

SOURCES OF VIRGINIA METEOROLOGICAL AND AIR QUALITY DATA
FOR USE IN HIGHWAY AIR QUALITY ANALYSIS WITH COMMENTS
ON THEIR USEFULNESS

by

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Research Analyst

(The opinions, findings, and conclusions expressed in this report are those of the author and not necessarily those of the sponsoring agencies.)

Virginia Highway & Transportation Research Council
(A Cooperative Organization Sponsored Jointly by the Virginia
Department of Highways & Transportation and
the University of Virginia)

Charlottesville, Virginia

April 1975
VHTRC 75-R42

PREFACE

The preparation of accurate air quality analysis portions of highway environmental impact statements requires valid meteorological and air quality data. These data are needed, in part, to determine the regional and local wind patterns on which pollutant dispersion levels are based, which in turn are used in predicting changes in air quality levels that will result from highway construction. In response to the needs of the Environmental Quality Division of the Virginia Department of Highways & Transportation for valid data, this report was prepared for use as a guide to the sources of meteorological and air quality data in Virginia and to provide comments on the usefulness of these data for highway air quality impact analysis.

In the compilation of the information in this report, the author contacted personnel in most of the agencies listed in the report and inspected the monitoring stations to assess the exposure of the instruments as it might influence the accuracy of the data collected.

Following the Introduction and Methodology sections of the report, the agencies contacted are presented alphabetically by category in the following order:

1. Federal Agencies
2. State Agencies
3. County Agencies
4. City Agencies
5. Public Utilities

An index provides an alphabetical listing of the agencies. Because the priorities and requirements of the several agencies included in the report can change, the report format has been devised to permit updating the information as warranted.

2630

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INTRODUCTION

Since passage of the Clean Air Act and its amendments and the Federal Aid Highway Act of 1970, the Virginia Department of Highways & Transportation has been required to submit environmental impact statements for federal-aid highway projects as a prerequisite for approving these projects. For the air quality analysis portion of these impact statements, the Department initially prepared relatively simple descriptive comments concerning the expected effects of a proposed highway on the quality of the air in its environs. However, it currently uses computer modelling to predict the impact.

With these sophisticated computer programs needed to meet federal regulations, the availability of reliable meteorological data and accurate background air quality data is crucial.

METHODOLOGY

Meteorological Data

The report lists, by agency, the available sources of meteorological data in Virginia and comments on the reliability of the data for use in air quality impact analysis.

Air Quality Data

The report lists by agency the available sources of air quality data in Virginia and comments on the usefulness of these data to the Department's Environmental Quality Division.

Carbon monoxide (CO) levels are the primary pollutant data required for highway air quality analysis. The primary sources of CO can be identified and monitored. In the comments concerning the limited reliability of these data for highway air quality

analysis, it is apparent that the Department's data requirements differ from the monitoring requirements of the agencies collecting the data.

Ozone and nitrogen dioxide are formed as areawide emissions without specific identifiable sources. So the locations of the monitoring sites for these pollutants are listed to show the regional monitoring network only.

Airports (Meteorological Only)

U. S. Department of Commerce
National Oceanic and Atmospheric Administration
Washington, D. C.

Some local airports, not in the National Weather Service System, monitor wind speed and direction. These sources have limited reliability because the data generally are not recorded and the instrument exposure varies from airport to airport.

Should an air quality study be conducted in an area where National Weather Service data are deemed not to be representative, local airports might furnish limited meteorological data.

Sectional aeronautical charts (CINCINNATI, WASHINGTON) showing all airports in the state are available for a nominal fee from the National Oceanic and Atmospheric Administration or from flight service offices located at major airports in Virginia.

Environmental Protection Agency (Air Quality Only)

U. S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Monitoring and Data Analysis Division
Research Triangle Park, North Carolina 27711

The State Air Pollution Control Board (SAPCB) sends all of its air quality data to the U. S. Environmental Protection Agency (EPA) office in North Carolina. The EPA operates the National Aerometric Data Bank for Storage And Retrieval of Aerometric Data (SAROAD)⁽¹⁾ collected by local, state and federal air pollution control agencies.

