

Analysis of Heat-Induced Pollution Releases – June 2023

Summary of Results

An extreme heat wave across Texas in recent weeks has led to systematic failures in the West Texas gas fields. Gas plants and compressor stations are especially vulnerable to failures leading to pollution releases. This pollution is hazardous to human health, and many pollutants released contribute to cancer, ozone formation, and climate change.

This heat wave, which has been attributed to climate change by scientific consensus, also puts a strain on Texas' energy grid. Given the grid's continued reliance on natural gas, systemic weaknesses due to extreme temperatures are a troubling trend. The natural gas industry must prepare for foreseeable temperature extremes to minimize future failures.

Findings

- 19 pollution events were attributed to high temperatures between June 15 and 29, 2023.
- 10 facilities experienced pollution events including four gas plants, four compressor stations, one tank battery, and one chemical manufacturing plant.
- 9 of 10 impacted facilities were in the natural gas extraction industry in West Texas. One facility was a chemical plant in the Houston region.
- 791,1354 pounds (395 tons) of pollution were released, including 19 unique pollutants (note that “nitrogen dioxide,” “nitrogen oxide,” “Nitrogen oxides (NOx)” and “Oxides of Nitrogen (NOx)” are different names for the same pollutant).
- More than 91% of the pollution released—725,382 pounds (362 tons)—was natural gas.
- The events averaged 41,650 pounds in size.
- Other significant pollutant emissions included carbon monoxide (24,926 pounds), sulfur dioxide (18,430 pounds), and nitrogen oxides (14,650 pounds).
- Seven counties experienced pollution events including six counties in the West Texas gas fields: Crane, Ector, Gaines, Martin, Midland, and Reagan; and Harris County on the Gulf Coast.
- Reagan County experienced the most pollution with 702,129 pounds across 9 incidents.

Methodology

Industry self-reported pollution events were retrieved from the Texas Commission on Environmental Quality State of Texas Emissions Event Report Database (“STEERS”) at <https://www2.tceq.texas.gov/oce/eer/> between 11:00 AM and 1:00 PM on June 30, 2023. 208 events were retrieved using the start date range of June 8-30, 2023. 19 events were identified as heat-related based on the entry field “Cause



of Emission Event or Excess Opacity Event, or Reason for Scheduled Activity.” Only events explicitly attributed to “hot weather,” “high ambient air temperature” or similar causes were included. Microsoft Excel data files were downloaded from the STEERS database and aggregated into a single file. The “Cause of Emission Event” field was manually entered into the downloaded data. Pivot tables were used to analyze data, except the “facility type” analysis which was performed manually.