MIDLOTHIAN, TEXAS AMBIENT AIR COLLECTION AND CHEMICAL ANALYSIS

THIRD QUARTERLY REPORT: FOR SAMPLES COLLECTED MAY 5 – 9, 2009

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1.0 Introduction

This report presents the analytical results for 35 chemicals measured in ambient air samples collected in Midlothian, TX, during May 5 – 9, 2009. The sampling and chemical analyses were conducted as part of a special study funded by the Texas Commission on Environmental Quality (TCEQ) to investigate citizen's concerns about air quality in Midlothian. This was the third of four 5-day sampling rounds planned for this study. The results from the first two rounds are reported online at http://www.tceq.state.tx.us/implementation/tox/research/midlothian.html#sampling. The fourth and final sampling round is scheduled for July 2009.

One hundred percent of the ambient air samples planned for this sampling round were collected and analyzed; however, a procedural mistake in sample documentation prevented the laboratory from positively matching the hexavalent chromium (Cr^{6+}) measurement results with the specific dates on which the samples were collected. The mistake occurred when the Chain-of-Custody Form (COC) that documents the sampling date and site was removed from each solitary sample container by laboratory receiving personnel without any of the sampling dates ever being copied from the COCs. Since the sample containers were all labeled with site identification codes, the location at which each sample was collected is known and five valid daily Cr^{6+} measurement results were obtained for each site despite the error (though the order in which the samples were collected at each site is indeterminate). A letter from the laboratory provided in Appendix A explains how the error occurred and the planned corrective action.

Tables 1-1 and 1-2 give the average VOC and metal concentrations, respectively, at each site over the five days. Benzene levels averaged about 0.1 ppb-v – 0.15 ppb-v higher at CAMS 52, Jaycee Park, and the Water treatment Pant this quarter compared with the first and second quarters. Approximately 0.16 ppb-v benzene was detected in the VOC field blank this quarter, raising the suspicion that the slight increase in the average concentrations reported for the ambient air samples may be artificial. The first and second quarter field blanks had 0.027 ppb-v and 0.022 ppb-v benzene, respectively.

Individual measurement results and an overview of the weather conditions during the period are given in Sections 3.0 and 4.0, respectively. Data quality and completeness is addressed in Section 5.0.

Table 1-1. Mean VOC Concentrations

VOC	Mean Concentration over 5 Sampling Days (ppb-v) [a]				
	CAMS 52	Wyatt Road [b]	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
Benzene	0.287	--	0.227	0.302	0.259
1,3-Butadiene	0.010	--	0.011	0.014	0.012
Carbon Tetrachloride	0.107	--	0.106	0.112	0.113
Chloroform	0.016	--	0.019	0.027	0.050
1,2-Dibromoethane	0.001	--	0.001	0.001	0.001
1,2-Dichloroethane	0.001	--	0.001	0.001	0.001
Dichloromethane	0.171	--	0.123	0.158	0.103
1,1,2,2-Tetrachloroethane	0.002	--	0.002	0.002	0.002
1,1,2-Trichloroethane	0.002	--	0.002	0.002	0.002
1,2,4-Trimethylbenzene	0.026	--	0.024	0.032	0.022
1,3,5-Trimethylbenzene	0.011	--	0.009	0.013	0.010
Vinyl Chloride	0.005	--	0.006	0.008	0.008
m/p-Xylene	0.084	--	0.057	0.081	0.052

[a] Mean concentrations were estimated using one-half the method detection limit as a proxy for non-detects.

[b] VOC samples are not collected at the Wyatt Road site.

Table 1-2. Mean Metals Concentrations

Metal	Mean Concentration over 5 Sampling Days (ng/m^3) [a]				
	CAMS 52	Wyatt Road	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
Aluminum	135	259	92.5	112	102
Antimony	0.332	0.422	0.365	0.431	0.567
Arsenic	0.667	1.029	0.625	0.811	0.572
Barium	5.78	7.41	5.35	5.83	4.78
Beryllium	0.007	0.011	0.004	0.005	0.004
Cadmium	0.165	0.498	0.138	0.177	0.190
Chromium (total)	3.03	5.04	2.64	2.25	2.28
Chromium (hexavalent)	0.038	0.035	0.008	0.012	0.009
Cobalt	0.092	0.162	0.076	0.080	0.079
Copper	5.89	19.3	5.46	7.16	24.4
Lead	2.60	13.8	1.81	1.68	5.12
Manganese	14.3	56.9	9.00	5.91	5.33
Mercury	0.020	0.071	0.011	0.014	0.015
Molybdenum	0.345	0.905	0.279	0.263	0.246
Nickel	1.08	1.76	1.15	1.06	3.15
Selenium	1.11	0.967	1.09	1.16	1.10
Silver	0.004	0.004	0.004	0.004	0.004
Thallium	0.017	0.017	0.016	0.019	0.016
Thorium	0.019	0.032	0.014	0.014	0.014
Uranium	0.015	0.027	0.010	0.012	0.013
Vanadium	1.99	2.44	1.79	1.79	1.72
Zinc	28.3	198	18.4	16.2	16.9

[a] Mean concentrations were estimated using one-half the method detection limit as a proxy for non-detects.

2.0 Project Description and Schedule

The levels of 60 volatile organic compounds (VOCs) and 22 metals in the PM_{10} size fraction, including both total chromium and hexavalent chromium ($Cr6^{+}$), are measured in air samples collected periodically at multiple sites. The samples are analyzed offsite by a NELAC accredited laboratory under the Texas laboratory accreditation program using methods approved by the U.S. Environmental Protection Agency (EPA) and TCEQ. The 60 VOCs that are measured include a core group of thirteen chemicals that were discussed at length in the December 2007 Draft Health Consultation Report conducted by the U.S. Department of Health and Human Services and the Texas Department of State Health Services. The other 47 VOCs are common constituents of ambient air that are measured by the laboratory as part of its routine VOC analysis and are being provided in a spreadsheet file supplementary to this report. Table 2-1 lists the core set of chemicals of interest. Wind speed, wind direction, outdoor temperature, atmospheric pressure, and rainfall are monitored continuously at each site during each sampling episode to aid in the data interpretation.

Once each calendar quarter, air samples are collected at five sampling stations during five consecutive 24-hour periods (except during extended periods of rainfall or wind stagnation). Four fixed sampling stations will remain in place long enough to sample during four consecutive quarters. The fixed sampling sites are roughly oriented in the predominantly downwind direction from local stationary emissions sources (Figure 2-1). Another sampling station is moved at the end of each quarter so that it eventually samples for one 5-day sequence at each of four centrally located city parks and schools. During the third sampling round, the fifth site was operated at Vitovsky Elementary School (Figure 2-2). Street addresses and coordinates of the sampling sites are given in Table 2-2.

Table 2-1. List of Target Compounds, Analytical Methods and Reporting Units

Target Compounds	Sampling/Analysis Methods	Reporting Units
Benzene 1,3-Butadiene Carbon Tetrachloride Chloroform 1,2-Dibromoethane 1,2-Dichloroethane Methylene Chloride 1,1,2,2-Tetrachloroethane 1,1,2-Trichloroethane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl Chloride M&p-Xylene	EPA Compendium Method TO-15: whole air sampling in passivated stainless steel canister with analysis using gas chromatography with mass spectrometry detection (GC/MS)	Parts per billion by volume (ppb-v)
Hexavalent Chromium	Modified CARB Method 039: particle collection on $NaHCO_3$-impregnated cellulose filters using a low volume sampler equipped with a Teflon® coated PM_{10} cyclone inlet; analysis is by ion chromatography (IC)	nanograms per cubic meter (ng/m^3)
Antimony Arsenic Beryllium Cadmium Chromium Cobalt Lead Manganese Mercury Nickel Selenium Aluminum Barium Copper Molybdenum Silver Thallium Thorium Uranium Vanadium Zinc	EPA Compendium Method IO-3.5: Particle collection on quartz fiber filters using high volume samplers equipped with PM_{10} inlets; analysis is by inductively coupled plasma/mass spectrometry (ICP/MS)	ng/m^3

Table 2-2. Sampling Sites

Site No.	Site Name	Street Address	Latitude	Longitude
Fixed Sites				
1	CAMS 52 Collocated	2725 Old Fort Worth Rd.	32.4822	-97.0269
2	Wyatt Rd.(N. of Gerdau Ameristeel)	1291 E. Wyatt Rd.	32.4696	97.0372
4	Jaycee Park	1711 Meadow Ln.	32.5030	-96.9976
5	Water Treatment Plant (N. of Ash Grove)	440 Tayman Dr.	32.5301	-96.9918
Temporary Sites				
3b	Vitovsky Elementary School	333 Church Street	32.5007	-96.9922

Figure 2-1. Fixed Sampling Sites (Squares) and Stationary Emissions Sources (Circles)

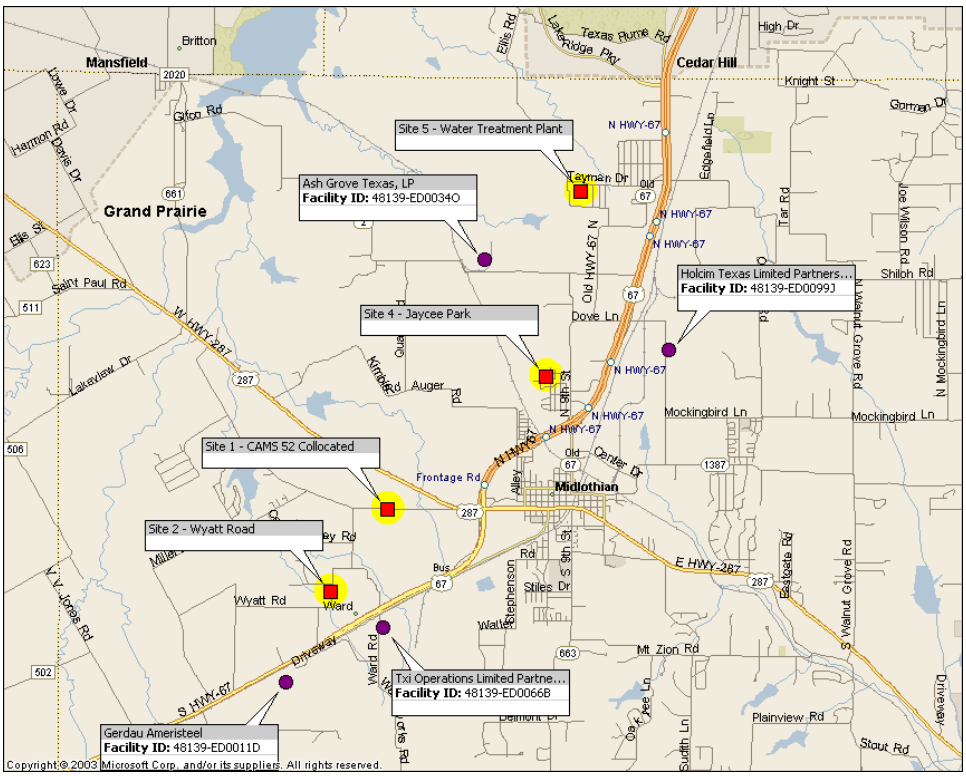
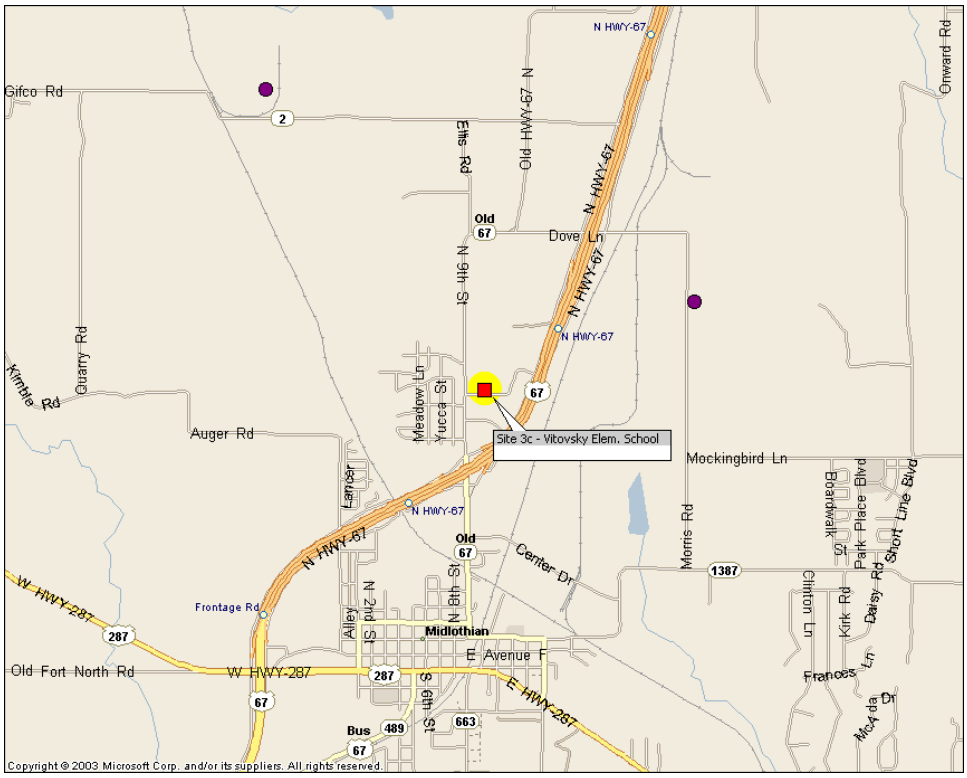


Figure 2-2. Vitovsky Elementary School Sampling Site



3.0 Third Round Results

The sampling results for each 24-hour period are given in a series of ten (10) tables that follow. The first five of the series (Tables 3-1 through 3-5) give the measurement results for one sampling site for all five days. The next five tables (Tables 3-6 through 3-10) give the sampling results for one day for all five sites. The hexavalent chromium results are presented separately in Table 3-11.

