| **California Area DEHS Smoke Readiness Plan Template** | |
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| **Directions: Replace content contained between the < and > symbols.** | |
| **Smoke Readiness Planning Checklist: Complete Before Developing Smoke Readiness Plan** | |
| 1. Consult with HVAC technician to: | |
| a. determine if the HVAC system is ready for smoke management using Checklist 1 (on next page).  b. determine the highest MERV rated filter the HVAC system can accommodate without causing too much pressure drop (MERV 11 or higher recommended). | |
| Image of MERV 13 filter attached to HVAC intake  c. determine whether a MERV 13 or higher filter may be added to HVAC intake without impacting HVAC system design by reducing air flow to an unsafe level (*see image*). If this is possible, determine the size MERV 13 filter needed for this purpose.  d. if not already present, add a pressure gauge or port to measure the filter pressure drop to at least 1 HVAC air handler in order to determine when to change filters. | |
| e. determine a smoke readiness operating mode for the HVAC system by identifying the outdoor air economizer, outdoor intake and recirculation/ventilation settings for the HVAC air handlers that will minimize to the greatest extent possible the amount of outside air entering the building and maximize the building’s air filtration rate. Ensure the smoke readiness operating mode for the HVAC air handlers will control odor, temperature, carbon dioxide level and maintain positive building pressure. | |
| 2. To reduce outside air infiltration, seal and caulk cracks and openings in the building envelope and around doors and windows using silicone caulk, spray foam insulation or weather stripping. | |
| 3. Determine the type and number smoke preparation supplies you will need. Recommended supplies include:   * Cases of MERV 11 and 13 Filters in sufficient number to:   + replace all HVAC air handler filters at the start of a smoke event, and   + maintain an elevated air filtration rate in the HVAC system during a prolonged smoke event. (*NOTE: Filter loading during a smoke event may require filters to be changed daily*.) * **<IF APPLICABLE>** Tape and other ducting supplies needed to affix a MERV 13 filter to the HVAC system air intake. * Inexpensive PM2.5 indoor air quality monitor ($100 or less) * Portable air purifiers and air scrubbers sufficient in number and capacity to create clean air spaces in the facility as needed and/or mitigate indoor sources of PM 2.5 (e.g. cooking, printers, copiers, etc.). | |
| | **Checklist 1: Determine if HVAC System is Ready for Smoke**  **Source: ASHRAE Guideline 44P Protecting Building Occupants from Smoke During Wildfire and Prescribed Burn Events** | | --- | | 1. Do the outdoor air dampers function correctly? | | 2. Are the HVAC controls, actuators, damper blades, linkage, and edge seals in good repair? Make all necessary repairs. | | 3. Does the building have a commercial thermostat or control system that allows the outdoor air dampers to remain closed when the system is set for an unoccupied state? | | 4. Are there record drawings, blower door tests, commissioning reports, equipment installation and service manuals or other information available? | | 5. Does the outdoor air economizer work correctly? | | 6. Can the minimum damper set point be changed and the economizer function be temporarily shut off? How is this accomplished for each air handler? | | 7. Is it possible to disable or reduce the relief fan airflow? | | 8. Does the demand control ventilation system work correctly? | | 9. Are all filters properly seated and edges sealed? | | 10. Have the filter and fan access doors been checked to confirm that they fastened and seal? | | 11. Where are the exhaust fans in the building and how are they controlled? | | 12. Which exhaust fans are critical for safety? (e.g. exhaust fans serving isolation rooms, commercial kitchen hoods and locations where hazardous materials are handled (e.g. laboratory)). | | 13. Where are the location of exhaust grilles? Can they be partially blocked to reduce the amount of filtered outdoor airflow? | | 14. If the building has more than one air handler or rooftop AC unit, can some of them be set to recirculation and a small number used to provide filtered outdoor air? | | 15. Does the building have an air conditioning system or portable cooling unit to prevent heat related illness? |   **Smoke Readiness Plan Template** | |
| **Before Smoke Event/Wildfire Season:** | |
| **1. Inventory Smoke Preparation Supplies:** | |
| **MERV 11 (or higher) filters** | |
| # Cases on hand \_\_\_\_\_\_\_\_ | Size \_\_\_\_\_\_\_\_\_\_ # Cases Required \_\_\_\_\_\_\_\_ |
| # Cases on hand \_\_\_\_\_\_\_\_ | Size \_\_\_\_\_\_\_\_\_\_ # Cases Required \_\_\_\_\_\_\_\_ |
| **MERV 13 (or higher) filters for HVAC outdoor air intake <if applicable>** | |
| # Cases on hand \_\_\_\_\_\_\_\_ | Size \_\_\_\_\_\_\_\_\_\_ # Cases Required \_\_\_\_\_\_\_\_\_ |
| # Cases on hand \_\_\_\_\_\_\_\_ | Size \_\_\_\_\_\_\_\_\_\_ # Cases Required \_\_\_\_\_\_\_\_\_ |
| **Duct Tape used to mount MERV 13 filter to HVAC Air Handler outdoor air intake** | |
| # Rolls on hand \_\_\_\_\_\_\_\_ | # Rolls Required \_\_\_\_\_\_\_\_\_\_ |
| ***<List here any other Ducting Materials needed to mount MERV13 filter to air intake>*** | |
| # On Hand \_\_\_\_\_\_\_\_\_  # On Hand \_\_\_\_\_\_\_\_\_ | # Required \_\_\_\_\_\_\_\_\_\_  # Required \_\_\_\_\_\_\_\_\_\_ |
| **Portable Air Purifiers/Air Scrubbers** | |
| # Units on hand \_\_\_\_\_\_\_\_\_ | Size \_\_\_\_\_\_ # Units Required \_\_\_\_\_\_\_\_\_\_\_\_ |
