GHG Emissions and Reductions from Solution Gas Flares in Alberta

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While significant progress has been made in quantifying, understanding and reducing the impact of solution gas flares, most efforts have focused on flare carbon conversion efficiency – the ability of a flare to fully convert carbon contained in hydrocarbon fuel to carbon dioxide. Comparatively little attention has focused on potential emissions of particulate matter or soot.

In Canada, emissions of both PM10 (particulate matter less than 10 micrometres, or ?m, in size) and PM2.5 (less than 2.5 ?m) are classed as criteria air contaminants and are tracked in the National Pollutant Release Inventory (NPRI). Despite the scientific need and legal requirement for quantifying and reporting industry particulate matter emissions, there are critical gaps in the ability to accurately obtain this data. This problem is especially urgent in the upstream oil and gas sector, where the distinct lack of practical approaches for predicting or even measuring particulate matter emissions from open industrial sources, such as flares, is a critical

issue.

Formation of soot in a turbulent diffusion flame such as a flare is a complex process affected by many factors. These include chemical composition of the fuel, temperature-time history of the fuel and reactant species, and turbulent diffusion of oxygen and other species in the flame. This project aims to develop practical methods for quantifying particulate emissions from solution gas flares.

Report