HON RTR Process Vents and NSPS NNNa/RRRa Vents

2023 A&WMA Conference – Louisiana

CK Associates
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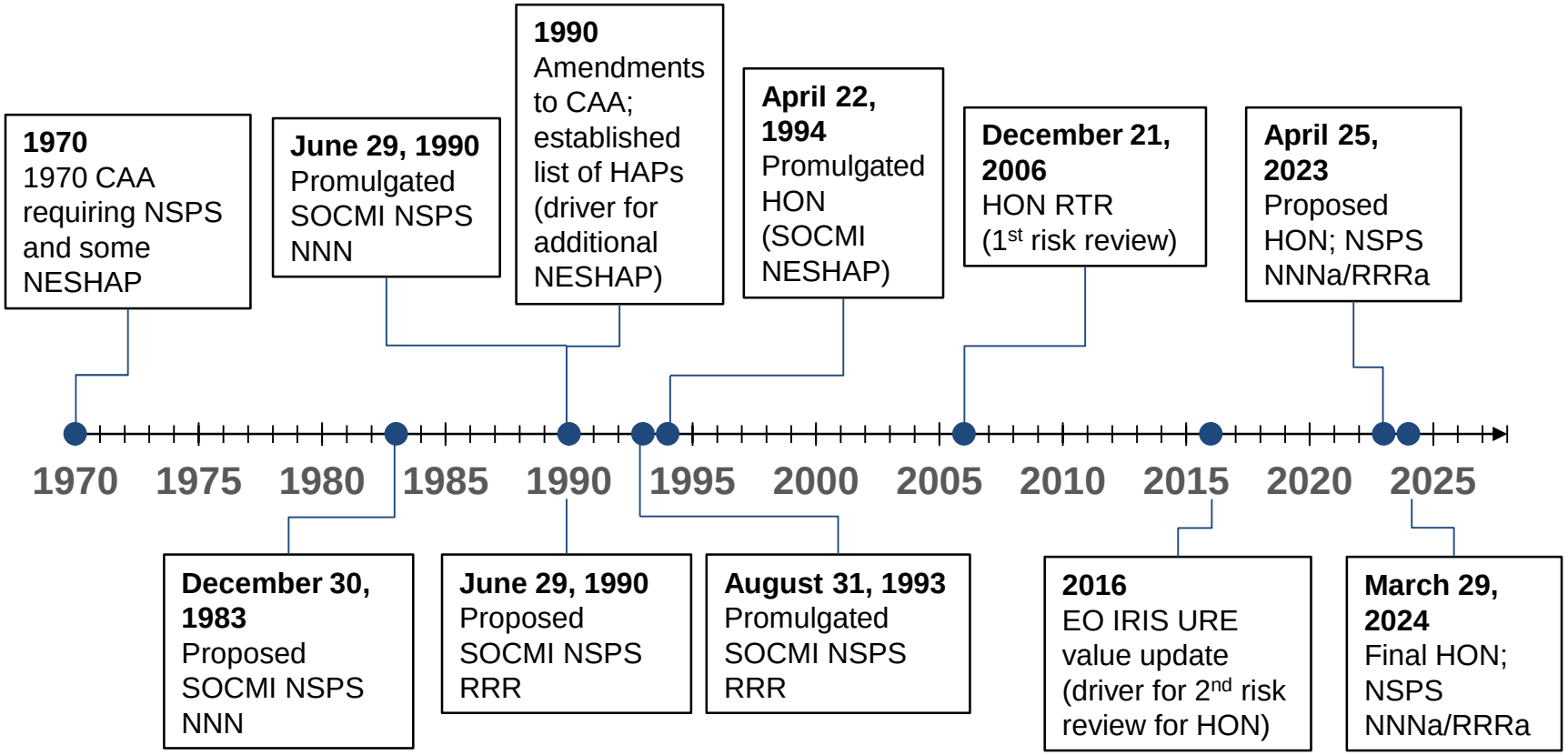
Objective

