



Properties of Natural Gas and Propane

PHYSICAL CHARACTERISTICS OF WHICH
OPERATORS SHOULD BE AWARE

October 17, 2012

What is Natural Gas?

■ Natural Gas is a combination of:

■ **Methane**

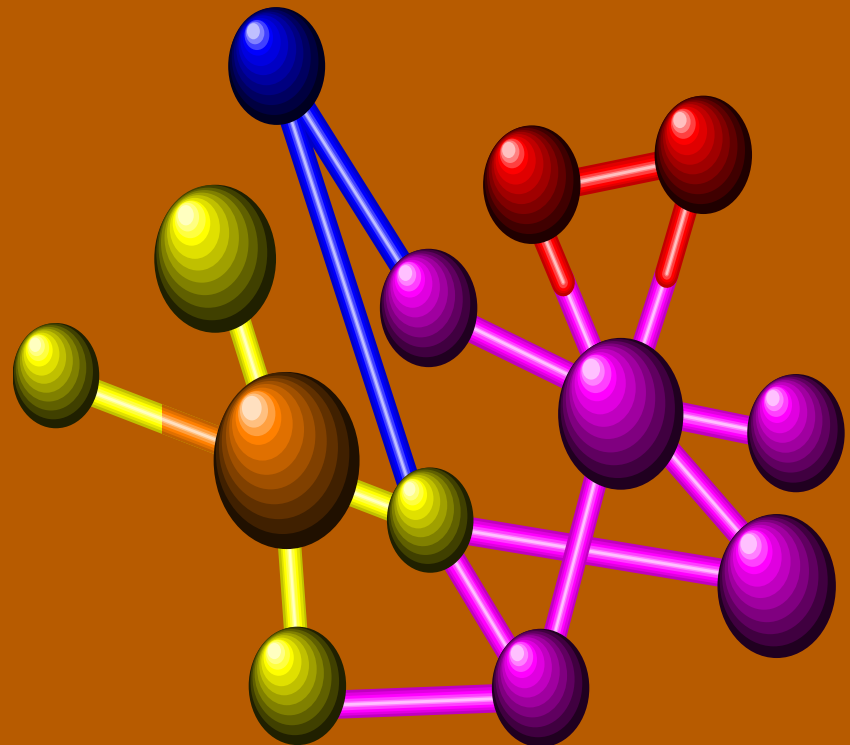
■ Ethane

■ Propane

■ Butane

■ Carbon Dioxide

■ Other Minor Constituents



Various Natural Gas Compositions

	<u>Methane</u>	<u>Ethane</u>	<u>Propane</u>	<u>Butane</u>	<u>Other</u>
Michigan	75.80	17.5	0	0	6.7
Pennsylvania	96.80	2.5	.2	0	.5
Texas	79.00	6.31	2.2	.07	12.42
PG&E	95.10	2.69	0.22	0.025	0.726

Basic Properties of Natural Gas

- Flammable
- Lighter than Air
- Colorless
- Non-Toxic
- Odorless
- Tasteless
- Ignition Temperature
Range 1000 -1200 °F



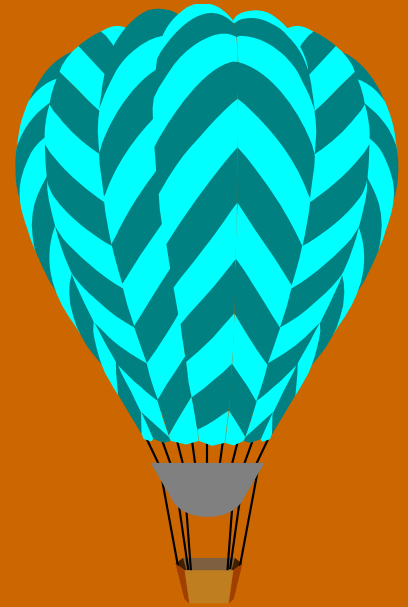
Gas ignited in a confined location can be

EXPLOSIVE!!