The SAROAD format identifies each monitoring site by state, city, and county, and denotes the type of agency using the site and type of project conducted at the site. The SAROAD data are available in several forms from the EPA, and requests must bear the SAROAD code for the site(s) of interest. SAROAD codes are available from the SAPCB in Richmond or from the EPA in North Carolina.

The currently available SAROAD data formats are as follows:

1. Yearly Report by Quarters (seasonal trends).

To order such data, state the pollutants of interest, the site combination and number, and specific years.

2. Raw Data Listing. One-, two-, and four-hour.

Hour averages of air quality data are available for monitoring sites for which 75% of the file data are complete. The following information must accompany the request for a raw data listing:

- (a) Pollutant or pollutants of interest
- (b) Method of measurement
- (c) Time interval (i.e., 2 hours/day, 24 hours/day, etc.)
- (d) Site or sites desired
- (e) Period of data desired (i.e., month, quarter, year, years)

Requests can be made for any data to be put onto magnetic tape or punched cards. In addition, certain averaging and summarizing data programs are available.

In requesting data on punched cards or magnetic tape, the following information must be provided:

Punched Cards

1. Location
2. Pollutant(s)
3. Method of measurement
4. Interval desired
5. Date

Magnetic Tape

1. Number of bits per inch
2. 7 or 9 track
3. Labels
4. Blanking factor

Since these requirements do change with time, it would be beneficial to contact EPA periodically for the latest procedures for SAROAD data acquisition.

Military Installations (Meteorological Only)

Most military bases in Virginia with airport facilities record meteorological data through their weather service systems but these data are not made available for general use. However, they are available from the National Climatic Center (see National Weather Service, page 7) on a 1- to 2-year delay basis.

Should the need arise for recent meteorological data from military bases, there are several ways of acquiring them. First, it is possible to contact the meteorological officer-in-charge for access to this information. Since the data requested are in their original form, it would probably be necessary to copy or duplicate them at the military base. Secondly, some of the data may be available through regional State Air Pollution Control Board personnel (primarily Regions VI & VII) who periodically use such data from military bases located in or around their regions in their own work.

National Weather Service (Meteorological Only)

National Climatic Center
Federal Building
Asheville, North Carolina 28801

For the state of Virginia, the most complete system for compiling meteorological data is maintained by the National Weather Service through its offices located at major airports in the state. However, the frequency of taking meteorological observations differs from airport to airport, both historically and at present. Since National Weather Service policy mandates that the frequency of observations occasionally be changed, periodic inquiries should be made to obtain current information for each of the National Weather Service offices.

Table 1 lists the airports currently recording data and the frequency of observations at each of them. These data usually are available from each airport, and also are available from the National Climatic Center, for a fee, on microfilm and magnetic tape. Table 2 lists the hourly historical data now available from the Center.

Some of the tapes contain data based on fewer than 24 observations per day. Such limited observations may produce biased wind pattern and stability classification data, which may limit the use of some of these stations' data.

Table 1

Weather Service Offices and Stations

Station and Airport Name	Type of Station	Observations per Day*
Charlottesville — Albemarle	Flight Service Station	24
Newport News — Patrick Henry	Flight Service Station	24
Norfolk Regional Airport	Weather Service Office	24
Richmond — Byrd International Airport	Weather Service Office	24
Roanoke — Woodrum Municipal Airport	Weather Service Office	24
Washington — Dulles Airport	Weather Service Office	24
Washington National Airport	Weather Service Office	24
Lynchburg — Preston Glenn Municipal Airport	Weather Service Office	18
Staunton — Municipal Airport	Supplementary Aviation Weather Reporting	18
Danville — Municipal Airport	Flight Service Station	16
Hot Springs — Ingalls Field	Supplementary Aviation Weather Reporting	15
Wallops Station — NASA WBSF	Weather Service Office	12

*All observations are consecutive hourly, for 7 days a week, except those for the Wallops Station, which are consecutive hourly, but not for 7 days a week.