- To provide a high-level overview of the proposed HON process vent provisions from the HON residual risk and technology review (RTR) as well as the proposed NSPS NNNa/RRRa vent provisions
- To provide understanding of the “why” behind EPA implementing the proposed rules
- To describe overlapping applicability between all 3 rules
- Compliance deadlines

Background

- CAA section 111 – review performance of NSPS every 8 years and if appropriate, revise
  - NSPS utilizes the BSER (best system of emission reduction) in achieving emission limitations
    - BSER must be adequately demonstrated in the affected industry
    - Review accounts for the expected growth of source category, pollution control measures, costs, non-air quality health and environmental impacts, energy, etc.
  - If there is a better system of emission reduction from review, EPA will develop performance standards that reflect the BSER to apply to new, reconstructed, and modified facilities
- CAA section 112 – NESHAP
  - Technology review of MACT standards every 8 years taking into account developments in practices, processes, and control technologies
  - Risk review within 8 years after initial promulgation of the NESHAP with MACT standards
    - Determines if risk level is acceptable and if MACT standards provide an ample margin of safety to protect public health and prevent an adverse environmental effect

Trajectory of Rulemakings



HON: 40 CFR Part 63 Subparts F, G, H, and I
NSPS NNN: 40 CFR Part 60 Subpart NNN
NSPS RRR: 40 CFR Part 60 Subpart RRR

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Who is Affected by the Proposed HON?

- HON: **New and existing** process vents from CMPUs (chemical manufacturing process units) that meet the gas stream characteristics in 63.107
  - To atmosphere or entry into a control device
  - Gas stream originates as a continuous flow from an air oxidation reactor, distillation unit, or reactor during operation of a CMPU
    - Applies to gas streams passing solely through associated recovery devices
  - >0.005 wt% (>50 ppmw) total OHAP
  - Does not meet listed exemptions in 63.107(h) (e.g., gas transferred for recovery reasons)

- HON process vents "in ethylene oxide (EO) service"

- Chlorinated process vents emitting dioxins/furans

Who is Affected by the Proposed NSPS NNNa/RRRa?

- [NNNa, RRRa]: Affected facilities [distillation units, reactor processes] within the SOCMI source category that commence construction, reconstruction, or modification **after April 25, 2023** that are part of a process unit that produces any of the chemicals listed in [60.667a, 60.707a] as a product, co-product, by-product, or intermediate

- Must not meet any listed exemption; examples:
  - NNNa: vent stream flow rates <0.008 scm/min (must still comply with testing and recordkeeping/reporting requirements)
  - RRRa: reactor process vents routed to an NNNa distillation unit
  - Batch operations

Documentation EPA Reviewed for NSPS and HON Technology Review

- RACT/BACT/LAER Clearinghouse (RBLC) database
- State/local rules and other federal regulatory developments pertaining to process vents
- Facility CAA section 114 ICR (information collection requests)

Review of NSPS NNN/RRR – Proposed NSPS NNNa/RRRa

- Removal of PRD exemption from “vent stream” definition
  - From review of RBLC database, one facility prohibited PRD releases

- Prohibition of bypassing an APCD (air pollution control device)
  - Consistent with EMACT, MON, and Petroleum Refineries NESHAP
  - Use of bypass line is a violation
  - Will address ambiguity with reactor processes bypassing an APCD

NSPS Review and HON Technology Review

HON Technology Review	NSPS NNN/RRR Review
Proposed HON MACT ➢ MACT standards for Group 1 process vents remain unchanged – flare, or reduce total OHAP by 98% by wt. or reduce OHAP conc. to <=20 ppmv • Based primarily on review of RBLC database • New flaring standards [63.108] o Consistent with EMACT, MON, and Petroleum Refineries NESHAP o Addresses combustion efficiency degradation	**Proposed NSPS NNNa/RRRa BSER** ➢ BSER standards unchanged – reduce TOC by 98% by wt. or reduce TOC conc. to <=20 ppmv • Flare, or non-flare control device and/or recovery device allowed for use of achieving BSER • New flaring standards [60.669a; 60.709a] o Consistent with EMACT, MON, and Petroleum Refineries NESHAP o Addresses combustion efficiency degradation

