

June 11, 2007

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**Subject: Final Comprehensive Environmental Response, Compensation, and Liability Act  
(CERCLA) Emergency Response Action Report  
Bullitt County Train Derailment Site  
Brooks, Bullitt County, Kentucky  
EPA Contract No. EP-W-05-054  
TDD No. TTEMI-05-001-0030**

Dear Mr. Smith:

The Tetra Tech, Inc. Superfund Technical Assessment and Response Team is submitting the enclosed final CERCLA emergency response action report for the Bullitt County Train Derailment site located in Brooks, Bullitt County, Kentucky. This report summarizes field activities conducted at the site during the emergency response conducted from January 16 through February 13, 2007.

If you have any questions about the enclosed report, please call me at (502) 357-9367 or Chuck Berry at (678) 775-3098.

Sincerely,



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START III Project Manager



Andrew F. Johnson  
START III Program Manager

Enclosure

cc: Katrina Jones, EPA Project Officer  
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**FINAL CERCLA EMERGENCY RESPONSE ACTION REPORT  
BULLITT COUNTY TRAIN DERAILMENT SITE  
BROOKS, BULLITT COUNTY, KENTUCKY  
EPA CONTRACT NO. EP-W-05-054  
TDD NO. TTEMI-05-001-0030**

**Prepared for**

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## 1.0 INTRODUCTION

This report has been prepared under the provisions of Technical Direction Document (TDD) No. TTEMI-05-001-0030, which the U.S. Environmental Protection Agency (EPA) Region 4 assigned to the Tetra Tech Superfund Technical Assessment and Response Team (START) under Contract No. EP-W-05-054. The overall scope of this TDD, which is monitored by On-Scene Coordinator (OSC) Art Smith, was to provide technical assistance during emergency response activities at the Bullitt County Train Derailment (Bullitt) site in Brooks, Bullitt County, Kentucky. Specific elements of this TDD included documenting on-site conditions and activities with logbook notes (Appendix C) and photographs (Appendix D), providing air monitoring, providing sampling support, constructing and maintaining the site database, and preparing a final report.

This Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) emergency response (ER) action report discusses the site background (Section 2.0) and emergency response activities (Section 3.0), and summarizes the data collected during the response (Section 4.0). In addition, six appendices are included with this report. Appendix A presents the figures referenced in the report. Appendix B provides analytical data resulting from air monitoring conducted by START, EPA's Environmental Response Team (ERT), and the Center for Toxicology and Environmental Health (CTEH), the CSX Transportation (CSXT) contractor. Appendix C provides a copy of Tetra Tech's field logbook notes, Appendix D presents a photographic log of emergency response activities and site conditions, and Appendix E provides a table of witnesses to the emergency response activities. Appendix F contains the SCRIBE database which includes monitoring and sampling reports on compact disc; this appendix will be provided under separate cover. Attachment 1 presents sample location maps provided by Arcadis. The Airborne Spectral Photographic Environmental Collection Technology (ASPECT) data evaluation report is provided in Attachment 2. Attachment 3 presents the EPA Region 4 Science and Ecosystem Support Division (SESD) reports of the oversight of Arcadis during sampling activities. The EPA SESD report of the review of analytical data and related documents resulting from the derailment is provided in Attachment 4.

## 2.0 BACKGROUND

At approximately 0840 hours on January 16, 2007, a train owned and operated by CSXT derailed from its tracks in Brooks, Bullitt County, Kentucky. The derailment was located along Kentucky Route 1020 and Huber Station Road, with geographical coordinates 38.033595 north latitude and 85.709236 west longitude, and occurred in an area developed in both residential and commercial properties (Appendix A,



Figure 1). The accordion-pattern derailment involved 25 railcars, 13 of which were carrying flammable liquids, gases, and accelerants. An explosion occurred within the pile up, and fire erupted creating a large plume of thick, black smoke which dispersed throughout Bullitt County. Flammable chemicals released from the railcar wreckage were observed flowing into nearby ditches as they burned.

The Zoneton Fire District (ZFD) initially responded to an emergency “911” call, and arrived at the scene at approximately 0850 hours. Residents in the immediate area of the fire were instructed to evacuate. The ZFD personnel assisted with residential evacuations and a one-mile radius evacuation zone from the derailment was established, with residents being instructed to leave or shelter in place (see Appendix A, Figure 2).

The Bullitt County Sheriff Department closed all roads entering the area of the derailment, the exclusion area, including Kentucky Route 1020. The CSXT rail line was also closed, and the aviation airspace over the town was restricted. Norton Hospital was notified by 0900 hours to re-route patients to Jewish South Hospital (Jewish South). Two emergency personnel who were overcome by fumes during the evacuation process and three residents thought to be exhibiting symptoms of chemical exposure were treated at Jewish South; the patients were subjected to emergency gross-decontamination by the local Emergency Managements Agency (EMA) prior to being treated. No serious or life-threatening injuries were reported.

A total of 3,600 gallons of fire-suppressing foam acquired from the Louisville Standiford Field Airport Fire Department (SDFFD) was initially used in an attempt to suppress the fire, but the foam did not extinguish it. The ZFD determined that the fire was uncontrollable and began to attack the fire with water application, which was also found to be ineffective.

EPA received official notification of the blaze at about 0930 hours on January 16, 2007. OSC Art Smith was dispatched to the scene from Louisville, Kentucky to offer assistance to the KY DEP. OSC Steve Spurlin was also summoned from Jackson, Tennessee. At 0945 hours, EPA notified Tetra Tech and requested mobilization of sufficient personnel and equipment to be prepared to perform entries in up to Level A personal protective equipment (PPE), monitor for toxic gases and vapors, and document site activities and conditions.



### 3.0 EMERGENCY RESPONSE ACTIVITIES

As requested by EPA, Tetra Tech START responded to the emergency at the Bullitt site on January 16, 2007 to document on-site conditions and activities with logbook notes (Appendix C) and photographs (Appendix D); perform Level A entries into the wreck site, if necessary; perform air monitoring; collect samples from containers, and perform hazard categorization field testing, if necessary. Tetra Tech mobilized personnel from offices in Louisville, Kentucky; Atlanta, Georgia; Nashville, Tennessee; Huntsville, Alabama; Chicago, Illinois; and Lenexa, Kansas; and Erlanger, Kentucky. This section summarizes emergency response activities conducted from January 16 through February 13, 2007.

#### **January 16, 2007**

OSC Smith arrived on scene at approximately 1100 hours. START member John Floyd arrived at approximately 1200 hours, and START members Sherry Weedman, Ryan Engelbrecht, and Roger Ragland arrived at approximately 1300 hours. They reported to the Incident Command Post (ICP) on East Blue Lick Road. The acting Incident Commander (IC) was Kevin Moulton of ZFD. Numerous agencies had already reported or arrived shortly after this time, including fire departments from Bullitt County, Okalona, Shepherdsville, and SDFD; the KY DEP Division of Air Quality (DAQ); the KY DEP Environmental Response Team; the EPA ERT; the Army National Guard 41<sup>st</sup> CST; the Kentucky Emergency Management Agency (KYEMA); Bullitt County Health Department (BCHD); the Louisville Metro Department for Public Health and Wellness (LMDPHW); the National Transportation Safety Board (NTSB); the United States Coast Guard (USCG) Gulf Strike Team; CSXT, and CSXT's air monitoring contractor, CTEH. The aviation airspace over the town was restricted, and an eight-mile stretch of nearby Interstate 65 was shut down to through traffic (see Appendix A, Figures 1 and 2). Emergency personnel were permitting only response personnel into the command post area, as the event had stirred great interest from local and national media.

OSC Smith notified START that the ASPECT fixed-wing aircraft was dispatched at 1100 hours. At that time, START received information from the command post that cyclohexane, methyl ethyl ketone (MEK; 2-butanone), and butadiene were chemicals confirmed to be involved in the derailment. OSC Smith volunteered to IC Moulton that EPA would undertake air monitoring activities in concert with the Army National Guard 41<sup>st</sup> CST and CTEH. CTEH conducted air monitoring and sampling activities utilizing AreaRAE instruments and SUMMA canisters. Four Army National Guard 41<sup>st</sup> CST members and two START members combined to create three two-person teams, and were deployed from the command post to conduct air monitoring activities for volatile organic compounds (VOC) and particulates



in Level C PPE. The START/CST teams used AreaRAEs, a MultiRAE and a Drager Multiwarn instrument with sensors for VOCs, oxygen, hydrogen sulfide (H<sub>2</sub>S), carbon monoxide (CO), and lower explosive limit (LEL). A real-time ambient mass sampler (DataRAM) for particulate monitoring, and a single point monitor (SPM) with a chlorine chemical cassette for chlorine gas monitoring were used as well. Team 1, consisting of two Army National Guard 41<sup>st</sup> CST members, traveled to the southern extent of the plume in the vicinity of Interstate 65. Team 2, consisting of two CST members, traveled to the northern extent of the plume in the vicinity of Interstate 65. Team 3, consisting of two START members, traveled to Rural Acres subdivision and residential and commercial areas of Shepherdsville to conduct air monitoring activities in areas not yet evacuated that were located in the path of the plume, to evaluate if evacuation was necessary. Based upon the presence of various VOCs, EPA determined that the level of concern would be 1.0 part per million (ppm), which was the permissible exposure limit for butadiene. The level of concern for particulates was set for both PM-10 monitoring and total particulates monitoring. CTEH set the PM-10 level of concern to be 0.25 milligrams per cubic meter (mg/m<sup>3</sup>). The total particulates level of concern was set at 3.5 mg/m<sup>3</sup>. The three teams reported no instrument readings above background levels on all instrumentation within their designated monitoring areas with the exception of one total particulate reading of 0.093 mg/m<sup>3</sup> measured near and directly downwind from the fire. From the point of the initial explosion and throughout the day, the large, dense plume appeared to rise high into the atmosphere and did not appear to “drop” or settle near or at ground level.

At approximately 1500 hours, OSC Steve Renninger, EPA ERT Gary Newhart, START Shelly Lam, and START Randy Mayer arrived at the Bullitt site and EPA, ERT, and START established a command post in the parking lot of a local hardware store near the intersection of Kentucky Route 1020 and State Road 61. START members David Reyna, Chris Draper, and Anna Purses arrived at the command post at approximately 1800 hours. OSC Renninger tasked START and ERT to begin conducting rapid assessment tool (RAT) monitoring in loops in the plume-impacted area. RAT is a software application that integrates multiple air monitoring and global positioning system (GPS) data collection instruments into one cohesive network. For this event, the RAT was designed to monitor CO, chlorine, LEL, oxygen, and VOCs utilizing a MultiRAE instrument and particulates utilizing a DataRAM instrument, while a Trimble GPS unit was continuously logging the coordinates of the locations where monitoring readings were collected. RAT monitoring loops were planned to be conducted every two hours. OSC Renninger also tasked START and ERT to begin placing EPA AreaRAEs at locations of concern and on the outer perimeter of the area of concern. The air monitoring data that were collected are discussed in Section 4.0.



The Scribe database reports from monitoring activities are provided in Appendix F (under separate cover).

Flight restrictions were lifted and Interstate 65 was opened for through traffic by 1900 hours. Emergency response activities were determined to be conducted on a 24-hour operational schedule. OSC Steve Spurlin and ATSDR representative Robert Safay arrived at the command post at approximately 1900 hours, and assumed the role of night operations EPA IC. Day operations EPA IC, OSC Smith, briefed OSC Spurlin on the day shift events and plans for night operations.

### **January 17, 2007**

Unified Command was established, which included the ZFD, KY EMA, CSXT, and EPA. EPA utilized federal resources to conduct air monitoring and oversee response operations performed by CSXT. A USCG safety officer was assigned to manage site safety. A Technical Specialist, Robert Safay, was staffed by the Agency for Toxic Substance and Disease Registry (ATSDR), and was assigned to provide toxicological information to the IC and public.

OSC Spurlin briefed START Weedman on night operations and plans for day operations. The fire from an MEK railcar had ceased burning, but a cyclohexane railcar continued burning. The smoke plume did not appear to be as concentrated as earlier in the incident, and it continued to rise into the atmosphere instead of settling near the ground. RAT monitoring loops and AreaRAE instrument monitoring at locations of concern had continued through the night. CTEH also continued air monitoring and sampling activities at the site of the fire, within the area of concern, and along the outer perimeter of the area of concern throughout the night. EPA, EPA ERT, and START relocated the command post to the Zoneton Fire Station, which also served as the ICP. EPA Dino Mattorano and Response Engineering and Analytical Contract (REAC) Mike Hoppe and Dave Adams arrived at the ICP on January 17, 2007 to provide additional AreaRAEs and personnel for air monitoring activities. EPA OSCs Ben Franco, Terry Tanner, and Jeff Crowley arrived at the ICP at approximately 1230 hours.

CSXT conducted preparations to “flare” the contents in three butadiene railcars. Separate transfer lines were connected to each of the butadiene railcars and then joined together into two lines that crossed Kentucky Route 1020 and led to a pit where the product would be disposed of through controlled combustion, also known as “flaring off”. Access to use the Kentucky Solite property for the flaring operations was obtained by CSXT prior to commencement of these activities. EPA tasked START to



collect air samples using SUMMA canisters provided by KY DEP before, during, and after the flaring operations to document air quality downwind, within one mile of the operation. KY DEP collected the first air sample prior to commencement of the flaring, in a nearby residential area within one mile downwind of the operation. Two SUMMA samples were collected on January 17, 2007. Preliminary analytical results for the SUMMA canister sampling are discussed in Section 4.0. Preparations for the flaring process were completed at 1530 hours and the flaring operations began. A large black plume of smoke was instantly produced, and unlike the plume from the initial derailment fire, the plume from the flaring operations appeared to be dropping and settling near the ground.

A total of 19 fixed AreaRAE instrument air monitoring stations were established. CTEH conducted monitoring within the work zone throughout the day and also responded to a large number of monitoring requests called in by citizens. In addition, three mobile teams conducted RAT air monitoring in loops around the perimeter of the area of concern, at schools, and other specified locations. The change in wind direction influenced monitoring locations as well. The EPA ASPECT aircraft continued to collect air monitoring data on January 17, 2007, and results correlated well with data collected by instrumentation on the ground. The ASPECT data evaluation report provided in Attachment 2 states that the concentrations of 1, 3-butadiene and maleic anhydride, after extrapolation based on an estimate of the plume thickness, were both estimated to be approximately 0-0.1 ppm. The ASPECT data evaluation report references the air monitoring activities as being conducted on January 15, 2007, but the activities did in fact occur from January 16 through 18, 2007. The Army National Guard 41<sup>st</sup> CST also collected air samples utilizing a HAPSITE gas chromatograph/mass spectrometer (GC/MS) instrument throughout the night shift. The concentrations measured by the AreaRAEs, the mobile monitoring crew's instruments, or the GC/MS instrument were below the applicable levels of concern. The Scribe database reports from monitoring activities are provided in Appendix F (under separate cover). OSC Renninger demobilized from the site on January 17, 2007.

### **January 18, 2007**

Flaring of the butadiene railcars continued through the night, and were completed at 1845 hours on January 18, 2007. The third air sample collected using a SUMMA canister was collected by START during the flaring operations at the flaring location at approximately 0426 hours.

The fire from the cyclohexane railcar also ceased on January 18, 2007. START and CTEH continued air monitoring activities including using AreaRAE instruments at fixed locations and mobile teams in the



perimeter of the area of concern. Air monitoring was also conducted at schools and other specified locations. Air monitoring and sampling results showed that there were no significant concentrations above background. Upon completion of the butadiene flaring operations, OSC Franco tasked START and ERT to remove AreaRAEs from their fixed field positions.

Confirmation of the contents and status of the 13 chemical railcars involved in the derailment was provided to EPA on January 18, 2007; this information is detailed in Table 1 on the following page.

