Proposed Amended Rule 1118: Control of Emissions from Refinery Flares

Working Group Meeting #2
October 26, 2022

Join Zoom Webinar

https://scaqmd.zoom.us/j/96627887514

Webinar ID: 966 2788 7514

Teleconference Dial-In: +1 669 900 6833

Image Courtesy: POLITICO

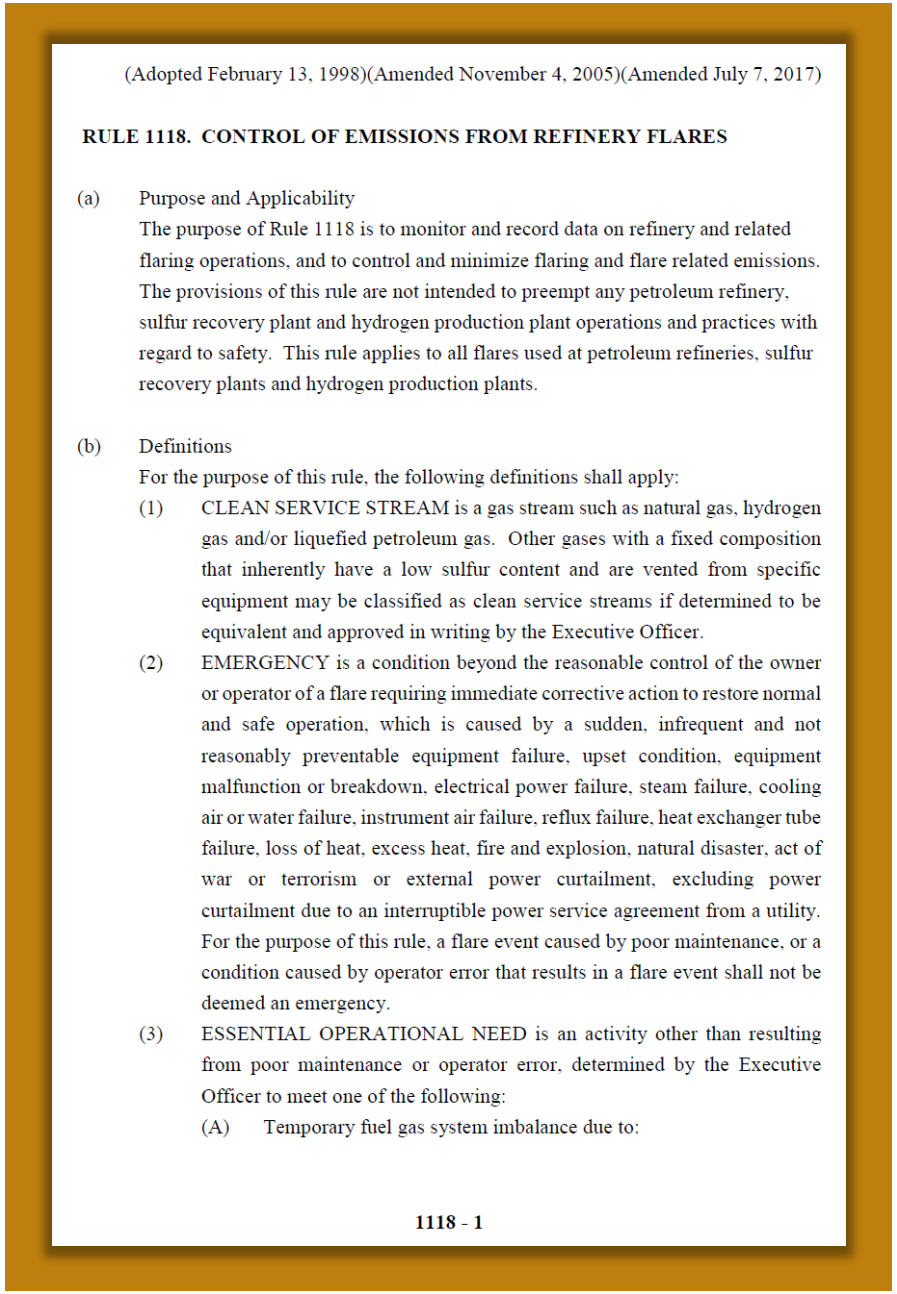
Agenda

- Background
- Summary of Working Group Meeting #1
- Progress Since Working Group Meeting #1
- Presentation by R.A. Nichols Engineering
- U.S. EPA Partial SIP Disapproval of Rule 1118
- Flare Events Data Analysis
- Next Steps

Background on Proposed Amended Rule 1118 (PAR 1118)

Rule 1118 Background

- Rule 1118 was adopted on February 13, 1998, and was amended in 2005 and 2017
- Eight petroleum refining facilities, three hydrogen plants, and one sulfur recovery plant within Los Angeles County operate a total of 31 flares subject to Rule 1118
- Rule 1118 requires facilities to submit notifications and reports, monitor emissions, meet emissions targets, and maintain a public inquiry hotline



(Adopted February 13, 1998)(Amended November 4, 2005)(Amended July 7, 2017)

RULE 1118. CONTROL OF EMISSIONS FROM REFINERY FLARES

(a) Purpose and Applicability

The purpose of Rule 1118 is to monitor and record data on refinery and related flaring operations, and to control and minimize flaring and flare related emissions. The provisions of this rule are not intended to preempt any petroleum refinery, sulfur recovery plant and hydrogen production plant operations and practices with regard to safety. This rule applies to all flares used at petroleum refineries, sulfur recovery plants and hydrogen production plants.

(b) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) CLEAN SERVICE STREAM is a gas stream such as natural gas, hydrogen gas and/or liquefied petroleum gas. Other gases with a fixed composition that inherently have a low sulfur content and are vented from specific equipment may be classified as clean service streams if determined to be equivalent and approved in writing by the Executive Officer.

(2) EMERGENCY is a condition beyond the reasonable control of the owner or operator of a flare requiring immediate corrective action to restore normal and safe operation, which is caused by a sudden, infrequent and not reasonably preventable equipment failure, upset condition, equipment malfunction or breakdown, electrical power failure, steam failure, cooling air or water failure, instrument air failure, reflux failure, heat exchanger tube failure, loss of heat, excess heat, fire and explosion, natural disaster, act of war or terrorism or external power curtailment, excluding power curtailment due to an interruptible power service agreement from a utility. For the purpose of this rule, a flare event caused by poor maintenance, or a condition caused by operator error that results in a flare event shall not be deemed an emergency.

(3) ESSENTIAL OPERATIONAL NEED is an activity other than resulting from poor maintenance or operator error, determined by the Executive Officer to meet one of the following:

(A) Temporary fuel gas system imbalance due to:

1118 - 1

Reason for Rule Amendment

Staff Proposed a 2-Phased Rule Amendment Approach:

Phase One – 2017 Rule Amendment

- Required facilities to prepare and submit a Scoping Document to inform the current rule amendment
- Included a Request for Information on Optical Remote Sensing Technologies

Phase Two – Current Rule Amendment:

- Will rely on Scoping Documents and staff research
- Consider if Optical Remote Sensing Technologies could assist in flare emission reductions or to better characterize flare emissions

Address AB 617 Community Emissions Reduction Plans (CERP) Actions

Assembly Bill 617 (AB 617) Background

- AB 617 signed into law in 2017
  - Statewide strategy to reduce toxic air contaminants and criteria pollutants in designated environmental justice communities
  - Establishes community-focused and community-driven actions to reduce air pollution and improve public health
- Currently six designated AB 617 communities in South Coast AQMD:

Wilmington/Carson/West Long Beach (WCWLB)

San Bernardino/Muscoy (SBM)

East Los Angeles/Boyle Heights/West Commerce (ELABHWC)

Southeast Los Angeles (SELA)

South Los Angeles (SLA)

Eastern Coachella Valley (ECV)

- Most of the refineries located in Wilmington/Carson/West Long Beach

AB 617 Community Emissions Reduction Plans (CERPs)

WCWLB CERP Action items for Rule 1118:

