

SECTION IX
AIR QUALITY SURVEILLANCE PLAN

FEDERAL GUIDELINES

AND

THE AIR QUALITY SURVEILLANCE PLAN

The following discussion details the compliance of the Air Quality Surveillance Plan with the requirements set forth in the Code of Federal Regulations, Title 40, Chapter 1, Part 51, Section 17.

- (a) (1) Establishment of a State air quality surveillance system which meets the minimum requirements indicated in 40 CFR 51.17, and which is in operation no later than two years after Environmental Protection Agency (EPA) approval of the plan. The Texas Air Control Board estimates, within the constraints of projected manpower and financial resources, such a network can be operational by May, 1977. Within this system plan, all minimum monitoring requirements except for tape samplers in each Region of the State, as specified in 40 CFR 51.17, (See Attachment 1) will be met as expeditiously as possible, within the limits of available funds and time required to recruit and train an adequate number of personnel to operate and maintain the required equipment. EPA's FY-77 Regional Operation Guidance document has given a low priority to the deployment of tape samplers due to their high cost of operation and because it is highly unlikely that any area in Texas will experience an emergency episode for particulate matter. Based on this priority, tape samplers are not included in this plan.
- (2) Location of one or more sampling sites in the area of estimated maximum concentration of each pollutant. These sampling sites are designated in Attachment 2.

For pollutants emitted directly to the atmosphere (particulates, sulfur dioxide, and carbon monoxide), a site of maximum concentration is located in populated areas in or immediately downwind of the area that is expected to have the highest emissions for that pollutant. This location provides data on the area of maximum population exposure. For example, the maximum concentration sites for carbon monoxide usually are located in densely

populated neighborhoods immediately downwind of an area with dense automobile traffic (e.g., the downtown area) or downwind of a major point source of carbon monoxide. A long-term monitoring site in the area of estimated maximum carbon monoxide levels is planned for downtown Houston in 1977. The City of Houston, Department of Public Health will operate this site and supply data suitable for entry in the Texas Air Quality Data Bank and the National Aerometric Data Bank. The present site will supply real-time air quality data for use in potential emergency episodes as described in paragraph (c) below. The site planned for 1977 has not been selected; the present site is a potential candidate.

Similarly, the maximum concentration sites for particulate matter and sulfur dioxide are located in high emission areas. There are some counties with high emissions which do not have long-term monitoring activity. The emissions in these cases result from one or two large isolated sources which are now in compliance with the Texas Air Control Board's air pollution regulations. The emissions from these sources have been reduced since 1972 and are periodically inspected to assure continued compliance with the appropriate regulations. Long-term monitoring in these isolated areas is not cost-effective, however, short-term and property-line sampling will be conducted from time to time as necessary.

Some pollutants are not emitted directly to the atmosphere but are formed in the air from other air contaminants by a series of chemical reactions. Of specific interest in this plan is the formation of ozone and nitrogen dioxide from the reaction of hydrocarbons and nitric oxide in the air. Because time is required for these reactions to occur, the maximum concentration sites for ozone and nitrogen dioxide are located in densely populated neighborhoods a considerable distance downwind of the area of high hydrocarbon/nitric oxide emissions (usually metropolitan or industrial districts). Locations of monitors by this method provides data in the area(s) with the maximum expected population exposure to these pollutants.

- (b) Description of the existing and proposed air quality surveillance system.
- (1) Basis for the design of the surveillance system and for the selection of samplers and sampling sites. Paragraphs A, B, and C below present the basis for system design and monitoring equipment requirements in terms of the objectives of air quality surveillance. Attachment 2 indicates the purpose for each sampling site and the date of its installation.

A. General

An adequate air quality surveillance network is an essential part of a reasonable and effective air pollution control program. Information that can be provided only by the network is required for planning and decision making within every phase of the control program. Because of its vital nature, such information should be comprehensive, accurate, and timely. Within the State of Texas, industrial and population centers are widely dispersed over a large geographic area stretching from Brownsville to Amarillo and from El Paso to Port Arthur. Equipment and manpower required for a network to cover this great expanse of territory and great diversity of industry are very costly; therefore, every attempt must be made to maximize the effectiveness of the resources used in the surveillance effort.

