

Alaska's 2013 Air Monitoring Network Plan

Chapter 4

Juneau

Air Quality Division

Air Monitoring
&
Quality Assurance
Program

619 E. Ship Creek Ave. #249
Anchorage, AK 99501

Phone: (907) 269-7577
Fax: (907) 269-7508

www.state.ak.us/dec/



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4 JUNEAU MONITORING SITE DESCRIPTION

4.1 *General Information*

The City and Borough of Juneau is located in Southeast Alaska and includes the mainland side of Gastineau Channel and Douglas Island. The City and Borough encompass 2,594 square miles of land and 488 square miles of water. Juneau has a mild, maritime climate with average winter temperatures ranging from 25°F to 35°F and average summer temperatures ranging from 44°F to 65°F. Annual precipitation varies throughout the region with 92 inches in downtown Juneau and 54 inches at the airport ten miles to the north-west. Snowfall averages 101 inches at the airport. The population of the City and Borough of Juneau is 31,275.¹

Currently there is one particulate matter monitoring site in Juneau which is operated by DEC staff. The AQS ID number for the site is 02-110-0004, Floyd Dryden Middle School (PM₁₀ and PM_{2.5}). Figure 4.1:2 below indicates the location of the site.

Juneau was designated non-attainment for PM₁₀ on November 15, 1990. The primary sources of particulate matter that attributed to non-attainment were road dust and emissions from residential wood stoves. Working with DEC, the community established a pollution control strategy which involved two separate action plans to minimize exceedance of the standard. The first was an aggressive street paving program to minimize the impact of road-dust. The second was to issue air quality notices that would limit use of woodstoves during wintertime meteorological conditions that would increase risk of an exceedance. The control strategy was successful and as a result the monitoring program has not recorded an exceedance of the PM₁₀ NAAQS since 1994. DEC has prepared a PM₁₀ Maintenance Plan for the Juneau Mendenhall Valley that is currently under review by EPA. If EPA approves this Plan, Juneau will be re-designated as a maintenance area for PM₁₀. Definitions of designations and siting criteria can be found in Appendix A.

In addition to the particulate samplers at Floyd Dryden, DEC operates a RadNet site for the EPA. The RadNet site is part of a nationwide monitoring network which tracks radiation in the nation's air, precipitation, drinking water, and milk. RadNet monitoring sites collect near real-time data for beta and gamma radiation. Equipped with an onboard data acquisition system, the data are transmitted by satellite uplink or cellular service to computers at the EPA National Air and Radiation Laboratory (NAREL). The sites also collect airborne particulate (filter) samples, drinking water samples, and milk samples which are shipped to NAREL to determine the concentration of radionuclides. At the Floyd Dryden site, DEC maintains the radiation detector with the data acquisition/communication system and operates the particulate sampling program.

¹ Population data obtained from 2010 US Census (April 1, 2011).

4.2 *Floyd Dryden Middle School Site - Juneau*

3800 Mendenhall Loop Road
Parameters: PM_{2.5}, PM₁₀

AQS ID 02-110-0004
Established: January 1, 1980

4.2.1 Site Information

The Juneau site is located on the roof of Floyd Dryden Middle School in the Mendenhall Valley, off Mendenhall Loop Road between North El Camino Street and Spruce Lane. The latitude is 58° 23' 30" north (58.383421), the longitude is 134° 33' 30" west (-134.558333), and the elevation is 18 meters (143 feet) above sea level. Figure 4.2:1 is a satellite image of the site and surrounding area. The site is located in the middle of a residential area and is a neighborhood-scale, population-oriented site.