- Lower performance targets and/or increase mitigation fees
- Increase capacity of vapor recovery systems to store gases during shutdowns
- Header modifications for gas diversion with process controls
- Back-up power systems for key process units
- Remote optical sensing for flare emission characterization
- Lower-emission flaring technologies
- Additional flare minimization plans

WCWLB CERP: http://www.aqmd.gov/docs/default-source/ab-617-ab-134/steering-committees/wilmington/cerp/final-cerp-wcwlb.pdf?sfvrsn=8

Summary of Working Group Meeting #1 and Progress Since Meeting

Summary of Working Group Meeting #1

Staff discussed:

- Regulatory background of Rule 1118
- 2017 Rule Amendments
- AB 617 Community Emissions Reduction Plans (CERPS) Action Items for Rule 1118
- Enhanced Flare Event Notification System (FENS)
- Scoping Documents
- Remote Optical Sensing Information Received Through Request For Information

Progress Since Working Group Meeting #1

Compiled and Initiated Flare Event Data Evaluation

- Data submitted in the quarterly reports
- Data collected through FENS

Continued Review of Scoping Plans

Set Up Meetings with Technology Vendors

Scheduling Site Visits To Facilities Subject to Rule 1118

R.A. Nichols Engineering

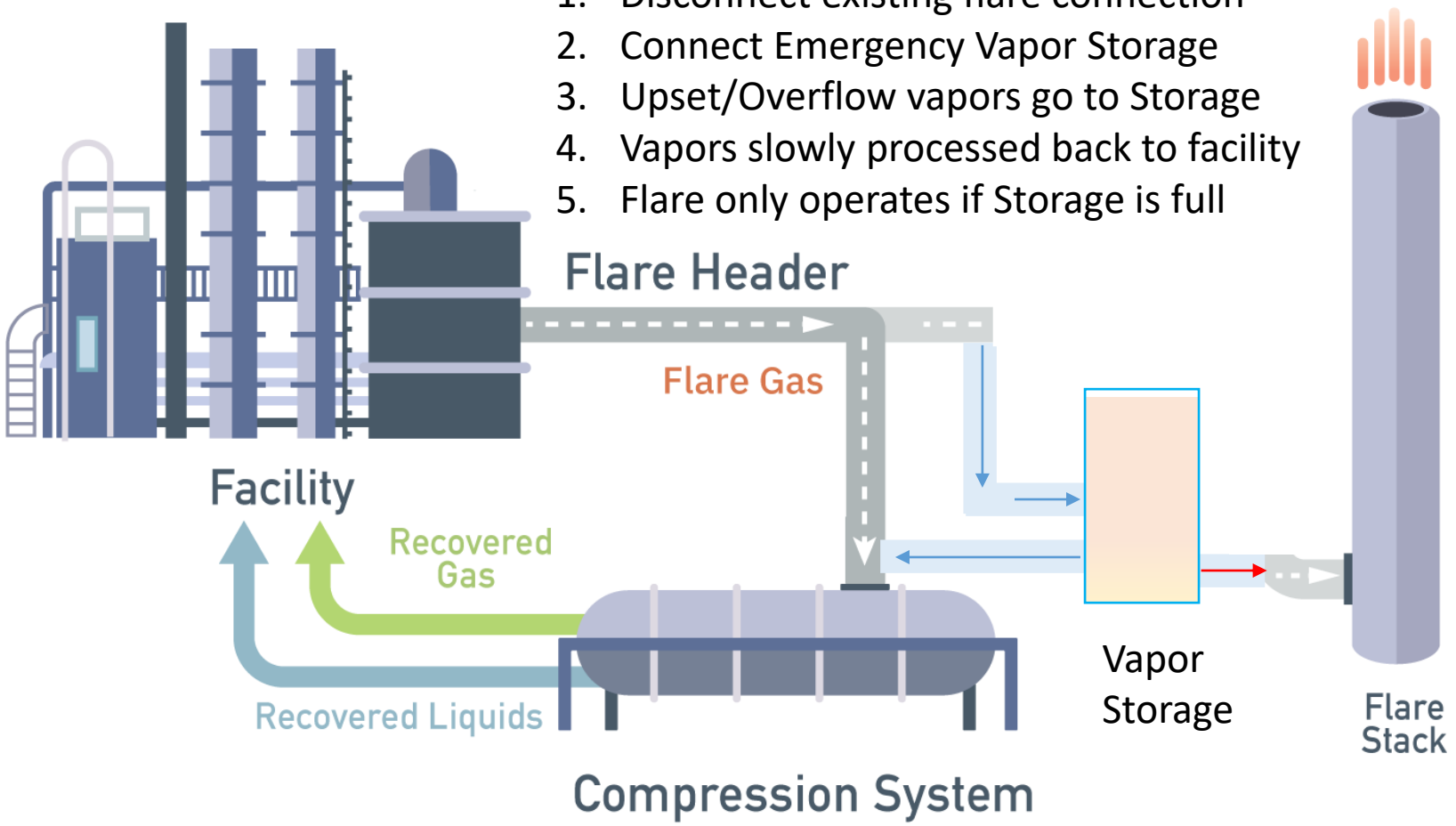
- Information being provided for discussion purposes only and does not indicate staff will include this technology in the technical assessment
- South Coast AQMD is technology neutral and does not endorse any specific technologies
- Staff encourages technology vendors to present during Working Group Meetings to initiate discussions on potential control options

Solutions to Reduce Flaring and Improve Monitoring of Flaring Events at Refineries

RANE
R. A. NICHOLS ENGINEERING
Combustable Vapor Experts

FLARE GAS RECOVERY SYSTEM

1. Disconnect existing flare connection
2. Connect Emergency Vapor Storage
3. Upset/Overflow vapors go to Storage
4. Vapors slowly processed back to facility
5. Flare only operates if Storage is full



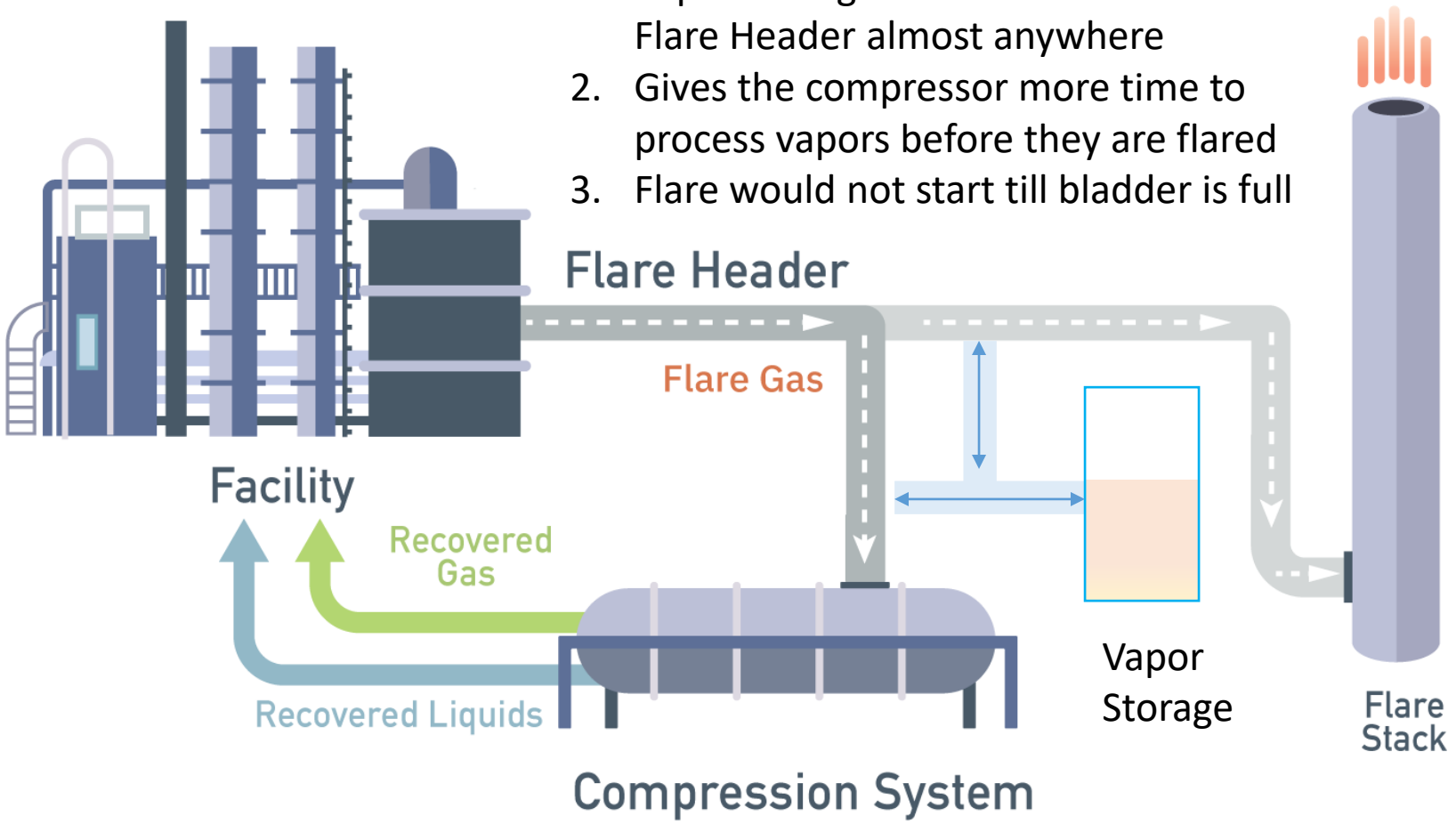
Solution #1. Dedicated Emergency Vapor Storage

