



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS, TEXAS 75202 – 2733

April 13, 2018

Office of the Regional Administrator

Chuck Carr Brown, Ph.D.  
Secretary  
Louisiana Department of Environmental Quality  
Post Office Box 4301  
Baton Rouge, Louisiana 70821-4301

Dear Secretary Brown:

This letter responds to the Louisiana Department of Environmental Quality's proposed exceptional event flags and demonstration for the air quality 8-hour ozone concentration value of 76 parts per billion during the hours 0900-1600 local standard time on September 14, 2017, at the Baton Rouge Dutchtown monitor (Air Quality System number 22-005-0004). Your demonstration was submitted to us in a letter dated April 3, 2018, after satisfying a 30-day public review requirement. The U.S. Environmental Protection Agency has completed its analysis of this submittal in accordance with the requirements of 40 Code of Federal Regulations (CFR) section 50.14.

In 2016, the EPA revised the Exceptional Events Rule (EER) found in sections 50.14 and 51.930 of 40 CFR parts 50 and 51 of the Clean Air Act. *See* "Treatment of Data Influenced by Exceptional Events," 81 FR 68216 (Oct. 3, 2016). After careful consideration of the information provided, the EPA concurs, based on the weight of evidence, that the LDEQ has made the demonstrations referred to in 40 CFR sections 50.14(a)(2), (b)(1) and (b)(4). In addition, LDEQ has met the schedule and procedural requirements in section 50.14(c) with respect to the same information. The EPA has reviewed the documentation provided by the LDEQ demonstrating that the ozone exceedance at the Dutchtown monitor on September 14, 2017, met the criteria for an exceptional event in the EER. The basis for our concurrence is set forth in the enclosed document review summary. The EPA will place a concurrence flag in the appropriate field in the EPA Air Quality System database.

The EPA's concurrence is a preliminary step in the regulatory process for actions that may rely on the dataset containing the event-influenced data and does not constitute final agency action. If EPA takes a regulatory action that is affected by exclusion of the ozone data for the September 14, 2017, event at the Dutchtown monitor, the EPA intends to publish notice of its proposed action in the Federal Register. The EPA's concurrence letter and accompanying evaluation summary document will be included in the record as part of the technical basis for that proposal. When the EPA issues the regulatory action, it will be a final agency action subject to judicial review.

We appreciate the work of the LDEQ to develop this exceptional event package. If you have any questions about our review, please contact me at (214) 665-2100, or have your staff contact Ms. Frances Verhalen, Air Monitoring/Grants Section Chief, at (214) 665-2172.

Sincerely,

A handwritten signature in cursive script that reads "Anne L. Idsal". The signature is written in black ink and is positioned above the printed name and title.

Anne L. Idsal  
Regional Administrator

Enclosure

***Technical Review of September 14, 2017, Exceptional Events Demonstration Package for the Baton Rouge Dutchtown monitoring site submitted by the Louisiana Department of Environmental Quality (LDEQ), dated April 3, 2018***

**Introduction**

The U.S. Environmental Protection Agency (EPA) promulgated a revised Exceptional Events Rule (EER) in 2016 (see 81 FR 68216, October 3, 2016), which superseded the prior rule and is now in effect. This demonstration package was submitted in accordance with the EER as revised in 2016.

The procedural elements of the EER require air agencies to provide EPA with an initial notification of a potential exceptional event which includes flagging the claimed event-influenced data resulting in a monitored exceedance or violation in the EPA's Air Quality System (AQS) database and providing the EPA with an initial description of the event. The air agency is also required to complete a public comment process, provide EPA with the public comments received, and address any comments that dispute or contradict factual evidence provided in the demonstration.

Under the EER, the air agency demonstration to justify exclusion of data must provide evidence that demonstrates to the Administrator's satisfaction (See 40 CFR 50.14(a)(1)(ii) and (b)(1)) that such event caused a specific air pollution concentration at a particular air quality monitoring location. Under 40 CFR 50.14(c)(3)(iv), the air agency demonstration package to justify data exclusion must include the following five elements:

- A. A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s).
- B. A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation.
- C. Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph 50.14(c)(3)(iv)(B). The Administrator shall not require a State to prove a specific percentile point in the distribution of data.
- D. A demonstration that the event was both not reasonably controllable and not reasonably preventable.
- E. A demonstration that the event was a human activity unlikely to recur at a particular location or was a natural event.

The LDEQ submitted its demonstration package to EPA on April 3, 2018. We address our review of the LDEQ demonstration for the Dutchtown ozone monitor 8-hour ozone exceedance on September 14, 2017, with respect to the criteria above in the remainder of this document.

In order for EPA to concur on an exceptional events demonstration, air agencies must satisfy all of the EER criteria. Air agencies should demonstrate that wildfire emissions were transported to the monitor, that the emissions from the wildfire(s) influenced the monitored concentrations, and provide evidence of the contribution of wildfire emissions to the monitored ozone exceedance or violation. After considering the information and analyses in the demonstration, the EPA reviews the demonstration package using a weight-of-evidence approach and decides whether to concur or not to concur with each flag. When using the weight-of-evidence approach, EPA considers all relevant evidence and qualitatively weighs this evidence based on its relevance to the EER criterion being addressed, the degree of

certainty, its persuasiveness, and other considerations appropriate to the individual pollutant and the nature and type of event (See 81 FR 68230 (October 3, 2016)).

### **Overview of Claimed Exceptional Event**

The LDEQ claimed in their exceptional events demonstration that emissions from large wildfires in the Pacific Northwest impacted the Dutchtown monitor in Baton Rouge, Louisiana, causing an 8-hour ozone exceedance of 76 parts per billion (ppb) on September 14, 2017. The LDEQ demonstration package highlighted 24 fires in the Pacific Northwest as significantly contributing fires. The Dutchtown monitor (AQS ID #22-005-0004) has a current 2015-2017 8-hour ozone design value of 71 ppb.

