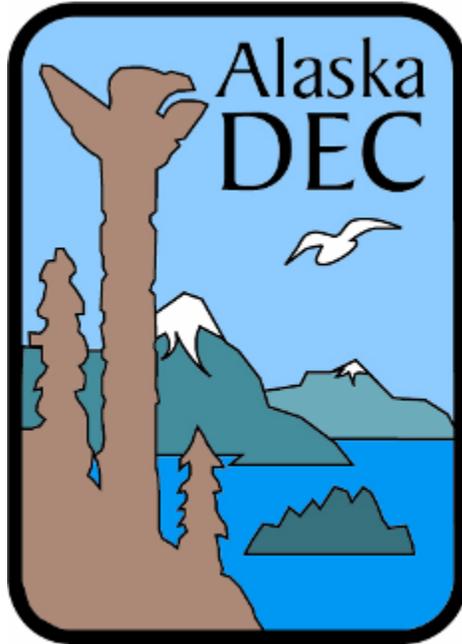


# Alaska's Air Monitoring 2011 Network Plan

## Chapter 5 – Matanuska Susitna Valley



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## 5 MATANUSKA-SUSITNA VALLEY MONITORING SITES

### 5.1 General Information

The Mat-Su Borough has a population<sup>1</sup> of 76,006 and covers 24,682 square miles of land and 578 square miles of water. There are three incorporated cities, several unincorporated communities, and twenty-five recognized community councils within the Mat-Su Borough. Average temperatures in the winter range from 6°F to 14°F; in the summer, 47°F to 67°F. Annual precipitation is 16.5 inches, with 58 inches of snowfall.

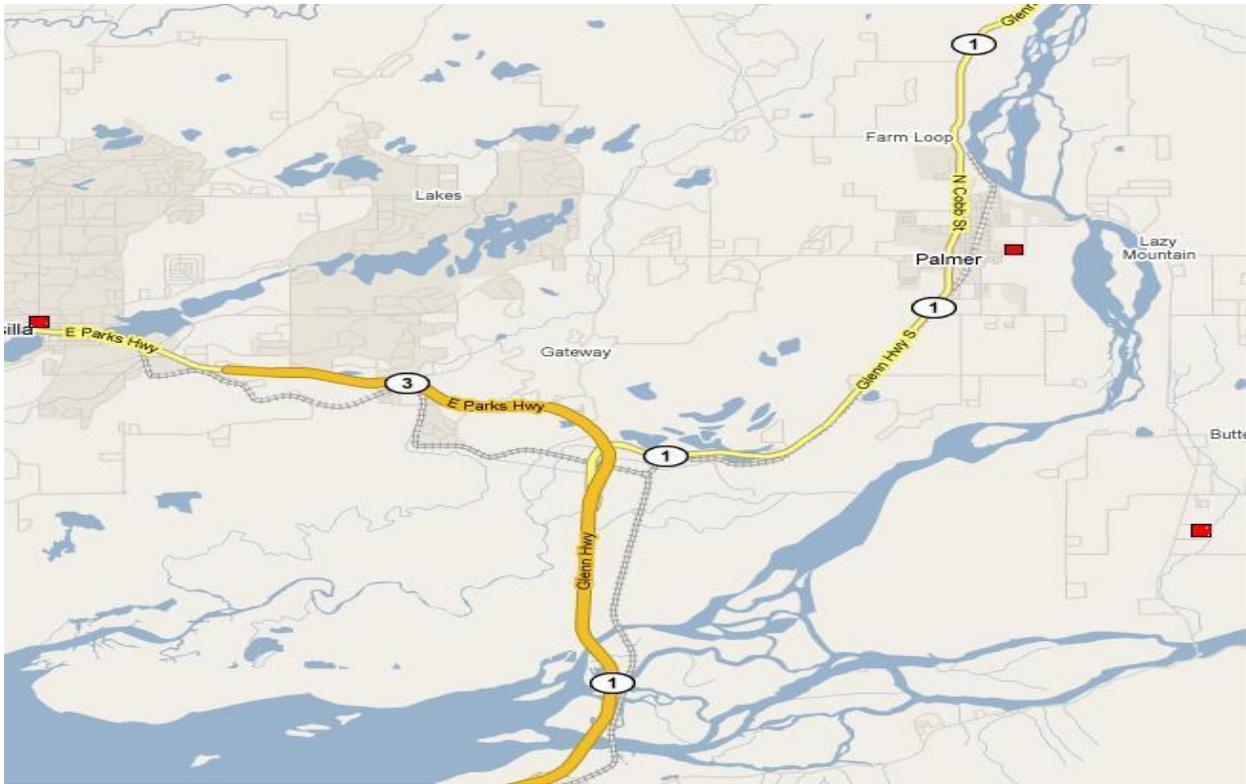
The State of Alaska has been conducting air quality monitoring investigations into particulate matter concentrations in the Matanuska–Susitna (Mat-Su) Valley since 1998. Monitoring was initiated in response to staff observations and well-documented accounts of wind-blown dust off the Matanuska and Knik River drainages. Particulate matter (PM) is divided into three factions depending on the size of the particle: PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>10-2.5</sub>. Monitoring in Mat-Su Valley began with sampling for PM<sub>10</sub> which means coarse particulate that is all particulate matter of a particle size less than or equal to 10 micrometers (µm). PM<sub>10</sub> is usual with crustal materials, which in this case is primarily wind-blown glacial silt from the river basins. PM<sub>2.5</sub> is referred to fine particulate and is particulate matter equal or less than 2.5 µm and usually associated with smoke. PM<sub>10-2.5</sub> is a recent monitoring development to further differential PM<sub>10</sub> from PM<sub>2.5</sub> and represents the faction of particles in the size range between PM<sub>10</sub> and PM<sub>2.5</sub>.