SOURCE: National Weather Service Offices and Stations, 13th Edition, U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Silver Springs, Maryland 20910.

Table 2

National Climatic Center Hourly Historical Data

<u>STATION NO.</u>	<u>NAME</u>	<u>NUMBER REELS</u>	<u>PERIOD OF RECORD</u>
13726	Blackstone	4	1/49 - 12/58
13755	Chincoteague	2	2/52 - 2/59
13728	Danville	1	2/49 - 12/54
93728	Ft. Belvoir	2	2/57 - 11/68
93735	Fort Eustis	1	11/60 - 11/68
13731	Front Royal	2	1/49 - 2/56
13732	Gordonsville	1	1/49 - 12/58
13702	Hampton/Langley AFB	2	1/49 - 11/68
13733	Lynchburg	2	1/48 - 6/54
13750	Norfolk NAS	3	1/49 - 12/69
13737	Norfolk WBAS	2	1/48 - 12/64
13868	Pulaski	1	1/49 - 12/54
13773	Quantico MCAS	3	10/53 - 12/69
13740	Richmond	2	1/48 - 12/64
13741	Roanoke	2	1/48 - 12/64
13743	Washington, Dulles	2	/52 - /61

Alexandria Health Department

Alexandria Health Department
Mr. Barry Kumar
517 N. St. Asaph Street
Alexandria, Va. 22314
Phone: 703-750-6501

Meteorological Data

Though the city of Alexandria does not have and is not planning to develop a meteorological network, it does have a vane on top of its Health Department to monitor wind speed and direction. The vane is located approximately 25-30 feet (7.6-9.1 meters) above street level, but is only 5 feet (1.5 meters) above the building's roof, which leads to some question of its accuracy.

However, this vane could be a source, though a somewhat limited one, for meteorological data in this highly developed area of Alexandria. The data could be useful in correlation with National Airport data.

Air Quality Data

Carbon Monoxide - CO monitoring at this location began during the 4th quarter of 1972. The monitor is located on the second floor of the Alexandria Health Department building, approximately 25 feet (7.6 meters) above and 50 feet (15 meters) from moderately to heavily traveled St. Asaph Street. It records the ambient CO levels produced by the stop and go traffic at the traffic light controlled intersection directly adjacent to the Health Department building.

Ozone and Nitrogen Dioxide - Ozone and NO₂ monitoring at this location began during the 4th quarter and 3rd quarter of 1972 respectively. The monitors record ozone and NO₂ levels for downtown Alexandria and east, northeastern Virginia.

Arlington County, Bureau of Environmental Health

Arlington County
Department of Environmental Health
1800 N. Edison Street
Arlington, Virginia 22207
Phone: 703-558-2661

Air Quality Data

Arlington County's continuous monitoring equipment is limited to one coefficient of haze instrument. According to Dr. Hilcken of the county's Department of Human Resources, the county has no plan to monitor highway related pollutants. CO and ozone monitoring in Arlington County is done by the SAPCB.

Fairfax County Health Department

Fairfax County Health Department
 Air Pollution Control
 4080 Chainbridge Road
 Fairfax, Virginia 22030
 Phone: 703-691-2541

Meteorological Data —
 Mr. E. M. Chase

Air Quality Data —
 Mr. Carl Palmer

Meteorological Data

At this time, the Fairfax County Health Department is the only local agency active in meteorological monitoring at a significant level. The meteorologist, E. M. Chase, was responsible for the establishment of the meteorological network (8 sites). The core of this system is a tower specially instrumented to record the wind speed, direction, and turbulence, as well as temperature and precipitation. This tower is the main meteorological control used for correlation with the other 7 sites (see Table 3), which have varying exposures with standard instruments monitoring and recording the same data except for air turbulence.

Based on Mr. Chase's comments and the design criteria, it appears that the system could provide meteorological data to aid in the complex highway air quality analysis for the Fairfax County area. In addition, the data from the system could be correlated with the meteorological data gathered by the National and Dulles Airports.

