



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

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OFFICE OF THE REGIONAL
ADMINISTRATOR

MAR 1-1 2014

Mr. Larry Hartig
Commissioner
Office of the Commissioner
Alaska Department of Environmental Conservation
P.O. Box 111800
410 Willoughby Avenue, Suite. 303
Juneau, Alaska 99811-1800

Dear Mr. Hartig:

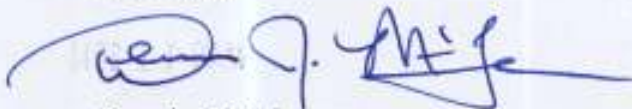
This letter responds to the Alaska Department of Environmental Conservation's September 30, 2013, submittal regarding the elevated 24-hour $PM_{2.5}$ National Ambient Air Quality Standard levels at the State Office Building site in downtown Fairbanks and the North Pole elementary school site between May and July 2010. The ADEC has requested that the U.S. Environmental Protection Agency concur that the $PM_{2.5}$ levels for the four submitted dates for each site were due to a wildfire exceptional event. One of the eight submitted 24-hour $PM_{2.5}$ concentrations (four measurements at two sites), exceeded the $35 \mu\text{g}/\text{m}^3$ $PM_{2.5}$ 24-hour NAAQS.

Our response to the ADEC's request is governed by the "Treatment of Data Influenced by Exceptional Events" rule (72 FR 13560, March 22, 2007). After careful consideration of the information provided, we concur with the ADEC's exceptional events flag for July 13, 2010, at the State Office building site. The basis for our decision is set forth in the enclosed document. We have not acted on the flags for May 29, June 1, and July 16, 2010, at both sites and the July 13, 2010, flag at the North Pole elementary school site, given that the levels recorded on these dates did not exceed the 24-hour $PM_{2.5}$ standard and did not have regulatory significance with regard to the 24-hour $PM_{2.5}$ standard or the 2012 annual $PM_{2.5}$ standard.

Note that the EPA's decisions on exceptional event exclusions are not considered final agency action until they are acted upon as part of a final regulatory action subject to public notice and comment. Such actions would include, for example, decisions to exclude the affected data from use in an approval of a non-attainment plan or determination of attainment.

Thank you for the ADEC's timely submittal of this exceptional event documentation. If you have any questions or wish to discuss this matter further, please contact me or have your staff contact Justin Spenillo, of our Air Planning Unit in the Office of Air, Waste and Toxics at (206) 553-6125.

Sincerely,



Dennis J. McLerran
Regional Administrator

Enclosure

cc: Alice Edwards
Director, Division of Air Quality
Alaska Department of Environmental Conservation

Barbara Trost
Program Manager, Air Monitoring and Air Quality
Alaska Department of Environmental Conservation

**EPA Region 10
 Review of Exceptional Event Request
 Fairbanks, AK
 24-hour PM_{2.5} NAAQS
 Dates Analyzed: July 13, 2010**

Background

On March 22, 2007, the EPA adopted a final rule, *Treatment of Data Influenced by Exceptional Events* (Exceptional Events Rule or EER, 72 FR 13560) to govern the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate. Under the EER, the EPA may exclude data from use in determinations of National Ambient Air Quality Standard (NAAQS) exceedances and violations if a state demonstrates that an “exceptional event” caused the exceedances. Before the EPA can exclude data from these regulatory determinations, the state must flag the data in the EPA’s Air Quality System (AQS) database and, after notice and opportunity for public comment, submit a demonstration to justify the exclusion. After considering the weight of evidence provided in the demonstration, the EPA decides whether or not to concur with each flag.

ADEC’s Request

The Alaska Department of Environmental Conservation requested concurrence on flagged 24-hour PM_{2.5} data for Fairbanks, Alaska on May 29, June 1, July 13, and July 16, 2010, at the State Office Building site (AQS site ID 02-090-0010-88101) and the North Pole elementary school site (AQS site ID 02-090-0033-88101). As the ADEC flagged the precision monitor values in AQS for June 1 and July 13 at the State Office Building site, the EPA considers the request to apply to both monitors at the site (Primary monitor ID and POC: 02-090-0010-1-88101, and Precision monitor ID and POC: 02-090-0010-2-88101). The recorded 24-hour PM_{2.5} levels for the sites ranged from 2.6µg/m³ to 44.5µg/m³ for the data values during the exceptional events for which ADEC is requesting the EPA’s concurrence.