The EPA has reviewed the extensive information provided by LDEQ and finds that the weight-of-evidence allows for concurrence with the flagged data. A summary of the EPA evaluation of the evidence provided in the demonstration in relation to the regulatory criteria follows.

### **Demonstration Evaluation According to EER**

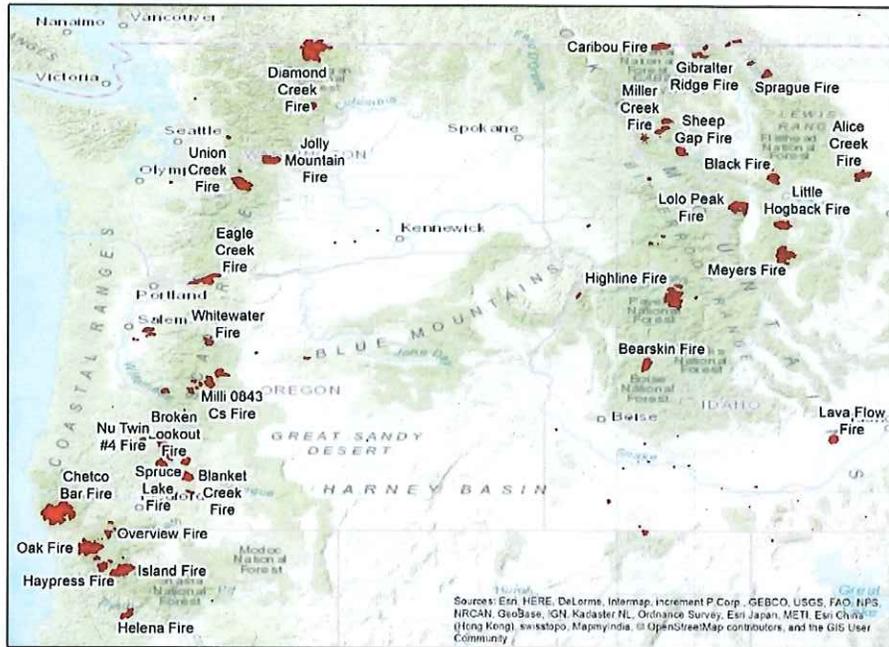
We discuss the specific requirements of the EER and our review under these provisions in this section of the technical review document. We also provide a summary table showing how the LDEQ package met all the criteria of the EER. The air agency must demonstrate the following to the Administrator's satisfaction under the EER:

- (A) Include a narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s).**

The LDEQ claimed in its exceptional events demonstration that emissions from 24 wildfires in the Pacific Northwest impacted the Dutchtown ozone monitor in Baton Rouge, Louisiana, causing an 8-hour ozone exceedance of 76 ppb on September 14, 2017. Section 1 of the LDEQ demonstration document contains a narrative conceptual model which traces the emissions/smoke from the Pacific Northwest wildfires burning during the first part of September 2017 to the Baton Rouge, Louisiana, area by September 14, 2017. The narrative conceptual model provides an overview of meteorological conditions, including discussion of surface and upper-level air circulations and Hurricane Irma, during September 2017, which were related to the unusual Baton Rouge area 8-hour ozone exceedances recorded on September 14, 2017. In summary, Section 1 of LDEQ's demonstration package meets the requirement to provide a narrative conceptual model.

- (B) Include a demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation.**

The LDEQ demonstrated to the Administrator's satisfaction that a clear causal relationship exists between large Pacific Northwest wildfires burning in early September 2017 and the 8-hour ozone exceedance at the Dutchtown ozone monitor on September 14, 2017. In Appendix 3, Figure 44 (also shown below), the LDEQ presented a map of 24 large wildfires in the Pacific Northwest that were burning in early September 2017, and the wildfires accounted for over 1.2 million acres burned.

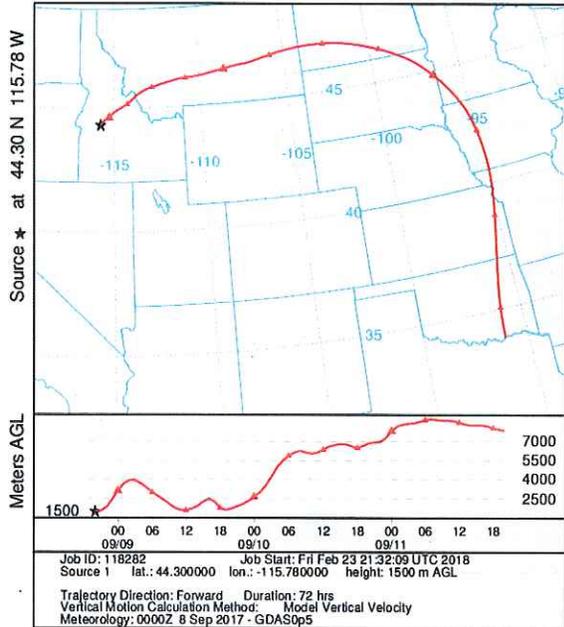


**Figure 44.** Map of wildfires active in the northwestern United States on September 14, 2017. The names of fires greater than 10,000 acres are shown.

