

Oregon Wildfire Response Protocol for Severe Smoke Episodes

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The following agencies collaborated on this guidance document:

Oregon Department of Environmental Quality
Lane Regional Air Pollution Authority
Oregon Health Authority
Oregon Occupational Safety and Health Administration
Oregon Emergency Management
Oregon Department of Forestry
U.S. Forest Service



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Based on an agreement between the participating agencies, the original version of this multi-agency document is maintained by DEQ. All parties may collaborate on updates.

Revision History	Date	Revision Summary
Version 1.0	May 28, 2013	Protocol developed
Version 1.1	Aug. 27, 2013	Agencies added, contact list updated
Version 2.0	June 3, 2014	Revised Table 4 recommended health actions, changed Visibility Index to the 5-3-1 Visibility Index, added Wildfire Communications Plan section, added Indoor Air Monitoring section, added 211info Service information, updated contact list, added out-of-state contact list
Version 3.0	June 16, 2015	Updated contact list, added conference call info, checked and updated all website links, other minor changes
Version 4.0	June 16, 2016	Updated contact list, 5-3-1 guidance, public health actions (based on most recent information), website links, and other minor edits.
Version 4.1	July 5, 2016	Updated Appendix A.1 Oregon Contact List
Version 4.2	July 7, 2016	Corrected EPA, OEM & NOAA contacts in A.1 Oregon Contact List
Version 4.3	July 13, 2016	Added information about OEM's Raptor to section 11. Corrected improper formatting on cover page.
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Version 5	April 20, 2017	Update DEQ contacts in Appendix A.1 Oregon Contact List.
Version 5.1	April 24, 2017	Update to cover page – added photos. Update to “Alternate formats” language.
Version 5.2	June 29, 2017	Correction of typos, updated contacts list, added Appendices C and D showing the location of smoke monitors during the fire season, and the email list of contacts used to notify participants of upcoming activities or smoke calls.

Alternative formats

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.

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1. Purpose

This protocol is intended to provide guidance for the state and federal agencies in Oregon who respond to severe smoke episodes caused by large or long-duration wildfires, to ensure a coordinated response in order to mitigate impacts on public health. This protocol also identifies other organizations, partners, and other governmental entities (county, city, and tribal) that state and federal responders need to coordinate with during these episodes. For all parties, it highlights general duties and responsibilities, provides examples of agency actions and assistance needed, desired outcomes, and recommended public health actions based on the level and duration of smoke exposure. This protocol is focused specifically on air quality impacts. This protocol is intended to guide the use of resources in response to air quality due to major wildfires. It does not replace, interfere with, or limit any action taken by a public agency in the course of performing its official duties.

2. Participating Agencies and Organizations

This protocol is used by, but is not limited to the following agencies, organizations and offices:

Table 1

AGENCY OR ORGANIZATION	
Federal	
1. Federal Land Managers : Includes U.S. Forest Service and Bureau of Land Management	USFS Region 6 office in Portland BLM, Oregon State Office in Portland
2. Federal Emergency Management Agency	Region 10 office Bothell, Wash.
3. Environmental Protection Agency	Region 10 office in Seattle
4. National Weather Service	Medford, Portland and Pendleton offices
National	
5. Air Resource Advisor	TBD (to be assigned to major Oregon wildfires)
6. Red Cross	Five regional offices in Oregon
State	
7. Oregon Department of Environmental Quality	DEQ Headquarters in Portland and DEQ regional offices
8. Oregon Health Authority	Public Health Division in Portland
9. Oregon Emergency Management	Offices in Salem
10. Oregon Occupational Safety and Health Administration	OR-OSHA Headquarters in Salem, field offices around the state.
11. Oregon Department of Forestry	Offices in Salem
12. State Fire Marshal	Offices in Salem
13. Oregon Governor Office	Located in Salem
14. Governor’s Office Regional Solutions Centers	Located in different regions of the state
15. 211info	Located in counties
Local	
16. County Health Department	See Appendix A for locations and contact information.

17. Lane Regional Air Protection Agency	Located in Springfield, Lane County
18. School Districts	In county affected by wildfire smoke
Tribal	
19. Tribal Government	Any tribal lands affected by wildfire smoke. See Appendix A for contact information.

3. Agency areas of expertise and involvement

Table 2 identifies the general areas of expertise of each agency or organization, as an indication of the assistance that would be provided and the level of involvement anticipated. While the level of involvement is relative to the severity of the wildfire smoke and the effect on air quality, some agencies would be expected to play more of a lead role, requiring more frequent daily communication and coordination, while other agencies would have a lesser role and would be involved on an as-needed basis.

Table 2

CONTACT AGENCY	General area of expertise/assistance	Anticipated level of involvement
Federal		
1. Federal Land Managers (U.S. Forest Service and BLM)	Wildfire suppression/containment, ensure incident management team is on the ground; provide wildfire status updates, and public outreach/coordination.	Extensive – depends on size of fire, often the lead agency
2. FEMA	Federal response agency for natural disasters	Low -- Unless smoke levels and fire danger pose an extreme threat.
3. EPA Region 10	Coordination with tribes, related to air quality on tribal lands/reservations	Depends on the extent wildfire smoke is affecting tribal lands/reservations.
4. National Weather Service	Coordinates with federal, state and tribal governments in the Pacific Northwest Area (Oregon, Washington, Idaho) as it relates to weather	Disseminates air quality alerts on its public websites
National		
5. Air Resource Advisor–reports to Incident Command and/or Agency Administrator	Technical specialist who works with Incident Command Team during major wildfires and has expertise in air quality monitoring and modeling, and addressing public health, transportation safety, firefighter safety	Extensive – Newly created position to provide assistance to incidents, and facilitate state response to air quality smoke impacts from major wildfires
6. Red Cross	Provides aid and assistance for natural disasters, mass care support for sheltering, feeding and distributing relief supplies	Depends on severity of smoke impact and risk to public health