| **2. Test HVAC system** using additional filtration (MERV 11 filters or higher) and smoke readiness operating mode prior to wildfire season.  **<SPECIFY SMOKE READINESS OPERATING MODE SETTINGS HERE>.**  *NOTE: During test, ensure building pressure remains positive while the HVAC system is in the smoke readiness operating mode by taping a flutter strip/piece of toilet paper to the outside edge of an exterior door and assigning a person to observe. If the pressure is positive the strip should be flowing outward.* | |
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| **Implementation of Smoke Readiness Plan:**   | **Decision Matrix** | | | --- | --- | | **Smoke Conditions** | **Action** | | No current smoke, and no smoke forecast from local air quality management district | Carry on with normal operations. Have Smoke Readiness Plan prepared and ready. | | Current smoke OR smoke forecast in coming days | Consider implementing Smoke Readiness Plan. For example, if at-risk populations are likely to be impacted (i.e. AQI >100/ Orange/ PM2.5 35-55 µg/m 3). | | Current smoke AND smoke forecast for coming day(s) | Implement Smoke Readiness Plan. |   **During Smoke Event:** | |
| 1. Note the PM2.5 concentrations on the indoor/handheld PM2.5 sensor(s) and the corresponding outdoor PM2.5 concentration as reported by local air quality district or the facility’s outdoor PM2.5 monitor.  2. **<IF APPLICABLE>** Install MERV 13 filter on outdoor air intake air vent. | |
| 3. Install MERV **<11 or higher>** on **<ID HVAC AIR HANDLER UNITS>**. | |
| 4. Confirm all filters are properly seated and edges are sealed. | |
| 5. Confirm that filter and fan access doors are fastened and sealed. | |
| 6. Set HVAC system to smoke readiness operating mode as specified by HVAC Technician. **<SPECIFY SMOKE READINESS OPERATING MODE SETTINGS IN CHECKLIST 2 found on next page>.** | |
| 7. Verify that the building remains under positive pressure while HVAC system is set to the smoke readiness operating mode by taping a flutter strip/piece of toilet paper to the edge of an exterior door and assigning a person to observe during test run. | |
| 8. Direct staff/residents to keep doors and windows closed to limit smoke intrusion. | |
| 9. **<IF APPLICABLE>** Limit the allowable entrances to **<ID EXTERIOR DOORS WITH VESTIBULE OR AIRLOCK>**. Mount signage to all doors that shall remain closed during wildfire smoke event. | |
| 10. Each morning, limit exterior door usage to entrances located away from prevailing winds by mounting signage to doors that are to remain closed during wildfire smoke event. | |
| 11. Each morning assess indoor levels of PM2.5 throughout the building using **<ID INDOOR AIR QUALITY MONITOR>**. Pay particular attention to kitchens, entryways, vestibules and areas where printers/copiers are located.  12. Place air purifiers/air scrubbers in areas with elevated PM2.5 as needed. An action limit of 35 µg/m3 is recommended. Otherwise use baseline data originating from PM2.5 indoor air quality monitor relative to outdoor PM2.5 levels (Source: US EPA [24 hour National Ambient Air Quality Standard for PM 2.5 in outdoor air](https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm)). | |
| 13. For restaurants, hospitals, schools and other buildings with commercial kitchens, it is recommended that cooking appliances and vent hood exhaust remain off during smoke events as these fans pull a lot of air out of the kitchen and the ventilation system is designed to bring only enough outside air to maintain the kitchen at slightly negative pressure. Kitchens should plan again for cold food menus or use alternative cooking methods such as microwave ovens or induction hot plates. Another option would be adding supplemental filtration to makeup air.  14. Each day of the smoke event, monitor port/pressure gauge which measures filter pressure drop to determine if filters need to be changed. *NOTE: Wildland fire smoke can quickly load filters and they may need to be changed as frequently as daily during smoke events.*  15. Each day of the smoke event, monitor PM2.5 indoor air monitors and outdoor PM2.5 levels to determine if mitigation measures are working. If Smoke Management Plan is not effective, consider relocating occupants to another building and/or suspending operations. If forced to relocate, close air intakes and shut off HVAC system to minimize smoke particles getting into the system. | |
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| **After Smoke Event:** | |
| 1. Return the HVAC system to normal operating settings. **<SPECIFY SETTINGS HERE>** | |
| 2. Remove outdoor intake temporary filters. | |
| 3. Evaluate filters and determine if they need to be cleaned or changed. | |
| 4. Verify operation of HVAC system after returning to normal. | |
| 5. Clean indoor surfaces to remove ash deposited from the smoke. | |
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| **Checklist 2: Placing HVAC in Smoke Ready Mode** | |
| 1. Set Building Automated System (BAS) controls to unoccupied state to close outdoor air dampers or manually set. | |
| 2. Make additional changes to BAS controls as stipulated by HVAC Technician. <specify here> | |
| 3. Disable or reduce the relief fan airflow. | |
| 4. Adjust exhaust fans and block exhaust grills. | |
| 5. Set some of the air handlers or rooftop AC unit to recirculation mode. | |
| 6. Make sure that spaces are conditioned adequately (e.g. turn on air conditioning system if hot). | |
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**NO ENTRANCE**

**USE THE ENTRANCE ON THE \_\_\_\_\_\_\_\_ SIDE OF THE BUILDING**

**THIS DOOR IS TO REMAIN CLOSED TO PREVENT WILDFIRE SMOKE FROM ENTERING THE BUILDING**

**EXIT ONLY IN CASE OF EMERGENCY**



**THIS DOOR IS TO REMAIN CLOSED TO PREVENT WILDFIRE SMOKE FROM ENTERING THE BUILDING**