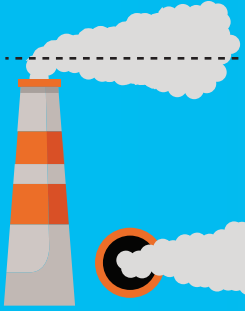


SMOKE PLUME CHARACTERISTICS REFERENCE GUIDE

CONING



APPEARANCE

- Broad, cone-shaped plume spreading outward downwind
- Maintains a steady, layered shape
- Expands gradually with distance

ATMOSPHERIC CONDITIONS

- Neutral to stable atmosphere

- Moderate to strong winds
- Can appear day or night
- Sometimes appears briefly within looping plumes under gusty conditions

TURBULENCE

- Mostly mechanical (wind-produced)
- Limited thermal turbulence

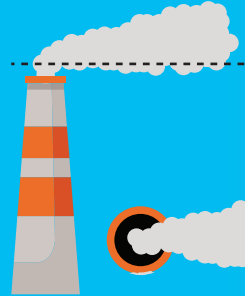
GROUND IMPACT

- Possible contact farther downwind
- Concentrations are typically lower but more persistent

TOP VIEW

- Widening, elongated pattern extending steadily downwind

LOFTING



APPEARANCE

- Well-defined bottom edge
- Diffuse, spreading upper edge
- Plume lifts upward and outward

ATMOSPHERIC CONDITIONS

- Stable air below plume
- Unstable or neutral air above
- Common near sunset as the inversion forms

TURBULENCE

- Downward mixing suppressed
- Upward dispersion enhanced

GROUND IMPACT

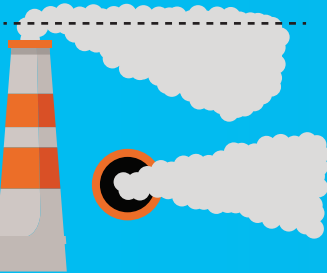
- Minimal ground-level concentrations
- One of the best dispersion conditions

- Strong surface protection except in shallow inversions

TOP VIEW

- Broad, elevated cloud spreading outward while staying lifted above the ground

FUMIGATING



APPEARANCE

- Sharp, well-defined top
- Ragged, diffuse bottom
- Fan-like downward mixing

ATMOSPHERIC CONDITIONS

- Occurs when an inversion is breaking up
- Common in morning as the sun warms the surface
- Strong vertical mixing below; stable air above traps the plume

TURBULENCE

- Thermal turbulence from warming ground
- Mechanical turbulence from wind shear may assist

GROUND IMPACT

- Highest potential for strong ground-level concentrations
- Downward mixing pushes pollutants toward surface

- Impacts decrease once the plume rises beyond the fumigation zone

TOP VIEW

- Expanding fan-shaped pattern with downward tilt

LOOPING



APPEARANCE

- Irregular waves or loops that rise and fall rapidly
- "Snake-like" or "accordion-like" plume motion
- Highly distorted outline

ATMOSPHERIC CONDITIONS

- Strong surface heating
- Unstable atmosphere (sunny days, light winds)

- Common in midday heat

TURBULENCE

- Dominated by strong thermal turbulence
- Vigorous up-and-down vertical motion

GROUND IMPACT

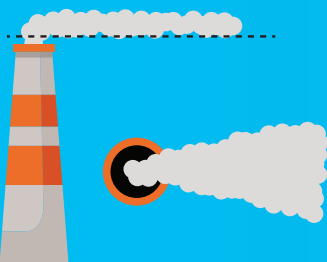
- Highest near-source ground-level concentrations

- Impacts are short-lived but potentially strong
- Dispersion increases quickly with distance

TOP VIEW

- Broken, wavy pattern extending downwind

FANNING



APPEARANCE

- Narrow, horizontal ribbon of smoke
- Very little vertical spread
- Smooth, layered structure

ATMOSPHERIC CONDITIONS

- Stable atmosphere (often with an inversion)
- Common at night or early morning

- Light winds maintain the thin profile

TURBULENCE

- Minimal turbulence
- Plume drifts without rising or looping

GROUND IMPACT

- Usually minimal near ground

- Can persist in a narrow band far downwind
- Higher concentrations aloft

TOP VIEW

- Long, narrow streak following the wind direction