7. 211info	Provides a statewide “go-to public phone number” for health information about wildfire smoke impacts	Depends on severity of smoke impact and risk to public health
State		
8. DEQ (For wildfire smoke affecting Lane Co, contact LRAPA . See #17 above and Appendix A #13)	Monitors air quality in the state*, determining if health standards are being exceeded, identifying areas at greatest risk, public/media outreach and coordination with Federal Land Managers, OHA, county health departments, others as needed (*except Lane Co. see LRAPA)	Extensive during periods of elevated smoke levels
9. OHA	Advises state, federal, tribal, and local authorities on health risk from smoke and potential public health interventions to mitigate it. Assisting DEQ, Oregon OSHA, and local health departments in communication and outreach. Assess health impacts as indicated by the situation.	Depends on severity and extent to which local health officials need assistance, or where no local health authority is in place
10. Oregon Military Department, OEM	Coordinates and facilitates emergency planning, with state emergency support function, and local emergency services agencies and organizations	Depends on severity and specific requests by local emergency management agencies for state assets. High involvement if Governor declares state of emergency.
11. Oregon OSHA	Address health and safety, of workers and state/private firefighters, through enforcement and/or consultation. Can assist in evaluating air quality concerns.	Depends on severity and specific requests for worker protection
12. ODF	Upon request, provide wildfire smoke forecasts where needed. (If fire on state forest lands, ODF is lead response agency, similar to No. 1 above.)	Primarily providing daily smoke forecasts
13. State Fire Marshal	Lead agency for response to structural protection for Conflagrations in Wildland Urban Interface Fires. Coordinates the same as ODF to provide the Incident Management Team (IMT) updates as needed to required agencies.	Primary response to fire danger and suppression, less on smoke risk
14. Oregon Governors’ Office	Coordinate with multiple agencies, especially if Governor declares a state of emergency	Update on as-needed basis, unless state of emergency is declared

15. Governor's Office, Regional Solution Centers	Coordinate with multiple agencies, especially if Governor declares a state of emergency	Update on as-needed basis, unless state of emergency is declared
Local		
16. County Health Departments	Notify public and media of health risk from smoke. Coordinate with DEQ, OHA, FLMs and OR-OSHA.	Extensive during periods of unhealthy to hazardous smoke levels.
17. School Districts	With assistance, determine if student health is at risk, the need to cancel school events or announce school closures	On as-needed basis during periods of unhealthy to hazardous smoke levels
18. City and local government	With assistance, determine health risk to community, public safety, need to cancel outdoor events, notify local businesses, alert fire and police	On as-needed basis during periods of unhealthy to hazardous smoke levels
Tribal		
19. Tribal Government	Coordinate with above agencies. Similar role to No. 7 and No. 17 above.	Can be high if wildfire impact is severe.

4. Agency actions and desired outcome

Table 3 describes the different actions and assistance needed during major wildfires, the agency or organization expected to take such action and the desired outcome.

Table 3

ACTION NEEDED	Lead agency and action taken	Desired Outcome
1. Air Monitoring		
Measuring ambient air quality	Mostly DEQ as lead agency. Air Resource Advisors may provide additional monitoring equipment via national cache resources and assist in deployment and data collection.	Ability to track ambient air quality levels in communities receiving the heaviest impact, and identify smoke-free areas where air quality is good
Indoor air quality exposure	Oregon OSHA is lead agency to evaluate air quality concerns for workers. DEQ and OHA can provide advice to schools.	Ability to monitor indoor smoke levels in work environments and schools
2. Smoke Forecasting and Modeling		

Smoke weather forecast	Oregon Department of Forestry is lead agency. DEQ assists in coordination. National Weather Service can be contacted to provide “spot weather forecasts” for wildfire.	Provide advance notice of possible smoke movement and impacts, improve public notification, lower risk of public exposure to high smoke levels
Smoke modeling	Air Resource Advisor can provide smoke modeling forecasts if requested.	Complementary to above
3. Issuing Health Warnings		
Provide public with frequent smoke updates on potential health risk and recommended public health actions via the web and media	Coordination between the Incident Management Team, DEQ, ARA, OHA, county health departments, local government, tribes and 211info. Assistance from federal land managers on fire status, and from ODF wildfire forecasting.	Frequent coordinated updates provided to the public via Oregon Smoke Blog, DEQ, OHA, local government websites, press releases and media outreach. 211info is provided with up-to-date health-related information.
4. Website management		
Updating the Oregon Smoke Blog and social media (see description under No. 6)	Blog initiated by federal land managers or DEQ, and updated by DEQ Public Affairs who will act as a “gate keeper” to avoid duplicative messaging and crowding of the smoke blog.	Provide the public with comprehensive “one-stop” website/social media on wildfire status, air quality levels, health risk, shelters, press releases and other critical info.
Updating DEQ, OHA, ODF and local websites	Managed by respective agency. Supplements the Oregon Smoke Blog website.	Complements the above website.
5. Public Actions		
Cancel or modify public events, outdoor and business activities Consult with schools on limited hours or closure	Decision made at the local level, by government, tribal, or school authorities, in consultation with DEQ, ARA, OHA, federal land managers, and possibly Oregon OSHA	Prompt action taken, via notification of media, 211info, and posting info on Oregon Smoke Blog and other websites
Set up public shelters, assist schools or other public buildings in protecting from smoke	Red Cross can provide support in sheltering operations, based on decisions by local health officials. Decisions about protecting schools and public buildings made at the local level, in consultation with DEQ, ARA, OHA, and possibly Oregon OSHA.	When determined necessary, prompt action taken to set up clean air shelters, or identify measures for protecting schools and public buildings from smoke

Recommended evacuation/relocation of sensitive populations	Decision made at local level, by health officials and tribal/local government (Sheriff or local emergency management), OEM, in consultation with DEQ, ARA, OHA, federal land managers and possibly Oregon OSHA.	Prompt action taken if dangerous smoke levels are expected to persist for a prolonged period. Requires close communication with DEQ, OHA, federal land managers, OEM, Oregon-OSHA, 211info, and possibly Red Cross, State Fire Marshal and State Police.
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5. Recommended Public Health Actions, based on level and anticipated duration of smoke exposure

Wildfire smoke is a mixture of gases and fine particles that can irritate eyes and respiratory systems, and worsen chronic heart and respiratory diseases. The quantity and duration of smoke exposure, as well as a person’s age and degree of susceptibility, play a role in determining whether or not someone will experience smoke-related health problems. Persons with pre-existing health conditions such as asthma or other chronic respiratory conditions and cardiovascular disease, people older than 65 years of age, infants and children, pregnant women, and smokers are particularly sensitive to smoke.