Fairbanks Monitored Values, 24-hr PM_{2.5}

Date	Fairbanks, Alaska State Office Building Monitor		North Pole Elementary School monitor
	PM _{2.5} concentration (µg/m ³) - Primary	PM _{2.5} concentration (µg/m ³) - Precision	PM _{2.5} concentration (µg/m ³)
May 29, 2010	21.8	22.7	13.4
June 1, 2010	23.4	-	23.9
July 13, 2010	44.5	42.3	22.7
July 15, 2010	21.3	-	2.6

PM_{2.5} levels from one of the four days at one monitor exceeded the 35 µg/m³ 24-hour PM_{2.5} NAAQS. During that time there were multiple wildfires occurring upwind of Fairbanks with a significant amount of smoke build-up which affected the area over the course of the summer.

The ADEC flagged the monitored values as wildfire exceptional events before the statutory deadline of July 1, 2011 and made the documentation available for public comment on August 23, 2013. The ADEC

submitted exceptional event documentation to the EPA on September 30, 2013, for the four dates listed above.

The EPA's Exceptional Event Evaluation

The EPA evaluated whether the documentation provided by the ADEC for the flagged values of the 24-hour PM_{2.5} NAAQS for July 13, 2010, at the State Office Building site in Fairbanks, Alaska, demonstrates that the requirements of the Exceptional Events Rule were met. The EPA has not evaluated the documentation for the May 29, June 1, and July 16, 2010, flags at both monitoring sites or the July 13, 2010, flag at the North Pole elementary school site because the flagged values for these days did not exceed the 24-hour PM_{2.5} standard and do not have regulatory significance with regard to the 24-hour PM_{2.5} standard or the 2012 annual PM_{2.5} standard.

The table below summarizes the requirements of the Exceptional Events Rule and describes how the ADEC met each requirement. All references to page numbers, tables, and figures relate to the ADEC's September 30, 2013 submittal.

Procedural Requirements:	The EPA's Evaluation of Flagged Exceedances:
<ul style="list-style-type: none"> The data are flagged and include an initial event description in EPA's AQS database. 40 CFR 50.14(c)(2)(i) and (iii) 	<p>The ADEC flagged and described the July 13, 2010, 24-hour PM_{2.5} value at the State Office Building site as a wildfire exceptional event in EPA's AQS database prior to the July 1, 2011, deadline.</p>
<ul style="list-style-type: none"> The public had an opportunity to review and comment on demonstration justifying data exclusion. 40 CFR 50.14(c)(3)(i) and (iv) 	<p>The ADEC provided a 30-day public comment period on the documentation for the claimed exceptional event. The public comment period began on August 23, 2013 and closed on September 24, 2013. The ADEC received no comments.</p>
<ul style="list-style-type: none"> Demonstration justifying data exclusion submitted timely to EPA. 40 CFR 50.14(c)(3)(i) 	<p>The EPA received demonstration documentation from the ADEC on September 30, 2013, before the deadline of not later than three years following the end of the calendar quarter in which the flagged concentration was recorded (in this case, September 30, 2013).</p>

Technical Criteria:	
<ul style="list-style-type: none"> The event satisfies the criteria in 40 CFR 50.1(j) (i.e., affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by EPA to be an exceptional event). 40 CFR 50.14(c)(3)(iii)(A) 	<p><i>Conceptual Model / Affected Air Quality</i> The ADEC showed how the natural wildfire event affected air quality during the summer of 2010. As evidence that the wildfires affected air quality, Table 5 (page 20) shows the July 13 PM_{2.5} level measured at the Fairbanks State Office Building monitor exceed the standard and compares it to the preceding days which have lower PM_{2.5}. Appendix C provides supporting elevated PM_{2.5} data and Figure 9 includes a map charting the numerous wildfires to the south of Fairbanks as the ADEC develops the conceptual model of how the nearby wildfires affected air quality in Fairbanks. Appendix A includes multiple articles from the early part of the summer that identify the multiple wildfires and warm conditions. More detailed information supporting that the wildfire event affected air quality is also provided in the Clear Casual Relationship section. This section describes the July 13 exceedance day and the prior days using HYSPLIT backward and forward trajectories, hourly PM_{2.5} levels, AICC fire maps, and descriptive narrative text. The EPA concludes that the submitted information supports that the wildfires in Alaska during the summer of 2010 affected air quality.</p> <p><i>Natural Event and not Reasonably Controllable or Preventable.</i> The ADEC described wildfires in Alaska on page 13. These natural events occur annually and 2010 was the fifth highest year in the past ten with 1,125,400 acres burned as a result of 686 fires releasing 549,494 tons of PM_{2.5} (figures and tables on page 14-15). Warm and dry conditions in May made the state susceptible to wildfires which moved north and westward towards Fairbanks by June/July (figures on page 10-12).</p> <p>The ADEC then discussed the Alaska Interagency Wildland Fire Management Plan (AIWFMP), which is an interagency plan that coordinates federal land management agencies' activities regarding controlling wildland fires. The plan manages fire response and suppression based on a variety of factors including: the protection of life and valued resources, the need for fire to ensure a healthy ecosystem, and the allocation of resources for wildfire management. Most of Alaska is designated as Modified/Limited Maintenance which</p>