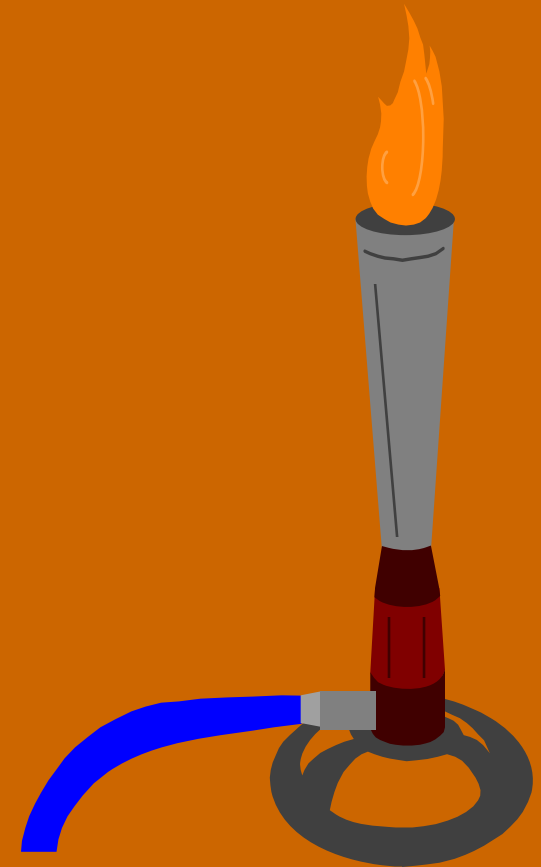
Specific Gravity

- Air is a standard at 1
- Number less than 1 is lighter than air, Natural gas $0.65 < 1$
- Number greater than 1 is heavier than air, Propane $1.65 > 1$