**TABLE 1. CSXT CHEMICAL RAILCAR INVENTORY AS OF JANUARY 18, 2007**

<b>Railcar Identification</b>	<b>Product</b>	<b>Damage/Leak Assessment</b>	<b>Status</b>	<b>Action Planned</b>
SCMX 4021	Butadiene	Breached and burned	Empty	Move to staging
SCMX 4015	Butadiene	Exposed to fire but no leak	Flared	Move to staging / flare residual vapor
SCMX 4152	Butadiene	Exposed to fire but no leak	Flared	Move to staging / flare residual vapor
SCMX 4004	Butadiene	Exposed to fire but no leak	Flared	Move to staging / flare residual vapor
PPGX 1776	Chlorine Residue	Exposed to fire and leaked	Empty	Move to storage
NATX 38259	Methyl Ethyl Keytone	Breached and burned	Empty	Move to storage
UTLX 644622	Ethoxylated Alcohol	Leaked but partially recovered	50 percent full	Transfer product to frac tank
CHVX 288100	Cyclohexane	Dripping from vacuum release device	Full	Transfer product and move to staging
CHVX 287003	Cyclohexane	Manway on fire	50 percent full	Extinguish fire, transfer product, and move to staging
UTLX 643189	Hydraulic Fluid	Breached and decomposed	3000 Gallons in car	Unload
UTLX 41536	Non-Haz Fatty Alcohol	Dents	Empty	Move to staging; conduct residue shipment
UTLX 667181	Maleic anhydride	Minor Leak	Full	Transfer product and move to staging
UTLX 663990	Maleic anhydride	Dents	Full	Transfer product and move to staging

CSXT obtained access to the So-Lite property to create a staging area for equipment, railcars, and various response-related operations. Stockpiles of soil removed from the area of derailment were staged on this property. CSXT conducted soil sifting operations in attempt to recover parts from the track and railcars in support of the NTSB in completing an investigation regarding the cause of the derailment. On January



30, 2007, NTSB determined that enough evidence had been recovered from the sifting operations and the agency relieved CSXT from conducting further soil sifting activities.

Further night operations for EPA, ERT, and START were called off by OSC Smith at 1700 hours. OSC Smith made the decision to rely on nighttime air monitoring data collected by CTEH from this point forward.

### **January 19, 2007**

START Bergner and Ragland collected the fourth SUMMA canister air sample at approximately 1020 hours, following the completion of the butadiene flaring operations. The sample was collected downwind (east) and within the one-mile radius of the derailment site. In response to reports that “polymerized” material was found floating in surface water at the confluence of Blue Lick Creek and Floyd's Fork, EPA tasked START and KY DEP to conduct surface water sampling activities along the drainage system. START members Weedman, Floyd, Bergner, and Ragland prepared for a surface water sampling event with KY DEP. Surface water samples were planned to be collected from an unnamed tributary north of the site to serve as a background sample, from an unnamed tributary south of the derailment site, and from Blue Lick Creek. The Army National Guard 41<sup>st</sup> CST was requested by EPA to conduct analysis of the surface water samples using the HAPSITE GC/MS instrument.

### **January 20, 2007**

Early on January 20, 2007, CSXT reported a spike in air concentrations of butadiene at the site. CSXT reported detecting peak concentrations of up to 1.5 ppm in the immediate area of the derailment. Work in the area was halted, and respiratory protection (using air-purifying respirators) was required in the immediate area of the derailment site. No exceedances of butadiene above the Permissible Exposure Limit (PEL) were detected in offsite areas during this period.

On January 20, 2007, START Bergner and Ragland conducted surface water sampling and visual assessments of unnamed tributaries and Blue Lick Creek to obtain data for comparison with data resulting from water sampling activities conducted by Arcadis, the CSXT contractor. START collected water samples and conducted field measurements at four locations: (1) one upgradient background sample was collected from Clear Run Creek north of the site; (2) one downstream sample was collected from the nearest unnamed tributary south of the derailment site; and (3) two samples were collected from Blue



Lick Creek, one upstream and one downstream of the surface water booms and skimmers that were placed in the creek. START recorded the following parameters at each of four locations: air temperature, water temperature, conductivity, pH, dissolved oxygen concentration, and nitrate concentration. A standard field thermometer was used to obtain air and water temperatures. Conductivity was measured using a calibrated Oakton® ECTestr with a range of 0 to 1,990 microSiemens. The following field screening kits were used to measure pH, dissolved oxygen concentration, and nitrate concentration: (1) LaMotte Wide-Range pH Test Kit Model P5085-2119, (2) LaMotte dissolved oxygen test kit Model EDO-7414, and (3) LaMotte Nitrate Test Kit Model NCR-3110. Water samples from each of the four sites were transported to the Army National Guard 41<sup>st</sup> CST for analysis using the HAPSITE GC/MS instrument. EPA's review of the analytical results confirmed the presence of MEK at parts-per-million levels, which are similar to the concentrations reported previously by Arcadis. CSXT and its contractor Arcadis continued to collect water samples to track trends in MEK concentrations in surface water downstream of the site. Surface water analytical data provided by Arcadis is provided in the Scribe database in Appendix F (provided under separate cover).

While conducting surface water sampling activities, START Bergner and Ragland observed an Arcadis field crew scraping the stream bed of the unnamed tributary south of the derailment, and filling the bed with limestone rock. START also observed boom placement in the unnamed tributary, at the confluence of Clear Run Creek and Blue Lick Creek, within Blue Lick Creek, at the confluence of Blue Lick Creek and Floyd's Fork, and at the confluence of Floyd's Fork and Salt River. The booms were observed to be providing some containment of the "polymerized" material and sheen seen floating in the creeks. Arcadis field teams were observed using skimmers and vacuum trucks to extract the material from the surface water within Blue Lick Creek.

Also during this day, OSC Smith focused on supporting the residential reoccupation process, and OSC Crowley, START Floyd and the EPA ERT conducted confirmation air monitoring activities within residences, schools, and other structures as requested. A MultiRAE four-gas instrument, a DataRAM instrument, and colormetric tubes were used to conduct the air monitoring activities. CTEH also conducted air monitoring activities in support of residential and commercial property re-entries. All monitoring results were found to be well below the associated levels of concern. Documentation regarding reoccupation for residential and commercial properties was developed by Mr. Safay of ATSDR, and this documentation was provided to citizens as the property and structures were cleared by air monitoring.



### **January 21 – February 13, 2007**

With all the fires extinguished, OSC Smith determined that the emergency response phase was completed as of January 21, 2007, and the investigation and cleanup phase began. The residential reoccupation activities continued through February 28, 2007. CTEH continued to conduct air monitoring activities in support of residential and commercial property re-entry as well as at the derailment site location in support of worker protection during various operations.

As of January 21, 2007, four railcars containing hazardous materials remained onsite: two railcars contained cyclohexane and the other two contained maleic anhydride. On January 27, 2007, CSXT conducted transfer operations of the cyclohexane material from the two railcars for transportation offsite. The maleic anhydride transfer operations began on February 12, 2007. Level B PPE was required for this operation, and OSC Smith requested two USCG officials to conduct oversight of the transfer operations. The two railcars were emptied at approximately 0100 hours. CSXT continued cleaning operations and completed the operation on February 13, 2007. CTEH conducted air monitoring during transfer operations of both the cyclohexane and the maleic anhydride chemical railcars.

Due to the fact that water service had been disrupted (see discussion below), and that roads remained closed over a half-mile distance in both directions (north and south) from the wreck site, up to 50 nearby residents remained evacuated from their homes as of January 22, 2007. Kentucky Route 1020 was eventually opened to public traffic on January 31, 2007. Water line replacement activities were conducted throughout January and February and water service was returned to the 15 affected residential properties on February 28, 2007. Residents were able to return to their homes at that time.

In addition to the soil and water sampling Arcadis conducted during the emergency phase, Arcadis also conducted soil and water sampling in numerous locations throughout the investigation and cleanup phase. Arcadis submitted a draft initial response soil investigation work plan and a draft initial response groundwater and surface water investigation work plan to EPA and KY DEP for review on January 23, 2007. Upon approval by EPA and KY DEP, Arcadis began investigative activities.

Surface water sampling and investigation was conducted on a regular basis by Arcadis at predetermined locations along the drainage system to evaluate the release associated with the derailment and track



concentration trends for the constituents of concern (COC) butadiene, cyclohexane, MEK, and maleic anhydride. The surface water samples were taken from the following locations:

- The unnamed tributary just south of the derailment to Clear Run Creek
- Clear Run Creek
- Clear Run Creek and its confluence with Blue Lick Creek
- Blue Lick Creek
- Blue Lick Creek to the confluence of Blue Lick Creek and Floyd's Fork
- Floyd's Fork
- Floyd's Fork and its confluence with Salt River
- Salt River, and
- Upstream of the derailment area.

The upstream sampling locations were established to evaluate background surface water quality. Analytical results reported positive concentrations detected for butadiene, MEK, and cyclohexane in various locations during the initial phase of the surface water investigation. At the time of delivery of this report, Arcadis reported that the concentrations of the COCs were trending downward. KY DEP established 7.15 mg/L for butadiene, 3.2 mg/L for cyclohexane, and 7.1 mg/L for MEK as the criteria for the COCs in surface water. Within one week from the date of the derailment Arcadis reported that the surface water concentrations for MEK were below the KY DEP criteria except at one location. The analysis of samples collected from the surface water sampling location within Clear Run Creek reported concentrations of MEK above 7.1 mg/L. Arcadis continued to conduct surface water investigations on a daily basis, and analytical results are provided in the Scribe database within Appendix F (provided under separate cover).

The groundwater investigation consisted of three elements including residential and domestic well sampling, surface water drainage inspection along Kentucky Route 1020, and groundwater seep and spring assessment along the reach of Clear Run Creek east of the derailment and above the confluence with the unnamed tributary to evaluate occurrence of groundwater seeps. Because the geology of the area is karst, six bedrock wells each with an approximate depth of 100 feet were installed within the immediate vicinity of the derailment. Arcadis sampled each bedrock well at four to five depths, depending on fracture location. Analytical results reported that COCs were not detected above the fixed laboratory method detection limits (MDL).



Arcadis identified a total of 60 residential sampling locations including residential wells, cisterns, ponds, and livestock feeding sources within a 6-mile radius of the derailment site. Arcadis conducted sampling activities at these locations for COCs to evaluate the water quality. Arcadis reported that analytical results from residential well sampling revealed no concentrations above the KY DEP drinking water criteria of 0.019 µg/L for butadiene, 10000 µg/L for Cyclohexane, and 7000 µg/L for MEK. Arcadis also identified and sampled 26 groundwater seeps and springs within 2 miles of the derailment site. Analytical results for samples collected from 3 seeps located within the immediate area of the derailment were reported to contain concentrations of MEK above the KY DEP criteria. At the time of delivery of this report, Arcadis was continuing to conduct seep sampling every two weeks.

Arcadis divided the soil sampling and investigation into four individual study areas to determine if COCs had impacted the soil in the area of the derailment and determine if additional investigations and remedial activities were warranted. The four study areas were divided as follows:

- Study Area A – East of Huber Station Road – This area encompasses the residential properties in their entirety east of Huber Station Road; these properties were suspected to be contaminated by the derailment.
- Study Area B – The right-of-way area on and adjacent to the CSXT track. This area extends approximately 1,000 feet to the north and 1,000 feet to the south of the derailment. Most of the sampling in this area was conducted during the removal of soil, damaged rail cars, track, and underlying ballast.
- Study Area C – The staging area for railcars located to the west of the railroad track across Coral Ridge Road. This area also includes the controlled burn area used to flare the butadiene.
- Study Area D – The area next to the tracks located to the northeast and southwest of the derailment area.

On January 20, 2007 CSXT ceased rail operations in order to excavate contaminated soil and ballast within the immediate area of the derailment. Excavation was initiated immediately to minimize the potential for the contamination to spread. CSXT excavated approximately 8,000 tons of ballast and soil within three main areas: the area encompassing the location where a butadiene tank car was breached during the derailment, the area directly east of the derailment, and within the ditch lines on both sides of the track in the area of the derailment.



Prior to beginning excavation, the Louisville Water Company (LWC) identified that a 6-inch diameter polyvinyl chloride (PVC) water main ran beneath the derailment site and determined that the pipeline integrity may be at risk as a result of the release of hazardous substances during the incident. LWC terminated water service in the immediate vicinity of the derailment on January 20, 2007, and began working with CSXT to resume service as quickly as possible.

During the excavation, shallow limestone bedrock was encountered at a depth of 6 feet below land surface. CSXT's environmental services contractor, Arcadis, collected samples to verify soil conditions. Appendix B, Table 2 presents soil sample analytical results for samples collected on January 20, 2007, and the soil sampling locations are provided in Appendix A, Figure 4. The analytical results revealed positive concentrations for maleic acid/maleic anhydride. Additional Arcadis analytical results are provided in the Scribe database in Appendix F (provided under separate cover). In an effort to manage the contamination remaining within the subsurface, an underground piping system capable of collecting liquid runoff was installed on both sides of the railroad track. This system was constructed to also be able to be used to extract vapors from the subsurface at a later date. CSXT backfilled the excavated area within the immediate area of derailment with clean material, and rail operations resumed on January 21, 2007.

Kevin Simmons with the SESD was tasked to provide field oversight of sampling methodology and to audit the CSXT laboratory results for potable water samples. SESD Simmons conducted field oversight of several operations conducted by Arcadis, including surface water sampling, boom management, waterway cleaning activities, and soil sampling. SESD Simmons reported to EPA that he found Arcadis to be in compliance upon completion of his reviews and oversight. This report is provided in Attachment 3. SESD Wayne Turnbull also conducted a review of analytical data and related documents resulting from the KY CSXT train derailment, and this report is provided in Attachment 4.

Sheryl Carbonaro, an EPA community involvement coordinator, was requested by OSC Smith to assist CSXT communications staff in preparing information updates to the public regarding response activities. EPA Carbonaro also assisted CSXT communications staff in preparation for a public meeting which occurred for the community of Bullitt County on January 31, 2007. Representatives from CSXT, CTEH, Arcadis, EPA, KY DEP, BCHD, and ZFD presented information to the public concerning the derailment. Meeting objectives included communicating the progress of the environmental cleanup, clearly defining



the remaining areas of environmental concern, and answering questions from the public. At the meeting, EPA reported to the public that based on evaluation of analytical results provided to date, EPA has found no evidence to indicate that air, soil, and groundwater in areas outside of the area of concern were affected by the train derailment.

At the time of delivery of this report, CSXT contractors including Arcadis remained onsite conducting investigative, remedial, and restoration activities.

#### **4.0 DISCUSSION OF FIELD AND LABORATORY RESULTS**

During the response, START, ERT, REAC, Army National Guard 41<sup>st</sup> CST, CTEH, and Arcadis collected air monitoring and sampling data from several locations. START was tasked with assembling and managing the data into one central database. START prepared Figure 3 (Appendix A) showing all air monitoring and sampling locations through January 30, 2007. Arcadis provided figures displaying surface water, groundwater, residential well and soil and sediment sampling locations; these figures are presented in Attachment 3.

The data collected from this monitoring and sampling can be divided into two phases: during the derailment fire (emergency response phase) and after the fire (investigation and cleanup phase). Monitoring and sampling during the fire was designed to ensure public safety while simultaneously allowing as many residents as possible to safely reoccupy their homes. The methods used were dynamic, with the sampling locations changing as additional data was collected. In contrast, after the fire was extinguished and site activities focused on investigation, cleanup, recovery, and remediation, the air monitoring perimeter was maintained in its final form with air monitoring focusing more on worker safety and the prevention of off-site migration of dust and vapors. Sampling activities conducted after the fire were intended to prevent further contamination within the surface water drainage system, and to investigate and remediate affected surface water, groundwater, and soil for the protection of human health and the environment.

##### **4.1 EMERGENCY RESPONSE PHASE MONITORING AND SAMPLING**

START, ERT, Army National Guard 41<sup>st</sup> CST, and CTEH were first on the scene with air monitors and sample collection devices. AreaRAE, SPM, Multiwarn, MultiRAE, DataRAM, and HAPSITE GC/MS instruments; colormetric tubes; and SUMMA canisters were among the types of devices used during the



response. REAC arrived at the scene on January 17, 2006 to provide additional air monitoring support. A total of 19 AreaRAE monitors were positioned to collect air quality data. The AreaRAE monitors were moved throughout the emergency response phase as necessary based upon prevailing wind directions.

