

# Level 1 Inspections

## Introduction

A Level 1 inspection is a field surveillance tool intended to provide frequent and specific observations of source performance. The inspector usually does not have to enter plant grounds, and the inspection is never announced in advance. The inspector makes visible emissions observations from the plant boundary for all visible stacks and vents that can be properly observed given the current meteorological conditions.

*Entry onto plant grounds is not necessary to conduct a Level 1 inspection.*

Level 1 inspections include evaluating visible emissions, condensing plume conditions, and process fugitive emissions. The inspector compares his or her observations of general plant operations to baseline data to confirm that the operations meet all permit requirements. Unusual conditions provide grounds for a higher level inspection in the near future.

*Unusual conditions observed in a Level 1 inspection provide grounds for conducting a higher level inspection in the near future.*

## General Inspection Stages

Evaluate visible emissions. If weather conditions permit, the inspector should use EPA Reference Method 9 procedures to determine the average opacity of plumes. The observations should be conducted during routine operations and should last from 6 to 30 minutes. Each stack and vent should be observed.

*Determine opacity using Reference Method 9 procedures.*

The inspector should note the timing and duration of all significant visible emissions spikes to determine the probable causes of these conditions. Significant puffs that occur regularly or randomly are usually not normal; however, in some cases, light puffing can occur even during optimal operating conditions.

*Light puffing can occur even during optimal operating conditions.*

Evaluate condensing plume conditions. The inspector should observe the stack and vents to determine if there is a **condensing plume** being emitted. A condensing plume is usually bluish-white and is caused when condensed vaporous materials enter the colder ambient environment. In some cases, the plume forms 5 to 10 ft after effluents leave the stack.

*Condensing plumes are usually bluish-white.*

A condensing plume is different from a **steam plume**, which is formed when water vapor condenses. A steam plume can be identified by its color and how it dissipates. Steam plumes are opaque white (rather than bluish-white), and they tend to dissipate rapidly, leaving no residue.

*Steam plumes are opaque white and tend to dissipate rapidly, leaving no residue.*

*If a major process has fugitive emissions, evaluate the visible emissions.*

*Level 1 inspections generally are not applicable to carbon bed adsorbers and incinerators.*

*Fabric filters operate with average opacities of less than 5 percent. Electrostatic precipitators and wet scrubbers operate with average opacities of less than 10 percent. Mechanical collectors operate with opacities of less than 20 percent.*

*Droplet reentrainment associated with wet scrubbers should be evaluated.*

Evaluate process fugitive emissions. The inspector should perform complete visible emissions observations on any major process fugitive emissions. If weather conditions preclude a complete observation, the inspector should note the presence and timing of any fugitive releases so that they can be correlated with other process operations.

## Variations In Level 1 Inspection Procedures

Level 1 inspections, though usually not applicable to carbon bed adsorbers and incinerators, are applicable to fabric filters, dry and wet scrubbers, mechanical collectors, and ESPs.

In general, fabric filters operate with average opacities of less than 5 percent, and ESPs and wet scrubbers operate with average opacities of less than 10 percent. Mechanical collectors usually operate with opacities of less than 20 percent.

In addition to evaluating stack emissions, condensing plume conditions, and fugitive emissions, the inspector should also evaluate droplet reentrainment associated with wet scrubbers.

Droplet reentrainment indicates a significant demister problem, which can create a local nuisance. The presence of droplet reentrainment is indicated by the following conditions:

- Obvious droplet fall in the immediate vicinity of the stack.
- Moisture and stains on adjacent equipment.
- A mud lip around the stack discharge.

## Summary

A Level 1 inspection procedure includes routine evaluation of source performance by visibly observing the source's stacks and vents. Visible observation does not require entry onto plant grounds, nor should the intended observation/inspection be announced ahead of time. Unusual conditions found at the time of observation/inspection might warrant a higher level inspection in the future.

At minimum, the inspector should evaluate visible emissions, condensing plume conditions, and process fugitive emissions. If the facility uses wet scrubbers, the inspector should also evaluate droplet reentrainment.

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## Review Exercises

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1. True or false? A Level 1 inspection is always announced in advance but usually does not require that the inspector enter plant grounds.
2. Opacity is determined by:
  - a. Reference Method 10
  - b. Reference Method 1
  - c. Reference Method 9
  - d. LIDAR
3. True or false? Puffing from stacks and vents always indicates abnormal operations.
4. A condensing plume is:
  - a. Bluish-white.
  - b. Typically formed 20 ft from the stack.
  - c. The same as a steam plume.
  - d. All of the above.
  - e. None of the above.
5. Level 1 inspections are applicable for:
  - a. Fabric filters
  - b. Incinerators
  - c. Carbon bed adsorbers
  - d. All of the above
  - e. None of the above
6. Fabric filters generally operate with opacities less than \_\_\_\_\_ percent.
  - a. 20
  - b. 15
  - c. 10
  - d. 5
7. Facilities that use wet scrubbers present this additional inspection consideration:
  - a. Plume color
  - b. Droplet reentrainment
  - c. Plume opacity
  - d. Steam plumes

## Answers

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1. False. Although it is true that a Level 1 inspection usually does not require the inspector to enter plant grounds, a Level 1 inspection is never announced in advance.
2. c. Reference Method 9
3. False. Light puffing can occur even during optimal operating conditions.
4. a. Bluish-white
5. a. Fabric filters
6. d. 5
7. b. Droplet reentrainment