

Alaska's Air Monitoring 2012 Network Plan

Chapter 7 – Seward



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7. SEWARD MONITORING SITES

7.1. General Information

Seward, Alaska is a small city situated at the head of Resurrection Bay on the Kenai Peninsula. Founded in 1903 as the marine terminus for what is now the Alaska Railroad, Seward is a year-round, deep-water, ice-free port providing an entry point and transportation link for moving products, materials, and people to the State's interior and major population centers. Seward also serves as a terminal for exporting Alaska's resources to international locations along the Pacific Rim. The Seward Highway, completed in 1951, connects Seward to the Sterling Highway which runs to the remainder of the Kenai Peninsula. The Seward Highway then turns north over Turnagain Pass and into Anchorage. In addition to transportation, Seward supports a major commercial fishing industry and maintains an industrial center for marine vessel servicing. Because of the natural scenic beauty of the Chugach Mountains and Resurrection Bay, Seward has become a world renowned tourist destination offering day cruises into the Kenai Fjords National Park, hiking, kayaking, wildlife viewing, and sports fishing. From late spring to early fall, Seward serves as a major destination for the cruise ship industry.

The population of the City of Seward is 2,693 with another 2,114 residents living in the adjacent areas of Bear Creek, Lowell Point, and Primrose¹. Located at the end of Resurrection Bay, Seward is surrounded by high mountains on both sides of the bay. Retreating glaciers and streams fed by the Harding Icefield have deposited glacial debris and alluvial soils with a high percentage of fine particles (glacial silt). The annual average temperature for Seward is 39.9°F with an average maximum temperature of 62.3°F in July and an average minimum temperature of 20.3°F in January. The average annual precipitation is 68.1 inches per year with an annual snowfall of 83.1 inches². Seward can only be characterized as a windy city. The predominant wind directions are north/south, with the greater percentage from the north. This follows with the alignment of the high mountain ridges on either side of the fjord. For the period from May 2010 through April 2011, the average wind speed was 8.3 mph with the highest sustained wind speed at 39 mph recorded in January. The highest recorded gusting wind was 56 mph recorded in November³. Figure 7.1:1 presents a satellite image of the Seward area showing the City location in relative to Resurrection Bay and the ridges of either side of the fjord.

The air quality monitoring program in Seward was established in January 2011 to evaluate the ambient air concentration of wind-blown dust categorized as particulate matter equal to or less than 10 micrometers (PM₁₀). The monitoring program was prompted by mounting complaints from local residents received by City officials and DEC over the last several years. The concern was not only wind-blown dust from natural sources but also coal dust from the Seward Coal Terminal, which stockpiles large quantities of coal for export to locations along the Pacific Rim. In 2010, the City requested assistance from DEC to establish a monitoring program to evaluate the dust levels and determine if further control strategies were necessary. The monitoring program is a cooperative effort between the City of Seward, the Qutekcak Native Tribe (QNT),

¹ Population data obtained from the 2010 U.S. Census, (April 1, 2011)

² Western Regional Climate Center, Period of Record: September 1949 to December 2005. wrc@dr.edu

³ Historical wind data for May 2010 - April 2011 was obtained from Weather Underground, <http://www.wunderground.com/history/airport/PAWD/2010/5/1/MonthlyHistory.html>

the Alaska Native Tribal Health Consortium (ANTHC) and DEC. The City provided the land and access to the monitoring sites, QNT is providing the site operators, ANTHC provided funding for the site installations and site operators, and DEC is providing the sampling equipment, materials, laboratory services, reporting, and technical oversight.

The monitoring program consists of a network of three sites. The three sites were selected to represent the overall air quality for the City of Seward. Designated as special purpose monitors (SPM), the sites will measure air quality on a neighborhood scale. One site is located in the downtown district, another located downwind of commercial and industrial activities of the Seward Coal Terminal and small boat harbor, and a third in a residential area near the Seward High School/Middle School Complex. The monitoring program will collect at least 12 months of valid data, operating on an EPA 1-in-6 day sampling schedule. The site locations are shown in Figure 7.1:2. More detailed information on the site descriptions are provided in the following sections.



Figure 7.1:1 Satellite Image of terrain surrounding Seward, Resurrection Bay, and the fjord. (Courtesy of Google Maps)



Figure 7.1:2 Satellite image of the Seward monitoring sites. The red squares indicate the locations. (Courtesy of Google Maps).