	<p>means that resources are more likely to be allocated when fire danger and growth is high. The wildfires and associated PM_{2.5} exceedance in July 2010 were not reasonably controllable or preventable given the number of fires, the size of the fires, and the fire management procedures agreed upon in the AIWFMP, which call for the state to protect life and high value areas but also not to suppress all fire given limited resources and ecological benefit of fires (page 16-19). The ADEC also implements the Alaska Enhanced Smoke Management Plan (along with the already mentioned AIWFMP) to manage smoke, permitted burning, and air quality (page 19). The ADEC did not identify any irregular anthropogenic sources of emissions during the period in question. Based on the submitted information, the EPA concludes that the wildfires were natural events and that they were not reasonably controllable or preventable due to their size and persistence through the summer and in light of the existence and implementation of the AIWFMP and ASMP.</p>
<ul style="list-style-type: none"> • There is a clear causal relationship between the exceedance and the claimed exceptional event. 40 CFR 50.14(c)(3)(iii)(B) 	<p>As described above, the ADEC described how the smoke from these wildfires (natural event) affected air quality. The ADEC then established the clear causal relationship by establishing the size, number, location, and ignition date of fires through maps and supporting acreage burned information on pages 27-29 of the demonstration. For the July 13, 2010, event at the State Office Building monitor, the ADEC uses back trajectories overlaid on AICC fire maps, HYSPLIT back trajectories, daily PM_{2.5} data, text narrative, and supporting meteorological information including wind speed, temperature, and wind direction to show how the exceedance at the monitor was a result of the nearby fires (page 50-60, 70). Specifically, text summaries describe the growth of the Willow Creek Fire from July 12-14 with it peaking on the day of the exceedance; the Willow Creek fire was ~13 miles to the southwest of Fairbanks as depicted on multiple maps including Figures 12, 13. During the same time, the nearby Tolkat2 fire continued to burn and contribute to the exceedance. The fire map with overlaid trajectory and HYSPLIT trajectory flow roughly from the southwest along the border of the Willow Creek fire and on to Fairbanks. MODIS imagery was not used for these days as clouds limited visibility of the fires. Hourly PM_{2.5} levels show the concentrations below 15µg/m³ prior to the event and then elevated values on the morning of the</p>