Table 3-1. Wyatt Road Daily Sampling Results [a]

	5/05/09	5/06/09	5/07/09	5/08/09	5/09/09	Mean [b]	Max	MDL
Metals (ng/m^3)								
Aluminum	187	173	276	704	212	258.667	704	3.900
Antimony	0.429	0.411	0.699	0.564	0.427	0.422	0.564	0.007
Arsenic	0.929	1.1	2.06	1.49	0.597	1.029	1.49	0.009
Barium	7.64	5.99	8.39	14.7	7.75	7.412	14.7	0.148
Beryllium	0.009	0.008	0.014	0.025	0.012	0.011	0.025	0.002
Cadmium	0.618	0.539	0.713	1.03	0.085	0.498	1.03	0.029
Chromium (total)	4.74	3.91	7.04	11.9	2.64	5.038	11.9	0.343
Cobalt	0.125	0.143	0.219	0.363	0.122	0.162	0.363	0.006
Copper	15.8	15.4	41.9	35.2	7.49	19.298	35.2	0.124
Lead	6.74	15.1	26	32.8	2.23	13.812	32.8	0.006
Manganese	36.9	37.2	88.2	162	17.2	56.917	162	0.057
Mercury	0.068	0.039	0.17	0.124	0.025	0.071	0.124	0.017
Molybdenum	0.562	1.19	1.83	1.53	0.317	0.905	1.53	0.012
Nickel	1.36	1.53	2.58	4.22	0.891	1.764	4.22	0.132
Selenium	0.965	1.21	1.51	1.37	0.745	0.967	1.37	0.013
Silver	ND	ND	0.004	ND	ND	0.004	0.004	0.008
Thallium	0.015	0.014	0.026	0.037	0.009	0.017	0.037	0.001
Thorium	0.026	0.025	0.039	0.073	0.028	0.032	0.073	0.001
Uranium	0.022	0.021	0.029	0.061	0.028	0.027	0.061	0.001
Vanadium	2.21	2.03	3.5	5.43	1.48	2.442	5.43	0.006
Zinc	89.4	179	417	488	15.5	198.150	488	3.010

[a] VOC samples are not collected at the Wyatt Road Site.

[b] Mean concentrations were estimated using one-half the method detection limit as a proxy for non-detects.

Table 3-2. CAMS 52 Daily Sampling Results

	5/5/09	5/6/09	5/7/09	5/8/09	5/9/09	Mean [a]	Max	MDL
VOCs (ppb-v)								
Benzene	0.232	0.283	0.246	0.399	0.275	0.287	0.399	0.006
1,3-Butadiene	0.013	0.008	0.009	ND	0.018	0.010	0.018	0.003
Carbon Tetrachloride	0.107	0.104	0.106	0.105	0.114	0.107	0.114	0.002
Chloroform	ND	0.023	0.026	ND	0.029	0.016	0.029	0.002
1,2-Dibromoethane	ND	ND	ND	ND	ND	0.001	ND	0.001
1,2-Dichloroethane	ND	ND	ND	ND	ND	0.001	ND	0.002
Dichloromethane	0.156	0.300	0.123	0.143	0.134	0.171	0.300	0.008
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	0.002	ND	0.003
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	0.002	ND	0.003
1,2,4-Trimethylbenzene	0.025	0.031	0.032	0.014	0.027	0.026	0.032	0.005
1,3,5-Trimethylbenzene	0.012	0.011	0.013	0.006	0.012	0.011	0.013	0.004
Vinyl chloride	0.006	0.005	0.007	ND	0.005	0.005	0.007	0.002
m/p-Xylene	0.104	0.170	0.056	0.025	0.065	0.084	0.170	0.007
Metals (ng/m^3)								
Aluminum	82.7	101	136	238	118	135.14	238	3.9
Antimony	0.358	0.382	0.291	0.204	0.426	0.3322	0.426	0.007
Arsenic	0.784	0.785	0.793	0.402	0.572	0.6672	0.793	0.009
Barium	4.84	5.51	4.79	6.36	7.42	5.784	7.42	0.148
Beryllium	0.004	0.005	0.007	0.01	0.007	0.0066	0.01	0.002
Cadmium	0.127	0.178	0.169	0.269	0.08	0.1646	0.269	0.029
Chromium (total)	2.16	2.59	3.22	4.89	2.31	3.034	4.89	0.343
Cobalt	0.048	0.09	0.102	0.149	0.072	0.0922	0.149	0.006
Copper	6.77	6.02	6.44	3.22	7	5.89	7	0.124
Lead	1.45	3.75	2.14	3.97	1.69	2.6	3.97	0.006
Manganese	4	8.66	14.9	38.3	5.82	14.336	38.3	0.057
Mercury	0.006	0.016	0.028	0.028	0.023	0.0202	0.028	0.017
Molybdenum	0.332	0.312	0.327	0.434	0.322	0.3454	0.434	0.012
Nickel	0.785	1.09	1.2	1.59	0.738	1.0806	1.59	0.132
Selenium	0.95	1.08	1.47	1.31	0.745	1.111	1.47	0.013
Silver	ND	ND	ND	ND	ND	0.004	ND	0.008
Thallium	0.012	0.011	0.023	0.03	0.008	0.0168	0.03	0.0009
Thorium	0.011	0.015	0.021	0.031	0.018	0.0192	0.031	0.0008
Uranium	0.01	0.012	0.014	0.026	0.015	0.0154	0.026	0.001
Vanadium	1.52	1.66	2.48	3.17	1.14	1.994	3.17	0.006
Zinc	14.3	35.3	28	51.5	12.3	28.28	51.5	3.01

[a] Mean concentrations were estimated using one-half the method detection limit as a proxy for non-detects.

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Table 3-3. Vitovsky Elementary School Daily Sampling Results

	5/5/09	5/6/09	5/7/09	5/8/09	5/9/09	Mean [a]	Max	MDL
VOCs (ppb-v)								
Benzene	0.248	0.169	0.273	0.282	0.165	0.227	0.282	0.006
1,3-Butadiene	0.012	0.012	0.011	0.010	0.010	0.011	0.012	0.003
Carbon Tetrachloride	0.105	0.117	0.102	0.105	0.101	0.106	0.117	0.002
Chloroform	0.024	0.020	0.002	0.025	0.023	0.019	0.025	0.002
1,2-Dibromoethane	ND	ND	ND	ND	ND	0.001	ND	0.001
1,2-Dichloroethane	ND	ND	ND	ND	ND	0.001	ND	0.002
Dichloromethane	0.194	0.146	0.070	0.109	0.098	0.123	0.194	0.008
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	0.002	ND	0.003
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	0.002	ND	0.003
1,2,4-Trimethylbenzene	0.027	0.029	0.022	0.026	0.017	0.024	0.029	0.005
1,3,5-Trimethylbenzene	0.010	0.010	0.008	0.011	0.008	0.009	0.011	0.004
Vinyl chloride	0.006	0.004	0.007	0.008	0.006	0.006	0.008	0.002
m/p-Xylene	0.051	0.093	0.043	0.058	0.042	0.057	0.093	0.007
Metals (ng/m^3)								
Aluminum	73	62.9	106	87.8	133	92.54	133	3.9
Antimony	0.467	0.324	0.342	0.436	0.257	0.3652	0.467	0.007
Arsenic	0.805	0.687	0.652	0.66	0.323	0.6254	0.805	0.009
Barium	5.39	4.29	5.61	6.41	5.04	5.348	6.41	0.148
Beryllium	0.003	0.004	0.005	0.005	0.005	0.0044	0.005	0.002
Cadmium	0.139	0.13	0.148	0.092	0.183	0.1384	0.183	0.029
Chromium (total)	2.64	2.33	2.77	2.3	3.16	2.64	3.16	0.343
Cobalt	0.06	0.07	0.095	0.063	0.091	0.0758	0.095	0.006
Copper	5.01	4.75	8.84	5.43	3.25	5.456	8.84	0.124
Lead	1.71	2.31	2.03	1.67	1.34	1.812	2.31	0.006
Manganese	8.73	5.4	10.6	5.18	15.1	9.002	15.1	0.057
Mercury	0.01	0.008	0.007	0.015	0.015	0.011	0.015	0.017
Molybdenum	0.364	0.239	0.244	0.267	0.283	0.2794	0.364	0.012
Nickel	0.862	1.45	1.36	0.775	1.28	1.1454	1.45	0.132
Selenium	0.918	1.04	1.5	0.753	1.26	1.0942	1.5	0.013
Silver	ND	ND	ND	ND	ND	0.004	ND	0.008
Thallium	0.012	0.01	0.023	0.008	0.028	0.0162	0.028	0.0009
Thorium	0.012	0.01	0.016	0.015	0.017	0.014	0.017	0.0008
Uranium	0.009	0.009	0.01	0.011	0.012	0.0102	0.012	0.001
Vanadium	1.51	1.47	2.32	1.11	2.56	1.794	2.56	0.006
Zinc	18.3	15.4	25.7	11.5	21.3	18.44	25.7	3.01

[a] Mean concentrations were estimated using one-half the method detection limit as a proxy for non-detects.

Table 3-4. Jaycee Park Daily Sampling Results

	5/5/09	5/6/09	5/7/09	5/8/09	5/9/09	Mean [a]	Max	MDL
VOCs (ppb-v)								
Benzene	0.322	0.203	0.460	0.326	0.200	0.302	0.460	0.006
1,3-Butadiene	0.017	0.013	0.016	0.012	0.013	0.014	0.017	0.003
Carbon Tetrachloride	0.098	0.106	0.116	0.132	0.110	0.112	0.132	0.002
Chloroform	0.026	0.024	0.029	0.025	0.030	0.027	0.030	0.002
1,2-Dibromoethane	ND	ND	ND	ND	ND	0.001	ND	0.001
1,2-Dichloroethane	ND	ND	ND	ND	ND	0.001	ND	0.002
Dichloromethane	0.189	0.238	0.175	0.094	0.095	0.158	0.238	0.008
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	0.002	ND	0.003
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	0.002	ND	0.003
1,2,4-Trimethylbenzene	0.044	0.028	0.032	0.030	0.024	0.032	0.044	0.005
1,3,5-Trimethylbenzene	0.019	0.012	0.013	0.012	0.011	0.013	0.019	0.004
Vinyl chloride	0.006	0.007	0.008	0.011	0.006	0.008	0.011	0.002
m/p-Xylene	0.088	0.046	0.065	0.151	0.055	0.081	0.151	0.007
Metals (ng/m^3)								
Aluminum	70.6	51.5	93.8	116	227	111.78	227	3.9
Antimony	0.434	0.299	0.293	0.413	0.714	0.4306	0.714	0.007
Arsenic	0.81	0.87	0.69	0.655	1.03	0.811	1.03	0.009
Barium	4.7	3.56	4.43	6.14	10.3	5.826	10.3	0.148
Beryllium	0.003	0.003	0.004	0.006	0.011	0.0054	0.011	0.002
Cadmium	0.138	0.097	0.25	0.181	0.219	0.177	0.25	0.029
Chromium (total)	2.14	2.14	2.14	2.26	2.59	2.254	2.59	0.343
Cobalt	0.049	0.047	0.076	0.072	0.155	0.0798	0.155	0.006
Copper	3.27	16.7	3.09	5.19	7.57	7.164	16.7	0.124
Lead	1.36	1.37	1.28	1.64	2.74	1.678	2.74	0.006
Manganese	3.32	2.91	3.6	5.81	13.9	5.908	13.9	0.057
Mercury	0.006	0.004	0.004	0.021	0.034	0.0138	0.034	0.017
Molybdenum	0.272	0.188	0.185	0.301	0.371	0.2634	0.371	0.012
Nickel	0.959	0.899	1.08	0.86	1.48	1.0556	1.48	0.132
Selenium	0.934	0.976	1.49	0.755	1.65	1.161	1.65	0.013
Silver	ND	ND	ND	ND	ND	0.004	ND	0.008
Thallium	0.011	0.01	0.022	0.011	0.04	0.0188	0.04	0.0009
Thorium	0.009	0.008	0.012	0.016	0.025	0.014	0.025	0.0008
Uranium	0.008	0.007	0.009	0.012	0.023	0.0118	0.023	0.001
Vanadium	1.44	1.35	2.21	1.13	2.8	1.786	2.8	0.006
Zinc	15.4	13.4	14.7	12.2	25.1	16.16	25.1	3.01

[a] Mean concentrations were estimated using one-half the method detection limit as a proxy for non-detects.