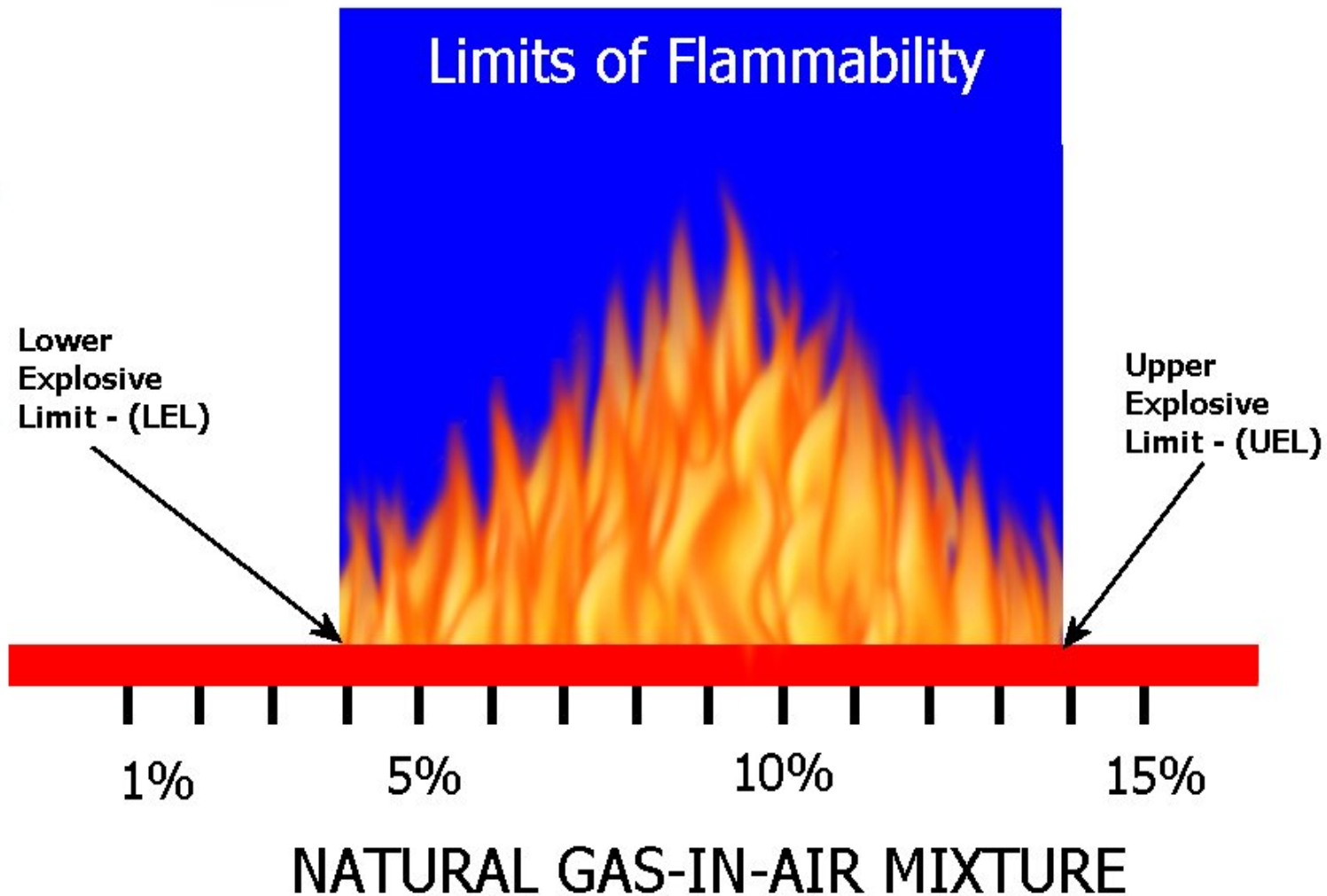


FLAMMABLE LIMITS

- LEL= Lower Explosive Limit
- UEL= Upper Explosive Limit
- FLAMMABLE RANGE



Flammability of Natural Gas

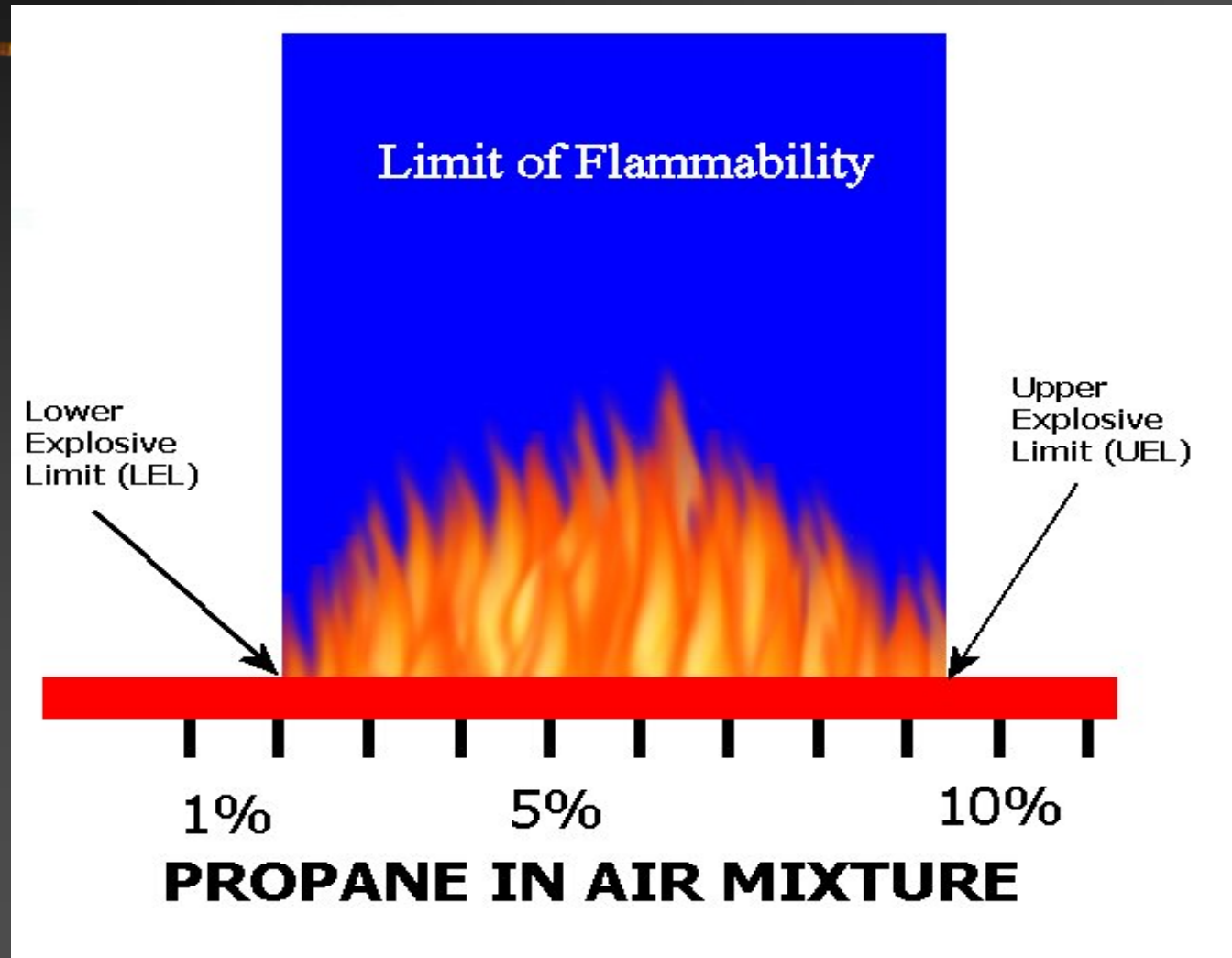


Basic Properties of Propane Gas

- Flammable
- Heavier than Air
- Colorless
- Non-Toxic
- Odorless
- Tasteless
- Ignition
Temperature range:
957-1090°F