From around 1300 hours on January 16 through January 19, 2007, START, ERT, REAC, Army National Guard 41<sup>st</sup> CST, and CTEH collected data that were used to initially determine evacuation zones, measure air quality beyond evacuation zones, ensure worker protection, and determine if residents could safely return to their homes. Millions of discrete data points were collected during this time; the complete database is provided on a compact disc in Appendix F (provided under separate cover). Tables presenting selected data that illustrate the types of monitoring activities that were conducted are provided in Appendix B, Tables 3 and 4. Table 3 summarizes results from monitoring for particulates and VOCs collected during RAT monitoring loops performed the evening of the day of the explosion. Based upon the EPA health based action level of 3,500  $\mu\text{g}/\text{m}^3$  for total particulates, the particulate and VOC monitoring results in this table did not exceed the levels of concern. START performed several rounds of confirmatory monitoring during the active fire suppression period. No elevated readings of any type were noted above the background levels (recorded in the ICP parking lot) except at the site of the fire. START monitored for VOCs, LEL, CO, H<sub>2</sub>S, oxygen content, and chlorine vapors. Table 4 shows CTEH AreaRAE instrument data collected at a station in the immediate area of the fire on January 17, 2007 and January 27, 2007 to determine VOC concentrations in the atmosphere. CTEH used the instruments to support worker protection and to monitor for VOC releases at the source. SUMMA canister air samples were collected before, during, and after the tank flaring operations, and a total of four samples were collected. Preliminary analytical results revealed Dichlorodifluoromethane and chloromethane detections in all four samples, but all concentrations were below the associated Region 9 PRG values for ambient air. MEK and benzene were also detected in the sample collected on January 18, 2007; while the concentration of MEK was below the Region 9 PRG for ambient air, the concentration of benzene (an estimated 0.671 micrograms per cubic meter [ $\mu\text{g}/\text{m}^3$ ]) exceeded the Region 9 PRG for ambient air of 0.25  $\mu\text{g}/\text{m}^3$ . Chlorodifluoromethane; trichlorofluoromethane; acetone; and 1,3-xylene & 1,4-xylene were detected in the sample collected on January 19, 2007, but all concentrations were below the associated Region 9 PRG values for ambient air. The CST used a HAPSITE GC/MS instrument to collect air samples from various residential and other areas based upon prevailing winds to monitor air quality. No significant concentrations were observed from the HAPSITE monitoring activities.



## 4.2 INVESTIGATION AND CLEANUP PHASE MONITORING AND SAMPLING

Once the fire was out and the evacuations began to be lifted, air monitoring focused on protecting worker safety and the safety of the residents and businesses during reoccupation. CTEH continued to conduct air monitoring and sampling activities at the derailment site to protect worker safety. Personal protective measures, including upgrading respiratory protection, were implemented when elevated concentrations of the COCs (butadiene, cyclohexane, MEK, and maleic anhydride) were recorded. CTEH also conducted numerous monitoring activities in residential and commercial structures prior to citizen reoccupation. Monitoring results from these activities revealed no measurements above background levels on any monitoring instruments. Surface water, groundwater, residential well, and soil sampling activities focused on the investigation, remediation, and restoration in support of protecting human health and the environment. Arcadis reported that no analytical results for the residential well samples were found to be above the KY DEP criteria for drinking water. Arcadis conducted surface water sampling activities of the drainage from the derailment site at multiple locations in order to track trends in contaminant concentrations. Table 5 presents analytical results for surface water samples collected from an unnamed tributary located south of the derailment from January 19 to February 13, 2007. The table displays that MEK contaminant concentrations trended downward with time. Finally, the excavated soil found to be contaminated was properly characterized by CSXT contractors and disposed of offsite.

## 5.0 SUMMARY

At approximately 0840 hours on January 16, 2007, a train owned and operated by CSXT derailed from its tracks in Brooks, Bullitt County, Kentucky. The accordion-pattern derailment involved 25 railcars, 13 of which were carrying flammable liquids, gases, and accelerants. An explosion occurred within the pile up, and fire erupted creating a large plume of thick, black smoke which dispersed throughout Bullitt County. Flammable chemicals released from the railcar wreckage were observed to be flowing into nearby ditches as they burned.

Residents in the immediate area of the fire were instructed to evacuate. The ZFD personnel assisted with residential evacuations and a one-mile radius evacuation zone from the derailment was established, with residents being instructed to leave or shelter in place.

The ZFD set up an ICP to facilitate integration of all responding organizations. The SDFFD supplied 3,600 gallons of fire-suppressing foam in attempt to suppress the fire, but the foam did not extinguish it.



The ZFD then began to attack the fire with water, and found it to be ineffective as well. The IC decided to let the fire burn out on its own. From the railcar inventory, the COCs were identified as butadiene, cyclohexane, MEK, and maleic anhydride. A controlled flaring operation to burn off the butadiene content from three railcars was conducted near the immediate area of the derailment. START, ERT, REAC, Army National Guard 41<sup>st</sup> CST, and CTEH performed air monitoring at the derailment site and throughout the evacuated area during the emergency response phase. Once the fire was extinguished, evacuations began to be lifted. START and CTEH conducted air monitoring activities within structures prior to citizen reoccupation.

After the fire was extinguished, NTSB began investigation activities to determine the cause of the derailment. CSXT's contractor, Arcadis, began investigation, cleanup, remedial, and restoration activities to determine the derailments affect on surface water, groundwater, and soil within and around the derailment area. Arcadis prepared investigation work plans, which were submitted to EPA and KY DEP for approval prior to activities during the investigation and cleanup phase.

CTEH maintained air monitoring stations throughout the investigation and cleanup phase. Air samples were also collected and analyzed at a fixed laboratory. Although the air monitoring in the exclusion zone showed spikes in VOCs above the level of concern, CTEH's data showed that the derailment fire and cleanup had little lasting impact on ambient air quality surrounding the accident site, both during the fire and throughout the remediation activities.

START mobilized to the response during the initial phase of the response to perform a variety of tasks, including providing air monitoring support, observing and documenting activities with logbook notes and photographs, conducting sampling activities, developing and maintaining the master database of all monitoring and sampling and analysis activities, and developing GIS maps to record and track the air monitoring locations and data.

At the time of delivery of this report, CSXT contractors remain at the site conducting restoration activities under the oversight and direction of KY DEP.



## **APPENDIX A FIGURES**

(4 Pages)

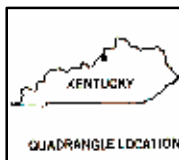
- Figure 1, Site Location
- Figure 2, Residential Well Sampling Locations Within a 1-Mile Radius of Train Derailment
- Figure 3, Air Monitoring Locations
- Figure 4, Soil Sampling Locations From Table 2



#### LEGEND



TRAIN DERAILMENT  
LOCATION



QUADRANGLE LOCATION



0 1,500 3,000 Feet



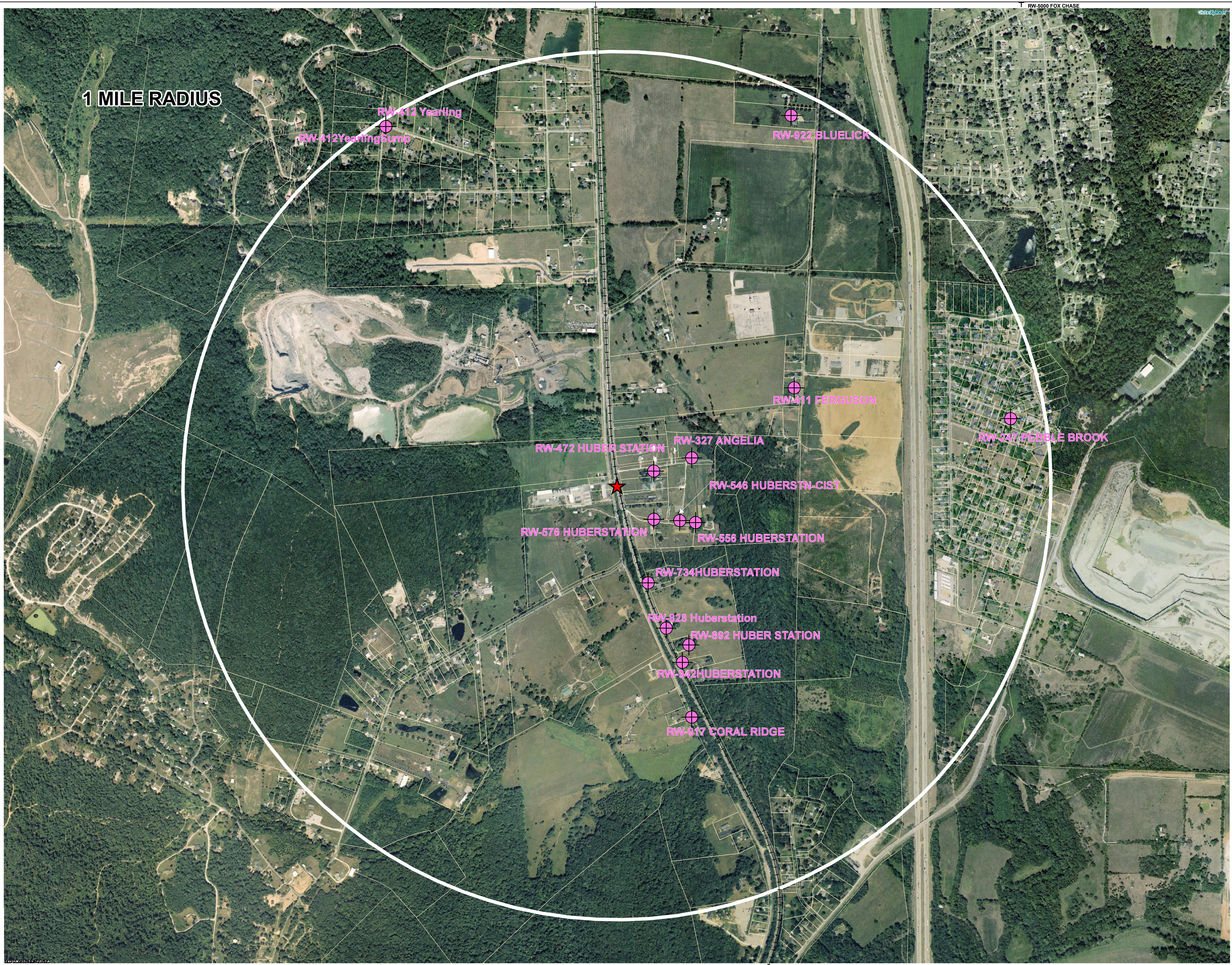
United States Environmental Protection Agency

BULLITT COUNTY TRAIN DERAILMENT  
BROOKS, BULLITT COUNTY,  
KENTUCKY

TDD: TTEMI-05-001-0030

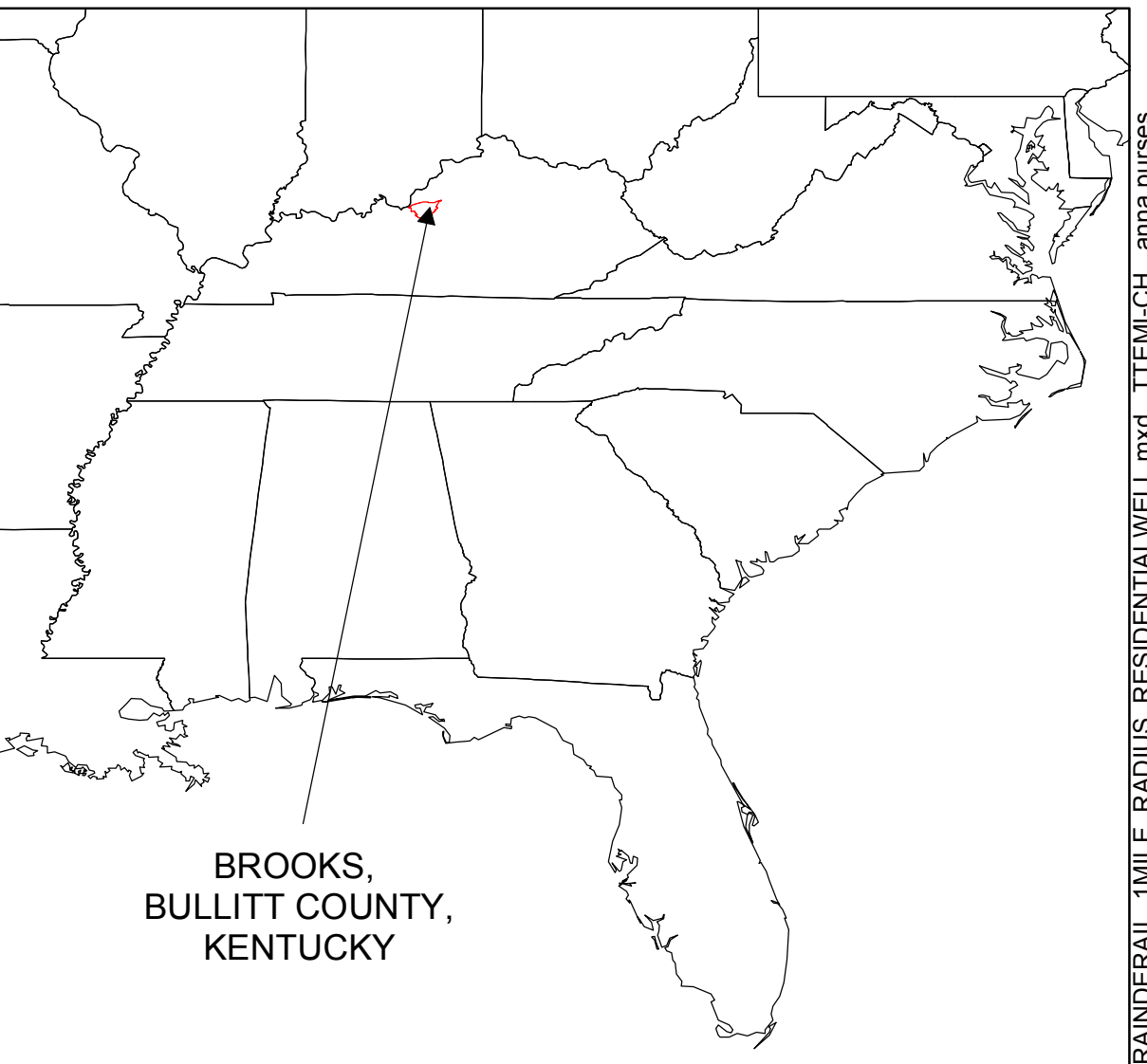
FIGURE 1  
SITE LOCATION

**Tetra Tech, Inc.**



# LEGEND

- RESIDENTIAL WELL SAMPLING LOCATION (LABELED WITH LOCATION ID)
- TRAIN DERAILMENT LOCATION
- PARCEL WITHIN 1 MILE RADIUS
- RAILROAD TRACKS