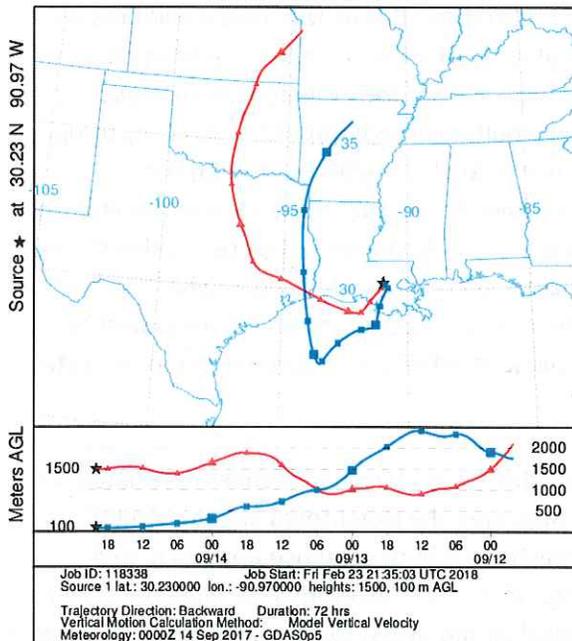
The LDEQ then showed that: (1) smoke/emissions from those Pacific Northwest wildfires were transported to the Dutchtown ozone monitor by using HYSPLIT wind trajectory analyses as evidence (Appendix 4, Figure 1, also shown below); (2) the smoke/emissions from those wildfires were present over the Dutchtown ozone monitor on September 14, 2017, by using HMS satellite data (Appendix 3, Figure 8, also shown below) as evidence; and (3) the smoke/emissions from those wildfires were mixed down to the Dutchtown ozone monitor on September 14, 2017, by using ceilometer data as evidence (Appendix 3, Figure 33, also shown below). The LDEQ demonstration package also included a review of local fires which suggested that local fires likely played only a small role in the high ozone concentrations measured on September 14, 2017. In addition, no abnormal emissions activity was documented or reported for Baton Rouge regarding September 14, 2017.

Based on EPA's evaluation of the information provided by the LDEQ, influences associated with the 24 Pacific Northwest wildfires cited by LDEQ impacted the Dutchtown ozone monitor on September 14, 2017. More specifically, using a holistic weight of evidence approach, EPA considered the information provided by LDEQ (e.g., air parcel trajectories, satellite data, and air pollutant and meteorological measurements at local air monitors) to be evidence that emissions from the Pacific Northwest wildfires reached the Baton Rouge area, affected air quality and caused the 8-hour ozone exceedance at the Dutchtown ozone monitor on September 14, 2017.

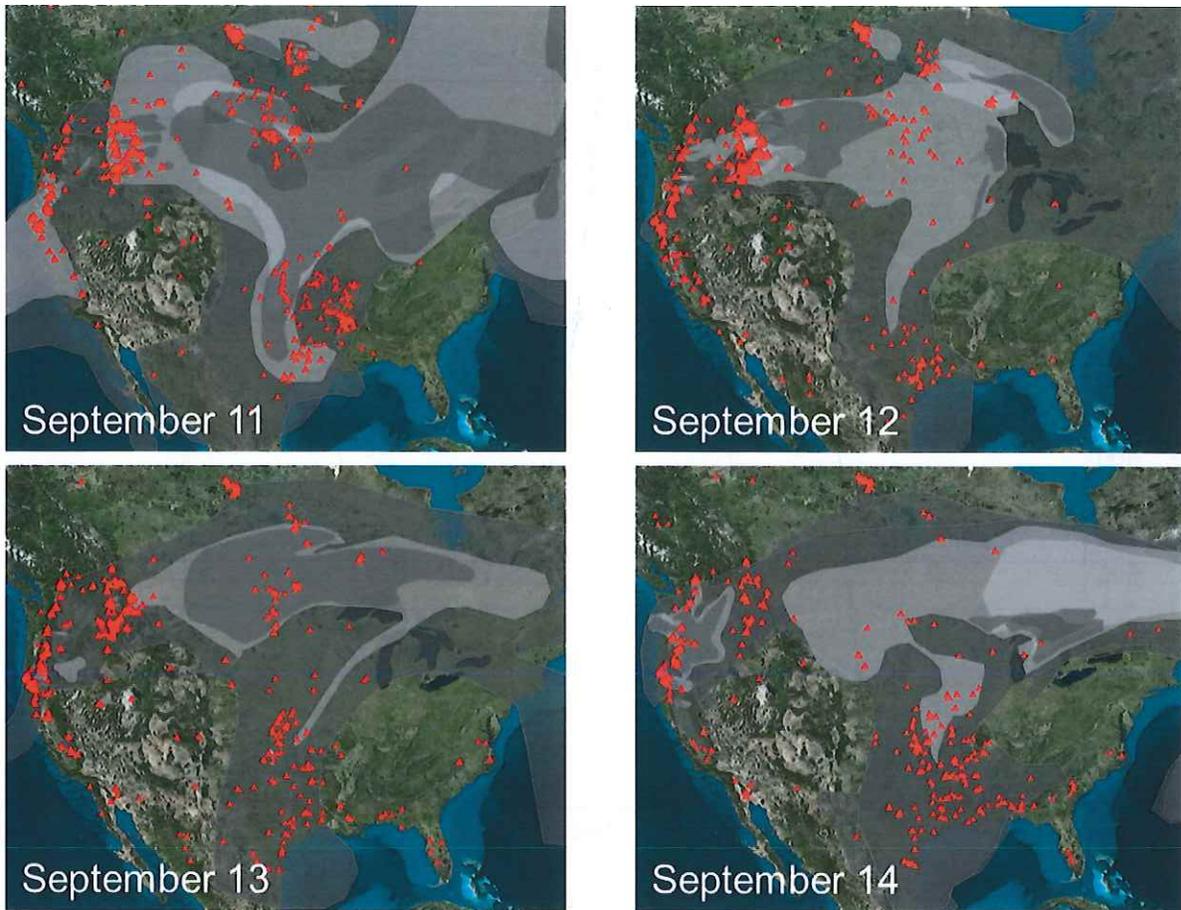
NOAA HYSPLIT MODEL  
 Forward trajectory starting at 2000 UTC 08 Sep 17  
 GFSG Meteorological Data