Currently, there are three particulate monitoring sites located near the population centers in the southern Mat-Su Borough. All three sites are operated by Alaska Department of Environmental Conservation, Air Quality Division staff.

The designated State & Local Air Monitoring Site (SLAM) site is located at Harrison Court in the unincorporated area of Butte. The Harrison Court site AQS ID number is 02-0170-0008. The other two monitoring sites located in Palmer and Wasilla are special purpose monitoring (SPM) sites. The Palmer site is located between E Dahlia Avenue and E Elmwood Avenue near S Gulkana Street. The Wasilla site is located behind Fire Station 61 near the intersection of W Swanson and Lucille. Figure 5.1:1 provides the map locations for all three monitoring sites.

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<sup>1</sup> Population data 2005 U.S. Census.



**Figure 5.1:1** Map of the Southern Mat-Su Borough area. The red squares indicate the location of the three monitoring sites.

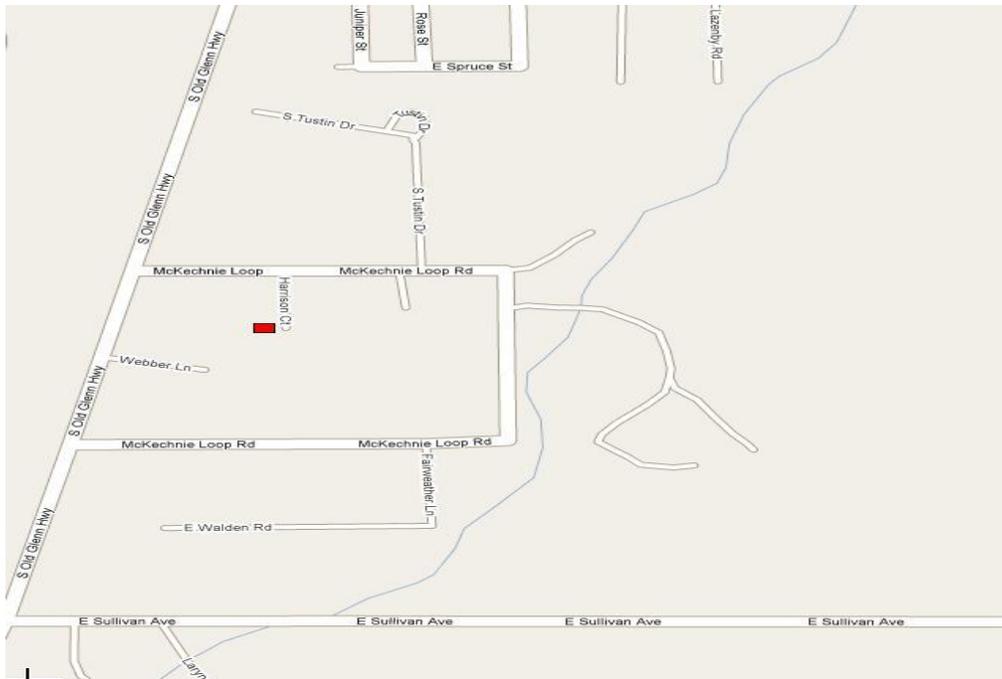
## ***5.2 HARRISON COURT (BUTTE) SITE- MATANUSKA-SUSITNA BOROUGH***

**Harrison Court**  
**Parameters: PM<sub>10</sub>, PM<sub>2.5</sub>**

**AQS ID 02-170-0008**  
**Established: April 11, 1998**

### **5.2.1 Site Information**

The Harrison Court monitoring site is located on a cul-de-sac at the end of Harrison Court, latitude 61° 32' 2.986" north (61.534163), longitude 149° 1' 53.96" (-149.031655), and 28 meters (90 feet) above sea level. This site has manual samplers for PM<sub>2.5</sub> and PM<sub>10</sub>, as well as a continuous monitor for PM<sub>10</sub>. Figure 5.2:1 is a street map of the monitoring site and surrounding area. Harrison Court is a neighborhood PM site.



**Figure 5.2:1 Map of the Butte area. The red square denotes the Harrison Court site.**

### 5.2.2 Sources

The major sources of coarse particulate matter impacting this site are dust from the Knik and Matanuska River basins. Both are glacier fed meandering rivers that deposit glacial silt over wide braided riverbeds and out to the Cook Inlet tidal zone. During times when the river is low (spring and fall) dry, windy weather suspends large amounts of silt in the air from the tidal flats and gravel bars. Several air quality alerts are issued per year during spring and fall months because of wind-blown dust events. Additionally, within 8 km (5 miles) are two small gravel airstrips (activity unknown but expected to be light), a dirt-track motor raceway, many acres of farmland, and recreation areas along both river basins. Most land in the area is undeveloped forest. Sources of fine particulate matter include residential wood smoke, vehicular exhaust, and forest fires.

### 5.2.3 Monitors

The Harrison Court (Butte) Site is currently equipped with:

- PM<sub>2.5</sub> (SLAMS) – Two Thermo Electron (formerly Rupprecht & Patashnick) Partisol 2000 samplers. Two samplers are operated on alternating 1-in-6 day schedules. This operating mode results with samples collected at the site which are in accordance with the EPA 1-in-3 day air monitoring schedule.
- PM<sub>10</sub> (SPM) – One General Metal Works high-volume sampler. Operated on a 1-in-6 sampling schedule.
- PM<sub>10</sub> (SPM) – A single Met-One BAM 1020 continuous monitor was installed to provide information in real time for evaluating the Air Quality Index.