Table 3

Fairfax County Air Pollution Control
 Meteorological Sites

Seven Corners (Montgomery Ward)
 6100 Arlington Boulevard, Falls Church
 Meteorological (wind speed and direction, temperature,
 precipitation).

Lewinsville (McLean Governmental Center)
 1437 Balls Hill Road, McLean
 Meteorological (wind direction and speed, temperature,
 precipitation).

Table 3 (cont.)

Great Falls (formerly Reston) — U. S. Army Topographic Command
 925 Springvale Road
 Meteorological (wind speed and direction, temperature, precipitation).

Westgate — Westgate Treatment Plant
 6901 Fort Hunt Road
 Meteorological (wind speed and direction, temperature, precipitation).

Fire Training Center*
 4600 West Ox Road
 Meteorological (wind 3-dimensional speed, direction and turbulence,
 temperature, and precipitation).

Fairfax Station
 10900 Pohick Road, Fairfax Station, Virginia
 Meteorological (wind speed and direction, temperature, precipitation).

Ravensworth
 5255 Port Royal Road
 Meteorological (wind speed and direction, temperature, precipitation).

Occoquan Hill (Water Authority)
 9700 Ox Road (Route 123)
 Meteorological (wind speed and direction, temperature)

*Main meteorological control tower.

Air Quality Data

The Fairfax County Health Department operates four each CO monitors, ozone monitors, and NO₂ monitors. In addition, it operates oxidant monitors during air pollution episodes. The oxidant data are available only through the Fairfax County Air Pollution Control Division. The monitoring stations are described below:

1. Montgomery Ward Store at 6100 Arlington Boulevard, Station No. L-46-G.

Carbon Monoxide — CO monitoring at this location began during the 3rd quarter of 1971. The monitor is located in a trailer on the roof top parking lot of the Montgomery Ward Building, approximately 40 feet (12 meters) above an extensive, but apparently light to moderately used paved parking lot. Heavily

traveled Arlington Boulevard is approximately 300 feet (91 meters) away from the monitor. In addition, this traffic movement is controlled by a stoplight on Arlington Boulevard at the corner of the Montgomery Ward parking lot approximately 600 feet (182 meters) from the monitor. Consequently, traffic backs up from the stoplight east along Arlington Boulevard, parallel to the monitor, which is 300 feet (91 meters) away.

At 300 feet from a highway, CO levels begin to approach background levels not significantly affected by CO generated by the highway traffic. However, in this situation, because of rush hour traffic congestion coupled with certain meteorological conditions and the varying influence of the immediate parking lot traffic around and on the Montgomery Ward Building, the station could at times be monitoring the ambient CO levels from the overall traffic surrounding the site.

Ozone and Nitrogen Dioxide — Ozone and NO₂ monitoring at this location began during the 4th and 3rd quarters of 1972, respectively. These monitors record ozone and NO₂ levels for eastern Fairfax County.

2. 10600 Page Avenue, Station No. L-46-A7.

Carbon Monoxide — CO monitoring at this location began during the 2nd quarter of 1974. The monitor is located in a trailer behind the Fairfax County Police Department on the edge of the restricted police vehicle parking lot. The monitor intake probe is approximately 10 feet (3.4 meters) above the ground.

At the time of day this site was visited (mid-afternoon), the surrounding parking lot had approximately 30 vehicles in it, with light, intermittent in-out vehicle flow. This lot provides only a fraction of the overall parking capacity (approximately 1,000-1,200 cars) adjacent to the Fairfax County Municipal buildings complex. The other parking areas begin approximately 100 feet (30 meters) away and extend in some directions a minimum of 600-800 feet (182-243 meters) from the monitor. These parking areas, however, are broken up by access roads and buildings. The closest major parking lot is used primarily by Fairfax County pool vehicles. Such a parking lot would probably not generate any significant peak levels of CO concentration. The traffic from the other parking lots contributes to the overall ambient CO level of this area. Peak CO levels probably

occur at the morning arrival and evening departure times for the Fairfax County employees. Off-peak, evening and weekend CO levels probably approach background levels, but are probably modified slightly by the light, intermittent traffic generated by the surrounding Police Department parking lot.