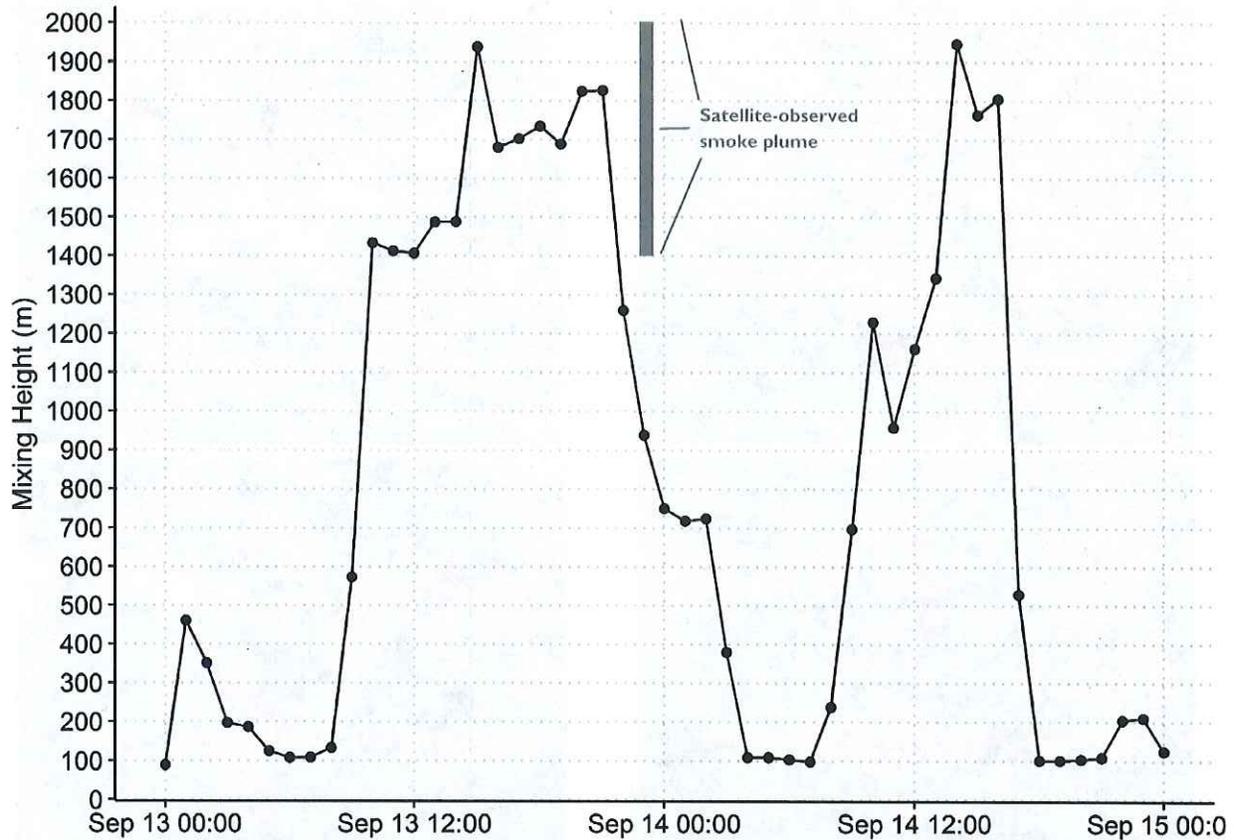
NOAA HYSPLIT MODEL  
 Backward trajectories ending at 2000 UTC 14 Sep 17  
 GFSG Meteorological Data



**Figure 1.** Forward HYSPLIT trajectories from the location of active fires in Idaho beginning on September 8, 2017 (left) and backward 72-hour trajectories from the Dutchtown monitor site in Baton Rouge beginning on the day of the exceedance, September 14, 2017 (right). The trajectories show the transport of smoke from fires in the northwest to Oklahoma by September 11, 2017, and further show that air parcels at Baton Rouge on September 14, 2017, were transported from Oklahoma beginning on September 11, 2017. The overlap of these trajectories indicates that smoke from northwestern fires was transported eastward, arriving in Louisiana on September 14, 2017.



**Figure 8.** Daily NOAA HMS fire and smoke observations. Red triangles indicate a fire detected by satellite observation. Gray areas indicate the locations of smoke plumes observed in satellite imagery. Image source: EPA AirNow-Tech.

