

**EMERGENCY RESPONSE REPORT**

**FOR**

**MACDONA UNION PACIFIC TRAIN DERAILMENT**

**DEL RIO SUBDIVISION**

**MACDONA, BEXAR COUNTY, TEXAS**

Prepared for

**U.S. Environmental Protection Agency Region 6**

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1445 Ross Avenue

Dallas, Texas 75202

Contract No. 68-W-01-005

TDD No. 06-04-06-0019

WESTON W.O. No. 12632.001.300.0494.01

NRC No. 726444

CERCLIS No. N/A

FPN N/A

EPA OSC Scott Harris, Ph.D.

START-2 FTL Luke Gatlin

Submitted by

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30 October 2004

## PROJECT SUMMARY

This final report describes the U.S. Environmental Protection Agency (EPA) response actions at the Macdona Union Pacific Train Derailment. The site is located southwest of San Antonio, Texas, 0.7 mile east of Texas Loop 1604 on Nelson Road, near Macdona, Bexar County, Texas. The detailed report follows this page, and all attachments are provided as separate portable document format (PDF) files. On 28 June 2004, Union Pacific Railroad (UP) notified the National Response Center (NRC No. 726444) and the NRC notified the EPA Region 6 Response and Prevention Branch (EPA-RPB) of a train derailment involving unknown hazardous materials near Macdona, Texas. The Superfund Technical Assessment and Response Team (START-2) was activated by the EPA-RPB to respond to the derailment and to initiate all relevant response activities. Representatives from the Texas Commission on Environmental Quality (TCEQ), the EPA On-scene Coordinator (OSC) Scott Harris, Ph.D., and START-2 members Luke Gatlin, Jose De La Portilla, Jay Donoho, Jeff McCully, and David McCarty arrived at the scene on 28 June 2004. The EPA START-2 tasks included responding to the incident, conducting air monitoring, collecting information regarding the release and source of release, identifying potentially responsible parties (PRPs), analyzing probable direction of release, identifying pathways of exposure, analyzing potential impact on natural resources, and providing written and photographic documentation of response activities. After the removal of hazardous materials was complete and the EPA OSC made the determination that TCEQ would continue air monitoring any additional cleanup activities that were to take place, EPA OSC Harris released the START-2 members from the site at 0800 hours on 12 July 2004.

This final report was prepared by Weston Solutions, Inc. (WESTON®) under Contract No. 68-W-01-005 for EPA Region 6. The EPA OSC was Scott Harris, Ph.D, and the START-2 Field Team Leader was Luke Gatlin.

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The EPA Task Monitor did not provide final approval of this report prior to the completion date of the work assignment. Therefore, Weston Solutions, Inc. has submitted this report absent the Task Monitor's approval.

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## 1. PROJECT IDENTIFICATION

**Date:** 30 October 2004

**To:** Scott Harris, Ph.D., On-scene Coordinator (OSC)  
U.S. Environmental Protection Agency (EPA)  
Region 6, Response and Prevention Branch

**Through:** Linda Carter, Project Officer (PO)  
EPA Region 6, Program Management Branch

**Through:** Robert Beck, P.E., Weston Solutions, Inc. (WESTON®)  
EPA Region 6, Superfund Technical Assessment and Response Team (START-2)  
Program Manager

**From:** Luke Gatlin, WESTON  
EPA Region 6, START-2 Field Team Leader

**Subject:** Emergency Response: Macdona Union Pacific Train Derailment  
Del Rio Subdivision, Macdona, Bexar County, Texas  
TDD. No. 06-04-06-0019  
W.O. No. 12632.001.300.0494.01  
NRC No. 726444  
FPN N/A  
CERCLIS ID N/A  
Latitude 29.3278027° North  
Longitude 98.6771851° West

Geographic coordinates of the train derailment site were determined by START-2 members using the hand-held Global Positioning System based on the World Geodetic System – 1984 (WGS-84) with accuracy estimated at +/- 50 feet circular probable error.

## 2. INTRODUCTION

At approximately 0503 hours on 28 June 2004, a Union Pacific Railroad (UP) train derailed near Macdona, Bexar County, Texas. At approximately 0712 hours on 28 June 2004, UP notified the National Response Center (NRC No. 726444), and the NRC notified the Region 6 EPA Response and Prevention Branch (EPA-RPB) of a train derailment involving unknown hazardous materials near Macdona, Texas. At 0730 hours, the EPA-RPB activated WESTON, the Region 6 START-2 contractor, to perform a response investigation and to initiate all relevant response activities.

