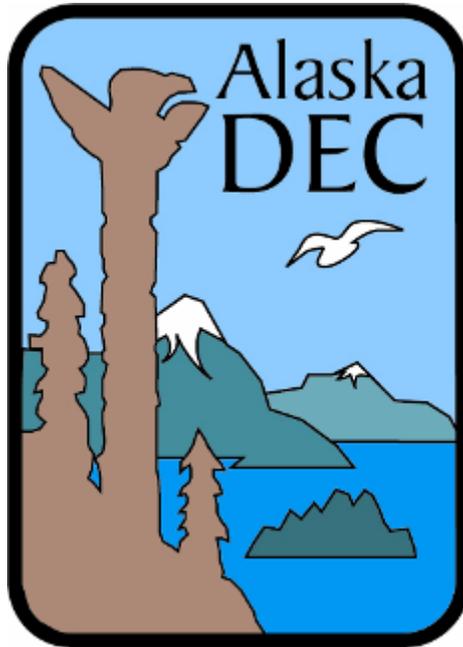


DRAFT

Alaska's Air Monitoring 2008 Network Plan

Chapter 4 - Fairbanks



Please provide comments by August 17, 2007 to:

State of Alaska Department of Environmental Conservation
Division of Air Quality
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4 FAIRBANKS MONITORING SITES

4.1 *General Information*

Fairbanks is the second largest city in Alaska (population¹ 31,324). The city of Fairbanks is located within the Fairbanks North Star Borough (FNSB; population 87,560). Fairbanks is situated on the banks of the Chena River in the upper Tanana Valley. Interior Alaska experiences seasonal temperature extremes. The average temperatures range from -2°F to -19°F in the winter and from 53°F to 72°F in the summer. Temperatures have been recorded as low as -78°F in mid-winter, and as high as 93°F in summer. Average annual precipitation is 11.3 inches. Ice fog is common during the winter. Fairbanks experiences 21 hours of daylight between May 10th and Aug. 2nd each summer, and less than 4 hours of daylight between Nov. 18th and Jan. 24th each winter.

Fairbanks was designated non-attainment for CO on November 15, 1990. The community developed a rigorous Inspection and Maintenance (I&M) program to reduce tail pipe emissions from automobiles and the EPA required automobile manufacturers to reduce environmental pollution, both of which have helped improve area air quality in the Fairbanks North Star Borough. Fairbanks was re-designated to CO “maintenance” status on July 23, 2004. Appendix A- lists the definitions of each designation.

The Fairbanks North Star Borough Air Program operates and manages four monitoring stations: two State and Local Air Monitoring Site (SLAMS) for CO and one SLAMS for PM_{2.5} and one Special Purpose Monitoring Site (SPM) for carbon monoxide. The FNSB SLAMS and SPM sites are identified below in Table 4-1. Appendix B- list siting criteria.

The Fairbanks monitoring sites are located within the Northern Alaska Air Quality Control Region. Figure 4.1:1 is a map showing the entire Fairbanks area and surrounding geographical features. Figure 4.1:2 is a satellite map indicating locations of the four monitoring sites. Fairbanks is bordered by hills to the north and west, with the flats opening up to the south and east.

¹ Population data from 2005 US Census.

Table 4-1: **SLAMS and SPM sites in the Fairbanks North Star Borough**

<u>PM_{2.5}</u>					
<u>Site Name</u>	<u>Location</u>	<u>AQS ID</u>	<u>Designation</u>	<u>Install Date</u>	<u>Scale</u>
State Office	Fairbanks	02-090-0010	SLAMS	Oct, 1998	neighborhood
<u>CO</u>					
<u>Site Name</u>	<u>Location</u>	<u>AQS ID</u>	<u>Designation</u>	<u>Install Date</u>	<u>Scale</u>
Hunter School	Fairbanks	02-090-0020	SLAMS	Jan, 1979	neighborhood
Old Post Office	Fairbanks	02-090-0002	SLAMS	Jan, 1972	micro
Armory	Fairbanks	02-090-0023	SPM	Oct, 2003	neighborhood