Particulate matter in smoke poses the greatest risk to public health. The potential health effects vary depending on the size of the particles. Particles larger than 10 micrometers usually irritate only the eyes, nose and throat. Particles smaller than 2.5 micrometers (PM_{2.5}) can be inhaled deeply into the lungs, increasing the risk of cardiovascular and respiratory problems. When smoke levels are high, even healthy people may experience symptoms.

Table 4 is designed for use by affected jurisdictions in consultation with DEQ, OHA and other agencies that are parties to this protocol. The table identifies recommended public health actions to be taken, based on the intensity and expected duration of smoke exposure. The Air Quality Index category and PM_{2.5} levels are derived from the federal PM_{2.5} health standard of 35 µg/m³ (micrograms per cubic meter) for a 24-hour average (the Air Quality category “unhealthy for sensitive groups”). Decisions about which public health actions to recommend would be based on monitoring data and the projected smoke duration. The duration of smoke exposure noted in the table uses 24 hours as the basis for two sets of recommended health actions. This is because there is some evidence that sheltering-in-place (staying indoors with windows and doors closed) offers some protection in the first 24 hours, but there is minimal evidence for benefit beyond that.

Recommendations in Table 4 are cumulative. For each level and duration of exposure, unless the listed actions supersede previous ones, the recommendations above and to the left still apply.

In the absence of any PM_{2.5} monitoring data, a visual evaluation can be made by using the visibility index (based on the viewing distance) in the column next to the Air Quality Index category. This index is referred to as the “5-3-1 Visibility Index” for estimating smoke levels, as described on page 9 and Table 5 of the protocol. Both the Air Quality Index category and 5-3-1 Visibility Index are intended to be used together to identify the public health risk and mitigation actions.

Whether or not the listed actions in Table 4 should actually be taken at various PM_{2.5} levels depends on

additional factors in the bulleted list below the table. As air quality worsens, safeguards that are suggested when better air quality categories are in place should also be implemented. For example, if the air quality is considered “unhealthy,” then actions should be followed for “unhealthy for sensitive groups,” “moderate” and “good” air quality days.

Table 4

		Recommended Public Health Actions	
Air Quality Index Category (24-hr average PM _{2.5} in µg/m ³)	5-3-1 Visibility Index ¹	Projected Smoke Exposure under 24 hours	Projected Smoke Exposure over 24 Hours
Good (0-12 µg/m ³)	Over 5 Miles	<ul style="list-style-type: none"> • If smoke event is forecast in your area, review this Protocol, Crisis and Emergency Risk Communication Toolkit for Wildfires², Frequently Asked Questions about Wildfire Smoke and Public Health document, and more health tips on the Oregon Public Health Division webpage.³ • The Oregon Smoke Blog has information about the latest air quality and other wildfire information: http://oregonsmoke.blogspot.com 	
Moderate (13-35 µg/m ³)	Over 5 Miles	<ul style="list-style-type: none"> • Distribute information (i.e., FAQs³) to public health partners and the public • Identify and provide information to vulnerable populations • Refer people to Oregon Smoke Blog for more information • Recommend sensitive groups use an air cleaner at home during wildfires³ 	<i>Follow recommended actions to the left and above, plus:</i> <ul style="list-style-type: none"> • Respond to media inquiries. (Use the Crisis and Emergency Risk Communication toolkit² for guidance)
Unhealthy for Sensitive Groups (36-55 µg/m ³)	3-5 Miles	<i>Above, plus:</i> <ul style="list-style-type: none"> • Issue a press release, outlining sensitive groups and encouraging them to reduce exposure. (Use the Crisis and Emergency Risk Communication toolkit² and FAQs³ document for guidance.) • If school is in session, refer to <i>Public Health Guidance for School Outdoor Activities during Wildfire Events</i>⁴ 	<i>Follow recommended actions to the left and above, plus:</i> <ul style="list-style-type: none"> • In the release, include consideration of sensitive groups leaving area until air quality improves or if that is not feasible, using air cleaner at home or spending time in a clean-air setting in the community (e.g., air-conditioned library) • Consider opening a clean-air shelter for sensitive groups

<p style="text-align: center;">Unhealthy (56-150 $\mu\text{g}/\text{m}^3$)</p>	<p style="text-align: center;">1-3 Miles</p>	<p><i>Above, plus:</i></p> <ul style="list-style-type: none"> • Consider cancelling public events held outdoors • Recommend public limit strenuous outdoor activities • Recommend that sensitive groups consider leaving area until air quality improves. If they can't, recommend spending time in a clean-air setting in the community (i.e., air conditioned library) or sheltering in place at home 	<p><i>Follow recommended actions to the left and above, plus:</i></p> <ul style="list-style-type: none"> • Open and publicize clean-air shelters for sensitive groups • Review health benefits for sensitive groups of leaving area until air quality improves, and that intermittent time in clean-air shelters or sheltering in-place might not be as protective
<p style="text-align: center;">Very Unhealthy (151-250 $\mu\text{g}/\text{m}^3$)</p>	<p style="text-align: center;">1 Mile</p>	<p><i>Above, plus:</i></p> <ul style="list-style-type: none"> • Cancel outdoor events • If school is in session, measure indoor air quality if possible, discuss school closure with school administrators • Recommend shelter-in-place for general population • Share information about periods of improved air quality to guide essential outdoor activity and ventilation of dwellings (refer to FAQs³ for more information) 	<p><i>Follow recommended actions to the left and above, plus:</i></p> <ul style="list-style-type: none"> • Open and publicize clean-air shelters for sensitive groups
<p style="text-align: center;">Hazardous ($>251 \mu\text{g}/\text{m}^3$)</p>	<p style="text-align: center;"><1 Mile</p>	<p><i>Above, plus:</i></p> <ul style="list-style-type: none"> • Recommend voluntary evacuation for sensitive groups 	<p><i>Follow recommended actions to the left and above, plus:</i></p> <ul style="list-style-type: none"> • Open and publicize clean-air shelters for the general public

¹For use of the **5-3-1 Visibility Index**, see below. The visibility test is not appropriate or effective in areas with high humidity, such as in Western Oregon near or on the coast, where water vapor (fog) may limit visibility.