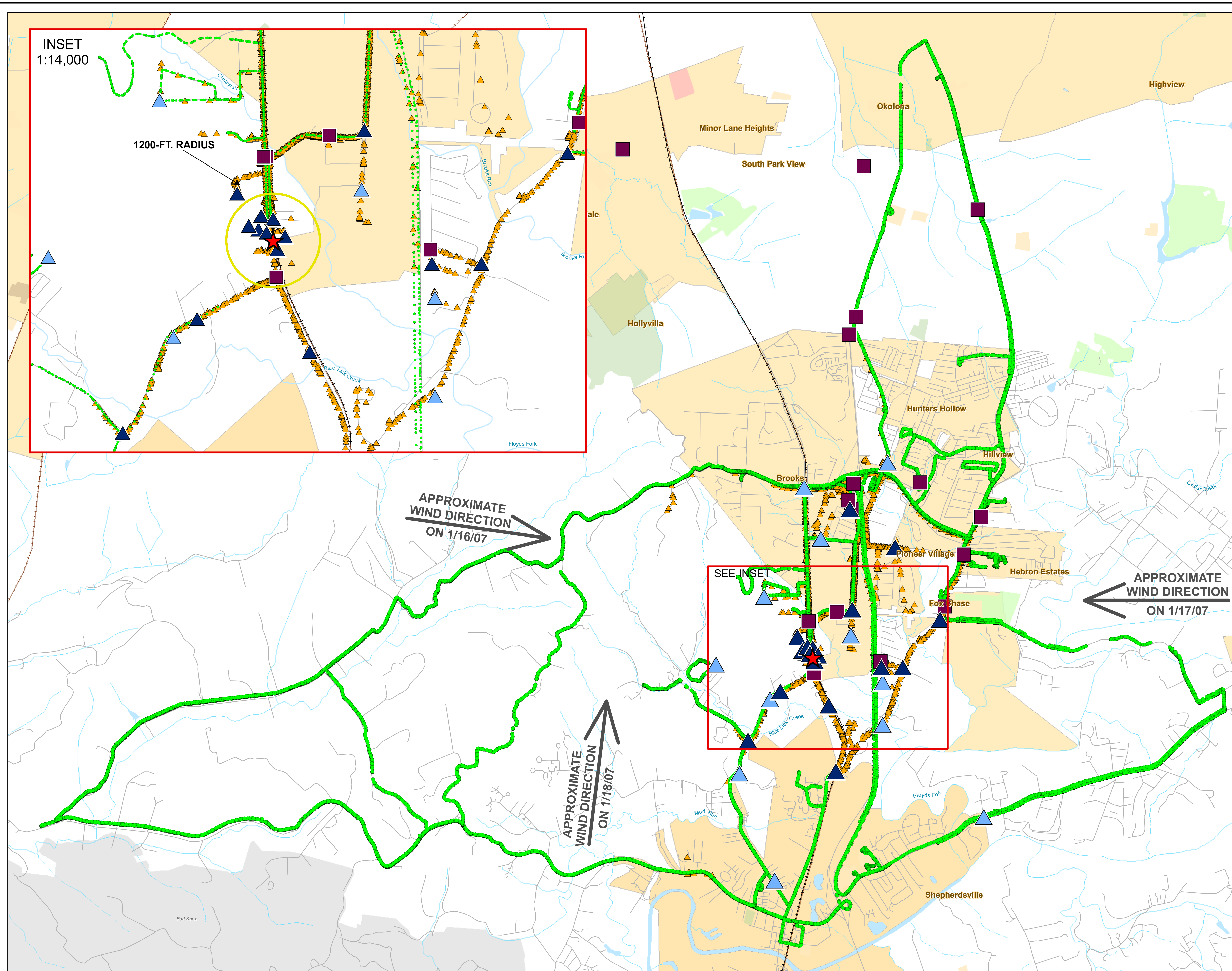


United States Environmental Protection Agency








BULLITT COUNTY TRAIN DERAILMENT  
BROOKS, BULLITT COUNTY,  
KENTUCKY  
TDD: TTEMI-05-001-0030


**FIGURE 2**  
**RESIDENTIAL WELL SAMPLING**  
**LOCATIONS WITHIN A 1-MILE RADIUS**  
**OF TRAIN DERAILMENT**






**LEGEND**

-  TRAIN DERAILMENT LOCATION
-  EPA STATIONARY MONITOR LOCATION
-  CTEH STATIONARY MONITOR LOCATION
-  CST HAPSITE STATIONARY MONITOR LOCATION
-  EPA RAT MONITOR LOCATION
-  CTEH MOBILE MONITOR LOCATION
-  RAILROAD TRACKS



0 2,500 5,000 7,500 10,000  
 Feet



 United States Environmental Protection Agency

**BULLITT COUNTY TRAIN DERAILMENT  
BROOKS, BULLITT COUNTY,  
KENTUCKY  
TDD: TTEMI-05-001-0030**

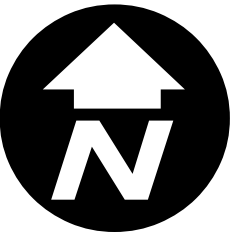
**FIGURE 3  
AIR MONITORING  
LOCATIONS**

 **Tetra Tech, Inc.**

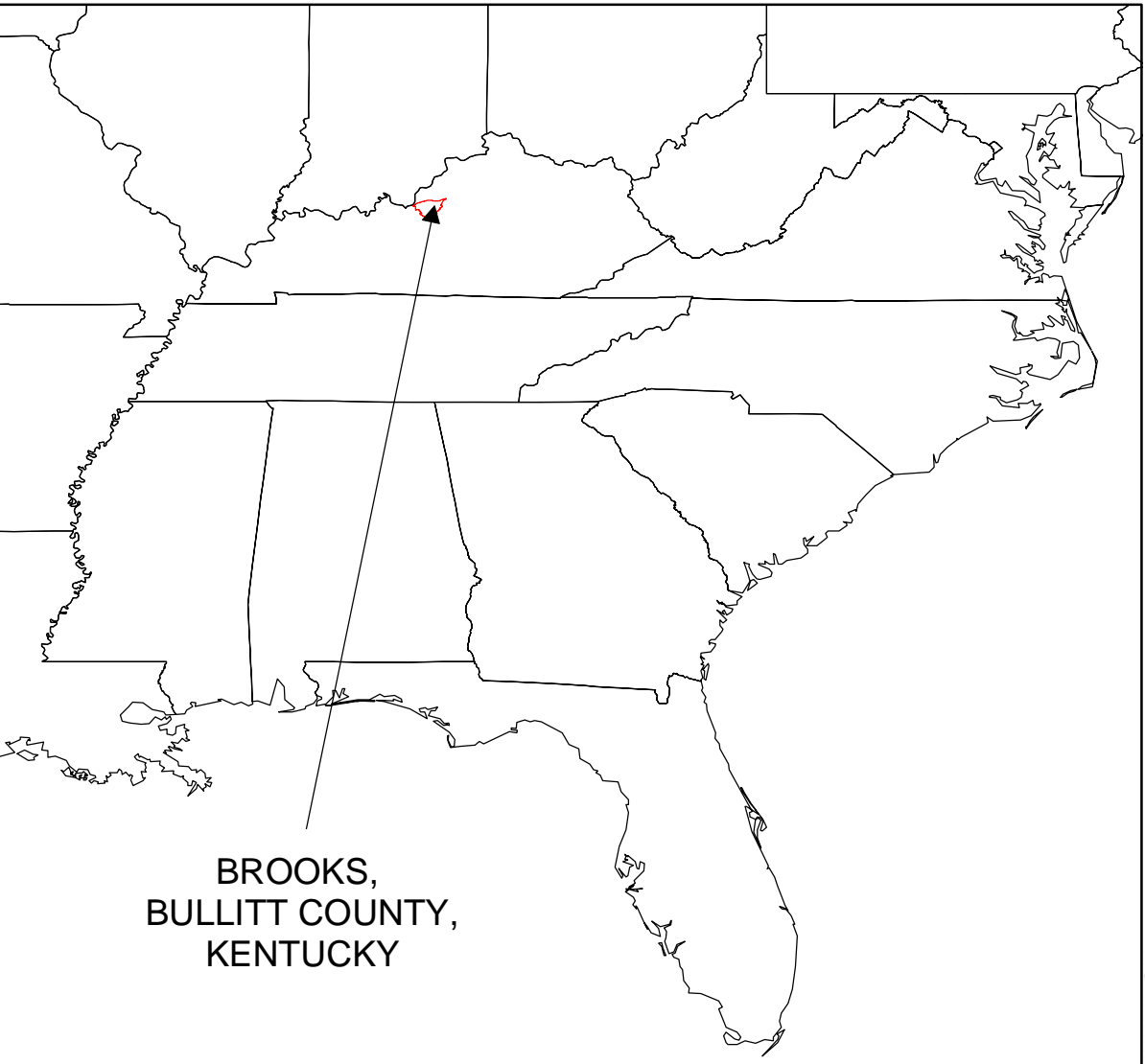


**LEGEND**

- SOIL SAMPLING LOCATION
- ★ TRAIN DERAILMENT LOCATION



0 80 160  
Feet



United States Environmental Protection Agency

**BULLITT COUNTY TRAIN DERAILMENT**  
**BROOKS, BULLITT COUNTY,**  
**KENTUCKY**  
TDD: TTEMI-05-001-0030

**FIGURE 4**  
**SOIL SAMPLING LOCATIONS**  
**FROM TABLE 2**

**Tetra Tech, Inc.**

## **APPENDIX B TABLES**

(4 Pages)

- Table 2, Soil Sample Concentrations for Samples Collected by Arcadis on January 20, 2007
- Table 3, RAT Air Monitoring Concentrations Collected by START and ERT on January 16, 2007
- Table 4, AreaRAE Air Monitoring Concentrations Collected by CTEH at Station 2 in the Immediate Area of the Derailment on January 17 and January 27, 2007
- Table 5, Surface Water Sample Concentrations for MEK Collected at Unnamed Tributary Located on West Side of 1020 South of Derailment By Arcadis on January 19 through February 13, 2007

**Table 2**  
**Soil Samples Concentrations**  
**for Samples Collected by Arcadis**  
**on January 20, 2007**

Sample Name*	1,3-Butadiene Soil Concentration (ug/kg)	Cyclohexane Soil Concentration (ug/kg)	Methyl Ethyl Ketone Soil Concentration (ug/kg)	Maleic Acid / Maleic Anhydride Soil Concentration (ug/kg)
SS-1E-(1'-2') 20/01/2007	ND	NA	NA	250 U
SS-29 Dup 20/01/2007 03:03	ND	NA	NA	12000
SS-29 20/01/2007 03:03	ND	NA	NA	7100
SS-2E-(1'-2') 20/01/2007	ND	NA	NA	250 U
SS-30 20/01/2007 03:11	ND	NA	NA	260 U
SS-31 20/01/2007 03:22	ND	NA	NA	250 U
SS-32 20/01/2007 03:27	ND	NA	NA	110 J
SS-33 20/01/2007 03:36	ND	NA	NA	1600
SS-34 20/01/2007 03:42	ND	NA	NA	5900
SS-3E-(1'-2') DUP 20/01/2	ND	NA	NA	250 U
SS-3E-(1'-2') 20/01/2007	ND	NA	NA	230 J
WCS-Grid 174 (01/20/07)	NA	NA	NA	140000
WCS-Grid 262 (01/20/07)	NA	NA	NA	5500
WCS-Grid 613 (01/20/07)	NA	NA	NA	530
WCS-Grid 709 (01/20/07)	NA	NA	NA	250 U

Notes:

This table contains validated data.

\* - See Figure 4 for soil sampling locations

ug/kg - Micrograms per kilogram

U - Analyte not detected and the associated value is the reporting limit

J - Estimated Value

**Table 3**  
**RAT Air Monitoring Concentrations**  
**Collected by START and ERT**  
**on January 16, 2007**

Parameter	Start Time	End Time	Maximum, Minimum, and Average RAT Air Monitoring Concentrations	
Particulates*	19:11:22	19:58:28	Max	113.9 ug/m <sup>3</sup>
			Min	10.8 ug/m <sup>3</sup>
			Avg	18.6 ug/m <sup>3</sup>
VOCs	19:11:22	19:58:29	Max	0 ppm
			Min	0 ppm
			Avg	0 ppm
Particulates*	20:13:22	20:59:56	Max	101.4 ug/m <sup>3</sup>
			Min	0.0 ug/m <sup>3</sup>
			Avg	6.7 ug/m <sup>3</sup>
VOCs	20:13:22	20:59:56	Max	0 ppm
			Min	0 ppm
			Avg	0 ppm
Particulates*	21:00:01	21:06:53	Max	18.0 ug/m <sup>3</sup>
			Min	0.1 ug/m <sup>3</sup>
			Avg	3.4 ug/m <sup>3</sup>
VOCs	21:00:01	21:06:49	Max	0 ppm
			Min	0 ppm
			Avg	0 ppm
Particulates*	23:13:05	23:25:22	Max	12.4 ug/m <sup>3</sup>
			Min	3.2 ug/m <sup>3</sup>
			Avg	6.0 ug/m <sup>3</sup>
VOCs	23:13:05	23:56:18	Max	0 ppm
			Min	0 ppm
			Avg	0 ppm

Notes:

Particulate data was collected using a DataRAM instrument

VOC data was collected using a MultiRAE instrument

\* - EPA Health Based Action Level is 3500 ug/m<sup>3</sup> for total particulates

RAT - Rapid Assessment Tool

START - Superfund Technical Assessment and Response Team

ERT - Environmental Response Team

VOCs - Volatile Organic Compounds

Max - Maximum parameter concentration

Min - Minimum parameter concentration

Avg - Average parameter concentration

ug/m<sup>3</sup> - Micrograms per cubic meter

ppm - Parts per million

**Table 4**  
**AreaRAE Air Monitoring Concentrations**  
**Collected by CTEH at Station 2 in the Immediate Area of the Derailment**  
**on January 17 through January 27, 2007**

Date	Maximum, Minimum, and Average AreaRAE Air Monitoring Concentrations For VOCs (ppm)	
01/17/07	Max	0.5
	Min	0.0
	Avg	0.0
01/18/07	Max	2.4
	Min	0.0
	Avg	0.2
01/19/07	Max	0.3
	Min	0.0
	Avg	0.0
01/20/07	Max	4.4
	Min	0.0
	Avg	0.0
01/21/07	Max	1.6
	Min	0.0
	Avg	0.0
01/22/07	Max	0.6
	Min	0.0
	Avg	0.0
01/23/07	Max	0.4
	Min	0.0
	Avg	0.0
01/24/07	Max	3.5
	Min	0.0
	Avg	0.0
01/25/07	Max	0.9
	Min	0.0
	Avg	0.0
01/26/07	Max	0.1
	Min	0.0
	Avg	0.0
01/27/07	Max	132.0
	Min	0.0
	Avg	2.2

Notes:

VOC data was collected using an AreaRAE instrument  
Station 2 was located at 38.035111 north latitude and -85.709222 west longitude  
CTEH - Center for Toxicology and Environmental Health  
VOCs - Volatile Organic Compounds  
Max - Maximum parameter concentration  
Min - Minimum parameter concentration  
Avg - Average parameter concentration  
ppm - Parts per million

**Table 5**  
**Surface Water Sample Concentrations**  
**for MEK Collected at Unnamed Tributary Located on West Side of 1020**  
**South of Derailment By Arcadis on January 19 through February 13, 2007**

Sample ID	Date	Methyl Ethyl Ketone Surface Water Concentration (ug/L)	
SW-UT-UP-DR(011907)	1/19/2007	1000	J
SW-UT-UP-DR(012007)	1/20/2007	1000	J
SW-UT-UP-DR(012207)	1/22/2007	<b>44000</b>	
SW-UT-UP-DR(012407)	1/24/2007	<b>45000</b>	DJ
SW-UT-UP-DR(012507)	1/25/2007	<b>59000</b>	
SW-UT-UP-DR(012607)	1/26/2007	<b>44000</b>	
SW-UT-UP-DR-(012707)	1/27/2007	<b>26000</b>	DJ
SW-UT-UP-DR-(012707)	1/27/2007	<b>26000</b>	DJ
SW-UT-UP-DR(012807)	1/28/2007	<b>37000</b>	
SW-UT-UP-DR(012907)	1/29/2007	<b>17000</b>	
SW-UT-UP-DR(013007)	1/30/2007	<b>27000</b>	
SW-UT-UP-DR(013107)	1/31/2007	<b>28000</b>	D
SW-UT-UP-DR(020107)	2/1/2007	<b>12000</b>	
SW-UT-UP-DR(020207)	2/2/2007	<b>23000</b>	
SW-UT-UP-DR(020307)	2/3/2007	<b>24000</b>	D
SW-UT-UP-DR(020307)	2/3/2007	<b>14000</b>	E
SW-UT-UP-DR(020507)	2/5/2007	<b>17000</b>	J
SW-UT-UP-DR(020607)	2/6/2007	<b>24000</b>	
SW-UT-UP-DR(020707)	2/7/2007	6200	
SW-UT-UP-DR(020707)	2/7/2007	<b>14000</b>	
SW-UT-UP-DR(021207)	2/12/2007	<b>10000</b>	J
SW-UT-UP-DR(021307)	2/13/2007	2500	D

Notes:

This table contains validated data.