Table 3-5. Water Treatment Plant Daily Sampling Results

	5/5/09	5/6/09	5/7/09	5/8/09	5/9/09	Mean [a]	Max	MDL
VOCs (ppb-v)								
Benzene	0.206	0.188	0.360	0.270	0.271	0.259	0.360	0.006
1,3-Butadiene	0.017	0.011	0.012	0.010	0.012	0.012	0.017	0.003
Carbon Tetrachloride	0.104	0.120	0.110	0.124	0.105	0.113	0.124	0.002
Chloroform	0.066	0.056	0.040	0.031	0.058	0.050	0.066	0.002
1,2-Dibromoethane	ND	ND	ND	ND	ND	0.001	ND	0.001
1,2-Dichloroethane	ND	ND	ND	ND	ND	0.001	ND	0.002
Dichloromethane	0.154	0.142	0.074	0.063	0.082	0.103	0.154	0.008
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	0.002	ND	0.003
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	0.002	ND	0.003
1,2,4-Trimethylbenzene	0.029	0.024	0.019	0.019	0.020	0.022	0.029	0.005
1,3,5-Trimethylbenzene	0.012	0.012	0.008	0.010	0.010	0.010	0.012	0.004
Vinyl chloride	0.007	0.009	0.007	0.009	0.007	0.008	0.009	0.002
m/p-Xylene	0.094	0.049	0.037	0.033	0.046	0.052	0.094	0.007
Metals (ng/m^3)								
Aluminum	73.6	64.1	112	121	139	101.94	139	3.9
Antimony	0.672	0.232	1.2	0.517	0.216	0.5674	1.2	0.007
Arsenic	0.821	0.514	0.682	0.465	0.376	0.5716	0.821	0.009
Barium	4.63	2.9	6.24	6.53	3.62	4.784	6.53	0.148
Beryllium	0.003	0.002	0.005	0.005	0.006	0.0042	0.006	0.002
Cadmium	0.139	0.137	0.259	0.21	0.206	0.1902	0.259	0.029
Chromium (total)	2.04	2.16	2.54	2.43	2.22	2.278	2.54	0.343
Cobalt	0.05	0.068	0.111	0.068	0.098	0.079	0.111	0.006
Copper	12.7	4.66	50.3	33.6	20.5	24.352	50.3	0.124
Lead	6.68	2.23	13.8	1.76	1.14	5.122	13.8	0.006
Manganese	4.39	3.18	5.33	5.3	8.43	5.326	8.43	0.057
Mercury	0.017	0.012	0.009	0.024	0.012	0.0148	0.024	0.017
Molybdenum	0.3	0.221	0.194	0.265	0.252	0.2464	0.3	0.012
Nickel	0.97	1.2	9.16	0.962	3.48	3.1544	9.16	0.132
Selenium	0.961	1.04	1.46	0.79	1.26	1.1022	1.46	0.013
Silver	ND	ND	ND	ND	ND	0.004	ND	0.008
Thallium	0.011	0.011	0.022	0.008	0.028	0.016	0.028	0.0009
Thorium	0.012	0.009	0.015	0.015	0.018	0.0138	0.018	0.0008
Uranium	0.012	0.009	0.013	0.014	0.018	0.0132	0.018	0.001
Vanadium	1.37	1.45	2.26	1.08	2.44	1.72	2.44	0.006
Zinc	18.1	16.9	21.7	12	15.6	16.86	21.7	3.01

[a] Mean concentrations were estimated using one-half the method detection limit as a proxy for non-detects.

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Table 3-6. May 5, 2009 Sampling Results

	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
VOCs (ppb-v)					
Benzene	0.232	--	0.248	0.322	0.206
1,3-Butadiene	0.013	--	0.012	0.017	0.017
Carbon Tetrachloride	0.107	--	0.105	0.098	0.104
Chloroform	ND	--	0.024	0.026	0.066
1,2-Dibromoethane	ND	--	ND	ND	ND
1,2-Dichloroethane	ND	--	ND	ND	ND
Dichloromethane	0.156	--	0.194	0.189	0.154
1,1,2,2-Tetrachloroethane	ND	--	ND	ND	ND
1,1,2-Trichloroethane	ND	--	ND	ND	ND
1,2,4-Trimethylbenzene	0.025	--	0.027	0.044	0.029
1,3,5-Trimethylbenzene	0.012	--	0.010	0.019	0.012
Vinyl chloride	0.006	--	0.006	0.322	0.007
m/p-Xylene	0.104	--	0.051	0.017	0.094
Metals (ng/m^3)					
Aluminum	82.7	187	73	70.6	73.6
Antimony	0.358	0.429	0.467	0.434	0.672
Arsenic	0.784	0.929	0.805	0.81	0.821
Barium	4.84	7.64	5.39	4.7	4.63
Beryllium	0.004	0.009	0.003	0.003	0.003
Cadmium	0.127	0.618	0.139	0.138	0.139
Chromium (total)	2.16	4.74	2.64	2.14	2.04
Cobalt	0.048	0.125	0.06	0.049	0.05
Copper	6.77	15.8	5.01	3.27	12.7
Lead	1.45	6.74	1.71	1.36	6.68
Manganese	4	36.9	8.73	3.32	4.39
Mercury	0.006	0.068	0.01	0.006	0.017
Molybdenum	0.332	0.562	0.364	0.272	0.3
Nickel	0.785	1.36	0.862	0.959	0.97
Selenium	0.95	0.965	0.918	0.934	0.961
Silver	ND	ND	ND	ND	ND
Thallium	0.012	0.015	0.012	0.011	0.011
Thorium	0.011	0.026	0.012	0.009	0.012
Uranium	0.01	0.022	0.009	0.008	0.012
Vanadium	1.52	2.21	1.51	1.44	1.37
Zinc	14.3	89.4	18.3	15.4	18.1

Table 3-7. May 6, 2009 Sampling Results

	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
VOCs (ppb-v)					
Benzene	0.283	--	0.169	0.203	0.188
1,3-Butadiene	0.008	--	0.012	0.013	0.011
Carbon Tetrachloride	0.104	--	0.117	0.106	0.120
Chloroform	0.023	--	0.020	0.024	0.056
1,2-Dibromoethane	ND	--	ND	ND	ND
1,2-Dichloroethane	ND	--	ND	ND	ND
Dichloromethane	0.300	--	0.146	0.238	0.142
1,1,2,2-Tetrachloroethane	ND	--	ND	ND	ND
1,1,2-Trichloroethane	ND	--	ND	ND	ND
1,2,4-Trimethylbenzene	0.031	--	0.029	0.028	0.024
1,3,5-Trimethylbenzene	0.011	--	0.010	0.012	0.012
Vinyl chloride	0.005	--	0.004	0.007	0.009
m/p-Xylene	0.170	--	0.093	0.046	0.049
Metals (ng/m^3)					
Aluminum	101	173	62.9	51.5	64.1
Antimony	0.382	0.411	0.324	0.299	0.232
Arsenic	0.785	1.1	0.687	0.87	0.514
Barium	5.51	5.99	4.29	3.56	2.9
Beryllium	0.005	0.008	0.004	0.003	0.002
Cadmium	0.178	0.539	0.13	0.097	0.137
Chromium (total)	2.59	3.91	2.33	2.14	2.16
Cobalt	0.09	0.143	0.07	0.047	0.068
Copper	6.02	15.4	4.75	16.7	4.66
Lead	3.75	15.1	2.31	1.37	2.23
Manganese	8.66	37.2	5.4	2.91	3.18
Mercury	0.016	0.039	0.008	0.004	0.012
Molybdenum	0.312	1.19	0.239	0.188	0.221
Nickel	1.09	1.53	1.45	0.899	1.2
Selenium	1.08	1.21	1.04	0.976	1.04
Silver	ND	ND	ND	ND	ND
Thallium	0.011	0.014	0.01	0.01	0.011
Thorium	0.015	0.025	0.01	0.008	0.009
Uranium	0.012	0.021	0.009	0.007	0.009
Vanadium	1.66	2.03	1.47	1.35	1.45
Zinc	35.3	179	15.4	13.4	16.9

Table 3-8. May 7, 2009 Sampling Results

	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
VOCs (ppb-v)					
Benzene	0.246	--	0.273	0.460	0.360
1,3-Butadiene	0.009	--	0.011	0.016	0.012
Carbon Tetrachloride	0.106	--	0.102	0.116	0.110
Chloroform	0.026	--	0.002	0.029	0.040
1,2-Dibromoethane	ND	--	ND	ND	ND
1,2-Dichloroethane	ND	--	ND	ND	ND
Dichloromethane	0.123	--	0.070	0.175	0.074
1,1,2,2-Tetrachloroethane	ND	--	ND	ND	ND
1,1,2-Trichloroethane	ND	--	ND	ND	ND
1,2,4-Trimethylbenzene	0.032	--	0.022	0.032	0.019
1,3,5-Trimethylbenzene	0.013	--	0.008	0.013	0.008
Vinyl chloride	0.007	--	0.007	0.008	0.007
m/p-Xylene	0.056	--	0.043	0.065	0.037
Metals (ng/m^3)					
Aluminum	136	276	106	93.8	112
Antimony	0.291	0.699	0.342	0.293	1.2
Arsenic	0.793	2.06	0.652	0.69	0.682
Barium	4.79	8.39	5.61	4.43	6.24
Beryllium	0.007	0.014	0.005	0.004	0.005
Cadmium	0.169	0.713	0.148	0.25	0.259
Chromium (total)	3.22	7.04	2.77	2.14	2.54
Cobalt	0.102	0.219	0.095	0.076	0.111
Copper	6.44	41.9	8.84	3.09	50.3
Lead	2.14	26	2.03	1.28	13.8
Manganese	14.9	88.2	10.6	3.6	5.33
Mercury	0.028	0.17	0.007	0.004	0.009
Molybdenum	0.327	1.83	0.244	0.185	0.194
Nickel	1.2	2.58	1.36	1.08	9.16
Selenium	1.47	1.51	1.5	1.49	1.46
Silver	ND	0.004	ND	ND	ND
Thallium	0.023	0.026	0.023	0.022	0.022
Thorium	0.021	0.039	0.016	0.012	0.015
Uranium	0.014	0.029	0.01	0.009	0.013
Vanadium	2.48	3.5	2.32	2.21	2.26
Zinc	28	417	25.7	14.7	21.7