Benefits of Dedicated Emergency Vapor Storage

- **Reduced Emissions and Reduced Flare Run time**. The larger the vapor storage volume capacity the more time the facility would have to process the vapors by other processes leading to less flare usage and reduced emissions
- **More control over when flaring events occur**. If the vapor volume is partially full, the refinery could schedule the time of day to flare when it has the least impact on all parties concerned.
- **Built in warning system and emergency flaring event detection**. The vapor volume capacity is easy to monitor. If it reaches full capacity, it confirms that a flaring event has occurred. Monitoring vapor capacity can give a warnings as to when a flaring event may happen.

FLARE GAS RECOVERY SYSTEM

1. Vapor Storage can be connected to the Flare Header almost anywhere
2. Gives the compressor more time to process vapors before they are flared
3. Flare would not start till bladder is full



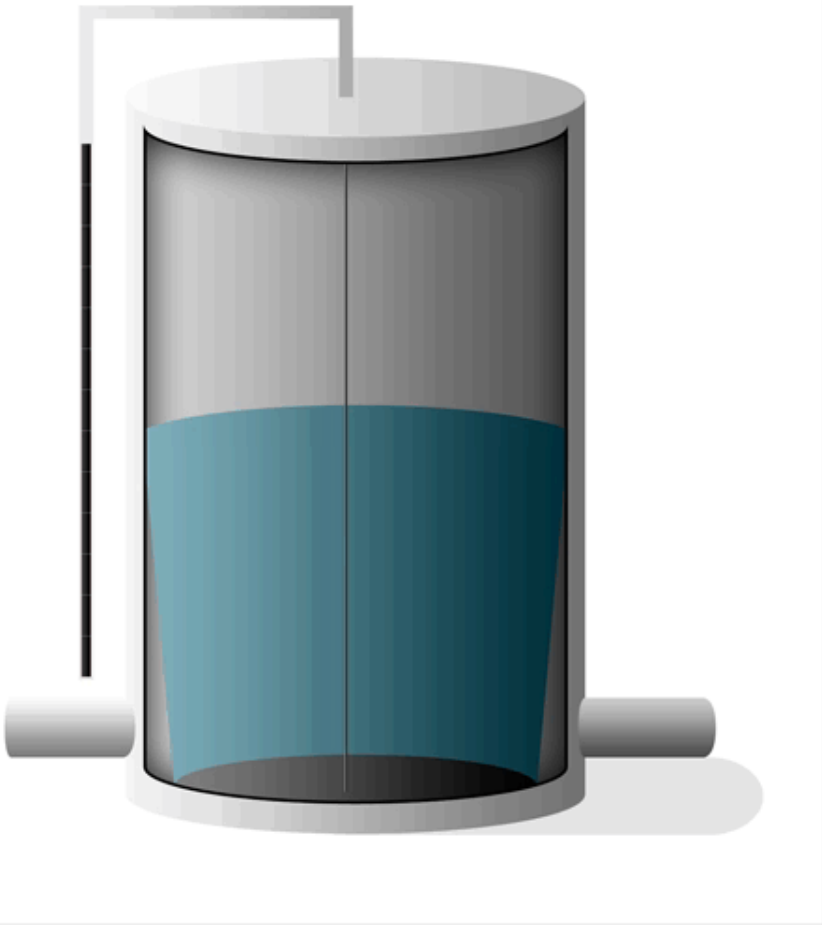
Solution #2 - Increase Vapor Storage anywhere in Collection System

Benefits of Additional Vapor Storage

- **The refinery has more options as to where add vapor storage capacity.** Vapor storage can be added as stand alone or tank integrated as well as be physically located further away from the flare.
- **Isolate various vapor streams to optimize future use and/or more efficient abatement.** Multiple Vapor bladders can be installed throughout the refinery dedicated to specific vapor streams.
- **Proven Technology.** Vapor Storage already exists in some Refinery Vapor Collection Systems in spherical tanks. Vapor Storage is industry standard is petrochemical marketing terminals, wastewater & organic recycling industries in Southern California.

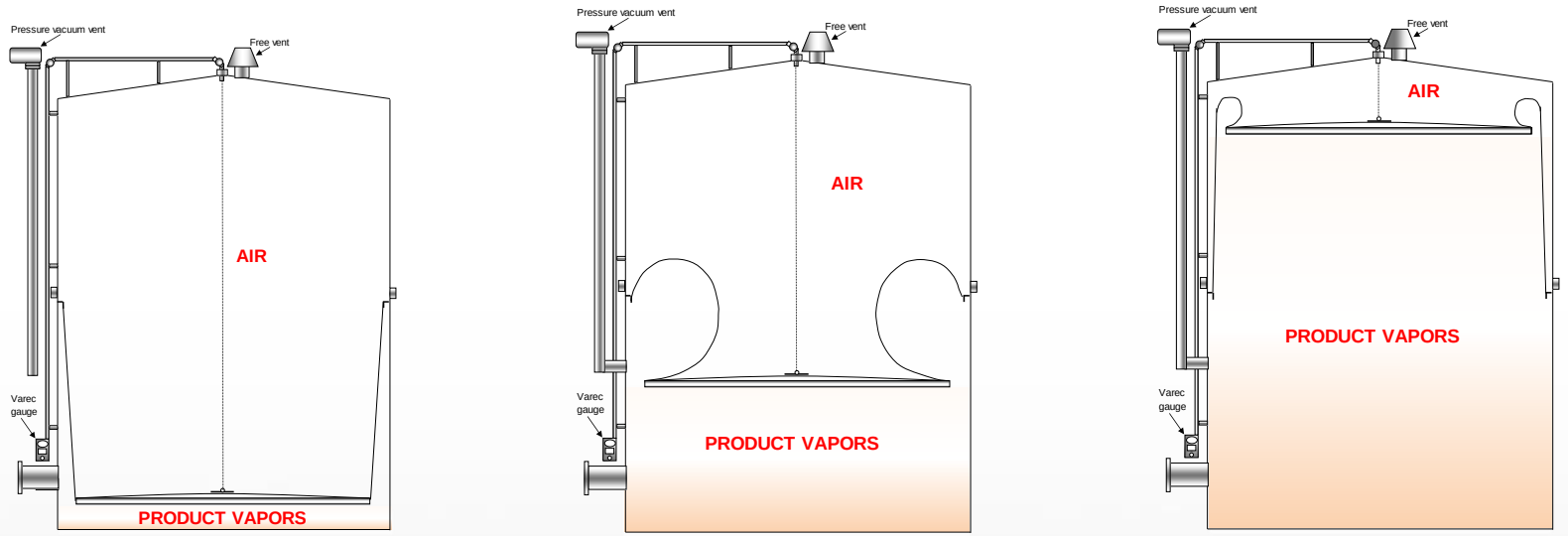
Stand Alone Vapor Storage Tanks

- Tank holds only vapor
- Can be retro-fitted into almost any existing tank
  - Bolted or Riveted Tanks
  - Tanks no longer suited for liquid service that might be demolished
  - Spherical tanks
- Different fabrics available depending on type of vapor to be stored and temperature
- Diameters from 10’ – 150’
- Total Cubic Storage from 2,000 to 800,000 Cubic Feet



