





### Explanation of Figures:

October 1, 2021 flight tracks over the Denver Julesburg Basin (DJB) **(a)** colored and sized by CH<sub>4</sub> restricted to 2300 ppb to maintain resolution even though the values over the two highlighted landfills are 2892 and 2763, respectively, over Erie and Fort Collins; and **(b)** colored and sized by C<sub>2</sub>H<sub>6</sub> without restriction. The prevailing wind direction is shown, and the light gray dots show the active wells in Weld and Larimer Counties. The Rocky Mountain Metropolitan Airport (RMMA), our base of operations, is shown on both maps.

Both figures show the various sources of CH<sub>4</sub> over the DJB, which arise from the 18,538 active wells, the various Oil and Gas (O&G) Processing and Compressor Facilities, the various Landfills, the various Dairy Facilities, the Waste Water Treatment Facilities, and the various Feedlots, the largest of which are shown on the maps. The largest feedlots and dairy facilities are in close proximity to O&G facilities and well operations concentrated in the Greeley/Platteville region. Since C<sub>2</sub>H<sub>6</sub> is only co-emitted with CH<sub>4</sub> from O&G operations, a comparison of the two maps highlight the different CH<sub>4</sub> source regions.

Starting with the two largest landfill source regions, the Erie and Fort Collins landfills, the C<sub>2</sub>H<sub>6</sub> measurements are only slightly elevated above background levels due to the large VOC upstream sources from Commerce City and Denver. Although these sources are also reflected on the CH<sub>4</sub> map, the landfill CH<sub>4</sub> clearly dominates over both sources. The data on October 1 accentuate these large sources due to the low wind speeds of 2 – 3 m/s and hence the reduced horizontal dispersion from these sources. A comparison of the data on the west side of both maps between Longmont and Fort Collins reveals elevated levels of CH<sub>4</sub> and C<sub>2</sub>H<sub>6</sub> from the large upstream Commerce City/Denver VOC sources. Based upon wind vectors and back trajectories this region was not included in our mass balance region, which includes the inflow region on the southeast along route I-76 and the outflow region on the SW-NE diagonal starting around Fort Collins. Both maps show elevated CH<sub>4</sub> and C<sub>2</sub>H<sub>6</sub> over Greeley and the Greeley-Weld County Airport ~ 0.1 degree to the east. This region revealed a persistence in elevated CH<sub>4</sub> and C<sub>2</sub>H<sub>6</sub> throughout each of our flights.