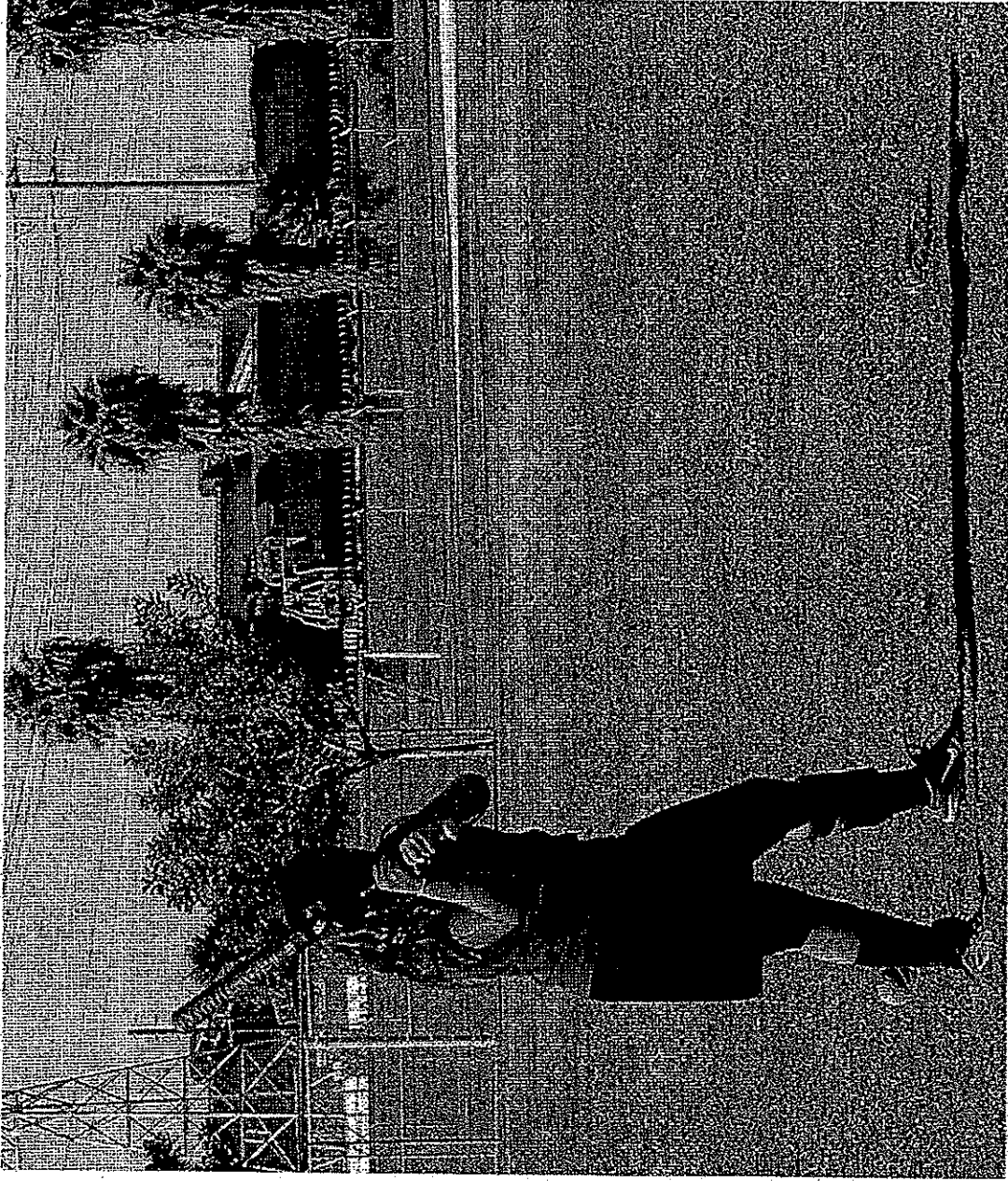


Appendix F



Daycare Center on San Gabriel Avenue across from proposed SCIG project; separated from the immediately adjacent Terminal Island Freeway by a chain link fence

Appendix G



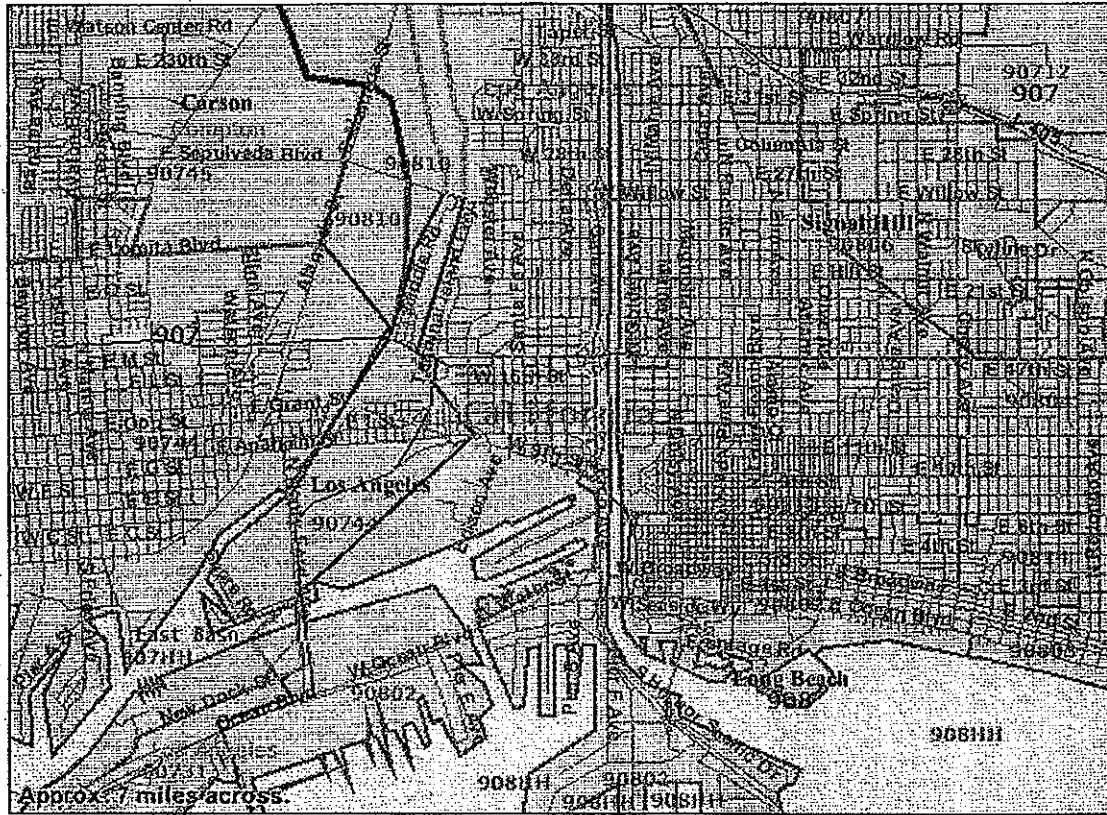
Cabrillo High School teen playing ball, with locomotive in background

Appendix H



This photo shows how close the train tracks are to residential neighbors north of Sepulveda. Photo taken before the sound wall was built. The Union Pacific ICTF is on the other side of the locomotive.

Appendix I. Demographic Data for Zip Codes in Wilmington and Long Beach Surrounding the SCIG Project Site



90744

NOTE: For information on confidentiality protection, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf1u.htm>.

Subject	Number	Percent
RACE		
Total population	53,308	100.0
One race	50,246	94.3
White	19,296	36.2
Black or African American	1,959	3.7
American Indian and Alaska Native	642	1.2
American Indian	369	0.7
Alaska Native	1	0.0
Both American Indian and Alaska Native	0	0.0
American Indian or Alaska Native, not specified	272	0.5
Asian	1,524	2.9
Asian Indian	54	0.1
Chinese	87	0.2
Filipino	929	1.7
Japanese	132	0.2
Korean	153	0.3
Vietnamese	66	0.1
Other Asian category	83	0.2
Two or more Asian categories	20	0.0
Native Hawaiian and Other Pacific Islander	476	0.9
Native Hawaiian	52	0.1
Samoaan	363	0.7
Guamanian or Chamorro	43	0.1

Other Pacific Islander category	11	0.0
Two or more Native Hawaiian or Other Pacific Islander categories	7	0.0
Some other race	26,349	49.4
Two or more races	3,062	5.7
Two races including Some other race	2,420	4.5
Two races excluding Some other race, and three or more races	642	1.2
Two races excluding Some other race	515	1.0
Three or more races	127	0.2
HISPANIC OR LATINO		
Total population	53,308	100.0
Hispanic or Latino (of any race)	45,106	84.6
Mexican	37,848	71.0
Puerto Rican	295	0.6
Cuban	98	0.2
Other Hispanic or Latino	6,865	12.9
Not Hispanic or Latino	8,202	15.4
RACE AND HISPANIC OR LATINO		
Total population	53,308	100.0
One race	50,246	94.3
Hispanic or Latino	42,628	80.0
Not Hispanic or Latino	7,618	14.3
Two or more races	3,062	5.7
Hispanic or Latino	2,478	4.6
Not Hispanic or Latino	584	1.1
Subject	Number	Percent

(X) Not applicable.

Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrices P3, P4, PCT4, PCT5, PCT8, and PCT11.

QT-P17. Ability to Speak English: 2000

Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Geographic Area: 90744 5-Digit ZCTA

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

Subject	Number	Percent
POPULATION 5 YEARS AND OVER		
BY LANGUAGE SPOKEN AT HOME AND ABILITY TO SPEAK ENGLISH		
Population 5 years and over	47,815	100.0
Speak only English	11,199	23.4
Speak a language other than English	36,616	76.6
Spanish	35,178	100.0
Speak English "very well"	14,539	41.3
Speak English "well"	8,226	23.4
Speak English "not well"	7,791	22.1
Speak English "not at all"	4,622	13.1
Other Indo-European languages	214	100.0
Speak English "very well"	172	80.4
Speak English "well"	42	19.6
Speak English "not well"	0	0.0
Speak English "not at all"	0	0.0
Asian and Pacific Island languages	1,089	100.0

Speak English "very well"	606	55.6
Speak English "well"	332	30.5
Speak English "not well"	134	12.3
Speak English "not at all"	17	1.6
All other languages	135	100.0
Speak English "very well"	62	45.9
Speak English "well"	16	11.9
Speak English "not well"	41	30.4
Speak English "not at all"	16	11.9
ABILITY TO SPEAK ENGLISH		
Population 5 years and over	47,815	100.0
Speak a language other than English	36,616	76.6
5 to 17 years	10,637	22.2
18 to 64 years	23,920	50.0
65 years and over	2,059	4.3
Speak English less than "very well"	21,237	44.4
5 to 17 years	4,914	10.3

QT-P32. Income Distribution in 1999 of Households and Families: 2000

Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Geographic Area: 90744 5-Digit ZCTA

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

Subject	Household	Families	Nonfamil
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	s	Total	Married-couple families	Female householder, no husband present	Other householders
NUMBER					
Total	14,017	11,461	7,664	2,527	2,556
Less than \$10,000	2,009	1,333	551	690	852
\$10,000 to \$14,999	1,174	971	494	369	276
\$15,000 to \$19,999	1,176	1,034	641	256	192
\$20,000 to \$24,999	1,307	1,127	812	184	204
\$25,000 to \$29,999	1,278	1,096	705	181	189
\$30,000 to \$34,999	986	826	556	165	107
\$35,000 to \$39,999	847	664	436	112	178
\$40,000 to \$44,999	640	557	411	124	65
\$45,000 to \$49,999	656	577	428	111	64
\$50,000 to \$59,999	1,058	857	691	70	111
\$60,000 to \$74,999	1,113	862	701	124	173
\$75,000 to \$99,999	849	773	599	95	52
\$100,000 to \$124,999	428	350	275	6	44
\$125,000 to \$149,999	212	177	161	16	22
\$150,000 to \$199,999	130	107	82	8	23
\$200,000 or more	154	150	121	16	4
Median income (dollars)	30,259	30,800	35,926	18,808	18,807
Mean income (dollars)	43,034	44,591	50,450	28,433	29,108
PERCENT DISTRIBUTION					

Total	100.0	100.0	100.0	100.0	100.0
Less than \$10,000	14.3	11.6	7.2	27.3	33.3
\$10,000 to \$14,999	8.4	8.5	6.4	14.6	10.8
\$15,000 to \$19,999	8.4	9.0	8.4	10.1	7.5
\$20,000 to \$24,999	9.3	9.8	10.6	7.3	8.0
\$25,000 to \$29,999	9.1	9.6	9.2	7.2	7.4
\$30,000 to \$34,999	7.0	7.2	7.3	6.5	4.2
\$35,000 to \$39,999	6.0	5.8	5.7	4.4	7.0
\$40,000 to \$44,999	4.6	4.9	5.4	4.9	2.5
\$45,000 to \$49,999	4.7	5.0	5.6	4.4	2.5
\$50,000 to \$59,999	7.5	7.5	9.0	2.8	4.3
\$60,000 to \$74,999	7.9	7.5	9.1	4.9	6.8
\$75,000 to \$99,999	6.1	6.7	7.8	3.8	2.0
\$100,000 to \$124,999	3.1	3.1	3.6	0.2	1.7
\$125,000 to \$149,999	1.5	1.5	2.1	0.6	0.9
\$150,000 to \$199,999	0.9	0.9	1.1	0.3	0.9
\$200,000 or more	1.1	1.3	1.6	0.6	0.2

(X) Not applicable.

Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P52, P53, P54, P79, P80, P81, PCT38, PCT40, and PCT41.

QT-P35. Poverty Status in 1999 of Families and Nonfamily Householders: 2000

Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Geographic Area: **90744 5-Digit ZCTA**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

Poverty Status	Number		Percent below poverty level
	All income levels	Below poverty level	
Families	11,461	2,742	23.9

With related children under 18 years	8,391	2,429	28.9
With related children under 5 years	4,413	1,398	31.7
Householder worked in 1999	8,964	1,813	20.2
Full-time, year-round	4,435	548	12.4
Householder 65 years and over	1,146	90	7.9
Family received:			
Supplemental Security Income (SSI) and/or public assistance income in 1999	1,753	709	40.4
Social Security income in 1999	1,706	237	13.9
Mean income deficit (dollars)	8,456	(X)	(X)
Married-couple families	7,664	1,481	19.3
With related children under 18 years	5,641	1,304	23.1
With related children under 5 years	3,086	852	27.6
Householder worked in 1999	6,244	1,082	17.3
Full-time, year-round	3,085	324	10.5
Householder 65 years and over	786	39	5.0
Family received:			
Supplemental Security Income (SSI) and/or public assistance income in 1999	867	244	28.1
Social Security income in 1999	1,119	115	10.3
Mean income deficit (dollars)	8,683	(X)	(X)
Families with female householder, no husband present	2,527	1,041	41.2
With related children under 18 years	1,906	938	49.2
With related children under 5 years	872	446	51.1
Householder worked in 1999	1,640	553	33.7
Full-time, year-round	772	166	21.5
Householder 65 years and over	288	51	17.7

Family received:			
Supplemental Security Income (SSI) and/or public assistance income in 1999	769	462	60.1
Social Security income in 1999	436	90	20.6
Mean income deficit (dollars)	8,589	(X)	(X)
Nonfamily householder	2,556	753	29.5
Below 150 percent of poverty level	1,175	(X)	(X)
Families below:			
150 percent of poverty level	4,594	(X)	(X)
185 percent of poverty level	5,708	(X)	(X)
With related children under 18 years	4,918	(X)	(X)
With related children under 5 years	2,855	(X)	(X)

(X) Not applicable.

Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P90, P91, P92, P93, PCT59, PCT60, and PCT61.

90745

QT-P3. Race and Hispanic or Latino: 2000

Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

Geographic Area: 90745 5-Digit ZCTA

NOTE: For information on confidentiality protection, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf1u.htm>.

Subject	Number	Percent
RACE		
Total population	55,473	100.0
One race	52,372	94.4
White	16,477	29.7
Black or African American	4,609	8.3

American Indian and Alaska Native	353	0.6
American Indian	217	0.4
Alaska Native	1	0.0
Both American Indian and Alaska Native	0	0.0
American Indian or Alaska Native, not specified	135	0.2
Asian	17,524	31.6
Asian Indian	249	0.4
Chinese	297	0.5
Filipino	15,117	27.3
Japanese	547	1.0
Korean	496	0.9
Vietnamese	260	0.5
Other Asian category	338	0.6
Two or more Asian categories	220	0.4
Native Hawaiian and Other Pacific Islander	2,048	3.7
Native Hawaiian	114	0.2
Samoan	1,660	3.0
Guamanian or Chamorro	131	0.2
Other Pacific Islander category	72	0.1
Two or more Native Hawaiian or Other Pacific Islander categories	71	0.1
Some other race	11,361	20.5
Two or more races	3,101	5.6
Two races including Some other race	1,506	2.7
Two races excluding Some other race, and three or more races	1,595	2.9
Two races excluding Some other race	1,390	2.5
Three or more races	205	0.4

HISPANIC OR LATINO		
Total population	55,473	100.0
Hispanic or Latino (of any race)	22,260	40.1
Mexican	17,983	32.4
Puerto Rican	393	0.7
Cuban	167	0.3
Other Hispanic or Latino	3,717	6.7
Not Hispanic or Latino	33,213	59.9
RACE AND HISPANIC OR LATINO		
Total population	55,473	100.0
One race	52,372	94.4
Hispanic or Latino	20,806	37.5
Not Hispanic or Latino	31,566	56.9
Two or more races	3,101	5.6
Hispanic or Latino	1,454	2.6
Not Hispanic or Latino	1,647	3.0
Subject	Number	Percent

(X) Not applicable.

Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrices P3, P4, PCT4, PCT5, PCT8, and PCT11.

QT-P17. Ability to Speak English: 2000

Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Geographic Area: 90745 5-Digit ZCTA

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

Subject	Number	Percent
POPULATION 5 YEARS AND OVER BY LANGUAGE SPOKEN AT HOME AND ABILITY TO SPEAK ENGLISH		

Population 5 years and over	51,498	100.0
Speak only English	19,211	37.3
Speak a language other than English	32,287	62.7
Spanish	17,158	100.0
Speak English "very well"	9,352	54.5
Speak English "well"	4,064	23.7
Speak English "not well"	2,674	15.6
Speak English "not at all"	1,068	6.2
Other Indo-European languages	606	100.0
Speak English "very well"	369	60.9
Speak English "well"	169	27.9
Speak English "not well"	43	7.1
Speak English "not at all"	25	4.1
Asian and Pacific Island languages	14,329	100.0
Speak English "very well"	8,479	59.2
Speak English "well"	4,329	30.2
Speak English "not well"	1,406	9.8
Speak English "not at all"	115	0.8
All other languages	194	100.0
Speak English "very well"	156	80.4
Speak English "well"	33	17.0
Speak English "not well"	5	2.6
Speak English "not at all"	0	0.0

ABILITY TO SPEAK ENGLISH		
Population 5 years and over	51,498	100.0
Speak a language other than English	32,287	62.7
5 to 17 years	6,138	11.9
18 to 64 years	22,680	44.0
65 years and over	3,469	6.7
Speak English less than "very well"	13,931	27.1
5 to 17 years	1,710	3.3
18 to 64 years	10,026	19.5
65 years and over	2,195	4.3
ABILITY TO SPEAK ENGLISH IN HOUSEHOLD		
Linguistically isolated households ¹	1,663	(X)
Population 5 years and over in households	50,974	100.0
In linguistically isolated households ¹	5,494	10.8
5 to 17 years	1,337	2.6
18 to 64 years	3,358	6.6
65 years and over	799	1.6
Subject	Number	Percent

(X) Not applicable.

¹ A linguistically isolated household is one in which no member 14 years old and over (1) speaks only English or (2) speaks a non-English language and speaks English "very well." In other words, all members 14 years old and over have at least some difficulty with English.

Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P19, P20, PCT13, and PCT14.

QT-P32. Income Distribution in 1999 of Households and Families: 2000

Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Geographic Area: **90745 5-Digit ZCTA**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on

confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

Subject	Households	Families			Nonfamily households
		Total	Married-couple families	Female householders, not husband present	
NUMBER					
Total	14,694	12,163	9,039	2,278	2,531
Less than \$10,000	988	494	214	212	523
\$10,000 to \$14,999	754	456	252	147	346
\$15,000 to \$19,999	590	427	292	90	181
\$20,000 to \$24,999	812	638	431	160	219
\$25,000 to \$29,999	919	807	585	205	170
\$30,000 to \$34,999	776	698	420	195	107
\$35,000 to \$39,999	727	711	482	179	83
\$40,000 to \$44,999	857	712	524	128	160
\$45,000 to \$49,999	831	680	464	147	116
\$50,000 to \$59,999	1,527	1,302	963	239	213
\$60,000 to \$74,999	2,061	1,795	1,433	270	204
\$75,000 to \$99,999	1,965	1,735	1,449	221	136
\$100,000 to \$124,999	1,043	946	846	47	35
\$125,000 to \$149,999	423	400	354	28	0
\$150,000 to \$199,999	264	227	203	10	29
\$200,000 or more	157	135	127	0	9
Median income (dollars)	50,610	53,218	58,428	37,462	24,905

Mean income (dollars)	58,820	62,024	67,574	43,859	34,976
PERCENT DISTRIBUTION					
Total	100.0	100.0	100.0	100.0	100.0
Less than \$10,000	6.7	4.1	2.4	9.3	20.7
\$10,000 to \$14,999	5.1	3.7	2.8	6.5	13.7
\$15,000 to \$19,999	4.0	3.5	3.2	4.0	7.2
\$20,000 to \$24,999	5.5	5.2	4.8	7.0	8.7
\$25,000 to \$29,999	6.3	6.6	6.5	9.0	6.7
\$30,000 to \$34,999	5.3	5.7	4.6	8.6	4.2
\$35,000 to \$39,999	4.9	5.8	5.3	7.9	3.3
\$40,000 to \$44,999	5.8	5.9	5.8	5.6	6.3
\$45,000 to \$49,999	5.7	5.6	5.1	6.5	4.6
\$50,000 to \$59,999	10.4	10.7	10.7	10.5	8.4
\$60,000 to \$74,999	14.0	14.8	15.9	11.9	8.1
\$75,000 to \$99,999	13.4	14.3	16.0	9.7	5.4
\$100,000 to \$124,999	7.1	7.8	9.4	2.1	1.4
\$125,000 to \$149,999	2.9	3.3	3.9	1.2	0.0
\$150,000 to \$199,999	1.8	1.9	2.2	0.4	1.1
\$200,000 or more	1.1	1.1	1.4	0.0	0.4

(X) Not applicable.

Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P52, P53, P54, P79, P80, P81, PCT38, PCT40, and PCT41.

QT-P35. Poverty Status in 1999 of Families and Nonfamily Householders: 2000

Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Geographic Area: 90745 5-Digit ZCTA

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

<input type="checkbox"/> Poverty Status	<input type="checkbox"/> Number	<input type="checkbox"/> Percent
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	All income levels	Below poverty level	below poverty level
Families	12,163	874	7.2
With related children under 18 years	7,453	665	8.9
With related children under 5 years	2,979	305	10.2
Householder worked in 1999	9,492	408	4.3
Full-time, year-round	6,074	79	1.3
Householder 65 years and over	1,924	113	5.9
Family received:			
Supplemental Security Income (SSI) and/or public assistance income in 1999	1,633	250	15.3
Social Security income in 1999	2,595	122	4.7
Mean income deficit (dollars)	7,329	(X)	(X)
Married-couple families	9,039	471	5.2
With related children under 18 years	5,527	321	5.8
With related children under 5 years	2,288	179	7.8
Householder worked in 1999	7,124	238	3.3
Full-time, year-round	4,647	70	1.5
Householder 65 years and over	1,434	77	5.4
Family received:			
Supplemental Security Income (SSI) and/or public assistance income in 1999	1,050	111	10.6
Social Security income in 1999	1,874	60	3.2
Mean income deficit (dollars)	7,077	(X)	(X)
Families with female householder, no husband present	2,278	296	13.0
With related children under 18 years	1,410	242	17.2

With related children under 5 years	520	100	19.2
Householder worked in 1999	1,702	113	6.6
Full-time, year-round	1,035	9	0.9
Householder 65 years and over	392	31	7.9
Family received:			
Supplemental Security Income (SSI) and/or public assistance income in 1999	458	124	27.1
Social Security income in 1999	514	57	11.1
Mean income deficit (dollars)	7,741	(X)	(X)
Nonfamily householder	2,531	377	14.9
Below 150 percent of poverty level	820	(X)	(X)
Families below:			
150 percent of poverty level	1,805	(X)	(X)
185 percent of poverty level	2,748	(X)	(X)
With related children under 18 years	1,980	(X)	(X)
With related children under 5 years	956	(X)	(X)

(X) Not applicable.

Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P90, P91, P92, P93, PCT59, PCT60, and PCT61.

90810

QT-P3. Race and Hispanic or Latino: 2000

Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data

Geographic Area: 90810 5-Digit ZCTA

NOTE: For information on confidentiality protection, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf1u.htm>.

Subject	Number	Percent
RACE		

Total population	35,637	100.0
One race	33,688	94.5
White	8,498	23.8
Black or African American	5,846	16.4
American Indian and Alaska Native	297	0.8
American Indian	161	0.5
Alaska Native	0	0.0
Both American Indian and Alaska Native	0	0.0
American Indian or Alaska Native, not specified	136	0.4
Asian	8,255	23.2
Asian Indian	41	0.1
Chinese	55	0.2
Filipino	7,167	20.1
Japanese	403	1.1
Korean	54	0.2
Vietnamese	109	0.3
Other Asian category	328	0.9
Two or more Asian categories	98	0.3
Native Hawaiian and Other Pacific Islander	1,093	3.1
Native Hawaiian	20	0.1
Samoan	887	2.5
Guamanian or Chamorro	104	0.3
Other Pacific Islander category	59	0.2
Two or more Native Hawaiian or Other Pacific Islander categories	23	0.1
Some other race	9,699	27.2
Two or more races	1,949	5.5
Two races including Some other race	1,100	3.1

Two races excluding Some other race, and three or more races	849	2.4
Two races excluding Some other race	733	2.1
Three or more races	116	0.3
HISPANIC OR LATINO		
Total population	35,637	100.0
Hispanic or Latino (of any race)	16,245	45.6
Mexican	13,373	37.5
Puerto Rican	140	0.4
Cuban	53	0.1
Other Hispanic or Latino	2,679	7.5
Not Hispanic or Latino	19,392	54.4
RACE AND HISPANIC OR LATINO		
Total population	35,637	100.0
One race	33,688	94.5
Hispanic or Latino	15,276	42.9
Not Hispanic or Latino	18,412	51.7
Two or more races	1,949	5.5
Hispanic or Latino	969	2.7
Not Hispanic or Latino	980	2.7
Subject	Number	Percent

QT-P17. Ability to Speak English: 2000

Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Geographic Area: **90810 5-Digit ZCTA**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

Subject	Number	Percent
POPULATION 5 YEARS AND OVER BY LANGUAGE SPOKEN AT HOME AND ABILITY TO SPEAK ENGLISH		
Population 5 years and over	32,593	100.0
Speak only English	12,427	38.1
Speak a language other than English	20,166	61.9
Spanish		
Spanish	12,786	100.0
Speak English "very well"	6,051	47.3
Speak English "well"	2,738	21.4
Speak English "not well"	2,568	20.1
Speak English "not at all"	1,429	11.2
Other Indo-European languages		
Other Indo-European languages	271	100.0
Speak English "very well"	148	54.6
Speak English "well"	56	20.7
Speak English "not well"	58	21.4
Speak English "not at all"	9	3.3
Asian and Pacific Island languages		
Asian and Pacific Island languages	7,005	100.0
Speak English "very well"	3,747	53.5
Speak English "well"	2,365	33.8
Speak English "not well"	841	12.0
Speak English "not at all"	52	0.7
All other languages		
All other languages	104	100.0

Speak English "very well"	78	75.0
Speak English "well"	12	11.5
Speak English "not well"	0	0.0
Speak English "not at all"	14	13.5
ABILITY TO SPEAK ENGLISH		
Population 5 years and over	32,593	100.0
Speak a language other than English	20,166	61.9
5 to 17 years	5,186	15.9
18 to 64 years	13,235	40.6
65 years and over	1,745	5.4
Speak English less than "very well"	10,142	31.1
5 to 17 years	1,778	5.5
18 to 64 years	7,189	22.1
65 years and over	1,175	3.6
ABILITY TO SPEAK ENGLISH IN HOUSEHOLD		
Linguistically isolated households ¹	1,323	(X)
Population 5 years and over in households	31,943	100.0
In linguistically isolated households ¹	4,669	14.6
5 to 17 years	1,402	4.4
18 to 64 years	2,878	9.0
65 years and over	389	1.2
Subject	Number	Percent

(X) Not applicable.

¹ A linguistically isolated household is one in which no member 14 years old and over (1) speaks only English or (2) speaks a non-English language and speaks English "very well." In other words, all members 14 years old and over have at least some difficulty with English.

Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P19, P20, PCT13, and PCT14.