B. Objectives of Air Quality Evaluation

This plan gives the requirements for a system that will satisfy the objectives of atmospheric surveillance. The plan recognizes that care must be taken to insure that surveillance efforts are not carried beyond the level needed to satisfy these objectives at the expense of other aspects of the control program. However, control regulations based on other than accurate and timely knowledge of pollutant concentrations may be unfair and extremely costly to the citizens in terms of health and materials damage, and to industry in terms of unnecessary controls. Providing such knowledge is the principal and vital purpose of air quality evaluation. To fulfill this purpose, the evaluation system, as described in Paragraph C, is assigned the task of providing data for the accomplishment or support of the following specific objectives and functions:

1. To verify compliance with and/or progress made toward meeting air quality standards.
2. To provide data during emergency episode conditions.

3. To observe pollution trends throughout Texas including non-urban areas.
4. To provide a data base for application in:
 - a. Evaluation of effects.
 - b. Land use and transportation planning.
 - c. Development and evaluation of abatement strategies.
 - d. Development and validation of diffusion models.
5. To discover and define air pollution problems not now recognized and to provide a basis for developing future regulations.
6. To provide data for epidemiological studies involving human beings and animals.

C. Network Design

System Coverage. From the above discussion, it can be seen that obtaining adequate air surveillance information for Texas will be neither cheap nor easy. Widespread sampling and monitoring stations covering numerous pollutants will be required to give an accurate and representative picture of the quality of the atmosphere in which Texans live. This plan proposes an Air Quality Surveillance System which will meet or exceed minimum monitoring requirements as prescribed by the Federal government except for tape samplers.

1. Minimum Federal Equipment Requirements. The Code of Federal Regulation, Title 40, Chapter 1, Part 51.17 requires that each state acquire a minimum of monitoring/sampling equipment to be in operation no later than two years after Environmental Protection Agency approval of the State's Implementation Plan. The equipment needed to satisfy this minimum requirement in each Texas Air Quality Control Region is shown in Attachment 1.
2. The Proposed Texas Air Quality Surveillance System. To provide the information needed for development of logical and effective air

pollution control strategies which will protect the health and welfare of all Texans without unduly hampering industrial operations or development, and to meet the other broad objectives discussed above, the State of Texas proposed to acquire and operate an adequate air surveillance control system. The system acquisition schedule and completion date has necessarily been delayed by two years, since sufficient funds and manpower were not made available to execute part of the program as previously proposed. The complete system layout, as revised, for each region is contained in Attachment 2. The location, sampler type, installation date, site category, and operating agency are indicated for each sampling site. The TACB operates all sites except as noted in Attachment 2. Each of these sites conforms to site location criteria published by EPA. Wind flow obstructions due to buildings, trees, or sudden changes in land elevations are avoided. Local sources and sinks, as well as other micro-meteorological factors are considered in each site selection. Each site produces data which is indicative of the general or average surrounding air quality. Several sites previously in this plan have been omitted because they do not meet these siting criteria.

To fulfill the objectives in Paragraph B, the Texas Air Quality Surveillance Network consists of several types of sites. The site classification of each site is given in Attachment 2. The largest group of sites are classified as air quality surveillance (AQS) sites. These are long-term sites useful to determine air quality trends. They are usually in populated areas throughout the Region or city. Some sites are located in areas subject to little man-made air pollution. This group of sites is designated as background (GB) sites. Information on the air quality in remote or non-urban areas is needed to determine whether air quality in cleaner areas is deteriorating significantly and to provide a frame of reference for measurements made in urban or polluted areas. Another group of sites is specifically designated to monitor unusually high pollutant levels that might occur during stagnant weather conditions. These are called emergency episode

(EE) sites. The pollutants most likely to reach unusually high levels under these conditions are sulfur dioxide and ozone. Because of their primary objectives, these three types of sites are long-term sites and will be discontinued only under extreme circumstances.

