

Environmental Updates & Permitting Compressors



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Services

- Air permits?
- Leak Detection and Repair Plans?
- Air dispersion modeling?
- Greenhouse Gas Reporting?
- NORM/TENORM (radiation)?
- Chemical Inventory Reporting?

We do it all!



Washington, DC • Columbus, OH • Raleigh, NC



Environmental Updates

1. 2015 Ozone Standard
2. OOOOa Status
3. Ohio Asbestos Changes
4. Federal Clean Power Plan
5. Chemical Storage Inventory
6. Incident Response Planning

2015 Ozone Standard

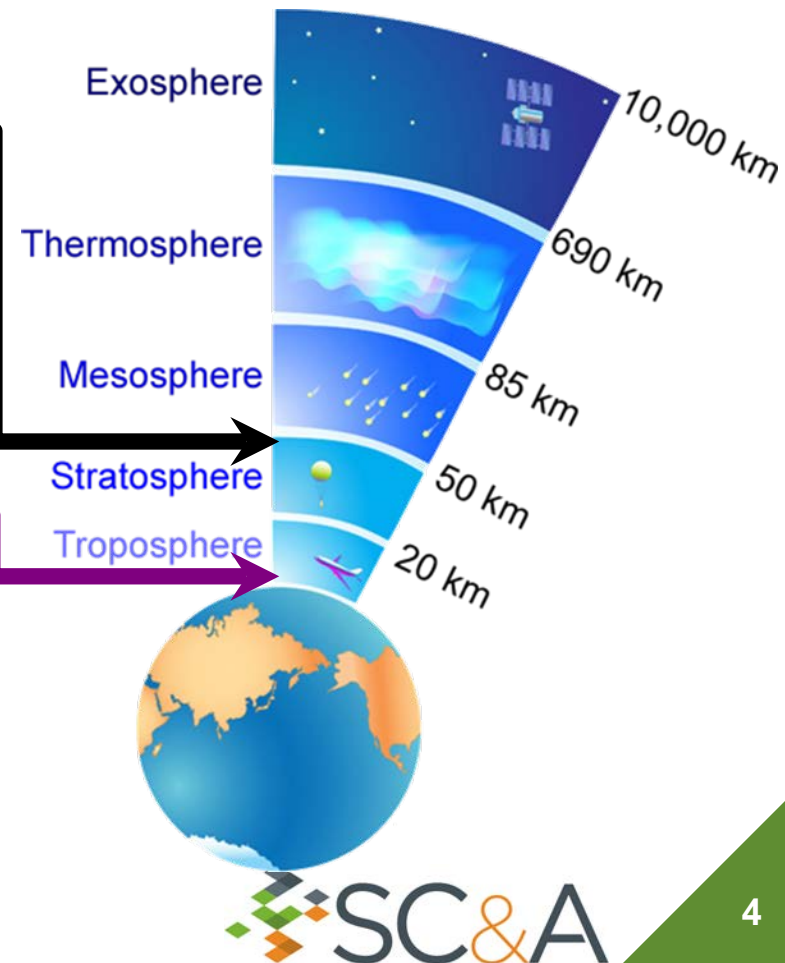
Ozone is beneficial or harmful depending on its location in our atmosphere

Stratospheric ozone

- Protects plants and animals by absorbing ultraviolet radiation
- Upper-level ozone = good ozone

Tropospheric ozone

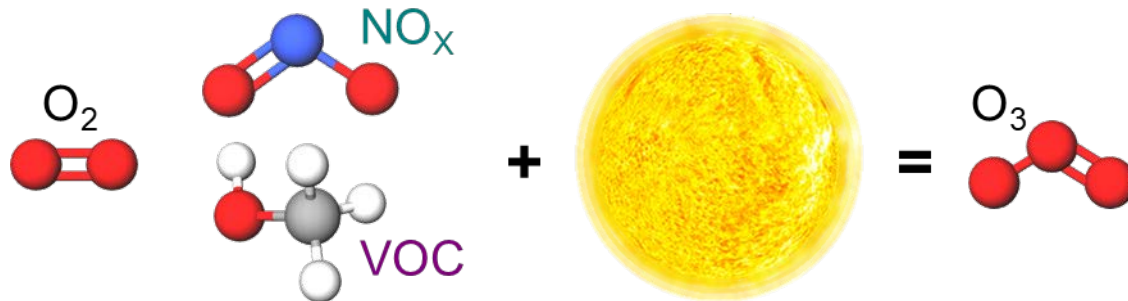
- Causes health and environmental impacts
- Ground-level **ozone** = bad **ozone**



