6.8			10.20		
sum (SO ₄ , Cl, HCO ₃ +CO ₃)				4.06			13.57			8.60		
Sulfate				5.5			1.1			1.3		
Chloride				2.0			1.6			1.5		
Bicarbonate + Carbonate				92.5			97.3			97.2		