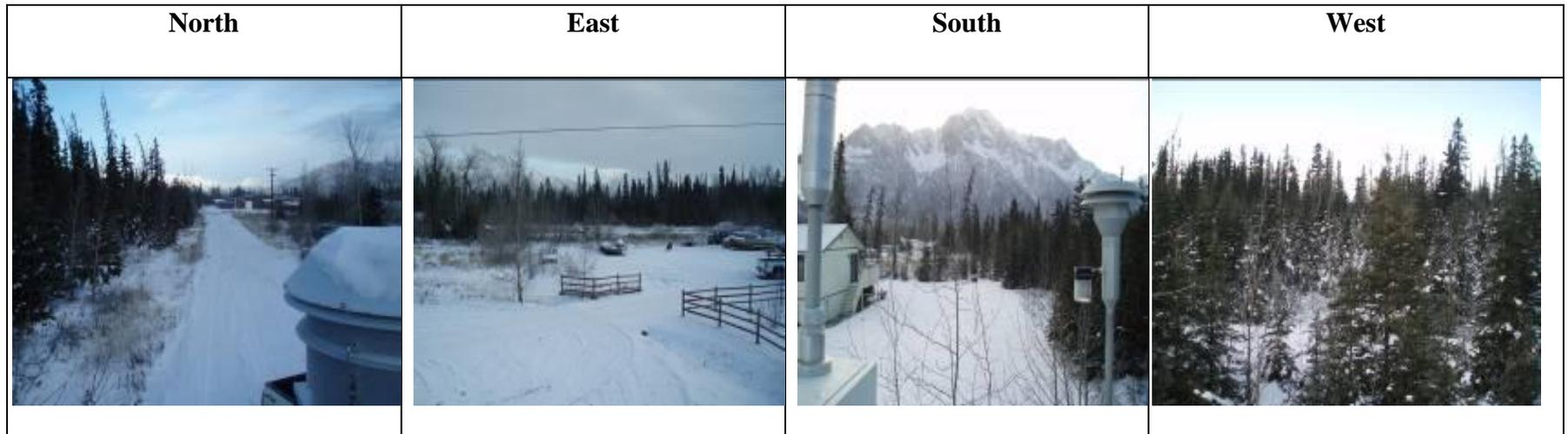
#### **5.2.4 Siting**

The manual operated equipment is located on the roof of the trailer and the continuous monitor is housed inside the trailer. All inlets are at a height of approximately four meters (13 feet) above the ground. There is uninterrupted airflow around the inlets. The monitoring objective of this site is to measure airborne glacial loess raised by high winds on the Knik and Matanuska river beds, as well as measure exposure to fine particulate matter from automobiles and home heating in this rural location. The trailer is on the southwest corner of the unpaved Harrison Court cul-de-sac. Photographs of the Harrison Court site are presented in Figure 5.2:2.

#### **5.2.5 Traffic**

There are only three house lots on Harrison Court, and traffic is very light. There are numerous unpaved roadways throughout the area. All main roads are paved. Average daily traffic for the area streets is not known.