On the other hand, some site objectives are short-term. One group of these sites is the growth area (GA) sites. These sites, usually in a developing residential or industrial area, monitor the changes in air quality as the area develops. This information is useful in the prevention of serious air pollution that might result from such growth. Once the development is complete, the original objective of the site is no longer appropriate. The site is either discontinued or reclassified. A few sites in this plan are source surveillance (SS) sites. Data from sites near specific sources of air pollution help in the design of effective control measures for these sources and in determining compliance of these sources with existing regulations. When the source no longer causes significant air pollution, the original site objective has been fulfilled and its monitoring equipment can be relocated to other problem areas or the site can be reclassified. Similarly, sites designated as exploratory (Exp) are inherently short-term. Data from these sites contribute to an improved understanding of the causes and behavior of air pollutants, especially the secondary pollutants. A better understanding of the causes of air pollution will lead to more effective, and perhaps less costly control strategies. Even though these sites are inherently short-term sites, they will not be discontinued or reclassified without prior consultation with EPA's Regional office.

Where available, dispersion model predictions are used to indicate the distribution of pollution from known point sources and projected emissions growth. This plan provides coverage of all the predicted high concentration areas except a few isolated point sources.

3. Sites Scheduled for Deployment. Six new sites for intermittent samplers (hi-vols and/or gas bubblers) and ten additional continuous monitoring sites are planned for deployment by May, 1977.

The new sites in Lubbock (hi-vol) and Beaumont (hi-vol and gas bubbler) will be located on the downwind side of the cities since these cities presently have monitors in the downtown areas. The Brownsville (hi-vol), Denton (hi-vol and bubbler), and Nueces County (hi-vol and bubbler) sites will be located in the downtown area of these cities. Also a new site will be located in Gregory (hi-vol and bubbler) near the rapidly expanding industrial complex in this area.

A continuous monitoring site will be located in the downtown areas of Austin, Dallas, Houston, Fort Worth and San Antonio primarily to monitor the maximum levels expected for carbon monoxide. Measurements of other pollutants can be related to the downwind continuous monitors already operating in all these cities. A site in Waco will provide continuous ozone data in this medium-size urban area. The continuous monitoring sites planned for Arlington and Bexar County will provide data on non-urban air quality under local prevailing winds. The continuous monitor for Tyler will provide sulfur dioxide data in this area of rapid growth in coal-fired power plants. This site will also provide information on the ozone levels in the Piney Woods of East Texas. The new continuous monitoring site planned for Nueces County will monitor the levels of ozone coming onshore from the Gulf of Mexico and the potentially high sulfur dioxide levels during northerly winds. Each of these new sites will conform to the siting criteria described above.

- (2) Location of samplers by Universal Transverse Mercator (UTM) grid coordinates or the equivalent. Latitude and longitude are given in Attachment 2 for existing sampling sites. Sampling sites proposed for installation in 1976-77 generally are indicated only by city or town. Precise locations will be determined during the site selection process.

- (3) Sampling Schedules. Sampling frequency will equal or exceed that specified in 40 CFR 51.17.

Hi-vol and gas bubbler samples will be taken over a 24-hour period (0000 to 2400 hours on the designated sampling day) at 6-day intervals. Samples will be taken simultaneously across the State on the designated sampling dates. The schedule thus provides 61 sampling days per year, with approximately an equal number of samples taken on each day of the week.

Continuous monitors will be operated on a scan-every-5 minutes sampling schedule. At 5-minute intervals, each instrument's instantaneous indication will be recorded on punched paper tape. Instrument scanning is automatic. The paper tape will later be collected and analyzed by a computer program.

- (4) Methods of sampling and analysis. Sampling methods will be as prescribed in the Code of Federal Regulations, Chapter 1, Parts 50 and 51. Standard procedures have been developed and published by the Texas Air Control Board (TACB) for pollutants not governed by Federal standards.

- (5) Methods of data handling and analysis procedures.

- i. Data Bank. Pollutant data that will be available from the network will be handled by automatic data storage, retrieval, and processing. A repository of ambient atmospheric data has been established at a leased central computer facility. All air quality data collected over a period of time longer than 90 days will be included in this data bank, both data collected by the TACB and data reported to the TACB by local air pollution control agencies in Texas.
- ii. Data Format. The EPA has developed and adopted a standard coding structure and format known as Storage and Retrieval of Aerometric Data (SAROAD) to facilitate the exchange of technical information needed for air pollution abatement, control, and research. The SAROAD system is described in SAROAD User's Manual dated July, 1971, and published by EPA's Office of Air Programs at Research Triangle Park, North Carolina. All data obtained from this network of samplers/monitors will be recorded in SAROAD format for entry into the Texas Air Quality Data Bank.

iii. Computer Programming Requirements

a. Data Validation. Computer software has been developed to assist in the validation of all data that is input into the data bank. Computer programs are structured so that all measurements are compared against a previously established table of limits for:

- 1) High values.
- 2) Low values.
- 3) Extreme changes in values for consecutive observations.

