On September 13, TX-TF1 was re-deployed by FEMA to Zephyr Field in New Orleans, Louisiana, to continue rescue operations after Hurricane Katrina made Landfall near New Orleans, Louisiana. This deployment came 5 days after the task force had returned home after conducting search and rescue operations for 13 days in the Orleans Parish.

Once all members of the team had checked in and completed the mobilization process, the 74 person Type-I US&R Task Force headed back to New Orleans, Louisiana, with 36 of the members having deployed during the first Hurricane Katrina deployment. Once the team arrived back in Louisiana, the task force continued their original mission of conducting search and rescue operations in the Orleans Parish and assisting residents stranded by rising water after the levee breach. TX-TF1 also conducted search and recovery missions by assisting local resources with any technical extrications.

Hurricane Katrina was named the costliest natural disaster and 1 of the 5 deadliest hurricanes in the history of the United States, with at least 1,245 people losing their lives. In total, property damage was estimated at $108 billion.

Joining TX-TF1 in Louisiana was MO-TF1, and 6 other FEMA US&R Task Forces who were just deployed to the east coast in preparation for Hurricane Ophelia.

On September 18, GDEM requested that TX-TF1 be released to Texas to prepare for the landfall of Hurricane Rita. TX-TF1 departed New Orleans, Louisiana, the morning of September 20, and returned to College Station later that day.