**Figure 5.2:2 Photographs of the Harrison Court Site**



**Views in four directions from the Harrison Court Site**



**Views from four directions toward the Harrison Court Site**

### 5.3 PALMER SITE- MATANUSKA-SUSITNA BOROUGH

Palmer

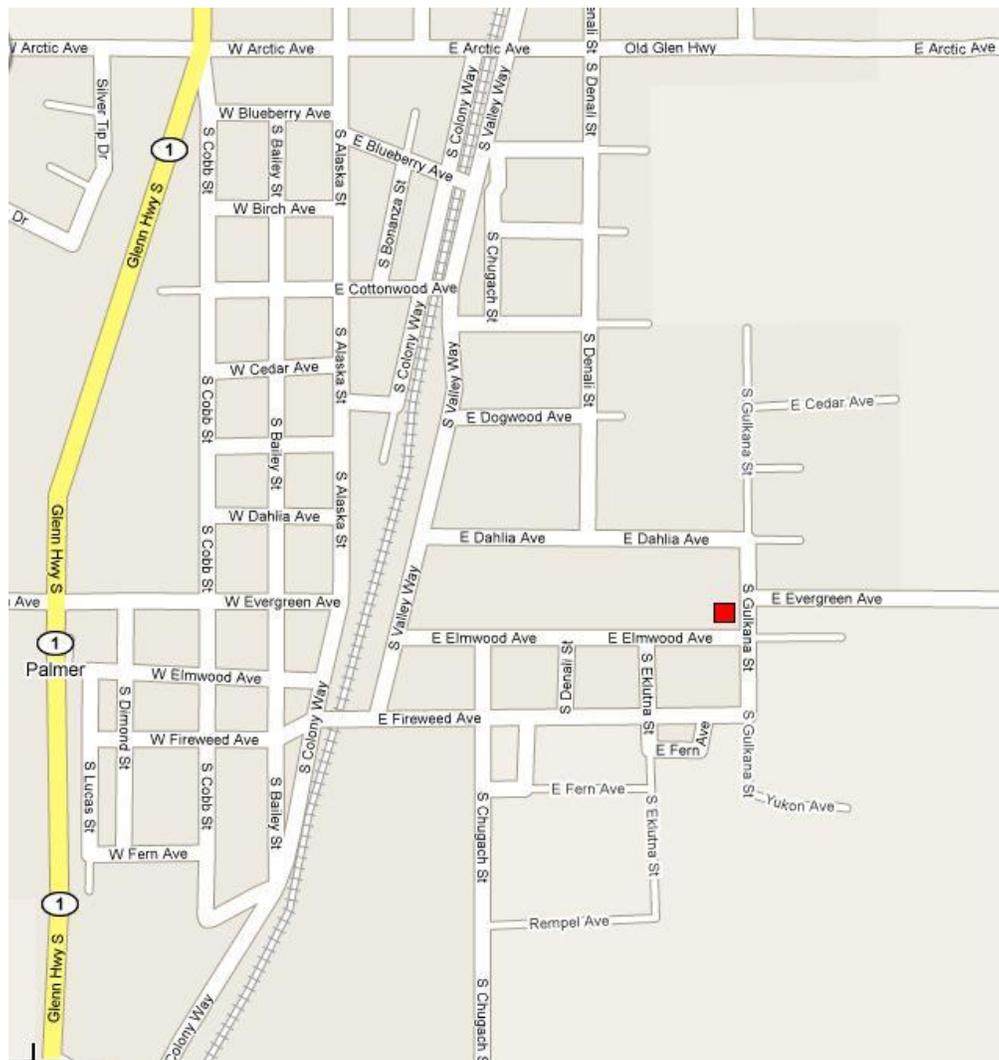
Parameters: PM<sub>10</sub>, PM<sub>2.5</sub> PM<sub>10-2.5</sub>

AQS ID 02-170-0012

Established: October 1, 2008

#### 5.3.1 Site Information

The Palmer monitoring site is located on South Gulkana Street between East Dahlia Avenue and East Elmwood Avenue near the city tennis court and Little League baseball field. The site coordinates are latitude 61° 35.961' north (61.598898), longitude 149°6.217' west (-149.106220). The average elevation for Palmer is 73 meters (239 feet) above mean sea level. The monitoring site is located approximately 600 meters due east of the central downtown district. The predominant land use within a 400 meter (0.25 mile) radius is residential and commercial buildings with large, open grass-covered areas. A map of the site is presented in Figure 5.3:1.



**Figure 5.3:1 Map of the City of Palmer. The red square denotes the monitoring site.**

### **5.3.2 Sources**

The major source of coarse particulate matter impacting the Palmer site is glacial silt dust or loess from the Matanuska and Knik River basins. Both are glacier fed meandering rivers that deposit glacial silt. During times when the river is low (spring and fall) dry, windy weather suspends large amounts of silt in the air. Several air quality alerts are issued per year during spring and fall months because of wind-blown dust events. Other minor sources of coarse particulate are road dust from the local paved road and dust from the Little League ballpark infield. Sources of fine particulate matter include residential wood smoke, vehicular exhaust, and forest fires.