2015 Ozone Standard

Ozone Sources

- Ozone formed via photochemical reaction between **volatile organic compounds (VOCs)** and **Nitrogen Oxides (NO_x)**
 - Ozone is monitored but **VOCs** and **NO_x** are regulated



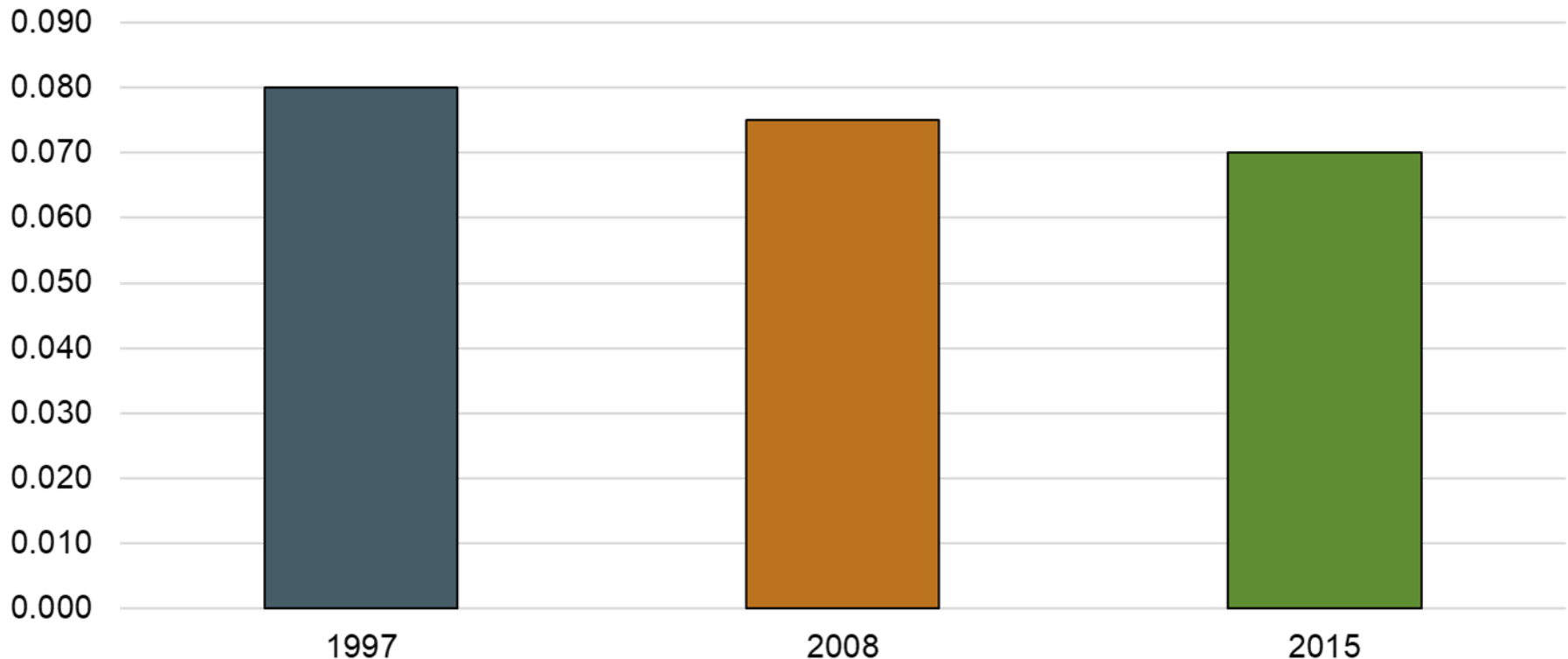
- **VOCs** include all organic compounds except **methane**, **ethane**, and **carbon dioxide (CO_2)**
- **VOCs** are emitted from fuel combustion, paints, oil and gas operations, plastic and chemical manufacturing, solvents, printing, and ***fugitive emissions of natural gas***