Limits for high values will be based on air quality standards. Limits for low values will represent the minimum detection capability of the instruments and methods of analysis. Computer-produced validation listings resulting from these data comparisons will be printed and will be manually reviewed by data quality control personnel in the TACB central office. After verification, the manually corrected listings will be returned to the central computer facility for correction or removal of incorrect entries.

b. Data Storage and Retrieval. Data will be stored indefinitely on magnetic disc or tape at the central computer facility and will be available for prompt retrieval when needed for compilation of historical summaries and special data analyses. Access to specific measurements will also be provided. The most recent twelve months of data will be kept available for rapid access from a satellite computer, remote console, or other input-output unit.

c. Data Reduction.

1) Means and Deviations. Computer programs exist to provide pollutant data averaging and other mathematical computations. Specifically, the following is required for data received from each atmospheric sensor.

- a) Hourly means of values recorded for carbon monoxide and ozone. Times start and stop on the even

hours so that 24-hour means will be calculated each day for each parameter.

- b) Three-hour period means for sulfur dioxide. This will require averaging for all consecutive three-hour periods beginning and ending on the even hour.
- c) Eight-hour means for carbon monoxide. This will require averaging for all consecutive non-overlapping eight-hour periods beginning and ending on the even hour.
- d) Annual and quarterly geometric mean, standard deviation, and geometric standard deviation for total suspended particulate.
- e) Annual and quarterly arithmetic mean, standard deviation, and geometric standard deviation for all pollutants other than suspended particulate on which data is gathered.

Data means (averages) provide a useful measure of central tendency of a pollutant concentration, while the standard deviations are useful for characterizing the spread of the data values about the mean value.

- 2) Quarterly Reports. Each quarter-year a comprehensive report on ambient air quality will be computer generated and produced for each Air Quality Control Region for public use. In addition, a quarterly report fulfilling the requirements of Paragraph 51.7(a) of the Code of Federal Regulations, Title 40, will be sent to the Regional Office of the Environmental Protection Agency within 45 days following the end of each calendar quarter. This quarterly report will contain all validated air quality data in machine readable form (cards or tapes) in SAROAD format for inclusion into the National Aerometric Data Bank. Other data may be submitted to EPA Region VI in hard copy for local use as required.
- (6) Timetable for installation of additional equipment to complete the system. The timetable for completion of the air quality surveillance system is detailed in Attachment 2.

(c) Emergency episode air monitoring. Sampling sites designated as emergency episode stations in each Region are indicated in Attachment 2. For each Region which is Priority I for any given pollutant, monitoring equipment for that pollutant was installed during calendar year 1974 in the area of estimated maximum concentration of that pollutant (Emergency Episode Station). The City of Houston, Department of Public Health will operate several monitors in Houston for emergency episode monitoring. These monitors will provide real-time data to compliment the data provided by TACB monitors in the Houston area. Data from emergency episodes monitoring sites are collected primarily during stagnant weather conditions when the potential for severe accumulations of air pollutants is large. If air pollution levels become a serious threat to public health, appropriate emergency control actions are initiated. The City of Houston, Department of Public Health is not required to report real-time data from monitoring stations designated exclusively as emergency episode stations to the Texas Air Control Board. Real-time data from the TACB monitoring sites or the City of Houston, Department of Public Health monitoring sites collected during an emergency episode are considered preliminary since the data has not been fully validated and are, therefore, not entered into the Texas Air Quality Data Bank or the National Aerometric Data Bank.