RANE Ring Stand Alone Vapor Storage Tanks

- 20 Rane Rings currently operate in the SCAQMD.
- Easy to operate, maintain and replace
- Improvements in fabric manufacturing as well as design mean much longer service life ~15-20 years



Showing the inside of a RANE Ring vapor bladder as it fills with vapor

Tank Integrated Vapor Storage Solutions – Two types

Tank Breather Bag

For fixed roof tanks with no internal floating roof

- Turns tank into a variable volume vapor space tank without disturbing liquid storage operations.
- An enclosed pillow tank is installed inside the vapor space of the tank
- The volume of air inside the pillow tank translates directly to vapor storage capacity inside of the tank.

Enclosed Vapor Storage

For IFR roof tanks with external domes

- Uses an enclosed pillow tank in the air space between the IFR and dome as a vapor storage space.
- The volume of air inside the pillow tank translates directly to vapor storage capacity.

Bottom line – Why add Vapor Storage

- Proven technology that can reduce flare time and associated vapor emissions by giving the refinery extra time to abate or reuse vapors instead of flaring them.
- Utilize existing equipment and processes already in place at the refinery which will hopefully be the easiest and most cost-effective way to track and reduce flaring

U.S. EPA Partial State Implementation Plan (SIP) Disapproval of Rule 1118

Background on State Implementation Plan (SIP)

- Districts exceeding National Ambient Air Quality Standards (NAAQS) are required to develop and submit a State Implementation Plan (SIP) for U.S. EPA approval
- A SIP consists of rules and documents that a state or local air district implements, maintains, and enforces to fulfill requirements of the Clean Air Act (CAA)
- SIPs are used to demonstrate how the region will meet the standards
- Regions must attain the NAAQS by specific dates or face the possibility of sanctions by the federal government and other consequences under CAA
  - Sanctions may include increased permitting fees, stricter restrictions for permitting new projects, and the loss of federal highway funds

U.S. Environmental Protection Agency Final Action on Rule 1118 (Amended July 7, 2017)

- On September 21, 2022, the U.S EPA announced a limited approval and limited disapproval of amendments to Rule 1118
- Staff is proposing a limited amendment to the rule to address EPA's disapproval
- Staff will continue the current rule amendment development efforts to reduce flaring

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[FR Doc. 2022–20421 Filed 9–21–22; 8:45 am]

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R09–OAR–2021–0943; FRL–9372–02–R9]

Air Plan Limited Approval and Limited Disapproval; California; South Coast Air Quality Management District; Refinery Flares

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is finalizing a limited approval and limited disapproval of revisions to the South Coast Air Quality Management District (SCAQMD) portion of the California State Implementation Plan (SIP). These revisions concern emissions of volatile organic compounds (VOCs) and oxides of nitrogen (NO_X) from refinery flares. Under the authority of the Clean Air Act (CAA or the Act), this action simultaneously approves a local rule that regulates these emission sources and directs California to correct rule deficiencies.

DATES: This rule will be effective on October 24, 2022.

ADDRESSES: The EPA has established a docket for this action under Docket No. EPA–R09–OAR–2021–0943. All documents in the docket are listed on the *https://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.*, Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy form. Publicly available docket materials are available through *https://www.regulations.gov,* or please contact the person identified in the **FOR FURTHER INFORMATION CONTACT** section for additional availability information. If you need assistance in a language other than English or if you are a person with disabilities who needs a reasonable accommodation at no cost to you, please contact the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

FOR FURTHER INFORMATION CONTACT: Donnique Sherman, EPA Region IX, 75 Hawthorne St., San Francisco, CA 94105. By phone: (415) 947–4129 or by email at *sherman.donnique@epa.gov.*

SUPPLEMENTARY INFORMATION: Throughout this document, "we," "us" and "our" refer to the EPA.

Table of Contents

I. Proposed Action

On March 25, 2022 (87 FR 17060), the EPA proposed a limited approval and limited disapproval of the following rule that was submitted for incorporation into the California SIP.

Local agency	Rule No.	Rule title	Amended	Submitted
SCAQMD	1118	Control of Emissions from Refinery Flares	07/07/2017	02/16/2018

https://www.federalregister.gov/documents/2022/09/22/2022-20137/air-plan-limited-approval-and-limited-disapproval-california-south-coast-air-quality-management

EPA Proposed Limited Approval and Limited Disapproval of Amendments to South Coast AQMD Rule 1118

- EPA proposed a limited approval because Rule 1118 improves the SIP and is largely consistent with the relevant CAA requirements
- EPA proposed a limited disapproval stating that Rule 1118 Section (j) provides "unbounded director's discretion"

Specifically, the rule does not satisfy the requirements of CAA section 110 and part D

Documents submitted for inclusion into the SIP should not include unbounded director's discretion that allows the State to approve alternatives to the applicable SIP without following the SIP revision process described in CAA section 110	Rule 1118 Section (j) provides the Executive Officer the authority to approve American Society for Testing and Materials (ASTM) methods other than those currently included in the rule	Without further specificity regarding how this authority will be exercised, it could functionally allow for a revision of the SIP without complying with the process for SIP revisions required by the CAA	This undermines the enforceability of the submission, constitutes a SIP deficiency, and conflicts with CAA Section 110

Rule 1118 Paragraph (j)(1)

- Current Language

Rule 1118 (Cont.) **(Amended July 7, 2017)**

(j) Testing and Monitoring Methods

(1) For the purpose of this rule, the test methods listed below shall be used:

(A) The higher (gross) heating value of vent gases shall be determined by:

(i) ASTM Method D4809-13, ASTM Method D 3588-98(2011), ASTM Method D4891-13, or other ASTM standard as approved by the Executive Officer, and

(ii) With a higher heating value analyzer that meets or exceeds the specifications in Attachment A.

Proposed Amendment to Rule 1118 Paragraph (j)(1)

- Proposed Amended Language to Address U.S. EPA's Disapproval

Rule 1118 (Cont.) **(Amended July 7, 2017)**

(j) Testing and Monitoring Methods

(1) For the purpose of this rule, the test methods listed below shall be used:

(A) The higher (gross) heating value of vent gases shall be determined by:

(i) ASTM Method D4809-13, ASTM Method D 3588-98(2011), ASTM Method D4891-13, or other ASTM standard as approved by the Executive Officer, the California Air Resources Board and the U.S. Environmental Protection Agency, as applicable; and

(ii) With a higher heating value analyzer that meets or exceeds the specifications in Attachment A.

