

PM2.5 Exceptional Event – Independence Day Fireworks



Event Date – July 4, 2012

Ogden Monitoring Station



Utah Department of
Environmental Quality

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Definition of Event

The Code of Federal Regulations (CFR) provides the definition and criteria for determining whether air quality data is impacted by an exceptional event. The 40 CFR 50.1 (j) definition states that “exceptional event means an event that 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 the Administrator in accordance with 40 CFR 50.14 to be an exceptional event.” The demonstration to justify data exclusion, as outlined in 40 CFR 50.14, specifies that the following evidence must be provided:

1. The event meets the definition of an exceptional event;
2. There is a clear causal relationship between the measurements under consideration and the event that is claimed to have affected air quality in the area;
3. The event is associated with a measured concentration in excess of normal historical fluctuations, including background;
4. There would have been no exceedance or violation but for the event; and
5. The fireworks event was held on July 4, Independence Day, as part of a traditional or national culture event (40 CFR 50.14 (b)(2)).

Introduction

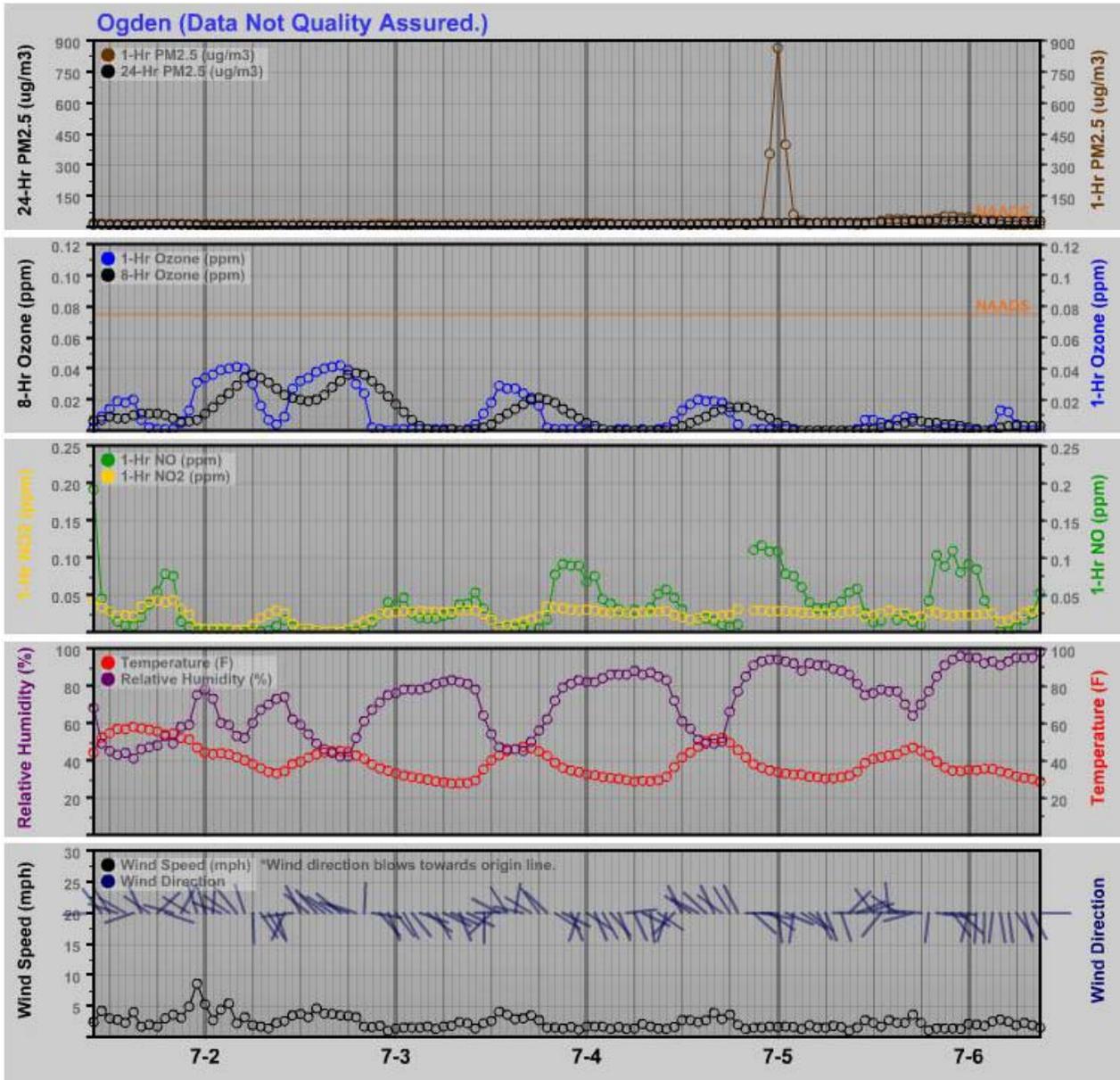
An exceedance of the 24-hr PM_{2.5} standard of 63.7 µg/m³ occurred on July 4, 2012 at the Ogden monitoring station, located in Ogden, Utah. The Division of Air Quality (DAQ) investigated the event and has determined that the exceedance is associated with fireworks events celebrating the national 4th of July holiday. DAQ and the Environmental Protection Agency have recognized a pattern of historical exceedances at this monitoring station from fireworks for the national 4th of July holidays.