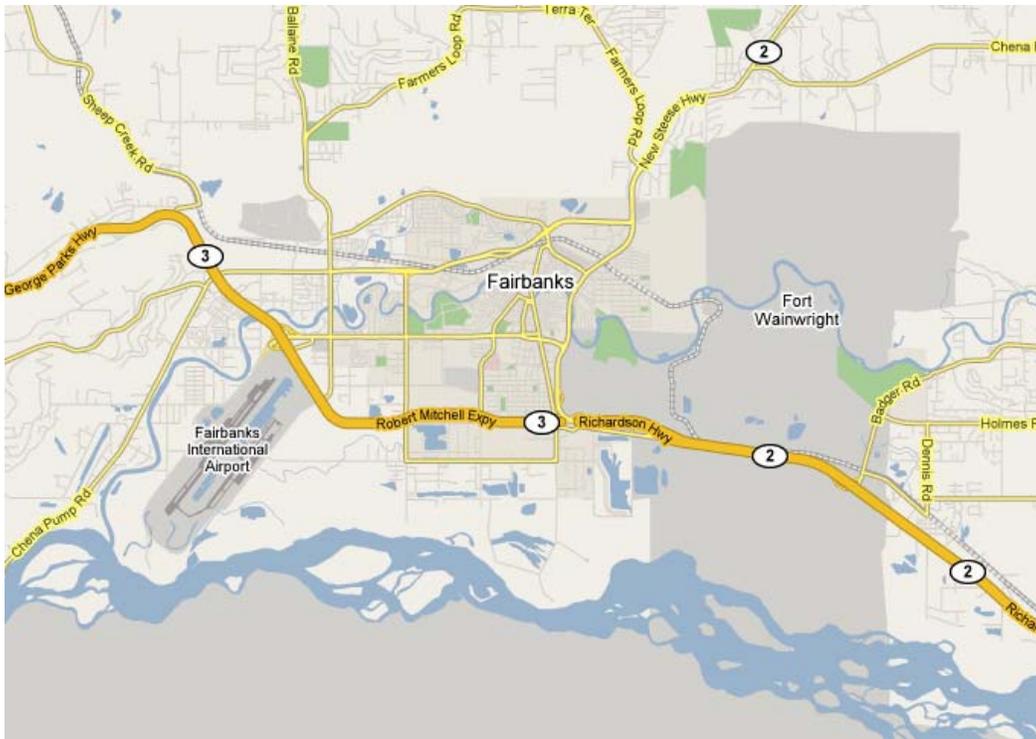


Figure 4.1:1: Map of Fairbanks area



Figure 4.1:2: Satellite photo of Fairbanks. Red circles indicate (in order from top down) the (1) Old Post Office, (2) The Armory, (3) State Office Building, and (4) Hunter Elementary School sites.

4.2 OLD POST OFFICE SITE - FAIRBANKS

250 Cushman Street
Parameters: CO

AQS ID 02-090-0002
Established: January 1, 1972

4.2.1 Site Information

The site is located in the Old Post Office building at 250 Cushman Street at latitude $64^{\circ} 50' 43''$, longitude $-147^{\circ} 43' 16''$, and 460 feet (140 meters) above sea level. Figure 4.2:1 shows a street map of downtown Fairbanks and satellite image of the area. The site is located in the middle of the central business district. The Old Post Office is a micro-scale, population-oriented site located in downtown Fairbanks.

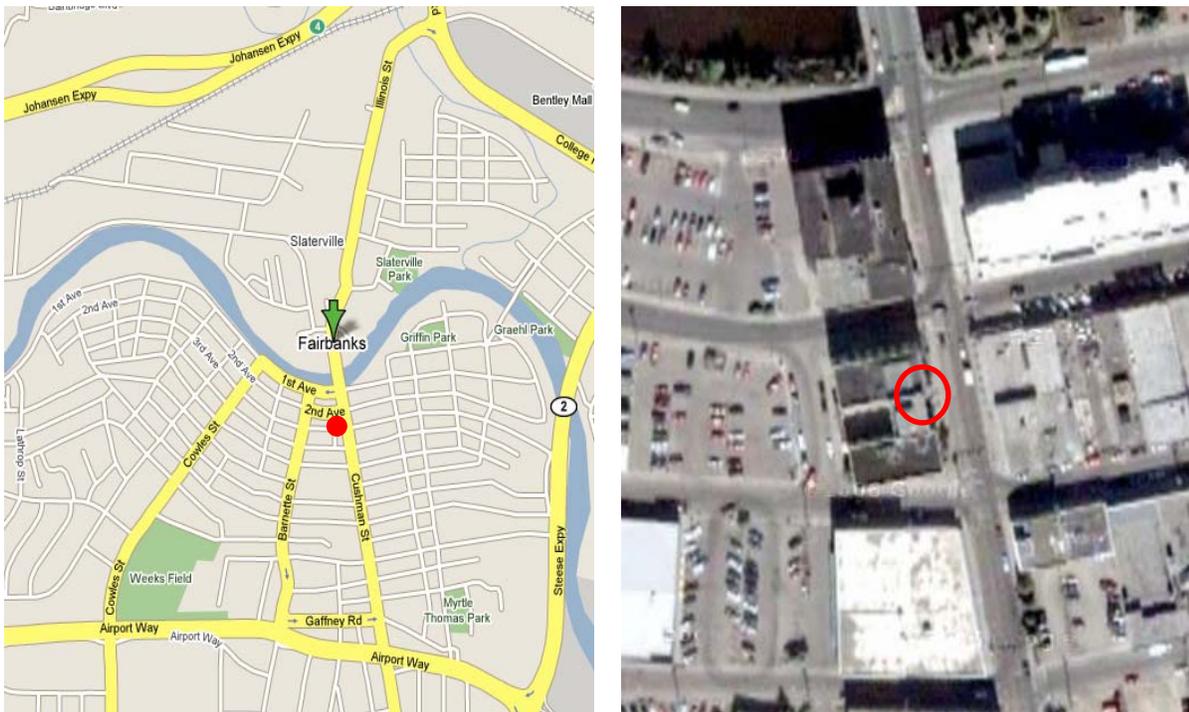


Figure 4.2:1: Map and satellite image of the Old Post Office monitoring site. The red circles indicate the sites location.