Rule Amendment Schedule

Staff will release Draft Rule Language and a Board Letter, which will explain the reason for the revisions to the rule language

- Documents released no later than the end of the year
- Staff intends to limit changes to only address SIP disapproval to expedite U.S. EPA's review

Public Hearing will be held in the first quarter of 2023

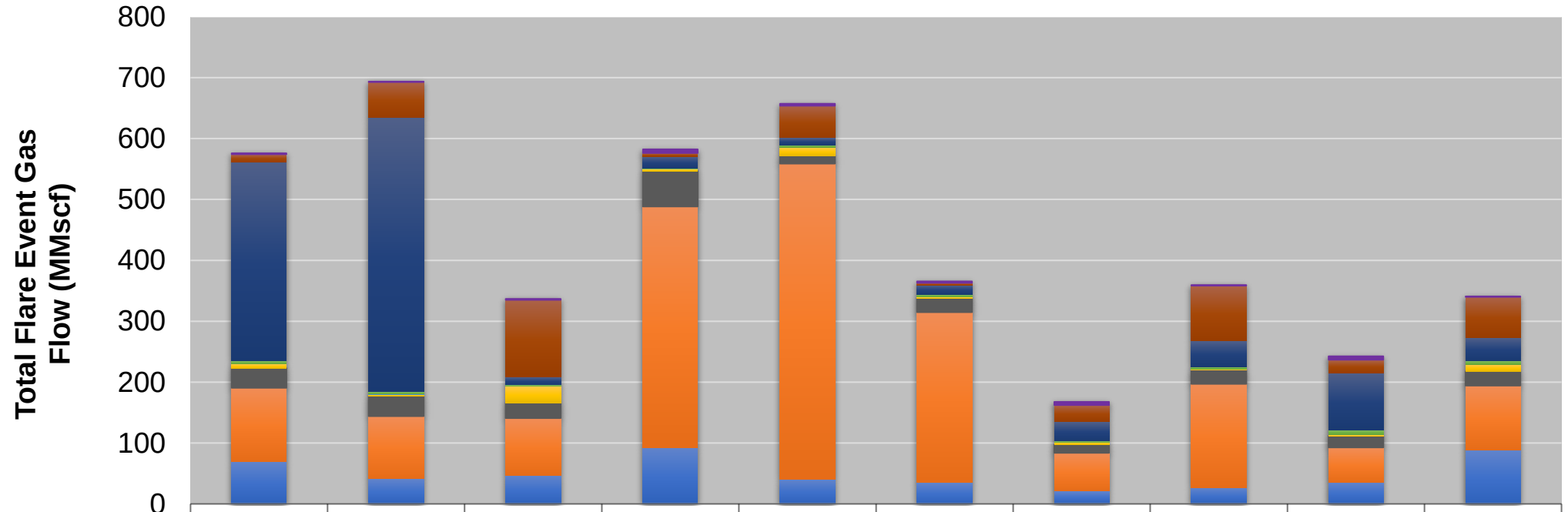
Staff will continue broader rule development efforts to reduce refinery flaring

Preliminary Flare Event Data

Background on Flare Events Data Availability

- Facilities have been submitting quarterly reports to South Coast AQMD for more than a decade
- An enhanced version of Flare Event Notification System (FENS) was first launched in 2019 and it was updated in 2020 to include new features
  - Includes an interactive map, real time data, wind speed and direction at each facility location, list of recent events and historical flaring information
- Facilities have been using FENS to report the flare events that exceed the thresholds specified in Rule 1118
  - FENS reserves the data for the reported flare events since 2019
- Flare events are individually labelled as “Planned” or “Unplanned” in FENS while quarterly reports use a more detailed list of flare event causes (13 types)
- Staff intends to present these two sources of data for the purpose of a thorough analysis of flare event frequency and magnitude

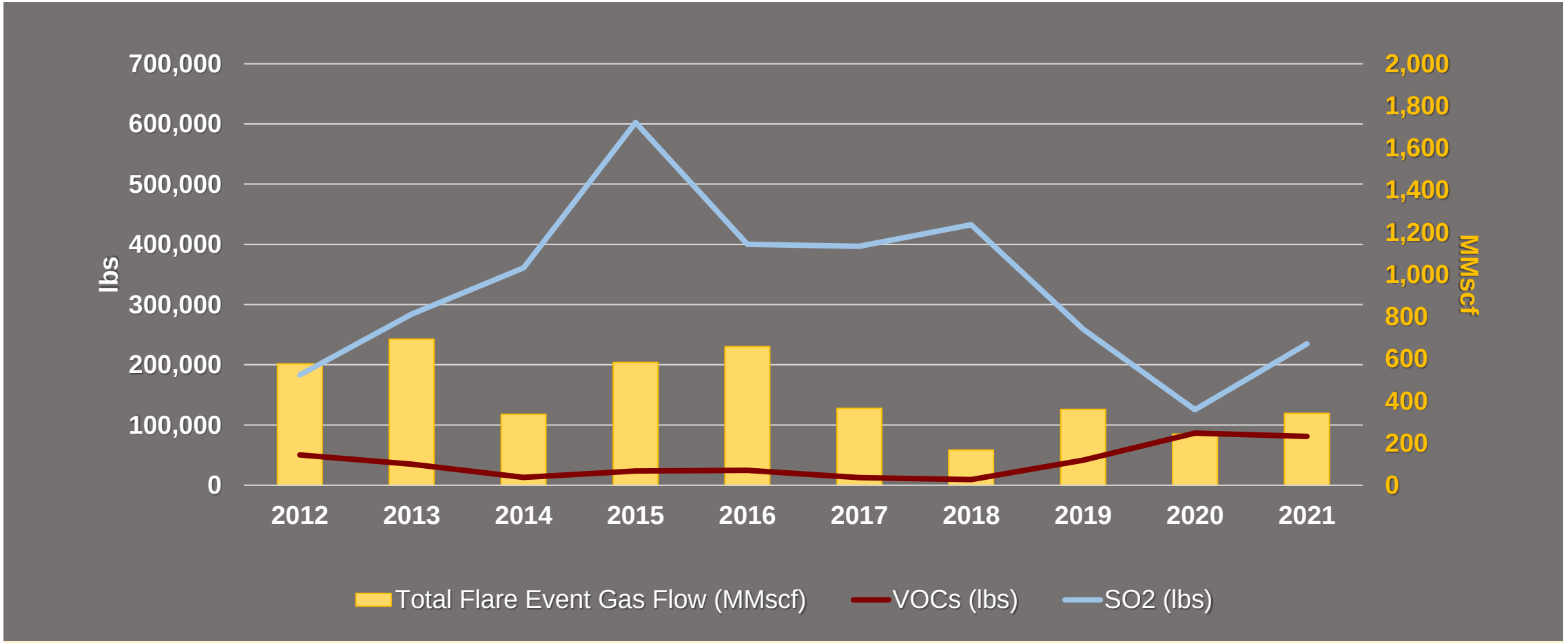
Historical Vent Gas Flared as Reported by Refineries in Quarterly Reports*



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Altair Paramount	1.8	0.8	1.8	5.8	3.4	2.4	5.2	0.7	5.5	0.9
Chevron Products Co.	12.8	58.6	126.0	5.9	52.7	3.6	27.6	90.2	21.7	66.4
Marathon LAR Carson	326.0	449.3	13.3	19.3	11.5	15.1	31.5	42.7	93.5	38.4
Marathon LAR Wilmington	5.4	4.3	2.4	1.6	3.6	4.2	1.7	4.4	8.2	6.1
Marathon SRP	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Phillips LAR Carson	6.8	2.9	27.2	2.9	14.1	2.3	4.2	1.3	2.1	11.3
Phillips LAR Wilmington	32.1	33.3	24.8	58.4	13.0	22.8	13.3	22.9	18.7	23.4
Torrance Refining Company	121.7	102.9	94.3	395.3	518.4	280.0	62.8	169.9	57.2	106.6
Valero/Ultramar	69.2	41.3	46.9	93.0	40.6	34.9	21.2	27.1	35.6	87.8

* Chart does not include Hydrogen Plants subject to Rule 1118, that data will be presented in a future Working Group Meeting.