Event Location

The City of Ogden is located north of Salt Lake City in Weber County. The Ogden monitoring station is located adjacent to the Ogden Community Action Center, where a large grass field is used for legal and illegal fireworks, as confirmed by Ogden Fire Department.

Affect Air Quality

The chart below is of the real time monitoring for PM2.5 and other parameters from July 2 to July 6, 2012 . A spike in PM2.5 occurred in the late evening of July 4, corresponding with the time when fireworks are set-off, lingering in the atmosphere into July 5 because of low wind speed.



Actual filter values before, during and after the 4th of July:

- July 2, 2012 – 13.7 $\mu\text{g}/\text{m}^3$
- July 4, 2012 – 63.7 $\mu\text{g}/\text{m}^3$
- July 5, 2012 – 11.6 $\mu\text{g}/\text{m}^3$

Normal Historical Fluctuation

The table below 2 presents the annual mean and maximum values for the 24-hr PM_{2.5} at the Ogden station from its inception in 2001 to 2011. The annual mean ranges from 9.1 to 14.6 µg/m³. The observed value for this event is 63.7µg/m³.

Ogden 24-hr PM_{2.5}

Year	Observations	Annual Mean (µg/m ³)	Annual Max (µg/m ³)
2001	50	12.4	66.6
2002	119	14.6	108.3 (4 th of July)
2003	118	9.9	38.3
2004	118	13.9	74.2
2005	115	10.5	42.4
2006	120	9.8	47.6
2007	121	11.7	76.8
2008	358	9.9	46.7
2009	343	10.2	56.4
2010	341	9.2	56.1
2011	347	9.1	64.6