4.2.2 Sources

The dominant source of CO emissions for this site is automobile exhaust. Within 200 meters of the site, land use is predominantly business (generally medical practices and small offices) with some small single family dwellings. Many older downtown houses have chimneys and may be using woodstoves in the winter for supplemental heat. The Alaska Railroad industrial area (north) and the Aurora Energy coal fired power plant (west) are both located within one mile of the site. Coal-fired power plants operated by the University of Alaska (to the west) and Fort Wainwright Army Post (to the east) are located within five miles. Fairbanks is occasionally impacted from wildland fire smoke in the summer months.

4.2.3 Monitors

The Old Post Office site is currently equipped with:

- CO (SLAMS) – A single Thermo Electron 48C CO monitor operates seasonally (October – March) with an inlet approximately 3 meters above the ground.

4.2.4 Siting

The Old Post Office is located between 2nd and 3rd Avenue on the west side of Cushman Street. The probe passes through the eastern exterior wall and extends out one meter at a height of two meters above the ground. The inlet is three meters from the nearest traffic lane on Cushman Street, and 10 meters (32 feet) from intersection at Second Avenue. There are no parking lots in the vicinity of the probe, but there is parallel parking on both Second and Third Avenues.

4.2.5 Traffic

This site is located at one of the busiest intersections in downtown Fairbanks. Traffic within one mile of the site sees daily traffic counts ranging from 3,700 to 7,400 vehicles per day.

Figure 4.2:2: Pictures of the Old Post Office Site

North	East	South
 A street-level view looking north from the Old Post Office Site. The image shows a sidewalk on the left with a concrete wall and flower boxes. A street with a white car and traffic lights is visible in the distance under a cloudy sky.	 A view looking east from the Old Post Office Site. The image shows a long, low building with a blue base and large windows. The sky is overcast with grey clouds.	 A view looking south from the Old Post Office Site. The image shows a wide street with a sidewalk on the right, lined with modern buildings and streetlights. The sky is blue with scattered clouds.
Views in three cardinal directions from the Old Post Office Site		
North	South	West
 A view looking north toward the Old Post Office Site. The image shows a sidewalk on the right with a concrete wall and flower boxes. A street with cars and traffic lights is visible in the distance.	 A view looking south toward the Old Post Office Site. The image shows a street with a metal shopping cart in the foreground. Buildings and traffic lights are visible in the background.	 A view looking west toward the Old Post Office Site. The image shows a tall, light-colored building with many windows. A red circle highlights a specific window on the lower floor. A person is walking on the sidewalk in the foreground.
Views in three cardinal directions toward the Old Post Office Site		

4.3 STATE OFFICE BUILDING

675 Seventh Avenue
Parameters: PM_{2.5}

AQS IDs 02-090-0010
Established: January 1, 1972

4.3.1 Site Information

The site is located on the State Office Building at 675 Seventh Avenue. The latitude is 64° 50' 27", longitude is -147° 43' 23", and 460 feet (140 meters) above sea level. Figure 4.3:1 shows a street map of the downtown Fairbanks area and satellite image of the area. The site is located in the middle of the central business district. This is a neighborhood scale population oriented PM_{2.5} site.