Ozone and Nitrogen Dioxide — Ozone and NO₂ monitoring at this location began during the 2nd quarter of 1974. These monitors record ozone and NO₂ levels for central Fairfax County.

3. McLean Governmental Center at 1437 Balls Hill Road, Station No. L-46-A8.

Carbon Monoxide — CO monitoring began at this location during the 2nd quarter of 1974. The monitor is located in a trailer at the corner of the parking lot behind the McLean Governmental Center. The data are probably influenced slightly by the intermittent CO levels produced by the traffic in this parking lot. Another CO source, though probably insignificant, is Backlick Road, a two-lane, apparently lightly traveled residential road approximately 175 feet (53 meters) in front of the monitor. The primary CO source is heavily traveled Rt. 123, Dolly Madison Boulevard, located approximately 250 feet (76 meters) behind the monitor. Peak CO levels recorded at this monitor probably coincide with the rush hour traffic and subsequent traffic backup at the stoplight on Rt. 123.

Overall, this monitor records the ambient CO levels produced primarily from the traffic on Rt. 123. However, since the monitor is just about at a distance from the highway at which such CO levels begin to approach background levels under certain meteorological and traffic conditions, it could be recording background CO levels.

Ozone and Nitrogen Dioxide — Ozone and NO₂ monitoring at this location began during the 2nd quarter of 1974. These monitors record ozone and NO₂ levels for northeast Fairfax County.

2666

4. Engleside — 8312 Richmond Highway, Station No. L-46-A3.

Carbon Monoxide — CO monitoring at this location began during the 4th quarter of 1973. The monitor is located in a trailer beside the State Police Building approximately 150 feet (45 meters) west of the heavily traveled Richmond Highway. The monitor is significantly influenced by the emissions of the rush hour traffic backup from a stoplight controlled intersection approximately 300 feet (91 meters) north on the Richmond Highway.

Ozone and Nitrogen Dioxide — Ozone and NO₂ monitoring at this location began during the 3rd quarter of 1973 and the 1st quarter of 1974, respectively. These monitors record ozone and NO₂ levels for southern Fairfax County.

Public Utilities

PEPCO

PEPCO

Mr. John J. Scovill — Manager —
Environmental Affairs
1900 Pennsylvania Avenue, N.W.
Washington, D. C. 20006
Phone: 202-872-2553

PEPCO has one meteorological site that might provide data useful to the Department. The company has a 340 foot (103 meter) tower monitoring wind speed, direction, and turbulence with height at their Douglas Point nuclear power plant site, which is located four miles south of Quantico on the Maryland side of the Potomac River. This monitoring began in May 1973, and the collected data are available on computer cards or magnetic tape.

VEPCO

VEPCO

7th & Franklin Streets
Environmental Services
Forrest B. Martin, VEPCO Meteorologist
Richmond, Virginia 23261
Phone: 804-771-3769

VEPCO has hired a meteorologist to plan and establish sophisticated meteorological (wind speed and direction) sensors at each of its power plants in Virginia.

Forrest B. Martin, the VEPCO meteorologist, stated that a meteorological system which measures wind speed and direction with height is being planned or built at the VEPCO power plants in the following locations:

1. Quantico
2. Yorktown
3. Chesterfield
4. Portsmouth

According to Mr. Martin, a careful analysis is being made to assure correct exposure of the sensors.

The Quantico site is now in partial operation, while the other sites are in various stages of completion. The data obtained from these locations will be stored on magnetic tape and will be available to highway environmental personnel.

Richmond Department of Public Safety (Air Quality Only)

Department of Public Safety
Air Pollution Control Board
501 N. Ninth Street
Richmond, Virginia 23219
Phone: 804-649-4208

Carbon Monoxide - The Air Pollution Control Bureau maintains no permanent CO monitors, but does spot CO monitoring with its mobile van at potential trouble spots in Richmond.

