

2022 ITRC Final Proposal

Proposed Project Title

Ethylene Oxide Emissions

Abstract

Nationally there are 58 ‘hot spots’ with levels of Ethylene Oxide (EtO) 100x the threshold that triggers the Clean Air Act (CAA). Many of these hotspots are located in communities with significant Environmental Justice (EJ) concerns. An EtO Emissions Project would focus on source and near-source emissions to better characterize and communicate risk in communities living near EtO-generating facilities. To accomplish this, the team would explore background EtO, appropriate EtO measurement methods, EJ-centric risk communication, interagency regulatory authority, and EtO reduction technologies

Problem Statement and Highlight the Importance to the States and to the Broader Environmental Community

Ethylene oxide (EtO) is produced in large volumes and is primarily used as an intermediate in the production of several industrial chemicals, the most notable of which is ethylene glycol. EtO is also used as a fumigant in certain agricultural products and as a sterilant for medical equipment and supplies (OSHA). In 2016, the EPA updated the risk value for EtO, lowering the concentration that would trigger various provisions in the CAA and changing EtO’s descriptor from ‘probably carcinogenic to humans’ to ‘carcinogenic to humans.’

Along with emissions from agricultural and medical processes, EtO is emitted by mobile sources such as vehicle tailpipes and tobacco smoke, resulting in disparate causes of EtO in the environment. Consequently, before source and near source emissions can be investigated, background EtO needs to be considered. Currently, inconsistencies exist in the way stakeholders define background EtO in risk assessments. A ‘one-stop-shop’ that provides scientifically grounded resources that help project managers differentiate between anthropogenic and point sources of EtO is needed.

No nationwide, comprehensive guidance exists that lists and summarizes all the different EtO analytical methods available. In order to accurately compare data across states and facilities, the different laboratory methods of measurement available need to be evaluated and a consensus established on when, where, and how each method is deployed.

The EPA estimates that EtO "...significantly contributes to potential elevated cancer risks in some census tracts across the U.S." Nationally there are 58 EtO 'hot spots' with levels 100x the level that triggers the CAA. Further, many residents in these communities live at or below the poverty level and are comprised of higher percentages of people of color than the national average, i.e., EJ communities. According to a May 3, 2019 NEJAC (National Environmental Justice Advisory Council) letter to the EPA Administrator, EJ communities are disproportionately exposed to EtO and other air toxins (cumulative impacts). Although some state and federal agencies and other entities have authored various documents regarding the best practices for engaging with EJ communities, inconsistencies exist between different guidance and thus need revision. Resources that train project managers on engaging, partnering, and collaborating with EJ communities would be impactful.

Multiple federal and state agencies have addressed or regulate EtO in some capacity, but all their guidance is not available in one place. EPA and CDC (Centers for Disease Control) guidance reference each other but neither refers to the FDA's (Food and Drug Administration) work. Additionally, there is no single compendium for states' EtO guidance. This situation of multiple regulatory authorities managing EtO can result in inconsistent or conflicting application of EtO regulations.

No consensus has been reached on the best path forward on EtO emissions reductions. Stakeholders use a variety of methods and the FDA and EPA have both opened comments to the public on this issue, however their innovation challenge and information collection requests have not yet produced any further guidance. An up-to-date guidance on EtO emissions reduction methods that compiles and contrasts the different reduction methods currently available is needed.

An ITRC mini project to create a fact sheets and/or informational videos developed by academia, regulators and regulated entities would provide a useful framework for managing EtO and engaging with EJ communities impacted by EtO exposure. The products could also include some information regarding the applicability of this information to other air pollutants and to reaching and working with EJ communities impacted by other types of pollution and contamination.

Fact sheets, videos, or other products would provide:

- ❖ A source to find existing background data from other studies that might be used to understand the impact of EtO and ways it was addressed in other communities
- ❖ A source of appropriate methods to differentiate between anthropogenic and point sources
- ❖ A source of appropriate methods to measure EtO and when and where to use each specific method
- ❖ A source of appropriate methods to be used to train project managers on engaging, partnering, and collaborating with EJ communities in a positive and impactful manner
- ❖ A source to find other useful guidance from states, agencies, and other entities
- ❖ A source to find EtO reduction technologies

AUDIENCE: The intended audience of this project proposal is state and federal regulators, and environmental professionals and risk assessors, with the intent of informing on the importance and fundamentals of including EtO observations and measurements in risk assessment.

The guidance would also be useful to risk managers, project managers and other scientists from state or federal government, consultants and academia working on EtO or with other projects that require the assessment of risks on EJ communities.

Project Deliverables

Products: Fact Sheets

Listed below are the subjects proposed to be covered in the *ITRC Fact Sheets*.

- ❖ *Topic 1: Background EtO*
- ❖ *Topic 2: Appropriate EtO Measurement Methods*
- ❖ *Topic 3: Risk Communication/Community Outreach*
- ❖ *Topic 4: Interagency Regulatory Authority*
- ❖ *Topic 5: EtO Emission Reduction Methods*
- ❖ *Topic 6: Case Studies*

Possible Products: Informational Videos

The Team will determine which topics from the above list would produce an engaging, informational video module. Each module will be 10-15 minutes long and provide detailed information on each topic.