**BOLD** - Results in bold exceed KDEP Human Health Concentrations  
of 7000 ug/L for Drinking Water

ug/L - Micrograms per liter

U - Analyte not detected and the associated value is the reporting limit

J - Estimated value

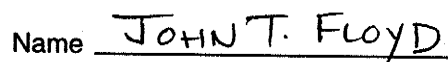
D - Reported from a secondary dilution

E - Estimated above the calibration limit

**APPENDIX C**  
**LOGBOOK NOTES**

(73 Sheets)

## ALL-WEATHER WRITING PAPER



Address 2000 WARRINGTON WAY  
SUITE 245 LOUISVILLE, KY 40222

Phone (502) 560-6688

Project I9010.L.060010030

BULLITT COUNTY, KY  
TRAIN DERAILMENT

01/16/2007

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation.

## PAGE

## REFERENCE

DATE \_\_\_\_\_

01/16/2007

PARTLY SUNNY  
LOW 30's

JOHN T. FLOYD

3

~ 0945 CALL OUT FROM EPA REQUEST  
FOR 5 START RESOURCES

1130 START FLOYD ON-SITE AT  
INCIDENT COMMAND NEXT TO  
LG & E SUBSTATION

- ESTABLISH CONTACT WITH EPA  
OSC ART SMITH, 41<sup>ST</sup> CST CO  
STEPHEN C. DAVIS AND MAJ ERIC  
HALLSTROM

- ACTING IC KEVIN MOULTON (  
ZONE TON FD)

- OSC SMITH INDICATED THAT  
EPA ASPECT FIXED-WING  
AIRCRAFT WAS DISPATCHED @ 1100

- OSC SMITH VOLUNTEERED TO  
ACTING IC MOULTON THAT EPA  
WOULD UNDERTAKE AIR MONITORING  
IN CONCERT WITH 41<sup>ST</sup> CST AND  
CSX CONTRACTORS

- REPORTS THAT CYCLOHEXANE AND  
METHYL ETHYL KETONE WERE  
INVOLVED IN FIRE - BUTADIENE  
CAR(S) UNKNOWN

01/16/2007

4  
01/16/2007

JOHN T. FLOYD

- 1230 - USE BUTADIENE AS THE MOST "CONSERVATIVE" HAZARD
- CST CAN PROVIDE 4 AREA RAE'S
  - CURRENT PLANS ARE FOR 3 TWO-PERSON AIR MONITORING TEAMS.

- 1 - TWO 4<sup>1<sup>ST</sup></sup> CST
- 2 - TWO 4<sup>1<sup>ST</sup></sup> CST
- 3 - TWO START (RAGLAND/  
ENGLEBRECHT)

TEAMS EACH HAVE:

- AREA RAE - CST RADIO
- GPS
- START ALSO USING SINGLE POINT MONITOR (SPM) WITH CHLORINE CHEM CASSETTE
- START TASKED WITH HEADING DIRECTLY TO RUHL ACRES SUBDIVISION (NOT EVACUATED, IN THE PATH OF PLUME)

01/16/2007

01/16/2007

JOHN T. FLOYD

- 1500 ~~SAMPLING AIR MONITORING~~  
TEAMS PREPARED TO DEPLOY
- MEET WITH INCOMING EPA ERT ASSETS
  - DEBRIEF WITH OSC RENNIGER
- 1545 START FLOYD OFF-SITE

5/13/2004

① + ②

3/12/07  
telle

01/19/2007

JOHN T. FLOYD

1430 START FLOYD ON-SITE

- FIRES (AND CONTROLLED  
BURN OF BUTADIENE) ARE  
OUT

- TRAIN CONSIST INCLUDED  
CYCLOHEXANE (1 CAR)  
MEK (1 CAR)

BUTADIENE (3 CARS) - ACTION LEVEL 4.25 ppm

- DRAINED AND BURNED OFF

MALEIC ANHYDRIDE - ACTION LEVEL 0.25 ppm

↳ SOLIDIFY ① MOVE CARS (2?) TO  
WEST SIDE OF TRACKS

↳ NO "CHEMICAL SPECIFIC" METHOD  
FOR DETECTING - CTEH USING

COLORIMETRIC TUBES (ACETIC ACID)

- SOIL STOCKPILES (CELLS) NEAR

"SO LITE" PLANT ON WEST SIDE  
OF S.R. 1020

- UPDATED COST TRACKING  
SPREADSHEET

- PREPARE SAMPLING PLAN WITH  
KY DEP

01/19/2007

01/19/2007

JOHN T. FLOYD

1800

SAMPLING PLAN WITH KY DEP

- 3 LOCATIONS
- DELIVER / CALL FOR P/U WITH 411 CST FOR ANALYSIS
- NEED ONE OF 3 LOCATIONS TO BE BACKGROUND (NORTH-WEST OF INCIDENT SITE?)

5  
3  
2  
1  
0  
1  
2  
3  
4

5  
3  
2  
1  
0  
1  
2  
3  
4

01/20/2007

JOHN T. FLOYD JTF

- 0500 START FLOYD AT START EQUIPMENT CAGE TO COLLECT SAMPLING EQUIPMENT
- 0645 - START FLOYD ON-SITE AT EOC  
- OFF-LOADING SAMPLING EQUIPMENT IN SOUTHERN-MOST STORAGE BAY AT ZONETON F.D. - PREP FOR SAMPLING
- 0815 START SAMPLING TEAM (BERGNER AND RAGLAND) DEPARTS EOC
- 0930 CONTACTED ARCADIS SAMPLING TEAM J. MANZO TO COORDINATE SCHEDULES
- 1030 ASSIST KYDEP IDENTIFYING "LIMITS" FOR MEK FOR SURFACE WATER
- 1115 ID'd SOURCE FOR  $LC_{50} = 3388 \text{ mg/l}$  (AQUATIC TOXICITY)
- 1225 OSC SMITH (CTEH, EPA ERT, KYDEP, START) MEETING ON RE-ENTRY  
CTEH: 4 TWO-PERSON TEAMS  
EPA: ADD 1 REP TO EACH TEAM  
SCREENING FOR: <sup>TOTAL</sup>VOC AND BUTADIENE  
- VOC WITH MULTIRAE (SWEEP ENTIRE STRUCTURE/HOUSE FIRST)  
- BIAS COLORIMETRIC TUBE SAMPLES FOR BUTADIENE @ HIGHEST VOC LOCATION

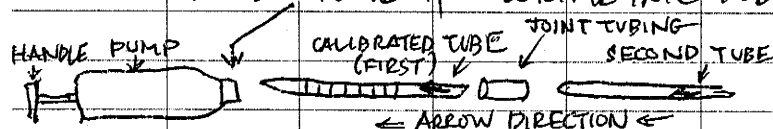
01/20/2007

JTF

01/20/2007

JOHN T. FLOYD JTF

- 1315 LEAVE COMMAND POST FOR CTEH TRAILER TO CALIBRATE FOUR (4) MULTIRAE PLUS WITH CTEH CALIBRATION GAS
- 1330 COMMENCE MULTIRAE CALIBRATION (DETAILED CALIBRATION NOTES IN ERT HAZMAT TECH MAYER LOGBOOK)
- 1355 MULTIRAE CALIBRATION COMPLETE
- 1410 MOBILIZED TO BROOKS ELEMENTARY TO BEGIN RE-ENTRY PROCESS (START FLOYD AND ERT H/T MAYER ON STANDBY WITH MULTIRAE PLUS AND GASTECH COLORIMETRIC TUBES)



- 1420 FIRST OF FOUR EPA/CTEH RE-ENTRY SCREENING TEAMS DEPART WITH RESIDENTS
- 1545 OSC CROWLEY INDICATED THAT SCREENING LEVELS WERE NON-DETECT AND DEMOBILIZED FROM SITE

01/20/2007

JTF

01/20/2007

JOHN T. FLOYD

1625 START FLOYD AND ERT H/T MAYER  
DEPART BROOKS ELEMENTARY  
TO RECON INCIDENT SITE

1755 RETURN TO EOC/COMMAND POST

1715 MULTIRAE PLUS RETURNED TO  
SOUTHERN-MOST STORAGE BAY  
AT ZONETON F.D.

1730 KYDEP K. MC DANIEL INDICATED  
ARCADIS WAS EXPECTING MOST  
RECENT SURFACE WATER SAMPLING  
RESULTS WITHIN THE HOUR

- START BERGNER AND RAGLAND  
HAVE DELIVERED 3<sup>RD</sup> AND FINAL  
SURFACE WATER SAMPLES TO 41<sup>ST</sup>  
CST - RETURNING WITH RESULTS  
FROM FIRST TWO SAMPLES

1750 - NOTIFIED KYDEP K. MC DANIEL TO CONTACT  
41<sup>ST</sup> CST RICK GRANT TO HAVE EXCESS/  
REMAINING SAMPLE VOLUME ANALYZED  
AT STATE LAB (PER 41<sup>ST</sup> CST GRANT REQUEST)

- MC DANIEL INDICATED OSC SMITH WANTED  
TO MEET AT EOC 01/21/2007 @ 1400 HOURS  
TO REVIEW SAMPLING DATA / PLAN ADDITIONAL  
SAMPLING EVENTS

1/20/2007

01/20/2007

JOHN T. FLOYD

1800

OSC SMITH, <sup>ERT</sup> ~~NDT~~ NEWHART,  
ERT GILBERT, ERT H/T MAYER  
START FLOYD

- MEET TOMORROW WITH CSX TO  
DISCUSS SCOPE OF CSX ENVIRONMENTAL  
SAMPLING PLAN

~ SURFACE WATER

~ GROUND WATER

~ DRINKING / WELL WATER

ALSO - SOILS AND SEDIMENTS

- STATUS ON CSX SOURCE REMOVAL

~ MAJORITY OF EXCAVATION IS ON  
EAST SIDE (INSTALL VAPOR EXTRACTION  
SYSTEM PRIOR TO BACK FILLING)

~ WEST SIDE INSTALL FRENCH DRAIN

1840

BRIEF START BERGNER AND RAGLAND

- RAGLAND OFF TOMMORROW

- BERGNER IN ~ NOON

1850

ERT GILBERT, <sup>ERT</sup> ~~NDT~~ NEWHART

- GIS / DATA CAPABILITIES - NEEDS

1915

41<sup>ST</sup> CST GRANT STOPPED BY FOR  
SAMPLING MAP

1925

- KYDEP MC DANIEL HAS HARD COPY  
OF SURFACE WATER DATA FROM 01/18/2007

01/20/2007

14

01/20/2007

MID 30'S °F

JOHN T. FLOYD

1940 START FLOYD DEPART EOC TO  
FORWARD COMMAND  
1950 - RETURNED TWO (2) GASTECH  
COLORIMETRIC SAMPLING PUMPS  
TO CTEH  
2005 - RECEIVED MAPS WITH MOST  
RECENT SAMPLING DATA FROM  
KYDEP MC DANIEL  
2020 START FLOYD OFF-SITE

01/20/2007

FREEZING RAIN

MID 30'S °F

01/21/2007

JOHN T. FLOYD

15

0730 START FLOYD ON-SITE @ EOC  
0750 EPA ERT GILBERT AND KYDEP  
GILES AT EOC - ~~ERT~~ NEWHART  
AND USCG GST CLAUSEN OUT  
TO VIEW EXCAVATION  
0830 KYDEP GILES TO FOLLOW UP WITH  
CSX / ARCADIS  
0900 ZONETON CHIEF ORKIES INDICATED  
THAT EOC WILL REMAIN AVAILABLE  
0930 NOTIFIED EPA ERT GILBERT OF  
CSX BRIEFING ASAP @ EOC  
- CSX LUNDSFORD, IC ORKIES,  
FIRE MARSHALL (FM) RABY, USCG  
GST CLAUSEN, KYDEP GILES  
- NTSB HAS CONTROL OF "CLEANED" CARS  
- CSX BELIEVES CRITICAL PATH FOR  
RE-OCCUPATION IS UTILITIES  
- IC ORKIES INDICATED A DESIRE TO  
BRING ALL UTILITIES (GAS, WATER,  
PHONE, ETC) TOGETHER TODAY TO  
DISCUSS EFFORTS TO RESTORE SERVICES  
1030 BRIEFING WINDING DOWN  
1130 DISCUSS WITH EPA ERT GILBERT  
GIS / DATA MANAGEMENT NEEDS

01/21/2007

01/21/2007

LIGHT RAIN  
LOW 30'S

John T. Floyd

- 1200 AWAITING MOBILIZATION ORDERS  
FOR REPLACEMENT GIS/DATA MANAGEMENT
- 1215 MET NEW OLDHAM COUNTY EMA  
DIRECTOR KEVIN NUSS
- 1230 ARCADIS DATA CONTACT DANIEL J.  
MC CARTHY — START GINA  
BERGNER @ EOC
- 1300 OSC SMITH @ EOC
- 1310 CTEH ENVIRONMENTAL REPRESENTATIVE  
IS MIKE FEAMSTER
- 1330 SURFACE WATER SAMPLING INFORMATION  
TO START BERGNER
- 1415 ENVIRONMENTAL SAMPLING MEETING  
— HAVE BEEN ADDRESSING
- ① SURFACE WATER
  - ② RESIDENTS  
WATER — MUNICIPAL  
PRIVATE  
SURFACE WATER  
SPRINGS  
ANIMALS
  - ③ SOIL/GROUND  
WATER
- ALSO AQUATIC BIOLOGISTS  
COLLECTING BENTHIC ORGANISMS

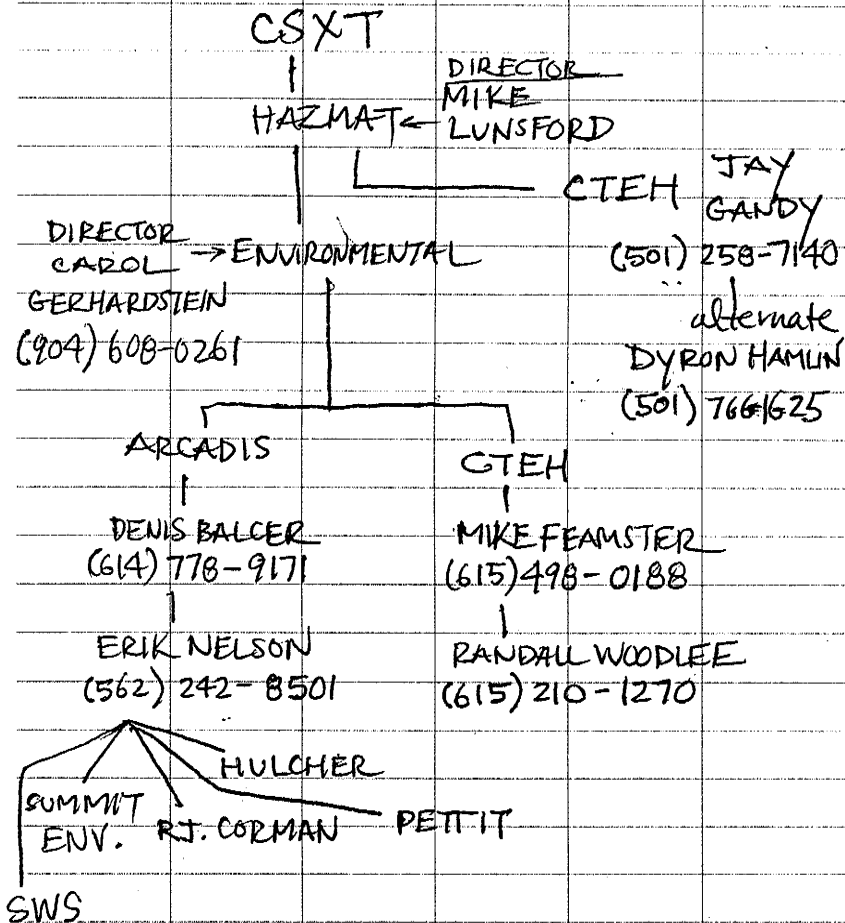
01/21/2007

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01/21/2007

JOHN T. FLOYD

CSX "ENVIRONMENTAL" STRUCTURE



1/21/07

01/21/2007

JOHNT. FLOYD

1445

OSC SMITH REQUESTED INFORMATION  
FROM AQUATIC BIOLOGIST

- ① "DATA" FROM INITIAL ASSESSMENT
- ② SCOPE OF ASSESSMENT / FOLLOWUP
- "CRUST" OF MATERIAL ~

- 18-22K GALLONS OF RECOVERED  
MATERIALS RECOVERED

- OSC SMITH RECOMMENDED  
REMOVING BOOM LOCATIONS EXCEPT  
WHERE RECOVERY IS ACTIVE

- SURFACE WATER SAMPLING ALL  
THE WAY DOWN TO FORMER  
SHEPARDVILLE DRINKING WATER  
INTAKE

- SPRINGS IN AREA EAST OF S.R.  
1020 / NORTH OF INCIDENT SITE  
(ARCADIS WILL PHOTOGRAPH, SAMPLE  
AND GPS SEEPS AND SPRINGS)

