# Speciation of organics emitted from oil and gas liquid storage tanks

Trevor O’Neil\*α, Trang Tran\*, Makenzie Holmes\*, Seth Lyman\*

\*Bingham Research Center, Utah State University, 320 Aggie Boulevard, Vernal, Utah 84078, U.S.A.

α Corresponding author

[Trevor.Oneil@usu.edu](mailto:Trevor.Oneil@usu.edu)

Abstract

Our team is working on several projects to improve estimates of the magnitude and speciation of organic compound emissions from Uinta Basin oil and gas wells. This fall and winter, we collected and analyzed pressurized gas and liquid samples from separators at oil and gas wells within the Uintah Basin. Samples from 70 wells were analyzed for hydrocarbon content by a commercial lab, and we analyzed for carbonyls (i.e., aldehydes and ketones) at a subset of 11 wells. Carbonyls are extremely photochemically reactive and are important precursors to wintertime ozone production in the Uinta Basin.

Samples were collected from gas/liquid separation units that utilize a gravity based separation, sending natural gas (predominantly methane) into distribution and sales lines and sending liquids into storage vessels at atmospheric pressure. When liquids transfer from pressurized separators to storage vessels, gases flash (i.e., evolve from the liquid) and can escape into the atmosphere. Emissions from storage vessels are an important part of overall ozone-forming organic compound emissions in the Uinta Basin.

We used the data collected to develop emission speciation profiles for oil and gas sources, and we compared these profiles against those developed in emission inventory efforts. Importantly, we found that gas flashed from pressurized hydrocarbon liquids contains carbonyls, implying that liquid storage vessels are a primary source of carbonyls to the atmosphere.