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC. EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

### **3. BACKGROUND**

On 28 June 2004 at 0503 hours, a train derailment occurred resulting from a west-bound UP train striking an east-bound Burlington Northern Santa Fe Railway (BNSF) train. The derailment occurred at the intersection of the railroad tracks and Nelson Road, east of the intersection of Texas Highway Loop 1604 and Wolf Road near Macdona, Bexar County, Texas. A Site Area Map and Site Location Map have been provided as Attachments A and B.

The derailment involved four locomotives and 35 railcars (see Site Sketch, Attachment C). The incident resulted in the release of 60 tons of chlorine gas from a punctured railcar, of five overturned tank railcars containing 77,000 gallons of ammonium nitrate, of 10,000 gallons of diesel fuel from the locomotive, of 600 gallons of locomotive lubrication oil, of 50 tons of alum oxide from a overturned boxcar, of cottonseed cake from an overturned boxcar, and of Australian garnet from an overturned boxcar in an area 300 yards north of the Medina River. The spilled diesel fuel resulted in a small fire that was extinguished by Southwest Volunteer Fire Department.

Local officials (San Antonio Fire Department and Southwest Volunteer Fire Department) secured the area around the incident, and residents were advised to either evacuate or shelter in place. According to local officials, the incident resulted in three fatalities, the UP conductor and two local residents, and 43 individuals were transported to local hospitals for evaluation and treatment. Unified Command was initiated and led by EPA OSC Harris and included the EPA Region 6, Bexar County Office of Emergency Management, San Antonio Fire Department, San Antonio Police Department, Southwest Volunteer Fire Department, the Texas Commission on Environmental Quality (TCEQ), and UP representatives.

### **4. ACTIONS TAKEN**

On 28 June 2004, EPA OSC Harris and START-2 members Luke Gatlin, Jose De La Portilla, Jay Donoho, Jeff McCully, and David McCarty mobilized to investigate the train derailment and to conduct air monitoring for chlorine gas. TCEQ representatives and the TCEQ Strike Team arrived at the derailment to coordinate with EPA and the potentially responsible party (PRP), UP, and to provide regulatory guidance. START-2 members Luke Gatlin and Jose De La Portilla

arrived at the derailment at 0830 hours on 28 June 2004. Additional START-2 members arrived on-site with EPA OSC Harris later on the same day. The National Transportation Safety Board (NTSB) conducted an investigation to fulfill their role, which was to determine the cause of the incident. As part of their investigation, a timeline was developed to accurately list the sequence of events; they also arranged to examine the punctured tank railcar at a later date when it was safe to do so.

START-2 conducted air monitoring for responders and citizen protection in two established air monitoring perimeters that surrounded the Hotzone (immediate area of incident containing elevated levels of contaminants of concern) and in additional designated areas of concern. The UP contractor, Center for Toxicology and Environmental Health, L.L.C. (CTEH), collected air monitoring data from 10 locations (Integrated Stations 1, 2, 3, 4, 5, 6, 7, 9, 11, and 12) within the Hotzone for personnel protection of the UP contractor, Specialized Response Services (SRS) (Attachment D). START-2 obtained a copy of the air monitoring information from CTEH (Attachment E).

Once on-site, START-2 was tasked to begin air monitoring the perimeter of the Hotzone with Draeger colormetric tubes for chlorine (see START-2 Mobile Air Monitoring Figure in Attachment F). The Draeger colormetric tubes used detected the presence of chlorine vapor concentrations between 0.3 and 10 parts per million (ppm). START-2 did not record any detections of chlorine with the Draeger colormetric tubes (see START-2 Air Monitoring Results – Mobile Air Monitoring Tables in Attachment G). START-2 conducted air monitoring with the Automatic Accuro 2000 Draeger colormetric tubes until 6 July 2004. START-2 also used RAE System Area RAEs to continually air monitor the perimeter of the Hotzone for chlorine gas. Two Area RAEs were placed inside the Hotzone on 28 June 2004; the Area RAEs sensors became immediately saturated with chlorine once placed inside the Hotzone and became inoperable. The additional Area RAEs were placed in areas designated by START-2 under the direction of EPA OSC Harris; four Area RAE units (units 1, 2/8, 3, and 7) were placed in an outer perimeter located adjacent to State Loop 1604 on 29 June 2004. Seven Area RAE units (units 17, 20, 21, 22, 23, 26, and 28) were placed in the inner perimeter surrounding the Hotzone on 4 July 2004 (see START-2 Perimeter Air Monitoring Map in Attachment H). The Area

RAEs were numbered based upon the numbers that were stenciled onto the unit prior to this event. START-2 continually conducted air monitoring, 24 hours per day, for the inner and outer perimeters of the Hotzone with Area RAEs until 11 July 2004. START-2 recorded chlorine concentrations between 0 and 0.5 ppm, with the highest recorded concentration at 0.5 ppm (see START-2 Air Monitoring Results – Inner and Outer Perimeter Air Monitoring Tables in Attachment G).