- SURFACE WATER ANALYSIS INCLUDES  
VOC'S AND SVOC'S (INITIALLY USING  
ANALYZING ALSO FOR MALEIC ACID)

- 3 DRINKING WATER WELLS

- ① WEST OF 1020 (FILLED IN WITH ROCKS)

01/21/2007

JF

01/21/2007

JOHNT. FLOYD

DRINKING WATER WELLS (CONTINUED)

- ② RESIDENCE EAST OF 1020  
(WELL ACTIVE / WATER TO HOUSE SHUTOFF)
- RESIDENCE ON CITY WATER

\* — NOTE: FIRE OUT 6:30 (AM/PM?)  
ON THURSDAY 01/18/2007

- ③ RESIDENCE EAST OF 1020  
(WELL ACTIVE / WATER TO HOUSE  
STILL ON — USE UNKNOWN)
- RESIDENCE IS ON CITY WATER

OVERALL

1540 ① AIR MONITORING — WORK SITE

- STOCKPILE
- EXCAVATION
- MINIMAL RESIDENTIAL  
MONITORING

\* BUTADIENE SPIKE AT ONE POINT OF  
EXCAVATION

- ② HIGH PERMEABILITY GRAVEL
- EAST / WEST FRENCH DRAIN
- LAYING PIPING FOR EXTRACTION
- STOCKPILE IN ADDITIONAL

01/21/2007

JF

20

01/21/2007

JOHN T. FLOYD

1550 SOIL/GW/SW WILL BE  
ADDRESSED IN TUESDAY "PLAN"  
- ENVIROSCIENCE IS PERFORMING  
ECOLOGICAL ASSESSMENT

- SEDIMENT WILL BE ADDRESSED

1605 ENVIRONMENTAL BRIEFING CONCLUDED

1640 OSC SMITH

- TOMORROW OVERLAP WITH

① START LEAD (FLOYD/WEEDMAN)

② GIS/DATA (PURSES/SPIKING)

- NO NEED FOR SAMPLING MONDAY

1720 UPDATED COST TRACKING FOR  
START - ESTIMATED 01/22/2007  
COSTS

1730 START BERGER SUMMARIZED  
01/20/2007 START SURFACE  
WATER SAMPLING RESULTS

1830 START FLOYD OFF-SITE

01/21/2007

OVERCAST

MID 30'S °E

21

01/22/2007

JOHN T. FLOYD

0800 START FLOYD ON-SITE @ EOC  
- START ANNA PURSES AND  
BILL SPIKING ARE TRANSITIONING  
GIS AND DATA MANAGEMENT  
RESPONSIBILITIES

0845 PREPARING PORTION OF  
START EQUIPMENT FOR DEMOBE

0900 START PURSES AND SPIKING  
SETUP IN EOC INSTEAD OF  
EPA ERT MCP

0930 IC ORKIES BRIEFING @ EOC  
- TRANSITION (WRITTEN) FROM  
FIRE SERVICE TO CSX/EPA  
(WILL INCLUDE SOME COUNTY  
AND STATE RESOURCES)

- NTSB IS RECONSTRUCTING  
THE RAIL ON SR 1020 (WILL  
BE SHUT DOWN TEMPORARILY)

0955 - KY DEP GILES RELAYED THAT  
NO FISH KILLS HAVE BEEN  
REPORTED

- CSX PREPARING SAFETY PLAN  
FOR SIFTING THE SOILS

01/22/2007

01/22/2007

JOHN T. FLOYD

1000 (BRIEFING CONTINUED)

IC ORKIES BEGINS DISCUSSIONS

ABOUT A HOTWASH / AAR

WEDNESDAY FEBRUARY 7<sup>TH</sup> @ 1600 HOURS

- NEXT BRIEFING TODAY @ 1700 HOURS

1030 OSC SMITH ON-SITE @ EOC

- SURFACE WATER DATA RECEIVED

AND BEING IMPORTED INTO SCRIBE

- OSC SMITH REQUESTED DIRECTIONS

(MAP) FROM AIRPORT TO EOC

(ZONETON F.D.) FOR EPA PIO

SHERYL CARBONERO

1130 RESIDENTIAL WELL DATA -

ATTEMPT TO IDENTIFY SAMPLING  
POINTS

1200 BRIEFING START / WEEDMAN

- OSC SMITH

1330 START FLOYD OFF-SITE

01/22/2007

30°

01/22/07

1400 - EPA / START awaiting data  
from CSX concerning  
water sampling. Critical  
points are:- affected water supply for  
displaced residents and  
for range animals in the  
area.- START Purser and Spiking  
working on SCRIBE database1600 - Weedman spoke w/ Gilbert  
and Smith, and they both  
indicated that they are  
on their way back to  
the command post.

1617 - OSC Smith returns

OSC Requests:

- CST data sharing w/ CSX

- Organize all files and materials

- Sat, Sun, Monday reporting  
period - POL REP

- KDEP SUMMA sharing w/ CSX

\* - Continue to share data as it comes  
in to CSX personnel / contractorsΣ 2 4 5  
1/22/07

1/22/07

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- 1540- Todd Jiles (KDEP), CTEH, and John Gilbert arrive  
 - CTEH delivers data to Purser & Spiking.

1545- CTEH departs.

- Gilbert & START Purser & Spiking review and discuss data w/ Arcadis

1620- Meeting w/ Command Staff

- To alleviate issue w/ press EPA will post a press release if media persists in meeting requests. EPA PIO, Cheryl Carbenero

- Non ER 502-955-8076 Fire Dept. Number. (Zoneton)

- State of Emergency in place until Thursday this week for security of residential areas.

- Fire Dept officially off call

- Effectively immediately, responsibility has been transferred in command to EPA, CSX, KDEP through duration of activities.

Sy w 1/22/07

1/22/07

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- Meeting will be held for residents concerning access @ 1900 hours
- Meeting schedule and organization w/ EPA will be reconstructed
- CSX reports:

- Focus on cleanup of surface body water, consolidate collection points / basins

- Area A (Hubers) start investigation sub surface of utility / lines corridors w/

to discuss geoprobe / hand auger operations / investigations. Expect analytical ~ Friday on soil sampling. If impacts detected, CSX will clean up.

- Will be replacing water and gas lines in areas where butadiene contamination was identified.

- Crossing at tracks removed to continue rail traffic; area setup for future removal.
- NTSB continues to research w/ CSX, air monitoring being conducted with this op.

Sy w 1/22/07

1/22/07

25°

- Residential surface soil removals are planned for areas residential and immediate to incident, and sampled, then back filled
- Residential water sampling from taps in houses to confirm non-contaminated. CSX will split samples as requested
- CSX continues to respond to hot line calls from residents.

CSX requests assistance from EPA to define area of concern for hot line calls.

- Reoccupation task force meeting tomorrow @ 1030.

### CSX Tuesday Ops:

- Revised plan ready 1/23/07
- cover this in 1700 meeting

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1/22/07

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1/22/07

- Tuesday working @ Zoneton
- Wednesday transition
- Thursday EPA, START, KDEP, CSX working collocated
- Cheryl Caranero onsite 1/23/07 to conduct PIO duties
- OSC to arrive this week and to work with and relieve OSC Smith for some periods.
- USGS will be aiding EPA w/ ~~eye~~ review of CSX plans. Division of Water Quality may also assist in this review.
- 1300 meeting w/ EPA, CSX, KDEP @ fire house.
- KDEP request French drain diagrams & residential water (tap) sampling efforts have ~~been~~ taken place from CSX.
- 1805 - meeting over
- START & Gilbert continue to work on SCRIPTSE database
- 1830 - Weedman off site

*S*  
1/22/07

1/23/07

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- 0800 - EPA Gilbert, START Spiking and Weedman onsite
- Weedman works on POLREP #5
  - Spiking & Gilbert work on DCR#3E database.
- 1040 - Re-occupation meeting begins, and Cheryl Carbanero onsite for EPA. Weedman in meeting to take notes.
- Water Co. indicates that they could accomplish  $\approx$  300 ft per day regarding water line replacement.
  - Ed Coplin, Arcadis, indicates that Arcadis is currently conducting residential Soil Sampling (0-2')
  - CTEH prepared Action Items list for re-occupation
  - CSX calls for follow-up meeting @ 1030 tomorrow
- 1145 - meeting adjourns

~~1/23/07~~

1/23/07

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- 1255 - START & EPA leave firehouse to drive down to the site. EPA Carbanero & START Spiking have not seen the site.
- 1430 - Because of the high activity at the site, START/EPA viewed activities from a distance. There is a lot of heavy equipment in operation in the area.
- 1455 - EPA/START return to fire station
- 1600 - Weedman offsite to office to pick up supplies
- 1700 - Weedman onsite

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~~1/23/07~~

1/23/07

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1700 - Command Meeting begins  
- Mike - USGS

### CSX Reports:

- malic anhydride material (2 cars) waiting for analytical to find if manufacturer can take it back
- cyclohexane ~~eat~~ material transfer awaiting possible buyer

SW  
SW

- Soil / metals sifter operations conducted on site to separate metal debris from soil for disposal purposes. Sifting will continue tomorrow
- Air monitoring conducted during all operations on site. No readings have been recorded to date, or all readings have been 0.00.
- Test pit / trenches dug in a 360° pattern to sample soil & gw.

SW  
1/23/07

1/23/07

SW - samples (surface water samples)

SW

- completed stream clean up. Continue to consolidate boms in streams
- Sampled shallow soils in area A (residential areas)
- hand augering conducted to collect subsurface soil samples in areas of underground utilities
- CSX requests information regarding defining the boundary of affected area again. EPA requests that CSX propose a boundary with sample locations results
- Geophysical study to identify missing parts of train from wreck conducted.
- Access agreements in finalization for new road construction behind residential area.

- EPA OSC Ken Rhame will be ~~reassigned~~ overlapping with Art Smith

1/23/07

1/23/07

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- ~~evaluated gw seeps~~ (SW) (High points of plans submitted)
- evaluate seeps
  - track surface water
  - Sample residential wells in immediate area
  - install perimeter gw wells
  - Fig 1 shows what sampling has been done
  - Proposing to reduce in order to focus on data trends
  - shallow soil samples in residential area
  - hand augering in area of underground utilities

1818 - Command meeting adjourns

1845 - START Weedman offsite

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1/23/07

38°

1/24/07

0815 - START Weedman &amp; EPA Gilbert, Carbanero, Smith

- START spiking onsite @ 0800
- Smith departs to recon convention center where CSX is located before EPA/START begin to move equipment over to set up office space

0900 - Ed Cotton calls to relay Ken Rhames information. Ken is needing directions to the Zoneton Fire District.

- START Weedman calls Ken to give directions.

1000 - START / EPA begin to load up all equipment and files to relocate to Convention Center in Shepardsville.

1115 - EPA / START has arrived at convention center and set up office space on the second floor.

S S W L 1/23/07

<sup>34</sup> 1/24/07

300

1150 - Sheila & Stacey w/ Arcadis review the convention center setup and give a tour of the bldg and rules.

1700 - Command meeting begins (CSX, EPA, KDEP)

CSX Reports:

Current Activities

- Soil sampling continues in residential area (Area A) Water came into excavation from this process, and water was collected for analysis
- drained  $\approx 1'$  material from french drain
- Visually observed  $\approx$  one dozen small fish. They were collected and CSX called EnviroSciences to conduct on site investigation
- EnviroSciences said they would come back in  $\approx 2$  weeks after spraying and cleaning activities are complete

Sy W 1/24/07

1/24/07

<sup>35</sup> 30°

- EnviroSciences believes the fish kill may be from the power washing and other cleaning activities of the creeks. The fish kill was observed on an unnamed tributary in vicinity of site that flows to Clear Run creek.
- MEK detected in gw wells, 2 wells, located  $\approx$  miles S, SE of site. Readings reported 0.26 - 0.84
- CSX suggests contacting health department, but will resample wells and send to alternate lab.
- CSX met w/ Louisville Water Co. again, and are working through options to restore service.
- CSX will report all waste generated for disposal and provide waste codes & description & quantities. CSX will also document if products are transported or any other means of it leaving site

Sy W 1/24/07

1/24/07

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- sifting operations continue.
- Cyclohexane transfer plan complete and tentatively scheduled for Friday.
- Maltec cars, if returned, will require liguiting material in cars, and will take  $\approx$  2 weeks to complete the transfer. CSX will also have a plan for this transfer.
- ~~2~~ pups recently born have all died. The mothers were placed in kennel located in residential Area before pups were born. CSX has hired a veterinarian pathologist to assist with the cause & effect of the deaths.
- CSX will provide EPA with ~~non-potable~~ ? Potable Well inventory.

### CSX Plan for Tomorrow:

- Implementing soil scraping to 6" in residential area (Area A)
- evaluating seep flows continues
- Wrights property @ 596 Sterns Ln. has not provided access.

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1/24/07

1/24/07

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- EPA will have someone from ~~SES~~ to review field processes and data to ensure quality.
- 1800 - meeting adjourns
- 1830 - Weedman offsite

5  
1/24/07

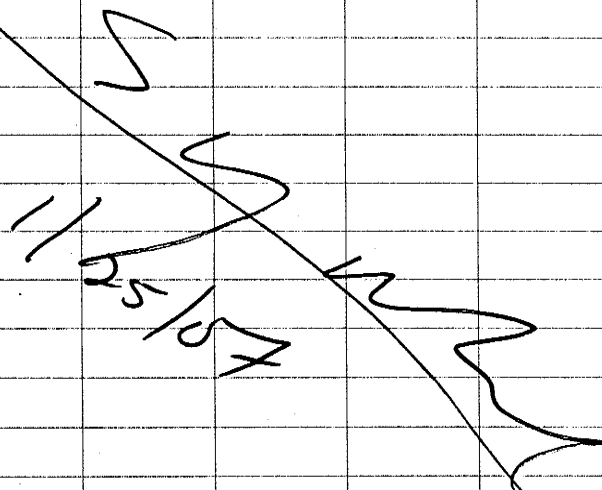
1/25/07

35°

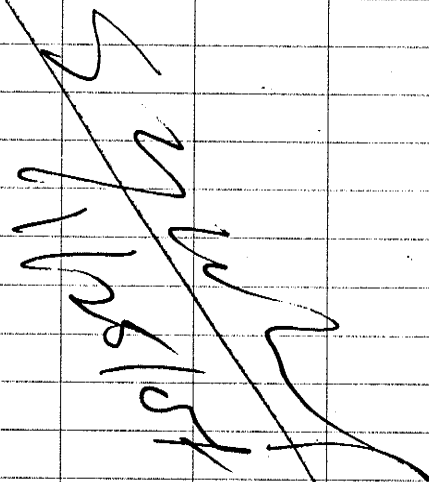
0800- START / EPA on site

- Kevin Simmons w/ EPA SESD

on site

0931- SESD, Weedman, and Rhame  
at site to document operations  
and walk streams and creeks1015- Dead frog located at  
Seep 6 Hubers Creek, frog  
placed next to pink flag <sup>sw</sup>  
flag marking seep 6


1/25/07



1/25/07

CSX  
1/25/07

1/25/07

1700 - Command Meeting32°<sup>41</sup>CSX Reports:

- Bowls Home - sample was not collected from well. It was from water hose. This sample resulted as having levels of MEK. Resampling has been completed from tap inside home.
- Completed scrapping 0-6" in front of two homes and pressure washed 3 homes
- Cyclohexane transfer tomorrow morning begins if NTSB allows access to car. (NTSB is working in the area, and ~~has~~ <sup>has</sup> a section of 1020 shut down from traffic.
- This evening CSX will conduct boom inspection and well identification
- Tomorrow sampling activities will continue

S G W

1/25/07

1/25/07

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- Waste is being proposed for offsite disposal. Any treatment onsite options will be forwarded to EPA prior to approval
- CSX working with Louisville Water Co. tomorrow concerning water line installation
- Completed well data from Area 1 will be delivered tomorrow
- \* - EPA requests samples from liquid in french drains and from surface soils from residence located at 596 Huker Station, and confirmation samples from big dig.
- Bank washing is planned to be completed tomorrow
- Dr. Gandy will be coordinating with pathology report on deceased puppies.