	<p>exceedance. In the subsequent days there are elevated hourly concentrations but not enough to exceed the 24 – hour standard. Wind direction information supported flow from the southwest where the fires were heading northeast towards Fairbanks.</p> <p>Based on the suite of evidence provided, including HYSPLIT model trajectories, AICC fire maps with trajectory overlaid, hourly PM_{2.5} data, wind direction data, and no evidence of significant sources of anthropogenic PM_{2.5}, the EPA concludes that there is a clear causal connection between the State Office Building monitor values recorded on July 13, 2010, and the wildfire exceptional events. The EPA has not evaluated the documentation for the May 29, June 1, and July 16, 2010 flags at either monitoring sites or the July 13, 2010, flag at the North Pole elementary school site.</p>
<ul style="list-style-type: none"> The event is associated with measured concentrations in excess of normal historical fluctuations including background. 40 CFR 50.14 (c)(3)(iii)(C) 	<p>To show PM_{2.5} concentrations during the 2010 wildfires were in excess of normal historical fluctuations, including background, the ADEC cited data (Figure 11, page 25) that showed that PM_{2.5} levels were generally below the 2006 PM_{2.5} NAAQS in the 11 summers between 2000 and 2011. When there were exceedances, they were shown to occur only during the fire season months between June and August and during heavy wildfire years. Supporting information included the number of acres that burned between 2000 and 2009 (Table 7) and wildfire summer months having a low average 24-hour PM_{2.5} concentration of 3-7.2 µg/m³ (Table 6).</p> <p>Based on the presented data, the EPA concludes that the values recorded on July 13, 2010, at the State Office Building monitor are in excess of normal historical fluctuations.</p>
<ul style="list-style-type: none"> There would have been no exceedances “but for” the event. 40 CFR 50.14(c)(3)(iii)(D) 	<p>To show there would have been no exceedances “but for” the event, the ADEC established that normal historical fluctuations / normal summer variability were often 3 – 7.2µg/m³ (Table 6). On July 13, 2010, an exceedance of 44.5µg/m³ was measured at the State Office Building site and was well above the 35 µg/m³ 24-hour PM_{2.5} NAAQS standard.</p> <p>As identified in the historical fluctuations section, summer time values are typically below 10 µg/m³. During the periods of elevated PM_{2.5} values, the</p>

	<p>wildfires were the major sources of emissions in the area, as identified in the 2008 and 2011 Alaska Wildfire Emissions Inventories. Additionally, the ADEC identified that during the time of submitted July 13, 2010 elevated value there had been no prescribed burning during July or the preceding month of June as depicted in Figure 5. Figure 4 shows that prescribed burning was responsible for ~1/50th of the acreage burned compared to wildfire acreage, and produced an even smaller fraction of PM_{2.5} emissions (227 tons of PM_{2.5} from prescribed burning in 2010 as compared to 549,494 tons of PM_{2.5} from wildfires in 2010). The “No Exceedance But For” section of the demonstration identifies that there were no other known sources of anthropogenic emissions above the background level that contributed to the elevated value recorded on July 13, 2010. The ADEC identified that potential sources of emissions did not contribute as there was no prescribed burning at that time and the major stationary sources do not contribute to the PM_{2.5} in the area above the background.</p> <p>With a weight of evidence demonstration of a clear causal relationship between the wildfire and the elevated emissions and the lack of prescribed burns or other PM_{2.5} emissions events during that time period, the EPA concludes that but for the wildfires near Fairbanks during the summer of 2010, there would have been no exceedances of the 24-hour PM_{2.5} NAAQS on July 13, 2010, at the Fairbanks State Office Building monitor.</p>
<ul style="list-style-type: none"> • Mitigation, 40 CFR 51.930 	<p>The ADEC implements the Alaska Enhanced Smoke Management Plan (along with the already mentioned AIWFMP) to manage smoke, permitted burning, and air quality (page 19). The ADEC also provided public notification with five Air Quality Advisories for the duration of the wildfire events in the area, two of which applied to the Fairbanks area during the early part of the summer (Appendix B).</p>

Conclusion

Based on the documentation submitted by the ADEC on September 30, 2013, the EPA concurs on the PM_{2.5} data values listed in following table which have been flagged by the ADEC in AQS as exceptional events.

Date	Fairbanks, AK State Office Building Monitor		North Pole Elementary School monitor
	PM _{2.5} concentration (µg/m ³) - Primary	PM _{2.5} concentration (µg/m ³) - Precision	PM _{2.5} concentration (µg/m ³)
May 29, 2010	Not reviewed		
June 1, 2010	Not reviewed		
July 13, 2010	44.5	42.3	-
July 15, 2010	Not reviewed		

The information and analyses presented in the ADEC's exceptional event demonstration package provided weight of evidence sufficient for the EPA concurrence on the flagged data from the Fairbanks State Office Building station site on the date listed above. Accordingly, we are placing a concurrence indicator in the EPA's AQS database for July 13, 2010 at the State Office Building primary and precision monitors.

Note that the EPA's decisions on exceptional event exclusions are not considered final agency action until they are acted upon as part of a final regulatory action subject to public notice and comment. Such actions would include, for example, decisions to exclude the affected data from use in an approval of a non-attainment plan or determination of attainment.