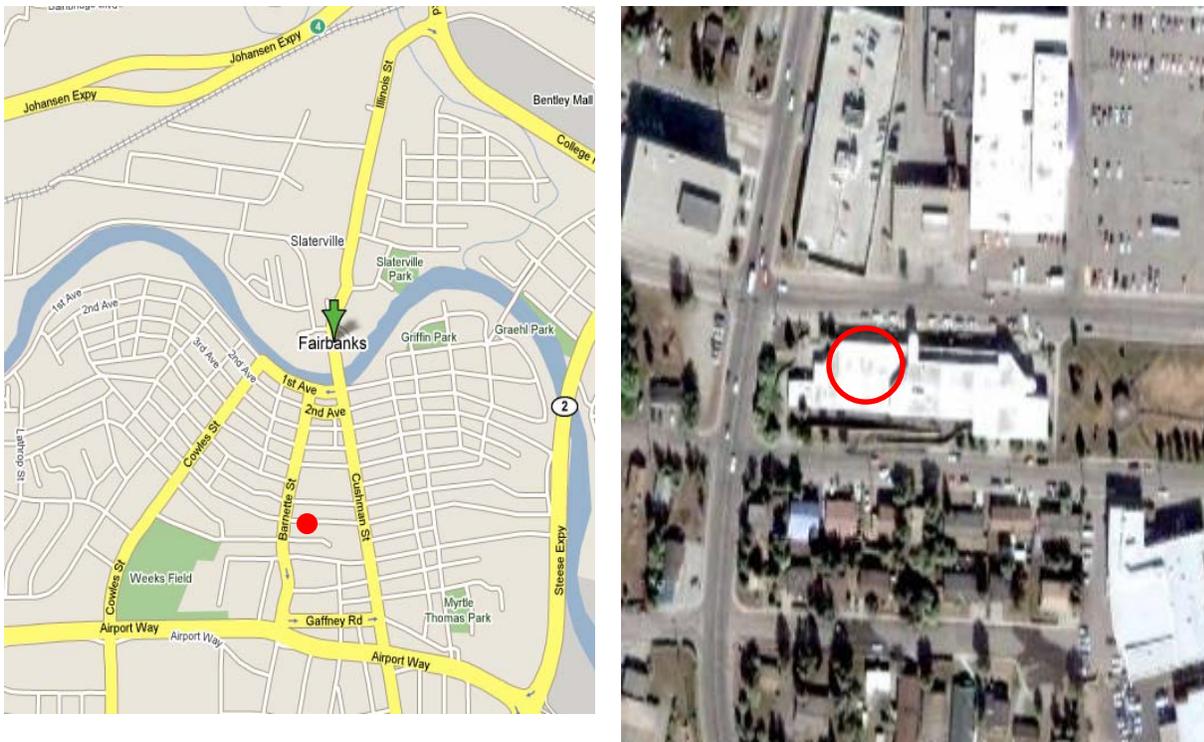


Figure 4.3:1: Map and satellite image of the State Office Building. The red circles indicate the sites location.

4.3.2 Sources

The dominant source of fine particulate matter (PM_{2.5}) for this site changes season to season. During the long winter months the primary sources of fine particulates are; home heating, automobile exhaust, and wood smoke and during the summer months it is from wildland fire smoke.

4.3.3 Monitors

The State Office Building site is currently equipped with:

- PM_{2.5} (SLAMS) – Two Thermo Electron (formerly Rupprecht & Patashnick) Partisol 2000 samplers. One sampler runs on a 1-in-3 day alternating sampling schedule with the second operating as a collocated monitor.
- PM_{2.5} (SPM) – A single Met-One Beta Attenuation Monitor (BAM 1020) was installed to provide information in real time for evaluating the Air Quality Index.
- PM_{2.5} (SPM) – A single Met-One Beta SASS Speciation Monitor. This multi filter sampler is set to sample on a 1-in-3 day sampling schedule.