QT-P32. Income Distribution in 1999 of Households and Families: 2000
 Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data
 Geographic Area: **90810 5-Digit ZCTA**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

Subject	House holds	Families			Nonfamily house holds
		Total	Married-couple families	Female householder, no husband present	
NUMBER					
Total	9,144	7,586	4,987	1,914	1,558
Less than \$10,000	1,099	699	186	431	440
\$10,000 to \$14,999	664	452	265	135	235
\$15,000 to \$19,999	626	529	275	168	172
\$20,000 to \$24,999	749	602	354	171	105
\$25,000 to \$29,999	576	448	267	134	126
\$30,000 to \$34,999	593	490	307	111	115
\$35,000 to \$39,999	603	561	341	162	40
\$40,000 to \$44,999	483	450	365	80	46
\$45,000 to \$49,999	419	390	248	113	49
\$50,000 to \$59,999	774	702	556	106	88
\$60,000 to \$74,999	985	878	660	145	66
\$75,000 to \$99,999	933	827	697	105	39
\$100,000 to \$124,999	336	275	234	27	33
\$125,000 to \$149,999	126	118	99	19	0

\$150,000 to \$199,999	93	93	77	0	0
\$200,000 or more	85	72	56	7	4
Median income (dollars)	36,966	40,119	47,553	26,625	17,875
Mean income (dollars)	48,614	50,847	57,575	35,737	26,031
PERCENT DISTRIBUTION					
Total	100.0	100.0	100.0	100.0	100.0
Less than \$10,000	12.0	9.2	3.7	22.5	28.2
\$10,000 to \$14,999	7.3	6.0	5.3	7.1	15.1
\$15,000 to \$19,999	6.8	7.0	5.5	8.8	11.0
\$20,000 to \$24,999	8.2	7.9	7.1	8.9	6.7
\$25,000 to \$29,999	6.3	5.9	5.4	7.0	8.1
\$30,000 to \$34,999	6.5	6.5	6.2	5.8	7.4
\$35,000 to \$39,999	6.6	7.4	6.8	8.5	2.6
\$40,000 to \$44,999	5.3	5.9	7.3	4.2	3.0
\$45,000 to \$49,999	4.6	5.1	5.0	5.9	3.1
\$50,000 to \$59,999	8.5	9.3	11.1	5.5	5.6
\$60,000 to \$74,999	10.8	11.6	13.2	7.6	4.2
\$75,000 to \$99,999	10.2	10.9	14.0	5.5	2.5
\$100,000 to \$124,999	3.7	3.6	4.7	1.4	2.1
\$125,000 to \$149,999	1.4	1.6	2.0	1.0	0.0
\$150,000 to \$199,999	1.0	1.2	1.5	0.0	0.0
\$200,000 or more	0.9	0.9	1.1	0.4	0.3

(X) Not applicable.

Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices P52, P53, P54, P79, P80, P81, PCT38, PCT40, and PCT41.

QT-P35. Poverty Status in 1999 of Families and Nonfamily Householders: 2000

Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

Geographic Area: **90810 5-Digit ZCTA**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see <http://factfinder.census.gov/home/en/datanotes/expsf3.htm>.

Poverty Status	Number		Percent below poverty level
	All income levels	Below poverty level	
Families	7,586	1,346	17.7
With related children under 18 years	5,169	1,203	23.3
With related children under 5 years	2,243	654	29.2
Householder worked in 1999	5,582	716	12.8
Full-time, year-round	3,161	203	6.4
Householder 65 years and over	1,029	65	6.3
Family received:			
Supplemental Security Income (SSI) and/or public assistance income in 1999	1,300	488	37.5
Social Security income in 1999	1,482	144	9.7
Mean income deficit (dollars)	8,611	(X)	(X)
Married-couple families	4,987	602	12.1
With related children under 18 years	3,343	527	15.8
With related children under 5 years	1,484	295	19.9
Householder worked in 1999	3,940	404	10.3
Full-time, year-round	2,341	146	6.2
Householder 65 years and over	692	21	3.0
Family received:			
Supplemental Security Income (SSI)	502	83	16.5

and/or public assistance income in 1999			
Social Security income in 1999	993	75	7.6
Mean income deficit (dollars)	7,607	(X)	(X)
Families with female householder, no husband present	1,914	587	30.7
With related children under 18 years	1,363	546	40.1
With related children under 5 years	533	261	49.0
Householder worked in 1999	1,144	214	18.7
Full-time, year-round	556	17	3.1
Householder 65 years and over	252	44	17.5
Family received:			
Supplemental Security Income (SSI) and/or public assistance income in 1999	667	369	55.3
Social Security income in 1999	363	66	18.2
Mean income deficit (dollars)	9,833	(X)	(X)
Nonfamily householder	1,558	372	23.9
Below 150 percent of poverty level	653	(X)	(X)
Families below:			
150 percent of poverty level	2,285	(X)	(X)
185 percent of poverty level	2,958	(X)	(X)
With related children under 18 years	2,478	(X)	(X)
With related children under 5 years	1,376	(X)	(X)

(X) Not applicable.

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
MONITORING AND ANALYSIS**

Rule 1158 Follow-Up Study #7

**Sampling Conducted
October 2002 – December 2002**

**Program Monitoring Conducted By
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Sumner Wilson, Senior Air Quality Instrument Specialist
Edward Ruffino, Air Quality Instrument Specialist II
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September, 2003**

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Report # MA 2003-05

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EXECUTIVE SUMMARY

Purpose

In June 1999, Rule 1158 affecting storage, handling and shipment of petroleum coke, coal, and sulfur was amended to further reduce particulate emissions from these sources. This study is one of an ongoing series, examining targeted compounds contained in the inhalable particulate fraction (PM₁₀) in the greater Long Beach/Wilmington area. This series of studies consists of PM₁₀ sampling in the spring/summer and fall/winter, observing trends in ambient PM₁₀ concentration and the elemental carbon content of collected samples.

Additional sampling was conducted in an attempt to characterize the impact of the September-October 2002 West Coast Port Strike on local air quality.

Sampling

Sampling was conducted at an increased rate between October 5, 2002 and December 16, 2002 compared to previous fall/winter Rule 1158 Follow-up studies. However, to ensure comparability with previous studies, field personnel were careful to collect samples coincident with the AQMD PM₁₀ monitoring network one-in-six day schedule. Sampling locations were those utilized for the previous Rule 1158 Follow-Up studies, with an additional location nearer to the port, to increase the amount of data collected during and after the strike. Field operations were conducted by members of the AQMD Special Monitoring Branch, while all laboratory operations and data analysis were performed by AQMD Laboratory personnel.

Key Findings

1. Study (three-site) average PM₁₀ values showed a continued decrease in PM₁₀ for the 2002 fall/winter study, a trend maintained since fall/winter 1999.
2. Recent, moderate increases in EC during the 2001 and 2002 studies suggest that the majority of EC reductions due to Rule 1158 were realized by the end of 2000, and since that time increased EC emissions from other sources have outpaced ongoing Rule 1158 improvements.
3. The series of studies have shown that the HUD site consistently experiences PM₁₀ and EC pollution levels higher than those experienced at other study sites. Further investigation would be necessary to determine the extent of the area surrounding HUD that is similarly affected, or to identify potential sources contributing to the higher concentrations.
4. While a cause/effect relationship cannot be established, the possibility that the unique commercial traffic conditions created by the West Coast Port Strike contributed to elevated EC concentrations in the Greater Long Beach area is not contraindicated by the study data. Study average EC concentrations were lower during the strike, and increased afterward through the end of the year.

1.0 INTRODUCTION

Over the course of several years prior to 1997, residents of Long Beach and Wilmington area neighborhoods lodged several complaints of black, oily airborne dust with the AQMD. Surveys of the area noted that there were numerous coal and petroleum coke production, storage, and shipment facilities. These included open stockpiles of green coke, enclosed "coke barns", refinery kilns producing petroleum coke, and a variety of coke and coal carrying trains and trucks. Other industrial processes including sulfur distribution facilities, heavy traffic patterns, and general construction activities were also noted in the area.

In August of 1996, AQMD staff attended a public meeting in San Pedro, which focused on public concern over the levels of particulate matter in the region. Subsequently, the AQMD coordinated with various public action groups to select several sites for particulate monitoring, including sites located at specific areas of community concern.

Two studies were conducted at these sites, one in May 1997¹ and one in fall/winter 1998². These studies were designed to characterize local micrometeorological parameters, and to microscopically and chemically characterize airborne particulate collected in the area. The most pronounced findings of these studies were the elevated levels of elemental carbon and inhalable particulate matter at some study sites, including a monitoring site adjacent to Elizabeth Hudson Elementary School in Long Beach.

In June 1999 the AQMD amended of Rule 1158 affected storage, handling and shipment practices for petroleum coke, coal, and sulfur. Subsequent California State legislation HSC 40459 (AB 1775 - Lowenthal) requires that the AQMD, in conjunction with CARB, prepare an annual study for the California State Legislature examining the frequency and severity of violations related to AQMD Rule 1158. To monitor the efficacy of the rule and provide supporting data for the Legislative Report, the AQMD initiated a series of *Rule 1158 Follow-up Studies*. These studies are conducted twice annually on an ongoing basis; once each spring/summer and fall/winter.

Removal and enclosure of open coke storage piles, and modification to equipment and work practices to comply with Rule 1158 requirements is ongoing. The Rule 1158 compliance schedule mandates implementation of the majority of control measures by August 1999, with full implementation of all measures by June 2004. Compliance field staff have documented a high rate of compliance with the initial rule implementation requirements, including covered transport, truck washing, prompt roadway/spill clean-up and the removal of several large open coke piles that has resulted in the reduction of fugitive coke emissions from storage, handling, and shipping operations.

¹ South Coast Air Quality Management District. (September 1997) *Micrometeorological and Ambient Air Quality Monitoring Conducted Simultaneously in the Vicinity of the Los Angeles and Long Beach Harbors*. Diamond Bar, CA.

² South Coast Air Quality Management District. (March 1999) *Micrometeorological and Ambient Air Quality Monitoring Conducted Simultaneously in the Vicinity of the Los Angeles and Long Beach Harbors*. Diamond Bar, CA.

2.0 PROJECT DISCUSSION

Throughout the series of Rule 1158 Follow-up studies, an effort has been made to maximize comparability of the data sets from year to year, by utilizing the same sampling sites, sampling coincident with the PM₁₀ monitoring network, conducting the study as nearly as possible on the same dates, and sampling for a fixed number of days (ten.) As the scheduled start date for this study approached, much of the West Coast and particularly the Long Beach/Wilmington area became impacted by the West Coast Port Strike (September 30, 2002 – October 9, 2002.)

The Port Strike posed the problem of altered maritime and intermodal transportation patterns in the area, which could impact comparability of Fall 2002 Study results with findings from previous studies. At the same time, it was thought that increased monitoring during the unique traffic conditions might provide an insight into the impacts made on local air quality by shipping and related commercial transportation. Consequently, the number of sampling locations and sampling days was increased to capture as much data as possible during this unique period.

From October 5, 2002 through December 16, 2002, PM₁₀ monitoring was conducted at four locations in the cities of Long Beach (two sites) and Wilmington (two sites). Sampling was conducted on a one-in-six day schedule, coincident with the AQMD PM₁₀ monitoring network. Additional samples were collected between network monitoring events through November 10th, as field technicians were available. The resulting data set consists of 116 samples, collected over 25 sampling days.

The body of this report will discuss the thirteen scheduled one-in-six day sampling events, to allow comparison of the data to the previous Fall 1158 Follow-up studies. The entire data set, and its correlation with a maritime traffic will be treated separately in Appendix A-1.

The Fall/winter 2002 Rule 1158 Follow-up study builds on a base of knowledge established by eight previous studies: two prior to Rule amendment and six follow-up studies. Together they constitute a set of three spring/summer studies (1997, 2000, 2001, 2002)^{3,4}, and three fall/winter studies (1998, 1999, and 2000)^{5,6}. The primary objectives of the current study were to collect data suitable for the evaluation of:

- Current inhalable particulate (PM₁₀) ambient concentration trends for the study area.
- Speciation of the carbonaceous component of the collected particulate samples for elemental and organic carbon content.
- Comparison of 2002 PM₁₀ mass and carbon data with that obtained during the earlier Rule 1158 studies.

³ South Coast Air Quality Management District. (September 1997)

⁴ South Coast Air Quality Management District. *Rule 1158 Follow-Up Study #2, #4 and #6*. Diamond Bar, CA.

⁵ South Coast Air Quality Management District. (March 1999)

⁶ South Coast Air Quality Management District. *Rule 1158 Follow-Up Study #1 and #3*. Diamond Bar, CA.

Site 2: Edison Elementary School (EDI)
625 Maine Avenue
Long Beach, California

Site #2 was located at the Edison Elementary School in Long Beach. The PM₁₀ sampler was located on a steel container at the western side of the school and playground. The sampler was also installed on a five-foot platform to clear the school building to the east. The meteorological exposure consists of (1), a main street artery (16th Street) which carries heavy vehicle traffic, is located to the north (2), school buildings to the east and south and (3), a small bus terminal to the west of the monitoring site.

Site 3: Wilmington Childcare Center (WIL)
1419 Young Street
Wilmington, California

The monitoring site was installed on the roof of the Childcare Center, near a elementary and middle school in the City of Wilmington. The meteorological exposure consists of (1), a residential area to the north (2), commercial/industrial development to the east (3), school to the south and (4) parking area/residential area to the west of the monitoring site.

2.2 SAMPLING AND ANALYSIS METHODOLOGY

The AQMD maintains a PM₁₀ monitoring network throughout the South Coast Air Basin (the Basin). The Federal Reference Method (FRM) SSI PM₁₀ samplers utilized in the PM₁₀ network and standard AQMD analytical procedures are summarized here:

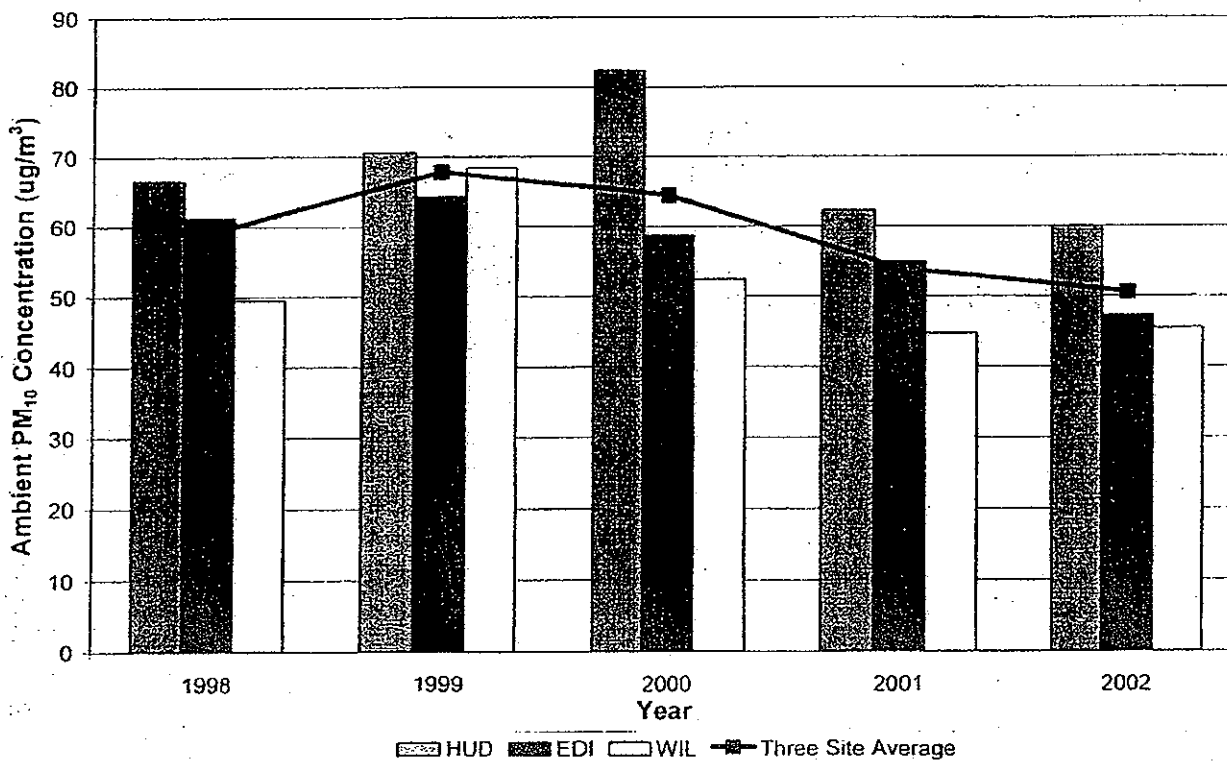
The SSI sampler used in this study is the EPA's FRM sampler found in 40CFR50 Appendix J. It is used to monitor PM less than 10 microns in size (PM₁₀). For the purposes of this study, the SSI samplers are used to collect PM₁₀ samples, which were also used for the determination of organic carbon (OC), elemental carbon and total carbon.

