

FY21 IRTD Final Report Summary

21-5. Development of Gas Analysis Capabilities

Project PI: Cristina Oropeza (cristina.m.oroepza@nasa.gov)

Team Members: Trey Barnes (thomas.barnes@nasa.gov) and Eric Parrish (eric.j.parrish@nasa.gov)

Project Description: The project objective was to develop gas analysis methodology and processes to identify and quantify contaminants specific to KSC, primarily volatile organic compounds (VOCs), utilizing the recently purchased gas chromatograph-mass spectrometer (GCMS) coupled with a sample pre-concentrator. This work established a standing, quick-turnaround quantitative GCMS methodology for KSC-specific VOCs associated with launching and landing spacecraft at trace-levels far below previous detection limits.

Closeout Summary: This project established a standing methodology for rapid turnaround identification and quantification of 119 targeted VOCs considered most likely to be encountered at KSC. Of these, 111 of the calibration files are based on manufacturer-certified gas standard mixes. The other eight were generated using standards generated in-house from neat, certified reference materials using procedures for standard generation that were developed under this project.

Additionally, the spectral signatures of two hydrofluorocarbon precision cleaning solvents, that are widely used in flight hardware processing, have been added to the mass spectral library for rapid qualitative identification.