



Volume II

Appendix D.10

Debris Recovery

The *Columbia* accident initiated the largest debris search in history. The evidence collected during the effort was instrumental in confirming the working hypothesis that had been developed by the Columbia Accident Investigation Board and the NASA Accident Investigation Team. The Board is very indebted to the thousands of individuals, companies, and organizations that responded to the call to service. We sincerely apologize to anybody inadvertently omitted from this appendix.

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Debris Recovery

Submitted by NASA Mishap Investigation Team, June 2003
David W. Whittle, Chair

The Shuttle Program activated the Mishap Investigation Team (MIT) on February 1, 2003. The MIT membership, processes and procedures are outlined in the Shuttle Program document NSTS 07700 Volume VIII. The MIT is initially composed of 10 members from various disciplines but was soon supplemented by hundreds of support personnel from several NASA centers. The specific MIT membership is published by way of memo six weeks prior to launch. The MIT assumed the responsibility for debris recovery, protection, and impoundment. The Columbia Accident Investigation Board had the prerogative to alter the debris collection process, but chose to retain the MIT in this role.

ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

Declaring Texas and Louisiana as federal disaster areas brought the Federal Emergency Management Agency (FEMA) and all their resources into the recovery picture. For the first three weeks there were two parallel recovery activities in place. One activity was for the recovery of the human remains and the second for the recovery of the Columbia debris. NASA had the lead responsibility for each activity with supporting roles by other state, federal, and local agencies. NASA, FEMA, Environmental Protection Agency (EPA), and the Forest Service were the primary players in the debris recovery activity. NASA identified the areas to be searched; the Forest Service provided the people and equipment to search the identified areas. EPA provided experts in decontamination of the debris and also tagged, photographed, and identified location of the debris. They then picked the debris up for transport. FEMA provided the money for most of the activity but of equal importance, FEMA had the authority and agreements to activate assistance from federal and state agencies.

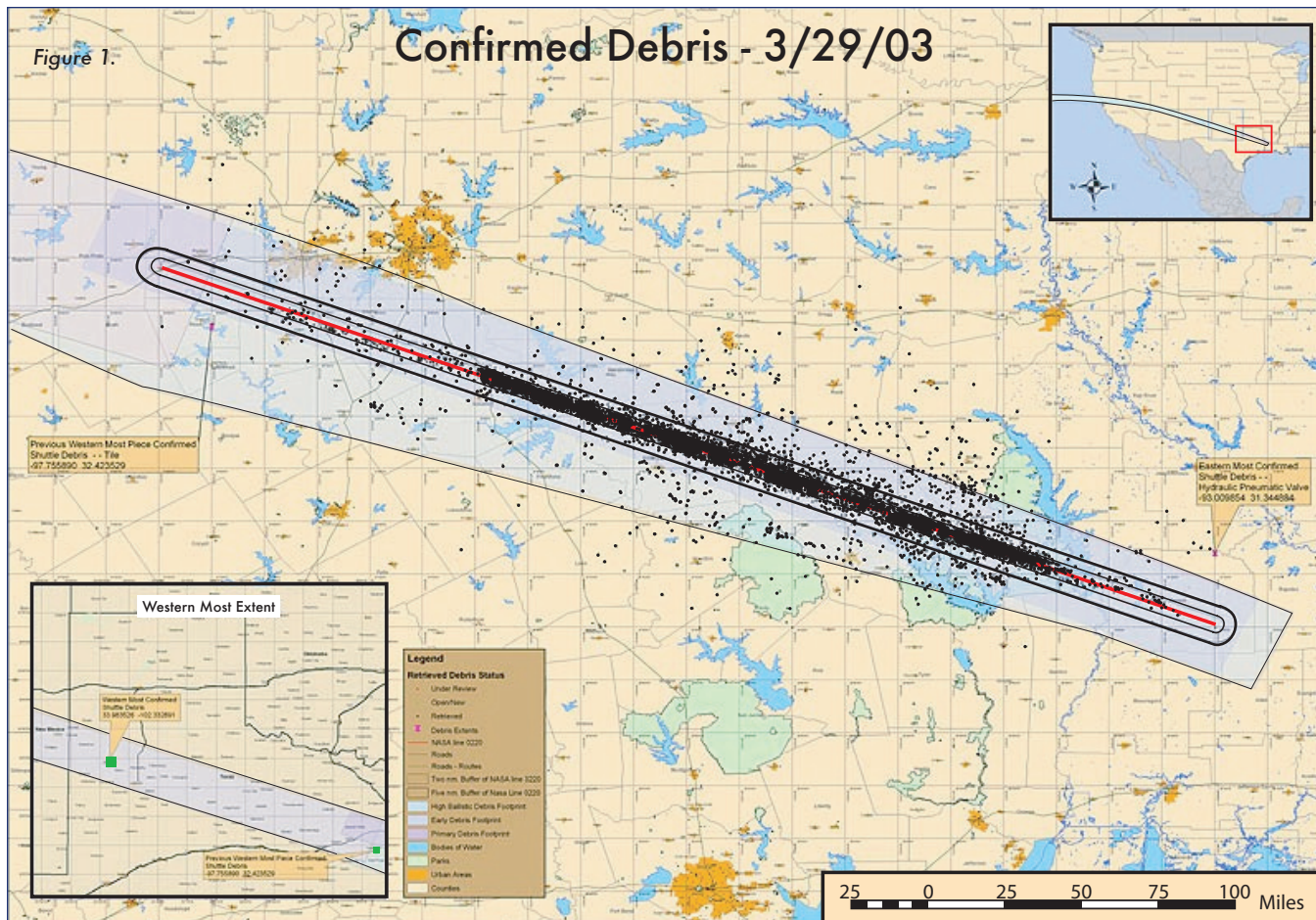
Initially Barksdale AFB was the location of the recovery coordination activity. As the magnitude of the debris area became evident a sub group of the MIT was deployed to Carswell field in Ft. Worth, Texas and to Lufkin, Texas. The Carswell group was responsible for responding to debris re-

ports between Corsicana, Texas and areas west of Ft. Worth, Texas. Based on reported debris items, small self-initiated searches were done by the Carswell operation, but none to the level done by the Forest Service between Corsicana and Toledo Bend Reservoir. The Lufkin representatives of the MIT worked debris recovery in the area from Corsicana, Texas to Ft. Polk, Louisiana. They identified the initial search corridor and coordinated with the Federal Emergency Management Agency (FEMA) and the Forest Service for the resources to search these areas. All MIT search activity was coordinated with daily teleconferences involving all locations.