The SSI sampler contains a pump controlled by a programmable timer. An elapsed time accumulator, linked in parallel with the pump, records total pump-operation time in hours. During operation, a known quantity of air is drawn through a particle size separator, which achieves particle separation, by impaction. The correct flow rate through the inlet is critical to collection of the correct particle size so that after impaction, only particles 10 microns in size or less remain suspended in the airstream. The flow of air then passes through a quartz filter medium, upon which the particles are collected. A programmable timer automatically turns the pump off at the end of the 24-hour sampling period.

The State of California has established $50 \mu\text{g}/\text{m}^3$ as the PM_{10} 24-hour standard. Sixteen of the forty-four (36%) samples collected during the course of the study exceeded this standard. The highest site average ($60 \mu\text{g}/\text{m}^3$) over the course of the study occurred at the HUD site. This continues the trend observed in previous studies, where HUD ranked highest among study sites for PM_{10} .

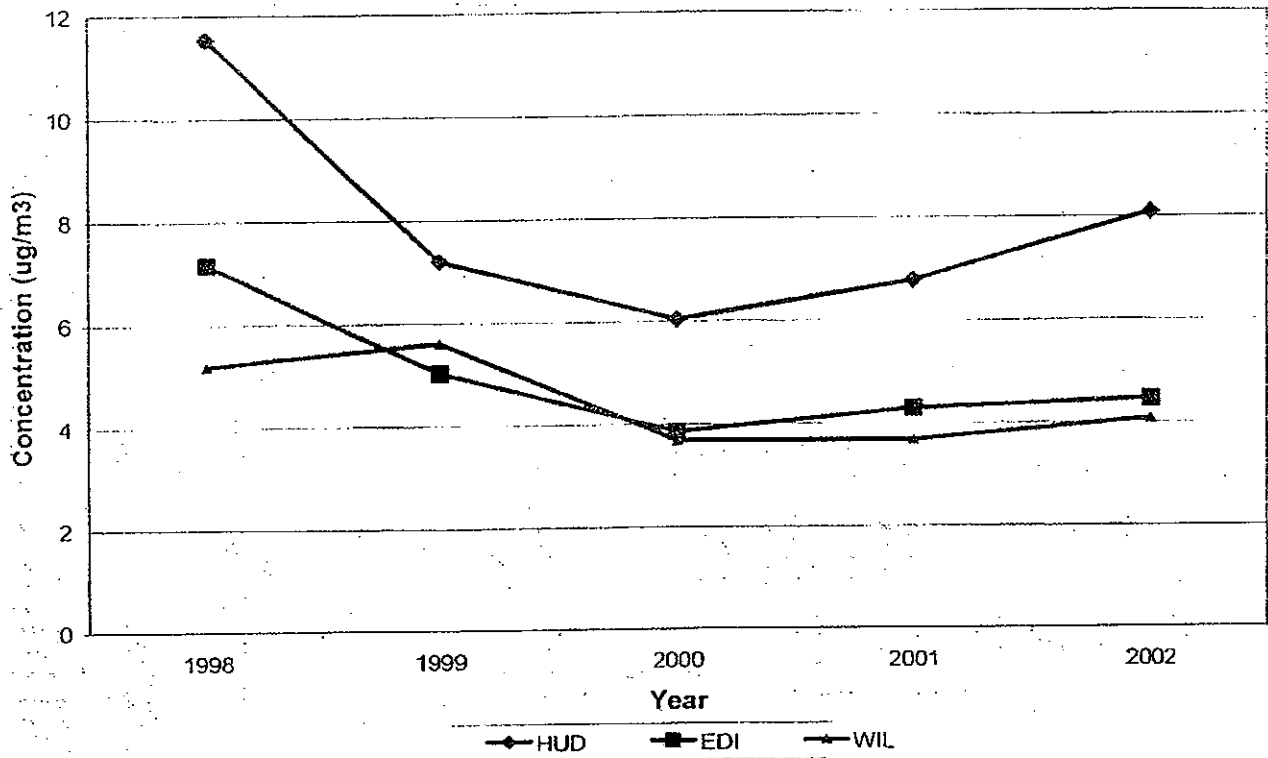
For all studies except the fall/winter 2000 study, the HUD site has exhibited the highest study PM_{10} average. It should also be noted that on several occasions in this and the previous seven studies the HUD site produced PM_{10} samples significantly higher than those observed at EDI and WIL. Taken together, these trends suggest that HUD consistently experiences higher PM_{10} concentrations than elsewhere in the study area. Such elevated samples may be the result of local sources or meteorological conditions influencing the immediate area adjacent to the sampler, and underscore the complexity and variety of particulate sources that contribute to ambient PM_{10} .⁸ These include carbonaceous components (EC and OC), crustal materials and wind-blown soils, sulfate and nitrate formed by precursor SO_x and NO_x emissions primarily as a result of combustion, and sodium chloride particulate resulting in part from wind-carried sea salt. Increases in PM_{10} observed at study sites may be the result of contributions from one or several of these sources. Particle formation is also highly influenced by meteorological conditions, which vary seasonally and from year to year.

Figure 2: Fall/Winter PM_{10} Trends



⁶Kim, B.M., Teffera, S., Zeldin, M.D. Characterization of $\text{PM}_{2.5}$ and PM_{10} in the South Coast Air Basin of Southern California: Part I – Spatial Variations. *J. Air and Waste Manage. Assoc.* 2000 50:2034-2044.

Figure 4: Average EC by Site and Year



The majority of control measures required by Rule 1158 were in place by August 1999. Site average EC concentrations at HUD and EDI saw a dramatic decrease from fall/winter 1998 to fall/winter 1999 following implementation of controls, and all sites continued to decrease through fall/winter 2000. Since fall/winter 2001, study sites have seen a modest rise in average EC concentrations, with the rise at the HUD site being more pronounced.

These trends suggest that implementation of Rule 1158 contributed to a significant decrease in EC in the study area, with the majority of reductions achieved by fall/winter 2000. Since that time, EC in the study area has begun to creep upward suggesting that competing sources have begun to contribute the dominant portion of EC, and that the contribution from those sources has begun to increase; marginally at EDI and WIL, more rapidly at HUD.

The HUD site has consistently had the highest average PM_{10} concentrations, the highest average EC concentrations, and is experiencing an increase in EC at a more rapid rate than other study sites. Taken together, these results suggest that HUD may be significantly impacted by local pollution sources not experienced by the remainder of the study area.

4.0 CONCLUSIONS

Study (three-site) average PM_{10} values showed a continued decrease in PM_{10} for the 2002 fall/winter study, a trend maintained since fall/winter 1999. PM_{10} concentrations at the HUD site were higher than those at other study sites, as has been observed throughout the series of fall/winter studies.

Ambient EC increased slightly during both the 2001 and 2002 studies for all study sites. The study average EC value for HUD was nearly two times higher than the other study sites for fall/winter 2002. As discussed earlier, elemental carbon arises in part from coke and coal storage as well as from transportation including diesel emissions from trucks, trains and ships. Changes in EC may be attributable to changes in the contributions from one or more of these sources.

From 1998 – 2000, ambient elemental carbon concentrations had decreased steadily over the series of fall/winter studies, but fluctuated during the spring/summer studies. This period of decline coincides with implementation of the majority of control measures put in place by Amended Rule 1158. Coupled with recent, moderate increases in EC during the 2001 and 2002 studies, this suggests that the majority of EC reductions due to Rule 1158 were realized by the end of 2000, and since that time increased EC emissions from other sources have outpaced ongoing Rule 1158 improvements.

The series of studies have shown that the HUD site consistently experiences PM_{10} and EC pollution levels higher than those experienced at other study sites. Further investigation would be necessary to determine the extent of the area surrounding HUD that is similarly affected, or to identify potential sources contributing to the higher concentrations.

A 5.3 DATA ANALYSIS

Figure A-1: Study Average EC and Number of Ships in Harbor

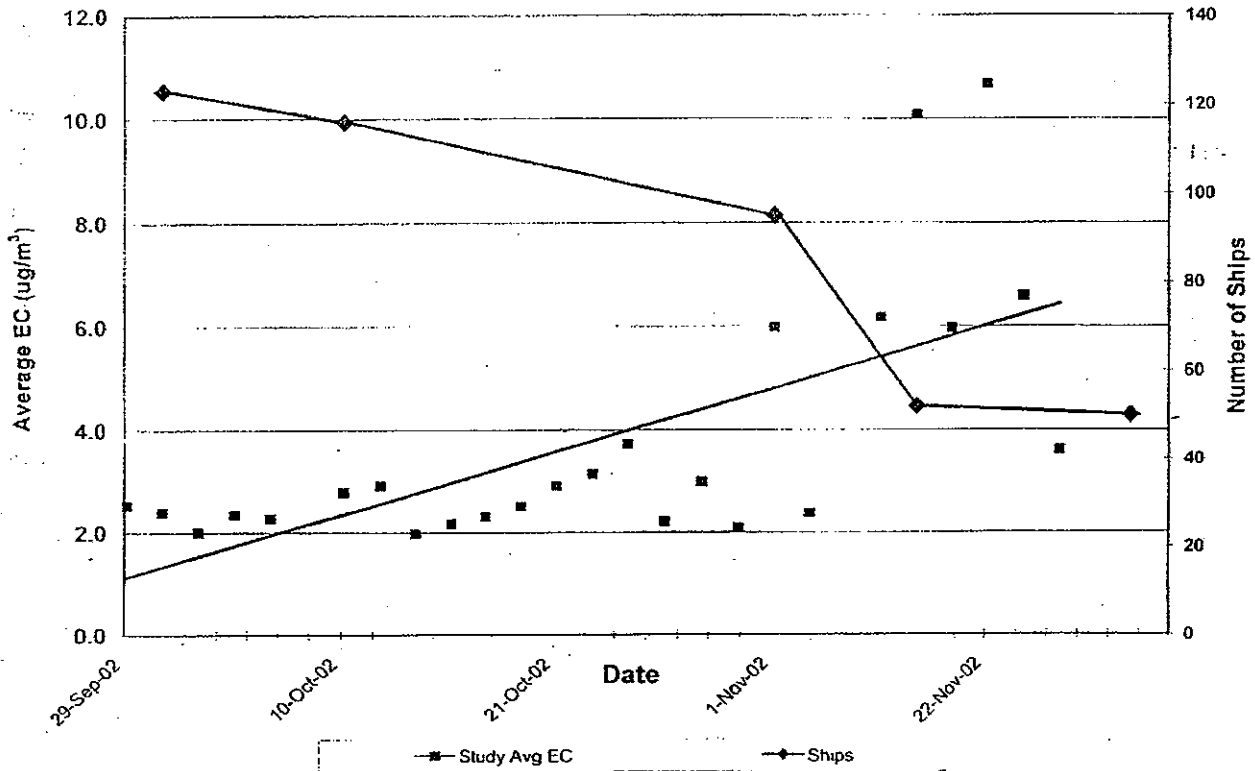


Figure A-1 illustrates daily five-site average EC concentrations (left vertical axis). For illustrative purposes, a linear trendline has been drawn through the data. Complete data tabulation can be found in Appendix A-2. The right vertical axis represents estimated shipping traffic at the Port of Long Beach, as described by the USCG.

An increasing trend in EC concentrations was noted beginning in late October/early November, which continued through the end of the year. This trend is common in the Basin as the low particulate summer months lead into the higher particulate winter. However, the trend for 2002 is the most pronounced since that observed in the 1998 study.

Coincident to the increasing particulate trend is a decreasing trend for shipping (and a postulated increase in land based intermodal transport). While a cause/effect relationship cannot be established, the possibility that the unique commercial traffic conditions created by the West Coast Port Strike contributed to elevated EC concentrations in the Greater Long Beach area is not contraindicated by the study data.