² Crisis and Emergency Risk Communication (CERC) Toolkit for Wildfires:
<http://public.health.oregon.gov/Preparedness/Partners/Pages/riskcommunicationtools.aspx>

³ FAQs in English and Spanish, Public Health Guidance for School Outdoor Activities during Wildfire Events, and Guidance on air cleaners for sensitive groups
<https://public.health.oregon.gov/Preparedness/Prepare/Pages/PrepareForWildfire.aspx>

⁴ Oregon Health Authority - [Public Health Guidance for School Outdoor Activities During Wildfire Events](#)

Considerations that may influence implementation of the above mitigating actions:

- Clear/predictable fluctuations in air quality throughout the day can allow for modifications in the recommendations from the above table. For example, schools could delay recess instead of canceling it if there is a pattern of clearing in the afternoon. Also, if clean air shelters are provided, they should be open and available at the times of day that smoke is heaviest (i.e., may be at night).
- If smoke is predicted to be heavy for short durations (i.e., a few hours) the public health

messaging should be to encourage people to avoid spending time outdoors.

- Indoor air quality may be poor in older dwellings. These may include schools, community centers with care centers, nursing homes, or group homes. When air quality is “unhealthy” for an extended smoke duration, it may be worthwhile to assess indoor air quality for these and other types of facilities where people who are sensitive to smoke live or stay.

Using the Visibility 5-3-1 Index

Since wildfires often occur in remote areas, air monitoring equipment may not be available. Smoke levels can rise and fall rapidly, depending on weather conditions including wind direction. Making visual observations using the 5-3-1 visibility index is a simple way to estimate smoke levels and what precautions to take, as noted in Table 4. While this method can be useful, you should always use caution and avoid going outside if visibility is limited, especially if you are sensitive to smoke.

The procedure for using this visibility index is as follows:

1. Determine the limit of your visual range by looking for distant targets or familiar landmarks such as mountains, mesas, hills, or buildings at known distances. The visual range is that point at which these targets are no longer visible. As a general rule of thumb: if you can clearly see the outlines of individual trees on the horizon it is generally less than five miles away.
2. Ideally, the viewing of any distant targets should be made with the sun behind you. Looking into the sun or at an angle increases the ability of sunlight to reflect off of the smoke, and thus making the visibility estimate less reliable.

Once distance has been determined, follow this simple guide:

1. If visibility is well over five miles away, the air quality can be considered generally good.
2. Even if visibility is five miles away but generally hazy, air quality could be considered moderate and beginning to deteriorate, and is generally healthy, except possibly for smoke-sensitive persons. The general public should avoid prolonged exposure if conditions are smoky to the point where visibility is closer to the five-mile range. See Table 4.
3. If under five miles, the air quality is unhealthy for young children, adults over age 65, pregnant women, and people with heart and/or lung disease, asthma or other respiratory illness. These people should minimize outdoor activity. See Table 4.
4. If under three miles, air quality is unhealthy for everyone. Young children, adults over age 65, pregnant women, and people with heart and/or lung disease, asthma or other respiratory illness should avoid all outdoor activities. See Table 4.
5. If under one mile, the air quality is hazardous. Everyone should avoid all outdoor activities. See Table 4.

Table 5

Using the 5-3-1 Visibility Index			
Distance you can see*	And you are:		Or you have:
		<ul style="list-style-type: none"> • An Adult • A Teenager • An older child 	<ul style="list-style-type: none"> • Age 65 & over • Pregnant • A young child
5 miles	Check visibility	Minimize outdoor activity	
3 miles	Minimize outdoor activity	Stay Inside	
1 mile	Stay Inside	Stay Inside	
<i>No matter how far you can see, if you feel like you are having health effects from smoke exposure, take extra care to stay inside or get to an area with better air quality. You should also see your doctor or other health professional as needed.</i>			
<i>* less reliable when humidity is high</i>			

6. Oregon Smoke Blog website

The Oregon Smoke Blog provides the public current air quality and health information on smoke impacts from wildfires. This blog provides timely “one-stop shopping” by including links to various agency websites, and providing critical information on wildfire status, air quality conditions and forecasts, school and activity closures, burn bans, location of clean air shelters and travel restrictions due to visibility. This blog would be activated by the U.S. Forest Service or DEQ, and managed by a team of state, federal, tribal and local agencies. The link to this blog is www.oregonsmoke.blogspot.com/. The 2016 points of contact for the Oregon smoke blog are DEQ’s Katherine Benenati or Greg Svelund (see appendix A for contact information).

7. Annual Pre-Wildfire Season conference call

Each year prior to the summer wildfire season, in May or June, representatives from the agencies, organizations, or offices listed in this protocol will hold a conference call to prepare for the upcoming season. The purpose of this call is to review this protocol, discuss any changes or specific preparation needs for the summer, and update the contact list of staff expected to be using this protocol if major wildfires occur. This contact list is provided in Appendix A.

8. As-Needed Wildfire conference calls and briefings

A daily conference call will be held during major wildfires to brief the parties identified in this protocol. These daily conference calls and briefings can be requested by any party, and will usually take place in the morning. They will include updates on the status of major on-going wildfires, and provide an opportunity to discuss current conditions related to air quality, local health impacts, smoke forecasts, recommended public actions, communications, emergency actions such as evacuation, and other issues important to the group. These briefings will include a wildfire status update from public information officers (if available) associated with Incident Command and any Air Resource Advisor assigned to the wildfire.

The lead agencies hosting these calls will alternate between the U.S. Forest Service, DEQ, and the OHA. For major wildfires in neighboring states (Washington, Idaho, Nevada or California) that are affecting Oregon, the daily briefing will include the appropriate contacts in those states that have essential information. In situations where a smaller group conference call is needed, such as between state and local health officials to discuss specific local public health issues, or with DEQ to discuss air quality levels in areas being heavily affected by wildfire smoke, the calls will be convened as needed. Requests for such calls should be made to either DEQ or the OHA, depending on the primary topic of concern.