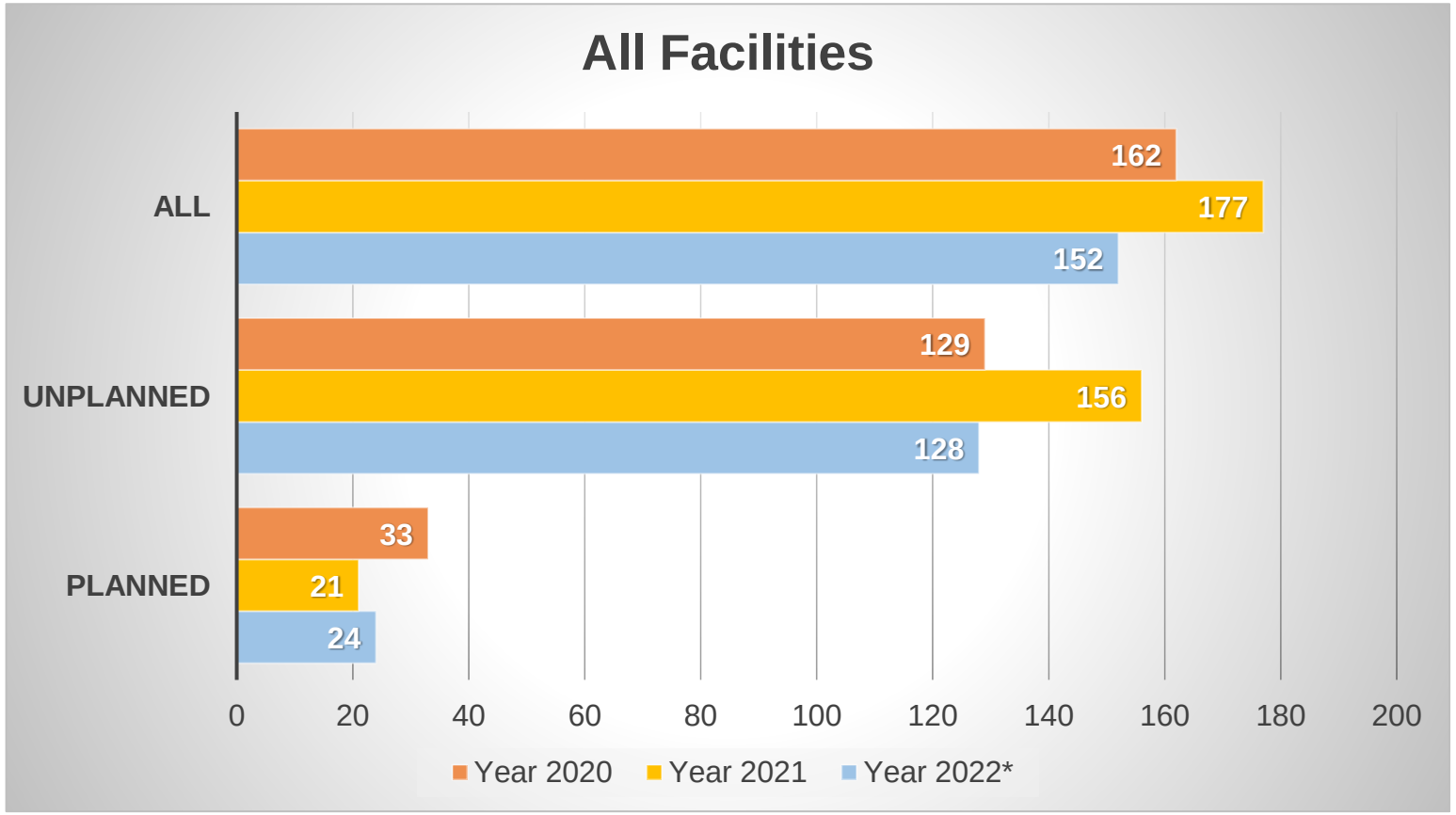
Summary of Annual Flaring Emissions as Reported by Refineries in Quarterly Reports*



* Chart does not include Hydrogen Plants subject to Rule 1118, that data will be presented in a future Working Group Meeting.

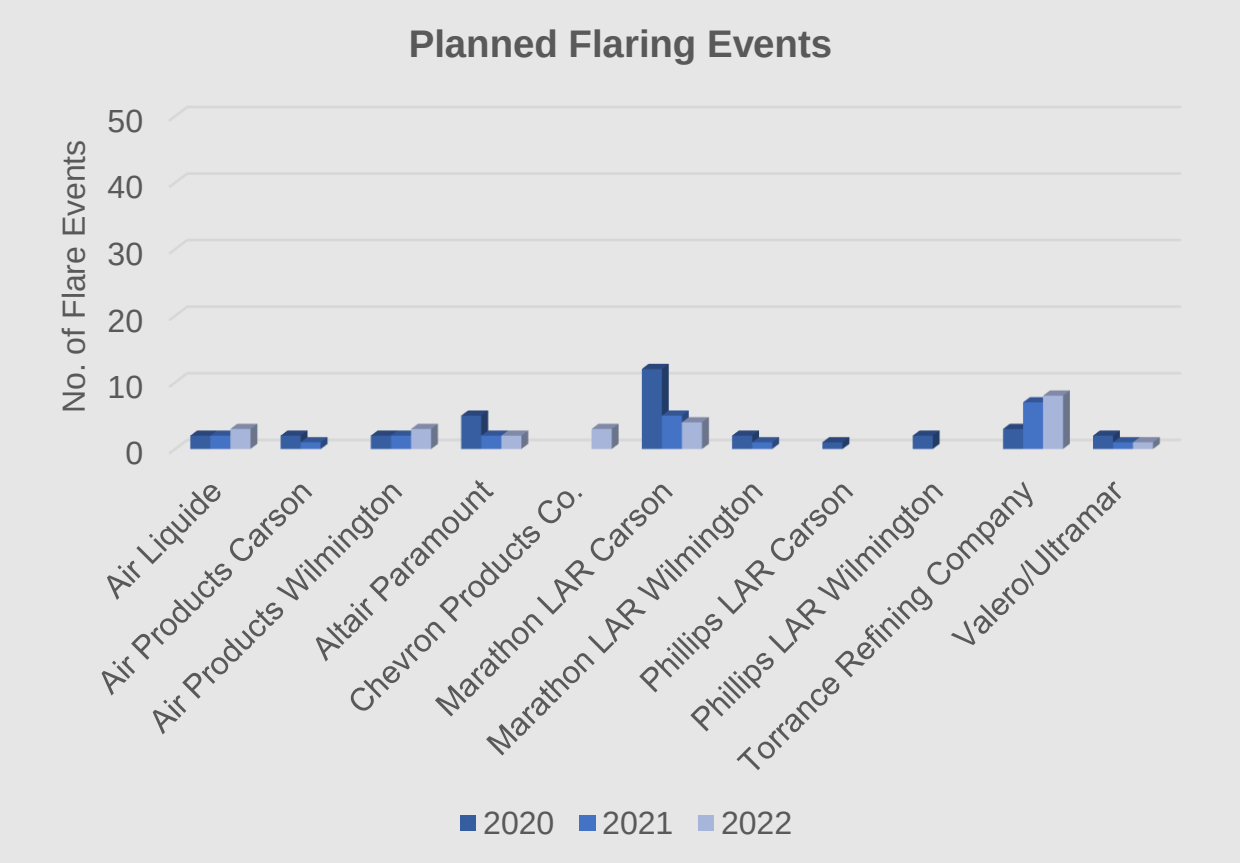
Note: Increase in VOC emissions during the recent years reflects an increase in the VOCs emission factor adopted in the 2017 amendment