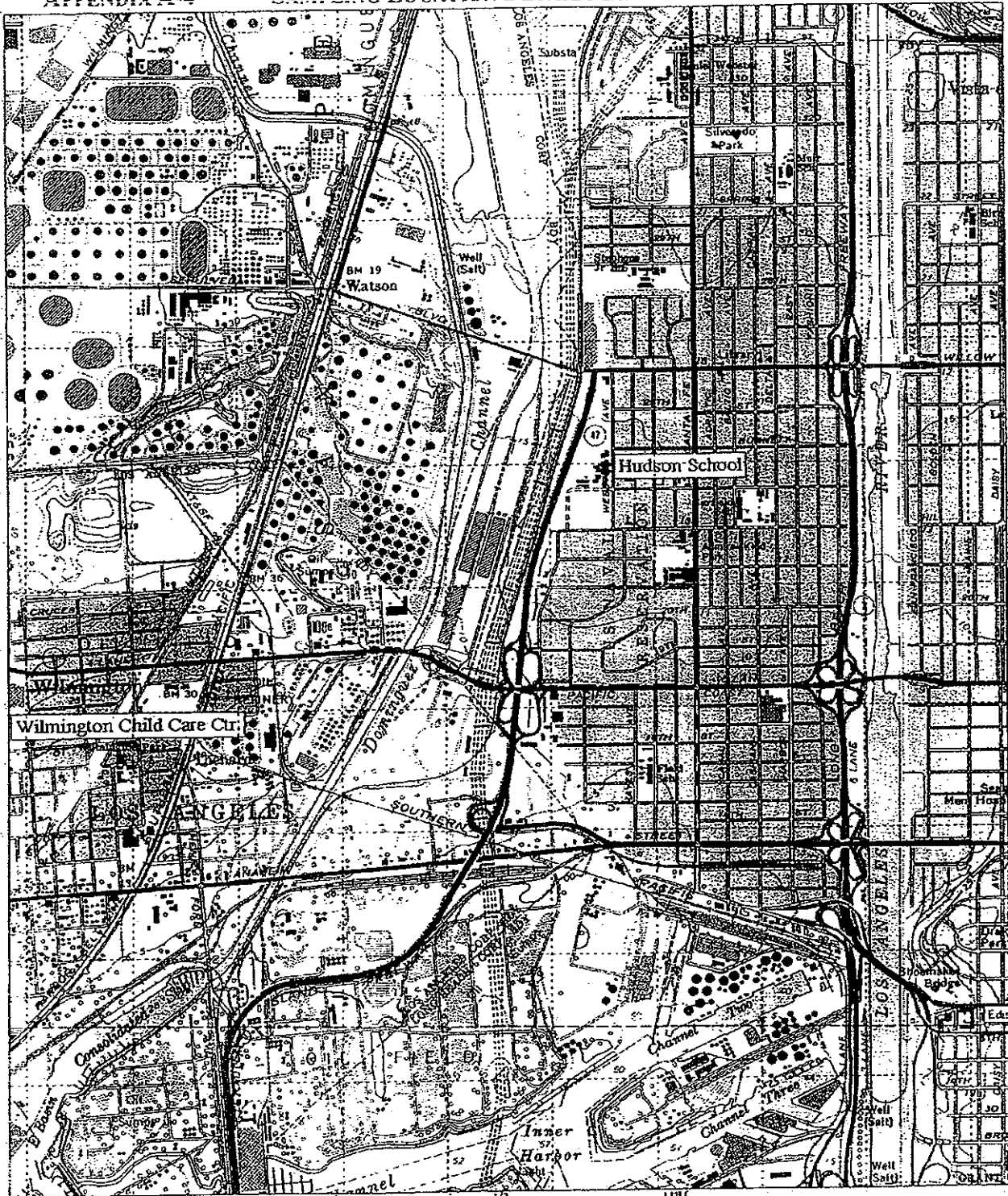
APPENDIX A-3 RULE 1158 LONG BEACH PM₁₀ MONITORING DATA

2002 Fall/Winter PM ₁₀ Ambient Concentration Results													
Location	10/5/02	10/17/02	10/23/02	10/29/02	11/4/02	11/10/02	11/16/02	11/22/02	11/28/02	12/4/02	12/10/02	12/16/02	Average
HUD	46	43	52	37	58	-	87	88	-	98	63	28	60
EDI	46	40	45	48	48	25	-	55	62	78	47	26	47
WIL	-	39	32	38	55	20	34	75	66	78	38	25	45
LB Station	45	35	43	32	50	23	28	51	51	75	44	24	42
* No Sample													
2002 Fall/Winter Organic Carbon Ambient Concentration Results													
Location	10/5/02	10/17/02	10/23/02	10/29/02	11/4/02	11/10/02	11/16/02	11/22/02	11/28/02	12/4/02	12/10/02	12/16/02	Average
HUD	6.5	5.1	5.3	3.6	4.7	-	10.5	10.7	-	9.8	9.8	3.0	6.9
EDI	6.9	4.4	4.4	3.9	5.0	3.8	-	7.4	8.7	7.4	8.4	2.5	5.7
WIL	-	4.8	3.3	3.8	7.5	3.0	5.3	8.6	9.9	7.3	7.8	2.2	5.8
LB Station	7.2	4.0	3.4	3.9	3.7	2.8	4.0	6.7	6.6	10.2	6.7	3.4	5.2
2002 Fall/Winter Elemental Carbon Ambient Concentration Results													
Location	10/5/02	10/17/02	10/23/02	10/29/02	11/4/02	11/10/02	11/16/02	11/22/02	11/28/02	12/4/02	12/10/02	12/16/02	Average
HUD	2.8	3.1	5.5	3.1	3.7	-	11.0	17.0	-	12.1	12.7	4.8	8.1
EDI	2.7	2.0	2.8	1.5	1.6	2.8	-	8.5	6.5	11.0	6.0	3.5	4.5
WIL	-	2.1	1.3	2.2	0.3	1.6	4.6	10.0	5.3	19.6	3.5	3.3	4.1
LB Station	2.5	1.7	3.0	1.8	3.1	2.8	4.4	7.3	7.0	5.9	7.6	2.7	4.2
2002 Fall/Winter Total Carbon Ambient Concentration Results													
Location	10/5/02	10/17/02	10/23/02	10/29/02	11/4/02	11/10/02	11/16/02	11/22/02	11/28/02	12/4/02	12/10/02	12/16/02	Average
HUD	9.5	8.2	10.8	6.7	8.4	-	21.6	27.8	-	26.9	22.4	7.7	15.0
EDI	9.6	6.4	7.2	5.4	6.6	6.6	-	15.9	15.2	18.5	14.4	6.0	10.2
WIL	-	7.0	4.6	6.0	7.8	4.7	9.9	18.7	15.2	17.9	11.3	5.5	9.9
LB Station	-	5.7	6.4	5.7	6.8	5.7	8.4	13.9	13.6	16.2	14.3	6.1	9.3
2002 Fall/Winter Elemental Carbon as a Percentage of Total PM ₁₀													
Location	10/5/02	10/17/02	10/23/02	10/29/02	11/4/02	11/10/02	11/16/02	11/22/02	11/28/02	12/4/02	12/10/02	12/16/02	Average
HUD	6.2%	7.2%	10.6%	8.4%	6.4%	-	12.7%	19.4%	-	17.5%	20.1%	17.1%	12.6
EDI	5.9%	5.1%	6.3%	3.2%	3.3%	11.2%	-	15.5%	10.6%	14.1%	12.8%	13.3%	9.2
WIL	-	5.4%	4.1%	5.7%	0.5%	8.1%	13.5%	13.4%	8.0%	13.6%	9.3%	13.2%	8.6
LB Station	-	4.8%	7.1%	5.7%	6.3%	12.3%	15.9%	14.3%	13.8%	7.9%	17.2%	11.1%	10.6

2001 Fall/Winter PM ₁₀ Ambient Concentration Results								
Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	40	62	97	39	36	76	86	62
EDI	24	-	105	33	33	63	72	55
WIL	16	43	47	37	25	75	70	45
LB Station	25	14	24	30	24	56	-	29
* No Sample								
2001 Fall/Winter Organic Carbon Ambient Concentration Results								
Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	5.6	12.9	10.9	9.7	6.9	16	17.2	11.3
EDI	3.3	-	8.8	8.7	7	13.9	15.9	9.6
WIL	2.9	9.2	6.9	9.4	4.7	15.5	13.5	8.9
2001 Fall/Winter Elemental Carbon Ambient Concentration Results								
Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	5.2	7.8	7.1	4.7	4.6	8.4	9.7	6.8
EDI	2.3	-	4.3	3.8	3.3	5.5	6.6	4.3
WIL	1.4	4.2	2.7	4.1	1.8	6.2	5.4	3.7
2001 Fall/Winter Total Carbon Ambient Concentration Results								
Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	10.8	20.7	18	14.4	11.5	24.4	26.9	18.1
EDI	5.6	-	13.1	12.5	10.3	19.4	22.5	13.9
WIL	4.3	13.4	9.6	13.5	6.5	21.7	18.9	12.6

2000 Fall/Winter PM ₁₀ Ambient Concentration Results								
Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	134	56	143	73	100	28	43	82
EDI	52	48	78	73	105	18	37	59
WIL	56	45	55	65	93	16	37	52
LB Station	44	49	92	-	105	20	35	58
* No Sample								
2000 Fall/Winter Organic Carbon Ambient Concentration Results								
Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	17.1	10.6	22.6	9	9.2	4.6	8.7	11.7
EDI	8.9	9.7	15.4	7.6	10.2	2.8	7.8	8.9
WIL	10.5	9.7	10.9	7	8.1	2.9	7.2	8.0
2000 Fall/Winter Elemental Carbon Ambient Concentration Results								
Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	7.6	6.4	11.6	4.8	4.6	3.7	3.6	6.0
EDI	3.8	4.1	7.4	4.3	3.3	2	2.1	3.9
WIL	4.6	4.1	5.1	3.8	3.6	1.7	2.9	3.7
2000 Fall/Winter Total Carbon Ambient Concentration Results								
Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	24.7	17	34.2	13.8	13.8	8.3	12.3	17.7
EDI	12.7	13.8	22.8	11.9	13.5	4.8	9.9	12.8
WIL	15.1	13.8	16	10.8	11.7	4.6	10.1	11.7

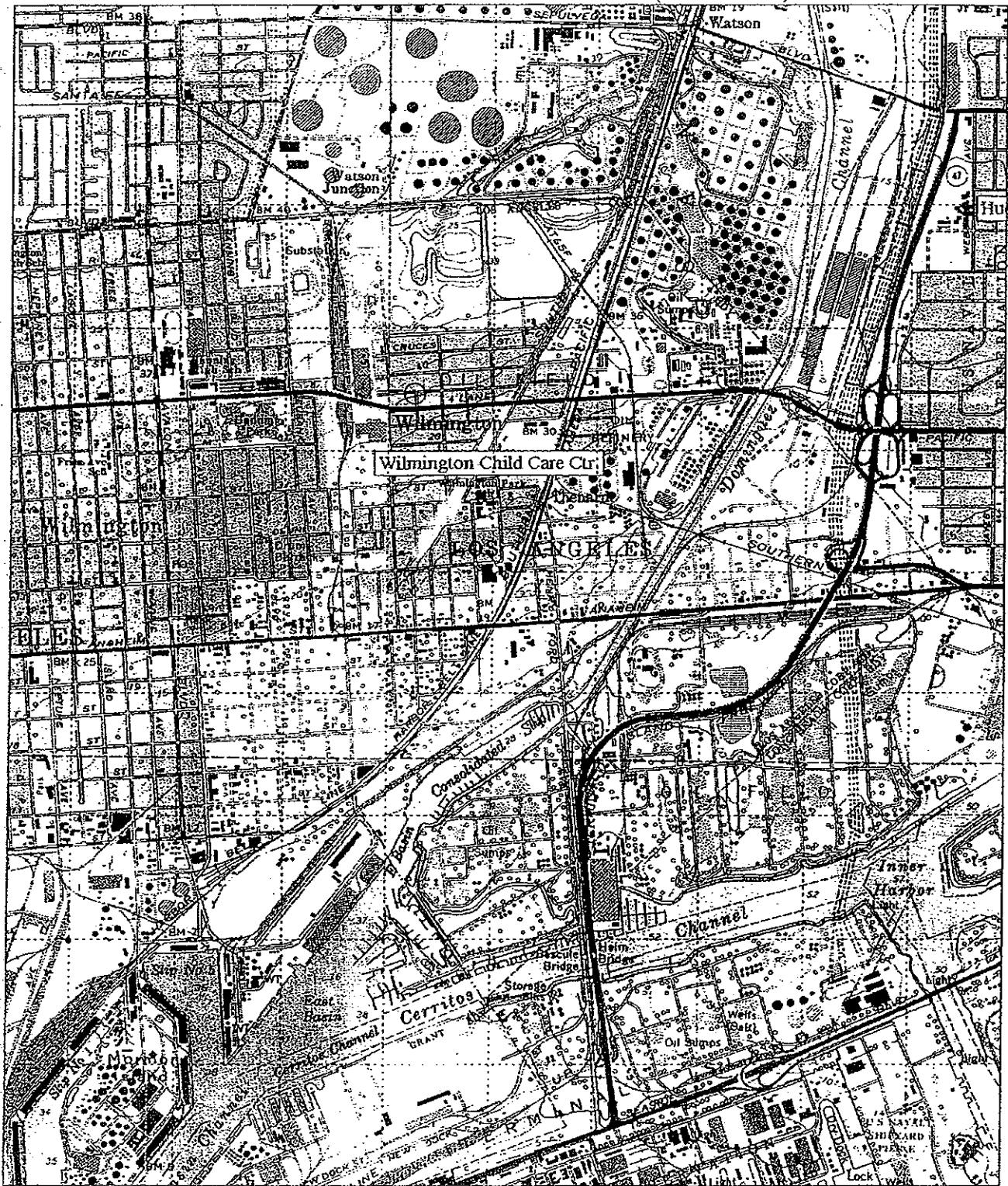
APPENDIX A-4 SAMPLING LOCATION DETAIL MAPS



Hudson School and Surrounding Area

APPENDIX A-4

SAMPLING LOCATION DETAIL MAPS (CONTINUED)



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Wilmington Childcare Center and Surrounding Area

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
MONITORING AND ANALYSIS**

Rule 1158 Follow-Up Study #9

Sampling Conducted
October 2003 -- November 2003

Program Monitoring Conducted By
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Report # MA 2004-13

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EXECUTIVE SUMMARY

Purpose

In June 1999, Rule 1158 affecting storage, handling and shipment of petroleum coke, coal, and sulfur was amended to further reduce particulate emissions from these sources. The mandated date for full compliance with the Rule was June 2004. This study is one of an ongoing series examining elemental carbon (EC) contained in the inhalable particulate fraction (PM₁₀) in the greater Long Beach/Wilmington area. This series of studies consists of PM₁₀ sampling in the spring/summer and fall/winter, observing trends in ambient PM₁₀ concentration and the EC content of collected samples.

Sampling

Sampling was conducted between October 24, 2003 and November 29, 2003, coincident with the AQMD PM₁₀ monitoring network one-in-six day schedule. Sampling locations were identical to those utilized for the previous Rule 1158 follow-up studies. It is intended that these sites be used throughout the entire series of studies. Field operations were conducted by RES Environmental, Inc., while all laboratory operations and data analysis were performed by AQMD staff. Twenty-one samples were collected over seven non-consecutive sampling days.

Key Findings

1. Other than the Hudson School site, measured average ambient PM₁₀ and elemental carbon are comparable to the AQMD Long Beach and Central Los Angeles network stations for the duration of the study. PM₁₀ averaged 49 $\mu\text{g}/\text{m}^3$ at Hudson School during the study compared to values ranging from 35 to 39 $\mu\text{g}/\text{m}^3$ at the other sites.
2. While averages have been used to show PM₁₀ trends over time based on the nine Rule 1158 follow-up studies, individual sites often experienced days where PM₁₀ exceeded the State 24-hour PM₁₀ standard of 50 $\mu\text{g}/\text{m}^3$. In 1998, approximately 70% of all measurements exceeded this standard. The number of 24-hour exceedences has since steadily declined and constituted less than 30% of the PM₁₀ measurements in the current study.
3. The current and previous monitoring studies indicate that higher PM₁₀ and EC concentrations are measured at the Hudson School site than any other study sites, and measurements are often higher compared to most of the AQMD network sites for PM₁₀. During this study the average EC at Hudson School (7.5 $\mu\text{g}/\text{m}^3$) was 50% higher than any other study site, including the AQMD network sites at Central Los Angeles (4.7 $\mu\text{g}/\text{m}^3$) and Long Beach (4.9 $\mu\text{g}/\text{m}^3$) – the two closest AQMD network sites with PM₁₀ measurements. The wind data suggests that the impact is greatest at the Hudson School site when the wind is from the northerly directions. The elevated EC level at the Hudson School site is attributable to impact from nearby sources, rather than sources originating at the Port. Closer examination of the Hudson School site is necessary to further identify nearby PM₁₀ and EC sources.