Unless otherwise announced, conference calls will be held on an as-needed basis from 8:30-9:30 a.m. each day. Below is an agenda outline for the calls. The order of the agenda may be changed to accommodate those who have time constraints. An email announcing the call will be sent by the call host to the participants the day before the call. Any participant who wishes to suggest additional discussion topics for the agenda should inform the host in advance.

Oregon Wildfire Conference Call, Briefings Agenda Example

8:30 - 9:30 a.m.

AGENDA	
Topic	Anticipated discussion leader
Group Introductions	Host
The current fire situation (location, size, etc.) and maps showing fire locations and detail as available	Incident Command PIO, ARA, USFS staff
Fire and smoke forecast	ODF
The current air quality situation using the state monitoring network and portable monitors	DEQ ARA
Is an air quality alert warranted? Potential safety issues? Is additional community support needed? Who? What? Where? When? How?	OHA, Oregon OSHA County health officials others
Messaging and information sharing for DEQ posts to the Oregon Smoke Blog and social media (all posts to be made through Katherine Benenati and/or Greg Svelund unless otherwise directed).	Host
Special Issues – Open discussion	any participant
Need for additional calls with a smaller group?	Host
Adjourn	

Wildfire Calls for Neighboring States

Washington: Subject to change or availability: 888-844-9904, 2103767#

California: 1 PM Call (when they occur): 888-844-9904, 9857932#

9. Oregon Wildfire Communications Group

The Oregon Wildfire Communications Group is a multiagency communications group consisting of the public affairs staffs from the agencies participating in this protocol, which coordinate the dissemination of wildfire smoke information to the public and media. The group oversees the Oregon Smoke Blog, works with the 211info service, responds to requests for air quality data and health effects information, coordinates multiagency press releases and public service messaging, and schedules briefings and meetings to ensure participants are up to date on wildfire status and air quality conditions in areas being affected by wildfire smoke. For further information on this communications group, contact Cory Grogan at OEM or Katherine Benenati at DEQ (see appendix A).

10. Indoor Air Monitoring Equipment

Wildfire smoke can also affect indoor air quality. Research has shown that when there are heavy outdoor smoke levels, a significant amount of smoke can still infiltrate indoors, even when windows and doors are closed. Many commercial buildings and schools mechanically draw in the outdoor air through air filtration systems. However, standard heating and cooling air filters will not remove most of the ultra-fine smoke particles. More information about the use of air filters, cleaners and other ways to reduce indoor smoke levels can be found in the document cited below *Wildfire Smoke: A Guide for Public Officials (2016)*.

There are different types of indoor air monitors that can be used to indicate the potential health risk when indoors. This monitoring equipment is generally focused on PM_{2.5}, but may also detect carbon monoxide and other toxic gases. Other features include measuring temperature and relative humidity. Indoor monitoring equipment is typically less expensive than outdoor equipment, is relatively low maintenance, and can provide the same real-time measurements in micrograms per cubic meter), via handheld or portable monitors. These monitors can be purchased, or in some cases rented, during wildfires. Contact DEQ for more information on the different types, availability and cost of this equipment. As noted in Table 3 of the protocol, DEQ is responsible for monitoring air quality outdoors, and does not have equipment for indoor air monitoring. For questions about employee health and possible indoor air monitoring in the workplace, contact Oregon OSHA.

11. Other references, resources, and links

Wildfire Smoke: A Guide for Public Officials. The smoke exposure levels listed in Table 4 are adapted from the 2016 guidance document [Wildfire Smoke: A Guide for Public Health Officials \(2016\)](#). This document is currently used in many states as a reference guide for how public agencies can best protect public health during wildfires. In addition to providing background information on the composition of smoke, potential health effects, and recommended actions, it contains specific strategies on how to reduce smoke exposure, such as indoor air filters and cleaners, use of masks and respirators, setting up clean air shelters, and examples of public service announcements for wildfire. This document is referenced here as general guidance to provide additional information, and like this protocol, is not intended to replace, interfere with, or limit any action taken by a public agency in the course of performing its official duties, nor does it represent a legally binding document.

Wildfire-related websites. In addition to the Oregon Smoke Blog, these web links can provide current information on wildfire activity:

- InciWeb (Incident Information System): <http://inciweb.nwcg.gov/>
- Northwest Coordination Center: <http://gacc.nifc.gov/nwcc/index.aspx>
- Oregon Department of Forestry: www.wildfireoregondeptofforestry.blogspot.com/
- U.S. Forest Service fire map: <http://activefiremaps.fs.fed.us/>
- National Weather Service air quality and smoke maps: <http://airquality.weather.gov/sectors/pacnorthwest.php>
- AIRNow: www.airnow.gov/
- RAPTOR - Oregon Emergency Management's real-time web mapping application allows the public to view incident data about wildfires, areas impacted by flooding, live weather radar, contact information for county emergency managers and more. <http://arcg.is/1XVxzQ2>
- Oregon DEQ Wildfire website: <https://www.oregon.gov/deq/aq/Pages/Wildfires.aspx>
- Oregon DEQ Air Quality Index maps (smoke levels provided in 1-hour and 24-hour averages): <http://www.deq.state.or.us/aqi>

Oregon Webcam. The following are links to live webcams that can be used to view wildfire smoke conditions around the state. However, many are designed to show only traffic and road conditions, and do not provide very good image resolution for viewing smoke.

- **Oregon Department of Transportation Trip Check.** Has a custom feature that allows multiple webcams to be viewed on the same page: www.tripcheck.com/Pages/CamerasEntry.asp
- **The Weather Underground.** This weather website has a webcams directory that allows the user to zoom in on Oregon to see live images of traffic and general views around the state: www.wunderground.com/webcams
- **U.S. Forest Service, Air Quality, Real Time Images.** This website currently provides only two live webcams in Oregon – Mt. Hood and the eastern part of the Columbia River Gorge – but both provide high-resolution images: www.fsvisimages.com/descriptions.aspx
- **Northwest Web Cams.** This website is a comprehensive list of all the webcams in Oregon. Note that some may no longer be operational, have broken links, or not good image quality: <http://www.northwestwebcams.com/oregon-web-cams.shtm>

Map of High Wildfire Risk Areas in Oregon. Here is a current ODF map on Significant Fire Potential (frequently updated):

http://nfdrs.smkmgmt.com/sfp/expanded_sfp.htm

and predicted significant multi-month and 7-day significant fire potential:

<https://www.predictiveservices.nifc.gov/outlooks/outlooks.htm>

Oregon Health Authority - health effects from wildfire smoke. The Oregon Health Authority

maintains information to support communication about the health effects of wildfire smoke and strategies to minimize these effects.