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NSPS Review and HON Technology Review (continued…)

- Removal of TRE (total resource effectiveness) index value
  - Based on review of facility data from CAA section 114 requests
    - Facilities routing multiple streams to a single APCD
    - Many streams voluntarily controlled despite TRE
    - Uncertainties with input parameters
    - EPA deems this as a "theoretical characterization tool" difficult to enforce
  - Removal of control option, "TRE index value >1.0" from both standards

- Standards apply at all times, even during SSM
  - 2008 *Sierra Club v. EPA* decision from U.S. Court of Appeals for the District of Columbia Circuit
    - EPA determined this applies equally to CAA section 111

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Technology Review for HON Process Vents (continued…)

- Group 1 process vent redefined; Group 1 definition options
  - **PV1: Total OHAP emissions >=1.0 lb/hr – $7,200/ton HAP reduced**
  - PV2: Total OHAP emissions >=0.1 lb/hr – $19,400/ton HAP reduced
  - PV3: Total OHAP conc. >=50 ppmv, volumetric flow rate >=0.005 scm/min, and TRE index value <=5.0 – $7,300/ton HAP reduced
- All were considered developments in practices, processes, and control technologies
- PV1 most cost-effective and does not rely on TRE index value; hence, selected as the new Group 1 definition
- Halogenated Group 1 process vents must reduce dioxins/furans (toxic equivalency basis) to a concentration of 0.054 ng/dscm
  - HON facilities that manufacture chlorinated SOCMI chemicals
  - HON currently does not regulate dioxin/furan emissions
  - MACT floor – 3 x RDL = 0.054 ng/dscm

Technology Review for HON Process Vents (continued…)

- With changes to Group 1 definition, Group 2 was redefined
- Group 2 process vents are not required to be monitored
- Group 2 process vents are required to verify their total OHAP emissions in accordance with the proposed methods/procedures in 63.115(g)

Documentation EPA Reviewed for HON Risk Review

- Emission Data
  - 2017 NEI and TRI from HON facilities
  - Facility CAA section 114 ICR

- Facility lists
  - NAICS codes beginning with 325, chemical manufacturing
  - Facilities from 2006 HON RTR
  - Office of Enforcement and Compliance Assurance's (OECA) Enforcement and Compliance History Online (ECHO) tool
  - American Chemistry Council (ACC) lists
  - Title V Permits, internet searches, and outreach to state agencies for inaccessible permits

Risk Review for HON Process Vents

- Calculated risk for entire SOCMI source category: 2,000-in-1 million driven primarily by EO emissions
- 2 HON facilities presented MIR >100-in-1 million from EO emissions from process vents
- Proposed to apply the same "in EO service" definition and EO control standards that were set in the MON RTR
- In EO service: *each Group 1 and Group 2 process vent in a process that, when uncontrolled, contains a concentration of >=1 ppmv undiluted EO, and when combined, the sum of all these process vents would emit uncontrolled, EO emissions >=5 lb/yr (2.27 kg/yr)* [63.101]
- EO controls [63.113(j)]
  - Vent emissions through a closed vent system to a control device reducing emissions by >=99.9% by wt., or to an EO conc. <1 ppmv for each process vent or to <5 lb/yr from all combined process vents; or
  - Vent emissions to a flare achieving the new HON flaring requirements under 63.108
    - Can send no more than 20 tpy of EO to all flares combined from an affected source [63.108(p)]