1750 - Meeting adjourns

Sg W  
1/25/07

1/25/07

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- \* Weekly work orders needed
- submit to Ken & Art by Monday
- bullet email of activities
- # people, hours, category

5  
7  
1/25/07

1/26/07

30°

- 0800 - START/EPA onsite.
  - SESD in field conducting oversight
  - Rhame to field to oversee activities
  - Carbonaro to meet CSX and Water Co.
  - 1230 - Rhame & Weedman arrive at Mr. Price's residence w/ CSX Mark Duffy and Carbonaro (EPA).
  - Mr. Price concerned about soil on back 17 acres where cattle graze, and requests sampling.
  - 1310 - EPA, CSX, START depart from Mr. Price's residence.
  - 1330 - Meet w/ EPA, START, CTEH at Cracker Barrel, to discuss air monitoring data and other issues for the public meeting.
  - CTEH would like CSC Smith to discuss as much as possible to the public regarding monitoring and how it relates to human and environmental health.
- Sg W  
1/25/07

1/26/07

30°

- Contact for CTEH Maps/Data
- 1500 - CTEH/EPA, START depart from Cracker Barrel
- 1530 - Return to Convention Center to begin preparing for press public reading
- 1730 - Command Meeting
- Soil Sampling from front yard of northern homes have resulted as non-detect
- Creek cleaning complete
- Cyclohexane transfer delayed today because of gasket issues. A stainless steel fitting is being made, and CSX plans to resume and complete closed loop transfer of cyclohexane
- resampled well that resulted in detections of MEK that could not be accessed yesterday.

Sg W  
1/26/07

1/26/07

35°

- USGS responded to monitoring well installation plan CSX put together that CSX should reconsider techniques based on naturally occurring salt water in the area. USES believes that this may interfere with the results of the conductivity testing CSX plans to conduct.

EPA reports:

- Public meeting will occur Wednesday evening. Press be invited before meeting!
- evacuated residents meeting on Monday evening

1/26/07

1/26/07

USCG- MIKE CLAUSEN (251) 680-9726  
 GST- BRADY WILSON (251) 680-9763  
 JOSH PECKERT (251) 680-8415  
 KYDEP KERRY MCDANIEL (270) 528-7853 COLUMBIA  
 BRIAN SCHRADER (270) 991-8115 COLUMBIA  
 MATI CANN (270) 316-9430 O'BORO

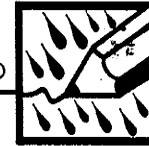
ARCADIS SAMPLING JASON MANZO (614) 554-4927  
 ANALYTICAL MARY MCKENZIE (440) 343-3554  
 HADLEY STAMM (440) 742-0358  
 OVERALL DENIS M. BALZER (614) 778-9171  
 DATA? DANIEL J. MCCARTHY

START

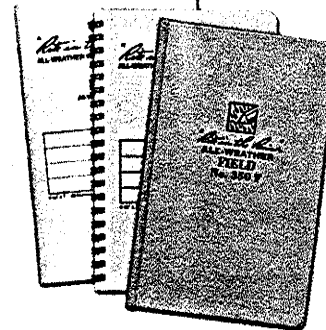
BILL SPIKING (660) 541-4742

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 1/26/07

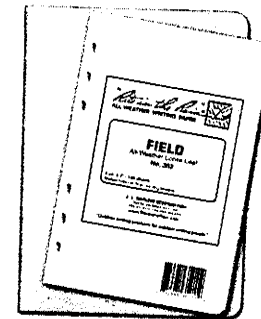
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 for outdoor writing people"



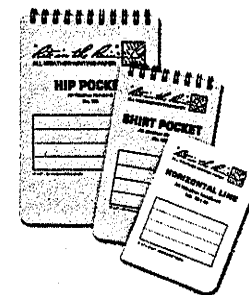
Bound Books / Notebooks



Loose Leaf / Binders



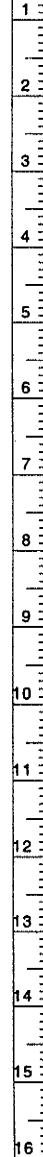
Copier Paper / All-Weather Pens



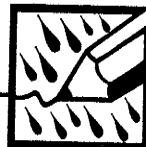
Memo Books

[www.RiteintheRain.com](http://www.RiteintheRain.com)

CM



"*Rite in the Rain*"  
ALL-WEATHER WRITING PAPER



## HORIZONTAL LINE

All-Weather Notebook  
No. 391

Bullitt Co. Train Derailment
1/16/07 1/19/07
TTMI-05-001-0030
X9010.L.06.001.0030

4 5/8" x 7" - 48 Numbered Pages

11/16/07 OX Derailment 300  
~~Butt~~ <sup>20</sup>

1200- START Weedman, Englebrecht,  
 Ragland, and Floyd mobilizing  
 to train derailment in  
 Bullit Co., KY.

- Currently START is aware  
 that the tankers are on fire,  
 and other unidentified tankers  
 are involved in the wreckage

11/16/07  
 S  
 3  
 W

11/16/07  
 S  
 3  
 W

4 1/16/07 CSX Derailment 30°  
1300- START Weedman, Englebrecht,  
and Ragland arrive to  
site. Floyd already on site @  
approx. 1200.

- 41 CST on site

- KDEP on site

- EPA OSC Smith on site

1500- 3 Teams deploy from IC  
to conduct air monitoring

- Teams will be conducting  
monitoring in Level C  
(CST Level 8) when approaching  
plume areas and smoky areas

- Team 1 - CST  
Ballard & Terrell

299.9865

traveling to the southern  
extent of the plume in  
the area of I-65 to  
monitor and place an Area RAE

- Team 2 - CST

Chowing & Gregory  
859.893.2508

traveling to northern extent of  
plume in area of I-65 to place  
an Area RAE S > W

1/16/07 CSX Derailment

5  
30°

Team 3 - START

Ragland & Englebrecht  
traveling to rural acres neighborhood  
and Shepardsville to monitor air in  
residential and commercial areas  
and place Area RAE

1548- All teams are reporting  
no deflection on all instrumentation

~~SUN PLUME CROSSING~~

1600- Team 3 reports that ~~20~~  
As ~~20~~ no deflections on  
instrumentation within and  
in surrounding area of  
rural acres.

- Team 3 now heading to  
Shepardsville

- Team 3 reported that there  
was no visible smoke in the  
area above rural acres.

1600- Weedman to CTEH trailer  
to review past, present, and  
future ops.

- Angela Harris - CTEH contact  
501.831.1418 - cell S > W

<sup>6</sup>  
1/16/07 CSX Derailment 25°  
- START & CTEH discuss  
operations throughout the night  
- Brad V. Cory  
Dyron-Hamlin Project Manager  
for CTEH

- 1730- START Englebrecht & Ragland  
complete monitoring  
- no deflections recorded  
except one particulate  
reading of  $\approx 0.03 \text{ mg/m}^3$  downwind  
of fire on Halls Lane.  
- START Weedman, Ragland,  
Englebrecht go to location  
ERT MCP is setup @ intersection  
of 1020 & 1526 (Brooks Rd) to  
discuss operations  
- OSC Smith & Reninger @ ERT  
location.  
1800- START Reyna & Draper arrive  
at ERT location  
- CST Holstrom reports data  
from teams 1 & 2 @ ERT location  
- readings reported no deflections  
on area raes

~~1/16/07~~ *syw*

- <sup>7</sup>  
1/16/07 Derailment 20°  
1830- START Purses arrives to ERT  
location  
- EPA leaves to meet at  
CTEH location  
1930- START Englebrecht & Ragland  
demob Reyna transporting  
them to their vehicles located  
off site.  
- Reninger & Harris & Dyron  
meet at ERT to discuss  
RAT loop and Area Raes  
locations.  
- CTEH will have 12 total  
Area Raes out to monitor  
- EPA will have 2 Area Raes  
out to monitor  
- Reninger calls for briefings @  
1000 2230 on 1/16/07 and  
0630 on 1/17/07 @ ERT  
MCP  
- CST will run HAP SITE  
along I 65 and in  
neighborhoods in the immediate  
area of the fire.

~~1/16/07~~ *syw*

1/16/07

Derailment

200

- CTEH level of concern is 2.0 ppm
- EPA level of concern is 4.25 ppm based on Butadiene
- Data will be transferred as RTF from the Area Raes from CTEH to ERT. Other readings collected will be transferred in Scribe. GPS in decimal degrees
- CTEH plans to pull air samples via summa canisters for analytical in residential areas on 1/17/07.
- EPA instructs RAT loop monitors

1/16/07

1/16/07

200

1200- CTEH will transfer data at 0900 & 1900

1/16/07

1/16/07 / 1/17/07

2130-meet w/ Reninger

- EPA will put out additional Area RAB's
- Will determine # of Area RAB's after 2230 meeting w/ CTEH

— DAY OPS —

- RAT LOOPS every two hours

2221 PER SHELLY - NIGHT OPS TO INCLUDE RAT LOOPS; PLACE REPEATER AND POSSIBLE AREA RAB PLACEMENT

2310 DEPART EPA EOC TO DO RAT LOOP

2330 GPS STOPS - NO WORLD FILE

2350 ARRIVE BACK @ EOC

SHELLY TO INSTALL FILE

0100 @ EOC RAT DATA DUMP

— VERY LIMITED DATA

0118 SWAP-OUT AREA RAB 2 WITH #9 @ AUBREY STORAGE

0124 SWAP-OUT AREA RAB 4 WITH #10 NEAR I-65 OVERPASS

1/17/07

1/17/07

0205 DEPART EOC TO DEPLOY 6 GA

AREA RAB AT PREDETERMINED LOCATIONS

0249 PLACE #3 @ 1526 AND 1450

N 38.06520 / W-85.69327

ACROSS FROM McDONALD'S ON TREE

LOCATION 7

0313 LOCATION 2

PLACE UNIT #6

N 38.00717 / W-85.67450

ON HALLS RD, IN CURVE PARALLEL TO MT. WASHINGTON (KY-44)

0321 LOCATION #3

PLACE UNIT #1

N 38.01913 / W-85.65032

SANDY DR.

ON (R) NEAR 300 SANDY

0341 LOCATION 9

UNIT #7

N 38.03265 / W-85.72928

END OF BIG VALLEY

ACROSS MOUND @ END OF STREET

0400 I-65 : Hwy 61 LOCATION

N 38.02247 / W-85.69806

UNIT #10

LOCATION #15

Sg W

11/17/07

0404 LOCATION 16

UNIT #9

N 38.02939 / W - 85.69495

ALBRIGHT STORAGE

BECHTEL ~~FW~~ OFF 61  
ON FENCE

0411 LOCATION 8

UNIT #8

N 38.04358 / W - 85.71918

CORNER OF COLT : GELDING

STRAIGHT AHEAD ON COLT

0428 LOCATION 14

UNIT #5

N. 38.04105 / - 85.70094

ON GATE @ CURVE IN E BLUE LOCUS  
AND ~~ENTRANCE ROAD TO~~

FERGUSON

0438 ARRIVE EPA EOC

0600 DEPART TO CONDUCT RAT LOOP

0735 RETURN FROM ANOTHER FAILED  
LOOP.

11/17/07

11/17/07

0600 - START Weedman, Bergner,  
Sumner, Ragland, Englebrecht  
on site for day ops.

- Overlap being conducted

0700 - Health & Safety plan is  
signed by new personnel  
to site. All personnel updated  
on past ~~disc~~ and current  
operations and situation of  
incident.- 16 Total Area Raes are  
in the field.

8 - EPA

8 - CTEH

- ERT currently have problems  
with Area Raes transmitting  
information, and have some  
issues with RAT syncing  
properly.

- Nomenclature for Area Raes:

1 - 16 on map

CTEH → 1 - 8 for field ops

EPA → 1 - 8 for field ops

- 3 additional locations  
are planned to be placed

11/17/07

11/17/07

by REAC, bringing the total to 19 Area Raes in the field.

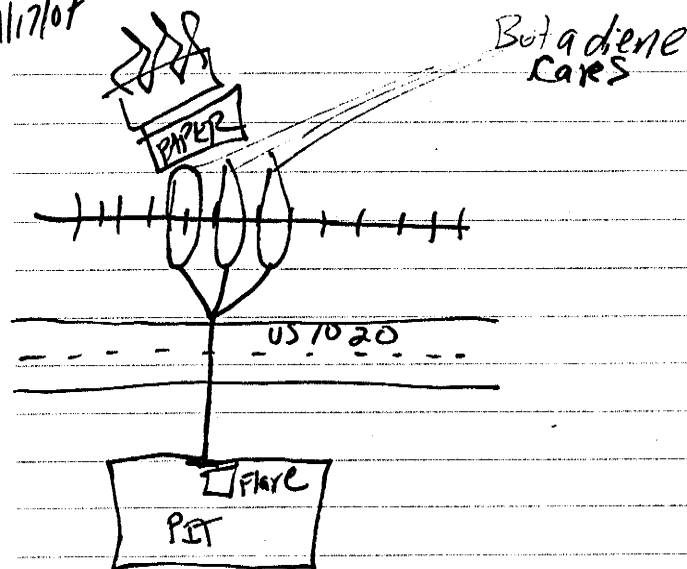
- REAC will also place repeater towers to correct issues with transmission
- REAC & PRT Area Raes will operate under one system

0720- OSC Spurlin ~~briefed~~ <sup>sees</sup> gives briefing on day ops to be conducted at the fire site.

- the fire continues from the cyclohexane rail car
- CSX & Shell (RP for the 3 butadiene cars) plan to begin "flaring" butadiene product off see diagram next page.

11/17/07

11/17/07



- ~~the~~ Lines will be collected to each of the three rail cars and then joined together into one line across the road to a pit where the product will be "burned off."
- This process will take ~3-4 hours to set up
- Property access is being secured by CSX
- This operation to burn product off could take up to 24 hrs.
- Upon completion the residue from the tanks will be "burned"

11/17/07

11/17/07 Derailment 200  
and vented through a stack  
at the location of the tanks.

- START is conducting recon of Area Rat locations with night crew, and night crew will leave the site ~~the~~
- START Bergner will be on RAT 100P op w/ ERT TC Randy Mayer
- Ragland & Englebrecht in charge of Area Rat maintenance and assist REAC as needed
- Sumner conducting GIS and database support.
- Weedman acting as liaison between ERT, REAC, START, EPA operations as directed by OSC Keninger & Smith.

0930- EPA & ERT relocate to US 61 & Brooks Rd  
- News stations, Kentucky Em, state police on location at Zone 1 on Fire district on US 61.

11/17/07

11/17/07

01/17/07 - 01/18/07 NIGHT OPS.