There were a great many people across NASA that volunteered to assist. NASA centers developed a list of volunteers and coordinated the rotating in of new people through points of contact at the task level. In most cases there was a time overlap between volunteers to insure that the task and philosophy was understood before the new volunteer was left alone. In some instances there was a rotation between a fixed set people, thus requiring minimal overlap. Those volunteering in the search areas received briefs and directions in the same way that the forest service searchers did. The Forest Service rotated crews on a 14, 21, or 30-day basis. This required a continuous indoctrination program for the new searchers.

DEBRIS DISTRIBUTION

One thousand four hundred fifty nine debris reports came in from 42 states, Canada, Jamaica, and the Bahamas. Teams representing the MIT addressed all reports. Using video, radar analysis, telemetry analysis, and public reports, the debris trail was identified. Video from a variety of sources as well as telemetry indicated that *Columbia* was losing pieces significantly west of Texas, even west of California. The greatest density of debris began south of Ft. Worth, Texas and ended in Ft. Polk, Louisiana. Although there is significant evidence that debris fell in Nevada, Utah, and New Mexico, the most westerly piece found was located in Littlefield, Texas. As expected, heavier pieces, with their



higher ballistic coefficients, were found towards the end of the debris trail closer to Louisiana while light objects were found earlier in the path in north central and west Texas. Figure 1 gives a sense of the magnitude of the debris that was located. Each dot represents a piece of debris. There are some outlying points where errors were made in the recorded position.

SEARCH PROCESS AND PROCEDURES

The process and procedures for debris recovery was different depending on the debris location. The states of Louisiana and Texas were handled differently than the search for debris in the rest of the United States. Texas had the largest concentrations of debris spread along a well-defined line. Louisiana had several large engine pieces, which had the highest ballistic coefficients, and a small scattering of smaller items in several parishes.

Along the *Columbia* flight path from Texas to the California coast, there were radar and visual evidence of debris leaving the Shuttle vehicle and perhaps hitting the ground. Radar, video analysis, and trajectory analysis were used to define high probability areas for ground search in New Mexico, Utah, and Nevada. Working through FEMA, local resources were activated to search these high probability areas for Shuttle debris. Notices were published and broadcast asking

that any debris or sighting information be forwarded to the NASA toll free number. Public notices via flyers and news media pieces were used several times during the recovery process.

At the Lufkin Disaster Field Office (DFO) search responsibilities were divided into five areas or responsibility each with a designated leader. These areas were:

1. All States outside Texas and Louisiana
2. Ground search within Texas and Louisiana
3. Air Search within Texas and Louisiana
4. Water search
5. Strategic search activities

The area leader coordinated search activities in each of the identified areas. Overall coordination was done at the daily planning and coordination meeting with the MIT.

SEARCH ACTIVITIES

Deployment

The MIT initially deployed to Barksdale AFB, Louisiana. Barksdale was chosen because it provided the facilities to handle large aircraft, had capabilities to accommodate a large contingent of people, had the appropriate facilities to accommodate human remains processing and transportation, and provided the security needed.

Active search was started on February 1, 2003. Within 2 weeks the number of ground searchers per day was in excess of 3,000. All search activity was coordinated through the Lufkin DFO, Barksdale MIT Operations Area, or Carswell Field MIT Office. After one month all search coordination was centered at the Lufkin DFO, this included the air, ground, and water search activities. Water search concluded on April 15, air search was completed on April 20. Ground search activity continued at full strength until April 25 and then gradually tapered off as the search of the identified areas was completed. Search of areas to the west of Texas were continued after the closure of the Lufkin DFO and managed from the Columbia Recovery Office (CRO).

Land Search

Initial priorities were to recover human remains. Because of the sensitivity and time importance of human remains recovery, it initially took priority over vehicle debris. The Texas Department of Public Safety (DPS), Texas National Guard, FBI, and NASA played significant roles in human remains recovery. Of equal importance was public safety. There was a concern that certain tanks from the orbiter might contain hazardous materials such as propellants. Public safety included clearing debris from schools and schoolyards as well as public areas. The EPA accomplished this task with the assistance of various local agencies. Early warnings about touching debris significantly slowed the recovery process. A change in policy to allow certain officials to evaluate and retrieve debris significantly sped up the early recovery. Once the Forest Service workers were employed, retrieval rates jumped to over 1,000 pieces a day.

Search of the larger debris areas used a variety of assets and techniques. In Texas alone, debris was spread over an area exceeding 2,000 square miles. The large area required a combination of ground and airborne search techniques (Figures 2 and 3). The heaviest debris corridor between Corsicana and Ft. Polk was the initial focus of attention. One hundred recovered items were used to define a debris distribution line. Analysis indicated this line represented the center of the debris distribution in east Texas. A +/- 2-mile corridor was defined around the centerline, which represented the 1-sigma lateral distribution of the debris. A second +/- 5-mile corridor was defined which represented the 2-sigma lateral debris distribution. It was decided that the center 4-mile wide corridor would be hand searched while the area outside the +/- 2-mile corridor to the +/- 5-mile corridor would be searched by air.



Figure 2.



Figure 3.

Most of the ground search was conducted by fire fighters from the US Forest Service assisted by representatives from Environmental Protection Agency (EPA) and NASA. For the ground search, a probability of detection (POD) of 75% for a 6" X 6" object was selected. The 75% POD determined the search techniques to be used by the field searchers. For the air search the POD was 50% for a 12" X 12" piece of debris. Over 3,000 US Forest Service wild land firefighters were used in the search activities. These searchers were staged out of four US Forest Service managed camps located in Corsicana, Palestine, Nacogdoches, and Hemphill, Texas. The area along the corridor from Granbury, Texas to Ft. Polk, Louisiana was divided into 2 nautical miles by 2 nautical mile grids. Grids were assigned to the Forest Service for search by the fire fighters.