The OHA Wildfires and Smoke webpage contains general information about wildfire smoke and health. <http://public.health.oregon.gov/Preparedness/Prepare/Pages/PrepareForWildfire.aspx> .

OHA Wildfire Smoke Crisis and Emergency Risk Communication Toolkit contains sample press releases, approved talking points, fact sheets, sample social media posts and more. It was developed for local and tribal health authorities to support clear, consistent and coordinated statewide public information during a severe smoke event. Updates to the kit are expected in July, so check Crisis and Emergency Risk Communication website throughout this season for updated materials. Changes will include improved reading level and translations for Spanish, Russian, Chinese, Vietnamese and Somali speakers. Find it at <http://public.health.oregon.gov/Preparedness/Partners/Pages/riskcommunicationtools.aspx>

12. Appendices

Current Agency Contact List. Appendix A of this protocol is a contact list of representatives from the agencies and organizations identified in this protocol. Annual updating of this contact list will be necessary, and should be conducted at the annual pre-wildfire season conference call, as noted in No. 7.

Examples of Wildfire Smoke Public Announcements. Appendix B of this protocol provides examples of two DEQ public announcement/press releases from 2012, which can be used as a guide for future announcements.

Monitoring Network in Oregon for PM_{2.5} AQI

The monitoring network and current data can be viewed on the ODEQ webpages as shown in the wildfire related websites link and the locations can be viewed in the appendix for general information.

Email contact list for notifying parties of upcoming participating parties of upcoming calls or activities associate with this protocol.

Appendix A
Oregon Contact List

A.1 Oregon Contact List

AGENCY OR ORGANIZATION	STAFF CONTACT
1. U.S. Forest Service	Rick Graw , Pacific Northwest Region, Air Quality Program Manager. 503-808-2918 rgraw@fs.fed.us
	Willie Begay , Pacific Northwest Region, Smoke Program Manager 503-808-2390 Cell 503-545-8173 wbegay@fs.fed.us
	Janice Peterson , Pacific Northwest Region, Forestry Sciences Lab 206- 732-7845 jlpeterson@fs.fed.us
2. Air Resource Advisor National Coordinator	n/a (if assigned to major wildfire event) Pete Lahm, Wildland Fire Air Quality Response Program (USFS) 202-205-1084 Mobile: 602-432-2614 plahm@fs.fed.us Pete.lahm@gmail.com
3. National Weather Service	Medford Ryan Sandler , Warning Coordination Meteorologist 4003 Cirrus Drive, Medford, OR 97504 541-776-4303 ext. 223 ryan.sandler@noaa.gov www.weather.gov/Medford Please send all Air Quality Alerts to mfr.forecasters@noaa.gov or call 541-776-4326 or 541-773-1067.
	Portland Tyree Wilde , Warning Coordination Meteorologist NOAA's National Weather Service 5241 NE 122 nd Ave., Portland, Oregon 97230 503-326-2340 ext. 223 503-853-4121 cell tyree.wilde@noaa.gov Please send all Air Quality Alerts to pqr.ops@noaa.gov or call 503-326-2356.
	Pendleton Mary Wister , Fire Weather Program Leader National Weather Service, Pendleton, Oregon 541-276-8134 To post air quality alerts, please call or send e-mail to: pdt.operations@noaa.gov
4. Red Cross	Monique Dugaw , Communications Director, Duty Officer 503-528-5629 1-888-680-1455 (duty officer) monique.dugaw@redcross.org
5. DEQ	Greg Svelund , DEQ Public Affairs, Bend Office 541-633-2008 541-647-4194 cell Svelund.greg@deq.state.or.us

Appendix A

Oregon Contact List

	<p>Katherine Benenati, DEQ Public Affairs, Eugene Office 541-686-7997 541-600-6119 cell Benenati.katherine@deq.state.or.us</p>
	<p>Meghan Fagundes, DEQ Western Region, Medford Office 541-776-6089 fagundes.meghan@deq.state.or.us</p>
	<p>Matthew Van Sickle, DEQ Public Affairs, Portland Office 503-229-6044 Vansickle.matthew@deq.state.or.us</p>
	<p>Peter Brewer, DEQ Air Quality Attainment and Wildfire Coordinator 541-633-2004 cell 541-752-9374 peter.brewer@state.or.us (or brewer.peter@deq.state.or.us)</p>
6. Oregon Health Authority	<p>Melissa Powell, Manager, Preparedness Surveillance and Epidemiology Team 971- 673-1131 melissa.e.powell@state.or.us</p>
	<p>Jamie Bash, Risk Communications Analyst 971-673-1394 Jamie.p.bash@state.or.us</p>
	<p>Richard Leman, Chief Medical Officer, Health Security Preparedness and Response 971-673-1089 richard.f.leman@state.or.us</p>
7. Office of Emergency Management	<p>Erik Rau – Emergency Management Planner 503-378-3252 Erik.rau@mil.state.or.us</p>
	<p>Cory E. Grogan, Public Information Officer 503-383-6608 Cory.grogan@state.or.us</p>
	<p>Stephen Bomar, Public Affairs Officer 503-584-3885 stephen.s.bomar.mil@mail.mil</p>
	<p>OEM Duty Officer Oregon Emergency Response System (OERS) 1-800-452-0311 Or 503-378-6377</p>
8. Oregon OSHA	<p>Penny Wolf-McCormick, Health Enforcement Manager, Emergency Preparedness Coordinator 503-229-5910 cell 971-707-0867 Penny.l.wolf-mcmormick@oregon.gov</p>
	<p>Aaron Corvin, Public Information Officer 503-947-7428 cell 971-718-6973 Aaron.corvin@oregon.gov</p>
	<p>Trena VanDeHey, Standards and Appeals Manager 503-378-3272 Trena.VanDeHey@oregon.gov</p>
9. Oregon Department of Forestry	<p>Nick Yonker, Meteorology Manager 503-945-7451 Cell: 971-208-8059 nick.j.yonker@oregon.gov</p>
	<p>Jim Gersbach, Public Information Officer 503-945-7425 Jim.Gersbach@Oregon.gov</p>