### **5.3.3 Monitors**

The Palmer Site is currently equipped with:

- PM<sub>10</sub> (SPM) – A single Met-One BAM 1020X continuous monitor was installed to provide information in real time for evaluating the Air Quality Index.
- PM<sub>2.5</sub> (SPM) - A single Met-One BAM 1020X continuous monitor was installed to provide information in real time for evaluating the Air Quality Index.
- PM<sub>10-2.5</sub> (SPM) – first generation upgrades to the Met-One BAM 1020X continuous monitors programmed to provide PM<sub>10-2.5</sub> data.
- Meteorological sensors for wind speed, wind direction, and ambient temperature.

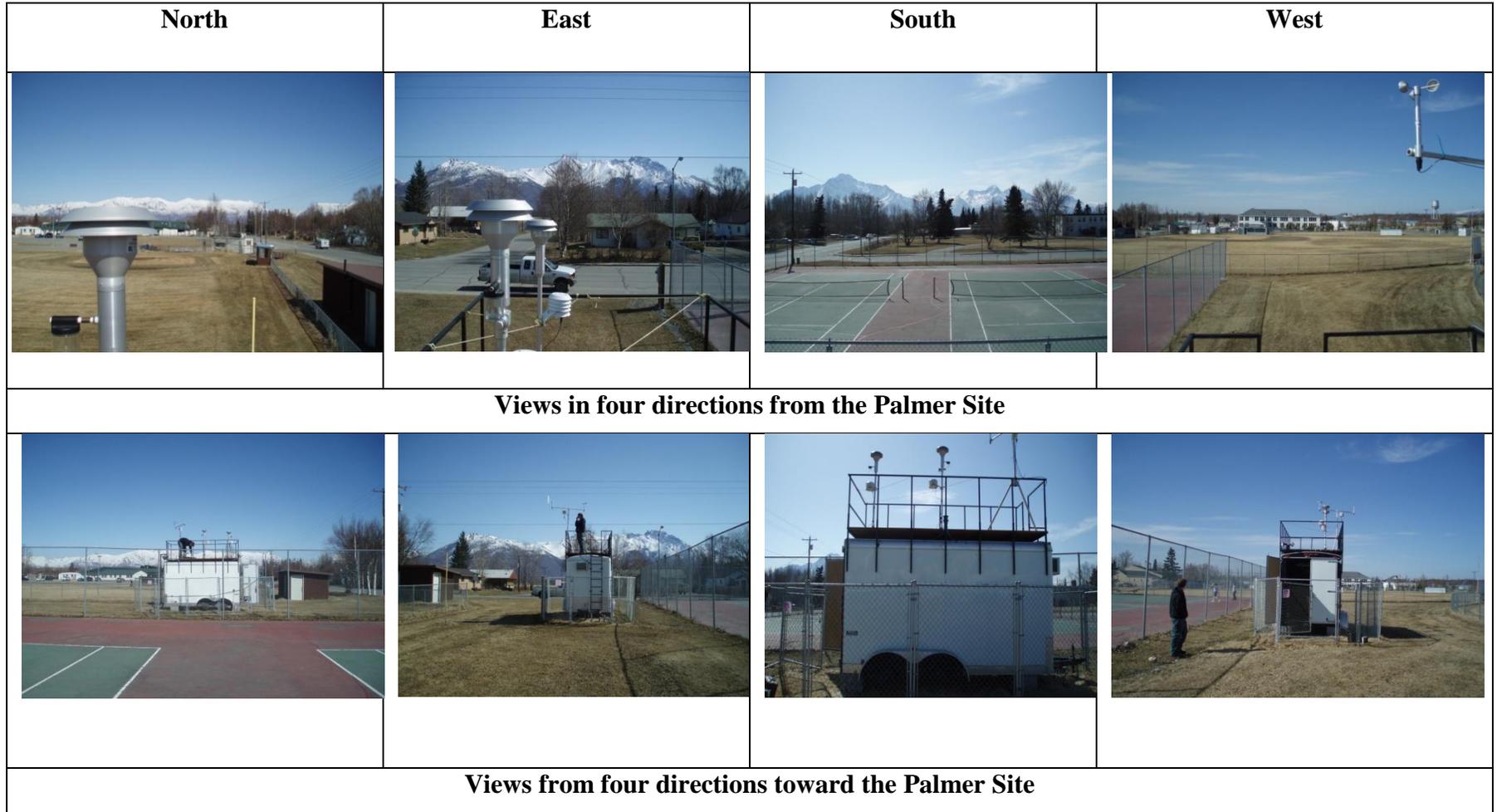
### **5.3.4 Siting**

The continuous particulate monitors are housed in an insulated temperature-controlled trailer. All inlets are at a height of approximately four meters (13 feet) above the