Air Search

Over 37 helicopters and 7 fixed wing aircraft were assigned to search areas outside of the center 4-mile corridor to the edge of the 10-mile corridor.

Several other airborne assets were used to search for debris. These include hyper spectral scanners, forest penetration radar, photography from a U-2 reconnaissance aircraft, forward looking infrared, and images from two satellite platforms. Other search attempts included powered parachutes and civil air patrol searches. Use of these high tech devices proved of little value. Either the sensors could not penetrate the vegetation or the required resolution was beyond sensor capabilities. Hyperspectral scanning offered some potential, but data analysis was extremely time consuming and cumbersome so it was terminated.

Water Search

The debris area also included several bodies of water. Toledo Bend reservoir and Lake Nacogdoches were deemed to have the highest probability of containing shuttle debris. The US Navy Supervisor of Salvage (SUPVSAL) organized the efforts of 8 dive teams to search these bodies of water. Over 31 square miles these water bodies were bottom mapped using sonar devices. The mapping identified 3,100 potential targets in Toledo Bend and 326 targets in Lake Nacogdoches. Divers visited all identified targets. Only one piece of shuttle debris was located in Toledo Bend and nothing was found in Lake Nacogdoches. Figure 4 shows representative lake dive activity.



Figure 4.

NTSB Boxes

Several areas in Texas, New Mexico, Nevada, and Utah were identified as having high potential of containing shuttle debris. These areas were identified using radar, trajectory analysis, and video analysis. These search areas were called NTSB boxes due to the analysis provided by the National Transportation Safety Board (NTSB) in identifying these areas. Four areas were identified in west Texas, one in New Mexico, two in Nevada and two in Utah. All these boxes were searched either by people on the ground or air. To date nothing has been found west of Littlefield, Texas (Figures 5 and 6).

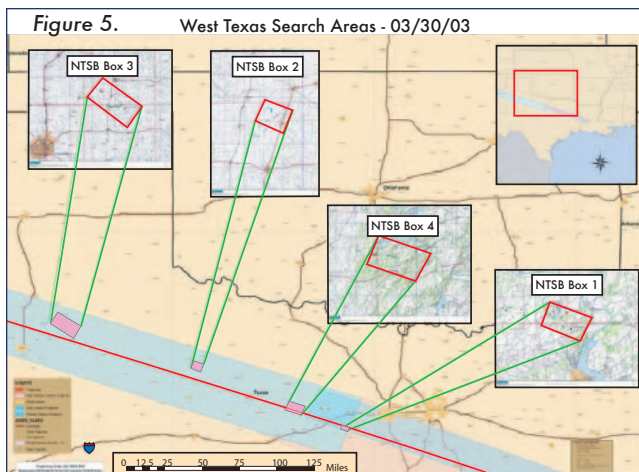


Figure 5. West Texas Search Areas - 03/30/03

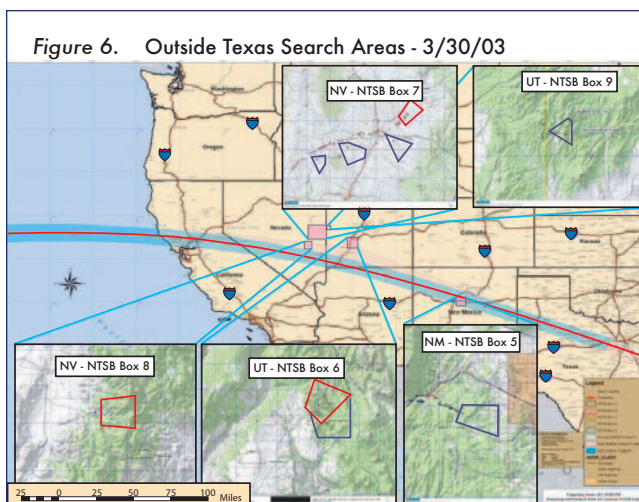


Figure 6. Outside Texas Search Areas - 3/30/03

California Coast

If the initial breakup occurred over the Pacific Ocean then there is a high likelihood that some *Columbia* debris fell into the ocean. Oceanographic data indicated three counties along the California coast, which had the highest probability of debris washing up on the beach. An organized search of the beach area was conducted using local law enforcement and local volunteer organizations. Figure 7 shows the shuttle crossing point on the California coast and the three counties involved in coastline searches. No debris was found.



Figure 7.

Statistics

By the time the search was ended the following assets were used:

- Over 30,000 people, over 1.5 million man-hours
- Over 130 federal, state, and local agencies
- 37+ helicopters
- 7+ fixed wing aircraft
- 84,000 pieces of *Columbia* were recovered
- 84,900 pounds were recovered
- By weight 39% of *Columbia* was recovered

The search covered the following:

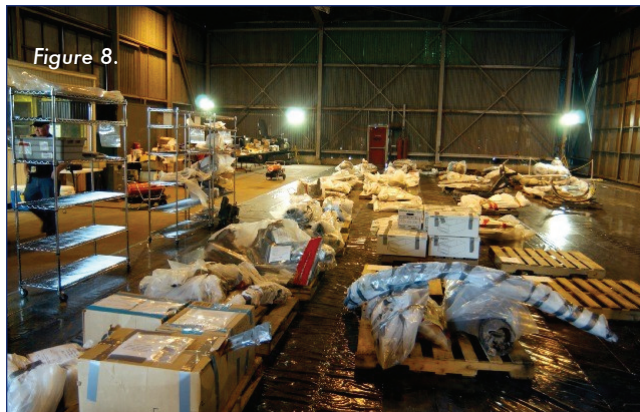
- 700,000 acres was searched on foot
- 1.6 million acres were searched with aircraft.

The total search area is equivalent to a 1.25 mile wide track across the U.S. from Boston to Seattle.