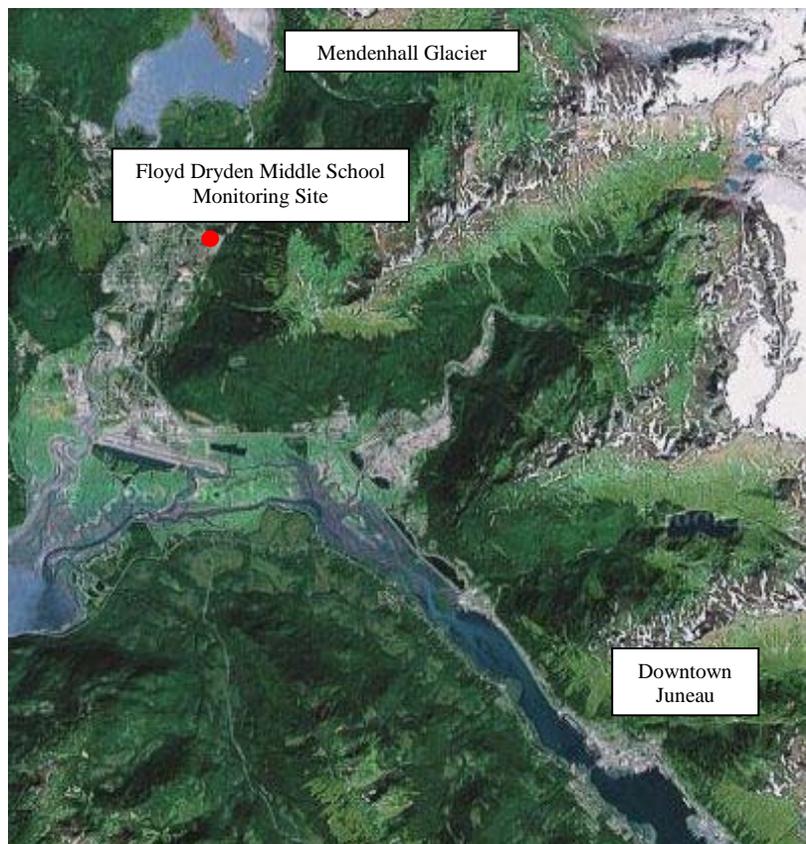


Figure 4.2:1: Satellite Image of Juneau and the Mendenhall Valley. Red circle indicates the monitoring site (Courtesy of Google Maps)

4.2.2 Sources

The Mendenhall Valley is located northwest of downtown Juneau and is separated from the Lemon Creek Valley by the west-east oriented Heintzelman Ridge. With the exception of wildfire smoke from Canada and the Alaskan mainland, pollution sources outside the valley are not expected to impact the monitoring site at Floyd Dryden Middle School. The sources of particulate matter within the Mendenhall Valley include:

residential wood smoke, dust from ball fields, playgrounds, road-dust tracking, automobile exhaust, fugitive dust from construction/land clearing, and smoke from open burning. Figure 4.2:1 presents a street map and satellite image of the neighborhood surrounding the site.

Juneau International Airport (average of 1050 passengers daily) is 3.2 km (2 miles) away at the south end of Mendenhall Valley, and may potentially affect the Floyd Dryden site when winds are from the south. Within 8 km (5 miles) are a gravel pit and the Mendenhall Glacier, both of which may cause crustal material to be re-entrained during dry windy conditions. On occasion during summer months, wildfire smoke, carried by long range transport from North-Western Canada, has been known to impact the Mendenhall Valley.