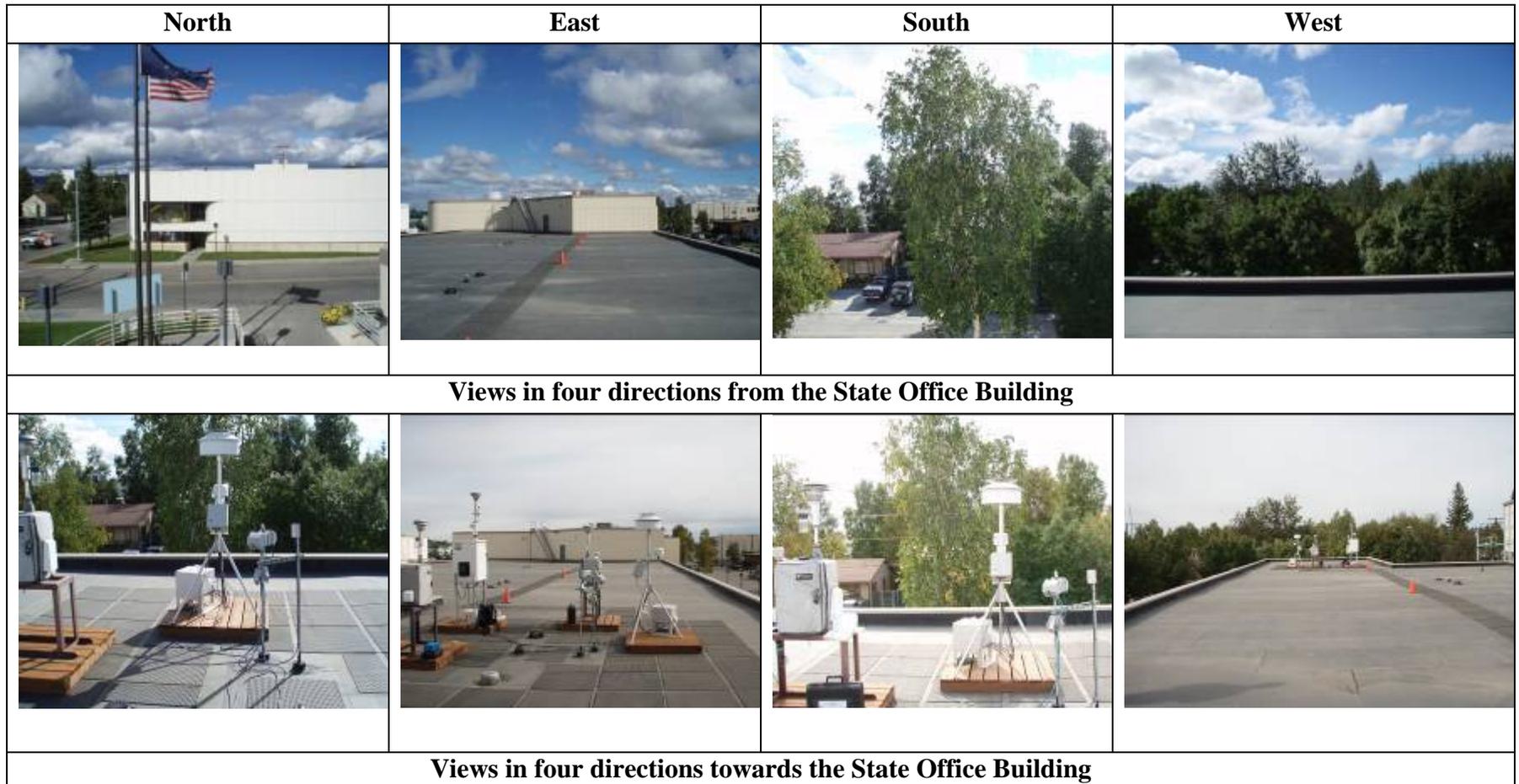
4.3.4 Siting

The equipment is located on the west end of the State Office Building's first story roof. The inlets for all samplers are approximately 6 meters above the ground. There is unrestricted airflow around the samplers. The building has a partial second floor that is approximately 3.75 meters higher than the roof the samplers sit upon. The nearest second floor wall is approximately 30 meters west of the samplers. There is a birch tree approximately 10 meters south of the samplers whose height exceeds that of the inlets.

4.3.5 Traffic

This site is located in downtown Fairbanks with numerous roads within one mile of the site. Area roads have daily traffic counts ranging from 3,700 to 7,400 vehicles per day. There are no parking lots in the vicinity of the probe, but there is parallel parking on Seventh Ave.

Figure 4.3.2: Pictures of the State Office Building



4.4 HUNTER ELEMENTARY SCHOOL SITE - FAIRBANKS

1630 Gillam Way
Parameters: CO

AQS ID 02-090-0020
Established: January 1, 1979

4.4.1 Site Information

The site is located at Hunter Elementary School on the corner of 17th Avenue and Gillam Way. The latitude is 64° 49' 58", longitude is -147° 43' 53", and 446 feet (136 meters) above sea level. Figure 4.4:1 shows a street map of the local area and a satellite picture of the Hunter site. This is a neighborhood scale, population oriented site.

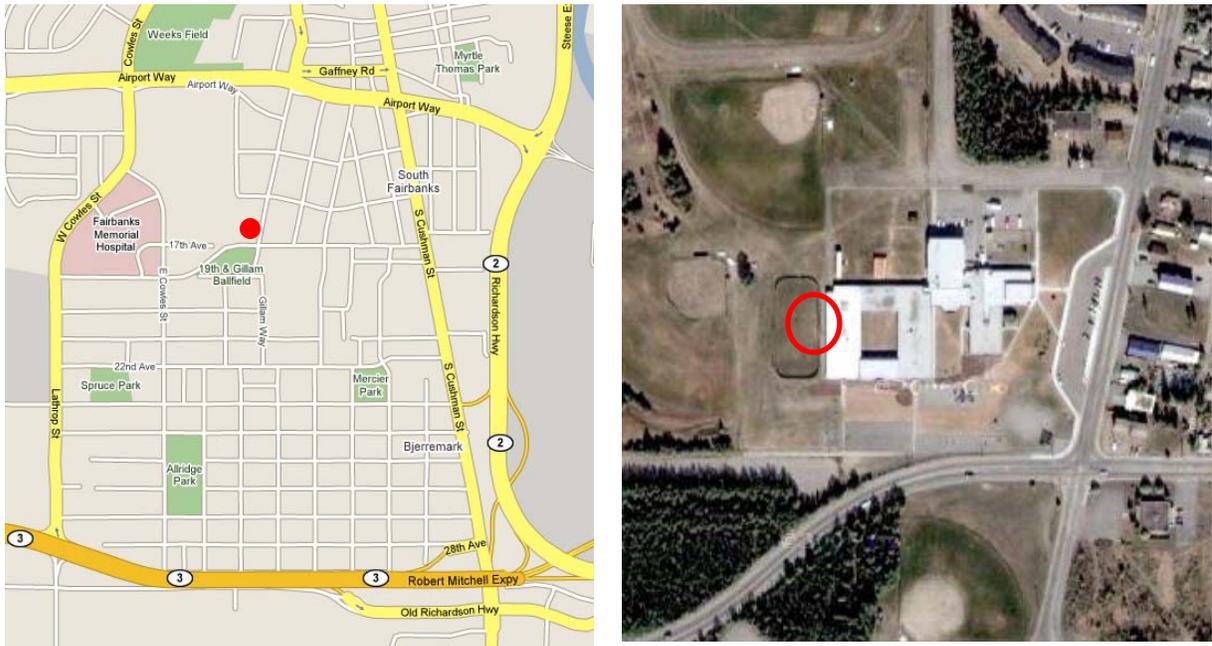


Figure 4.4:1: Map and satellite image of the Hunter Elementary site. The red circles indicate the sites location.