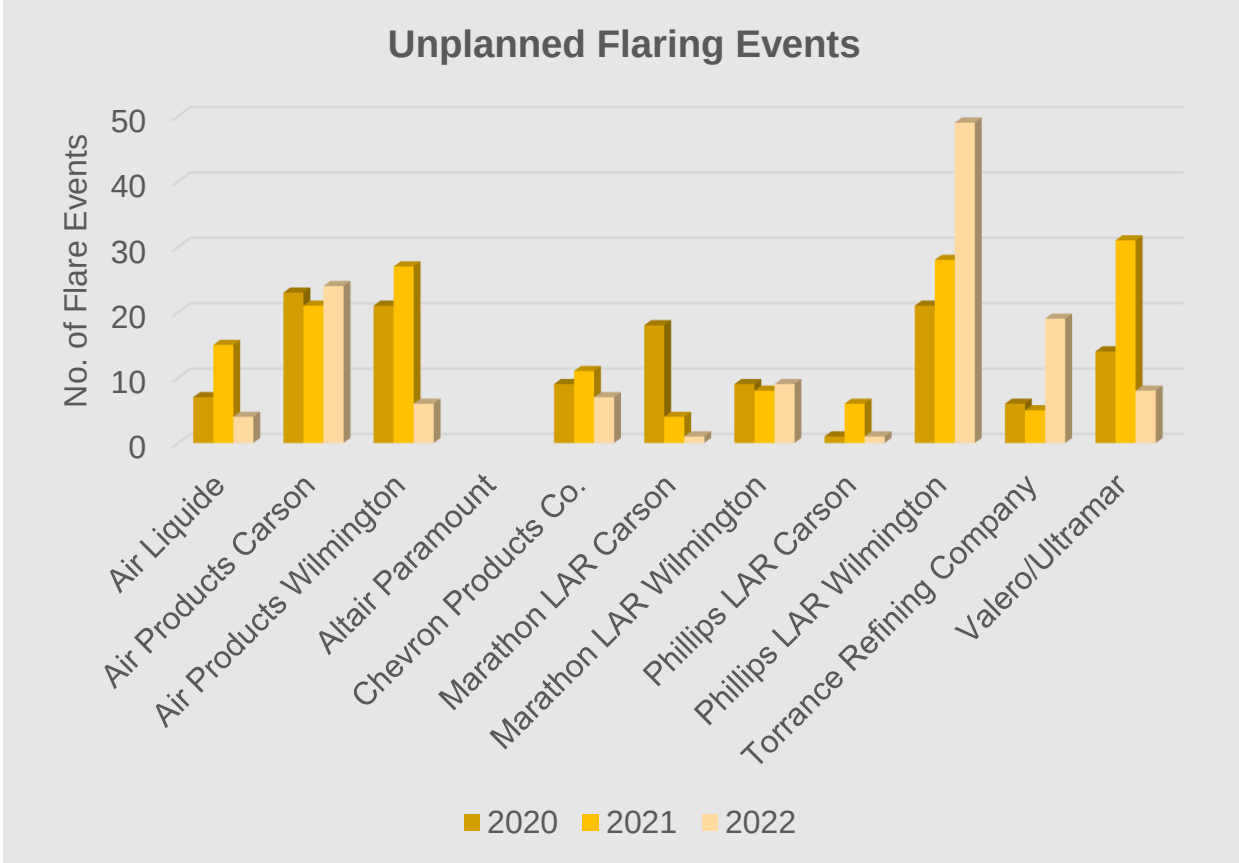
FENS – Total Count of Flare Events (2020-2022)



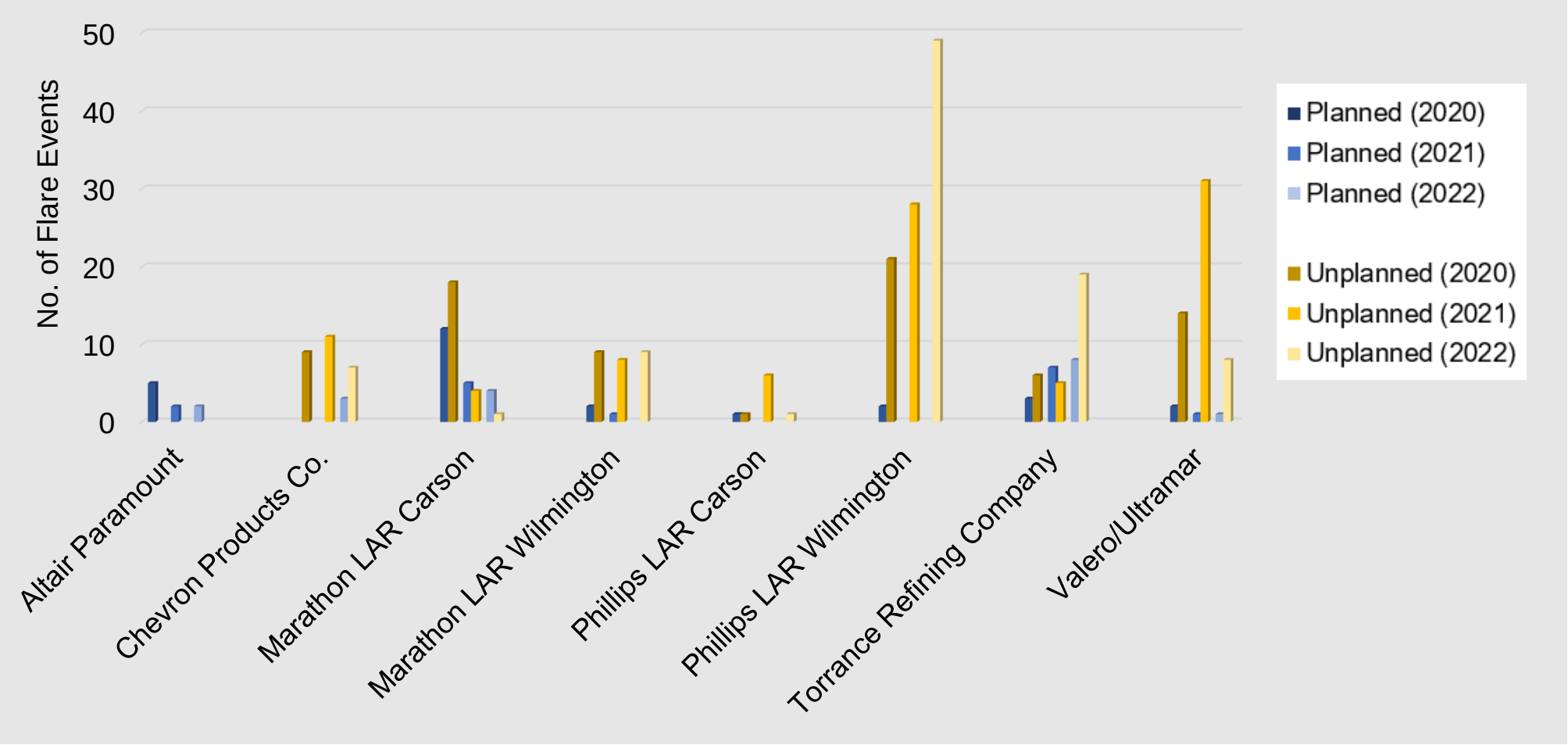
* Year 2022 includes flare events occurred by October 20, 2022

FENS – Planned vs. Unplanned Flare Events (2020-2022)