Table 3-9. May 8, 2009 Sampling Results

	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
VOCs (ppb-v)					
Benzene	0.399	--	0.282	0.326	0.270
1,3-Butadiene	ND	--	0.010	0.012	0.010
Carbon Tetrachloride	0.105	--	0.105	0.132	0.124
Chloroform	ND	--	0.025	0.025	0.031
1,2-Dibromoethane	ND	--	ND	ND	ND
1,2-Dichloroethane	ND	--	ND	ND	ND
Dichloromethane	0.143	--	0.109	0.094	0.063
1,1,2,2-Tetrachloroethane	ND	--	ND	ND	ND
1,1,2-Trichloroethane	ND	--	ND	ND	ND
1,2,4-Trimethylbenzene	0.014	--	0.026	0.030	0.019
1,3,5-Trimethylbenzene	0.006	--	0.011	0.012	0.010
Vinyl chloride	ND	--	0.008	0.011	0.009
m/p-Xylene	0.025	--	0.058	0.151	0.033
Metals (ng/m^3)					
Aluminum	238	704	87.8	116	121
Antimony	0.204	0.564	0.436	0.413	0.517
Arsenic	0.402	1.49	0.66	0.655	0.465
Barium	6.36	14.7	6.41	6.14	6.53
Beryllium	0.01	0.025	0.005	0.006	0.005
Cadmium	0.269	1.03	0.092	0.181	0.21
Chromium (total)	4.89	11.9	2.3	2.26	2.43
Cobalt	0.149	0.363	0.063	0.072	0.068
Copper	3.22	35.2	5.43	5.19	33.6
Lead	3.97	32.8	1.67	1.64	1.76
Manganese	38.3	162	5.18	5.81	5.3
Mercury	0.028	0.124	0.015	0.021	0.024
Molybdenum	0.434	1.53	0.267	0.301	0.265
Nickel	1.59	4.22	0.775	0.86	0.962
Selenium	1.31	1.37	0.753	0.755	0.79
Silver	ND	ND	ND	ND	ND
Thallium	0.03	0.037	0.008	0.011	0.008
Thorium	0.031	0.073	0.015	0.016	0.015
Uranium	0.026	0.061	0.011	0.012	0.014
Vanadium	3.17	5.43	1.11	1.13	1.08
Zinc	51.5	488	11.5	12.2	12

Table 3-10. May 9, 2009 Sampling Results

	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
VOCs (ppb-v)					
Benzene	0.275	--	0.165	0.200	0.271
1,3-Butadiene	0.018	--	0.010	0.013	0.012
Carbon Tetrachloride	0.114	--	0.101	0.110	0.105
Chloroform	0.029	--	0.023	0.030	0.058
1,2-Dibromoethane	ND	--	ND	ND	ND
1,2-Dichloroethane	ND	--	ND	ND	ND
Dichloromethane	0.134	--	0.098	0.095	0.082
1,1,2,2-Tetrachloroethane	ND	--	ND	ND	ND
1,1,2-Trichloroethane	ND	--	ND	ND	ND
1,2,4-Trimethylbenzene	0.027	--	0.017	0.024	0.020
1,3,5-Trimethylbenzene	0.012	--	0.008	0.011	0.010
Vinyl chloride	0.005	--	0.006	0.006	0.007
m/p-Xylene	0.065	--	0.042	0.055	0.046
Metals (ng/m^3)					
Aluminum	118	212	133	227	139
Antimony	0.426	0.427	0.257	0.714	0.216
Arsenic	0.572	0.597	0.323	1.03	0.376
Barium	7.42	7.75	5.04	10.3	3.62
Beryllium	0.007	0.012	0.005	0.011	0.006
Cadmium	0.08	0.085	0.183	0.219	0.206
Chromium (total)	2.31	2.64	3.16	2.59	2.22
Chromium (6+)	0.072	0.122	0.091	0.155	0.098
Cobalt	7	7.49	3.25	7.57	20.5
Copper	1.69	2.23	1.34	2.74	1.14
Lead	5.82	17.2	15.1	13.9	8.43
Manganese	0.023	0.025	0.015	0.034	0.012
Mercury	0.322	0.317	0.283	0.371	0.252
Molybdenum	0.738	0.891	1.28	1.48	3.48
Nickel	0.745	0.745	1.26	1.65	1.26
Selenium	ND	ND	ND	ND	ND
Silver	0.008	0.009	0.028	0.04	0.028
Thallium	0.018	0.028	0.017	0.025	0.018
Thorium	0.015	0.028	0.012	0.023	0.018
Uranium	1.14	1.48	2.56	2.8	2.44
Vanadium	12.3	15.5	21.3	25.1	15.6
Zinc	118	212	133	227	139

Table 3-11. Third Round Hexavalent Chromium Sampling Results in ng/m^3

Rank	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
1st	0.0941	0.0525	0.0211	0.0204	0.0201
2nd	0.0626	0.0395	ND	0.0177	0.0197
3rd	0.0292	0.034	ND	0.0169	ND
4th	ND	0.0292	ND	ND	ND
5th	ND	0.0199	ND	ND	ND
Min	ND	0.0199	ND	ND	ND
Max	0.0941	0.0525	0.0211	0.0204	0.0201
Mean [a]	0.038	0.035	0.008	0.012	0.009

[a] Mean concentrations were estimated using one-half the method detection limit as a proxy for non-detects.

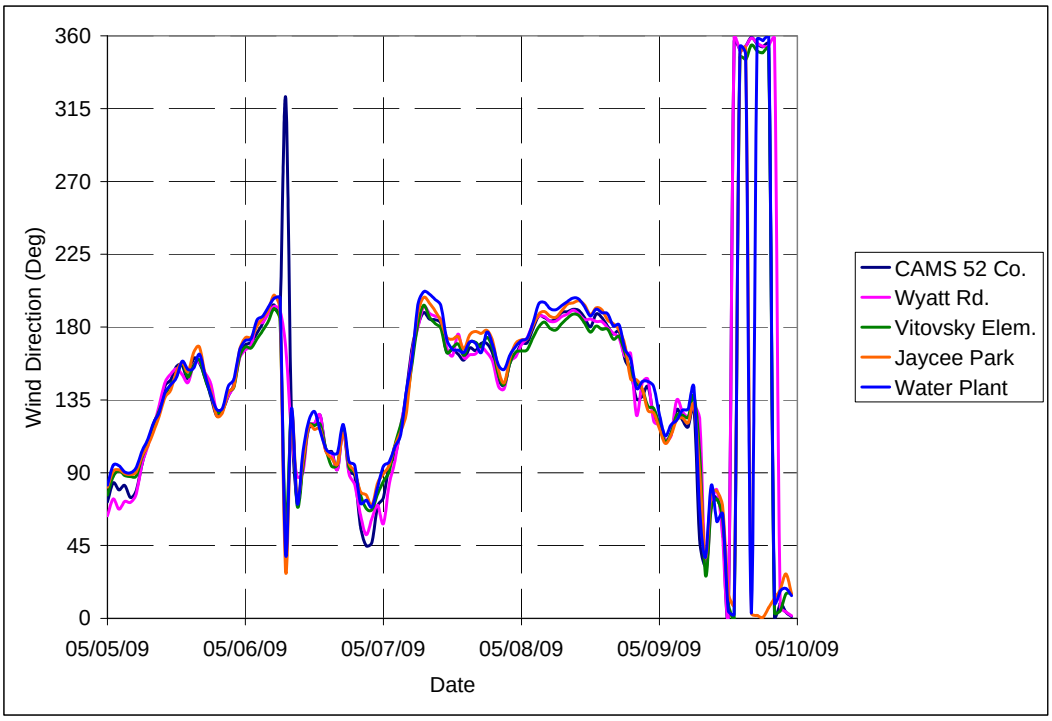
4.0 Weather Summary

Table 4-1 gives the predominant wind directions on each day that samples were collected. The winds were primarily from the south, southeast, and east the first four days but became more northerly on the fifth day, May 9. Time series graphs of 1-hour resultant wind directions are given in Figure 4-1. Daily wind roses from each site are given in Appendix A.

Table 4-1. Predominant Wind Directions

	Predominant Wind Direction				
	CAMS 52	**Wyatt Rd.**	**Vitovsky Elementary School**	**Jaycee Park**	**Water Treatment Plant**
5-May-09	E, SE, SSE	ENE, SE, SSE	E, SE, SSE	E, SE, SSE	E, SE, SSE
6-May-09	E, S	E, SSE, S	E, S	E, S	ENE, ESE, S
7-May-09	SSE, S	SSE, S	SSE, S	S	SSE
8-May-09	S	S	S	S	S
9-May-09	N	N	N, SE	N, NNE, ESE	N

Figure 4-1. Time Series of 1-hour Wind Direction Resultants

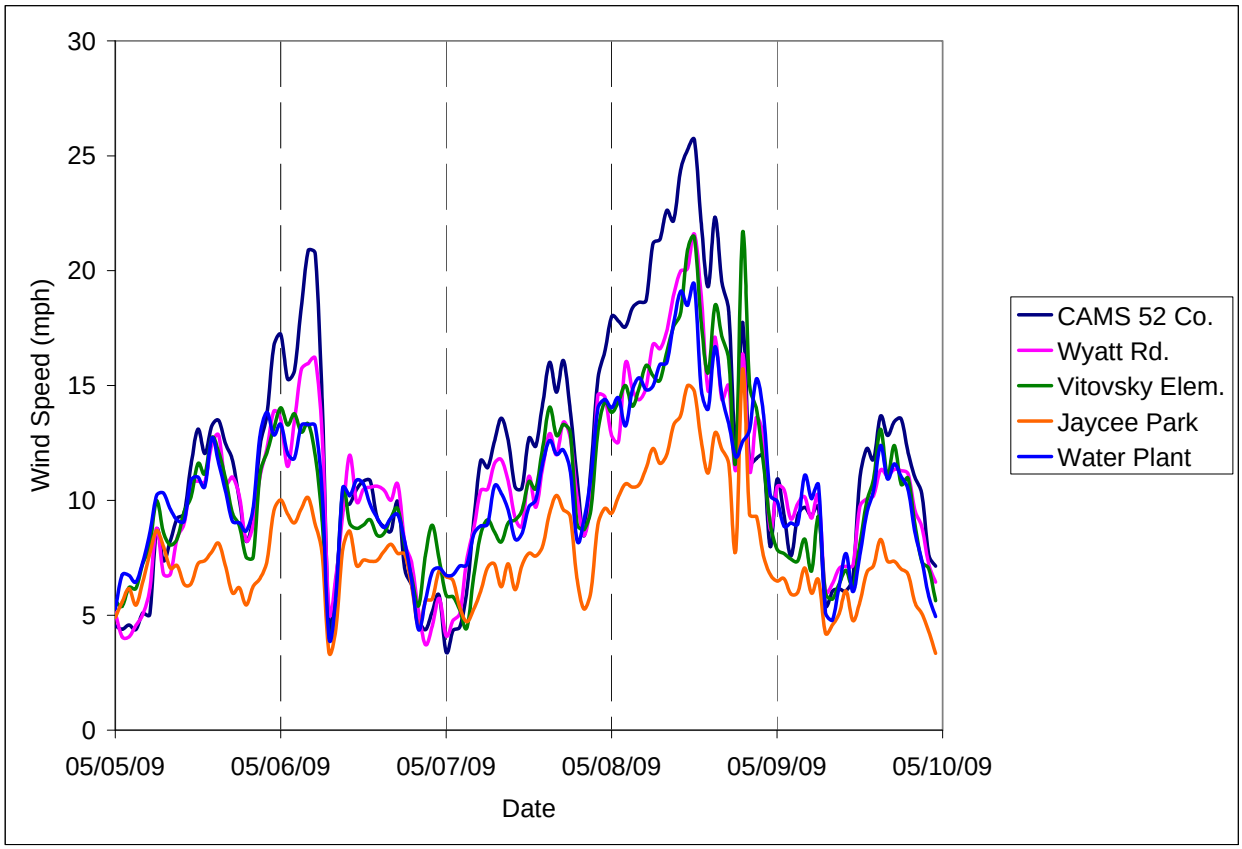


Wind speeds averaged about 10 miles per hour (mph) or less except on May 8 when the average wind speeds at the five sites ranged from 11 mph to 19 mph (Table 4-2 and Figure 4-2). The average wind speed at DFW Airport during May 2009 was 9.6 mph.

Table 4-2. Average Wind Speeds

	Average Wind Speed				
	CAMS 52	**Wyatt Rd.**	**Vitovsky Elementary School**	**Jaycee Park**	**Water Treatment Plant**
5-May-09	9.5	8.9	9.2	6.9	9.7
6-May-09	10.7	10.0	9.4	7.4	9.4
7-May-09	11.4	10.2	9.7	7.2	9.9
8-May-09	18.6	15.5	15.9	11.4	14.9
9-May-09	9.7	9.2	8.4	6.0	8.7

Figure 4-2. Time Series of 1-hour Wind Speed Averages



Daily maximum temperatures ranged from the high 70s to 90 degrees for the five days (Table 4-3 and Figure 4-3). The normal daily high temperature at DFW Airport for May is 83 degrees. No rainfall was measured over the five days (Table 4-4 and Figure 4-4). Barometric pressures ranged from lows of about 975 – 980 milibars (mb) to highs of about 987 – 993 mb (Figure 4-5).