ATTACHMENT 1

Minimum Federally-Prescribed Equipment

Region	Hi-Vols	Tape Samplers	Gas Bubblers	Continuous Monitors		
				SO ₂	CO	O ₃
I	3	1	1	-	-	-
II	3	1	1	-	-	-
III	3	1	1	-	-	3
IV	7	2	1	-	-	-
V	7	2	3	1	-	2
VI	3	1	3	1	-	-
VII	13	8	9	4	-	4
VIII	3	1	1	-	-	5
IX	3	1	1	-	-	3
X	3	1	5	2	-	2
XI	6	2	3	1	2	2
XII	3	1	1	-	-	-
Total	57	22	30	9	2	21

ATTACHMENT 2

Air Sampling/Monitoring Network

Site Category Key

AQS	Air Quality Surveillance
BG	Background
EE	Emergency Episodes
EXP	Exploratory
GA	Growth Area
MC	Maximum Concentration
SS	Source Surveillance
Area	Area Representative
Local	Locally Representative

Pollutant/Parameter Key

TS	Total Sulfur
THC	Total Hydrocarbons
WS	Wind Speed
WD	Wind Direction
T	Temperature

Other pollutants designated by their chemical symbols.

REGION I

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
001001	Abilene	AQS	5/71		99-44-30	32-27-00
066001	Brownwood	BG	9/72		98-59-15	31-43-10
556002	Wichita Falls	MC	12/70	12/70	98-30-05	33-54-45

REGION II

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
007002	Amarillo	MC	2/69	2/69	101-51-31	35-12-48
334001	Lubbock	MC	1/61		101-50-50	33-35-20
	Lubbock	AQS	1977		to be determined	

REGION III

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
022010	Austin	MC	8/73	8/73	97-42-58	30-18-48
022012	Austin	MC	2/74		97-44-10	30-22-25
537007	Waco	AQS	2/73		97-10-00	31-33-15

Continuous Monitors

SAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
	Austin	AQS MC Exp Local	O3 CO THC, CH4 WS, WD, T	1976	to be determined	
	Waco	AQS Area	O3 WS, WD, T	1977	to be determined	

REGION IV

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
065003	Brownsville	AQS	2/74		97-24-32	25-57-00
	Brownsville	AQS	1977		to be determined	
232001	Harlingen	MC	2/61		97-41-37	26-11-43
246004	KGBT Towers	BG	12/74		95-54-00	26-23-00
314013	Laredo	AQS	1976		99-29-58	27-34-27
339001	McAllen	MC	1/66		98-14-35	26-12-27
546001	Weslaco	AQS	12/74	12/74	97-57-30	26-09-55

REGION V

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
072001	Point Comfort	SS	12/70		96-34-00	28-40-30
115001	Corpus Christi	MC	1/57	2/69	97-25-30	27-46-45
115003	Corpus Christi	AQS	2/69	1976	97-23-15	27-44-15
115019	Corpus Christi	AQS	5/73	5/74	97-25-50	27-47-30
345001	Tilden	BG	3/75		98-32-55	28-27-43
534001	Victoria	AQS	3/75	3/75	96-59-04	28-49-14
	Nueces County	AQS	1976	1976	to be determined	
	Gregory	AQS,GA	1977	1977	to be determined	

Continuous Monitors

SAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
		MC EE	O ₃			
		AQS	NO ₂			
		MC EE	TS, H ₂ S, SO ₂			
		Exp	THC, CH ₄			
		Exp	NO, NO _x			
		Area	WS, WD, T			
	Nueces County	BG	O ₃	1976	to be determined	
		AQS	TS, H ₂ S, SO ₂			

REGION VI

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
362001	Midland	AQS	5/71	9/72	102-04-30	31-59-55
391001	Odessa	MC	1/63	5/71	102-21-50	31-52-15
391002	Odessa	AQS	11/75	11/75	102-21-30	31-52-20
52001	Tom Green Co.	BG	8/69	8/69	100-26-06	31-27-40

REGION VI
(cont'd.)