DEBRIS HANDLING

Debris from the *Columbia* was decontaminated if necessary and then tagged with information concerning its location. Pictures were taken of the debris in its found location. Collection centers were opened at Corsicana, Palestine, Nacogdoches, and Hemphill, Texas (Figure 8). All collection sites shipped debris to Barksdale AFB, Louisiana. Barksdale AFB was the location of most debris packaging and shipping to Kennedy Space Center. Debris going to Barksdale AFB was entered into the database, photographed, packaged for protection, and shipped to the Kennedy Space Center (KSC) Shuttle Landing Facility (SLF) hangar.

Twenty to thirty items were identified as “hot items” and were shipped to other locations. These too were entered into the database. Examples of these items are General Purpose Computers, film, cameras, MAGER GPS, OEX (MADS) recorder, and OPS recorders. All these items had information, which could potentially impact the search and the investigation. In some cases battery life times could limit access to potentially important information.



COLUMBIA RECOVERY OFFICE

On April 28, as the field search was winding down, the Columbia Recovery Office (CRO) was opened at Johnson Space Center in Houston. This office will remain open to respond to calls from the general public and to retrieve any debris reported by the public. When required a contractor will be dispatched to decontaminate and recover reported items. Items will be shipped to KSC to be included with other debris. It is expected that the CRO will be in place until fall 2003 after which time the responsibility for call response will transfer to KSC.

MIT REPORTED LESSONS LEARNED AND RECOMMENDATIONS

1. It is important to get a good database as early as possible. A good database administrator should be named immediately. Database functionality, hosting, changes, etc should be coordinated through a single point. NASA should consider developing a database that could serve as a starting point for similar activities.
2. Significant administrative support should be identified early in the process. Large amounts of data need to be organized and accessed throughout the field activity. There is also the need for records retention and archiving. Planning for records retention and archival needs to start early.
3. Leaving decision making at the field level made for a more efficient operation. This activity was a perfect example of letting the field operations be managed in the field.
4. The mapping capability provided by the Geographic Information System (GIS) was a significant asset. It provided a good communications tool between the field and management and between the DFO and remote locations.

5. Having dual top NASA management representatives in the field with overlapping responsibilities was confusing to many people including the other agencies that worked with the MIT. Due to the cooperative nature of the specific individuals in this particular case, there were no conflicts that affected the work at hand.
6. Having the leadership operate from a central location helps interagency and team communications significantly.
7. FEMA provided access to significant people resources. The declaration of a disaster by the President made this possible. NASA should consider how to accomplish debris retrieval if a disaster were not declared or if a similar accident were to happen outside the US.
8. Remote sensing provided little assistance identifying debris locations.
9. Communications support is a must. Cell phones, telephones, and computers are absolute requirements. These resources were provided by FEMA. NASA should have a plan to provide similar capabilities in cases where FEMA is not involved.
10. Mobility of management is important for a search area of this magnitude. Face-to-face meeting with leaders at the remote locations is very important. FEMA provided fixed wing aircraft and helicopter support for management visits to remote locations.
11. Planning for a major Shuttle event on foreign soil needs attention. The fact that the NASA and NTSB had previously coordinated responsibilities was significant in determining lines of responsibility. Similar coordination needs to take place with host countries of Transoceanic Abort Landing (TAL) sites.

MIT REPORTED CONTINGENCY ACTION PLAN COMMENTS

The contingency action plans published by the Shuttle program and the NASA centers worked very well. They provided directions for the initial notification and coordination. The program has conducted contingency simulations at least every 18 months. These simulations play a key part in making the process familiar to the key players. As is often the case, the *Columbia* accident was not exactly the scenario simulated or expected. The *Columbia* scenario did not impact the contingency declaration, MIT activation, or management process. The impoundment of evidence and key documentation began immediately and had few problems throughout the entire search process. The Contingency plan did not take into consideration the disaster declaration made by the president. This made significant additional resources available to the MIT. These additional resources were easily incorporated into the recovery plan and were key in the success of the effort.

COST

FEMA spent over \$305 million to fund the search activity. NASA funds were also used for SLF and aircraft support. Not included in the cost figures are the wages of the hundreds of civil servants employed at the recovery area and in analysis roles at various centers.

SUMMARY

This search activity is probably the largest search ever carried out in the history of the United States and likely in the world. Its success is a tribute to those agencies and individuals who participated in this unparalleled cooperative effort.

Most significantly, the recovered debris has been an essential component in our understanding of the important details of the accident scenario. It has corroborated other key data in the investigation. Without it there would be significant uncertainty in the cause and the location of the initial damage to *Columbia*.

ACKNOWLEDGEMENTS

Acme Electric Company of Texas
Air Conditioning Unlimited
Air Line Pilots Association
Alabama Forestry Commission
The Alabama Coushatta Tribe of Texas
Alaska Division of Forestry – Tok Area Office
Alaska Fire Service
Alaska Interagency Coordination Center
Alpine Rescue Team
Alvarado Fire Department
American Red Cross
Analytical Spectral Devices
Anderson County Courthouse
Angelina & Neches River Authority
Angelina County Precinct 3 Constable
Angelina County Precinct 5 Constable
Angelina County Sheriff Office
Appleby Volunteer Fire Department
Arcada Associates
Arizona State Land Department
Arizona Task Force 1
Arkansas Forestry Commission
Arkansas-oklahoma Interagency Fire Center
Ark-La-Tex Narcotics
Arlington Police Department
Armed Forces Institute of Pathology
Artel Inc
At&t World Service
Austin/Travis County Mhmr
Ball Aerospace
Beckville Volunteer Fire Department
Betty Hardwick Center
Big County of Abilene
Blue Bell
Bluebonnet Critical Incident Stress Management Team
Boeing
Boise Interagency Dispatch Center
Booz Allen Hamilton
Brandom Elementary School
Brookshires
Broward County Sheriffs Office
Bureau of Alcohol Tobacco Firearms and Explosives
Bureau of Indian Affairs – Albuquerque Area Office
Bureau of Indian Affairs – Blackfeet Agency
Bureau of Indian Affairs – Cheyenne River Agency
Bureau of Indian Affairs – Crow Agency