4.4.2 Sources

The dominant source of CO emissions for this site is from vehicle exhaust. Within 200 meters of the site, land use is predominantly single family dwellings, small businesses (generally medical practices and small offices) and public schools. Many houses have chimneys and may be using wood stoves in the winter for supplemental heat.

Other sources of CO may be from the Fairbanks Memorial Hospital (less than one quarter mile west), the Aurora Energy coal fired power plant (one mile north), and the coal-fired power plants operated by the University of Alaska (two to three miles northwest) and Fort Wainwright Army Post (one mile east).

4.4.3 Monitors

The Hunter Elementary site is currently equipped with:

- CO (SLAMS) – A single Thermo Electron 48C CO monitor operates seasonally (October – March) with an inlet approximately 2.5 meters above the ground.

4.4.4 Siting

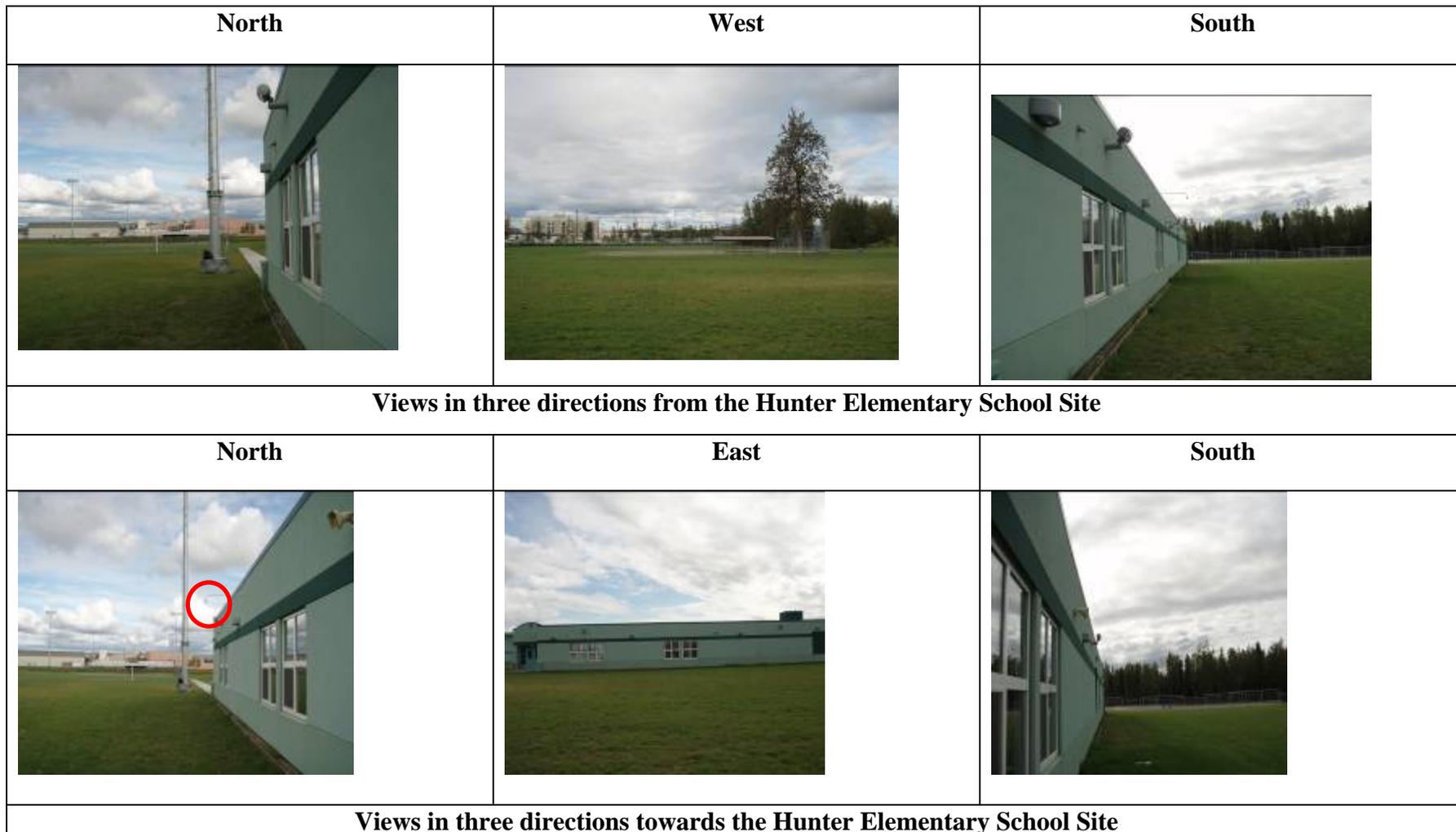
The school is between 16th Avenue and 17th Avenue on the west side of Gillam Way. The CO inlet is 50 meters from the nearest traffic lane on 17th Avenue, and approximately 30 meters from the nearest traffic lane of 16th Avenue. The probe extends 1.5 meters through the western exterior wall at a height of 2.9 meters. On the west side of the school is a grass strip of land and a hockey rink. There are no streets or parking areas in the vicinity of the probe.