Continuous Monitors

SAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
391002	Odessa	Exp BG MC EE Exp Exp Area	CO O ₃ TS, H ₂ S, SO ₂ THC, CH ₄ NO, NO ₂ , NO _x WS, WD, T	11/75	102-21-30	31-52-20

REGION VII

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
006001	Alvin	GA	8/72	8/72	95-14-08	29-23-43
032002	Baytown	AQS	12/66	3/71	94-58-44	29-44-48
095003	Clute	AQS	6/74	6/74	95-23-30	29-00-30
148001	Dickinson	AQS	2/76 G	2/76 G	95-03-30	29-28-00
198002	Galveston	AQS	1976 G		94-48-00	29-19-00
233003	Alief	AQS	7/72	7/72	95-34-04	29-41-47
233004	Cypress	AQS	7/72	7/72	95-39-02	29-56-12
233005	Spring	BG	6/72		95-25-51	30-03-07
233024	Aldine	AQS	2/74	6/74	95-19-35	29-54-05
256001	Houston	AQS	1/57	5/57	95-22-13	29-45-38
256004	Houston	AQS	1/68 H	1/70 H	95-13-42	29-38-05
256005	Houston	AQS	1/68 H	2/69 H	95-21-19	29-38-07
256008	Houston	AQS	1/68 H	1/70 H	95-26-24	29-41-52
256011	Houston	AQS	1/68 H	1/70 H	95-29-02	29-49-04
256012	Houston	AQS	1/68 H	2/69 H	95-22-54	29-51-14
256013	Houston	AQS	1/68 H	1/70 H	95-17-05	29-49-38
256017	Houston	AQS	3/72 H	2/69 H	95-12-47	29-44-00
256028	Houston	AQS	9/72 H	2/72 H	95-11-14	29-43-06
256034	Houston	MC	4/73	6/74	95-13-22	29-46-12
256035	Houston	AQS	10/73 H	5/72 H	95-15-00	29-44-00
256040	Houston	AQS	1976 H	1976 H	95-31-26	29-43-59
256041	Houston	AQS	1976 H	1976 H	95-26-15	29-48-05
261001	Huntsville	GA	3/75		95-32-41	30-43-24
307001	LaMarque	AQS	1/76 G	1/76 G	95-00-00	29-21-30
353001	Matagorda	BG	1/67	7/70	95-58-29	28-41-05
406002	Pasadena	AQS	7/68	7/69	95-12-45	29-42-45
406006	Pasadena	AQS	5/72	5/72	95-07-05	29-39-15
517002	Texas City	AQS	6/74	6/74	95-56-07	29-24-05
517004	Texas City	AQS	1/72 G	1/72 G	94-55-52	29-23-04
517013	Texas City	AQS	1976 G	1976 G	94-55-47	29-20-00
517051	Texas City	AQS	1/74		94-56-58	29-23-46

G - Monitors operated by Galveston County-Mainland Cities Health Department

H - Monitors operated by Houston City Health Department

REGION VII
(cont'd.)

Continuous Monitors

BAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
095003	Clute	SS Exp GA SS, Exp SS Area	CO O ₃ TS, H ₂ S, SO ₂ THC, CH ₄ NO, NO ₂ , NO _x WS, WD, T	6/74	95-23-30	29-00-30
233024	Aldine	AQS MC EE AQS Exp Exp Area	CO O ₃ TS, H ₂ S, SO ₂ THC, CH ₄ NO, NO ₂ , NO _x WS, WD, T	2/74	95-19-35	29-54-05
256034	Houston	AQS MC, EE Exp MC, EE Exp Exp Area	CO O ₃ NO ₂ TS, H ₂ S, SO ₂ THC, CH ₄ NO, NO _x WS, WD, T	4/73	95-12-22	29-46-12
517002	Texas City	AQS MC, EE Exp MC, EE Exp Exp Area	CO O ₃ NO ₂ TS, H ₂ S, SO ₂ THC, CH ₄ NO, NO _x WS, WD, T	6/74	94-56-07	29-24-05
256035	Houston	EE EE EE EE EE EE	TS, SO ₂ , H ₂ S O ₃ CO THC, CH ₄ NO, NO _x WS, WD, T	1971 H	95-15-00	29-44-00
(256037)	Houston, Downtown	AQS (EE)* AQS (EE) MC, AQS (EE) Exp (EE) AQS (EE) Local (EE)	TS, SO ₂ , H ₂ S O ₃ CO THC, CH ₄ NO, NO _x WS, WD, T	1977 (1971) H	to be determined (95-21-15)	(29-44-20)

*A proposed monitoring site is planned for the downtown area to measure estimated maximum concentrations of carbon monoxide. The present site will supply real-time data for use during emergency episodes. The planned site for 1977 has not been selected. The present location is a potential candidate.