Bureau of Indian Affairs – Eastern Cherokee Agency
Bureau of Indian Affairs – Eastern Nevada Agency
Bureau of Indian Affairs – Flathead Agency
Bureau of Indian Affairs – Fort Apache Agency
Bureau of Indian Affairs – Fort Belknap Agency
Bureau of Indian Affairs – Fort Berthold Agency
Bureau of Indian Affairs – Fort Hall Agency
Bureau of Indian Affairs – Fort Peck Agency
Bureau of Indian Affairs – Fort Totten Agency
Bureau of Indian Affairs – Jicarilla Agency
Bureau of Indian Affairs – Laguna Area Agency
Bureau of Indian Affairs – Lower Brule Agency
Bureau of Indian Affairs – Mescalero Agency
Bureau of Indian Affairs – Navajo Area Office
Bureau of Indian Affairs – Northern Cheyenne Agency
Bureau of Indian Affairs – Northern Idaho Agency
Bureau of Indian Affairs – Northern Pueblos Agency
Bureau of Indian Affairs – Phoenix Area Office
Bureau of Indian Affairs – Pine Ridge Agency
Bureau of Indian Affairs – Puget Sound Agency
Bureau of Indian Affairs – Quinault Nation
Bureau of Indian Affairs – Ramah Navajo Agency
Bureau of Indian Affairs – Rocky Boys Agency
Bureau of Indian Affairs – Rosebud Agency
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Bureau of Indian Affairs – Southern Pueblos Agency
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Bureau of Indian Affairs – California State Office
Bureau of Indian Affairs – Carson City District
Bureau of Indian Affairs – Casper Field Office
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Bureau of Indian Affairs – Elko Field Office
Bureau of Indian Affairs – Ely District
Bureau of Indian Affairs – Eugene District
Bureau of Indian Affairs – Galena Zone
Bureau of Indian Affairs – Grand Junction Field Office
Bureau of Indian Affairs – Idaho Falls District
Bureau of Indian Affairs – Lakwview District
Bureau of Indian Affairs – Lewistown Field Office
Bureau of Indian Affairs – Las Cruces District
Bureau of Indian Affairs – Las Vegas Field Office
Bureau of Indian Affairs – Lower Snake River District
Bureau of Indian Affairs – Medford District
Bureau of Indian Affairs – Miles City District
Bureau of Indian Affairs – Montana State Office
Bureau of Indian Affairs – Montrose District
Bureau of Indian Affairs – Nevada State Office

Bureau of Indian Affairs – New Mexico State Office	City of Port Arthur
Bureau of Indian Affairs – Oregon State Office	City of Rowlett
Bureau of Indian Affairs – Phoenix Field Office	City of San Antonio
Bureau of Indian Affairs – Rawlins District	City of San Augustine
Bureau of Indian Affairs – Roswell District	City of The Colony
Bureau of Indian Affairs – Richfield Field Office	Civil Air Patrol Texas Wing
Bureau of Indian Affairs – Rock Springs District	Clarksville Warren City Volunteer Fire Department
Bureau of Indian Affairs – Roseburg District	Clayton Volunteer Fire Department
Bureau of Indian Affairs – Royal Gorge Field Office	Coca-Cola
Bureau of Indian Affairs – Safford Field Office	College Station Police Department
Bureau of Indian Affairs – Salem District	Collin County
Bureau of Indian Affairs – Salt Lake Field Office	Collin County Commissioners Court
Bureau of Indian Affairs – Taos Field Office	Collin County Sheriffs Office
Bureau of Indian Affairs – Upper Columbia Salmon Clearwater District	Colorado Forest Service
Bureau of Indian Affairs – Upper Snake River District	Colorado Task Force 1
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Bureau of Indian Affairs – Vale District	Community Four Volunteer Fire Department
Bureau of Indian Affairs – Vernal Field Office	Conagra Foods
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California Task Force 2	D & B Security
California Task Force 3	Dallas County
California Task Force 5	Dallas Fire Department
California Task Force 7	Dallas Fort Worth Fire Department
California Task Force 8	Dallas Fort Worth International Airport
Cameron County Sheriffs Office	David Wade Correctional Center
Casper Interagency Dispatch Center	Deep East Texas Workforce Development Center
Carthage Fire Department	Deer Park Fire Department
Center for Disease Control & Prevention	Defense Criminal Investigative Service
Center Independent School District	Defense Intelligence Agency
Central Heights Volunteer Fire Department	Department of Defense
Central Idaho Interagency Fire Center	Department of Health And Human Services
Cherokee County	Department of Interior
Cherokee County Sheriffs Office	Department of Transportation
Chevron	Dewberry & Davis
Chireno Independent School District	Diboll Fire Department
Chireno Volunteer Fire Department	Diboll Police Department
City of Alto	Digitalnet Government Solutions
City of Alvarado	Diversified Technology LLC
City of Diboll	Douglas County
City of Euless	Douglas Fire Department
City of Fort Worth	Douglas Independent School District
City of Garland	Dow Chemical Emergency Response
City of Hemphill	Durango Interagency Dispatch Center
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City of Joshua	East Texas Copy Systems
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City of Many	Eastex Maintenance Service Inc
City of Maypearl	Ellis County
City of Mesquite	Ellis Environmental Group
City of Mount Vernon	El Paso County Search & Rescue
City of Nacodoches	El Paso County Woodland Park
City of Nederalnd	Emergency Corp
City of Orange	Environinental Restoration LLC
City of Palestine	Environmental Protection Agency – EPA/START/WESTON
City of Plano	Environmental Systems Research Institute
	Etoile Volunteer Fire Department