The school parking lot is on the east side of the building and is paved. A smaller, paved, faculty parking lot is on the north side of the building. A small unpaved lot provides supplementary parking near the faculty lot, but is used very little. All parking lots have plug-ins for automobile head-bolt heaters in winter.

4.4.5 Traffic

Average daily traffic for this location is unknown at this time, but is expected to be below 5,000 vehicles per day.

Figure 4.4:2: Pictures of the Hunter Elementary School Site



4.5 ARMORY SITE - FAIRBANKS

202 Wien Street & 2nd Ave
Parameters: CO

AQS ID 02-090-0023
Established: March 1, 2002

4.5.1 Site Information

The site is located at the Alaska Army National Guard Armory on the corner of 2nd Avenue and Wien St. at latitude 64° 50'32", longitude -147° 45'03", and 446 feet (136 meters) above sea level. Figure 4.5:1 shows a street map of the local area and a satellite picture of the Armory site. This is a neighborhood scale, population oriented site.

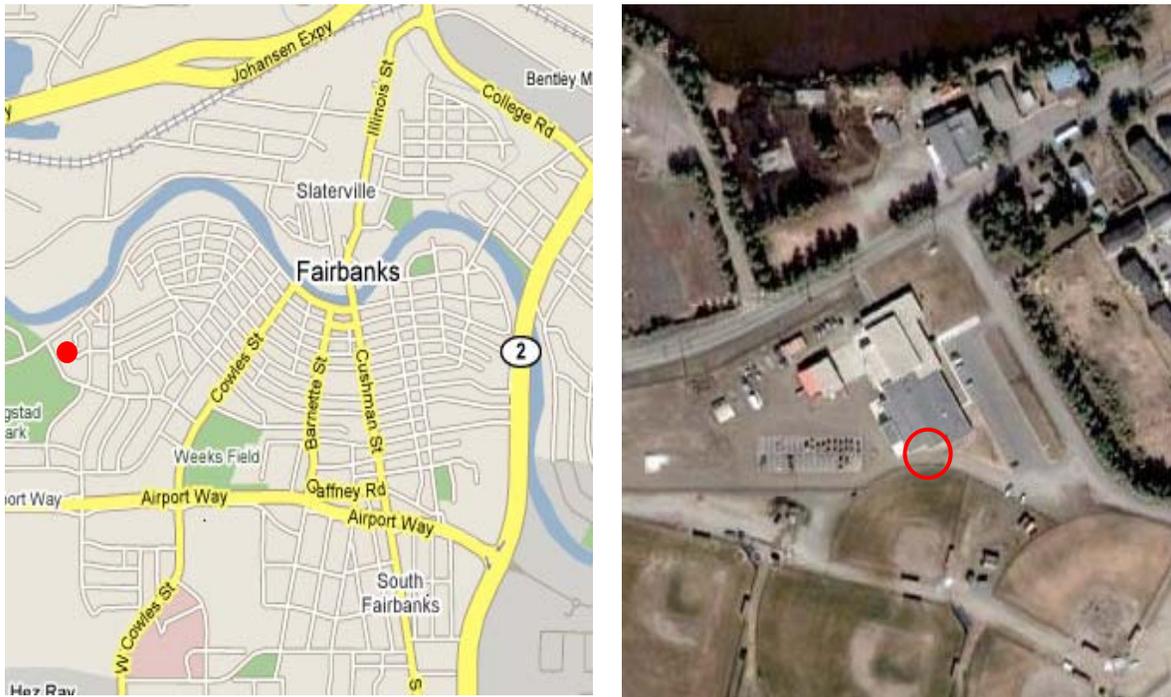


Figure 4.5:1: Map and satellite image of the Alaska Army National Guard Armory monitoring site. The red circles indicate the sites location.

4.5.2 Sources

The dominant source of CO emissions for this site is from vehicle exhaust. Within 200 meters of the site, land use is predominantly single family housing and apartments to the east and south and recreational/industrial to the west and north. Downtown Fairbanks lies ¼ mile east of the armory. Many of the older houses have chimneys and may be using wood stoves in winter for supplemental heat.