1.0 INTRODUCTION

Over the course of several years prior to 1997, the AQMD had received complaints of black, oily airborne dust from residents of Long Beach and Wilmington area neighborhoods. Surveys of the area noted that there were numerous coal and petroleum coke production, storage, and shipment facilities. These included open stockpiles of green coke, enclosed "coke barns", refinery kilns producing petroleum coke, and a variety coke and coal carrying trains and trucks. Other industrial processes including sulfur distribution facilities, heavy traffic patterns, and general construction activities were also noted in the area.

In August 1996, AQMD staff attended a public meeting in San Pedro that focused on public concern over the levels of particulate matter in the region. Subsequently, the AQMD staff coordinated with various public action groups to select several sites for particulate monitoring, including sites located at specific areas of community concern.

Two studies were conducted at these sites, one in May 1997¹ and one in fall/winter 1998². These studies were designed to characterize local micrometeorological parameters, and to microscopically and chemically characterize airborne particulate collected in the area. The most pronounced findings of these studies were the elevated levels of elemental carbon and inhalable particulate matter at some study sites, including a monitoring site adjacent to Elizabeth Hudson Elementary School in Long Beach.

In June 1999, the AQMD amended Rule 1158 affecting storage, handling and shipment practices for petroleum coke, coal, and sulfur. Subsequent state legislation (HSC 40459) requires that the AQMD, in conjunction with the California Air Resources Board (CARB), conduct studies examining the frequency and severity of violations related to AQMD Rule 1158, including impacts on ambient air quality. A summary of these activities are to be submitted to the State Legislature annually. To monitor the efficacy of the Rule and provide supporting data for the Legislative Report, the AQMD initiated a series of *Rule 1158 Follow-up Studies*. These studies are conducted twice annually on an ongoing basis each spring/summer and fall/winter, and address the requirements of HSC 40459 to maintain a particulate monitoring program in the port area assessing prevalent coke particulates and improvements in air quality.

Removal and enclosure of open coke storage piles, and modification to equipment and work practices to comply with Rule 1158 requirements is ongoing. The Rule 1158 compliance schedule mandates implementation of the majority of control measures by August 1999, with full implementation of all measures by June 2004. AQMD Compliance staff have documented a high rate of compliance with the initial rule implementation requirements, including covered transport, truck washing, prompt

¹ South Coast Air Quality Management District. (September 1997) *Micrometeorological and Ambient Air Quality Monitoring Conducted Simultaneously in the Vicinity of the Los Angeles and Long Beach Harbors*. Diamond Bar, CA.

² South Coast Air Quality Management District. (March 1999) *Micrometeorological and Ambient Air Quality Monitoring Conducted Simultaneously in the Vicinity of the Los Angeles and Long Beach Harbors*. Diamond Bar, CA.

2.0 PROJECT DISCUSSION

From October 24, 2003 to November 29, 2003, PM₁₀ monitoring was conducted at three locations in the cities of Long Beach (two sites) and Wilmington (one site). This study constituted the ninth in a series of follow-up studies evaluating improvements in local air quality precipitated through implementation of Rule 1158, as amended on June 11, 1999.

This study builds on a base of knowledge established by several previous studies: two prior to Rule amendment and eight follow-up studies. Together they constitute a set of six spring/summer studies (1997, 2000, 2001, 2002 and 2003)^{3,4} and four fall/winter studies (1998, 1999, 2000, 2001, and 2002)^{5,6}. The primary objectives of the current study are to collect data suitable for the evaluation of:

- Current inhalable particulate (PM₁₀) ambient concentration trends for the study area.
- Speciation of the carbonaceous component of the collected particulate samples for elemental and organic carbon content.
- Comparison of 2003 PM₁₀ mass and carbon data with that obtained during the earlier Rule 1158 studies.

The prevailing winds in the study area place portions of the community downwind of coal and coke production and/or storage facilities, and fugitive dust from these activities has been a longstanding community concern. This fugitive dust contributes to increases in the PM₁₀ particulate concentration. Mobile sources such as diesel trucks, trains and ships in the area also contribute to the overall ambient particulate matter concentrations.

Site selection and the sampling calendar were influenced by several factors. Sampling dates were scheduled to repeat as closely as possible the sampling dates of the previous studies, while coinciding with the U.S. EPA one-in-six monitoring schedule utilized by the AQMD in its PM₁₀ monitoring network. Samples were scheduled for collection on October 24 and 30, 2003, and November 5, 11, 17, 23, and 29, 2003, producing a data set consisting of 21 samples.

The three current monitoring sites were chosen from seven sites used in the fall/winter 1998 study, *Micrometeorological and Ambient Air Quality Monitoring Conducted Simultaneously in the Vicinity of the Los Angeles and Long Beach Harbors* (March 1999); the sites have remained constant during the course of the *Rule 1158 Follow-Up* series of studies (Figure 1.) Site selection criteria included site locations relative to coal

³ South Coast Air Quality Management District. (September 1997)

⁴ South Coast Air Quality Management District. *Rule 1158 Follow-Up Study #2, #4, #6 and #8*. Diamond Bar, CA.

⁵ South Coast Air Quality Management District. (March 1999)

⁶ South Coast Air Quality Management District. *Rule 1158 Follow-Up Study #1, #3, #5, and #7*. Diamond Bar, CA.

2.2 SAMPLING AND ANALYSIS METHODOLOGY

The AQMD maintains a PM₁₀ monitoring network throughout the South Coast Air Basin (Basin). The Federal Reference Method (FRM) selective size inlet (SSI) PM₁₀ samplers utilized in the PM₁₀ network and analytical procedures are summarized here.

The SSI sampler used in this study is the U.S. EPA's FRM sampler found in the Code of Federal Regulations (40CFR50 Appendix J). It is used to monitor particulate matter 10 microns in diameter and less (PM₁₀). For the purposes of this study, the SSI samplers are used to collect PM₁₀ samples, which were also used for the determination of organic carbon (OC), elemental carbon (EC), and total carbon.

The SSI sampler contains a pump controlled by a programmable timer. An elapsed time accumulator, linked in parallel with the pump, records total pump operation time in hours. During operation, a known quantity of air is drawn through a particle size separator, which achieves particle separation, by impaction. The correct flow rate through the inlet is critical to collection of the correct particle size so that after impaction, only particles with a diameter of 10 microns or less remain suspended in the airstream. The flow of air then passes through a quartz filter medium, upon which the particles are collected. A programmable timer automatically turns the pump off at the end of the 24-hour sampling period.

Once a sample has been collected it is returned to the laboratory, following chain-of-custody protocols, where both PM₁₀ mass and carbon content are determined. Ambient PM₁₀ mass is determined by subtracting the weight of the clean unsampled filter (measured in the laboratory prior to sampling) from the weight of the sampled filter containing the collected PM₁₀, to yield the mass of the PM₁₀ collected on the filter. This mass is then divided by the amount of air drawn through the filter to give the ambient concentration, expressed as mass per cubic meter ($\mu\text{g}/\text{m}^3$).

Ambient carbon levels are determined by taking a small portion of the PM₁₀ filter and putting it into a carbon analyzer. The analyzer consists of a computer-controlled programmable oven, computer controlled gas flows, a laser, and a flame ionization detector (FID). The sample is first heated in the oven in increasing amounts of oxygen. As the temperature rises, organic carbon followed by elemental carbon are evolved from the filter. The laser beam passes through the filter, and the transmitted intensity increases at the detector as the light-absorbing carbon leaves the filter, causing the filter to become less black. The evolved carbon is swept from the oven by gas flow, and is transported to the FID where it is detected (in the form of methane) throughout the heating process. The computer that controls these processes collects data on the oven temperature profile, laser light absorption, and FID response to determine the OC and EC content of the filter. This information, combined with the volume of air sampled, provides the OC and EC concentration in the ambient air.

3.2 PM₁₀ TREND ANALYSIS

Figure 2 summarizes the ambient PM₁₀ concentrations observed over the course of the six fall/winter studies. The black line represents the three-site average for each study. The data show an overall PM₁₀ decline from a 2000 average of 64.5 $\mu\text{g}/\text{m}^3$ to a 2003 average of 42.3 $\mu\text{g}/\text{m}^3$ – an average decline of 7 $\mu\text{g}/\text{m}^3$ per year.

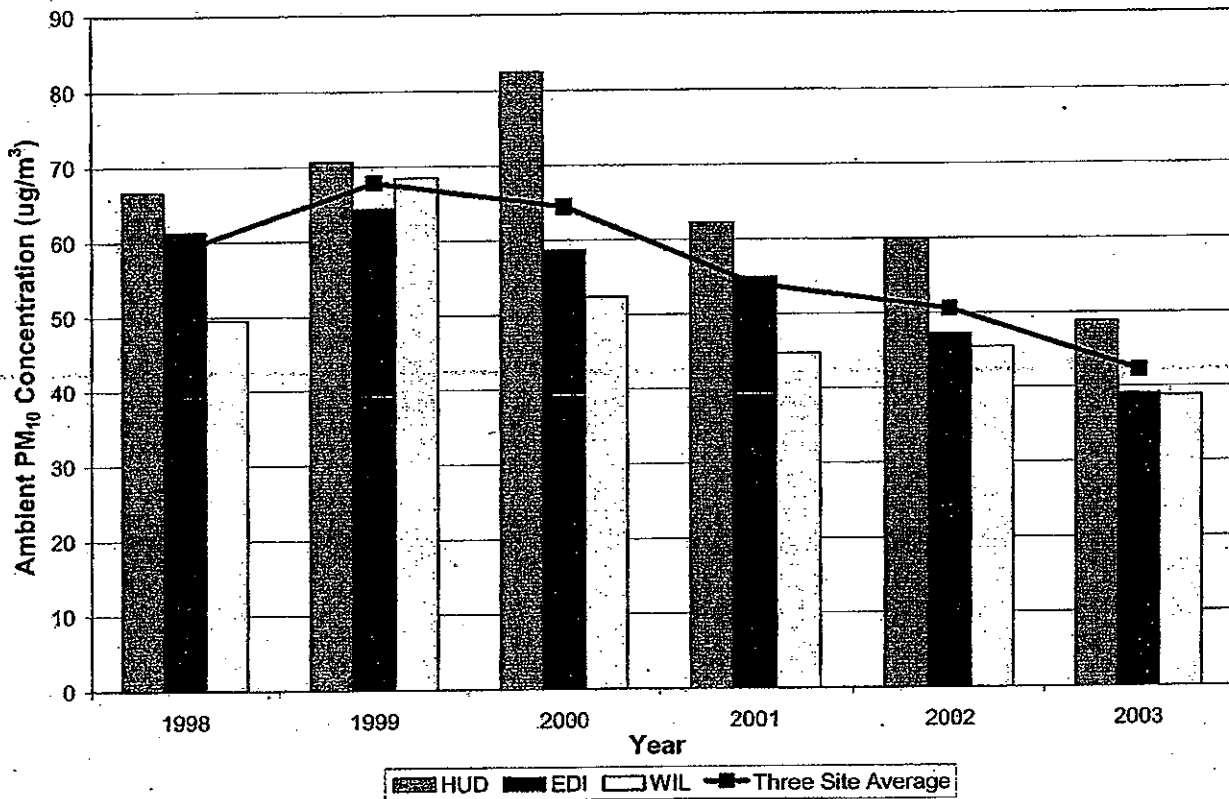


Figure 2: Fall/Winter Ambient PM₁₀ Concentrations by Site and Year

During the course of fall/winter study sampling, yearly exceedences of the state PM₁₀ standard have declined from approximately 70% of samples taken in 1998 to less than 30% of samples in 2003.

Elemental carbon concentrations were averaged over the duration of each study, and the results are presented in Figure 4. Complete data tabulations can be found in Appendix A-1. The compiled fall/winter data in Figure 4 shows the ambient EC downward trend from 1998 through implementation of Rule 1158 revisions in 2000. Subsequently, average EC concentrations have risen slightly over the past three years.

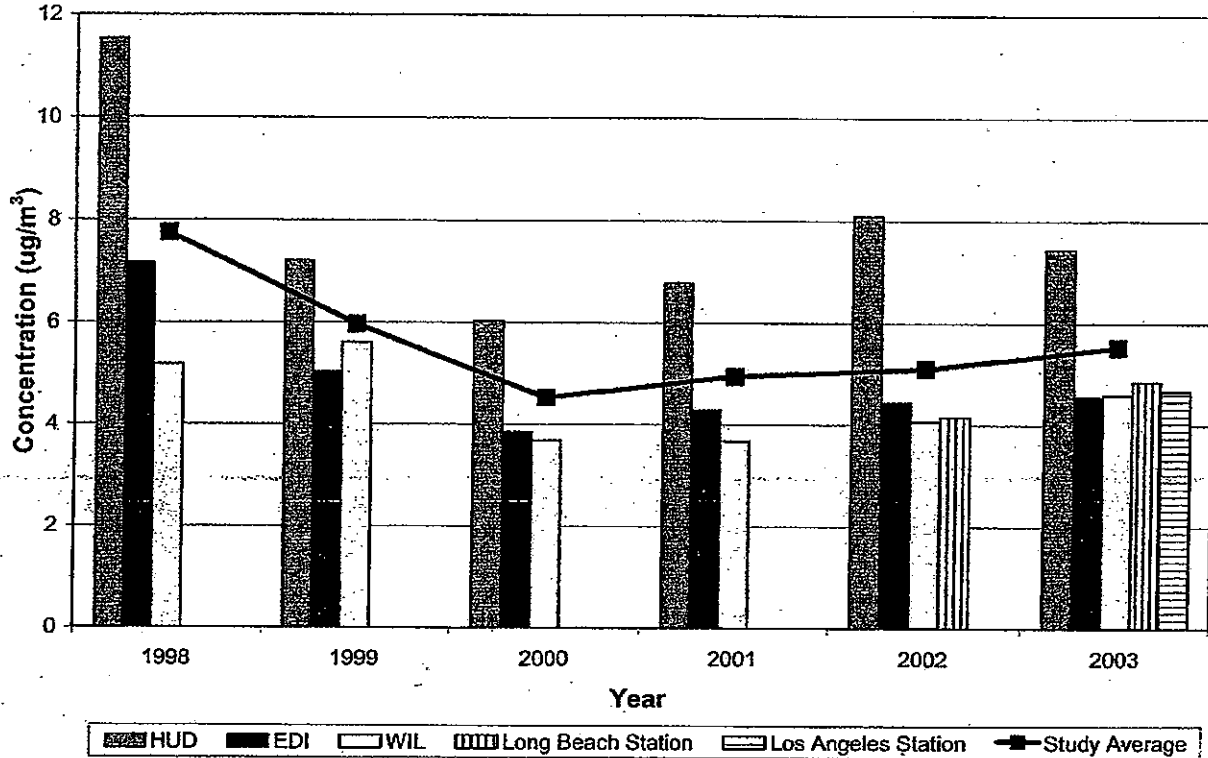


Figure 4: Fall/Winter Average EC by Site and Year

The marked EC reduction from 1998 thru 2000 can be attributed to implementation of the amended Rule 1158. After the major benefits of the Rule were realized, EC concentrations increased slowly over the following years as contributions from heavier commercial and private vehicular traffic increased. Seasonal meteorological variability may also account for some of the year to year differences. However, ambient EC concentrations have not returned to pre-rule amendment levels.