REGION VII
(cont'd.)

Continuous Monitors

SAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
256038	Houston	EE	TS,SO ₂ ,H ₂ S	6/74 H	95-17-08	29-50-15
		EE	O ₃			
		EE	THC,CH ₄			
		EE	NO,NO _x			
		EE	WS,WD,T			
256039	Houston	EE	TS,SO ₂ ,H ₂ S	6/74 H	95-16-45	29-36-45
		EE	O ₃			
		EE	THC,CH ₄			
		EE	NO,NO _x			
		EE	WS,WD,T			
256007	Houston	EE	O ₃	1971 H	95-23-02	29-43-07
		EE	NO,NO _x			
		EE	WS,WD,T			
	Houston	EE	O ₃	1/77 H	95-29-02	29-49-04
		EE	NO,NO _x			
		EE	WS,WD,T			
	Houston	EE	O ₃	6/78 H	to be determined	
		EE	NO,NO _x			

REGION VIII

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date Hi-vols	Installation Date Bubblers	Site Longitude W	Site Latitude N
	Arlington	AQS	1977	1977	to be determined	
131002	Dallas	AQS	8/67	1/68	96-47-28	32-46-50
131003	Dallas	AQS	1/69 D		96-50-05	32-46-20
131020	Dallas	AQS	1/69 D		96-47-33	32-41-32
131023	Dallas	AQS	1/69 D		96-51-23	32-46-54
131027	Dallas	AQS	1/69 D		96-41-04	32-44-05
131029	Dallas	AQS	1/69 D		96-48-31	32-51-54
131038	Dallas	AQS	1/70 D		96-41-36	32-48-26
131042	Dallas	AQS	9/70 D		96-45-41	32-49-03
131044	Dallas	AQS	11/74 D	11/74	96-51-50	32-49-34
131045	Dallas	MC	9/73	6/74	96-48-28	32-55-35
	Denton	AQS	1977	1977	to be determined	
188001	Fort Worth	AQS	1/58	1/68	97-19-45	32-45-00
188002	Fort Worth	MC	9/75		97-21-26	32-48-19
188012	Fort Worth	AQS	1/69 F		97-16-32	32-43-41
188017	Fort Worth	AQS	1/69 F		97-23-54	32-39-10

D - Monitors operated by Dallas Environmental Health and Conservation Dept.

F - Monitors operated by Fort Worth Department of Public Health

REGION IX
(cont'd)

Continuous Monitors

SAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
457036	San Antonio	AQS	CO	2/74	98-32-30	29-30-10
		MC EE	O ₃			
		AQS	NO ₂			
		GA	TS, H ₂ S, SO ₂			
		Exp	THC, CH ₄			
	Exp	NO, NO _x				
	San Antonio	Area	WS, WD, T	1976	to be determined	
		AQS	O ₃			
		MC	CO			
	Bexar County	Exp	THC, CH ₄	1977	to be determined	
Exp		NO, NO ₂ , NO _x				
Local		WS, WD, T				
BG		O ₃				

REGION X

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Hi-vols	Bubblers	Installation Date	Site Longitude W	Site Latitude N
033001	Beaumont	MC	1/59		1976	94-05-30	30-03-30
	Beaumont	AQS			1976	to be determined	
383003	Nederland	MC	6/73	6/74		94-01-00	29-57-15
419006	Port Arthur	AQS	5/72	5/72		93-56-00	29-52-23
548001	West Orange	AQS	2/74	6/74		93-45-50	30-05-05

Continuous Monitors

SAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
383003	Nederland	AQS	CO	5/73	94-01-00	29-57-15
		MC EE	O ₃			
		AQS	NO ₂			
		MC EE	TS, H ₂ S, SO ₂			
		Exp	THC, CH ₄			
		Exp	NO, NO _x			
		Area	WS, WD, T			
548001	West Orange	AQS	CO	2/74	93-45-50	30-05-05
		AQS EE	O ₃			
		AQS EE	TS, H ₂ S, SO ₂			
		Exp	THC, CH ₄			
		Exp	NO, NO ₂ , NO _x			
		Area	WS, WD, T			