Eugene Interagency Communications Center
Evergreen Helicopter
Fairmount Volunteer Fire Department
Farm Service Agency
Farmington Construction Office
Federal Bureau of Investigation – Beaumont
Federal Bureau of Investigation – Dallas
Federal Bureau of Investigation – Houston
Federal Bureau of Investigation – Laredo
Federal Bureau of Investigation – Lufkin
Federal Bureau of Investigation – New York
Federal Bureau of Investigation – Tyler
Federal Aviation Administration – Southern Region
Federal Aviation Administration – Southwest Region
Federal Emergency Management Agency
Federal Highway Administration
Firefighters National Trust
Firecom Llc
Flathead Interagency Dispatch Center
Flatwoods Job Corps Center
Flatwoods Volunteer Fire Department
Florida Division of Forestry
Florida Interagency Coordination Center
Florida Task Force 1
Florida Task Force 2
Foremost
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Fort Worth Fire Department
Fort Worth Independent School District
Franklin County Fire Department
Franklin County Sheriffs Office
Fremont County
Frito Lays
Fuller Springs Volunteer Fire Departmenet
Galveston Sheriffs Department
Gary Volunteer Fire Department
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Grayson County Sheriffs Office
General Services Administration
Georgia Forestry Commission
Georgia Interagency Coordination Center
Global Aerospace
Go Jo Company
Goldstar Ems
Good Samaritan Hospital
Goodyear
Grand Junction Interagency Dispatch Center
Gregg County
Gregg County Office of Emergency Management
Gulf Engineers And Consultants
Harris County
Harris County Sheriffs Department
Harrison County
Harrison County Sheriffs Office
Hardin County
Haynes Construction
Heart of Texas
Henderson County
Henderson County Sheriffs Office
Henderson Police Department
Hill County Mental Health And Mental Retardation
Hopkins County Sheriffs Office

Houston County
Houston County Office of Emergency Management
Houston Police Department
Huntington Police Department
Indiana Division of Forestry
Indiana Task Force 1
Intercommunity Volunteer Fire Department
Jasper County Sheriffs Office
Jasper/newton/sabine County Oem
Jefferson County
Johnson County
Joshua Volunteer Fire Department
Kaufman City Volunteer Fire Department
Kaufman County
Kaufman County Office of Emergency Management
Kaufman County Sheriffs Office
Keltys Baptist Church
Kemp Volunteer Fire Department
Kentucky Airmotive
Kentucky Division of Forestry
Kentucky Interagency Coordination Center
Kern County Fire Department
Kevric Company
Kgas Radio Station
Kingtown Volunteer Fire Department
Klamath Falls Interagency Fire Center
Kongsberg Maritime
Lake Nacogdoches Volunteer Fire Department
Lamar County Sheriffs Office
Land o' Pines
Larimer County Search & Rescue
LBJ Job Corp Center
Leesville County Sheriffs Office
Leon County Sheriffs Department
Lilbert Looneyville Volunteer Fire Department
Lincoln Zone Coordination Center
Linn Flat Fire Department
Livingston Fire Department
Livingston Police Department
Lockheed Martin
Lonestar Police Department
Longview Fire Department
Lopez Garcia Group
Los Angeles County Fire Department
Louisiana Office of Forestry
Louisiana Department of Health & Hospitals
Louisiana Department of Public Safety & Corrections
Louisiana Department of Wildlife & Fisheries
Louisiana Military Department
Louisiana National Guard
Louisiana Office of Emergency Preparedness
Louisiana State Police
Lufkin Chamber of Commerce
Lufkin Fire Department
Lufkin Police Department
Maness Scientific Inc
Marshall Fire Department
Marshall Police Department
Maryland Task Force 1
Massachusetts Task Force 1
Maypearl Volunteer Fire Department
McDonald's

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NASA – Dryden Flight Research Center	National Transportation Safety Board – Dallas South Central Regional
NASA – Glenn Research Center	National Weather Service
NASA – Goddard Space Flight Center	National Weather Service – Los Angeles Office
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National Interagency Coordination Center	North Carolina Interagency Coordination Center
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National Park Service – Amistad National Recreation Area	Oklahoma Division of Forestry
National Park Service – Arches National Park	Oklahoma Emergency Management
National Park Service – Bandelier National Monument	Orange County Sheriffs Office
National Park Service – Big Ben National Park	Oregon Department of Forestry
National Park Service – Big Cypress National Preserve	Omni Glow
National Park Service – Big Thicket National Preserve	Ozarka Water
National Park Service – Blueridge Parkway	Panola County
National Park Service – Buffalo National River	Panola County Constable
National Park Service – Carlsbad Caverns National Park	Panola County Sheriffs Office
National Park Service – Chickasaw National Recreation Area	Papillon Grand Canyon Helicopters
National Park Service – Chiricahua National Monument	Paris Police Department
National Park Service – Cuyahoga Valley National Park	Parker County
National Park Service – Delaware Water Gap National Recreation Area	Parker County Office of Emergency Management
National Park Service – Everglades National Park	Pepsi
National Park Service – Fort Laramie National Historic Site	Perry's Victory & International Peace Memorial
National Park Service – Fort Smith National Historic Site	Phoenix International Inc
National Park Service – Fredericksburg/Spotsylvania National Military Park	Phoenix Kingman Zone
National Park Service – Gettysburg National Military Park	Polk County
National Park Service – Glacier National Park	Polk County Sheriffs Office
National Park Service – Grand Canyon National Park	Private
National Park Service – Grand Teton National Park	Raytheon