After an initial decline in EC concentration between 1997 and 2000, the spring/summer studies do not show any consistent trend (see Figure 5). However, these studies do reinforce the observation that HUD is characteristically higher for EC than other sites examined.

The current and previous monitoring studies indicate that PM_{10} and EC concentrations measured at the Hudson School site are often higher than the other study sites, and higher than many AQMD network sites for PM_{10} . This indicates that localized sources or meteorological conditions may disproportionately impact the Hudson site. Higher EC results were seen on days where the wind was predominantly out of the north. Hudson School is located in close proximity to BP-Arco, a large oil refining facility, which is located to the northwest, and is adjacent to the Terminal Island Freeway and a significant rail spur (see map, Appendix A-3).

Ambient EC remains well below concentrations observed in studies prior to Rule 1158 amendment (June 1999). The fall/winter data shown in Figure 4 clearly shows the ambient EC downward trend from 1998 through implementation of Rule 1158 in 2000. The marked EC reduction from 1998 thru 2000 can be attributed to implementation of the amended Rule 1158.

Subsequently, EC has risen slightly over the past three years. After the major benefits of coke/coal abatement were realized, EC concentrations have increased slowly, as contributions from heavier commercial and private vehicular traffic increased. However, ambient EC concentrations have not returned to pre-rule amendment levels.

In summary, the spring/summer series of studies is yielding increasingly less information on the impact of Rule 1158. However, the fall/winter measurements have been more illustrative of trends in the area. The longer trend shown in the data for the spring and fall studies suggests that the measurable benefits of Rule 1158 revision have been observed, and other sources of PM_{10} and EC in the area are now more dominant than the coke/coal contribution.

The studies indicate higher PM_{10} and EC concentrations at the Hudson School site than at the other study sites, and that monitoring at Hudson School often show higher measured levels than many of the AQMD PM_{10} network sites. The wind data suggests that, like EC, PM_{10} is greatest at the Hudson site when the winds are northerly, and not when the wind is onshore from the port. This suggests greater influence of the ambient air quality at the Hudson School site by nearby PM_{10} and EC sources, among them BP Arco and the Terminal Island Freeway, than by Port coke/coal operations.

APPENDIX A-I

RULE 1158 LONG BEACH PM₁₀ MONITORING DATA (CONTINUED)

2001 Fall/Winter PM₁₀ Ambient Concentration Results

Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	40	62	97	39	36	76	86	62
EDI	24	*	105	33	33	63	72	55
WIL	16	43	47	37	25	75	70	45
LB Station	25	14	24	30	24	56	*	29

* No Sample

2001 Fall/Winter Organic Carbon Ambient Concentration Results

Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	5.6	12.9	10.9	9.7	6.9	16	17.2	11.3
EDI	3.3	*	8.8	8.7	7	13.9	15.9	9.6
WIL	2.9	9.2	6.9	9.4	4.7	15.5	13.5	8.9

2001 Fall/Winter Elemental Carbon Ambient Concentration Results

Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	5.2	7.8	7.1	4.7	4.6	8.4	9.7	6.8
EDI	2.3	*	4.3	3.8	3.3	5.5	6.6	4.3
WIL	1.4	4.2	2.7	4.1	1.8	6.2	5.4	3.7

2001 Fall/Winter Total Carbon Ambient Concentration Results

Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	10.8	20.7	18	14.4	11.5	24.4	26.9	18.1
EDI	5.6	*	13.1	12.5	10.3	19.4	22.5	13.9
WIL	4.3	13.4	9.6	13.5	6.5	21.7	18.9	12.6

2000 Fall/Winter PM₁₀ Ambient Concentration Results

Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	134	56	143	73	100	28	43	82
EDI	52	48	78	73	105	18	37	59
WIL	56	45	55	65	93	16	37	52
LB Station	44	49	92	*	105	20	35	58

* No Sample

2000 Fall/Winter Organic Carbon Ambient Concentration Results

Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	17.1	10.6	22.6	9	9.2	4.6	8.7	11.7
EDI	8.9	9.7	15.4	7.6	10.2	2.8	7.8	8.9
WIL	10.5	9.7	10.9	7	8.1	2.9	7.2	8.0

2000 Fall/Winter Elemental Carbon Ambient Concentration Results

Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	7.6	6.4	11.6	4.8	4.6	3.7	3.6	6.0
EDI	3.8	4.1	7.4	4.3	3.3	2	2.1	3.9
WIL	4.6	4.1	5.1	3.8	3.6	1.7	2.9	3.7

2000 Fall/Winter Total Carbon Ambient Concentration Results

Location	11/8/00	11/14/00	11/20/00	11/26/00	12/2/00	12/8/00	12/14/00	Average
HUD	24.7	17	34.2	13.8	13.8	8.3	12.3	17.7
EDI	12.7	13.8	22.8	11.9	13.5	4.8	9.9	12.8
WIL	15.1	13.8	16	10.6	11.7	4.6	10.1	11.7

1999 Fall/Winter PM₁₀ Ambient Concentration Results

Location	11/2/99	11/8/99	11/14/99	11/20/99	11/26/99	12/2/99	12/8/99	12/14/99	Average
HUD	92	38	50	30	47	69	68	171	71
EDI	85	33	47	37	49	74	93	97	64
WIL	92	89	46	30	65	70	*	87	68
LB Station	77	22	38	27	38	50	55	59	46

* No Sample

1999 Fall/Winter Organic Carbon Ambient Concentration Results

Location	11/2/99	11/8/99	11/14/99	11/20/99	11/26/99	12/2/99	12/8/99	12/14/99	Average
HUD	9.9	6	6	4.5	11	13.3	10.4	22.2	10.4
EDI	8.3	4.8	5.8	4.9	10.5	14.1	13.4	14.2	9.5
WIL	8.1	14.1	6.4	4.4	12.6	13.5	*	12.2	10.2

1999 Fall/Winter Elemental Carbon Ambient Concentration Results

Location	11/2/99	11/8/99	11/14/99	11/20/99	11/26/99	12/2/99	12/8/99	12/14/99	Average
HUD	7.9	4.1	4.8	2.7	5.9	7.9	6.6	17.8	7.2
EDI	5.7	2.6	4	2.7	4.6	6.1	6.1	8.5	5.0
WIL	6	6.7	4.1	2.4	7.4	5.5	*	7.2	5.6

1999 Fall/Winter Total Carbon Ambient Concentration Results

Location	11/2/99	11/8/99	11/14/99	11/20/99	11/26/99	12/2/99	12/8/99	12/14/99	Average
HUD	17.8	10.1	10.8	7.2	16.9	21.2	17	40	17.6
EDI	14	7.4	9.8	7.6	15.1	20.2	19.5	22.6	14.5
WIL	14.1	20.8	10.5	6.8	20	19	*	19.4	15.8

1998 Fall/Winter PM₁₀ Ambient Concentration Results

Location	11/1/98	11/7/98	11/13/98	11/19/98	11/25/98	12/1/98	Average
HUD	61	56	72	89	*	55	67
EDI	50	49	67	73	74	55	61
WIL	54	43	45	52	70	33	50
LB Station	43	31	39	54	*	27	39

* No Sample

1998 Fall/Winter Organic Carbon Ambient Concentration Results

Location	11/1/98	11/7/98	11/13/98	11/19/98	11/25/98	12/1/98	Average
HUD	7.5	6.4	11.2	14.2	*	8.6	9.6
EDI	7	5.5	11.3	10.4	9.3	10.1	8.9
WIL	6.9	5.7	8.4	8.3	9.9	5.8	7.5

1998 Fall/Winter Elemental Carbon Ambient Concentration Results

Location	11/1/98	11/7/98	11/13/98	11/19/98	11/25/98	12/1/98	Average
HUD	6.2	6.2	16.6	19.8	*	8.9	11.5
EDI	4.3	3.3	9.2	12.5	7.9	5.8	7.2
WIL	4.1	3.8	5.9	7.3	6.6	3.4	5.2

1998 Fall/Winter Total Carbon Ambient Concentration Results

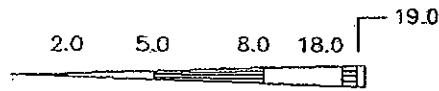
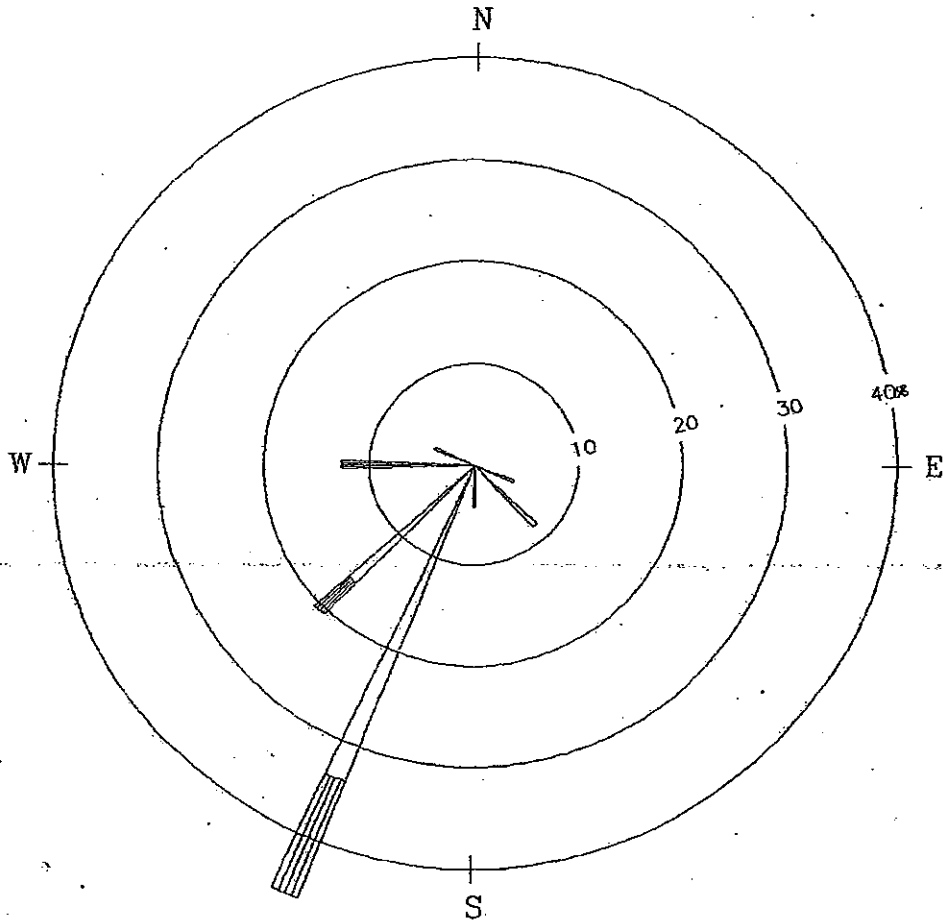
Location	11/1/98	11/7/98	11/13/98	11/19/98	11/25/98	12/1/98	Average
HUD	13.7	12.6	27.9	34	*	17.5	21.1
EDI	11.3	8.8	20.5	22.9	17.2	15.9	16.1
WIL	11	9.4	14.4	15.6	16.5	9.2	12.7

APPENDIX A-1

RULE 1158 LONG BEACH PM₁₀ MONITORING DATA (CONTINUED)

2000 Spring/Summer PM ₁₀ Ambient Concentration Results								
Location	5/24/00	5/30/00	6/5/00	6/11/00	6/17/00	6/23/00	6/29/01	Average
HUD	27	31	40	32	18	19	42	30
EDI	20	28	37	31	25	17	35	28
WIL	22	38	41	33	19	24	37	31
LB Station	*	*	32	30	17	19	34	26
* No Sample								
2000 Spring/Summer Organic Carbon Ambient Concentration Results								
Location	5/24/00	5/30/00	6/5/00	6/11/00	6/17/00	6/23/00	6/29/01	Average
HUD	2.9	2.6	3.8	3.0	2.3	2.0	3.7	2.9
EDI	2.5	2.6	3.6	2.8	2.6	2.1	3.1	2.8
WIL	2.5	2.9	3.7	3.0	2.4	2.9	3.3	3.0
2000 Spring/Summer Elemental Carbon Ambient Concentration Results								
Location	5/24/00	5/30/00	6/5/00	6/11/00	6/17/00	6/23/00	6/29/01	Average
HUD	1.7	1.2	2.6	1.4	0.7	0.8	2.5	1.6
EDI	1.2	1.2	1.7	1.4	0.8	0.6	1.3	1.3
WIL	1.3	1.2	1.8	1.1	0.9	1.0	1.6	1.2
2000 Spring/Summer Total Carbon Ambient Concentration Results								
Location	5/24/00	5/30/00	6/5/00	6/11/00	6/17/00	6/23/00	6/29/01	Average
HUD	4.6	3.7	6.4	4.4	3	2.8	6.2	4.4
EDI	3.7	3.8	5.3	4.2	3.4	2.7	4.4	3.9
WIL	3.8	4.1	5.5	4.1	3.3	3.9	4.9	4.2

1997 Spring/Summer PM ₁₀ Ambient Concentration Results								
Location	5/4/97	5/8/97	5/12/97	5/14/97	5/20/97	5/22/97	5/27/97	Average
HUD	48	50	36	*	32	39	58	44
EDI	*	*	*	*	*	*	*	*
WIL	43	50	35	42	30	36	48	41
LB Station	* No Sample							
1997 Spring/Summer Organic Carbon Ambient Concentration Results								
Location	5/20/97	5/22/97	5/27/97	Average				
HUD	3.6	4.3	6.9	4.9				
EDI	*	*	*	*				
WIL	4.1	4.2	5.8	4.7				
1997 Spring/Summer Elemental Carbon Ambient Concentration Results								
Location	5/20/97	5/22/97	5/27/97	Average				
HUD	2.3	2.4	5.4	3.4				
EDI	*	*	*	*				
WIL	1.2	1.6	3.3	2.0				
1997 Spring/Summer Total Carbon Ambient Concentration Results								
Location	5/20/97	5/22/97	5/27/97	Average				
HUD	5.9	6.7	12.3	8.3				
EDI	*	*	*	*				
WIL	5.3	5.8	9.1	6.7				

