

Scenario 02: All Engines - Scaled for 500 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: ALL500
 - 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: 7.55 lb/hr
 - o $1500 \times 8 / 453.59 = 26.4556$ lb/hr (from Graton Calculations spreadsheet)
 - o $26.4556 \times 500 / 8760 = 1.51$ lb/hr
 - Scaling for 50 hours of operation per year instead of 8760
 - o $1.51 \times 5 = 7.55$ 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 m³/s
 - From specs, 342 m³/min
 - $342/60 = 5.7$
 - $5.7 \cdot 5 = 28.5$

Initial Baseline Source Scenario Inputs (All):

- Dispersion: Urban
- Population 42900
 - Google Search for Rohnert Park Population
- No Debug File
- Pollutant Emission Rate:
 - 7.55 lb/hr NO₂ (with Chemistry)
 - OLM
 - In-Stack NO₂/NO_x 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