2015 Ozone Standard

The Ozone National Ambient Air Quality Standard (NAAQS) was lowered to 0.070 ppm in 2015

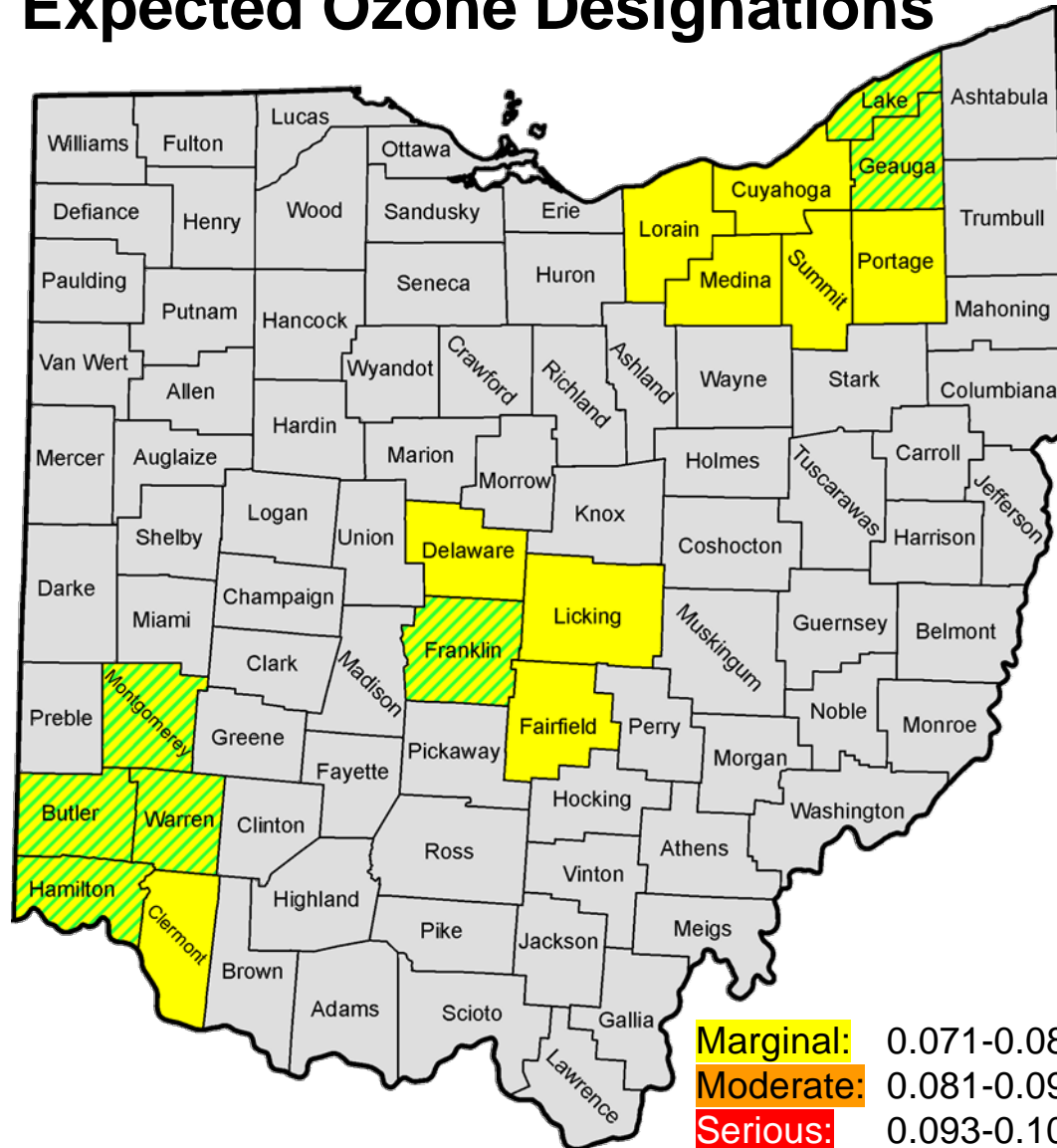
- *3-year average of the 4th highest annual daily 8-hour max*

Ozone NAAQS (1997-2017)