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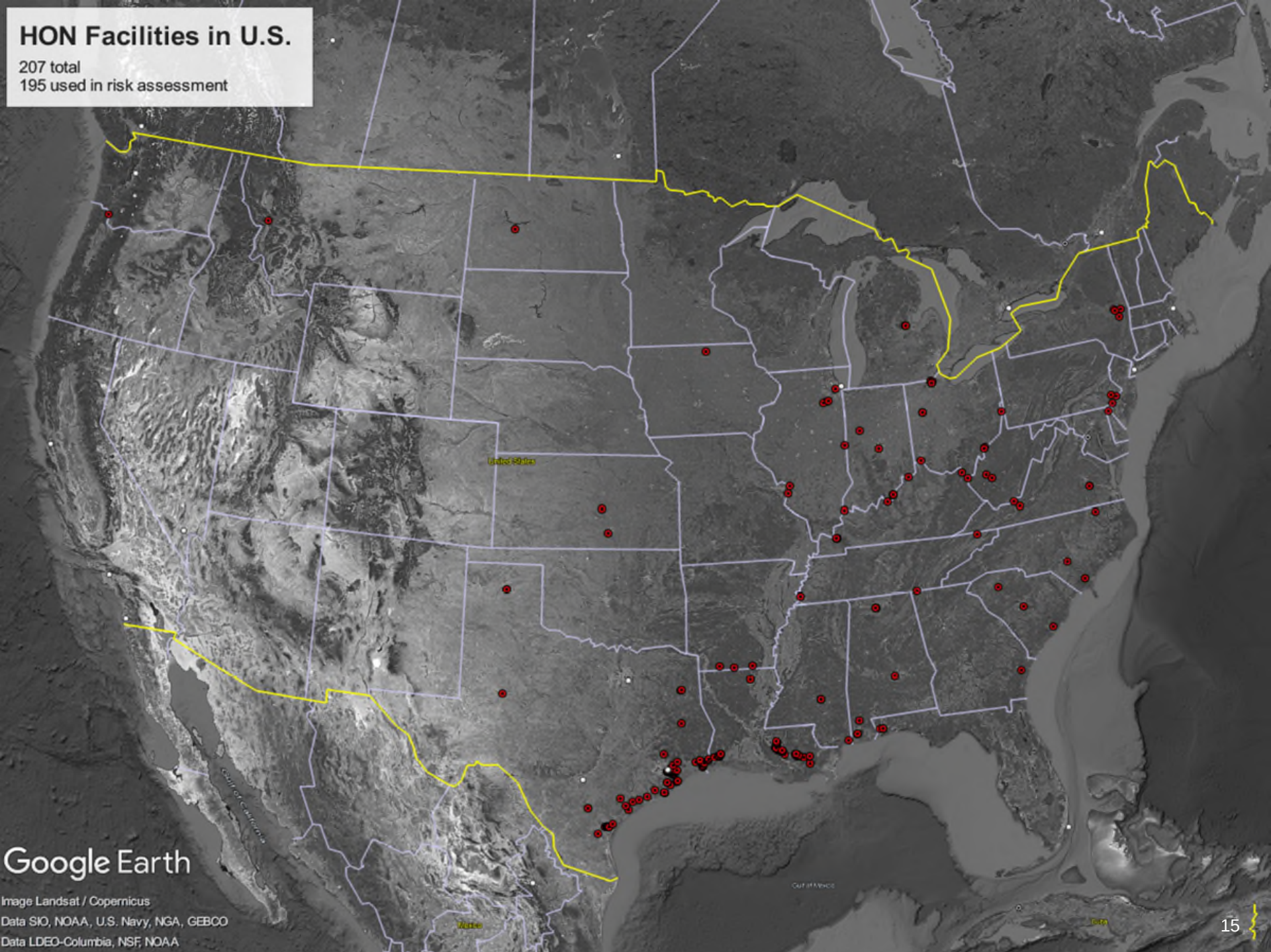

HON Facilities in U.S.
207 total
195 used in risk assessment
Google Earth
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Data LDEO-Columbia, NSF, NOAA