Appendix A Oregon Contact List

10. Governor's Office Regional Solutions Centers	http://www.oregon.gov/gov/admin/regional-solutions/Pages/default.aspx
11. Oregon Department of Transportation	David Thompson , Program Manager, ODOT Public Information 503-986-4180 David.H.Thompson@odot.state.or.us
	Greg Ek-Collins , State Emergency Operations Manager 503-986-3020 Greg.ek-collins@odot.state.or.us
12. Office of State Fire Marshal	Mariana Ruiz-Temple , Chief Deputy State Fire Marshal 503-934-8238 mariana.ruiz-temple@state.or.us
13. Lane Regional Air Protection Agency	Jo Niehaus , Public Affairs 541-736-1056 ext. 217 cell 503-575-6319 jniehaus@lrapa.org
14. County Health Departments	Each Oregon County has points of contact listed http://public.health.oregon.gov/ProviderPartnerResources/LocalHealthDepartmentResources/Pages/lhd.aspx
15. Tribal Government	Confederated Tribes of the Umatilla Indian Reservation Eli Harris , Technician 2, Natural Resources 541-429-7421 naturalresources@ctuir.org or eliharris@ctuir.org
	Confederated Tribes of Warm Springs Tim Outman , Air Quality Specialist 541-553-2016 cell 541-460-0305 tim.outman@ctwsbnr.org
	Confederated Tribes of Coos, Lower Umpqua, & Siuslaw Indians Margret Corvi , Environmental Monitoring Specialist 541-888-1304 MCorvi@ctclusi.org
	For other tribal contacts ¹ : Legislative Commission on Indian Services - Natural Resources Cluster – Tribal Contacts .
16. 211info www.211info.org/	Troy Hammond , Chief Operating Officer 503-416-2620 Cell: 503-504-9867 troy@211info.org
17. EPA Region 10	Mike McGown, Smoke Management Coordinator 208-378-5764 Mcgown.michael@epa.gov
	Mehrdad Khatibi 206-553-1603 Khatibi.mehrdata@epa.gov

¹ Oregon Tribal Contact List - may not be the actual contact for wildfire smoke and air quality issues.

Appendix A Out-of-State Contact List

A.2 Out-of-State Contact List

AGENCY OR ORGANIZATION	STAFF CONTACT
18. Idaho Department of Environmental Quality	Boise, ID Mark Boyle , Smoke Management Program Coordinator, Air Quality Division, 208-666-4607 Mark.Boyle@deq.idaho.gov
19. Washington Department of Ecology	Yakima, WA Sean Hopkins , Smoke Management Team Lead, Central Regional Office 509-575-2804 seho461@ecy.wa.gov
20. Nevada Division of Environmental Protection	Carson City, NV Sig Jaunarajs , Supervisor Environ. Scientist IV, Bureau of Air Quality Planning 775-687-9392 sjaunara@ndep.nv.gov
	Sheryl Fontaine, Air Quality Scientist sfontaine@ndep.nv.gov
	Daren Winkelman, Air Monitoring Supervisor 775-687-9342 dwinkelman@ndep.nv.gov
21. California Air Resources Board	Greg Vlasek , Monitoring and Laboratory Division, Office of Emergency Response 916-323-4294 cell 916-838-0872 gvlasek@arb.ca.gov
	Charles Pearson 916-322-7054 cpearson@arb.ca.gov
22. U.S. Forest Service, California Region 5	Porterville, CA Trent Procter , Regional Air Program Manager, Southwest Region 559-784-1500 ext. 1114 559-783-3308 cell tprocter@fs.fed.us

B.1 Example 1 Wildfire Smoke Public Announcement News Release

For release: *date*

Contacts: *names, phone numbers*

***[Agency name]* Urges Oregonians to Protect Themselves from Wildfire Smoke**

It's wildfire season in Oregon and smoke could be on the way. *[Agency name]* advises people to take precautions to protect themselves from unhealthy smoke levels.

Wildfire season is underway with *[xx wildfires]* currently burning in the state. Under certain weather conditions smoke from these fires can drift into communities and quickly cause unhealthy air quality. Should smoke events occur, *[agency name]* and health officials urge local residents to take the following precautions to avoid breathing problems or other symptoms from smoke:

- Be aware of smoke concentrations in your area and avoid the places with highest concentrations.
- Avoid smoke either by leaving the area or protecting yourself by staying indoors, closing all windows and doors and using a filter in your heating/cooling system that removes very fine particulate matter
- Avoid strenuous outdoor activity in smoky conditions.
- People suffering from asthma or other respiratory problems should follow their breathing management plans or contact their healthcare providers.

Remember, local smoke levels can rise and fall rapidly, depending on weather factors including wind direction. People can conduct a visual assessment of smoke levels to quickly get a sense of air quality levels and take precautions. If people have additional concerns, they should contact the nearest regional or local public health agency for the latest in health conditions from smoke.

For more information about local conditions:

- Visit the Oregon Smoke Blog for more information regarding active fires and air quality,
- Along with tools to help people assess smoke levels in their area.
- Tune to local radio and TV stations and the Weather Channel in affected areas that may include the very latest fire information in news programming and weather reports.
- Obtain a dedicated NOAA Weather Radio receiver, which will alert you 24 hours a day to hazards in your area.

B.2 Example 2 Wildfire Smoke Public Announcement News Release

For release: *date*

Contacts: *names, phone numbers*

Smoke From *[wildfire name]* Creates Hazardous Air Quality

Calm winds and a temperature inversion caused smoke concentrations to reach hazardous levels between 4 a.m. and 8 a.m. today. Conditions improved as daytime temperatures increased, but very smoky conditions could return early Wednesday morning.

The *[wildfire]*, *xx* miles from *[location/city]* sent dense smoke into the town in the early morning hours today. Calm conditions and a temperature inversion caused smoke from the fire to settle in at ground level between 3 a.m. and 9 a.m. Smoke concentrations at the air quality monitor in *[city]* reached hazardous levels during this time.