2015 Ozone Standard

Expected Ozone Designations



- Ozone data from 2014-16 used in Ohio ozone designations
- Counties violating 2015 ozone NAAQS highlighted in green
- Final designations expected 2nd quarter
- 2015-17 ozone data indicates Montgomery County will violate 2015 ozone NAAQS

2015 Ozone Standard

Within 3 years, Ohio Environmental Protection Agency (EPA) must develop regulations for attaining the 2015 ozone NAAQS

- Ohio already has 65 regulations for VOC emissions from types of operations and individual facilities



- Ohio Choice Plus (formerly E-check) is a tailpipe testing program that is part of Ohio EPA's VOC reduction plan
 - Required in Cleveland/Akron



2015 Ozone Standard

Ohio EPA VOC reduction plan options:

1. Expand Ohio Choice Plus beyond Cleveland / Akron
 - Originally included Cincinnati, Dayton, and Springfield
2. Develop more VOC regulations
 - Could include natural gas fugitive emissions from compressors, pipelines, and wells
 - EPA proposed removing natural gas fugitive emissions control requirements for ozone non-attainment areas
3. Allow Federal engine standards to reduce VOC emissions
 - EPA considering relaxation of Federal engine standards
4. Hope for cool summers
 - Franklin county only needs two more 0.070 summers or one 0.068 summer

OOOOa Status

Title 40 of the Code of Federal Regulations, Part 60, (40 CFR 60) Subpart OOOOa was issued on June 3, 2016

- Separate from 40 CFR 60, OOOO
 - 40 CFR 60, OOOO applies to sources constructed, modified, or reconstructed after August 23, 2011 and on or before September 18, 2015
 - 40 CFR 60, OOOOa applies to sources constructed, modified, or reconstructed after September 18, 2015
- Includes **greenhouse gases (GHGs)** and **VOC** emissions
- Added new requirements, including for compressor stations
- Compliance required within 60 days of startup or June 3, 2017, whichever is later

OOOOa Status

- After OOOOa was issued, industry groups filed requests for EPA to reconsider aspects of the rule
 - Fugitive emissions monitoring (including compressors)
 - Well site pneumatic pump standards
 - Professional Engineer certifications
- In May and June 2017, EPA issued stays on the portions of the rule it was reconsidering before they were implemented
- U.S. Court of Appeals vacated the stay
 - Reconsidered requirements effective August 31, 2017
- EPA requested additional information on what should be reconsidered on November 1, 2017
- On March 1, 2018 EPA modified parts of OOOOa
 - Repair during scheduled compressor shutdowns

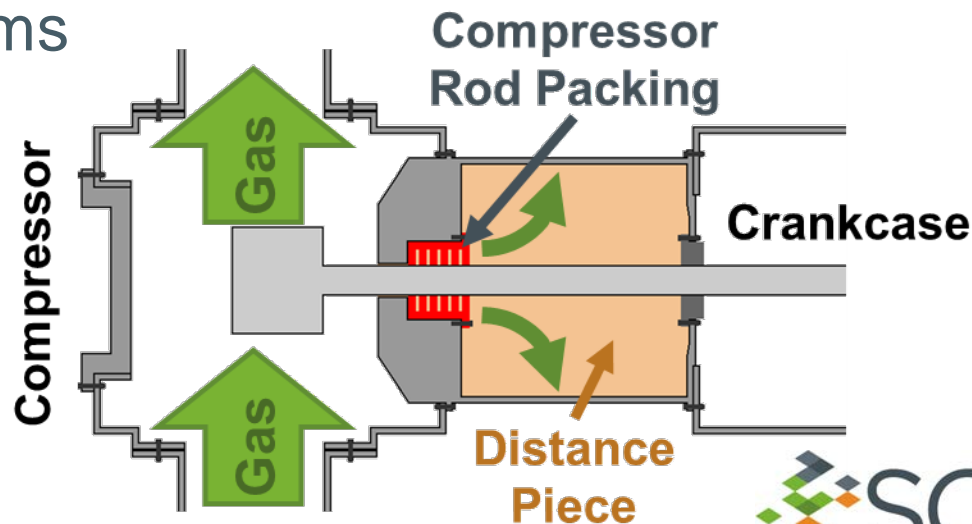
Centrifugal Compressor Requirements:

- Utilize a closed vent, wet seal degassing system to reduce **VOC** and **methane** emissions by 95.0%
 - Control device or route gas back into process
 - Annual inspection of ducting and closed vent system
- Emissions testing and continuous monitoring required for control systems with a maximum heat input capacity <44 megawatts
 - If using a flare: manufacturer's performance specifications or testing can be used instead of emissions testing
 - If using a boiler or heater: exempt from emission testing if waste gas is primary fuel or introduced with primary fuel

OOOOa Status

Reciprocating Compressor Requirements:

- Same as OOOO
- Replace compressor rod packing after 26,000 operating hours or 36 months from startup or last replacement; OR
- Collect natural gas emissions from rod packing in distance piece and vent it to a process or control device
 - Annual inspection of ducting and closed vent system
 - Emissions testing and continuous monitoring required for control systems



Compressor Fugitive Emissions Requirements:

- Leak detection & repair (LDAR) for all fugitive components
- Survey within 60 days of startup; then semi-annual surveys
 - Exceptions for difficult-to-monitor and unsafe-to-monitor
- Survey with optical gas imaging (OGI) or Method 21 sniffer
- Repair as soon as practicable
 - Within 30 calendar days; OR
 - If technically infeasible, unsafe, or compressor shutdown required, complete during next scheduled shutdown or within 2 years, whichever is earlier
 - Resurvey equipment after repair

OOOOa Status

OOOOa Applicability: Compressor Station Modification

1. Compressor Added or Replaced

- If new compressor added, entire compressor station is modified and applicable to OOOOa
- If compressor replaced with new compressor of a greater total horsepower, entire compressor station is modified and applicable to OOOOa
- If compressor replaced with new compressor of lesser or equal total horsepower, no modification

2. Components Added or Replaced

- Modification only if an increase in emissions
- Routine replacement, maintenance, or repair is not a modification

OOOOa Status

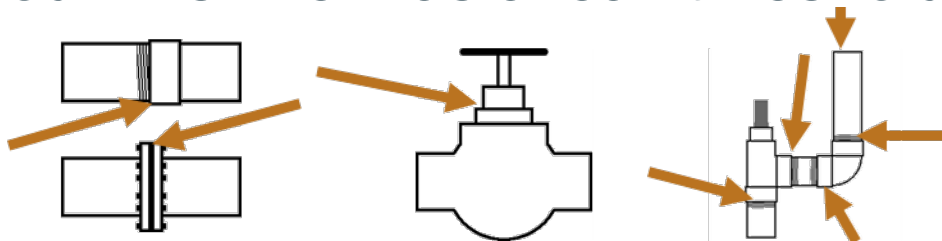
OOOOa Applicability: Compressor Station Reconstruction

- If the fixed capital cost of the new components exceeds 50% of the fixed capital cost to construct a new facility
 - Facility: compressor station and components
 - Fixed capital cost: capital needed to provide all the depreciable components (property that is depreciable)
- Compressor rod packing replacement is a fixed capital cost
 - Track capital costs of compressor rod packing versus facility construction capital costs



LDAR Plan Components I

- LDAR requirements are different than other leak programs
 - No maximum percentage of difficult-to-monitor
 - Weather information collection requirements
- What is affected equipment
 - Equipment with fugitive emissions of **VOC** or **methane**
 - Valves, connectors, pressure relief devices, open-ended lines, flanges, covers, thief hatches, compressors, instruments, meters, but **not** pneumatic controller vents
- How to find leaks
 - OGI has leak threshold of 10,000 ppm
 - Method 21 sniffer has a leak threshold of 500 ppm



LDAR Plan Components II

- When are leaks checked
 - Quarterly for most components
 - Annually for difficult-to-monitor components
 - Schedule for unsafe-to-monitor components
 - 30 days after repair or replacement of components
- When Leaks are Repaired
 - If it cannot be repaired during leak check, leaking equipment must be tagged or digitally photographed
 - Leaking components must be repaired within 30 calendar days, unless compressor shutdown required
 - Leaking equipment is repaired when resurvey indicates no fugitive emissions OR no soap bubbles observed