Air Pollution Control Devices (APCD) and Recovery Devices

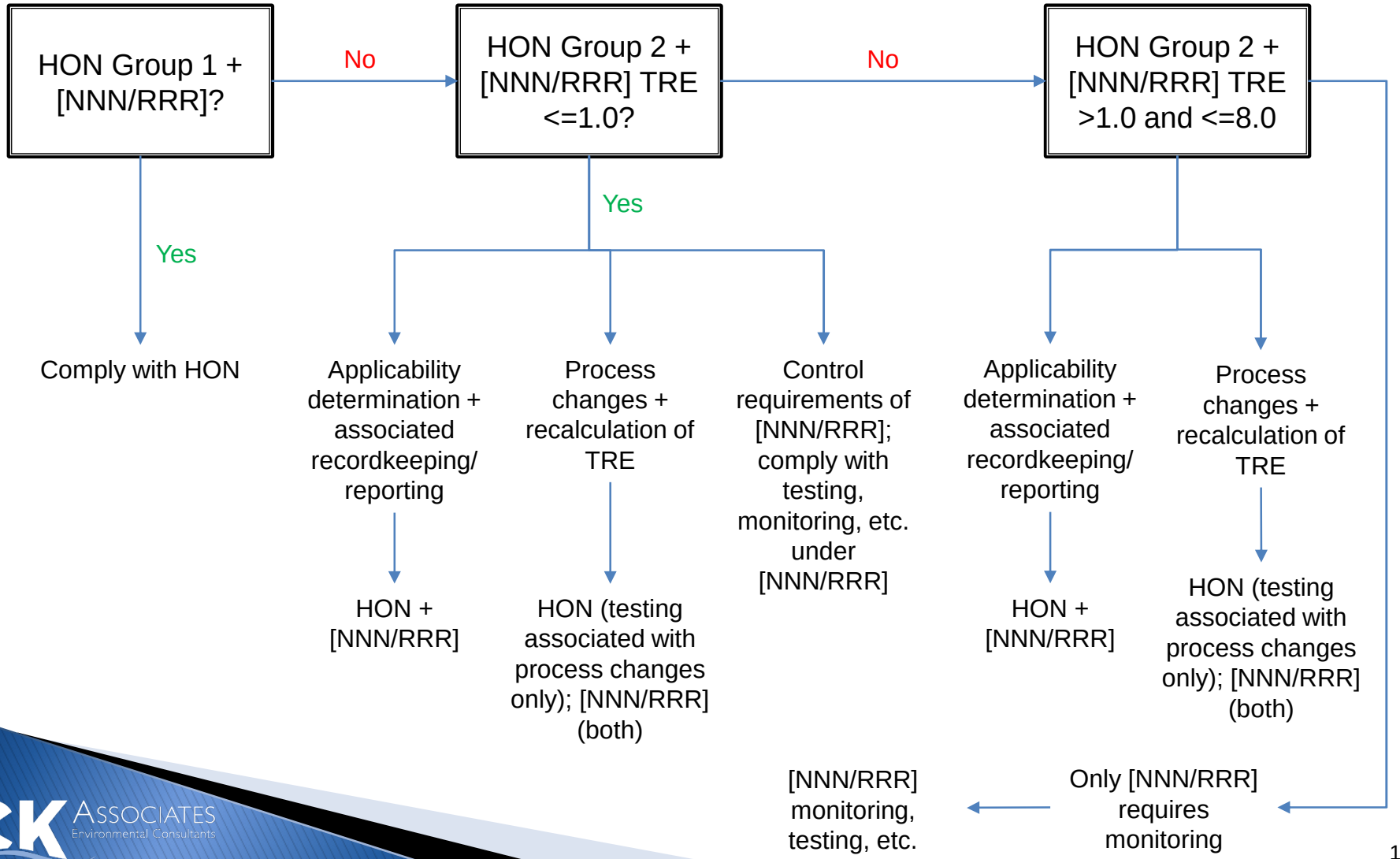
- Control device – combustion and recapture devices – and/or [recovery devices]
  - Absorber/scrubber
  - Condenser
  - Adsorber
  - Process heater/boiler
  - Flare
  - Incinerator (catalytic/thermal)