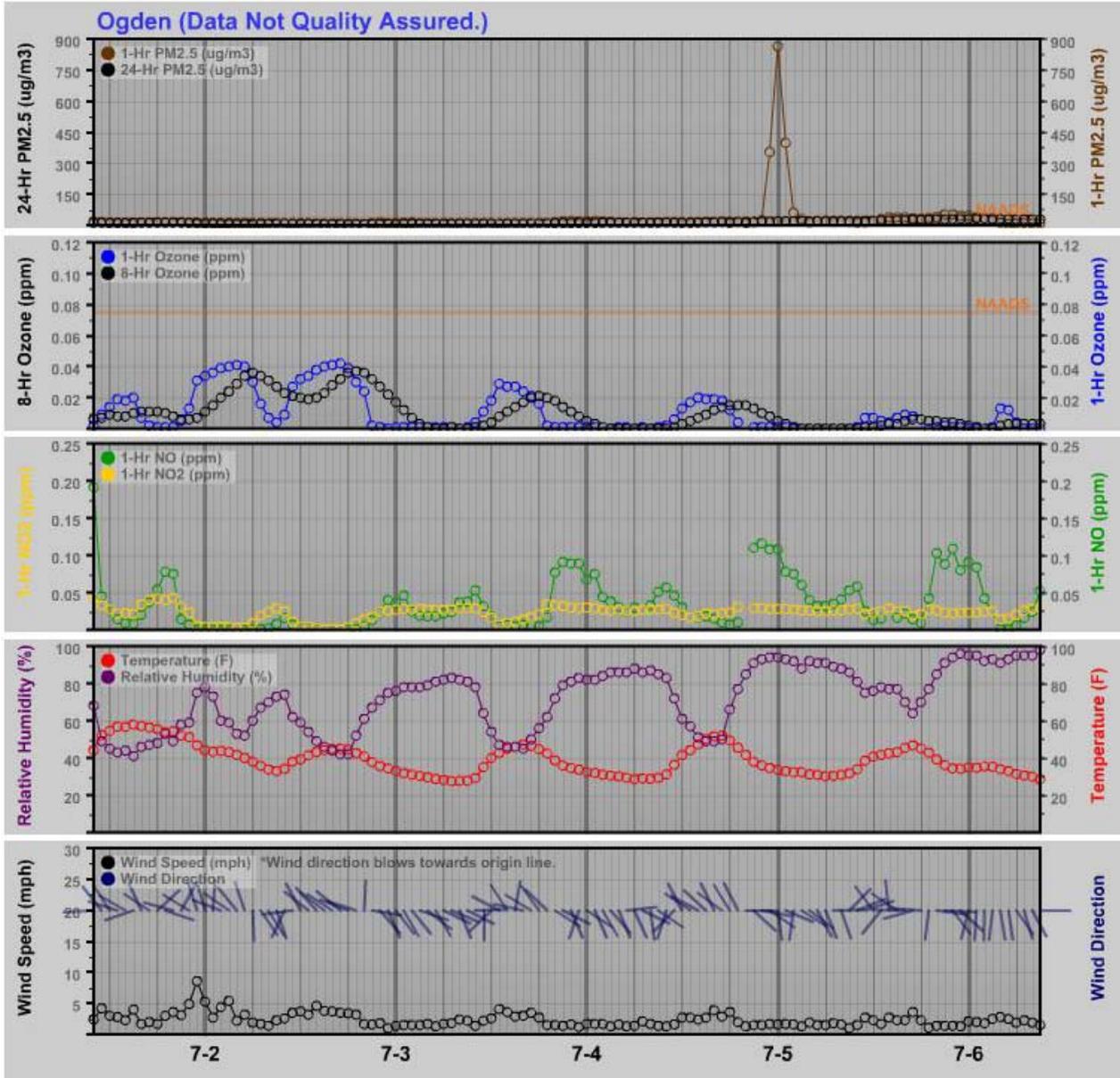
Causal Relationship

The table below shows the real time hourly PM2.5 values for July 4, 2012. The hourly values (MC = PM2.5 in $\mu\text{g}/\text{m}^3$) are normal throughout the day until 21:00 hours or 9 p.m., when fireworks begin. The PM2.5 hourly values jump from 24.9 to 353.8 at 9 p.m., peak at 10 p.m. (normally the end of fireworks exhibitions) and begin to decline at 11 p.m.

Interval	Date	MC
001h	7/4/2012 00:00:00	15.1
	7/4/2012 01:00:00	11.4
	7/4/2012 02:00:00	11.6
	7/4/2012 03:00:00	11.2
	7/4/2012 04:00:00	9.6
	7/4/2012 05:00:00	10.7
	7/4/2012 06:00:00	10.6
	7/4/2012 07:00:00	12.7
	7/4/2012 08:00:00	12.1
	7/4/2012 09:00:00	12.1
	7/4/2012 10:00:00	9
	7/4/2012 11:00:00	8.9
	7/4/2012 12:00:00	8.9
	7/4/2012 13:00:00	12.8
	7/4/2012 14:00:00	10.8
	7/4/2012 15:00:00	10.6
	7/4/2012 16:00:00	15.4
	7/4/2012 17:00:00	10.7
	7/4/2012 18:00:00	8.2
	7/4/2012 19:00:00	13.6
	7/4/2012 20:00:00	24.9
	7/4/2012 21:00:00	353.8
	7/4/2012 22:00:00	865.3
	7/4/2012 23:00:00	398.2