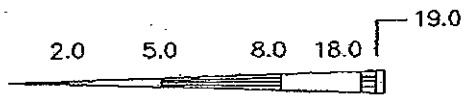
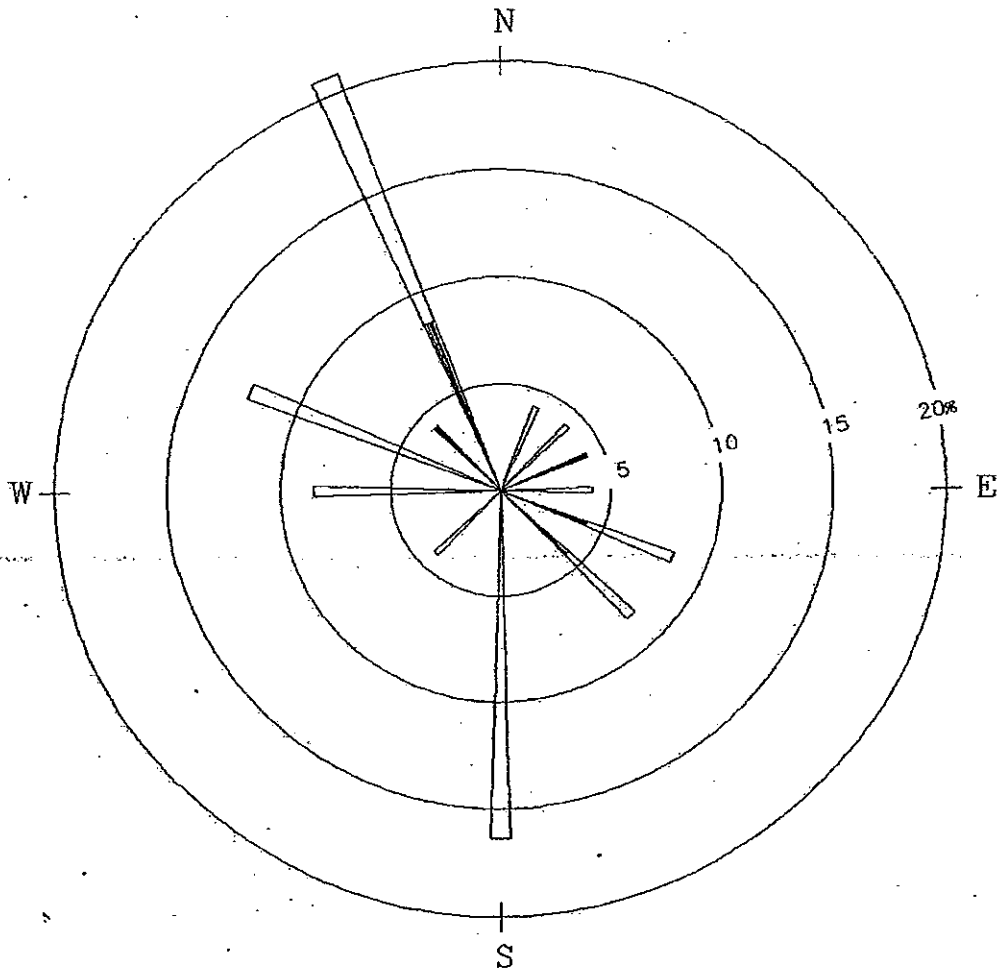


WIND SPEED CLASS BOUNDARIES
(MILES/HOUR)

NOTES:
 DIAGRAM OF THE FREQUENCY OF OCCURRENCE FOR EACH WIND DIRECTION. WIND DIRECTION IS THE DIRECTION FROM WHICH THE WIND IS BLOWING.
 EXAMPLE - WIND IS BLOWING FROM THE NORTH .0 PERCENT OF THE TIME.

WINDROSE

LONG BEACH/AQMD
 PERIOD: 10/30/03

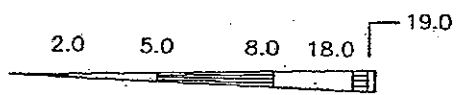
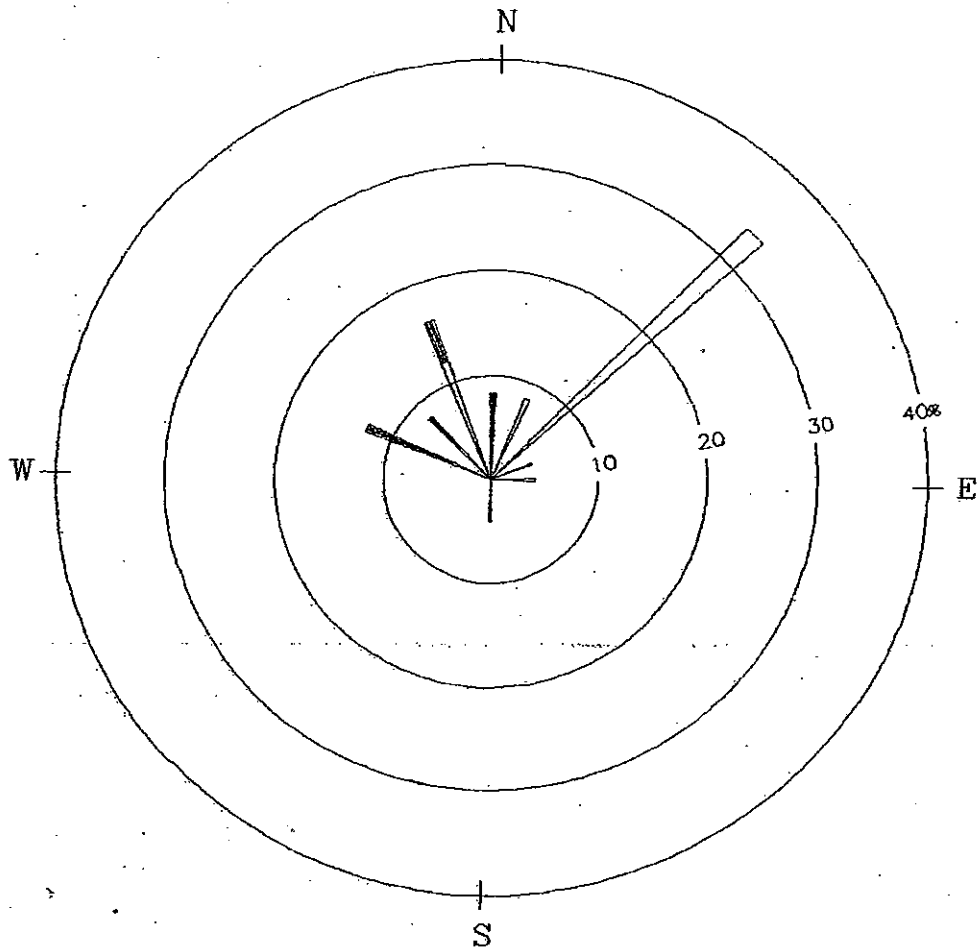


WIND SPEED CLASS BOUNDARIES
(MILES/HOUR)

NOTES:
 DIAGRAM OF THE FREQUENCY OF OCCURRENCE FOR EACH WIND DIRECTION. WIND DIRECTION IS THE DIRECTION FROM WHICH THE WIND IS BLOWING. EXAMPLE - WIND IS BLOWING FROM THE NORTH .0 PERCENT OF THE TIME.

WINDROSE

LONG BEACH
 PERIOD: 11/11/03

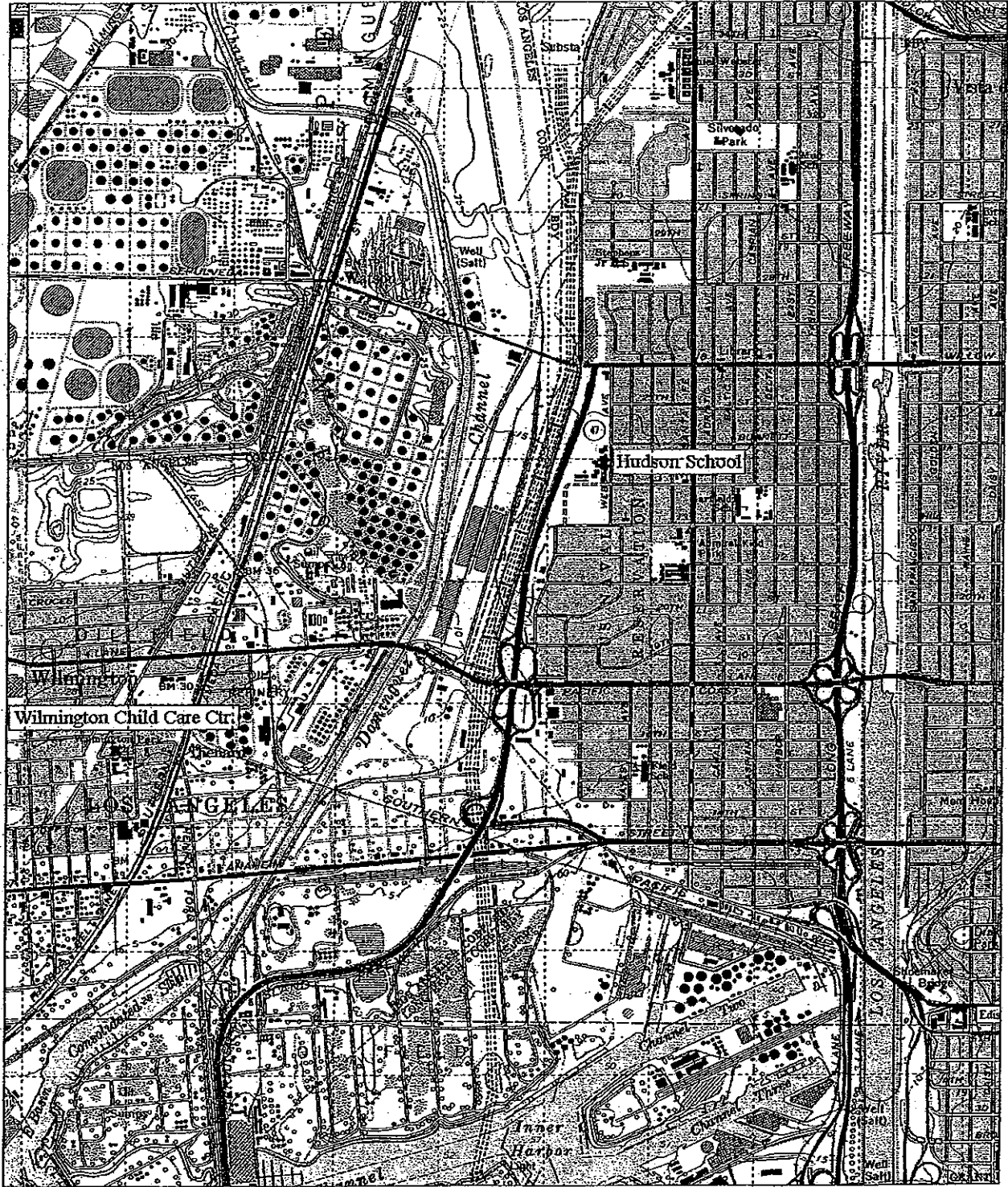


WIND SPEED CLASS BOUNDARIES
(MILES/HOUR)

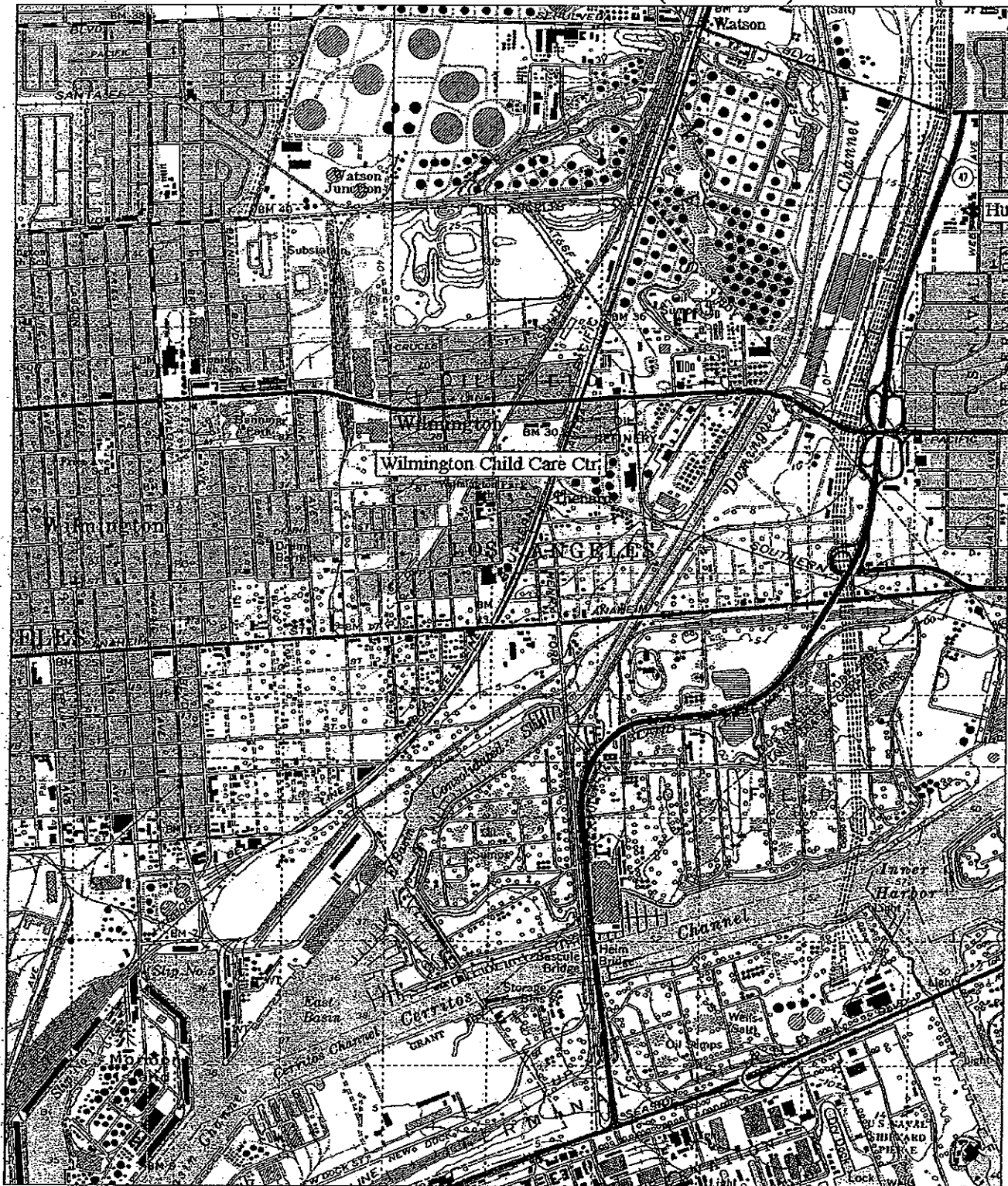
NOTES:
 DIAGRAM OF THE FREQUENCY OF OCCURRENCE FOR EACH WIND DIRECTION. WIND DIRECTION IS THE DIRECTION FROM WHICH THE WIND IS BLOWING. EXAMPLE - WIND IS BLOWING FROM THE NORTH 8.3 PERCENT OF THE TIME.

WINDROSE

LONG BEACH
 PERIOD: 11/23/03



Hudson School and Surrounding Area



Wilmington Childcare Center and Surrounding Area