EXCEPTIONAL EVENTS: When and How to Use

IASC 2017 Spring Meeting
May 3, 2017
2016 Revisions to the Exceptional Events Rule

• In Sept. 2016, EPA finalized the **2016 Revisions to the Exceptional Events Rule**

• General Exceptional Events Rule Background
  - Establishes procedures and criteria for identifying and evaluating affected air monitoring data
  - Provides a mechanism by which air quality data can be excluded from regulatory decisions
  - Applies to all EPA regulated NAAQS pollutants and applicable event types
  - Applies to state, local (delegated), and tribal air agencies that operate monitors that produce regulatory data and to federal land managers (FLMs)/agencies if agreed by the state
  - Affects design value calculations, NAAQS designations, attainment determinations, and State/Tribal/Federal Implementation Plans
An event happens and affects air quality at an “official” monitoring station.
The air agency notifies EPA that they are considering an exceptional events demonstration and we work together prior to a submittal via the initial notification process.
The agency prepares a demonstration to EPA that identifies data to be excluded.
The EPA Regional Office reviews the demonstration to determine whether it meets the required criteria for excluding data affected by an event.
If EPA concurs with the demonstration, EPA notifies the air agency by letter and attaches “concurrence flags” to the identified data in the Air Quality System database.
Concurred data would not be included in the dataset used to make regulatory determinations.
Exceptional Events – Initial Notification Process

- Communication tool to assess regulatory significance, codify early and regular communication between EPA and agencies to clarify expectations
- Streamlines resources for agencies and EPA by providing information to assess regulatory significance prior to investment of resources into preparation of demonstrations (avoids wasting resources)
- Regulatory significance: designation, classification, attainment determination, attainment date extension, finding of SIP inadequacy leading to SIP call, or case-by-case basis
- If EPA will review an event, then we initiate further communication to identify specific events for review (and provide technical assistance)
- EPA may or may not concur once the complete demonstration is reviewed
Exceptional Events Communication Best Practices

Goal: Systematic communications process among air agencies, FLMs, and the EPA Regional office before, during and after exceptional events demonstration development, submittal and review

• Fire roles and responsibilities
  ▪ Burn manager/agency can provide fire-specific information (e.g., emissions, acres burned, meteorology, modeling, communication and outreach, etc.)
  ▪ Air agency and/or FLM can assess regulatory significance of EPA approval for data exclusion
  ▪ Air agency and/or FLM can prepare the demonstration, including data gathering and analysis
  ➢ State/local agency communication and collaboration process may vary
  ▪ Air agency is responsible for initial notification to EPA (can be delegated to FLM), deciding (w/ EPA input) whether to submit a demonstration, submitting a demonstration and/or endorsing an FLM’s submission
Exceptional Events Demonstrations – What Is Needed?

- Return to the core Clean Air Act statutory elements
  - Event affected air quality in such a way that a clear causal relationship exists between the specific event and the monitored exceedance or violation
  - Event was not reasonably controllable and the event was not reasonably preventable
  - Event was a human activity that is unlikely to recur at a particular location or was a natural event

- Codify requirements for submittal content and organization including a “narrative conceptual model”
- Remove “general schedule” deadlines for data flagging and demonstration submittal
- New fire-related rule language and preamble text
Exceptional Events Rule Revisions – Fire-related Definitions

- **Wildland** - area in which human activity and development are essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.

- **Prescribed Fire** - fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to meet specific land or resource management objectives. *Prescribed fire on wildland is a human-caused event eligible for treatment as an exceptional event.*

- **Wildfire** - fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire. *A wildfire that predominantly occurs on wildland is a natural event.*
Applying the EE Rule to Wildfires and Prescribed Fires

<table>
<thead>
<tr>
<th>Rule Criterion</th>
<th>Wildfire</th>
<th>Prescribed Fire</th>
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</thead>
<tbody>
<tr>
<td>Clear causal relationship</td>
<td>Analyses described later in talk</td>
<td>Analyses described later in talk</td>
</tr>
<tr>
<td>Natural event OR Human activity unlikely to recur</td>
<td>Natural event - presumed for wildfires on wildland</td>
<td>Human activity - recurrence is either:</td>
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<td></td>
<td></td>
<td>• the natural fire return interval, OR</td>
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<td></td>
<td>• the fire frequency needed to establish, restore and/or maintain a sustainable</td>
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<td>and resilient wildland ecosystem (as documented in a land/resource management plan)</td>
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<tr>
<td>Not reasonably preventable</td>
<td>Presumed for wildfires on wildland</td>
<td>Incorporates concept of “foregone benefits” and uses same approach as unlikely</td>
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<tr>
<td></td>
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<td>to recur</td>
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<tr>
<td>Not reasonably controllable</td>
<td>Presumed for wildfires on wildland</td>
<td>Fire conducted under a certified and implemented Smoke Management Program or</td>
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<td>using basic smoke management practices</td>
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Smoke Management Program Elements

- **Recommended Smoke Management Program (SMP) elements:**
  - Authorization to Burn
  - Minimizing Air Pollutant Emissions
  - Smoke Management Components of Burn Plans
  - Public Education and Awareness
  - Surveillance and Enforcement
  - Program Evaluation

- **SMPs must be “certified”:**
  - Responsible state (or delegated local) agency “certifies” that it has adopted and is implementing a SMP in a letter to the EPA Administrator or Regional Administrator
  - SMPs in SIPs are certified
## Basic Smoke Management Practices