OOOOa Status

LDAR Plan Components III

- Who is checking Leaks
 - Document personnel training
- Maintain Documents
 - 5+ years with Ohio EPA air permit (2 years in OOOOa)
 - Analyzer calibration, OGI path, repairs, leaks
 - Digital pictures or video of OGI during monitoring
 - Measured reading for Method 21 sniffer
 - Weather conditions
 - Justifications for difficult-to-monitor and unsafe-to-monitor
 - Justifications for delay of repair



Changes to Ohio Asbestos Program

Until January 1, 2018, Ohio Department of Health (ODH) and EPA managed different aspects of Ohio's asbestos program

- Ohio EPA responsibilities:
 - Demolition and renovation projects
 - Notification, inspection, work practices, and disposal
- ODH responsibilities:
 - Training, licensing, and certification of asbestos workers

Beginning January 1, 2018, Ohio EPA has sole responsibility for all aspects of asbestos control, licensure, and certification



Changes to Ohio Asbestos Program

- No changes to 10-day prior notification or fee structure
- Ohio EPA district offices and local air agencies will continue to conduct inspections and respond to complaints
 - Ohio EPA district & local air agency staff will be trained:
 - Asbestos abatement supervisor
 - Asbestos abatement specialist
 - Asbestos evaluation specialist
- Online asbestos notifications now made through Ohio EPA eBusiness Center



eBusiness Center

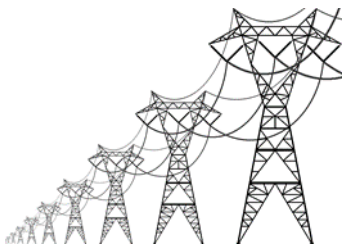
Clean Power Plan

Two sets of regulations to reduce GHGs from electric generating utilities (EGUs)

1. New EGUs constructed after January 8, 2014 or reconstructed after June 18, 2014
 - EGUs must be Integrated Gasification Combined Cycle (IGCC) or include controls to significantly reduce CO₂
 - Federal air regulation implemented in 2014
2. Existing EGUs constructed, modified, or reconstructed on or before January 8, 2014
 - Complicated plan of credits for state-wide CO₂ emissions divided by total in-state megawatt hours generated
 - Federal requirements for approving state air regulations
 - Regulation stayed by U.S. Supreme Court and Congress

Clean Power Plan

- EPA has proposed to repeal requirements for existing EGUs
 - All other similar regulations require emissions controls or work practices to reduce emissions
 - EPA now believes the Clean Power Plan was premised on a novel and expansive view of agency authority
 - Repealing the Clean Power Plan removes the requirements for existing EGUs; new/reconstructed EGUs are unaffected
 - EPA Administrator is debating repeal vs. replace
 - There are no good, commercially available CO₂ emissions controls
 - Any plan could be reviewed every 10 years anyway



Chemical Inventory

Emergency Planning & Community Right-to-Know Act

- The Tier II Chemical Inventory report was modified to incorporate the updated Hazard Communication System
 - Safety Data Sheets (SDS) physical and health hazards

Physical State & Quantity	Hazards
Check all that apply *	
Physical Hazards	Health Hazards
<input type="checkbox"/> Explosive	<input type="checkbox"/> Acute toxicity (any route of exposure)
<input checked="" type="checkbox"/> Flammable (gases, aerosols, liquids, or solids)	<input type="checkbox"/> Skin corrosion or irritation
<input type="checkbox"/> Oxidizer (liquid, solid or gas)	<input type="checkbox"/> Serious eye damage or eye irritation
<input type="checkbox"/> Self-reactive	<input type="checkbox"/> Respiratory or skin sensitization
<input type="checkbox"/> Pyrophoric (liquid or solid)	<input type="checkbox"/> Germ cell mutagenicity
<input type="checkbox"/> Pyrophoric Gas	<input type="checkbox"/> Carcinogenicity
<input type="checkbox"/> Self-heating	<input type="checkbox"/> Reproductive toxicity
<input type="checkbox"/> Organic peroxide	<input type="checkbox"/> Specific target organ toxicity (single or repeated exposure)
<input type="checkbox"/> Corrosive to metal	<input type="checkbox"/> Aspiration hazard
<input checked="" type="checkbox"/> Gas under pressure (compressed gas)	<input type="checkbox"/> Simple Asphyxiant
<input type="checkbox"/> In contact with water emits flammable gas	
<input type="checkbox"/> Combustible Dust	
<input type="checkbox"/> Hazard Not Otherwise Classified (enter specific hazard in Notes field in Facilities)	