Railroad Retirement Board
Richfield Interagency Fire Center
Rockwall County
Rockwall County Sheriffs Department
Rockwall Police Department
Rocky Mountain Interagency Helitack
Rocky Mountain Rescue Group
Roh, Inc.
Rosser Volunteer Fire Department
Rusk County
Rusk County Fire Department
Rusk County Office of Emergency Management
Rusk County Sheriffs Office
Rusk County Volunteer Fire Department
Sabine County Firefighters
Sabine County Sheriffs Office
Sabine Parish Sheriffs Department
Sabine River Authority
Salado Volunteer Fire Department
Salvation Army
San Augustine County
San Augustine Independent School District
San Luis Obispo Fire Department
Santa Barbara County Fire Department
Science Applications International Corp
Scurry Volunteer Fire Department
Shelby County
Shelby County Sheriffs Department
Shreveport Fire Department
Shreveport Police Department
Sierra Fron Interagency Dispatch Center
Skylane Helicopters
Skywarn
Smith County
Smith County Office of Emergency Management
Smith County Sheriffs Office
South Carolina Forestry Commission
South Channel Bay Area Stress Management
South Dakota Division of Resource Conservation And Forestry
Southwest Texas Debriefing Team
Southwestern Land Office
Spacelab, Inc.
Spokane County Fire District 4
State of Utah
Stephen F. Austin State University – Arthur Temple College of Forestry
Stephen F. Austin State University – Hues Gis Lab
Stewarts Catering
Sulphur Springs Police Department
Susan Rames
Sweetwater County
Swift Shady Grove Volunteer Fire Department
Temple Fire And Rescue
Temple Fire Department
Tennessee Task Force 1
Tennessee Interagency Coordination Center
Tennessee Southern Research Station
Tetra Tech
Texas A & M
Texas A & M at Corpus Christi
Texas Alcoholic Beverage Commission
Texas Animal Health Commission

Texas CISM Network
Texas Commission on Environmental Quality
Texas Department of Criminal Justice
Texas Division of Emergency Management
Texas Department of Health And Human Services
Texas Department of MHMR
Texas Department of Public Safety
Texas Department of Transportation
Texas Forest Service
Texas Interagency Coordination Center
Texas National Guard
Texas Natural Resources Information System
Texas Parks and Wildlife Department
Texas Rangers
Texas State Senate
Texas Task Force 1
Texas Water Development Board
Titus County
Tomball Fire Department
Tawakoni Fire Department
Travis County Sheriff's Office CISM Team
Txu Communications
Tyler Fire Department
Tyler Volunteer Fire Department
Uma Fire Management
Unedda Ice
Unita County
United Space Alliance
University of Texas Center For Space Research
Upshur County Sheriffs Office
Urban Search And Rescue
URS Corp.
U.S. Air Force – Barksdale Air Force Base
U.S. Air Force – U.S. Air Force Bomb Squad
U.S. Air Force – National Air Intelligence Center
U.S. Air Force – National Security Emergency Preparedness
U.S. Air Force – Patrick Airforce Base
U.S. Army
U.S. Army Corps of Engineers
U.S. Attorney's Office
U.S. Coast Guard – 13th Coast Guard District
U.S. Coast Guard – Atlantic Strike Team
U.S. Coast Guard – Auxillary
U.S. Coast Guard – Gulf Strike Team
U.S. Coast Guard – National Strike Force Coordination Center
U.S. Coast Guard – Pacific Strike Team
U.S. Fish & Wildlife Service – Anahuac National Wildlife Refuge
U.S. Fish & Wildlife Service – Aransas National Wildlife Refuge
U.S. Fish & Wildlife Service – Arizona Ecological Services Field Office
U.S. Fish & Wildlife Service – Attwater Prairie Chicken National Wildlife Refuge
U.S. Fish & Wildlife Service – Balcones Canyonlands National Wildlife Refuge
U.S. Fish & Wildlife Service – Blackwater National Wildlife Refuge
U.S. Fish & Wildlife Service – Brazos National Wildlife Refuge
U.S. Fish & Wildlife Service – Buenos Aires National Wildlife Refuge
U.S. Fish & Wildlife Service – Charles M Russell National Wildlife Refuge
U.S. Fish & Wildlife Service – Chenier Plains National Wildlife

