DESERT BREEZE

VOLUME III ISSUE2 JUNE 2015

FIREWORK COMBUSTION AND SAFTEY

Fireworks can make celebrating the Fourth of July one of the most exciting holidays of the year. However, misuse of fireworks can lead to property damage, wildfires, and injuries. It has been reported that two out of every five fires occurring on the Fourth of July have started by fireworks. The Consumer Product Safety Commission claims fireworks cause approximately 9,600 injuries treated in U.S. hospital emergency rooms each year.

In addition, firework smoke can produce particulate matter with an aerodynamic diameter of 10 microns and less (PM10) that contains a toxic mix of metals

and chemicals. PM10 can become lodged deep in people's lungs and cause respiratory related health effects such as bronchitis, asthma, airway inflammation, coughing, wheezing, and decreased lung function. PM10 air monitors usually show a spike for about three hours following a fireworks show.

Fireworks also create nitrogen oxides (NOx) and sulfur oxides (SOx). These acid gases are key contributors to smog and acid rain. However, the levels delivered by fireworks are miniscule in comparison to other man-made combustion sources and even natural sources such as lightning. Furthermore, toxins produced by fireworks are considered to be insignificant because of the infrequent use of fireworks plus most toxins are combusted before they reach ground level.

Knowing and practicing the following safety tips will help everyone have an enjoyable, safe and sane Fourth of July.

- Purchase and ignite only legal fireworks.
- Store fireworks in a secure location to prohibit access by children.
- Place pets indoors; they may become frightened.
- Keep a bucket of water nearby in which to place all used fireworks.
- Have a water hose or fire extinguisher nearby to put out stray sparks.
- Know the emergency number to call for your area, your address location, and basic first aid.
- Keep persons with respiratory conditions upwind and away from the smoke.
- Have a designated adult light all fireworks.
- Light one at a time, move away quickly, and keep at a safe distance until the display is finished.
- Use only outdoors, away from anything that can burn.
- To prevent injuries, never throw fireworks and never hold fireworks in your hand.

ELECTRIC VEHICLES

Many current Electric Vehicle (EV) enthusiasts became converts to all-electric vehicles after their first drive. Electric vehicles are quick, quiet, clean, and fun to drive. When the accelerator is depressed, the response is immediate, and smooth. The noise you hear is that of the tires on the road, and that noise is not as noticeable with the windows rolled up. With no gasoline and motor oil to add or change there is no spillage, and less dirt attracted by oil.

EVs are slowly gaining acceptance in the United States. April sales figures show a slow and steady increase in sales of electric plug-in vehicles. The first production EV sold in the United States has sold approximately 200,000 units. Combined with other models currently offered, total sales exceed 500,000 units. Factoring in Federal, State, and local incentives can bring a higher initial advertised prices down to a point comparable to; or, even better than that of a similar internal combustion engine vehicle. The pace of technological

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change is such that leasing an EV is an economical form of ownership for those who drive less miles, and can observe a lease mileage cap.

The EPA estimates that 80% of commuters drive less than 40 miles to work. For most people, the common EV range of 70-100 miles is adequate. An EV serves as a perfect commuter vehicle, recharging overnight, and some charge during the day, at the work place. Recharging at night has an advantage of lower rates when demand is reduced. Businesses can attract drivers of electric vehicles by installing charging infrastructure public locations and network (membership) charging stations at locations around town. Prices for level 2 Electric Vehicle Supply Equipment (EVSE) have become more affordable.

Time and driving style are critical factors standing in the way of EV proliferation and acceptance. For EV enthusiasts, who venture out of town on longer trips, or longer commutes, extra time is required both to make the trip and to recharge batteries to extend the vehicle range. Driving style can dramatically affect range. A trip that can be completed by driving with more focus on range extension can also be a trip that stops early because efficiency is not a concern. Wind resistance is much more formidable at higher speeds; and, travelling at higher speeds in an EV will reduce total range. An EV driver trying to maximize range by maintaining a certain speed may be an annoyance to other drivers. EV efficiency, or 'EVciency' is a notion that is not yet popularly accepted.

Recharge rates can range from half an hour to several hours, depending EVSE, and the capacity of a vehicle's on-board charger. Motorists familiar with adding 200-300 miles of range in five to ten minutes (by filing with gasoline) may feel it takes too much time to replenish the battery. Concerns about the ability of a given vehicle to complete a long trip are referred to as 'range anxiety'. Range anxiety will diminish as battery technology improves, charging infrastructure becomes more widespread, and the time required to recharge is reduced. To reduce "Anxiety" many manufacturers decided to manufacture Plug-in Hybrids like the Chevrolet Volt and Ford C-Max. However, there are EVs like the Chevrolet Spark and the Tesla Model S. Recently, Tesla added a charging station in Mojave, and a new charging station in Tehachapi is slated for completion in 2016.

District's Attainment Status and Federal's New Ozone Standard

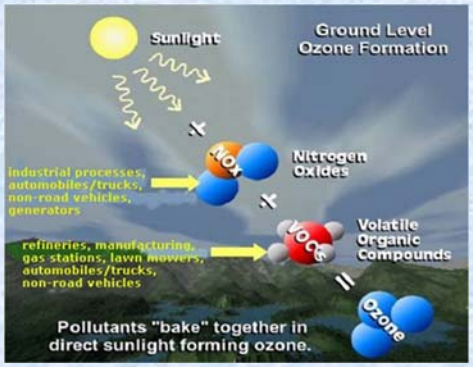
Ozone (O_3), colorless gas with a pungent, irritating odor, is a highly reactive gas composed of three oxygen atoms. Ground-level ozone – what we breathe – can be formed from reactions between volatile organic compounds (VOC) and nitrogen oxides (NOx) in the presence of heat and sunlight. Emissions from industrial facilities, electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are the major man-made sources of NOx and VOCs.