REGION VIII
(cont'd)

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
188060	Fort Worth	AQS	9/75	F	97-24-46	32-43-42
188061	Fort Worth	AQS	3/71	F	97-19-56	32-47-48

Continuous Monitors

SAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
131045	Dallas	AQS	CO	9/73	96-48-28	32-55-35
		MC EE	O ₃			
		AQS	NO ₂			
		GA	TS, H ₂ S, SO ₂			
		Exp	THC, CH ₄			
	Dallas	Exp	NO, NO _x	1976	to be determined	
		Area	WS, WD, T			
		AQS	O ₃			
		MC EE	CO			
		Exp	THC, CH ₄			
Arlington	Exp	NO, NO ₂ , NO _x	1977	to be determined		
	Local	WS, WD, T				
	BG	O ₃				
	BG	CO				
	BG	THC, CH ₄				
188002	Fort Worth	AQS	CO	9/75	99-21-26	32-48-19
		MC EE	O ₃			
		AQS	NO ₂			
		Exp	THC, CH ₄			
		Exp	NO, NO _x			
	Fort Worth	Area	WS, WD, T	1976	to be determined	
		AQS	O ₃			
		MC	CO			
		Exp	THC, CH ₄			
		Local	WS, WD, T			

REGION IX

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
158003	Eagle Pass	AQS	6/71		100-30-00	28-41-00
457005	San Antonio	AQS	1/69	S	98-35-40	29-30-20
457022	San Antonio	AQS	1/72	S	98-28-23	29-31-47
457024	San Antonio	AQS	1/71	S	98-34-05	29-25-58
457034	San Antonio	MC	9/72		98-29-07	29-24-46
457036	San Antonio	AQS	2/74	2/74	98-32-30	29-30-10
457040	San Antonio	AQS	1/72	S	98-26-50	29-21-43

S - Monitors operated by San Antonio Metropolitan Health District

REGION XI

Non-Continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
170002	El Paso	MC	3/69	4/69	106-29-00	31-45-30
170007	El Paso	AQS	5/69 E	6/75	106-32-00	31-46-57
170010	El Paso	AQS	5/69 E	11/72	106-24-32	31-53-58
170011	El Paso	AQS	5/69 E	9/75	106-23-45	31-47-55
170015	El Paso	AQS	5/69 E	11/72	106-21-20	31-44-00
170018	El Paso	AQS	5/69 E		106-26-20	31-46-14
170019	El Paso	AQS	1/71 E	11/72	106-27-25	31-47-07
170025	El Paso	AQS	11/72 E		106-34-15	31-49-14
170027	El Paso	AQS	11/73	6/74	106-29-10	31-45-45
170028	El Paso	AQS	7/74	7/74	106-24-15	31-45-13
171005	Anthony	AQS	12/74		106-35-51	31-59-50
274003	McDonald	BG	7/74		104-00-30	30-40-00

Continuous Monitors

SAROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
		AQS	O ₃			
		MC EE	TS, H ₂ S, SO ₂			
		Exp	THC, CH ₄			
		Exp	NO, NO ₂ , NO _x			
		Local	WS, WD, T			
170028	El Paso	AQS	CO	7/74	106-24-15	31-45-13
		MC EE	O ₃			
		AQS	NO ₂			
		AQS	TS, H ₂ S, SO ₂			
		Exp	THC, CH ₄			
		Exp	NO, NO _x			
		Area	WS, WD, T			

REGION XII

Non-continuous Samplers

SAROAD #	Site Name	Site Category	Installation Date		Site Longitude W	Site Latitude N
			Hi-vols	Bubblers		
377001	Mount Pleasant	BG	12/73		94-58-37	33-10-48
516001	Texarkana	MC	1/64	12/73	94-02-33	33-25-30
524002	Tyler	AQS	10/69	10/69	95-18-00	32-21-00

E - Monitors operated by El Paso City-County Health Department

REGION XII
(cont'd)

Continuous Monitors

ROAD #	Site Name	Site Category	Monitors	Installation Date	Site Longitude W	Site Latitude N
	Tyler	GA BG Area	SO ₂ O ₃ WS,WD,T	1976		to be determined