Table 4-3. Daily Peak Temperatures

	Peak Temperature				
	CAMS 52	**Wyatt Rd.**	**Vitovsky Elementary School**	**Jaycee Park**	**Water Treatment Plant**
5-May-09	79.7	79.6	80.2	80.5	78.7
6-May-09	80.1	80.0	78.9	79.1	78.2
7-May-09	85.6	84.7	84.7	84.7	82.9
8-May-09	90.0	88.9	88.8	88.9	87.5
9-May-09	77.8	77.2	77.9	77.9	77.1

Figure 4-3. Time Series of 1-hour Temperature Averages

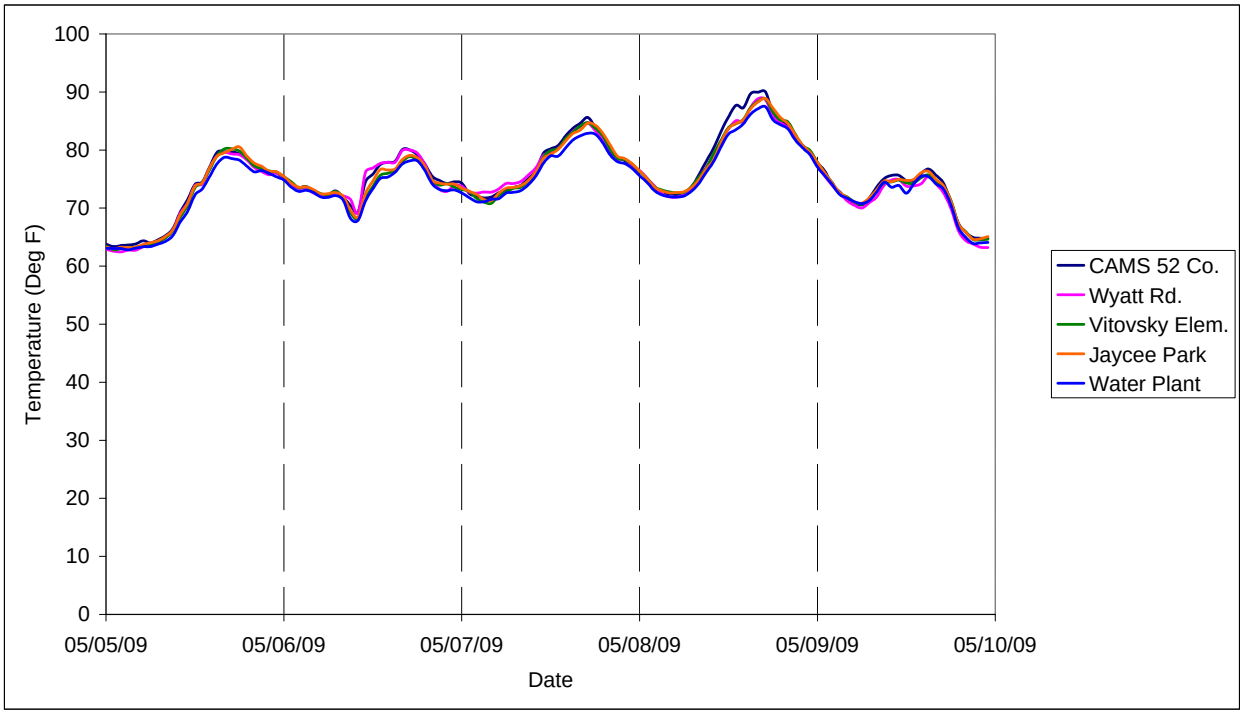


Table 4-4. Daily Rainfall Totals

	Total Rainfall				
	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
5-May-09	0.00	0.00	0.00	0.00	0.00
6-May-09	0.00	0.00	0.00	0.00	0.01
7-May-09	0.00	0.00	0.00	0.00	0.00
8-May-09	0.00	0.00	0.00	0.00	0.00
9-May-09	0.00	0.00	0.00	0.00	0.00

Figure 4-4. Time Series of 1-hour Rainfall Totals

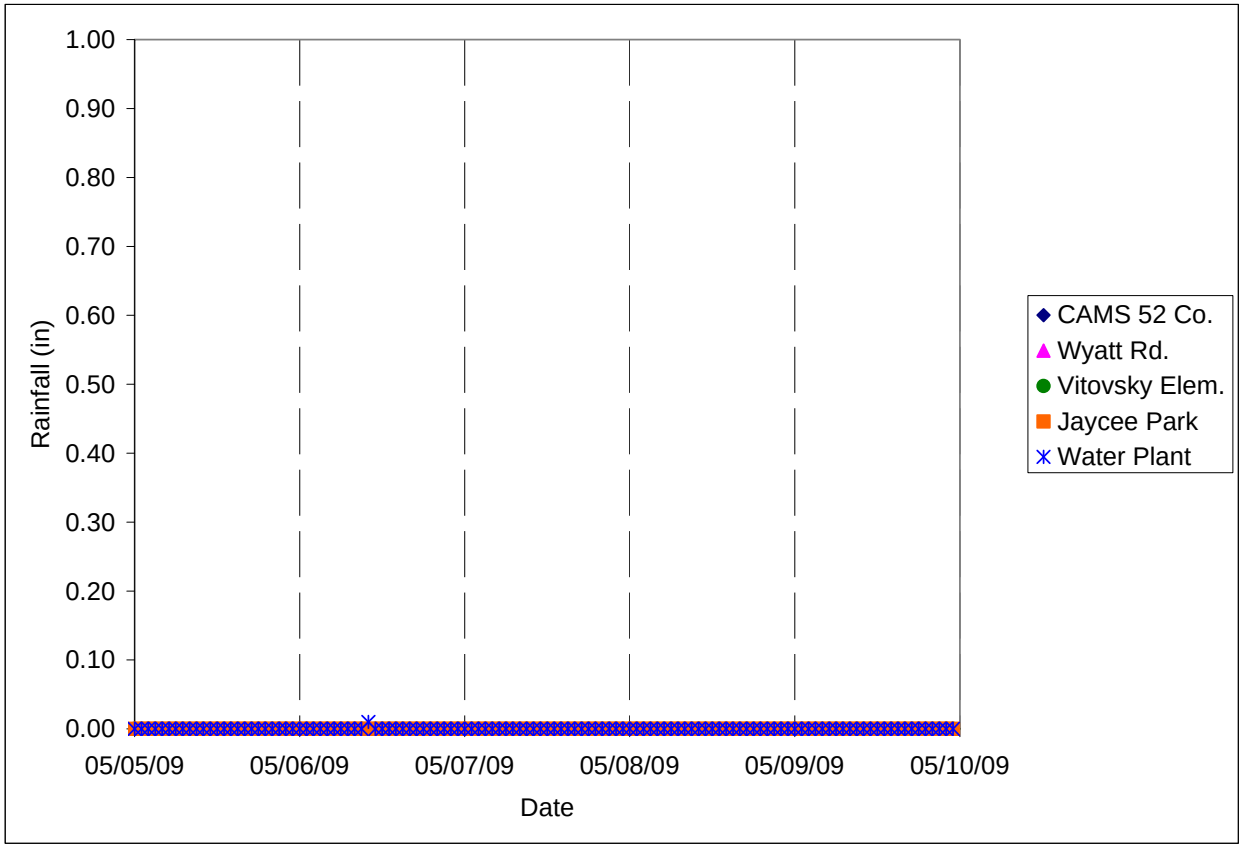
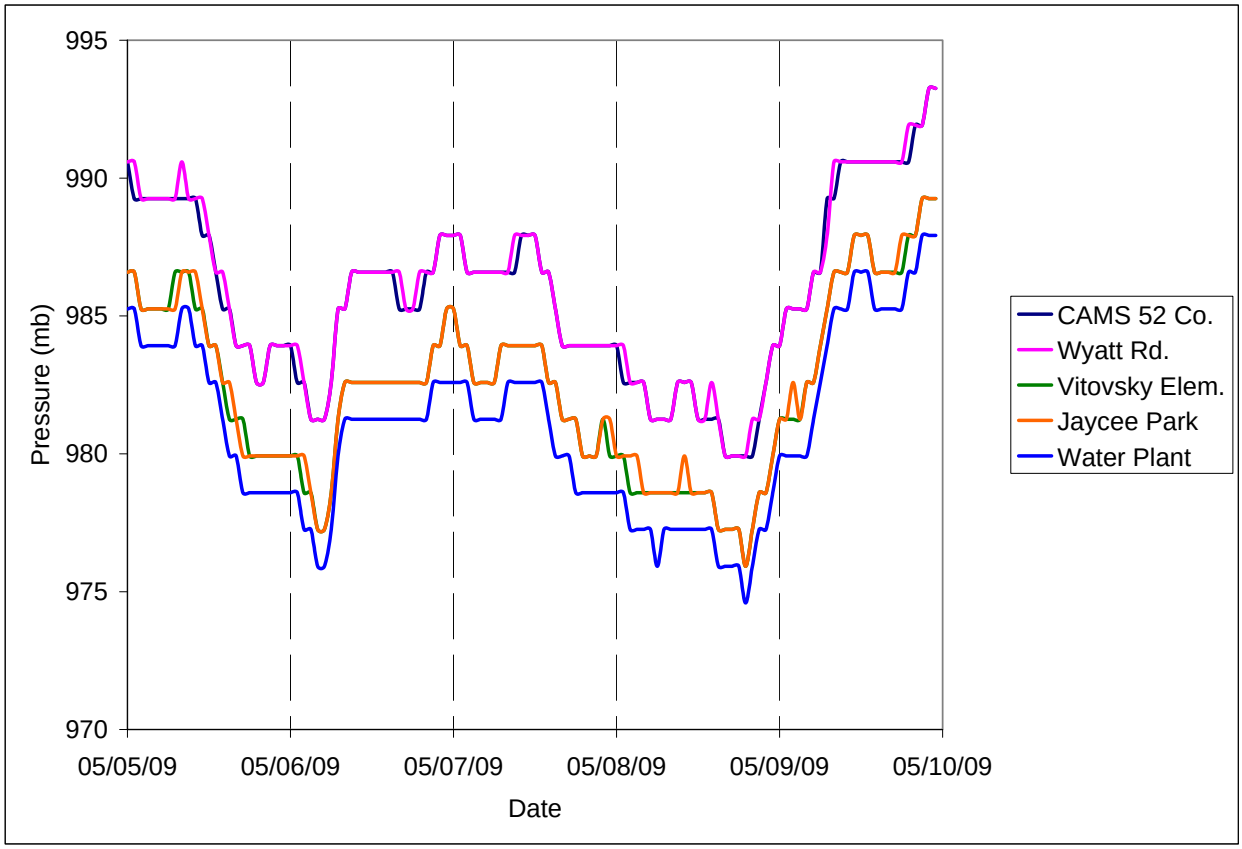


Figure 4-5. Time Series of 1-hour Barometric Pressure Averages



5.0 Data Quality and Completeness

5.1 Air Quality Data

One hundred percent of the VOC, PM_{10}, and Cr^{6+} samples planned for this sampling round were collected and analyzed (Tables 5-1 and 5-2); however, a procedural mistake in sample documentation prevented the laboratory from positively matching the hexavalent chromium (Cr^{6+}) measurement results with the specific dates on which the samples were collected. The mistake occurred when the Chain-of-Custody Form (COC) that documents the sampling date and site was removed from each solitary sample container by laboratory receiving personnel without any of the sampling dates ever being copied from the COCs. Since the sample containers were all labeled with site identification codes, the location at which each sample was collected is known and five valid daily Cr^{6+} measurement results were obtained for each site despite the error (though the order in which the samples were collected at each site is indeterminate).

Table 5-1. VOC Data Completeness [a]

Collection Date	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
5-May-09	100%	100%	100%	100%	100%
6-May-09	100%	100%	100%	100%	100%
7-May-09	100%	100%	100%	100%	100%
8-May-09	100%	100%	100%	100%	100%
9-May-09	100%	100%	100%	100%	100%
5 – 9 May 09	100%	100%	100%	100%	100%

[a] Calculated as the number of valid results for the 13 target VOCs, expressed as a percentage of the number planned, based on one sample per site per day.

Table 5-2. Metals Data Completeness [a]

Collection Date	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
5-May-09	100%	100%	100%	100%	100%
6-May-09	100%	100%	100%	100%	100%
7-May-09	100%	100%	100%	100%	100%
8-May-09	100%	100%	100%	100%	100%
9-May-09	100%	100%	100%	100%	100%
5 – 9 May 09	100%	100%	100%	100%	100%

[a] Calculated as the number of valid results for the 21 target metals, expressed as a percentage of the number planned, based on one sample per site per day.