Ozone - Ozone monitoring at this location began during the 2nd quarter of 1974. The monitor records ozone levels in the downtown Richmond area.

Roanoke

City of Roanoke — Air Pollution Control
215 Church Avenue, S. W.
Roanoke, Virginia 24011
Phone: 703-981-2421

Carbon Monoxide — Carbon monoxide has been monitored at two locations in Roanoke since the 3rd quarter of 1971. However, the method used to monitor CO at these locations proved to be unreliable and monitoring was discontinued in mid-1974.

There are plans to install a reliable CO monitor in the Roanoke area in the near future.

Oxidants and Nitrogen Dioxide — Oxidants and NO₂ have been monitored in Roanoke since the 3rd quarter of 1971. However, the method used to monitor these pollutants has questionable accuracy, so the data from these monitors should not be used. (2)

State Air Pollution Control Board (SAPCB)

Meteorological Data

SAPCB
Dr. Jess, Meteorologist
Ninth Street Office Building
Richmond, Virginia 23219
Phone: 804-770-2378

The State Air Pollution Control Board (SAPCB) has one meteorologist, Dr. Jess, who is located at the SAPCB's central office. His primary responsibilities are concerned with providing meteorological expertise to SAPCB personnel.

According to Dr. Jess, the SAPCB has not established a definite system of meteorological recording instruments. Nor are plans foreseen for an investment in these instruments in the near future. The SAPCB relies primarily on the meteorological data compiled by the National Weather Service stations. However, it does maintain wind sensors at some of its regional offices and in close proximity to some of its air quality monitors. The exposure of most of these instruments would limit the use of the historical wind speed/direction data by themselves. These data could be used beneficially if complemented by appropriate Weather Service data.

Air Quality Data

SAPCB
1005 W. Cary Street
Richmond, Virginia 23220
Attn: Mr. Peter H. Wilson
Phone: 804-770-5160 or 4354

The SAPCB maintains overall control of air quality monitoring for the state of Virginia. However, local health departments participate in some of the operation, maintenance and data collection activities.

The SAPCB has been monitoring since 1968, but for pollutants pertinent to highway environmental analysis, it has been monitoring CO, ozone, oxidants, and NO₂ in various capacities only since 1971, following passage of the Clean Air Act and imposition of the monitoring requirements placed on the states by this act. (3)

So since 1971, the SAPCB has increased the number of its monitoring sites, relocated some sites, and replaced equipment as warranted by significant advances in technology. Consequently, most of the air quality monitoring installations have collected less than four years of data.

All data recorded on a regular basis by the SAPCB and local agencies in conjunction with the SAPCB are available through the SAPCB's Richmond office. The data are stored in paper form, usually on a SAROAD data sheet that contains hourly averages of the pollutants (CO, ozone, and NO₂), 24 hours a day, for one-month periods. The data are usually complete except for interruptions for normal monitoring equipment maintenance and calibration and for downtime. There is usually about a one-month delay between putting the data on the SAROAD data sheets in the various agencies and divisions and sending the sheets to Richmond for filing.

Data Related to Highway Department Needs

Carbon Monoxide

The SAPCB has met and exceeded federal requirements for CO monitors in the state. Additional monitors will be added to the state network as needed.

Ozone

The SAPCB is currently giving ozone a higher priority than CO, even though federal requirements for ozone monitors in the state have been exceeded, because it views ozone as a major air quality problem. Three ozone monitors were added to the network in 1974 and others will be acquired as needed.

Nitrogen Dioxide

NO₂ monitoring in the state has had a complicated history. The SAPCB began monitoring NO₂ in 1970, and by the end of 1971 had established 19 monitoring sites. However, most of these monitors used the Jacobs-Hochheiser method of analysis, whose use was discontinued because of its questionable accuracy. All currently reported NO₂ data are collected by the Fairfax County Department of Public Health, which reports the data to the SAPCB. These data are collected by the Saltzman or conductimetric methods, which are more reliable than the Jacob-Hochheiser method.⁽⁴⁾

Monitoring Stations

The air quality monitors listed below are maintained directly by the regional SAPCB offices. Other monitors in the state air quality monitoring network are maintained by local agencies and are described under those agencies elsewhere in this report.

