REGION 6 EXECUTIVE SUMMARY

TOPIC: Ethylene Oxide (EtO) Briefing on Chemical Sector and Commercial Sterilizers

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PURPOSE/ACTION NEEDED: Information - Summary of work done regarding EtO in the chemical sector, including outreach, community meetings and potential follow-up work. Update on future outreach for commercial sterilizers and facilities, geographic locations, and status of outreach communication plans.

ENVIRONMENTAL/PUBLIC HEALTH CONCERNS:

EtO is a flammable, colorless gas, frequently used to make other chemicals and sterilize equipment. Long-term exposure to EtO can irritate the eyes, skin, nose, throat, and lungs, and harm the brain and nervous system. Breathing air containing elevated EtO levels over many years increases the risk of some types of cancers, including cancers of the white blood cells and breast cancer in females.

BACKGROUND INFORMATION:

Petrochemical Facilities: In March 2020, EPA's Office of Inspector General issued a Management Alert to notify the Office of Air and Radiation that communities near 25 facilities nationwide were at elevated risk from EtO emissions, and that EPA needed to provide notice and information to those communities about risks from breathing EtO. For EPA R6, there were 10 facilities with estimated risks exceeding 100 cases in 1,000,000 – a level that EPA considers not protective of human health and the environment. Of the 10 facilities identified as having risks over 100 in 1,000,000, 8 are petrochemical plants that produce or use EtO. The two remaining facilities are commercial sterilizers and are expected to be addressed in the upcoming sterilizer outreach. EPA R6 conducted 7 virtual community outreach events in August and September 2021 to address the estimated risk of residents near all 8 chemical facilities. EPA is posting information online about each meeting, including meeting summaries and questions & answers.

Commercial Sterilizers: In early 2022, EPA expects to publish a draft national rule update for the EtO commercial sterilizers industry sector. Currently, EPA has identified at least 5 commercial sterilization facilities in R6 that emit EtO at concentrations that are predicted to impose an estimated risk greater than 100 in 1,000,000. Pending updated emissions information received in response to an Information Collection Request in November 2021, EPA plans to first revise its risk assessments modeling and to conduct outreach activities via R6 for the communities near these facilities in the first quarter of ~~early~~ 2022.

CURRENT STATUS:

Petrochemical Plants: EPA plans no further action at three facilities: Shell Technology Center in Houston, TX, and BCP Ingredients and Taminco in St. Gabriel, LA. These facilities have updated estimated cancer risks below 100 in 1,000,000. However, f~~F~~ive facilities still have updated estimated risks over this guideline. Noncancer results risk assessment show Sasol has a hazard index (HI) above 1, (HI of 3) due to chlorine. Additional steps are recommended at these five facilities to further address estimated risks of concern.

Commercial Sterilizers: OAQPS has sent information collection requests (ICR) to multiple commercial sterilizers to support the national rulemaking effort, with responses due in November 2021.

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TECHNICAL INFORMATION AND CONCERNS:

Petrochemical Facilities: The identified facilities have reported reduced EtO levels from 2014-2020, via emissions reductions or re-evaluation of emission levels.

- Eastman Chemical – Longview, TX: From 2014-2020, reported EtO levels have reduced by approximately 75%. In 2014, EtO emissions were estimated at 14,828 lbs, and in 2020 emissions were estimated to be 3,720 lbs. The facility plans to add a scrubber to the Eastman Solvents Plant 1, with an estimated efficiency of 95%. Depending on production, this could lower the site's EtO emissions to 1,280 lbs.
- Union Carbide – Taft, LA: From 2014-2020, reported EtO levels have reduced by approximately 64%. In 2014, EtO emissions were estimated at 20,860 lbs and in 2020 emissions were estimated to be 7,847 lbs. In 2020, the facility installed a new water scrubber for the waste gas lines between pressurized storage tanks and the site logistics flare. This scrubber was installed in early 2021 and is expected to recover EtO from the waste gas stream, returning it to the EtO manufacturing process and further reducing emissions.
- Indorama (formerly known as Huntsman Petrochemical) – Port Neches, TX: From 2014-2020, reported EtO levels have reduced by approximately 44%. In 2014, EtO emissions were estimated at 21,552 lbs and in 2020 emissions were estimated to be 12,113 lbs. 54% of reported sitewide emissions from 2014-2019 consisted of emissions events. The facility has taken action to reduce air emissions events but has not successfully resolved the issue. Additional efforts are planned by the facility, including work on advanced process controls, utilization of the risk-based mechanical integrity program, other electrical and infrastructure improvements, and continued focus on LDAR program.
- Evonik – Reserve, LA: From 2014-2020, reported EtO levels have reduced by approximately 48%. In 2014, EtO emissions were estimated at 3,222 lbs, and in 2020 emissions were estimated to be 1,661 lbs. The facility is currently considering a more stringent LDAR program and quarterly monitoring schedule for all components. Additionally, the facility is evaluating the scrubber for technical enhancements, and planning to acquire a contractor to model the current emissions profile and establish a basis for technical improvements and further reduction.
- Sasol – Westlake, LA: From 2014-2020, reported EtO levels have reduced by approximately 75%. In 2014, EtO emissions were estimated at 12,640 lbs, and in 2020 emissions were estimated at 4,702 lbs. The facility is planning to incorporate vapor control unit testing for destruction and removal efficiency, anticipating a reduction in reported EtO emissions. Additionally, the hazard index (HI) value for this facility was estimated as 3, with chlorine as the main risk driver. HI values greater than 1 are associated with potential for increased adverse health effects.
- EPA plans no further action for the remaining petrochemical facilities: Shell Technology Center (Houston, TX), BCP Ingredients and Taminco (St. Gabriel, LA), as they have updated cancer risks below 100 in 1,000,000.

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COMMUNITY OUTREACH:

Petrochemical Facilities: EPA Region 6 held a webinar on May 20, 2021 at 6:30 p.m. to provide community leaders, public officials, and leaders of community organizations in Texas and Louisiana with information about ethylene oxide and its health effects through an "EtO 101" virtual presentation. Virtual community meetings were held in seven locations near the eight facilities in August and September 2021.

- Eastman Chemical – Virtual community meeting held August 10, 2021.
- BCP Ingredients and Taminco – [Joint] virtual community meeting held August 12, 2021.
- Indorama (Huntsman) – Virtual community meeting held August 17, 2021.
- Union Carbide Corp. – Virtual community meeting held August 19, 2021.
- Evonik Industries – Virtual community meeting held August 24, 2021.
- Shell Technology Center – Virtual community meeting held August 26, 2021.
- Sasol Corporation – Virtual community meeting held September 30, 2021.

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The following national rules are under review by OAQPS, with their anticipated final date to complete the review and potential revisions:

- Commercial Sterilizers: 2022
- Hospital Sterilizers: 2023
- Group 1 Polymers and Resins (Neoprene): 2024
- Synthetic Organic Chemicals Manufacturing Industry: 2024
- Polyether Polyols Production: 2024
- Chemical Manufacturing Area Sources: 2024