  Absorber/scrubber, Condenser, Adsorber: recapture/recovery

  Process heater/boiler, Flare, Incinerator (catalytic/thermal): combustion

- See respective monitoring and testing requirements, as applicable, in 63.114-63.116 (HON non-EO PV), 63.124 (HON EO PV), 60.663a-60.664a; 60.669a (NNNa), 60.703a-60.704a; 60.709a (RRRa)

Proposed HON Overlapping with NSPS NNN/RRR



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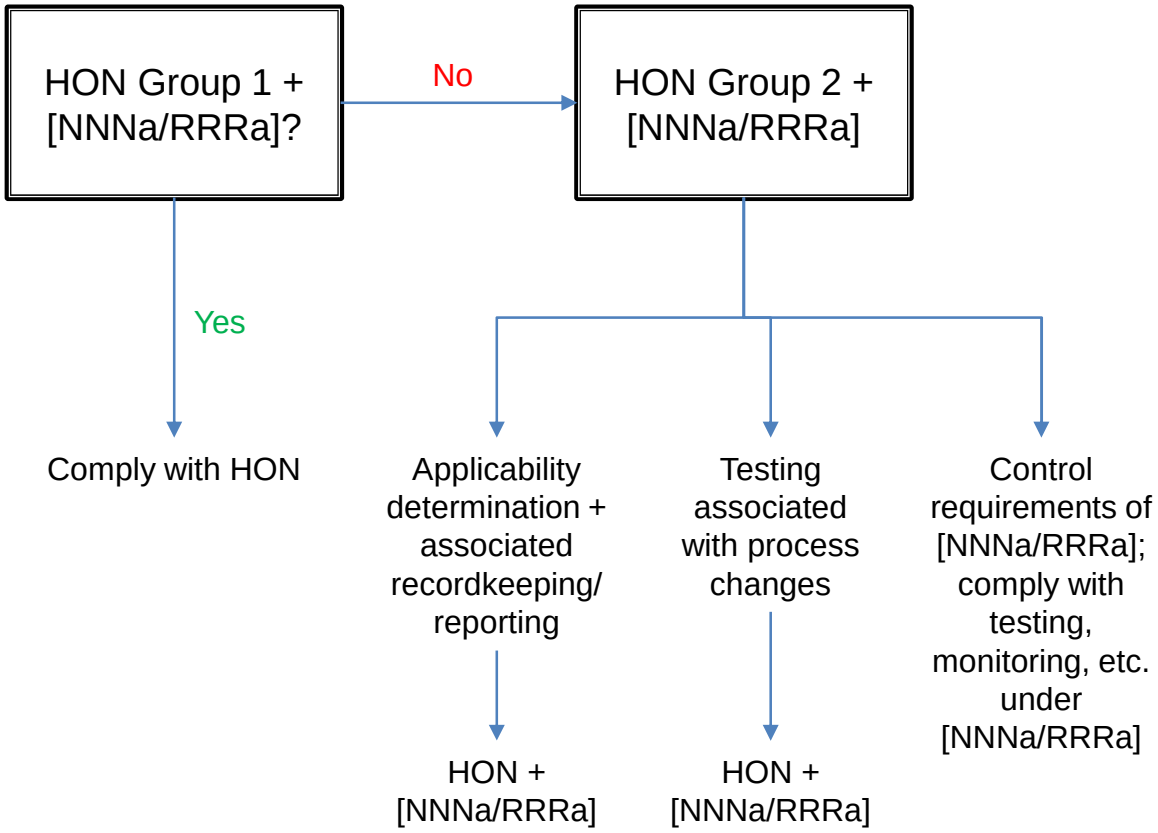
Proposed HON Overlapping with NSPS NNNa/RRRa