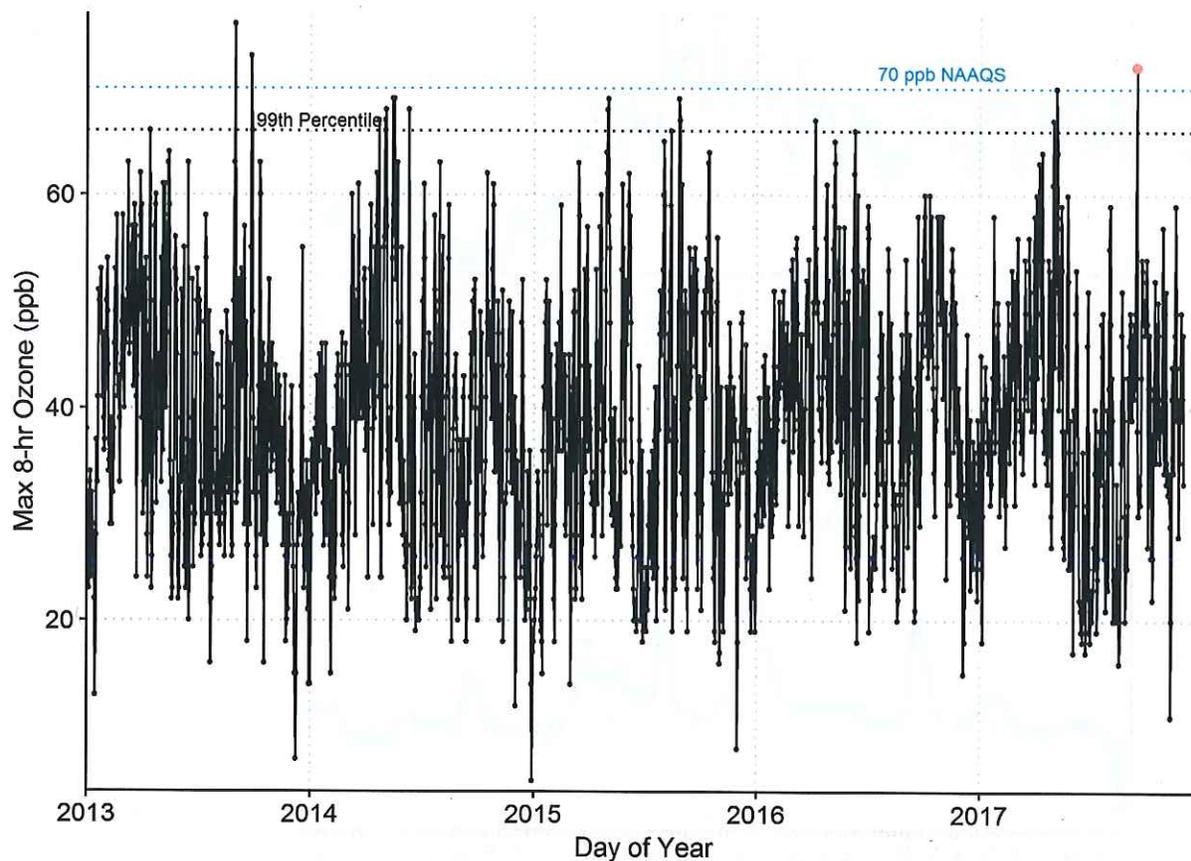


**Figure 33.** Mixing height in meters measured at the Capitol site using an optical scattering ceilometer on September 13 and 14, 2017. The vertical mixing height measured at each hour is shown with black points. The timing and vertical height of the observed smoke plume are also shown.

**(C) Include analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph (c)(3)(iv)(B) of Section 50.14.**

The LDEQ included analyses of ground-level monitoring data which compared the event-influenced 8-hour ozone concentration (76 ppb) and event-influenced ozone precursor concentrations to concentrations at the same monitoring site (or nearby monitoring sites) at other times. These analyses supported the clear causal relationship requirement to the Administrator’s satisfaction. First, the 8-hour ozone exceedance recorded at the Dutchtown ozone monitor on September 14, 2017, was unusual in that it was part of an area-wide 8-hour ozone exceedance day in the Baton Rouge/Lafayette, Louisiana area which has not been recorded at any other time in the past five years 2013-2017. Six of the eight ozone monitors in the five parish Baton Rouge area along with both ozone monitors in the upwind Lafayette area exceeded the 2015 70 ppb 8-hour ozone standard on September 14, 2017, showing the significance of this area-wide exceedance day affecting 80% of the monitoring network. An 8-hour ozone exceedance day in Lafayette has not been recorded since September 26, 2013 (Appendix 4, Figure

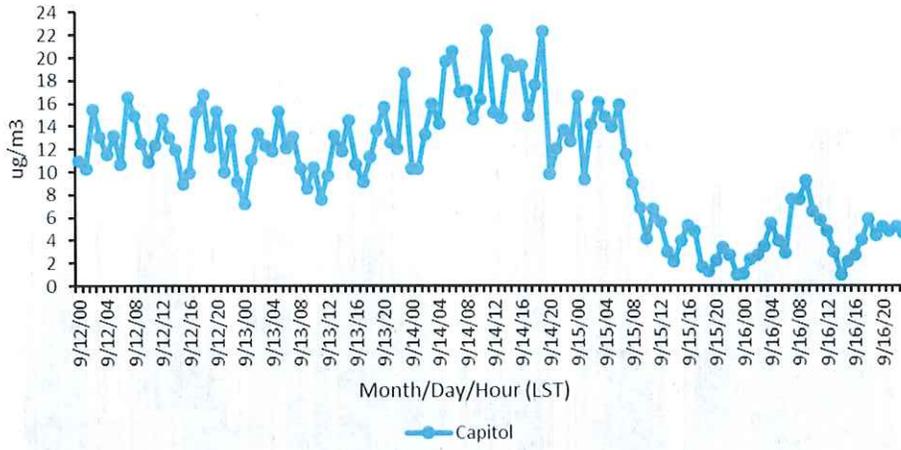
18, and also shown below). Also, extensive area-wide exceedance days are more likely to be influenced by larger scale regional emissions events rather than by smaller scale local emissions events.



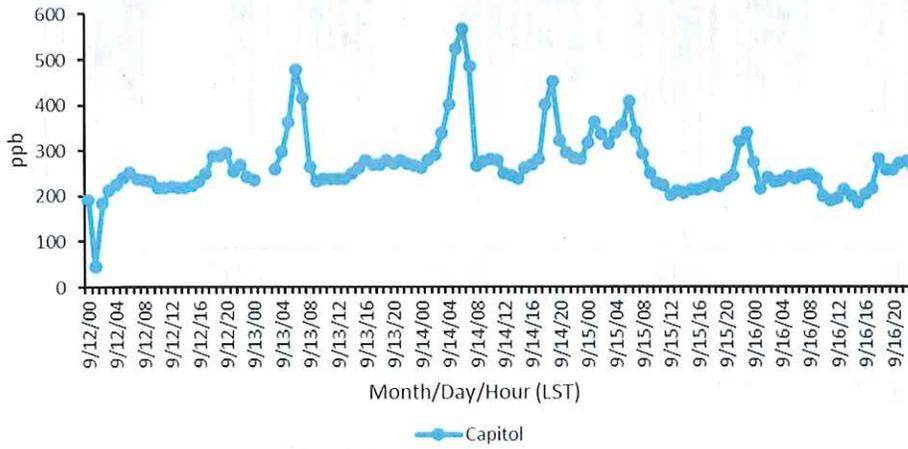
**Figure 18.** Daily maximum 8-hr ozone concentrations at the Lafayette monitoring site (AQS ID 22-055-0007) from 2013 through 2017.