5.1.1 VOC Data Quality

Field blank results for the 13-core VOC are given in Table 5-3. The VOC field blank was collected at the Jaycee Park sampling site on May 10, 2009. Seven of the core VOCs were detected in the field blank; however, only benzene and dichloromethane were found at levels greater than five times the respective detection limit. The benzene field blank level, 0.156 ppb-v, is greater than one-half the average level measured in the ambient air samples collected during the third round. The comparatively high level detected in the field blank raises the suspicion that a slight increase in the average concentrations reported for the ambient air samples relative to the first and second quarters may be artificial. The dichloromethane field blank level, 0.066 ppb-v, was slightly less than one-half the average ambient level detected over the five days.

Table 5-3. VOC Field Blank Results

Analyte	Collected at Jaycee Park on 10-May-09		Average Ambient Concentration [a] (ppb-v)
	Field Blank (ppb-v)	Detection Limit (ppb-v)	
Benzene	0.156	0.006	0.269
1,3-Butadiene	ND	0.003	0.012
Carbon Tetrachloride	0.006	0.002	0.110
Chloroform	0.007	0.002	0.028
1,2-Dibromoethane	ND	0.001	0.001
1,2-Dichloroethane	ND	0.002	0.001
Dichloromethane	0.066	0.008	0.139
1,1,2,2-Tetrachloroethane	ND	0.003	0.002
1,1,2-Trichloroethane	ND	0.003	0.002
1,2,4-Trimethylbenzene	0.008	0.005	0.026
1,3,5-Trimethylbenzene	0.006	0.004	0.011
Vinyl Chloride	ND	0.002	0.007
m,p-Xylene	0.014	0.007	0.069

[a] Average concentration for all sites and samples collected this quarter.

Field duplicate results for the 13-core VOC are given in Table 5-4. Measurement precision, which was estimated for each core VOC by the average relative percent difference, was 30% or less except for dichloromethane and m/p-xylene.

Table 5-4. VOC Field Duplicate Results

Analyte	Collected at Jaycee Park 5-May-09		Detection Limit (ppb-v)	Relative Percent Difference
	Primary Sample (ppb-v)	Duplicate Sample (ppb-v)		
Benzene	0.322	0.294	0.006	9%
1,3-Butadiene	0.017	0.017	0.003	0%
Carbon Tetrachloride	0.098	0.11	0.002	12%
Chloroform	0.026	0.029	0.002	11%
1,2-Dibromoethane	ND	ND	0.001	NC
1,2-Dichloroethane	ND	ND	0.002	NC
Dichloromethane	0.189	0.321	0.008	52%
1,1,2,2-Tetrachloroethane	ND	ND	0.003	NC
1,1,2-Trichloroethane	ND	ND	0.003	NC
1,2,4-Trimethylbenzene	0.044	0.042	0.005	5%
1,3,5-Trimethylbenzene	0.019	0.014	0.004	30%
Vinyl chloride	0.006	0.007	0.002	15%
m/p-Xylene	0.088	0.06	0.007	38%

NC – RPD not calculated for ND results.

5.1.2 Metals Data Quality

Field blank results for metals, including Cr^{6+}, are given in Table 5-5. Nine of the 22 metals, which are indicated in Table 5-5 by bold type, were detected in the field blank sample at levels greater than five times the respective detection limit. Conventional quartz fiber high volume air sampling filters, as were used to collect PM_{10}, typically contain variable amounts of aluminum and other metals that contribute to field blank concentrations.

Field duplicate results for metals are given in Table 5-6. The measurement precision, expressed as the relative percent difference between collocated measurement results, was within 20% for all metals except cadmium, copper, lead, mercury, and zinc.

Table 5-5. Metals Field Blank Results

Analyte	Collected at Wyatt Rd on May 7, 2009		Average Ambient Concentration [a] (ng/m^3)
	Field Blank (ng/m^3)	Detection Limit (ng/m^3)	
Aluminum	**22**	**3.9**	**150.36**
Antimony	**0.093**	**0.007**	**0.44028**
Arsenic	0.015	0.009	0.78208
Barium	1.11	0.148	6.1272
Beryllium	0.0006	0.002	0.00684
Cadmium	0.082	0.029	0.25344
Chromium (total)	1.98	0.343	3.2504
Chromium (6+)	ND	0.0043	0.0204
Cobalt	0.011	0.006	0.10424
Copper	0.903	0.124	13.204
Lead	0.256	0.006	5.5572
Manganese	0.778	0.057	20.5744
Mercury	0.005	0.017	0.029
Molybdenum	**0.121**	**0.012**	**0.44408**
Nickel	0.309	0.132	1.71044
Selenium	0.003	0.013	1.12568
Silver	ND	0.008	0.004
Thallium	0.0005	0.0009	0.0176
Thorium	0.003	0.0008	0.01984
Uranium	0.004	0.001	0.01656
Vanadium	**0.044**	**0.006**	**2.0448**
Zinc	7.79	3.01	63.504

[a] Average concentration for all sites and samples collected this quarter.

Table 5-6. Metals Field Duplicate Results

Analyte	Collected at Wyatt Road May 5, 2009		
	Primary Sample (ng/m^3)	Duplicate Sample (ng/m^3)	Relative Percent Difference
Aluminum	187	200	7%
Antimony	0.429	0.469	9%
Arsenic	0.929	0.99	6%
Barium	7.64	8.54	11%
Beryllium	0.009	0.01	11%
Cadmium	0.618	0.266	80%
Chromium (total)	4.74	5.13	8%
Cobalt	0.125	0.14	11%
Copper	15.8	10.2	43%
Lead	6.74	4.93	31%
Manganese	36.9	36.5	1%
Mercury	0.068	0.033	69%
Molybdenum	0.562	0.544	3%
Nickel	1.36	1.3	5%
Selenium	0.965	1.02	6%
Silver	ND	ND	NC
Thallium	0.015	0.015	0%
Thorium	0.026	0.029	11%
Uranium	0.022	0.025	13%
Vanadium	2.21	2.39	8%
Zinc	89.4	56.3	45%

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5.2 Meteorological Data

Data completeness for meteorological parameters was 100% all sites (Table 5-7). No site recorded calm winds or rainfall for more than six hours on more than one day (Tables 5-8 and 5-9, respectively).

Table 5-7. Meteorological Data Completeness

	Completeness (WS, WD, T, P, Rain)				
	CAMS 52	**Wyatt Rd.**	**Vitovsky Elementary School**	**Jaycee Park**	**Water Treatment Plant**
5-May-09	100%	100%	100%	100%	100%
6-May-09	100%	100%	100%	100%	100%
7-May-09	100%	100%	100%	100%	100%
8-May-09	100%	100%	100%	100%	100%
9-May-09	100%	100%	100%	100%	100%
5 – 9 May 09	100%	100%	100%	100%	100%

Table 5-8. Number of Hours per Day with Calm Winds

	Number of Calm Hours				
	CAMS 52	**Wyatt Rd.**	**Vitovsky Elementary School**	**Jaycee Park**	**Water Treatment Plant**
5-May-09	0	0	0	0	0
6-May-09	0	0	0	0	0
7-May-09	0	0	0	0	0
8-May-09	0	0	0	0	0
9-May-09	0	0	0	0	0
# Days > 6	0	0	0	0	0

Table 5-9. Number of Hours per Day with Measured Rainfall

	Number of Hours with Measured Rainfall				
	CAMS 52	Wyatt Rd.	Vitovsky Elementary School	Jaycee Park	Water Treatment Plant
5-May-09	0	0	0	0	0
6-May-09	0	0	0	0	1
7-May-09	0	0	0	0	0
8-May-09	0	0	0	0	0
9-May-09	0	0	0	0	0
# Days > 6	0	0	0	0	1

Collocated measurements of 1-hour average vector wind direction at CAMS 52 by TCEQ and URS are shown in the scatter plot given in Figure 5-1. On average, the measurements recorded by URS were about 6 degrees counterclockwise from the measurements recorded by TCEQ. The agreement between the two measurement systems was within 10 degrees for 107 of the 120 hours. A similar scatter plot for wind speed is given in Figures 5-2. The linear regression r-square for the collocated wind speed measurements was 1.00; however, a slight relative bias was apparent as the TCEQ wind speed measurements averaged about 0.4 mph higher.

Figure 5-1. Scatter Plot Showing the Agreement between Collocated 1-hour Resultant Wind Direction Measurements made by TCEQ and URS at CAMS 52

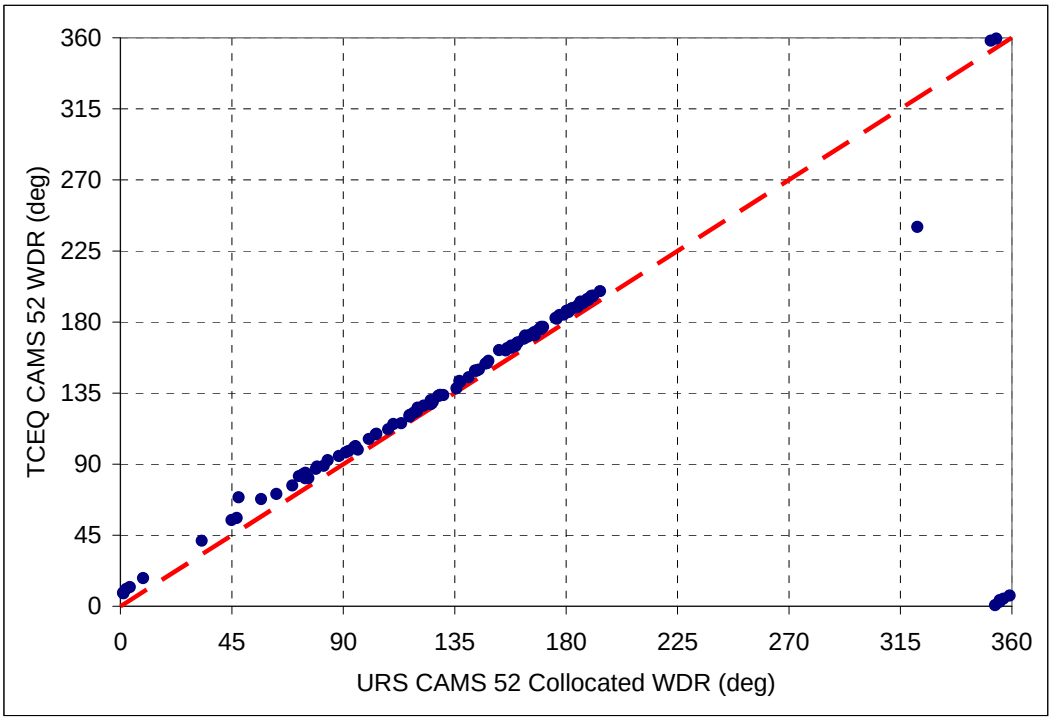
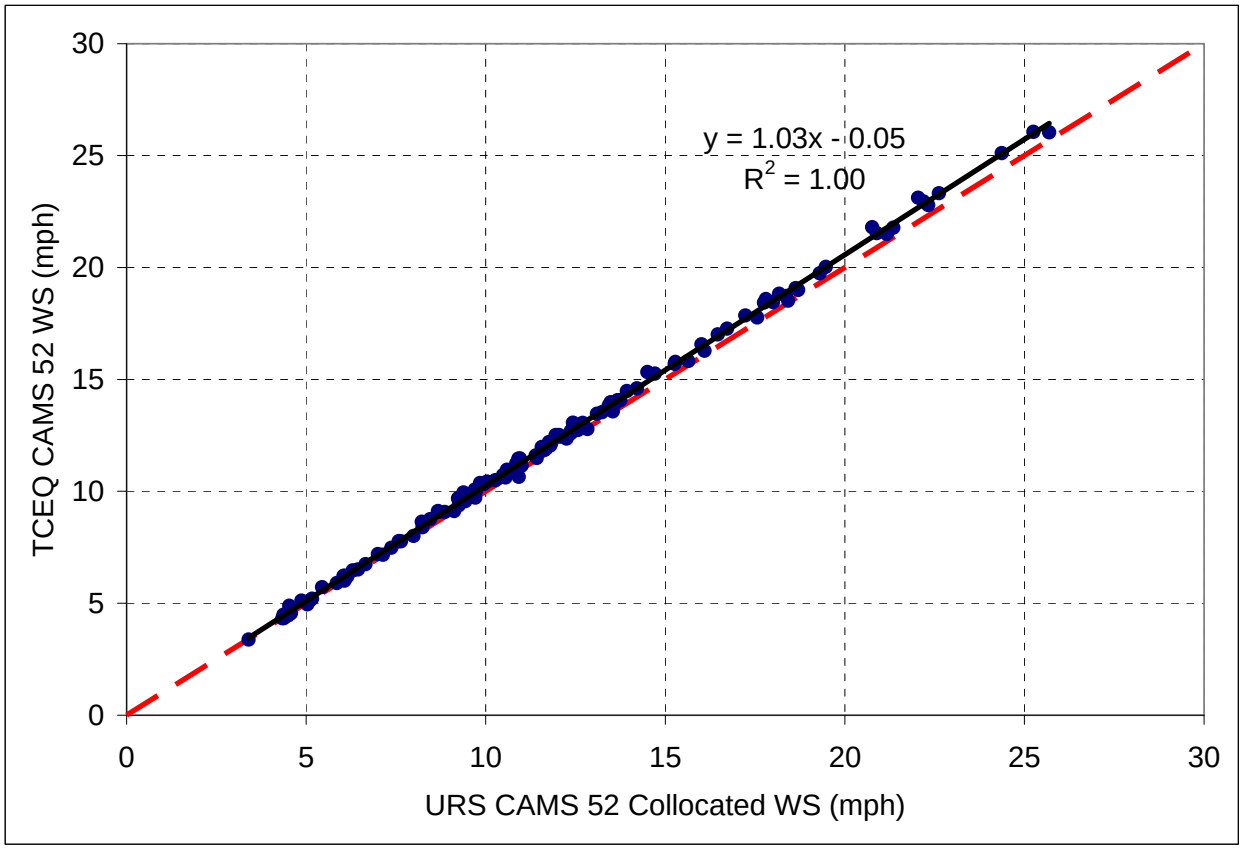