Refuge	U.S. Forest Service – Huron-Manistee National Forests
U.S. Fish & Wildlife Service – Kenai National Wildlife Refuge	U.S. Forest Service – Idaho Panhandle National Forest
U.S. Fish & Wildlife Service – Northeast Regional office	U.S. Forest Service – Inyo National Forest
U.S. Fish & Wildlife Service – Okefenokee National Wildlife Refuge	U.S. Forest Service – Kaibab National Forest
U.S. Fish & Wildlife Service – Sandhill Crane National Wildlife Refuge	U.S. Forest Service – Kisatchie National Forest
U.S. Fish & Wildlife Service – Santa Ana National Wildlife Refuge	U.S. Forest Service – Klamath National Forest
U.S. Fish & Wildlife Service – Southwest Regional Office	U.S. Forest Service – Kootenai National Forest
U.S. Fish & Wildlife Service – Texas Point National Wildlife Refuge	U.S. Forest Service – Lake Tahoe Basin Management Unit
U.S. Fish & Wildlife Service – Texas Mid-coast National Wildlife Refuge	U.S. Forest Service – Land Between the Lakes National Recreation Area
U.S. Forest Service – Angeles National Forest	U.S. Forest Service – Lassen National Forest
U.S. Forest Service – Apache-Sitgreaves National Forest	U.S. Forest Service – Lewis & Clark National Forest
U.S. Forest Service – Arapaho & Roosevelt National Forest	U.S. Forest Service – Lincoln National Forest
U.S. Forest Service – Ashley National Forest	U.S. Forest Service – Lolo National Forest
U.S. Forest Service – Beaverhead/deerlodge National Forest	U.S. Forest Service – Los Padres National Forest
U.S. Forest Service – Big Horn National Forest	U.S. Forest Service – Malheur National Forest
U.S. Forest Service – Bitterroot National Forest	U.S. Forest Service – Manti-Lasal National Forest
U.S. Forest Service – Black Hills National Forest	U.S. Forest Service – Mark Twain National Forest
U.S. Forest Service – Boise National Forest	U.S. Forest Service – Mendocino National Forest
U.S. Forest Service – Bridger-Teton National Forest	U.S. Forest Service – Modoc National Forest
U.S. Forest Service – Caddo-LBJ National Grasslands	U.S. Forest Service – Monongahela National Forest
U.S. Forest Service – Caribbean National Forest	U.S. Forest Service – Mt. Baker-Snoquaimie National Forest
U.S. Forest Service – Caribou-Targhee National Forest	U.S. Forest Service – Mount Hood National Forest
U.S. Forest Service – Carson National Forest	U.S. Forest Service – National Forests in Alabama
U.S. Forest Service – Chattahoochee-Oconee National Forest	U.S. Forest Service – National Forests in Florida
U.S. Forest Service – Chequamegon-Nicolet National Forest	U.S. Forest Service – National Forests in Mississippi
U.S. Forest Service – Cherokee National Forest	U.S. Forest Service – National Forests in North Carolina
U.S. Forest Service – Chippewa National Forest	U.S. Forest Service – National Forests and Grasslands in Texas
U.S. Forest Service – Chugach National Forest	U.S. Forest Service – Nebraska National Forest
U.S. Forest Service – Cibola National Forest	U.S. Forest Service – Nez Perce National Forest
U.S. Forest Service – Clearwater National Forest	U.S. Forest Service – Ochoco National Forest
U.S. Forest Service – Cleveland National Forest	U.S. Forest Service – Okanogan National Forest
U.S. Forest Service – Coconino National Forest	U.S. Forest Service – Olympic National Forest
U.S. Forest Service – Columbia River Gorge National Scenic Area	U.S. Forest Service – Ouachita National Forest
U.S. Forest Service – Colville National Forest	U.S. Forest Service – Ozark and St. Francis National Forests
U.S. Forest Service – Coronado National Forest	U.S. Forest Service – Payette National Forest
U.S. Forest Service – Custer National Forest	U.S. Forest Service – Pike and San Isabel National Forests
U.S. Forest Service – Dakota Prairie Grasslands	U.S. Forest Service – Plumas National Forest
U.S. Forest Service – Daniel Boone National Forest	U.S. Forest Service – Prescott National Forest
U.S. Forest Service – Davy Crockett National Forest	U.S. Forest Service – Region 1 Northern Regional Office
U.S. Forest Service – Deschutes National Forest	U.S. Forest Service – Region 2 Rocky Mountain Regional Office
U.S. Forest Service – Dixie National Forest	U.S. Forest Service – Region 3 Southwestern Regional Office
U.S. Forest Service – Eldorado National Forest	U.S. Forest Service – Region 4 Intermountain Regional Office
U.S. Forest Service – Fishlake National Forest	U.S. Forest Service – Region 5 Pacific Northwest Regional Office
U.S. Forest Service – Flathead National Forest	U.S. Forest Service – Region 6 Pacific Northwest Regional Office
U.S. Forest Service – Francis Marion-sumter National Forest	U.S. Forest Service – Region 8 Southern Area Regional Office
U.S. Forest Service – Fremont National Forest	U.S. Forest Service – Region 9 Eastern Regional Office
U.S. Forest Service – Gallatin National Forest	U.S. Forest Service – Rio Grande National Forest
U.S. Forest Service – Grand Mesa, Uncompahgre & Gunnison National Forests	U.S. Forest Service – Rogue River National Forest
U.S. Forest Service – George Washington and Jefferson National Forests	U.S. Forest Service – Sabine National Forest
U.S. Forest Service – Gifford Pinchot National Forest	U.S. Forest Service – Salmon-Challis National Forest
U.S. Forest Service – Gila National Forest	U.S. Forest Service – Sam Houston National Forest
U.S. Forest Service – Helena National Forest	U.S. Forest Service – San Bernardino National Forest
U.S. Forest Service – Hoosier National Forest	U.S. Forest Service – San Juan National Forest
U.S. Forest Service – Humboldt-Toiyabe National Forests	U.S. Forest Service – Santa Fe National Forest
	U.S. Forest Service – Savannah River Project
	U.S. Forest Service – Sawtooth National Forest
	U.S. Forest Service – Sequoia National Forest
	U.S. Forest Service – Shasta-Trinity National Forest
	U.S. Forest Service – Shawnee National Forest
	U.S. Forest Service – Shoshone National Forest
	U.S. Forest Service – Sierra National Forest

U.S. Forest Service – Siskiyou National Forest
U.S. Forest Service – Siuslaw National Forest
U.S. Forest Service – Six Rivers National Forest
U.S. Forest Service – Stanislaus National Forest
U.S. Forest Service – Superior National Forest
U.S. Forest Service – Tahoe National Forest
U.S. Forest Service – Targhee National Forest
U.S. Forest Service – Tongass National Forest
U.S. Forest Service – Tonto National Forest
U.S. Forest Service – Uinta National Forest
U.S. Forest Service – Umitilla National Forest
U.S. Forest Service – Umpqua National Forest
U.S. Forest Service – Wallowa-Whitman National Forest
U.S. Forest Service – Wasatch-cache National Forest
U.S. Forest Service – Wayne National Forest
U.S. Forest Service – Wenatchee National Forest
U.S. Forest Service – White Mountain National Forest
U.S. Forest Service – White River National Forest
U.S. Forest Service – Winema National Forest
U.S. Forest Service – Willamette National Forest
U.S. Marshals Service
U.S. Navy – Combat Camera
U.S. Navy – Coastal Systems Station
U.S. Navy – EOD Training and Evaluation Unit Two
U.S. Navy – Mobile Diving and Salvage Unit Two
U.S. Navy – Mobile Diving and Salvage Unit Two Det 101
U.S. Navy – Mobile Diving and Salvage Unit Two Det 409
U.S. Navy – Mobile Diving and Salvage Unit Two Det 608
U.S. Navy – Naval Research Laboratory
U.S. Navy – Naval Air Station Joint Reserve Base Fort Worth
U.S. Navy – Naval Media Center
U.S. Navy – Naval Safety Center
U.S. Navy – Naval Sea Systems Command
U.S. Navy – Pearl Harbor Naval Shipyard
U.S. Navy – Shore Intermediate Maintenance Activity Mayport
Utah Task Force 1
Uvalde County
Uvalde County Sheriffs Department
Van Zandt County Sheriffs Office
Veridian
Vernon Parish Sheriffs Office
Virginia Department of Forestry
Virginia Task Force 1
Virginia Task Force 2
Volunteers
Washington Task Force 1
Waxahachie Independent School District
Weston Solutions
Woden Fire Department
Woods Volunteer Fire Department
Woodville Volunteer Fire Department
Wyle Life Sciences