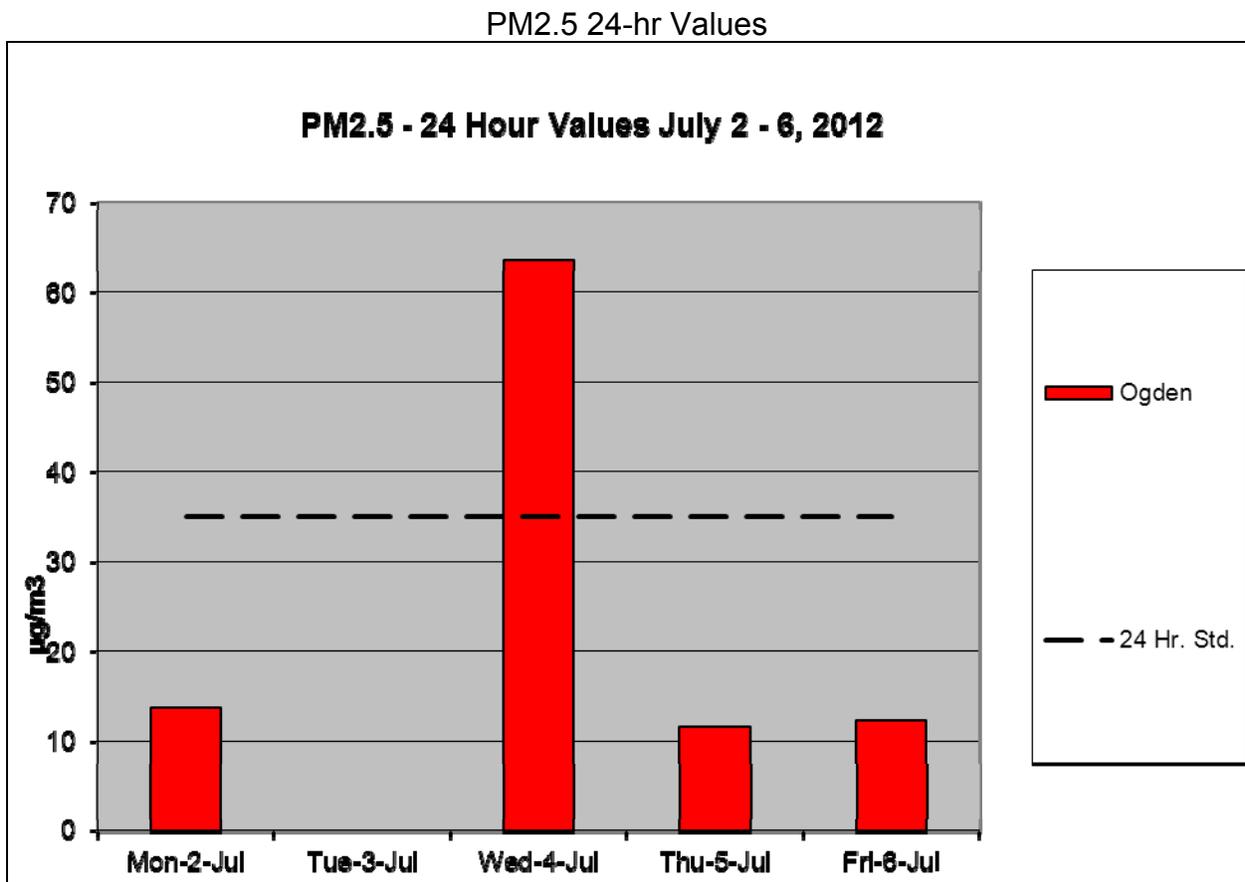
Meteorology

Meteorological data from the Ogden station shows that the late night winds were mostly southerly, with minimal wind speeds around 3 mph. Localized impact at the Ogden station would be expected with these stagnant conditions.