Figure 5-2. Scatter Plot Showing the Agreement between Collocated 1-hour Wind Speed Averages Measured by TCEQ and URS at CAMS 52 (diagonal line represents 1:1)



APPENDIX A

Explanation of Cr^{6+} Sample Documentation Error and Corrective Action

ERG

www.erg.com

June 9, 2009

Al Hendler
URS Corporation
9400 Amberglen Blvd
Austin, TX 78720
Project Name: JPTX

Dear Al Hendler,

As discussed with you via phone, there was an issue at the laboratory concerning the receipt of the samples collected in Midlothian, TX from 5/05/09 to 5/09/09. We were unable to identify the exact sample date for the samples that were collected in Midlothian, TX from May 5-9, 2009.

Our usual process for hexavalent chromium samples is to label the container with the sample identification code and date sampled to identify the samples. The Chain of Custody (COC) has the same information as the label on the container. The COCs are wrapped around the container for shipment to the field. After the sample is taken and sent back to the laboratory, the COCs are taken off the container and the samples are logged into our Laboratory Information Management System (LIMS). LIMS provides a unique identification code that is put on the COC and the COC is then matched back up with the container.

Because we were unsure what days the Midlothian samples would be taken, we did not place a date on the container label; however, they were labeled with the site codes. When the hexavalent chromium samples were received at the laboratory, the receiving personnel did not notice that the containers were not labeled with sample dates. When the COCs were removed, we were unable to determine which COC went with each of the samples after sample login. The codes were identified but the sample dates were not verifiable.

Because of this laboratory error, a new procedure was adopted to uniquely identify each of the sample containers. A container number will be recorded on the COCs before the samples are logged into LIMS. After the samples are given their unique identification code, the COC will be matched back to the container based on the identification code on the container.

Because we were unable to identify the exact sample date for these samples that were collected in Midlothian, TX from May 5-9, 2009, each of them are labeled with the range of sampling dates. The analytical data pass all of ERG laboratory's quality control requirements. The sample reports are attached to this letter.

If you have any questions, please contact me at 919-468-7924.

Sincerely,

Julie L. Swift

Julie Swift
Program Manager

601 Keystone Park Drive, Suite 700, Morrisville, NC 27560 • Phone (919) 468-7800 • Fax (919) 468-7803
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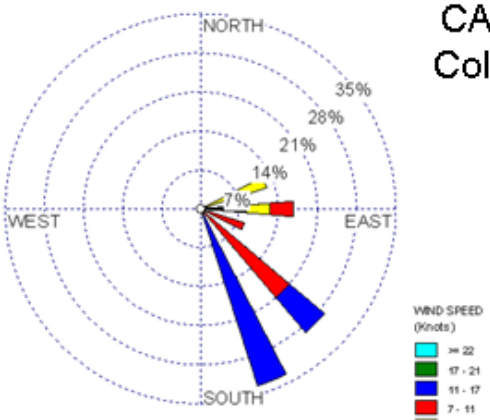
APPENDIX B

Daily Wind Roses

CAMS 52
Collocated



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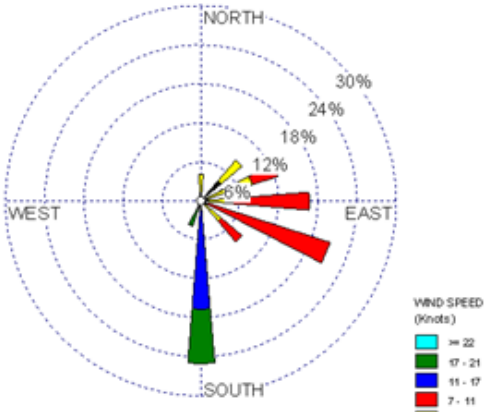
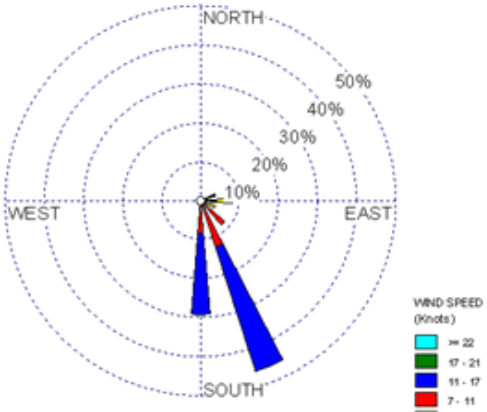
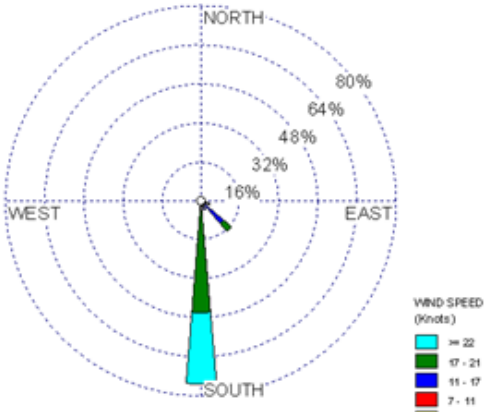


6 May 09



7 May 09



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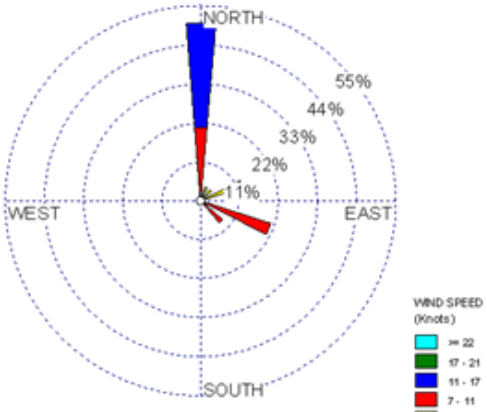

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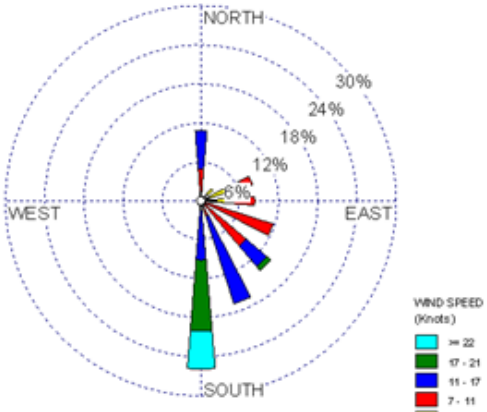
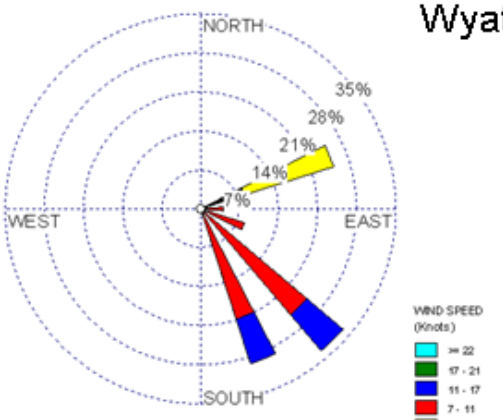


5 – 9 May 09

Wyatt Road



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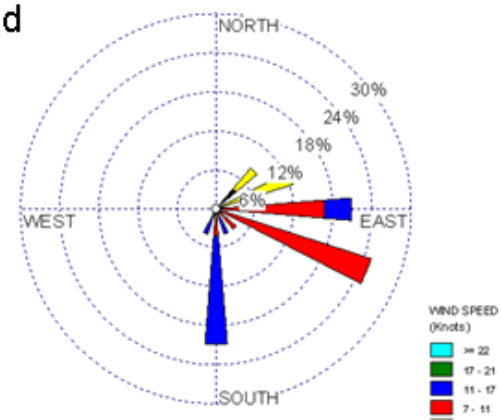

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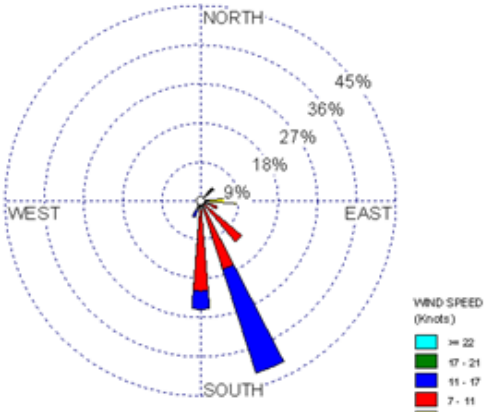

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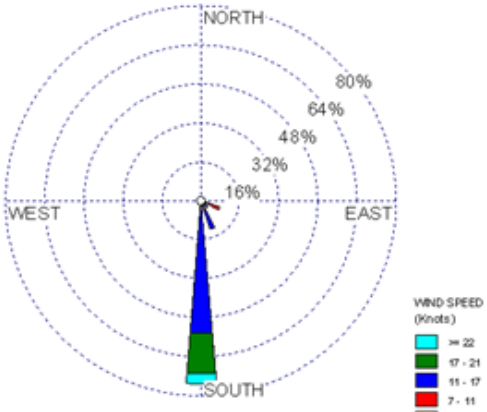

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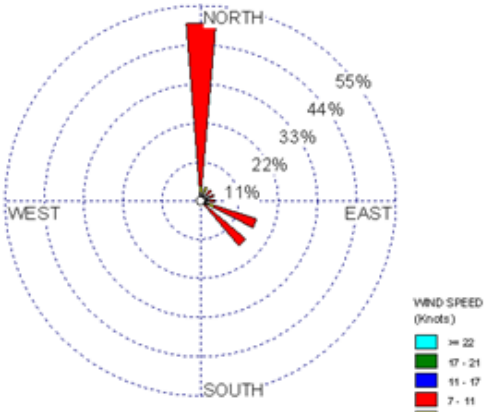

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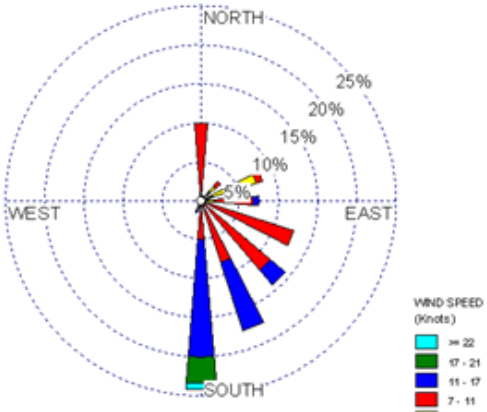

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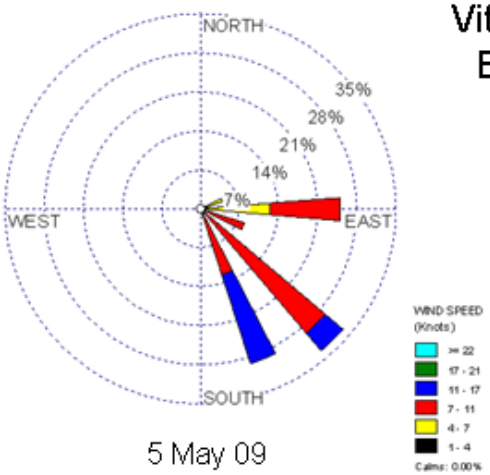