7.2. *Seward Community Library Site*

Seward Community Library, 238 5th Avenue

Parameters: PM₁₀

AQS ID n/a

Established: January 13, 2011

7.2.1. SITE INFORMATION

This monitoring site is located in the Seward Downtown district at the southeast corner of 5th Avenue and Adam Street. The site coordinates are latitude 60° 06' 08.90" North (60.102472), longitude 149° 26' 19.70" West (-149.438806), and 13 meters (43 feet) above sea level. This site has two collocated mechanical high volume (Hi-Vol) samplers. The PM₁₀ concentrations collected from the collocated samplers will be statistically compared to evaluate data precision

for the Seward network. Figure 7.2:1 is a satellite image of the Seward downtown district showing the location of the Library Site.

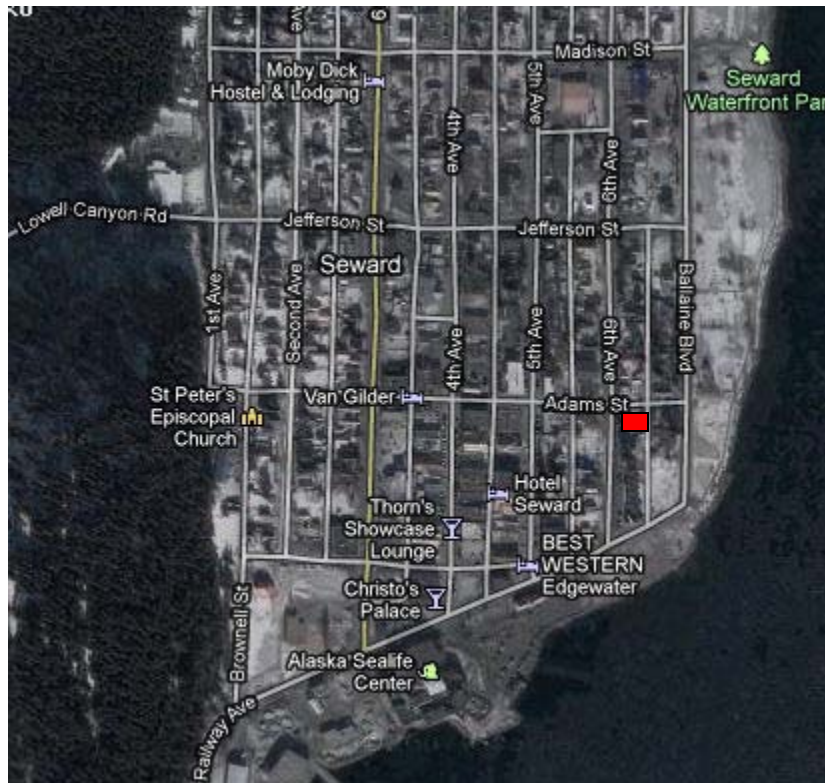


Figure 7.2:1 Satellite image of the Seward Downtown District: The red square denotes the location of the Seward Community Library site. (Courtesy of Google Maps)

7.2.2. SOURCES

The major sources of coarse particulate matter impacting this site are anticipated to be wind-blown dust entrained into the air from glacial silt in the local soil (open un-vegetated areas), breakdown of road surfaces, road sanding materials used in the winter, stockpiles of materials such as aggregate for road maintenance, and the Seward Coal Terminal. The library site is located approximately 2.2 kilometers (1.4 miles) from the Seward Coal Terminal stockpiles.

7.2.3. MONITORS

The Library site is currently equipped with:

- PM₁₀ (SPM) – Two Thermo Environmental Instrument (formerly General Metal Works) Hi-Vol samplers, operated on the EPA 1-in-6-day sampling schedule.

7.2.4. SITING









The manually operated equipment is located on the roof of the Seward Community Library. All inlets are at a height of approximately four meters (13 feet) above the ground level on 5th

Avenue. There is uninterrupted airflow around the inlets. The monitoring objective of this site is to measure airborne dust. Photographs of the Library site are presented in Figure 7.2:2.

7.2.5. TRAFFIC

Traffic in the Seward downtown district is relatively light. Annual average daily traffic counts range from 2,732 vehicles per day along 3rd Avenue to 640 vehicles per day along Railway Avenue. All the main streets and commercial parking lots are paved. The alleyways between blocks are unpaved.

Figure 7.2:2 Photographs of the Seward Community Monitoring Site with Collocated Samplers

From the North looking toward the samplers	From the North-northeast looking toward the samplers	From the South-southwest looking toward the samplers	From the West looking toward the samplers
			
Looking to the North from the samplers	Looking to the East from the samplers	Looking to the South from the samplers	Looking to the West from the samplers
			

7.3. *Ballaine Boulevard Site*

Ballaine Boulevard Lift Station

Parameters: PM10

AQS ID n/a

Established: January 13, 2011

7.3.1. SITE INFORMATION

The Ballaine Boulevard monitoring site is located near the beach adjacent to the Seward City campgrounds. The monitoring platform and sampler were installed within the fence line of the Ballaine Boulevard Lift Station. The site coordinates are latitude 60° 06' 43.87" North (60.112186), longitude 149° 26' 13.12 West (-149.436978). The elevation for the site is approximately 6 meters (20 feet) above mean sea level. Figure 7.3:1 shows the location of the monitoring site.