Other potential sources of CO within a mile of the site are; the Golden Heart Utilities Water Treatment Plant (northeast), the Alaska Railroad (north), and the Fairbanks Memorial Hospital (south). Within three miles of the site there are three coal-fired power

plants: University of Alaska Fairbanks (west northwest), Aurora Energy (north) and Fort Wainwright (east southeast).

4.5.3 Monitors

The Armory site is currently equipped with:

- CO (SLAMS) – A Monitor Lab8830 monitor operates seasonally (October-March) with an inlet approximately 2.5 meters above the ground.

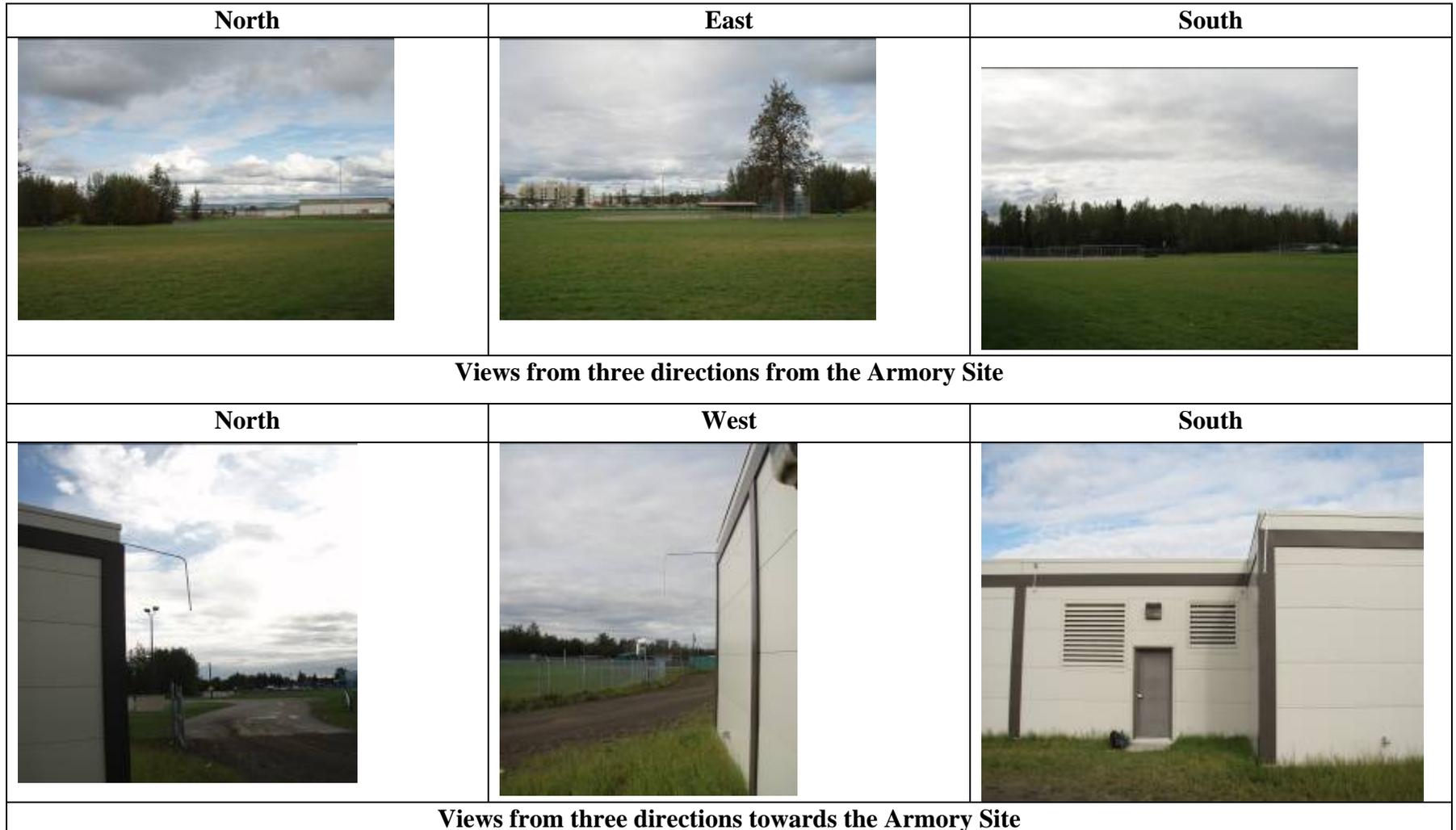
4.5.4 Siting

The armory site is located on the corner of 2nd Avenue and Wien St. The CO inlet is 738 meters from the nearest traffic lane of Wien St. The probe extends 1.5 meters through the western exterior wall at a height of 3 meters. There are numerous baseball fields to the south of the probe. The main parking lot is east of the building and is paved. There is a small parking in vicinity of the probe on the southwest side of the building, and is paved.

4.5.5 Traffic

Average daily traffic for this location is unknown at this time, but is expected to be below 5,000 vehicles per day.

Figure 4.5:2: Pictures of the Armory Site



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