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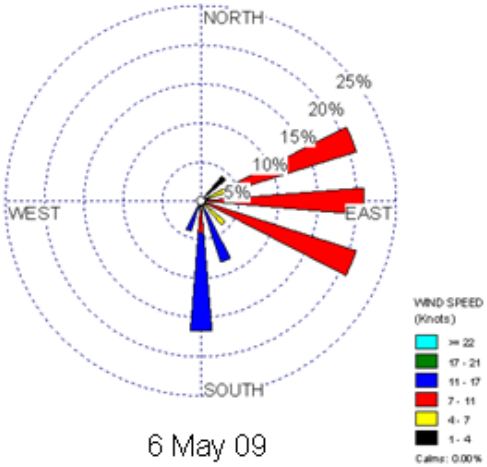

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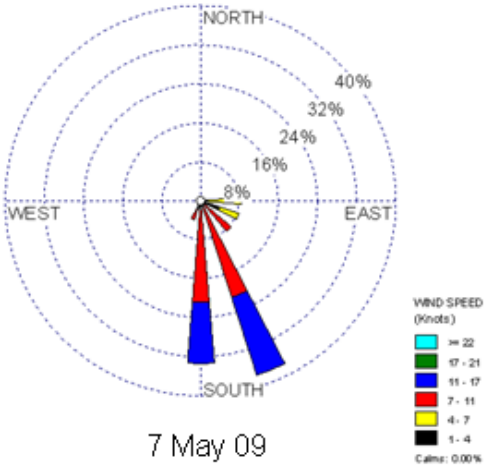

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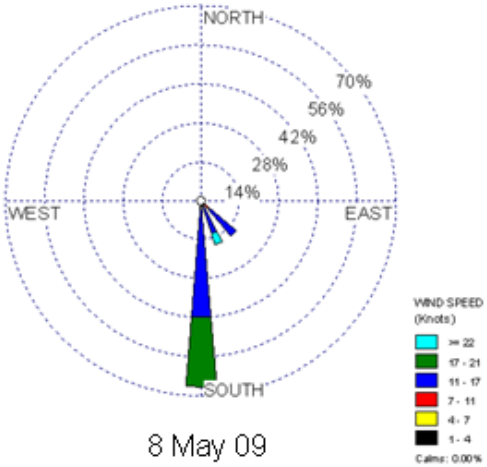

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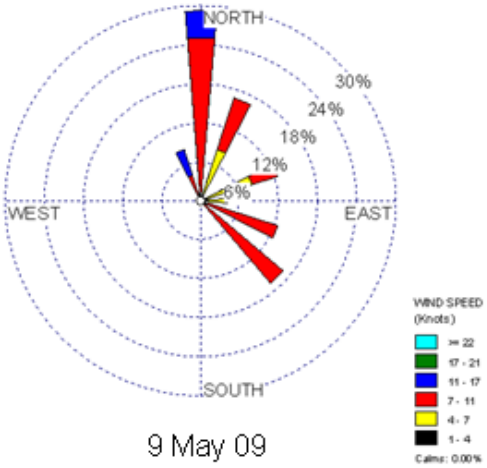

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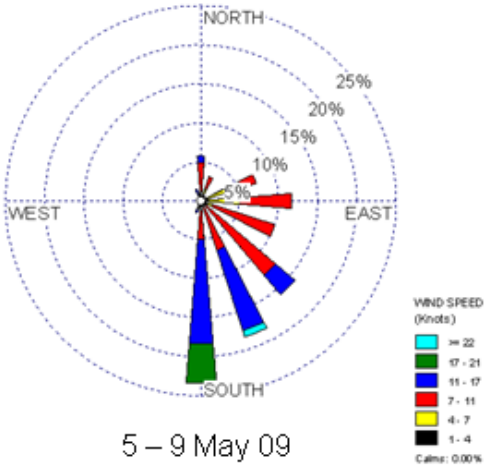
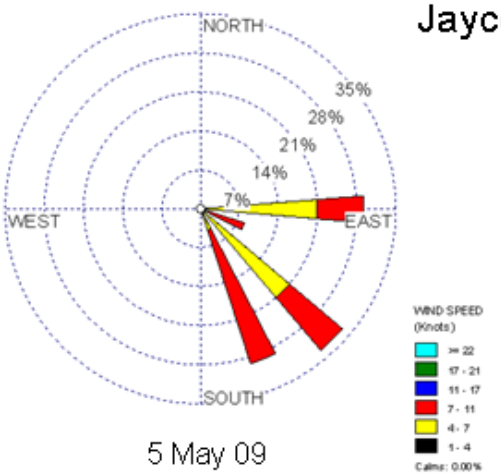


5 – 9 May 09

Jaycee Park



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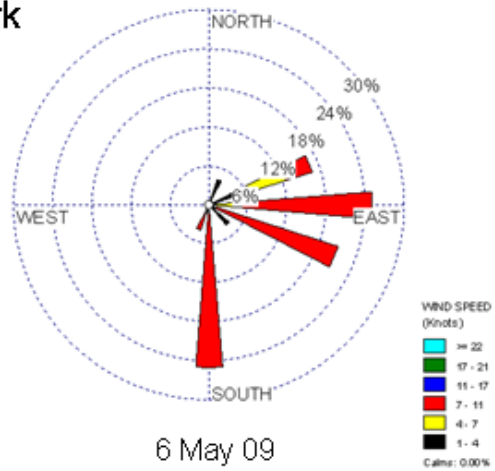

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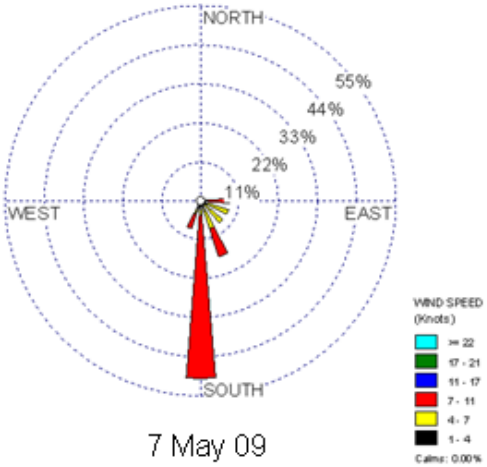

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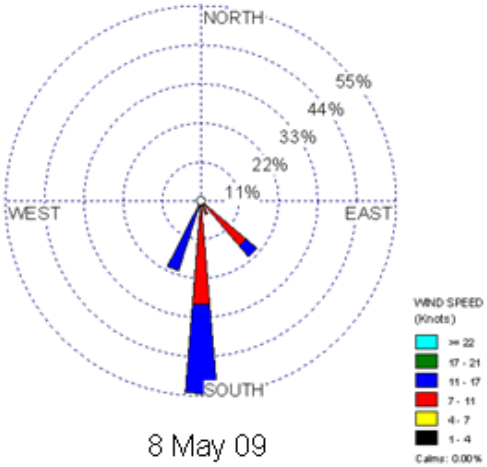

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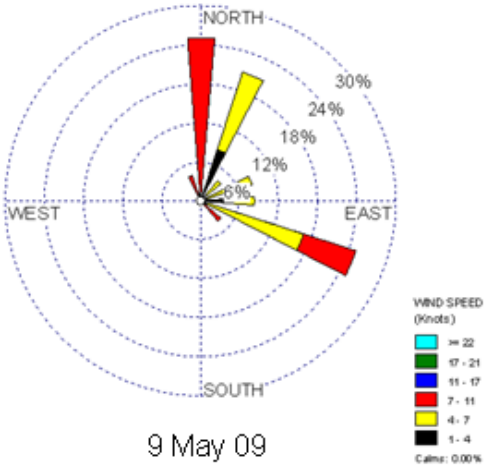

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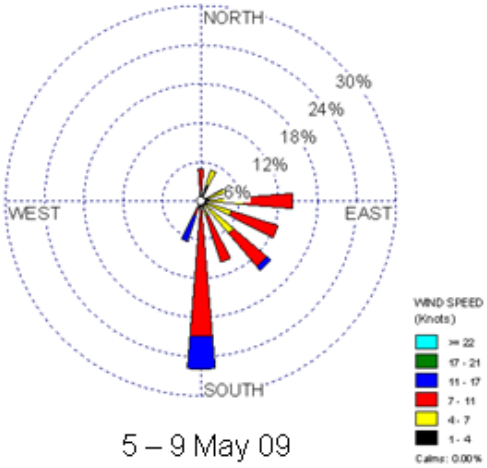
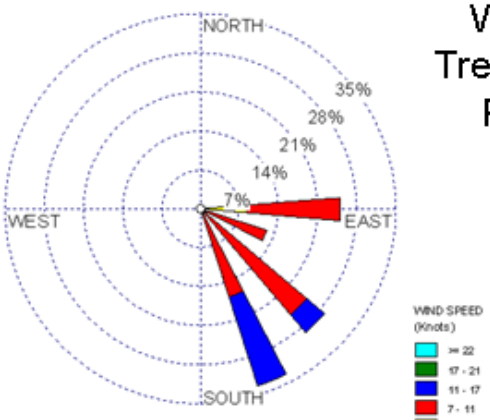
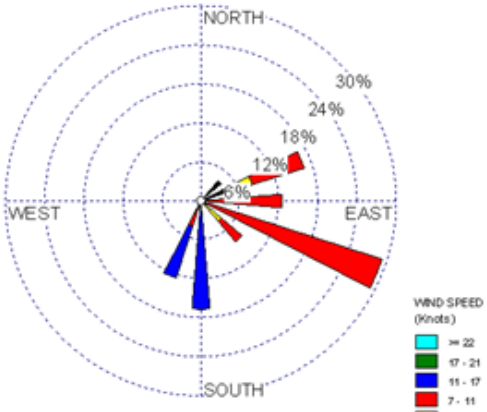


5 – 9 May 09

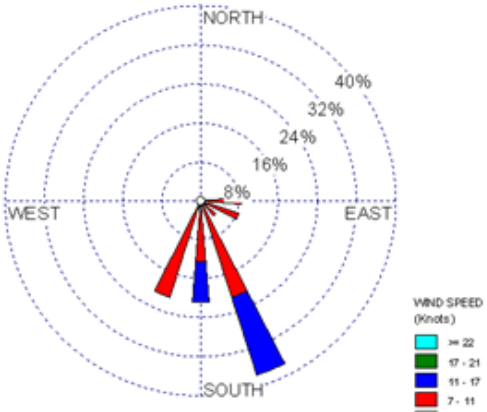
Water Treatment Plant



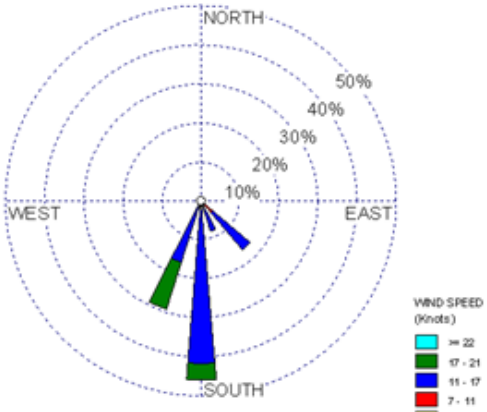
5 May 09



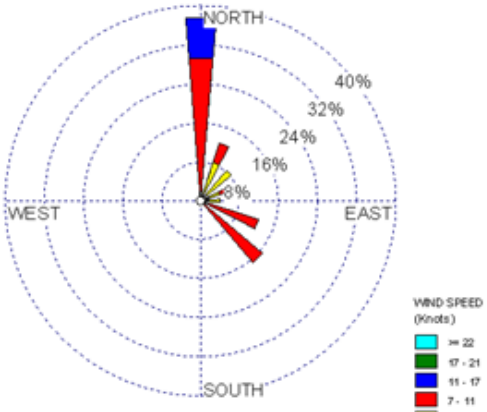
6 May 09



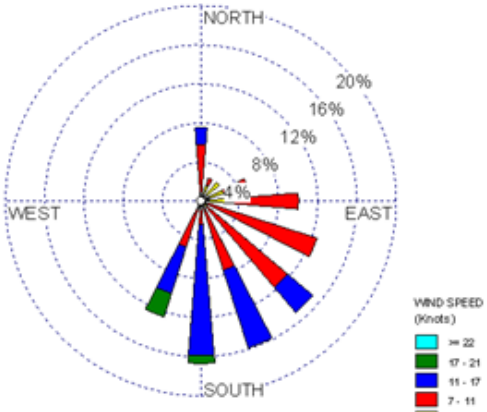
7 May 09



8 May 09



9 May 09



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