<table>
<thead>
<tr>
<th>Basic Smoke Management Practice</th>
<th>Benefit achieved with the BSMP</th>
<th>When the BSMP is Applied – Before/During/After the Burn</th>
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<tbody>
<tr>
<td>Evaluate Smoke Dispersion Conditions</td>
<td>Minimize smoke impacts</td>
<td>Before, During, After</td>
</tr>
<tr>
<td>Monitor Effects on Air Quality</td>
<td>Be aware of where the smoke is going and degree it impacts air quality</td>
<td>Before, During, After</td>
</tr>
<tr>
<td>Record-Keeping/Maintain a Burn/Smoke Journal</td>
<td>Retain information about the weather, burn and smoke. If air quality problems occur, documentation helps analyze and address air regulatory issues.</td>
<td>Before, During, After</td>
</tr>
<tr>
<td>Communication – Public Notification</td>
<td>Notify neighbors and those potentially impacted by smoke, especially sensitive receptors</td>
<td>Before, During</td>
</tr>
<tr>
<td>Consider Emission Reduction Techniques</td>
<td>Reducing emissions through mechanisms such as reducing fuel loading can reduce downwind impacts</td>
<td>Before, During, After</td>
</tr>
<tr>
<td>Share the Airshed – Coordination of Area Burning</td>
<td>Coordinate multiple burns in the area to manage exposure of the public to smoke</td>
<td>Before, During, After</td>
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Mitigation Plans

- Identified areas with frequently occurring events (3 events in 3-year period for 1/1/13 – 12/31/15) are required to develop a mitigation plan
  - Specific to pollutant and event type (e.g., wildfire O₃)

- Mitigation plan (elements specified) to be prepared with opportunity for public notice/comment and submitted for EPA’s review
  - EPA Administrator shall notify the State upon completion of the review

- Areas have 2 years from the effective date of the rule (Sept. 30, 2016) or notification from the Regional office to submit
  - After 2 years, EPA will not concur with demonstrations for events that are focus of the mitigation plan
Clear Causal Relationship

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.

- Weight of evidence analyses
- Supported by a comparison of the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times
- EPA guidance document for wildfire O₃ demonstrations
- Analysis for prescribed fire is similar to analysis for wildfire
Clear Causal Relationship – PM$_{2.5}$ and PM$_{10}$

- Analyses that the **event occurred**
  - Comparison to historical concentrations
  - Occurrence and geographic extent of the event (news statements, advisories, satellite imagery, etc)

- Analyses showing that the **event-related emissions/pollutant were transported** to the monitor(s) recording the elevated concentration(s)
  - Satellite imagery
  - Back/forward trajectories
  - Directional wind data

- Analyses showing that the **event-related emissions/pollutant reached ground level**
  - Speciation data at the monitor (or at regional monitors)
  - Spatial extent maps comparing event days and non-event days
Clear Causal Relationship – Wildfire O$_3$ Guidance

- Uses a tiered approach for analyses to support the clear causal relationship criterion
  - **Tier 1** clear causal analyses – key factor:
    - Wildfire influences on ozone levels are **clearly higher** than non-event-related concentrations or occur **outside of the area’s normal photochemical ozone season**
  - **Tier 2** clear causal analyses – key factors:
    - Wildfire influences on ozone levels are **higher** than non-event-related concentrations
    - **Fire emissions compared to the distance** of the fire from the affected monitor indicate a clear causal relationship
  - **Tier 3** clear causal analyses
    - Appropriate when Tier 1 or Tier 2 analyses are not conclusive

- Appropriate tier to be determined by the EPA Regional office with the affected air agency during the “Initial Notification” discussions
Tier 1

- Show that the event meets the Tier 1 key factor
- Use time series plots and evidence of transport to the monitor (e.g. trajectory analysis, satellite imagery with evidence of ground impact)
Tier 2

- Show that the event meets the Tier 2 key factors: Q/D (emissions/distance) screening criterion and threshold-based monitored concentrations
- Include evidence required for a Tier 1 analysis
- Use additional evidence to show influence at the monitor (e.g. precursor/co-emitted pollutant analysis, speciation data, pollutant ratios)
Tier 3

- Compare event to Tier 1 and Tier 2 key factors
- Include evidence required for Tier 1 and Tier 2 analyses
- Use additional evidence to show wildfire emissions caused the $O_3$ exceedance(s)
  - Should be able to specifically identify wildfire effects on $O_3$ concentrations, and clearly distinguish from human/meteorological effects or other sources
  - Can be similar to Tier 2 evidence if able to show effects directly on $O_3$, or could include analyses like photochemical/statistical modeling, matching day analysis
Next Steps

- Additional Implementation Documents:
  - Revisions to 2013 *Interim Exceptional Events Guidance*
  - Alternate Paths for Data Exclusion
  - Prescribed Fire/Ozone
  - Other event guidance

- Continued development of exceptional events tools:
  - Templates
  - Website updates
  - AQS modifications to reflect rule revisions (input from AQS workgroup)
  - Standardized metrics and tracking
  - Targeted efforts with FLMs – communications and tools
  - Best practices for multi-agency exceptional events demonstrations
Available Resources

• Exceptional Events Website:
  http://www2.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events

• Includes links to:
  ▪ Final Rule
  ▪ Final Wildfire/Ozone Exceptional Events Implementation Guidance
  ▪ Fact Sheets
  ▪ 2013 Interim Guidance Documents
  ▪ Quick Reference Guide for Exceptional Events Demonstrations
  ▪ Examples of Reviewed Exceptional Event Submissions
  ▪ Best Communication Practices Documents
  ▪ Publicly-available Support Information and Tools
Questions and Comments

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