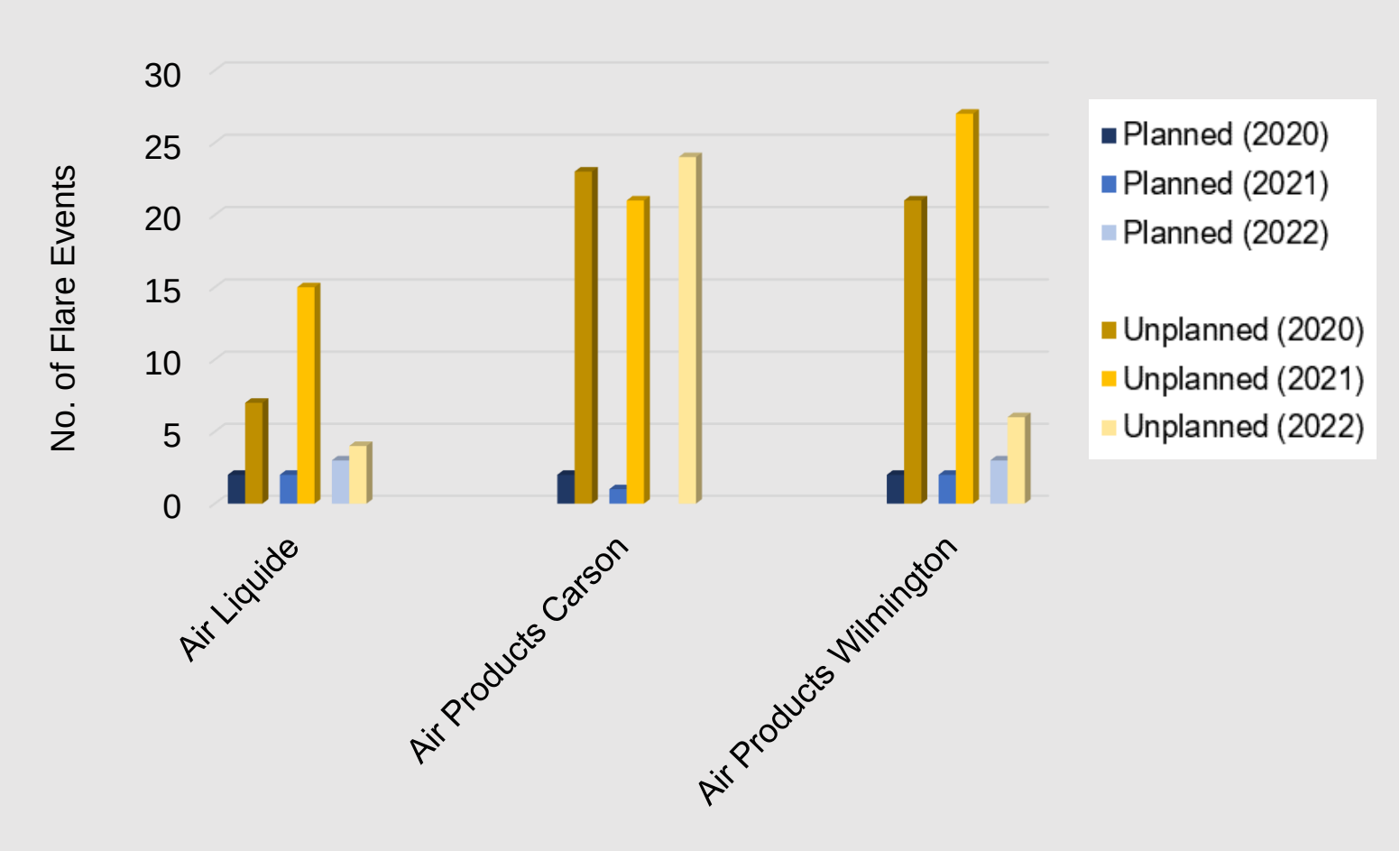




FENS – Count of Flare Events (2020-2022) at Refineries



FENS – Count of Flare Events (2020-2022) at Hydrogen Plants



Next Steps

Continue Information Gathering

- Further Evaluate Technologies and Techniques to Reduce Flaring
  - Dive deeper into scoping plans
  - Meet with optical remote sensing manufacturers to seek updates
    - Invite to present in future meetings
- Continue Meeting with Stakeholders and Site Visits
  - Scheduling site visits with all facilities subject to Rule 1118
- Continue with Working Group Meetings

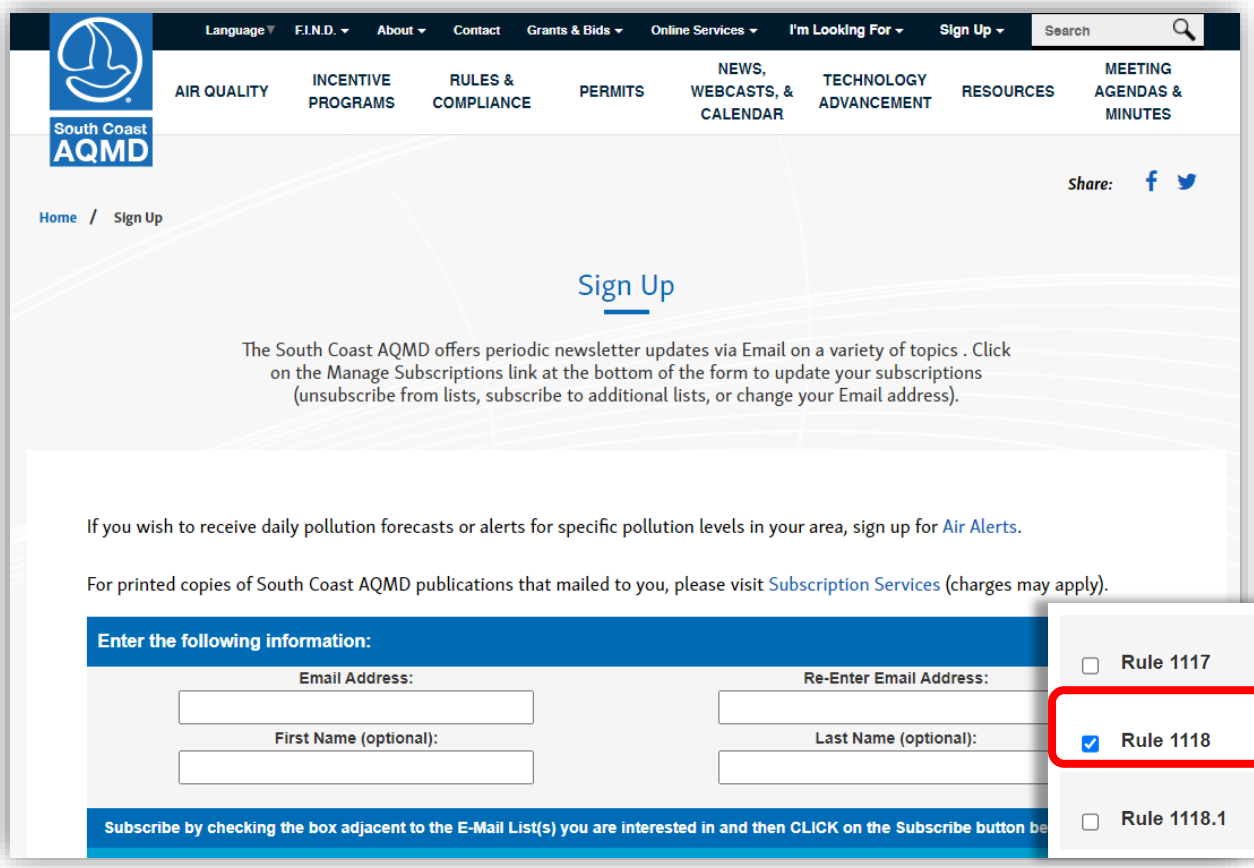
SIP Fix Amendment

- Stationary Source Meeting – November 18, 2022
- Release Draft Rule Language – End of the Year
- Public Hearing – First Quarter 2023

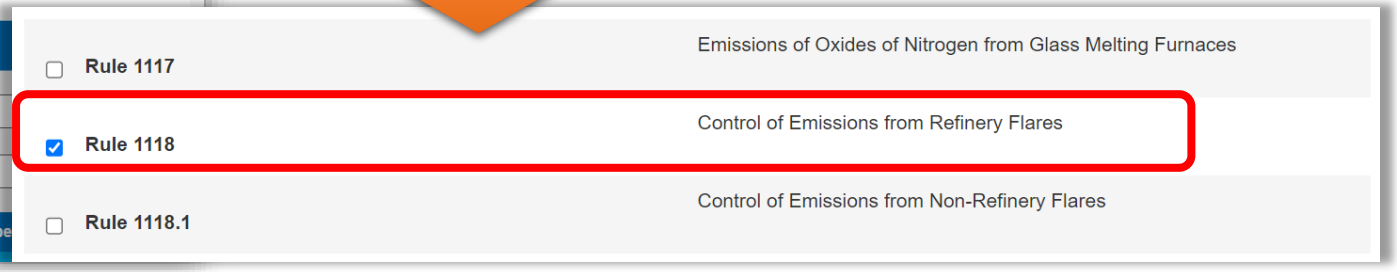
Image Courtesy: POLITICO

Staying Updated with PAR 1118

- Sign up and receive email updates via: http://www.aqmd.gov/sign-up



Subscribe by scrolling down the page and checking off the box for Rule 1118 to receive future meeting notices and links to documents



Additional Information on Rule 1118

- South Coast AQMD website has further information on Rule 1118 including:
  - Link to FENS
  - Contact information for the Rule 1118 facilities
  - Information on subscription to receive community notifications and information via email
  - Supporting documents including files from past rule amendments
  - Frequently asked questions
- Access through the following link:
  http://www.aqmd.gov/home/rules-compliance/compliance/r1118

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