ground. There is uninterrupted airflow around the inlets. The monitoring objective of this site is to measure coarse particulate from airborne glacial loess raised by high winds on the Knik and Matanuska river beds, as well as measure exposure to fine particulate matter from vehicular exhaust, wood smoke from residential heating and forest fires and then compare the emissions coarse versus fine particulates for PM difference. Photographs of the Palmer site are presented in Figure 5.3:2.

### **5.3.5 Traffic**

All main roads in immediate area of the monitoring site are paved. Average daily traffic for the area streets is not known.

**Figure 5.3:2 Photographs of the Palmer Site**



## 5.4 WASILLA SITE - MATANUSKA-SUSITNA BOROUGH

Wasilla

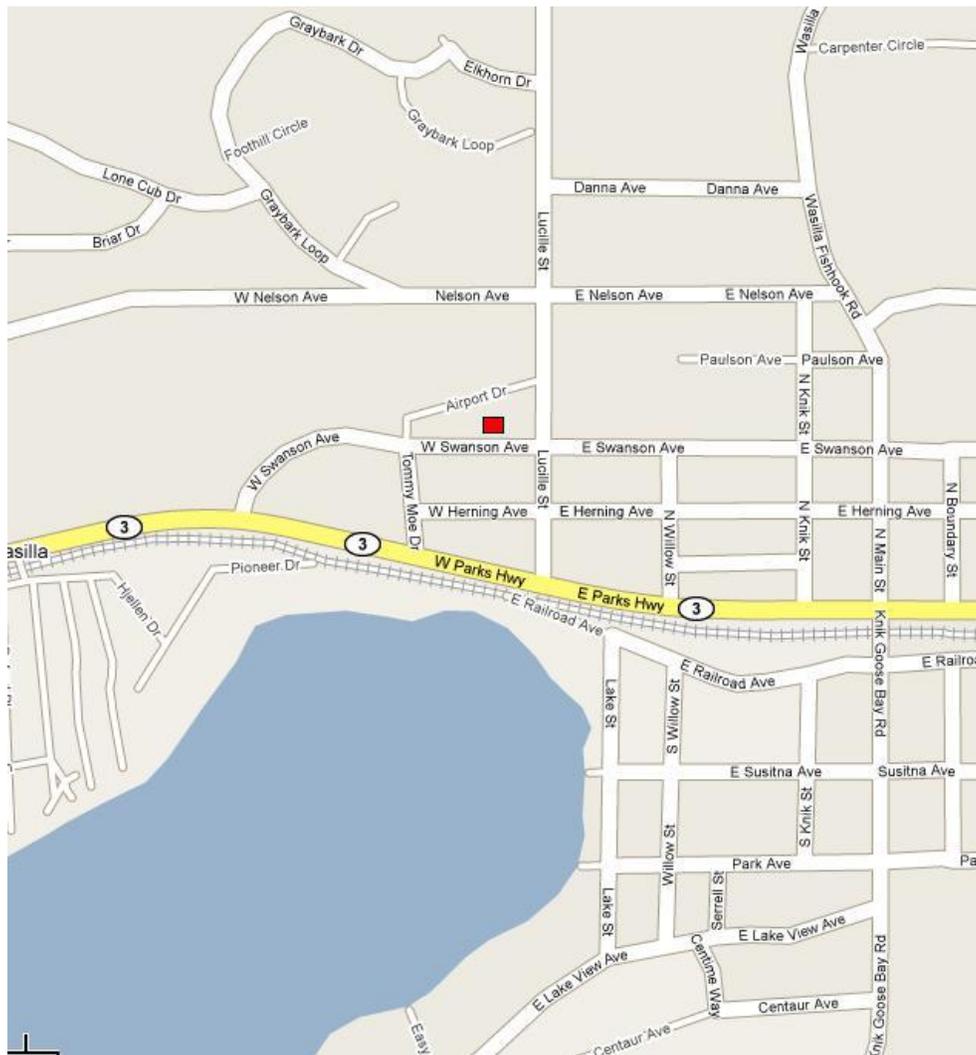
Parameters: PM<sub>10</sub>, PM<sub>2.5</sub> PM<sub>10-2.5</sub>