Region V — State Capital

2112 Spencer Road
Richmond, Virginia 23230
Phone: 804-770-7940

1. Henrico County, State Fairgrounds, Station No. 72-G.
This monitor began monitoring ozone in the 4th quarter of 1972 and is located in the dairy exhibit building near the race track. It records the ozone levels for the northern edge of the Richmond urban area.
2. Richmond, 2112 Spencer Road, Station No. 72-K.
This monitor, which began monitoring in the 2nd quarter of 1974, is located at the SAPCB monitoring division office in the west end of Richmond. It had been in the ABC warehouse location since the 2nd quarter of 1973.
3. Richmond, OIC Building at Main and Belvedere, Station No. 158-0.
This monitor began collecting CO levels in the 3rd quarter of 1971 and is located approximately 15 feet (4.5 meters) above and 25 feet (7.6 meters) away from heavily traveled Belvedere Avenue. Stoplights located at the intersections on either side of this building (and monitor) produce heavy stop and go traffic, especially during rush hours. Consequently, the data are influenced by the ambient CO levels produced by the traffic on Belvedere.
4. Richmond, McGuire V.A. Hospital, Station No. 158-P.
This monitor began monitoring in the 2nd quarter of 1973. It is located in a trailer approximately 150 feet (46 meters) from the intersection of Broad Rock Road and Belt Boulevard, and records ozone levels for southside Richmond.
5. Richmond, ABC Warehouse at Hermitage Road, Station No. 158-Q.
CO monitoring at this location began during the 2nd quarter of 1973. The monitor is located in a trailer,

2674

with its sampler intake approximately 25 feet (7.5 meters) away from moderately traveled Hermitage Road. During rush hours, however, traffic backs up along Hermitage Road from the stoplight at Robin Hood Road, which is approximately 150 feet (46 meters) north of the trailer. This monitor is recording ambient CO levels produced by the traffic on Hermitage Road, especially during rush hour.

Other CO sources having lesser but varying periodic effects on the overall CO levels in the area are I-64 & 95, approximately 500 feet north (152 meters) and the Parker Field parking lot, the far edge of which begins approximately 100 feet (30 meters) away from the monitor on the other side of Hermitage Road.

Region VI — Hampton Roads

SAPCB
Pembroke Office Park
Pembroke One-Suite 610
Virginia Beach, Virginia 23462
Phone: 804-449-6845

1. Chesapeake, Dog Pound at Robertson and Freeman Streets, Station No. 176-F.
CO monitoring at this site began during the 3rd quarter of 1973. The monitor is located in a trailer at a corner of the small parking lot of the dog pound. The sampler intake is approximately 12 feet (3.7 meters) above the ground.

There are no significant CO sources at this location. The trailer was placed here to monitor several pollutants, including CO, coming from the industrial complexes in this area of Chesapeake. The main source in question, for CO, is a VEPCO power plant approximately a mile away. The closest industry, a rendering plant approximately 250 feet (76 meters) away, produces no CO, and attracts an insignificant amount of traffic. Consequently, CO levels at this location are generally the lowest measured by the three Tidewater CO monitors.

In the absence of any nearby significant CO concentrations, this monitor could provide useful background CO data for this area of Tidewater.

2. Hampton, Virginia School at 700 Shell Road, Station No. 179-C.
Carbon Monoxide — CO monitoring at this location began during the 4th quarter of 1972. The monitor is located in a trailer, approximately 150 feet (46 meters) from the heavily traveled Newport News Connector. This road is subject to heavy rush hour traffic to and from the Newport News Shipbuilding and Dry Dock Co. In fact, this monitor was located here to record the potentially high CO levels generated by this road. The immediate neighborhood roads do not appear to generate significant CO levels. However, the CO levels generated by the traffic at the intersection of Pembroke Avenue and Sherdeen Road, approximately 550 feet (153 meters) from the monitor, could occasionally affect the CO readings.

