

Benicia Refinery
Benicia, California



Flaring Facts

Flare Facts

- Flaring is a necessary safety measure to combust material that cannot be safely stored or otherwise processed. These safety devices protect our employees, our neighbors, the environment and our equipment.
- Flaring will typically occur during maintenance activities, including process unit startup, shutdown and other turnaround events. Flaring events are managed in accordance with the [Valero Benicia Refinery - Flare Minimization Plan](#)
- Flaring as permitted by the BAAQMD and EPA, to combust material to their least harmful constituents: CO₂, NO_x, SO₂.
- The estimated emissions reported to CAL-EMA and other agencies is based on the concentration in the flared material and the total volume of material flared.
- SO₂ is measured by Ground Level Monitors (GLMs) which have been in service for decades, as well as the open-path monitors posted on the [Valero Benicia Refinery - Air Quality Monitoring Program website](#).
- Typical flaring events rarely register on these monitors, due to the elevation of the flares and prevailing winds. The SO₂ is dispersed at a higher elevation driven by the flare's height (over 300' above grade) and the prevailing winds.
- When refinery operations require flaring, it cannot be deferred to a more convenient day or time because it is a safety measure taken when necessary.

Flare Facts

Understanding REFINERY FLARES

Why do they occur?

Flaring may result from the start-up and shutdown of units or during accidents or upsets.

How am I protected?

Air District flare regulations were the first and most comprehensive flare rules in the nation. The regulations are designed to limit the frequency and magnitude of flaring events (Rule 12-12) and to monitor the flares (Rule 12-11). These 2 rules protect the health of residents living close to the refineries and reduce overall levels of air pollution in the Bay Area.

What are they?

Refinery flares are safety devices that burn pollutants that would otherwise be directly released into the atmosphere.

THEY REQUIRE REFINERIES TO:

- Immediately notify the Air District of flaring
- Monitor the volume and composition of gases burned in flares
- Calculate the emissions based on the data collected
- Determine the reasons for the flaring and implement prevention measures to keep it from happening again
- Continuously monitor and record the flares
- Submit the data monthly to the Air District

By instituting better operating practices and equipment, flare emissions have been reduced by **75 PERCENT**



WHAT IS A FLARE?

A flare is a safety device, essentially a safety relief valve, which a refinery uses to safely burn excess material, or hydrocarbons, which cannot be recovered or recycled. The excess hydrocarbons are combined with steam and safely burned in the flare which is more environmentally sound than releasing the hydrocarbons directly into the atmosphere.

HOW DOES A FLARE WORK?

Similar to a pilot light on a hot water heater, the flare tip is continually lit in the event flaring is necessary. When a refinery experiences a process interruption, such as an unplanned loss of power, the refinery's system may be unable to send the hydrocarbons through for further refining. In this case, the excess hydrocarbons are routed to the refinery flare system, combined with steam and safely burned.

WHAT CAUSES A REFINERY TO FLARE?

Although flaring is minimized as much as possible, a refinery may flare as part of start-up or shut-down procedures during maintenance or unplanned process interruptions such as a power outage or equipment failure.

IS IT NORMAL TO HEAR NOISE OR SEE SMOKE FROM A FLARE?

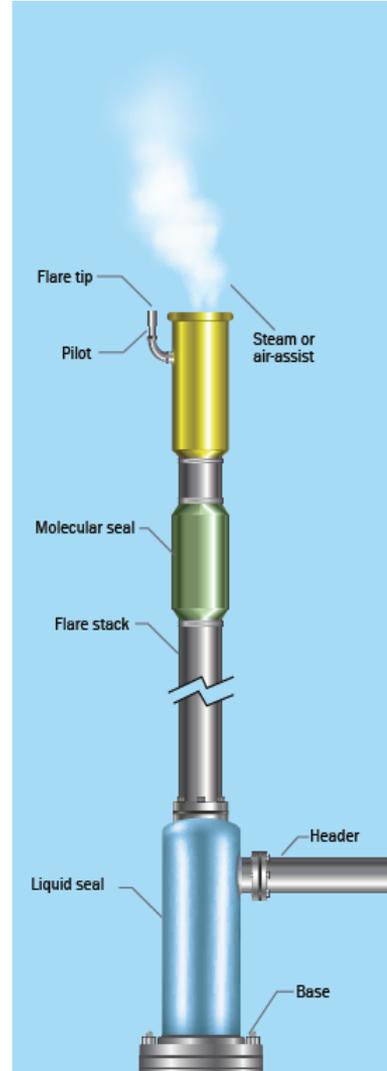
Yes, while steam minimizes the amount of smoke produced by the flare, there may still be some smoke during flaring. The rumbling noise that can sometimes be heard during flaring is due to mixing hydrocarbons, air and steam. Neither the smoke nor the noise is cause for concern; flaring is a controlled process that is closely monitored by refinery operators.