Analyses of ozone precursor ground level air monitoring data supported the claim of aged wildfire emissions impacting the Dutchtown ozone monitor on September 14, 2017. Clear enhancements in  $PM_{2.5}$ , CO, and  $NO_2$  ambient concentrations were seen on September 14, 2017, compared to the previous two days (September 12-13, 2017) and the following two days (September 15-16, 2017), and this is shown in the time series graphics below:

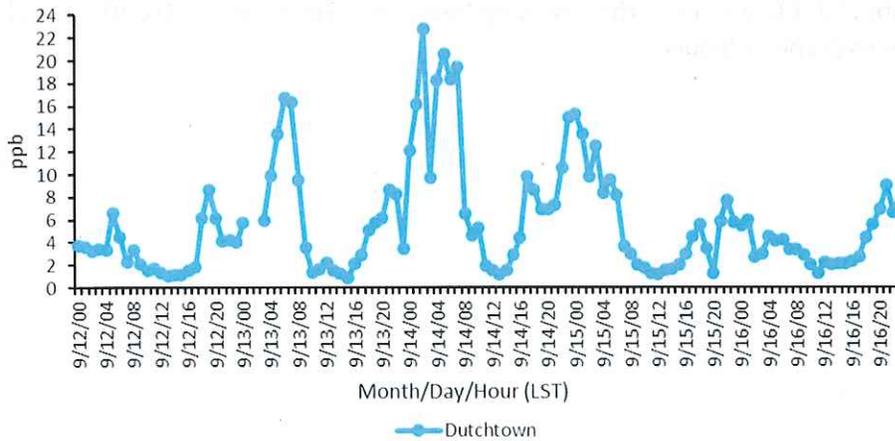
PM-2.5 Hourly Concentration Time Series  
September 12-16, 2017



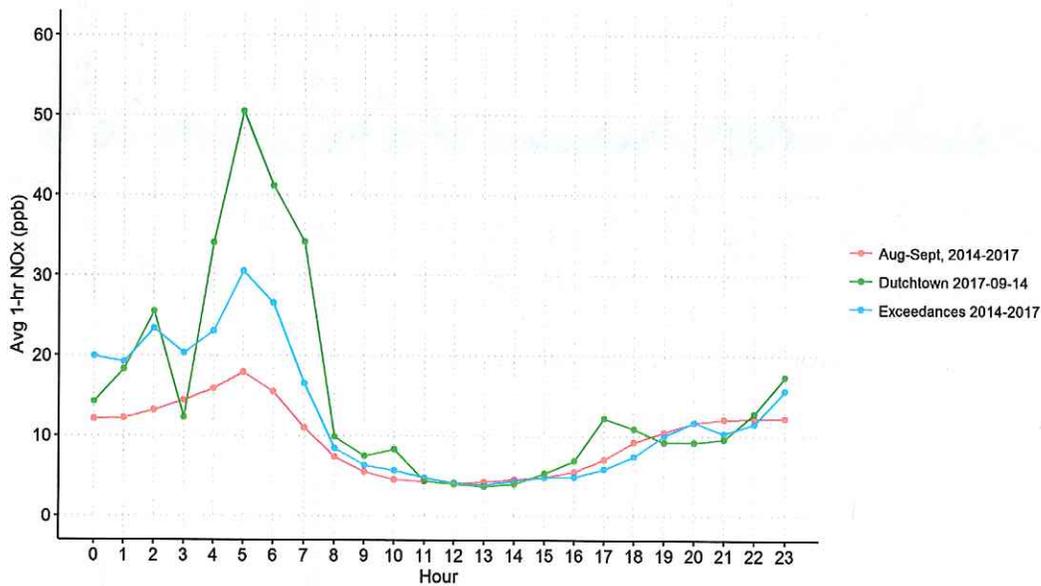
CO Hourly Concentration Time Series  
September 12-16, 2017



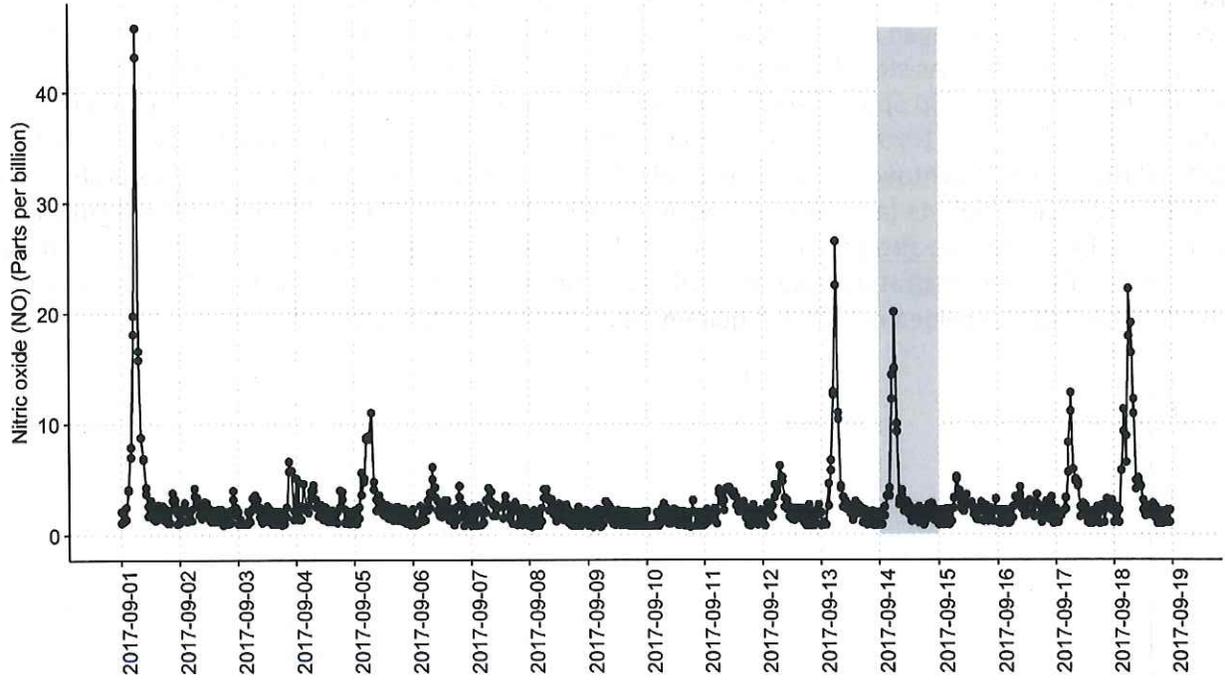
NO2 Hourly Concentration Time Series  
September 12-16, 2017