Incident Response Planning

Manufacturing Facility (MF)

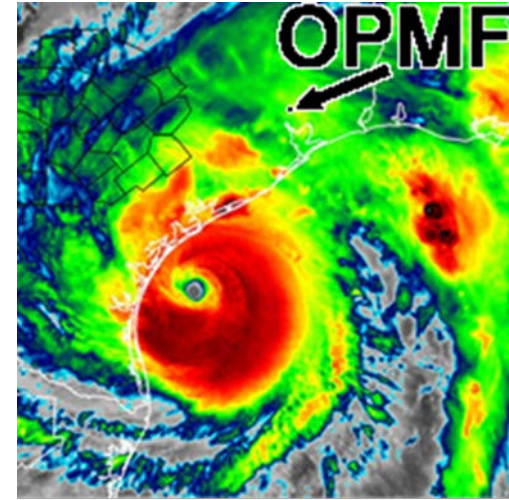
- 120 acre property in exurban / rural Texas
 - ~43 acres for facility operations
- Site access control
 - Perimeter fence
 - Gated entry
 - Onsite security personnel
- Site-specific emergency response plan
 - Onsite emergency response equipment and personnel
 - Municipal Volunteer Fire Department (VFD)
 - Local Emergency Planning Committee (LEPC)



Incident Response Planning

Hurricane Harvey

- A major category 4 hurricane
- Landfall: Rockport, TX on August 26, 2017
- Closest National Weather Service (NWS) station to OPMF in Baytown, TX
 - 45.1 inches of rainfall over 5-day period



NWS Harvey Satellite Image 8/25/17

Measured Rainfall and Selected Maximums – NWS Baytown, TX

Day	Measured Rainfall	100-yr/24-hr	50-yr/24-hr	Previous High
8/26/2017	1.64 inches	13 inches	12 inches	0.84 inches
8/27/2017	16.57 inches	13 inches	12 inches	2.11 inches
8/28/2017	12.65 inches	13 inches	12 inches	1.10 inches
8/29/2017	11.86 inches	13 inches	12 inches	2.50 inches
8/30/2017	2.38 inches	13 inches	13 inches	2.35 inches

100 and 50 year precipitation from National Oceanic and Atmospheric Administration
Previous high from NWS Climate Data for Baytown, TX

Incident Response Planning

Observations I

- Site incident response plans focus on site emergencies
 - Flooding was not included in response plans until 2009
 - Focus was internal systems failures, rather than external
- Emergency responders were busy rescuing flood victims and needed to divert resources to evacuate plant area
 - Some flood evacuees prohibited from returning to homes
 - Responding fire department was within evacuation zone
- Communications disrupted by Hurricane Harvey
 - Some residents did not receive evacuation notices
 - Door-to-door notifications required
- Evacuation zone required shutdown of major trucking route for delivery of emergency supplies into Houston

Incident Response Planning

Observations II

- Negative Google / Facebook reviews left online
- National press nearby, elevating to international coverage
 - Journalists reviewed MF public comments submitted to EPA against changes to incident response planning
- Local emergency command (Sheriff's Office) made decisions and issued their own public comments
 - Texas does not allow public release of Tier II Chemical Inventory, but said plant could release if they wanted to
 - MF official "he was balancing the public's right to know and the public's right to be secure"
 - Federal Emergency Management Agency and EPA in DC had different responses than officials onsite

Incident Response Planning

Incident Response Planning

- What does your emergency response plan say about catastrophic weather or terrorism events?
- Does your plan include internal and external risks?
- Is your plan flexible enough to accommodate unexpected or unanticipated events?
- Who is speaking to the public for you?
- Who is speaking to government agencies for you?
- What will you do for the residents you evacuate?
- How will you communicate if power / telephones out?



Thank you

Remember:

- New ozone standard will bring additional requirements
- Air permits are required for compressors
- New compressors must do leak detection and repair
- As of January 1, 2018 Ohio EPA does asbestos training
- Incident response planning needs to consider both internal and external breakdowns

If you have any questions or need any environmental or emergency planning assistance, please contact me.



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