IS FLARING BAD FOR THE ENVIRONMENT?

While flaring does produce some emissions, it is the safest and most environmentally sound manner for a refinery to dispose of excess hydrocarbons.

IS FLARING REGULATED?

Yes, flaring is regulated by both the EPA and state environmental agencies. The specific regulations vary from state to state, but all refineries must report flaring to their respective regulatory agency and abide by the environmental guidelines and operating permits set forth by the agency.

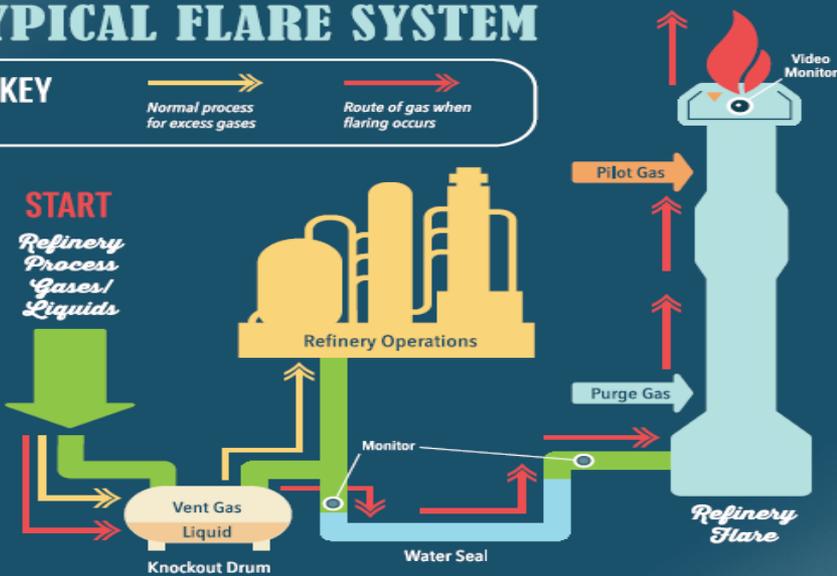


TYPICAL FLARE SYSTEM

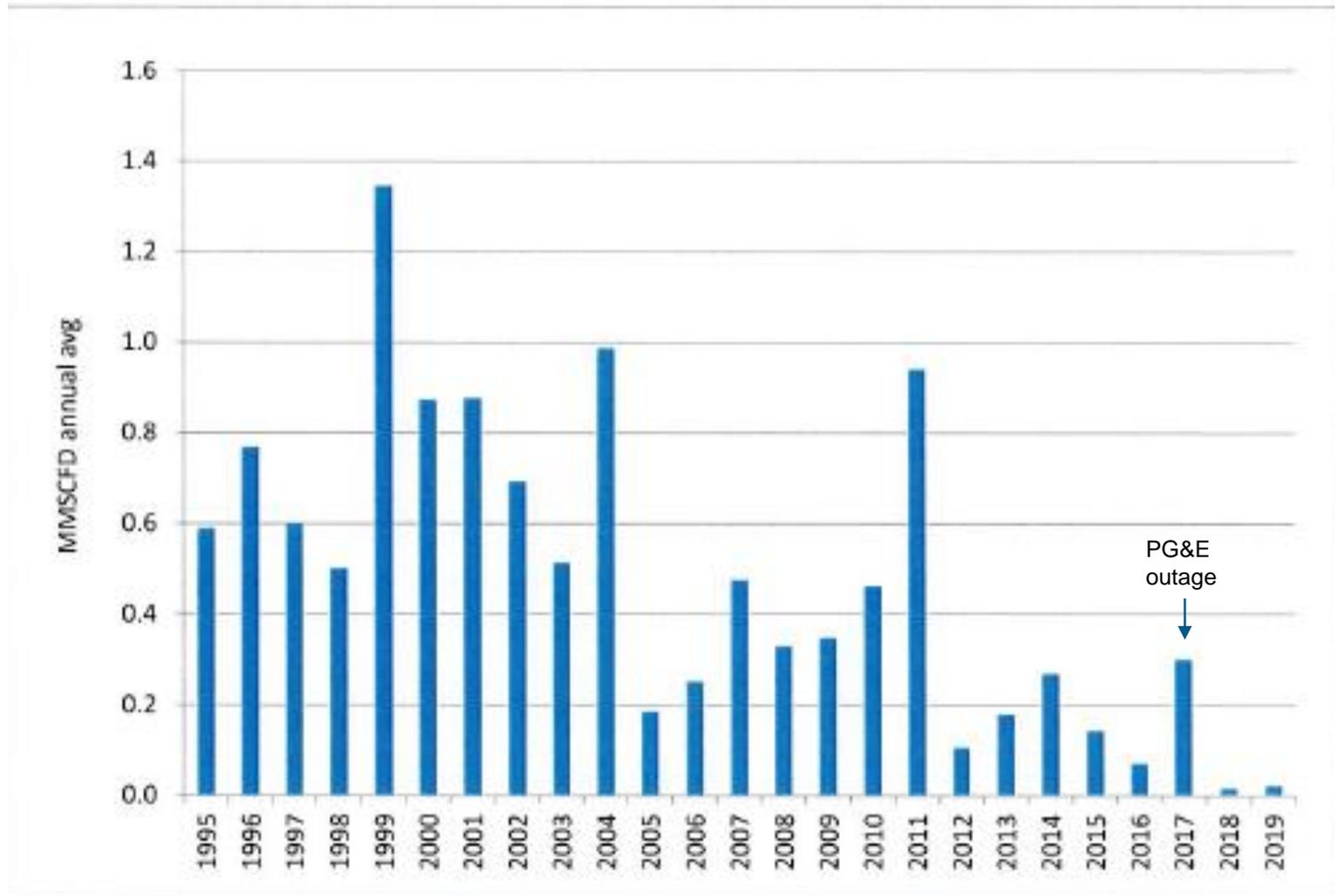
KEY

Normal process for excess gases (green arrow)
Route of gas when flaring occurs (red arrow)

START
Refinery Process Gases/Liquids



Flare Vent Gas Volume – Reducing Flaring



City of Benicia - Noise Ordinance

- In June 2018, the Benicia city council updated the noise ordinance for the Industrial Park.
- The maximum permissible decibel levels are set at 75 dBA, during all time periods, throughout the day.
- Atmospheric conditions, such as wind direction, can increase or decrease sound decibel levels and Valero performs decimeter readings to make sure operational activities are below the industrial park's noise ordinance threshold.
- Noises associated with the flaring process and sounds such as the release and production of steam coming from our operations is monitored by refinery personnel & the Benicia Fire Department.

Source	Sound Level (dBA)	Distance (ft)	Exposure Duration
Empty / Quiet room	40	-	-
Normal conversation	60	3	-
Household shop vacuum	85	10	16 hours
OSHA Action Level	85	-	-
Lawn mower	90	-	-
Diesel compressor / Welder at load	90	10	8 hours
OSHA PEL	90	-	8 hours
Loud bar / Dance music	95	-	4 hours
Router / Radial arm saw / Chop saw	95	3	4 hours
 Monster truck rally / Loud headphones	100	-	2 hours
Chainsaw / Jackhammer	110	10	30 mins
Threshold of discomfort	120	-	-
 Loud rock concert	125	100	195 secs
Threshold of pain	130	-	-
Pile driving rig on impact	130	30	98 secs
Jet aircraft engine on takeoff	140	150	24 secs
Gunshot	140-170	-	-

Questions and Answers