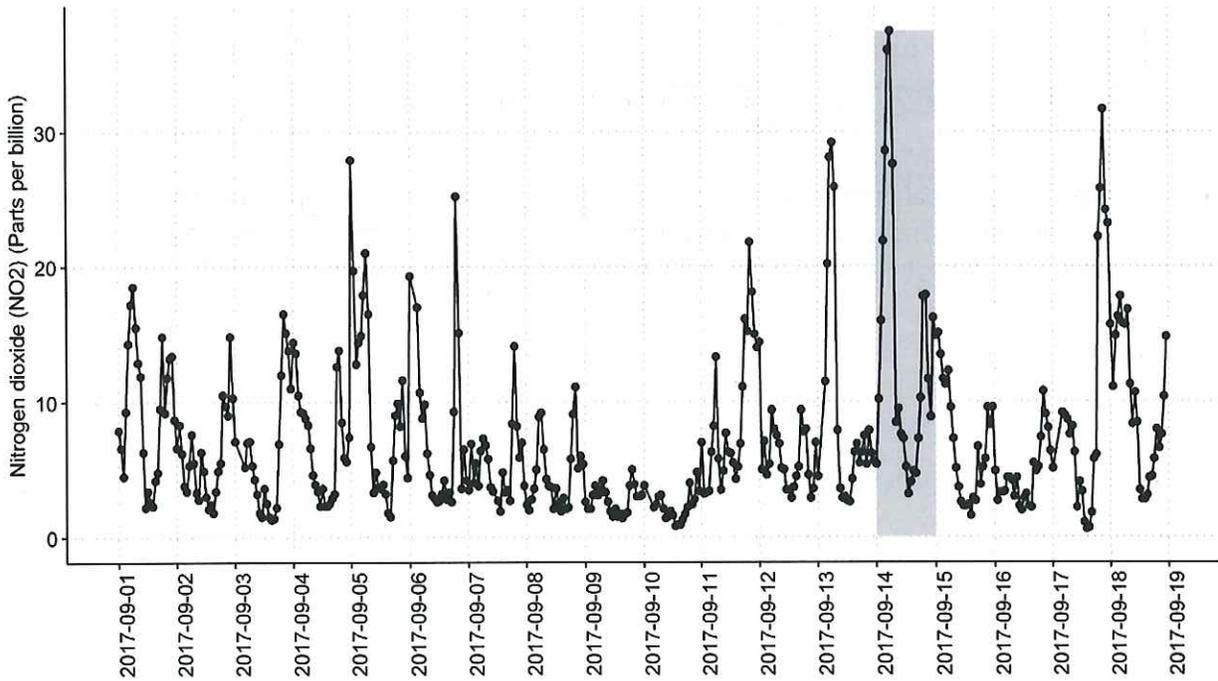
Note the enhancements of all three pollutants on September 14, 2017. Nitrogen Dioxide is generally representative of more aged emissions, and the CO hourly concentration reached a peak of 568 ppb at the nearby Capitol site. As stated in Appendix 3, page 53 of the LDEQ demonstration, "CO mixing ratios greater than 0.3 ppm (300 ppb) have been considered as indicative of smoke impacts" (Lindaas et al, *Atmos. Chem. Phys.*, 17, 10691-10707). In addition, the ambient NO<sub>x</sub> concentration, which contains both NO and NO<sub>2</sub>, at the Dutchtown site was unusually elevated as shown in Appendix 3, page 55 of the LDEQ demonstration in Figure 41 (also seen below). And the NO<sub>2</sub> concentrations, indicative of aged emissions, at the nearby Capitol site also showed a notable enhancement on September 14, 2017, as seen on page B-10 of the LDEQ demonstration (also seen below). Taken all together, the EPA agrees that the data comparisons LDEQ provided meet the requirement of 40 CFR 50.14(c)(3)(iv)(C).



**Figure 41.** Diurnal profile of 1-hr NO<sub>x</sub> measurements at Dutchtown on September 14, 2017 (green), average measurements at Dutchtown in August and September for 2014-2017 (red), and average measurements at Dutchtown on exceedance days for 2014-2017 (blue).



**Figure B-19.** Nitric oxide measurements at the Capitol monitoring site from September 1 through September 18, 2017.



**Figure B-20.** Nitrogen dioxide measurements at the Capitol monitoring site from September 1 through September 18, 2017.

**(D) Include a demonstration that the event was both not reasonably controllable and not reasonably preventable.**

The EPA requires that air agencies establish that the event be both not reasonably controllable and not reasonably preventable at the time the event occurred. This requirement applies to both natural events and events caused by human activities that are unlikely to recur at a particular location; however, it is presumed that wildfires on wildland will satisfy both factors of the “not reasonably controllable or preventable” element unless evidence in the record clearly demonstrates otherwise. The LDEQ demonstration discusses large wildfires burning in the Pacific Northwest in the first part of September 2017 which caused the 8-hour ozone exceedance at the Dutchtown ozone monitor on September 14, 2017. These large wildfires occurred predominantly on wildland in the Pacific Northwest. In section 4 of the LDEQ demonstration, 40 CFR 50.14(b)(4) is referenced regarding the Administrator’s determination that “every wildfire occurring predominantly on wildland meets the requirements identified in 50.14(c)(3)(iv)(D) regarding the not reasonably controllable or preventable criterion.” The EPA agrees that the Pacific Northwest wildfires burning in September 2017 were natural events that, by their nature, are not reasonably controllable or preventable.