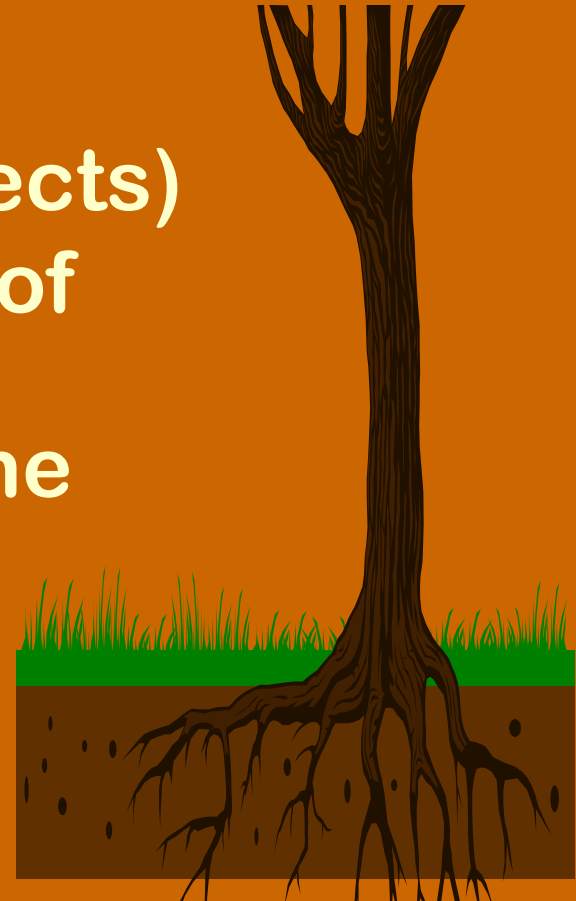
Flammability of Propane



EFFECTS OF GAS ON PLANT LIFE

Gas does not poison the soil,
but it can ...

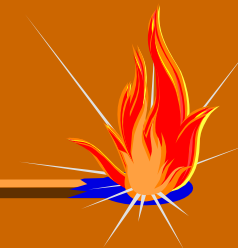
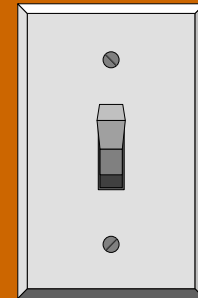
- Dry the soil out (drought effects)
- Reduce the oxygen content of the soil
- Change the pH (acidity) of the soil
- Change the color of the soil
- Reduce the soil's ability to support plant growth



POTENTIAL SOURCES OF GAS LEAK IGNITION?



- Any Open Flame
- Any Spark
- Electrical Switches
- Electrical Motors
- Automobiles
- Static Electricity
- Telephone
- Doorbell

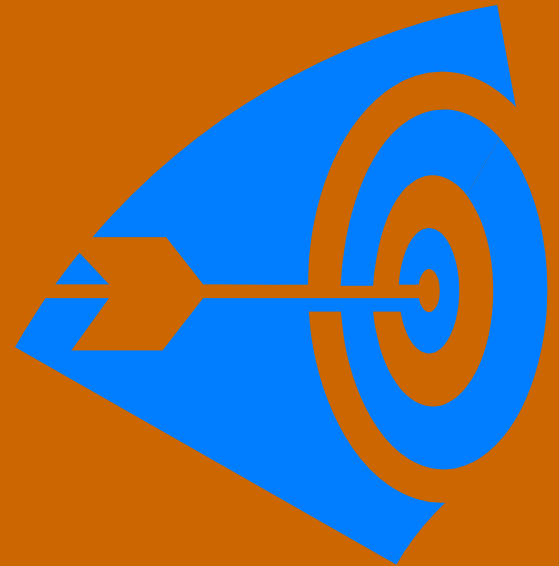


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What is the main point of all this?

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Be aware of gas properties and flammability ranges when in operations and when providing emergency response, especially where gas is in a confined place.



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Questions?