AQS ID 02-170-0013

Established: October 1, 2008

### 5.4.1 Site Information

The Wasilla monitoring site is located in the 100 block of West Swanson Avenue behind the Station 61 Fire Station near the intersection with Lucille Street. The site coordinates are latitude 61° 34.998' north (61.598796), longitude 149° 27.212' west (-149.455255). The average elevation for Wasilla is 104 meters (341 feet) above mean sea level. The monitoring site is located approximately 500 meters west-northwest of the central downtown district and approximately 200 meters north of the George Parks Highway. The predominant land use in a 0.5 km radius area is residential and commercial buildings with paved roads, parking lots,



**Figure 5.4:1** Map of the City of Wasilla. The red square denotes the monitoring site.

and mixed areas of land, both vegetated and graveled. A map of the site is presented in Figure 5.4:1.

#### **5.4.2 Sources**

The major sources of coarse particulate matter impacting the Wasilla site are wind-blown dust from unpaved areas, traffic dust and glacial silt from river beds feeding in the northern end of the Cook Inlet. Several air quality alerts are issued per year during spring and fall months because of wind-blown dust events. Sources of fine particulate matter include residential wood smoke, vehicular exhaust, and forest fires.

#### **5.4.3 Monitors**

The Palmer Site is currently equipped with:

- PM<sub>10</sub> (SPM) – A single Met-One BAM 1020X continuous monitor was installed to provide information in real time for evaluating the Air Quality Index.
- PM<sub>2.5</sub> (SPM) - A single Met-One BAM 1020X continuous monitor was installed to provide information in real time for evaluating the Air Quality Index.
- PM<sub>10-2.5</sub> (SPM) – first generation upgrades to the Met-One BAM 1020X continuous monitors programmed to provide PM<sub>Coarse</sub> data.
- PM<sub>2.5</sub> (SPM) – A single Thermo Electron (formerly Rupprecht & Patashnick) Partisol 2000 sampler. The manual sampler runs on a 1-in-6 day sampling schedule.

#### **5.4.4 Siting**

The continuous particulate monitors are housed in an insulated temperature-controlled trailer within a small security fenced area. All inlets are at a height of approximately four meters (13 feet) above the ground. There is uninterrupted airflow around the inlets. The monitoring objective of this site is to measure coarse particulate from airborne road dust, glacial loess raised by high winds on exposed ground and river beds, as well as measure exposure to fine particulate matter from vehicular exhaust, wood smoke from residential heating and forest fires and then compare the emissions course versus fine particulates. Photographs of the Wasilla Site are presented in Figure 5.4:2

#### **5.4.5 Traffic**

All main roads in immediate area of the monitoring site are paved. Average daily traffic for the area streets is not known. Commuter traffic and summer tourist traffic along the George Parks Highway can be heavy at times. The annual average daily traffic for the Parks Highway west of Fishhook Road was 16,494 in 2005 (as recorded by Alaska DOT).

**Figure 5.4:2 Photographs of the Wasilla Site**

North	East	South	West
			
<p><b>Views in four directions from the Wasilla Site</b></p>			
			
<p><b>Views from four directions toward the Wasilla Site</b></p>			