Breathing ground-level ozone can induce respiratory symptoms that includes coughing, throat irritation and pain and burning in the chest when taking a deep breath. Additionally, evidence from studies indicates that higher daily ozone concentrations are associated with increased asthma attacks, increased hospital admission and increased mortality.

Based on their findings, Environmental Protection Agency (EPA) created National Ambient Air Quality Standards (NAAQS) for ground-level ozone, because the Clean Air Act (CCA) requires EPA to set NAAQS for pollutants considered harmful to public health and the environment. Attainment status means an achievement of having "good" air quality based on standards set by EPA. If a District cannot meet NAAQS ozone standard, EPA determines that the particular District is in "non-attainment."

Eastern Kern Air Pollution Control District (District) is one of 35 air districts in California. The District was in "attainment" for 1997 8-hour Ozone 0.08 parts per million (ppm) set by EPA. However, EPA lowered the standard to 0.075 ppm on March 27, 2008. As a result, the District became "non-attainment/marginal" by EPA's NAAQS.

As mentioned above, ozone can be formed from reactions between VOCs and NOx. Therefore, limiting VOCs and NOx emissions helps limit ozone creation. In 2014, the District adopted Rule 410.8 (Aerospace Assembly and Coating Operations) and amended other rules because those rules limit VOCs emission from coatings and adhesives used in industries. Additionally, any stationary piston engines that operate within the District are required to comply with District's Best Available Control Technology (BACT) guidelines to limit NOx emissions. Implementing more stringent measures for mobile vehicles and putting more electric vehicles on the road also decreases NOx emissions significantly.



Because it is all about the people, making sure we can live, breath, and work today and tomorrow while the investment that we make with our time and resources goes towards our goal of attaining a healthier air for our present and future generations.

POLLUTANT OF THE QUARTER: CARBON DIOXIDE (CO_2)

Even though carbon dioxide is a vital necessity for life on earth to exist, there is, surprisingly, very little of it in our atmosphere. Carbon dioxide is the 4th highest constituent in our air, behind nitrogen (the highest), oxygen, and argon. At 0.04% of the earth's atmosphere, there doesn't seem to be a lot of CO_2, but that 0.04% is essential to plant life on earth. It is the fizz in your soda and the sparkle in sparking water. Ideal combustion of hydrocarbons (fossil fuels) produce carbon dioxide and water; therefore, the gasoline, diesel, natural gas, and propane fueled vehicles all produce carbon dioxide.

In 1958 carbon dioxide concentration was estimated to be 315 parts per million. Currently, carbon dioxide concentration is measured to be approximately 400 parts per million. The carbon dioxide concentration increase is correlated with the increased use of fossil fuels. With more people on the planet than any other time, the causal factors of: internal combustion engines, electrical power (coal fired plants), cement products (cement process emits extraordinary amounts of CO_2), and various other industrial products, the atmospheric carbon dioxide concentration has risen to a modern era historical high.

Approximately, one fourth of the carbon dioxide emitted by human activity is absorbed by land plants, another one fourth is absorbed by oceans, and the remaining one half is entrained into the atmosphere.

According to the United States Environmental Protection Agency (EPA), carbon dioxide traps heat in the atmosphere, and is the fundamental cause of the **greenhouse** effect (warming of the atmosphere). According to EPA carbon dioxide has a 100-year global warming potential (GWP) of 1.0; compared to methane with 100-year GWP of 34. GWP is the estimated potential of specific gas to warm the atmosphere.

Carbon dioxide is entrained in many substances. As stated previously, the cement process emits a large amount of carbon dioxide. The main component of cement, limestone (calcium carbonate – $CaCO_2$) releases CO_2 when heated to over 1652°F (900°C).

FUN FACT: Make your own CO_2
with baking soda (sodium bicarbonate – $NaHCO_3$) and vinegar (acetic acid – $C_2H_4O_2$) – see below

Although, carbon dioxide is a greenhouse gas, the California Air Resources Board does not considered it a toxic air contaminant. However, carbon dioxide, at high concentrations, (because it is heavier than air) can be deadly because it displaces air. Also, unlike hydrogen sulfide (with its pungent rotten egg odor), carbon dioxide is odorless and colorless; making it difficult to detect without instruments.

From the air we breathe, to "dry Ice" (-109°F -- frozen carbon dioxide), to cement, carbon dioxide is an essential part of our lives. Much concern has been made about the rapid increase of carbon dioxide in the last 60 years. As with all things in life, we must achieve a balance to survive in our modern society (driving cars, eating ice cream and building houses), to breath and live.

BEAT THE HEAT

As the summer months approach us, it is important to know the signs of heat stress and how you can prevent illness due to high temperatures. People who are exposed to the extreme heat or work in hot environments may be at risk. Heat stress can result in heat stroke, heat exhaustion and heat rashes. Some symptoms of heat stroke are hot and dry skin, hallucinations, chills, and slurred speech. A few signs of heat exhaustion are heavy sweating, dizziness, weakness and nausea. If experiencing these symptoms call 911, move to a cool shaded area, and spray body with water. To beat the heat and find a cooling center near you, please visit http://www.co.kern.ca.us/pio/coolingcenters.aspx

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Board of Directors usually meet once every two months starting in January at various locations.

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For news updates and other information, please visit the Eastern Kern APCD website at www.kernair.org

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