Ozone — Ozone monitoring at this location also began during the 4th quarter of 1972. It is the only ozone monitor operating in the Hampton-Newport News area (northern Tidewater).
3. Norfolk, Post Office Garage at Tidewater Drive and Brambleton Avenue, Station No. 181-I.
Carbon Monoxide — CO monitoring at this location began during the 3rd quarter of 1971. The monitor is located in a trailer in the Post Office Garage Parking Lot. Its air sampler is 12 feet (3.7 meters) above ground level and approximately 50 feet (15 meters) from the heavily traveled intersection of Tidewater Drive and Brambleton Avenue. This monitor was located here to record potentially high CO levels in a downtown Norfolk location. So the CO data here are significantly influenced by the heavy traffic.
4. Norfolk, Norfolk Airport, Old Norfolk Airport Terminal, Station No. 181-K.
This monitor is located on the third level of the old Norfolk Municipal Airport Control Tower, approximately 40 feet (12 meters) above the ground. It is the only monitor for the Norfolk-Virginia Beach area of eastern Tidewater.
5. Suffolk, Tidewater Community College, Station No. 183-D.
This monitor is located on the second floor of the Science Building at the Tidewater Community College, in the south-southwestern part of the Tidewater area.

Region VII - Northern Virginia

SAPCB

7115 Leesburg Pike, Room 104

Falls Church, Virginia 22043

Phone: 703-534-0067

1. Arlington County, 2600 South Shirlington, Station No. 1-47-H.

Carbon Monoxide - CO monitoring at this location began during the 4th quarter of 1972. The monitor is located on the third floor of the Rosenthal Chevrolet Building, approximately 40 feet (12 meters) above and 50 feet (15 meters) from heavily traveled I-95. This monitor is recording ambient CO levels significantly influenced by the nearby I-95 traffic. Emissions from the small parking area immediately below the monitor probe are insignificant.

Ozone - Ozone monitoring at this location also began during the 4th quarter of 1972. This station monitors ozone levels in the central part of highly urbanized Arlington County.

RECOMMENDATIONS

Meteorological Data

Most of the collection of meteorological data in Virginia is being done by the National Weather Service at its stations located at the major airports in the state. The Service's data have become a general source for historical and current meteorological data for air quality research. So, in general, the existing network of monitors in the state supplies meteorological data adequate for determining regional wind patterns.

However, if air quality monitoring is conducted by the Department, auxillary meteorological monitoring will be necessary to provide accurate meteorological data for calculating pollutant dispersion levels at the Department air quality monitoring locations.

Air Quality Data

Carbon Monoxide

In accordance with the Environmental Protection Agency's monitoring site requirements, the SAPCB and the local air pollution control agencies have located most of their CO monitors in close proximity to areas of probable maximum CO concentrations.⁽⁵⁾ The Department, however, needs background CO data for its air quality analysis, CO data that are not significantly influenced by a single nearby source. Consequently, most of the CO data being collected is of limited use for determining background CO levels. Therefore, there is a need for additional background CO monitoring where presently collected data are not believed to be representative and where no background CO data at all are available.

Ozone and Nitrogen Dioxide

Since ozone and nitrogen dioxide are formed on an area source basis, the existing network of the monitors is satisfactory and no additional monitoring is needed at this time.

2678

REFERENCES

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INDEX

	<u>Page No.</u>
AIRPORTS	
Meteorological Data	3
ENVIRONMENTAL PROTECTION AGENCY	
Air Quality Data	4
MILITARY INSTALLATIONS	
Meteorological Data	6
NATIONAL WEATHER SERVICE	
Meteorological Data	7
ALEXANDRIA	
Meteorological Data	10
Air Quality Data	10
ARLINGTON	
Air Quality Data	11
FAIRFAX	
Meteorological Data	12
Air Quality Data	13
PUBLIC UTILITIES	
PEPCO	
Meteorological Data	17
VEPCO	
Meteorological Data	17
RICHMOND	
Air Quality Data	19
ROANOKE	
Air Quality Data	20

2682