No Exceedance or Violation But For the Event

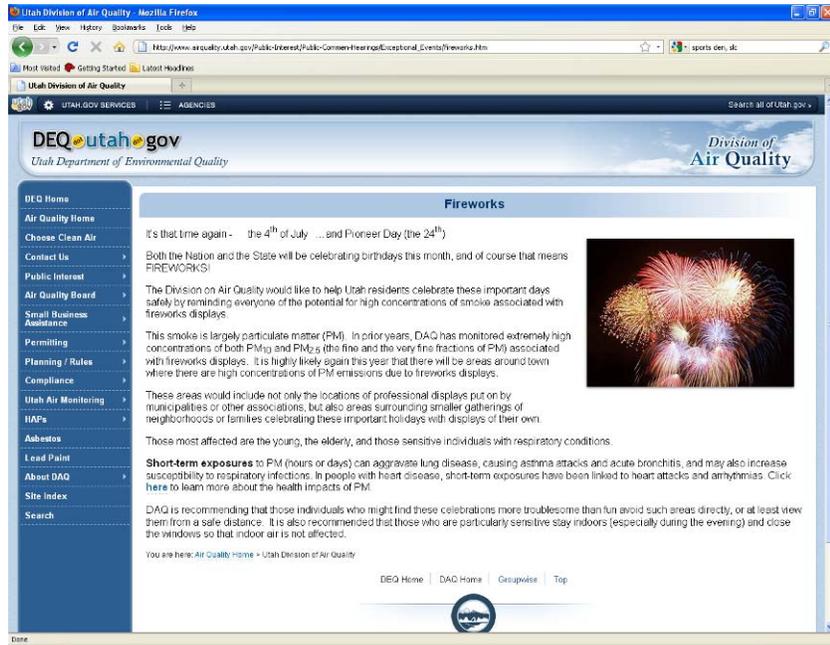
The figure below shows the PM_{2.5} 24-hr values for the Ogden station from July 2 to July 6, 2012. There is no data for July 3, 2012. The exceedance occurred during the national holiday.



Mitigation

Utah Air Quality Public Notifications

The DAQ web page provides information on fireworks events, explaining the type of air quality impact from fireworks and warning sensitive populations to stay indoors.



Public Comment

The notice of public comment availability was posted in the Utah Bulletin and on the DAQ web site. A copy of the Utah Bulletin publication follows. The public comment period was held from October 1 to October 31, 2012. No comments were received.

SPECIAL NOTICES

Environmental Quality Air Quality

Notice of Public Comment Period for the Fireworks Exceptional Events

Fireworks Exceptional Events -- Event Date: July 4, 2012

Federal regulations (40 Code of Federal Regulations (CFR) Part 50) allow states to exclude air quality data that exceed or violate a National Ambient Air Quality Standard (NAAQS) if it can demonstrate that an "exceptional event" has caused the exceedance or violation. Exceptional events are unusual or naturally occurring events that can affect air quality but are not reasonably controllable or preventable using techniques implemented to attain and maintain the NAAQS. Exceptional events are events for which the normal planning and regulatory process established by the Clean Air Act are not appropriate.

Exceptional events may be caused by human activity that is unlikely to recur at a particular location, or may be due to a natural event. EPA defines a "natural event" as an event in which human activity plays little or no direct causal role to the event in question. For example, a natural event could include such things as high winds, wild fires, and seismic/volcanic activity. In addition, the EPA will allow states to exclude data from regulatory determinations on a case-by-case basis for monitoring stations that measure values that exceed or violate the NAAQS due to emissions from fireworks displays from cultural events. These events can be flagged as being affected by exceptional or natural events and then justified.

Federal regulations (40 CFR Part 50.14 (c) (3)(i)) require that all relevant flagged data, the reasons for the data being flagged, and a demonstration that the flagged data are caused by exceptional events be made available by the State for 30 days of public review and comment. These comments will be considered in the final demonstration of the event that is submitted to EPA. The following monitored values have been attributed to exceptional events:

July 4, 2012, Ogden Monitor Station, 63.7 microg/m³ PM2.5 (Due to Firework Display Emissions)

The documentation to support removing this data from use in regulatory determinations will be available by October 1, 2012, for public review and comment. It can be viewed at the following website www.airquality.utah.gov/Public-Interest/Public-Comment-Hearings/Exceptional_Events/Exceptional_Events.htm or at the DEQ Building located at 150 North 1950 West in Salt Lake City, Utah.

In compliance with the American with Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact Brooke Baker, Office of Human Resources at (801) 538-4412 (TDD 538-4414).

The comment period will close at 5:00 p.m. on October 31, 2012. Comments postmarked on or before that date will be accepted. Comments may be submitted by electronic mail to jkarmazyn@utah.gov or may be mailed to:

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End of the Special Notices Section