Figure 7.3:1 Satellite image of the Ballaine Boulevard monitoring site and surrounding area - The red square denotes the monitoring site location. (Courtesy of Google Maps)

7.3.2. SOURCES

The major sources of coarse particulate matter impacting this site are anticipated to be wind-blown dust entrained into the air from glacial silt in the local soil, breakdown of road surfaces, road sanding materials used in the winter, stockpiles of materials such as aggregate for road maintenance, and the Seward Coal Terminal. The site is surrounded by un-vegetated ground in the City campground and other adjacent lots. The monitoring site is located downwind of the Seward Coal Terminal at a distance of 1.33 kilometers (0.8 miles).

7.3.3. MONITORS

The Ballaine Boulevard site is currently equipped with:









- PM₁₀ (SPM) – One Thermo Environmental Instrument (formerly General Metal Works) Hi-Vol sampler operated on the EPA 1-in-6-day sampling schedule.

7.3.4. SITING

The sampler inlets are at a height of approximately three meters (9 feet) above the ground. There is uninterrupted airflow around the inlet. The monitoring objective of this site is to measure coarse particulate from airborne dust. Photographs of the Ballaine Boulevard site are presented in Figure 7.3:2.

7.3.5. TRAFFIC

All main streets in the immediate area of the monitoring site are paved; however, local parking lots for the adjacent camping area are not. Annual average daily traffic for that section of Ballaine Boulevard is 1600 vehicles per day.

Figure 7.3:2 Photographs of the Ballaine Boulevard Monitoring Site			
Looking from the North toward the sampler	Looking from the East toward the sampler	Looking from the South toward the sampler	Looking from the South-southwest toward the sampler
			
Looking from the sampler to the North	Looking from the sampler to the East	Looking from the sampler to the South	Looking from the sampler to the West
			

7.4. Seward Mountain Manor Site

Seward Mountain Manor 2203 Oak Street

Parameters: PM10

AQS ID n/a

Established: January 13, 2011

7.4.1. SITE INFORMATION

This monitoring site is located at Mountain Manor, a senior nursing and assisted living facility owned and operated by Providence Health & Services. The sampler is located on the roof of the main building of the complex. The site coordinates are latitude 60° 07' 54.24" North (60.131733), longitude 149° 26' 35.28" West (-149.443133). The average elevation for Mountain Manor is approximately 43 meters (140 feet) above mean sea level. The monitoring site is located in a residential area of Seward on the hillside above the Seward High School/Middle School and upwind of the Seward Coal Terminal. Figure 7.4:1 is a satellite image of the monitoring site and surrounding area.



Figure 7.4:1 Satellite image of the Mountain Manor monitoring and surrounding area - The red square denotes the monitoring site location. (Courtesy of Google Maps)

7.4.2. SOURCES

The major sources of coarse particulate matter impacting this site are wind-blown dust from unpaved areas, traffic dust, and glacial silt from river beds feeding into 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.

7.4.3. MONITORS

The Mountain Manor site is currently equipped with:

- PM₁₀ (SPM) – One Thermo Environmental Instrument (formerly General Metal Works) Hi-Vol sampler operated on the EPA 1-in-6-day sampling schedule.




7.4.4. SITING

The sampler inlet is 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 dust. Photographs of the Mountain Manor Site are presented in Figure 7.4:2.

7.4.5. TRAFFIC

The average daily traffic for Oak Street is not specifically known but the nearest traffic count site along Swetman Avenue is 160 vehicles per day. The Seward High School and Middle School complex are down the hillside from the Mountain Manor along Swetman Avenue. Many of the roads in the immediate area of the monitoring site are not paved, including Oak Street; however, the drive and parking lot for the Mountain Manor are paved. During the school year there is bus and other vehicle traffic for student drop off and pick up.

Figure 7.4:2 Photographs of the Mountain Manor Monitoring Site

Looking from the North toward the sampler	Looking from the East toward the samplers	Looking from the South toward the sampler	Looking from the West toward the sampler
			<p>Not available because of the sampler's close proximity to the edge of the roof</p>
Looking from the sampler toward the North	Looking from the sampler toward the East	Looking from the sampler toward the South	Looking from the sampler toward the West