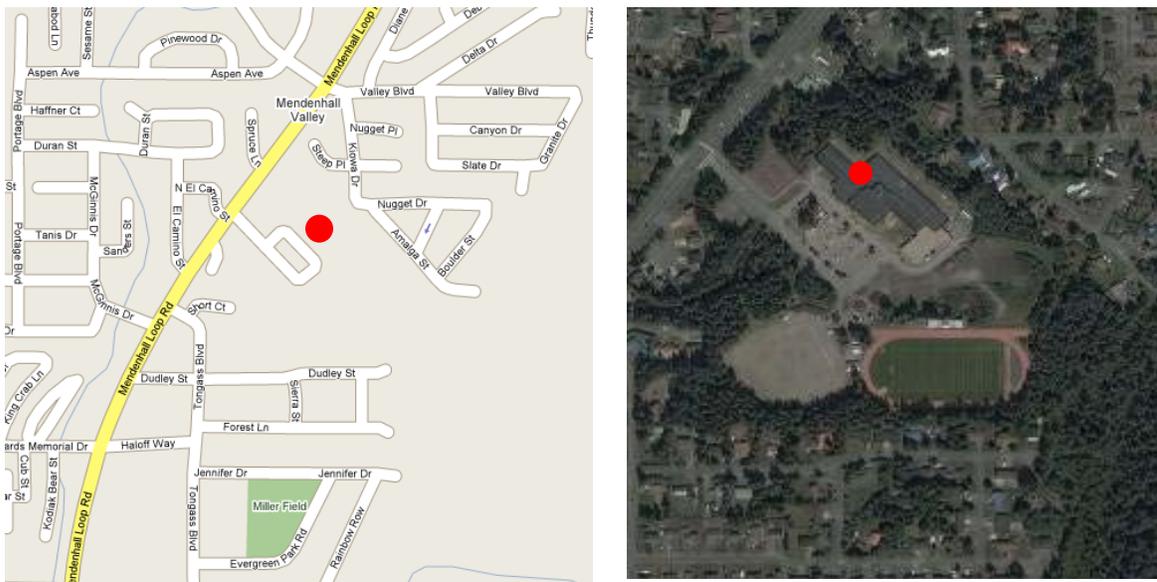


Figure 4.2:2: Map and satellite image of the Floyd Dryden monitoring site. The red circle indicates the monitoring site. (Courtesy of Google Maps)

4.2.3 Monitors

The Floyd Dryden Site is currently equipped with:

- PM₁₀ (SLAM) – Two Thermo Scientific Partisol 2000 FRM samplers running collocated on a 1-in-6 day sampling schedule.
- PM_{2.5} (SLAM) – A single MetOne Instruments BAM 1020 continuous monitor provides information in near real-time for documenting compliance with the NAAQS and calculating the Air Quality Index.
- Radiation – (RadNet) A single RadNet fixed air monitoring station. The RadNet apparatus contains sampling equipment for collection of particulate samples and has an onboard radiation detector and data acquisition system that uploads near real-time radiation data to EPA's NAREL computer system.

4.2.4 Siting

The samplers are installed on the roof of Floyd Dryden Middle School, approximately six meters (19 feet) above the ground. There is a furnace flue approximately 20 meters (64 feet) to the east of the sampler roof location. There is also a nearby dryer vent coming out of the building on the ground level directly below the current sampler location. The school has a penthouse which is approximately four meters above the roof and six meters (19 feet) to the south of the closest monitor.

The samplers are installed approximately 65 meters (207 feet) from the nearest traffic lane. A row of 15 meter (48 feet) tall trees are within 25 meters (80 feet) on the northern side of the site. Airflow is generally uninterrupted with the exception of the trees to the north-northeast. These trees are not considered to be a barrier because most elevated PM concentrations occur during winter inversions and/or during times when the wind is less than five mph. Under these conditions, the particulate concentrations are thought to have homogeneous dispersion. The monitors are on the north side of the school and away from the parking lot.

Photographs of the Floyd Dryden site are shown in Figure 4.2:3. Please note that a third Partisol is shown in the photographs. The third sampler is maintained in standby status in case one of the other samplers malfunctions.

4.2.5 Traffic

The Floyd Dryden site is approximately 200 meters east of Mendenhall Loop Road. The nearest traffic count site on Mendenhall Loop Road shows an average daily traffic count of 14,184 vehicles. This value is the highest average daily count along the Mendenhall Loop Road.² All roads in the vicinity of the monitoring site are paved and, in the winter, sanded for traction. The school has a paved parking lot with a lane for school bus traffic.

² State Department of Transportation and Public Facilities, 2009 traffic maps,

Figure 4.2:3: Pictures of the Floyd Dryden site.

