

# Scenario 01: All Engines - Scaled for 50 hours

Wednesday, June 2, 2021 8:35 AM

## Scenario Info

Big Building, the casino

- ID: CASINO
- Base elevation: 0
- Tiers of Current Building
  1. 40 ft
- Type: Rectangular
- Reference Point: SW Corner
- X-Coordinate: 524056.64 m
- Y-Coordinate: 4245718.52 m
- X-Length: 570 ft
- Y-Length: 700 ft
- Rotation Angle: 0 deg

Smaller building/yard that contains engines

- ID: YARD
- Base elevation: 0
- Tiers of Current Building
  1. 25 ft
- Type: Rectangular
- Reference Point: SW Corner
- X-Coordinate: 524028.9 m
- Y-Coordinate: 4245790.36 m
- X-Length: 46 ft
- Y-Length: 136 ft
- Rotation Angle: 0 deg

Source Used for Run:

- Source ID: ALL50
  - o Treating all 5 engines as 1
- X-Coordinate: 524036.4 m
- Y-Coordinate: 4245812.86 m
- Release Height: 15.67 ft
  - o 188.02 inches (Sheila emailed)
- Base Elevation: 27.0 m
  - o For location: 38.360393, -122.724930
  - o From <https://www.freemaptools.com/elevation-finder.htm>
- Release Type: Vertical
- Emission Rate: 0.755 lb/hr
  - o  $1500 \times 8 / 453.59 = 26.4556$  lb/hr (from Graton Calculations spreadsheet)
  - o  $26.4556 \times 50 / 8760 = 0.151$  lb/hr
    - Scaling for 50 hours of operation per year instead of 8760
  - o  $0.151 \times 5 = 0.755$  lb/hr
    - 5 emergency engines total
- Fixed
- Gas Exit Temperature: 435 C
  - o From specs, 435 C
- Stack Inside Diameter: 0.418 m

- 14 inch diameter
- Total area =  $5 \cdot \pi \cdot (7)^2$
- Total radius =  $7 \cdot \sqrt{5} = 15.65247584249853$
- Total diameter =  $15.6525 \cdot 2 = 31.305$  in
- $31.305/12 = 2.6088$
- Gas Exit Velocity: 57.391 m/s
  - autopopulated
- Gas Exit Flow Rate: 28.5 m<sup>3</sup>/s
  - From specs, 342 m<sup>3</sup>/min
  - $342/60 = 5.7$
  - $5.7 \cdot 5 = 28.5$

#### Other point sources

- Source ID: STCK1-5
  - EmGens 1-5
- X-Coordinate: 524036.4 m (constant)
- Y-Coordinate: 4245812.86, 4245806.86, 4245809.86, 4245815.86, 4245818.86 [m]
  - In order from 1 to 5
  - Spaced them 3 m apart, with STCK1 in the position of the STCKALL
- Release Height: 15.67 ft
  - 188.02 inches (Sheila emailed)
- Base Elevation: 27.0 m
  - For location: 38.360393, -122.724930
  - From <https://www.freemaptools.com/elevation-finder.htm>
- Release Type: Vertical
- Emission Rate: 0.151 lb/hr
  - $1500 \cdot 8 / 453.59 = 26.4556$  lb/hr (from Graton Calculations spreadsheet)
  - $26.4556 \cdot 50 / 8760 = 0.151$  lb/hr
    - Scaling for 50 hours of operation per year instead of 8760
- Fixed
- Gas Exit Temperature: 435 C
  - From specs, 435 C
- Stack Inside Diameter: 1.1667 ft
  - 14 inch diameter
  - $14/12 = 1.1667$
- Gas Exit Velocity: 57.391 m/s
  - autopopulated
- Gas Exit Flow Rate: 28.5 m<sup>3</sup>/s
  - From specs, 342 m<sup>3</sup>/min
  - $342/60 = 5.7$

#### Initial Baseline Source Scenario Inputs (All):

- Dispersion: Urban
- Population 42900
  - Google Search for Rohnert Park Population
- No Debug File
- Pollutant Emission Rate:
  - 0.755 lb/hr NO<sub>2</sub> (with Chemistry)
    - OLM
    - In-Stack NO<sub>2</sub>/NO<sub>x</sub> Ratio: 0.5
    - Ozone Concentration: 69.0 ppb
- Downwash: Include all Buildings (CASINO, YARD)

- Note that checkmark is on CASINO but that shouldn't matter
- Meteorology Parameters
  - Min Temp: -9.67 F
    - Default value = 250 K
  - Max Temp: 115 F
    - Google search for highest recorded temp rohnert park, ca showed 113 F, with cloverdale at 115
  - Min Wind Speed: 0.5 m/s
  - Anemometer Height: 10.0 m
  - Do NOT adjust friction velocity
- Surface Characteristics:
  - Albedo: 0.29
  - Bowen Ratio: 0.925
  - Surface Roughness: 0.0403
- NO AERMET Seasonal Tables
- NO External File
- Include Terrain Effects and Force AERMAP Re-Run
  - Map Type: USGS DEM/CDED
  - The following autopopulated and I left them alone
    - SW Corner: (521527.32, 4243218.52)
    - Height: 5366.0
    - Width: 5120.32
    - Mesh Size: 40
- Source Base Elevation: AERMAP Calculated
- NO Flagpole Receptors
- Minimum Distance to Ambient Air: 9.14 m
- Maximum Distance of Downwind Receptors (Probe Distance): 2.0 km
- NO Additional Receptors
- Do NOT apply inverse break-up fumigation
- Do NOT apply shoreline fumigation