**(E) Include a demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.**

According to the Clean Air Act and the EER, an exceptional event must be “an event caused by human activity that is unlikely to recur at a particular location or a natural event”. The EER includes in the definition of wildfire that “[a] wildfire that predominantly occurs on wildland is a natural event” (40 CFR 50.1(n)). The Pacific Northwest wildfires from early September 2017 were wildfires that predominantly occurred on wildland and thus the EPA agrees that they are considered a natural event. The next page has a summary table showing how the LDEQ package met all the criteria of the EER.

Technical Criteria Under the EER	Citation in LDEQ Demonstration	Criterion met?
Initial notification of potential exceptional event [40 CFR 50.14(c)(2)]	Appendix 1	Yes – November 8, 2017 letter from Chuck Carr Brown, Secretary of LDEQ, to Mr. Sam Coleman, Regional Administrator of EPA Region 6.
A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s) [40 CFR 50.14(c)(3)(iv)(A)]	Section 1	Yes – The LDEQ demonstration provides narrative in Section 1 describing how wildfire emissions from large fires in the Pacific Northwest in the first part of September 2017, led to the 8-hour ozone exceedance at the Baton Rouge Dutchtown ozone monitor on September 14, 2017.
A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation [40 CFR 50.14(c)(3)(iv)(B)]	Section 2 and Appendices 3 and 4	Yes – HYSPLIT wind trajectories, HMS satellite data, ceilometer mixing height data, and ground level air monitoring data all support by weight of evidence a clear causal relationship between wildfire smoke/emissions from the Pacific Northwest fires and the 8-hour ozone exceedance at the Dutchtown ozone monitor on September 14, 2017.
Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the clear causal relationship requirement [40 CFR 50.14(c)(3)(iv)(C)]	Sections 2.2.1, 2.3.2 and 2.4.4 and Appendices 3 and 4	Yes – Review of historical ground level ozone and precursor monitoring data supports the claim that the 8-hour ozone exceedance at the Dutchtown ozone monitor on September 14, 2017 was unusual, and that aged emissions from the Pacific Northwest wildfires contributed to the 8-hour ozone exceedance at the Dutchtown ozone monitor on September 14, 2017.
A demonstration that the event was both not reasonably controllable and not reasonably	Section 4	Yes – The claimed event (Pacific Northwest wildfires) was a complex of wildfires that occurred predominantly on wildland, and thus they are

Technical Criteria Under the EER	Citation in LDEQ Demonstration	Criterion met?
preventable [40 CFR 50.14(c)(3)(iv)(D)]		considered not reasonably controllable and not reasonably preventable.
A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event [40 CFR 50.14(c)(3)(iv)(E)]	Section 3	<b>Yes</b> – The Pacific Northwest wildfires are considered a natural event.
Documentation that the State followed the public comment process and conducted at least a 30-day comment period [40 CFR 50.14(c)(3)(v)(A)]	Executive Summary	<b>Yes</b> – LDEQ conducted a 30-day public comment process from March 1 – April 2, 2018.
Submit the public comments with the demonstration [40 CFR 50.14(c)(3)(v)(B)]	Appendix 5	<b>Yes</b> – Public comments submitted with demonstration on April 3, 2018.
Address in the demonstration those comments disputing or contradicting factual evidence provided in the demonstration [40 CFR 50.14(c)(3)(v)(C)]		<b>Not Applicable</b> – Public comments did not dispute or contradict factual evidence provided in the demonstration.

The EPA provides additional detail regarding our review of the LDEQ demonstration with respect to the provisions of the EER:

**A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s).**

- Section 1 of the LDEQ demonstration meets the requirement to provide a narrative conceptual model.

**A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation.**

- The discussion in Section 2 and Appendices 3 and 4 of the LDEQ demonstration document serves to explain the clear causal relationship between the Pacific Northwest wildfires and the 8-hour ozone exceedance at the Dutchtown ozone monitor on September 14, 2017.

**Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the clear causal relationship requirement.**

- The discussion in Section 2 and Appendices 3 and 4 of the LDEQ demonstration document serves to support the clear causal relationship between the Pacific Northwest wildfires and the 8-hour ozone exceedance at the Dutchtown ozone monitor on September 14, 2017.

**A demonstration that the event was both not reasonably controllable and not reasonably preventable.**

- The EPA agrees that the Pacific Northwest wildfires were a natural event that, by its nature, was not reasonably controllable or preventable.

**A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.**

- The Pacific Northwest fires were wildfires that predominantly occurred on wildland, thus they were considered a natural event.

#### **Schedule and Procedural Requirements of the EER**

Specific schedule and procedural requirements an air agency must follow to request data exclusion are identified in 40 CFR 50.14(c). The EPA agrees these requirements were met. The LDEQ conducted a 30-day public process from March 1-April 2, 2018. The LDEQ provided public comments in Appendix 5 of its demonstration. The comments supported and supplemented the LDEQ's submitted demonstration.

#### **Conclusion**

The LDEQ's demonstration for the September 14, 2017, Pacific Northwest wildfires sufficiently satisfies the exceptional event statutory and regulatory criteria. Principally, the demonstration package shows to the Administrator's satisfaction that a "clear causal relationship" existed between the Pacific Northwest wildfires and elevated ozone levels recorded on September 14, 2017 at the Dutchtown ozone monitor.

This concurrence does not constitute final EPA action regarding use of this data. A final action will arise only after the EPA determines the attainment status of the area, or issues another regulatory determination, as identified in 40 CFR 50.14(a)(1)(i).