[Agency name] urges everyone to avoid outdoor exertion during such conditions. People with respiratory or heart disease, the elderly and children should remain indoors.

The National Weather Service predicts that calm conditions, a high pressure system and nighttime temperature inversions could cause very smoky mornings through Saturday. Conditions are expected to improve as daytime temperatures rise and the smoke lifts away from ground level.

However, under certain weather conditions wildfire smoke can drift into communities and quickly cause unhealthy air quality. Should additional smoke events occur, *[agency name]* and health officials urge local residents to take the following precautions to avoid breathing problems or other symptoms from smoke:

- Be aware of smoke concentrations in your area.
- Avoid smoke by staying indoors, closing all windows and doors and using a filter in a heating/cooling system that removes very fine particulate matter. If possible, avoid smoky areas.
- Avoid strenuous outdoor activity including sports practice, work and recreation.
- People with concerns about health issues, including those suffering from asthma or other respiratory problems should follow their breathing management plans or contact their healthcare providers.

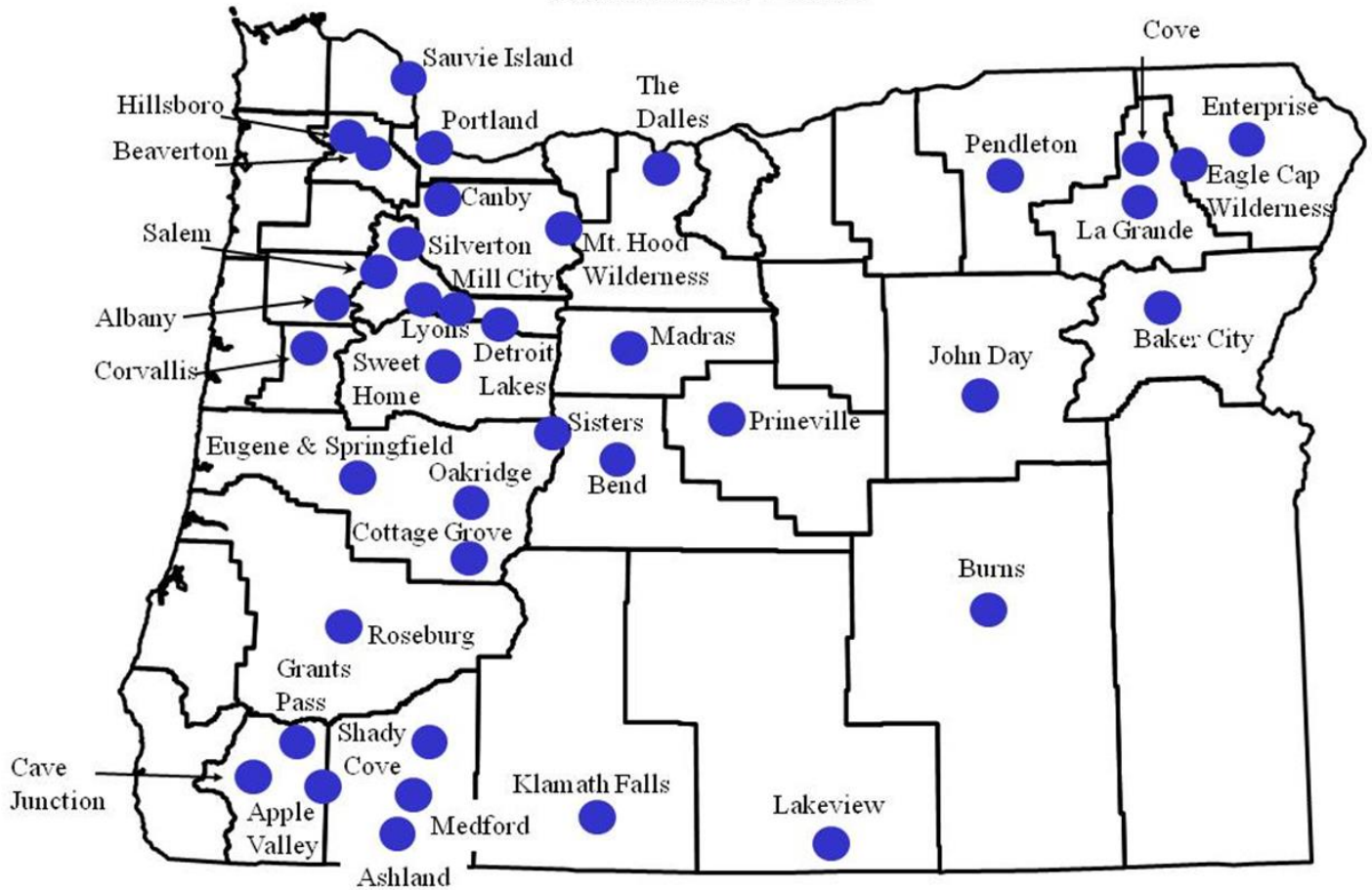
Remember, local smoke levels can rise and fall rapidly, depending on weather factors including wind direction. People can conduct a visual assessment of smoke levels to quickly get a sense of air quality levels and take precautions. If people have additional concerns, they should contact the nearest regional or local public health agency for the latest in health conditions from smoke.

For more information about local conditions:

- Visit the Oregon Smoke Blog for more information regarding active fires and air quality, along with tools to help people assess smoke levels in their area.
- Tune to local radio and TV stations and the Weather Channel in affected areas that may include the very latest fire information in news programming and weather reports.
- Obtain a dedicated NOAA Weather Radio receiver, which will alert you 24 hours a day to hazards in your area.

Appendix C Oregon Stationary Monitor Network Summer and Fire Season

ODEQ PM2.5 AQI Network Summer 2017



Appendix D Wild Fire Smoke Response Email Contact List

Email listing of contacts for Wildfire Severe Smoke Response email notification:

awalsh@chdinc.org
Aaron Corvin <aaron.corvin@oregon.gov>
administrator@ci.hines.or.us
Anthony Barnack (barnack.anthony@deq.state.or.us)
ariane_sarzotti@nps.gov
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craig.geddes@malheurco.org
curtis.peetz@redcross.org
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