HON Compliance Deadlines

Commenced construction or reconstruction on or before April 25, 2023: upon startup or –

April 25, 2023

- Proposed HON published in Federal Register

March 29, 2024

- Final HON
- May be published in Federal Register some time after ~April

~March-April 2025

- HON fenceline monitoring begins

~March-April 2026

- EO emission points and associated APCD
  - Removal of SSM exemptions
- Quarterly reporting for fenceline monitoring begins

~March-April 2027

- Non-EO emission points and associated APCD
  - Removal of SSM exemptions
- Root cause analysis and corrective actions for fenceline monitoring begins

Key:
Emission Points: heat exchange systems, process vents, storage vessels, transfer racks, wastewater, equipment leaks

APCD: flare or non-flare control device

Commenced construction or reconstruction after April 25, 2023:

- Upon initial startup or 60 days after publication of final HON, whichever is later

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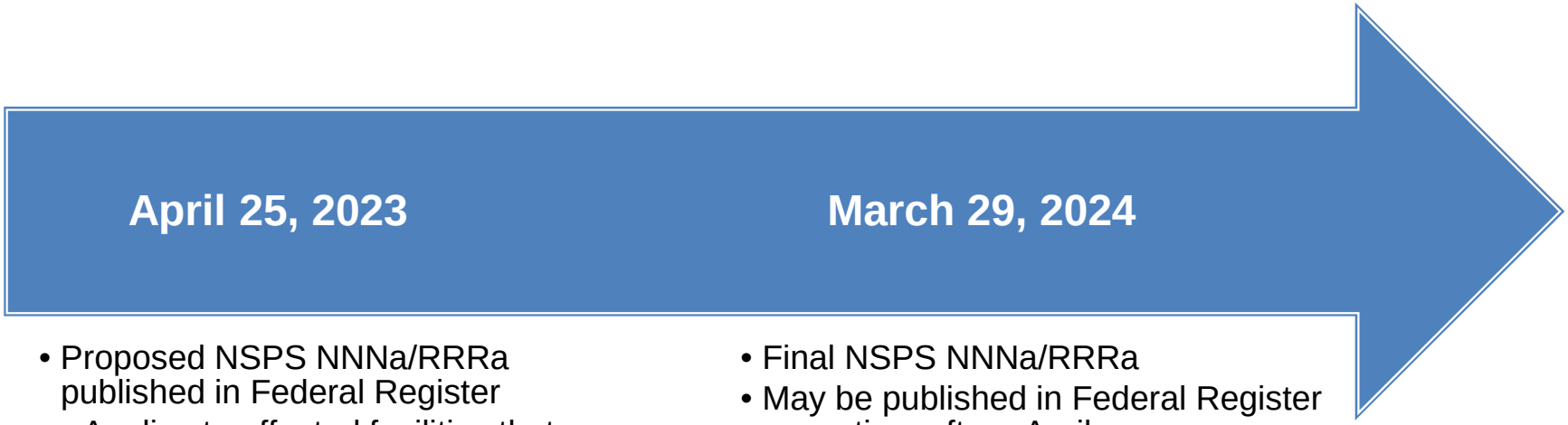
NSPS NNNa/RRRa Compliance Deadlines



- Proposed NSPS NNNa/RRRa published in Federal Register
  - Applies to affected facilities that commenced construction, reconstruction, or modification after April 25, 2023
  - Comply with standards:
    - on and after the date on which the initial performance test completed, but no later than 60 days after reaching maximum production rate, or
    - 180 days after initial start-up, whichever comes first

- Final NSPS NNNa/RRRa
- May be published in Federal Register some time after ~April

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Contact Information

- Alex Baumann
  - alexander.baumann@c-ka.com
- CK Associates
  - air.team@c-ka.com
  - (225) 755-1000

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