On 28 June 2004, SRS and UP entered in the Hotzone in Level B personal protective equipment (PPE) due to the unknown chemical concentration and the extent of contamination. The emergency response teams entered the Hotzone to recover potential citizens affected by the released chlorine gas. SRS and UP entered the Hotzone to determine the cause of the chlorine release and to stop the release. PPE was downgraded to Level C once CTEH air monitoring recorded readings below the Level B PPE action level determined by the UP response and cleanup teams.

On 28 June 2004, SRS and UP sealed the chlorine railcar puncture associated with the leaking chlorine with a wooden plug. On 29 June 2004, UP applied lime to the punctured railcar, surrounding railcars, materials, and soil to reduce the acidity created by the mixing of chlorine vapors and moisture within the Hotzone. Once the lime had been applied, all affected materials, debris, and soil were removed from the site for proper disposal. The application of lime produced a particulate release that reportedly left the site. Nearby residents and city employees reported to local officials viewing a large white cloud leaving the area of the derailment; several off-site individuals went to local hospitals for medical evaluation.

On 30 June 2004, UP recovered the spilled diesel fuel that had pooled in the nearby soils and railway due to placement of booms and dikes. The recovered product and affected soil was removed and transported to a UP oil remediation facility in Kirby, Texas. For additional detailed information regarding the removal of diesel and affected media, contact TCEQ Region 13 State On-Scene Coordinator Cameron Lopez. UP relocated the punctured chlorine tank railcar south of the railroad tracks and began recovering the remaining chlorine gas on 1 July 2004.



Prior to the relocation of the punctured chlorine tank railcar, air dispersion models (created by SAFER STAR) were evaluated to simulate a possible release scenario during the chlorine tank railcar relocation operation. Based on the models, the Unified Command determined which residents located within the plume of the hypothetical release scenario were to be evacuated or sheltered in place during chlorine transfer operations. START-2 was tasked to conduct air monitoring in an area designated to be within the possible plume. Elevated levels of chlorine were not detected during the chlorine tank railcar transfer operation, and the evacuated residents were allowed to return to their homes 30 minutes after a stability check was performed on the relocated chlorine tank railcar. After the relocation of the punctured tank railcar, UP began to use a vapor recovery system to extract the remaining chlorine contained in the punctured railcar. The vapor recovery system used negative pressure to transfer the chlorine gas from the punctured tank and into a caustic scrubber. The chlorine gas reacted with the caustic solution to create a hypochlorite solution. The solution was transported off-site for processing by Occidental Chemical Corporation (OxyChem) in Houston, Texas.

On 2 July 2004 and 6 July 2004, CTEH, with oversight by START-2, conducted air monitoring at residents' homes that were located within the plume to determine if chlorine gas was present. CTEH utilized Toxi RAEs, colormetric tubes, and pH paper to monitor the residences for chlorine gas. Chlorine gas was not present within the homes, and the Unified Command determined that the residents could return to their homes. Additionally, CTEH analyzed a resident's automobile for pH that was located within the plume and determined the automobile had a pH reading of 7.

On 11 July 2004, the punctured railcar had been completely emptied and the ammonium nitrate fertilizer was transported from the derailed railcars to active railcars for transportation off-site. At 0820 hours on 11 July 2004, START-2 completed air monitoring and began demobilization activities. CTEH completed air monitoring at 1200 hours and air monitored the remaining homes that were suspected to have been affected by the chlorine release. The TCEQ Strike Team demobilized at 1200 hours. EPA OSC Harris released START-2 from the site at 0800 hours on 12 July 2004. After START-2 demobilization, the START-2 PTL returned to the incident site

and observed UP continuing remediation of affected soils and materials and salvage of the remaining derailed railcars.

Supplemental documentation from federal, state, and local agencies, UP, and CTEH are included within the files that accompany this report (Attachment L). A summary sheet describing the contents of Attachment L is provided within the attachment.

## **5. LIST OF ATTACHMENTS**

- A. Site Area Map
- B. Site Location Map
- C. Site Sketch
- D. CTEH Air Monitoring Location Map
- E. CTEH Air Monitoring Results
- F. START-2 Mobile Air Monitoring Location Map
- G. START-2 Air Monitoring Results
- H. START-2 Perimeter Air Monitoring Location Map
- I. Copy of NRC Report No. 726444
- J. Copy of POLREPS
- K. Copy of Logbook
- L. Additional Multi-agency and PRP Documentation
- M. Copy of TDD No. 06-04-06-0019 and Amendments A through E