1743 MEETING

\* TAKE ONE SUMA

- GET GPS, NEAREST HOUSE #
- COMPLETE COC, TRANSFER CANS TO STATE (MAC CANN)
- OPE CHECK W/ MAC FOR FLOW RATE

- CAPTURE CANISTER #

- NEXT ONE AFTER FLARE

✓ \* AREA RAEs - CST ~~W/ REIN~~ <sup>(1)</sup>

KYLE : KEVIN

- DATALOG

- READ

- CHECK / CHANGE BATTERIES

REACT, DINO AND RANDY ARE OUT

- ~~ERT~~ AND REACT HAVE SOME SPARES

REACT = MIKE OR DAVID

? - WHICH AREA RAEs HAVE  $Cl_2$ ?✓ \* BURN STARTED TODAY @ 1515, EXPECT 20<sup>th</sup> HOURS✓ \* BEN FRANCO - CALLS COME IN  
RAT TEAM TO CHECK-OUT

11/7/07

11/7/07

HALLSTROM

1806 Met w/ MRS. HODGET, CST

WE NEED ONE PERSON TO RIDE  
W/ RAT

PREVAILING WINDS TOWARDS RT CORNER

(\*) CST HAS TENT W/ ONE SCBA's  
AND LUDLUM

JAMES AND SHANNON

1820 DINO W/ NRT CONDUCTS AREA RAE  
BRIEFING

#s ON MAP ARE LOCATION NUMBERS

RAE NUMBER MAY BE SOMETHING ELSE

✓ \* NEED TOPD

\* 16 : 15 ARE

MADE ON ASPECT FLIGHT; @ 15-1700  
PLUME @ 3000 ft.

(\*) NEED CTEM LOCATION UPDATE

✓ \* REPEATER ① 38.0005.44 / -85.4408.59

- TO LOCATION 19 RAE  
REPEATER NEARBY

② NEAR RAE 17

C SIGN 38.5447.15 / -85.4303.97

17 IS ON PHELPS Rd

38.0055.15 / -85.4329.38

11/7/07

11/17/07

1923 MET W/ HALLSTROM: BEN FRANCO

1 TEAM OF 2 FOR AREA RAES

HAP-SITE @ CALL-IN LOCATIONS

RAT LOOP IF POSSIBLE

CST ALSO TO CHECK OUT-UTING

AREA RAES

HAP-SITE ALSO

\* GARY NEWHART OVERNIGHT

\* HAP-SITES NORTH OF 1-MILE

\* RADIUS, PLUS CALL-INS

\* MAP W/ SCHOOLS

— HAP @ LIKELY SCHOOLS

— RAT @ MOST

1947 BRIEF TEAM

NRT OR REAC

① KEVIN/DINO/ROGER: RYAN

② MIKE: DAVID/KYLE

1955 TWO TEAMS DEPLOYED

11/17/07

11/17/07

1906 CF-SUZANNE-BEEN TO TO  
CALLIN SITE

MIKE MINTON @ 4801 BROOKS HILL RD

BOB WOOLRIDGE @ 887 OLD BRASS HILL

STARTING LOOPS NOW

2026 CMD MEETING @ FIREHALL

GARY NEWHART, SPURLIN, SMITH PRESENT

MASS CARE/FEEDING: SHELTER-IN-PLACE

OP - 2000 - 0800

2200 PIO MAKES STATEMENT (PRESS)

0000 ANOTHER BRIEFING

EMA - JOHN BASTEN, D

BOB STEVENS, N

GEORGE LOGUE, N (PRIME)

EPA - SPURLIN

CO HEALTH - NED FITZGERALD

RED CROSS - MIKE CRENSHAW

CSX - MIKE LINSFORD/ROGER MARUM

ATSDR - BOB SAFAY

KYDEP - MARK JOHNS

MR. WHITMAN - CALL-INS

— EPA, ATSDR PUTTING INFO TOGETHER

CLOSING DECON @ JEWISH HOSPITAL

— CLOSE, BUT LEAVE SET-UP/UNMANAGED

11/17/07

11/17/07

2044 \* INSTRUCTED TO PUT BRIEF  
STATEMENT TOGETHER FOR  
SPURLIN @ 2200

① NEXT PRESS @ 1000  
② IAP @ 0800

CALL-INS, SCHOOLS, MONITORING DESCRIPTION  
FOCUSING EFFORTS BASED ON PLUME  
# TEAMS, # POINTS

2054 Met w/ R/D LAWELL  
BROOKS ELEM

2058 CF RANDY FOR SHELLEY

2050 DELIVER TALKING POINTS TO SPURLIN  
# NEED TO EMAIL TO NILES, LAURA @ EPA.GOV

2215 DIND BRIEF. ALL GOOD  
ALL DATA LOGGING AND CAN SEE  
MANY OTHERS LOGGING  
ADDED 1 RAE @ HARDWARE AND  
1 @ ROGERS

2220 SCHOOL MAP TO CST

2235 Spoke w/ MARK JONES KDEP  
RE: SUMA CANISTER

8:00 AM RELINQUISH TO KDEP  
FOR ANALYSIS

SPOKE w/ DAVID LEO  
HAS BACKGROUND

SS w/ Mark Jones (859) 760-6656

11/17/07

① EMAIL SUMA DATA TO:  
NEWHART, GARY @ EPA.GOV  
SMITH, ART @ EPA.GOV  
FRANCO, BENJAMIN @ EPA.GOV  
SHELLY.LAM @ TTEMI.COM

2247 Met w/ GARY NEWHART  
CALL FROM CAP. BRANDT WAS  
ON BROOKSHILL RD  
NEED COORDS ON SUMA  
PULL IN THE PLUME

1,3-BUTADIENE TO LDL (CLEAST <1 ppm)  
MER

CYCLOHEXANE

2356 DISCUSSED PULLING SUMA IN  
CONJUNCTION w/ HAPSITE w/  
COL. DAVIS AND MAJ. HALSTROM  
INTIMATED ~ 0230 MAY WORK.

2358 CALLED KYLE - ALL OK  
CALLED KEVIN - ONE LOW O<sub>2</sub>  
ALARM ON UNIT #4

THEY WILL MERGE AND DO CHECKS  
THEN PREP FOR SUMA } CST  
MISSION

*[Handwritten signature/initials]*

9/18/07

0001 MET W / CPT. GRANT

FLAMES &gt; 30 ft

DATA SIMILAR TO BACKGROUND

LDL = 3ppb MEK

ASPECT = 0 - 0.1 ppm 1,3-BUTADIENE

0022 KYLE - UNIT #12; LOC 19

\* 1.2 ppm HIGH

0.4 WHEN ARRIVED

INFORMED OSC SPURLIN AND

GARY NEWHART

/ \* INSTRUCTED TO CONFIRM W / DRAGAR

0042 CT DUKON HAMLIN CTEH

501-766-1625

CORY DAVIS, CTEH 501-258-7881

0044 COL. DAVIS POLICE

\* HWY 1020 : HWY 61 (PRESTON)

RAFT LOOP

SENDING CALVARY

WNW 1.6 mph

LOC 17 / UNIT 14 ALSO

0107 INFORM SPURLIN

0115 CORY, CTEH - NO DETECTIONS @

1020 : 61; ALSO NO APPEARANCE

(0.1 @ 1900 HR)

HEADING TO EPA 19 (KYLE)

11/18/07

0126 CALL KYLE TO TELL CTEH EN ROUTE

DRAPER IN W / REYNARD : SUZANNE

TO 1020 : 61 AND ON TO EPA 19

\* 0151 KYLE - UNIT 14 IS GONE

0226 MET KYLE @ UNIT 19 LOCATION

CTEH ON SCENE, ALL OK

RAFT OK

SWEEP BULLITT LEEK MIDDLE

SCHOOL - OK

\* REMOVED 19 FROM SERVICE

0234 CALL GARY NEWHART TO UPDATE

ASKED GARY TO REVIEW CONFIG

\* AND DETERMINE APPROPRIATE FIX

0240 CALL FROM GARY - SPURLIN WANTS TO

REPORT THEFTS TO POLICE AND ANNOUNCE

AT MORNING BRIEF

\* GET W / REAC : ERT TO BRIEF ON THEFT

0259 ARRIVING ORAL LOGS ELEM

ATTEMPT RAFT

0333 RAFT DIED

0350 BACK @ EOC

11/18/07

1/18/07

0424 SUMA AT SITE

0426 START @ 30" H<sub>g</sub>0435 FINISH @ ~3" H<sub>g</sub>

N 38.02.06

W-88.42.35

GET ON MAP

0448 BACK @ GOC

0501 COMPLETE CDC FOR SUMA

0536 CALL TO CORN @ CTEH FOR WEATHER  
FR N ~ 0.1

1/18/07

1/18/07

1/18/07

30°

1100 - Hebron School (middle)  
assessment requested based  
on a call in of individuals  
with headaches. OSC Franco  
requests RAT team to deploy  
and conduct air monitoring.

3300 Hebron Ln, Shepardsville, KY

1111 - OSC Smith calls to  
put a "hold" on Hebron middle  
School assessment.

- RAT team instructed to  
assess area around Jewish  
Hospital

1212 - RAT collected ~~data~~ @ North Bullitt  
High. RAT team recorded  
a reading of 0.1 ppm on  
the multirae in breathing  
zone in area of a sewer  
grate.

1400 - CTEH reports ~~that~~ <sup>that</sup>  
readings of  $\approx 0.1 - 0.14 \text{ mg/m}^3$   
(particulate) in the immediate  
area of the flaring operation.

1/18/07

1/18/07

30°

- START/ERT placed ~~at~~ a  
multirae <sup>and</sup> a dataram at  
the flag pole in front of  
Zone ten Fire district which is  
operating as Command Center  
for the response. A multirae and  
dataram was also placed at  
the front door of Zone ten Fire  
district.

1630 - Burning has started again.

- Burning stopped for a few  
hours this afternoon, and  
CSX crews/contractors  
had to move around some  
other railcars involved in  
the wreckage to enable  
the butadiene tank to  
be tilted and retrieve  
remaining product to be  
burned/flared.

- The plume is staying  
lower to the ground than  
observed in past burning  
operations. The RAT team  
reported a reading on the

1/18/07

1/18/07

30°

dataram of  $3.0 \text{ mg/m}^3$  for particulates  $\approx 200 \text{ ft}$  from the flare site. ~~W~~<sup>SW</sup> RAT team indicated that ~~at et~~<sup>at</sup> the elevated reading was only a spike and quickly returned to below action levels for ~~VOC~~<sup>VOC</sup> particulates. Levels for VOC's remained below action levels.

- START checked monitors (multirae & Dataram) at command post, and readings were reported below action levels.

1700 - OSC Smith calls off all START ops for the night shift.

- Data will be collected from CTEH for monitoring tonight.
- Night crew is on site, and is assisting Day crew with removing Area Raes from the field.

- OSC Franco has ordered

~~1/18/07~~

1/18/07

30°

to have 4 STARTS onsite for day ops on 1/19/07.

Breakdown:

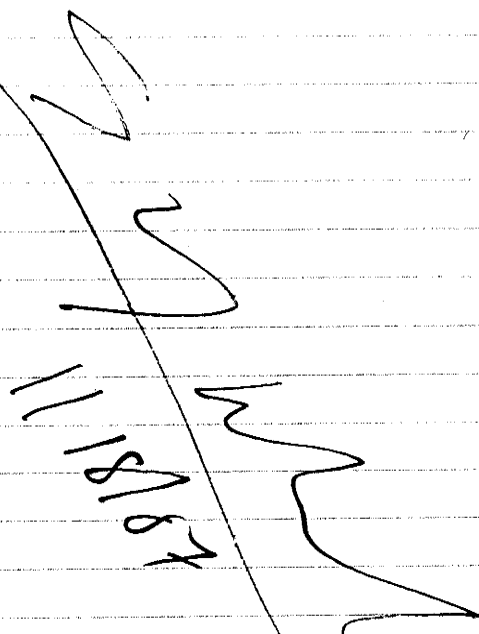
- 2 - GIS / Data management
- 1 - LEAD
- 1 - ROVER

1800 - OSC Franco instructs that Location 7, 14, 20, and 21 need to be put back in place until the current burning activities are completed.

- 2 START personnel will monitor these Areas until burn is completed.

~~1/18/07~~

11/18/07



11/19/07

30° 33

0900 - Roger & Gina to go with KIDEP and conduct water quality assessment.

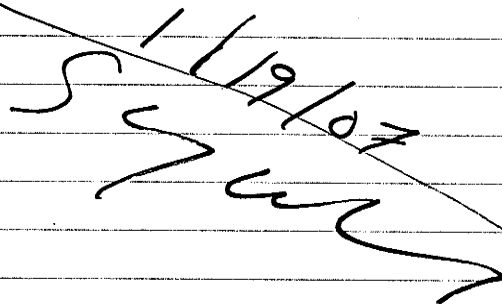
- Also collect 4th

Summa canister sample

- Shelly & Anna will continue data management

1025 - Gina and Roger have completed air sampling with the Summa canisters. It was conducted east of the site within the 1 mile radius downwind. see field team logbook for specifics.

11/19/07



11/19/07  
 S  
 W

11/19/07

1700 - Meet w/ Todd Jiles KBEP

: START to discuss  
 water sampling

SAMPLES:

- Back ground - North of site Unnamed trib.
- South of site - Unnamed trib.
- Preston - Blue Lick

11/19/07  
 S  
 W

"Rite in the Rain"  
ALL-WEATHER WRITING PAPER



Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Project \_\_\_\_\_

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# CONTENTS

PAGE

REFERENCE

DATE

START

BULLITT COUNTY

TRAIN DETAILMENT

TEAM # 3

LOG BOOK # 1

01/16/07

MAC CANN -

BULLITT CO. TRAIN DERAIL  
 R. RAGLAND
CLOUDY  
85°F

01/16/07

DATE	TIME	GPS	P10	SPM
		LAT 38 LONG -85	PPM	PPM
01/16/07	1526	.040004 .710132	0.5	0.00
		RUNL AC ENTRANCE		
1/16/07	1543	.017422 .691059	0.0	0.00
		RUNL AC SOUTH CORNER		
1/16/07	1547	.031720 .691090	0.0	0.00
		RUNL AC NORTH CORNER		
1/16/07	1553	.030571 .692310	0.0	0.00
		618365 UNDER PLUME		
1/16/07	1604	.025115 .693637	0.0	0.00
		37. JCT 61 & 273 SHP VILL		
1/16/07	1616	.09363 .714125	0.0	0.00
		HALLS LN UNDER PLUME SHP VILL		
1/16/07	1640	.013444 .681199	0.0	0.00
		ELKHART LN UNDER PLUME SHP VILL		
1/16/07	1646	.014963 .688863	0.0	0.00
		61 & TANGER LAND INCL APT SHP VILL		
1/16/07	1653	.006244 .679590	0.0	0.00
		RUNL AC SOUTH CORNER		
1/16/07	1710	.031720 .691090	0.0	0.00
		RUNL AC NORTH CORNER		
1/16/07	1715	.030571 .692310	0.0	0.00
		10202 DERAILMENT APT TO PLUME LN		
1/16/07	1725	.033039 .709320	0.0	0.00

 BULLITT CO. TRAIN DERAIL  
 R. RAGLAND

01/16/07

DRM	LEL	O <sub>2</sub>	CO	H <sub>2</sub> S	PH #
mg/m <sup>3</sup>	%	%	PPM	PPM	
0.000	0	20.9	0	0	1
0.000	0	20.9	0	0	2
0.000	0	20.9	0	0	3
0.000	0	20.9	0	0	-
0.000	0	20.9	0	0	-
0.000	0	20.9	0	0	-
0.093	0	20.9	0	0	485
0.000	0	20.9	0	0	6
0.000	0	20.9	0	0	-
0.000	0	20.9	0	0	-
0.000	0	20.9	0	0	-
0.000	0	20.9	0	0	708

## BULLITT CO. TRAIN DETAIL

R RAGLAND

01/16/07

DATE TIME

GPS

LAT38 LONG-85

PID

PPM

SPM

PPM

01/16/07

DEW

mg/m<sup>3</sup>

LEL

%

O<sub>2</sub>

%

CO

PPM

H<sub>2</sub>S

PPM

P<sub>4</sub> #

## BULLITT CO TRAIN DETAIL

R RAGLAND

01/16/07

DEW

mg/m<sup>3</sup>

LEL

%

O<sub>2</sub>

%

CO

PPM

H<sub>2</sub>S

PPM

P<sub>4</sub> #

6

## BOLLITT CO TRAIN DETAIL

1/16/07

1847 CTEH: ERT MONITORING MEETING

## ACTION LEVELS

BUTADIENE	S	0.85	4.25 ppm
CYCLOHEXANE	100	1.4	140
MEK	200	0.9	180
CI	0.5	-	0.5

## BOLLITT CO TRAIN DETAIL

1/17/07

Sunny +40°F 7  
K. England

11:00 - LOCATION 14; Unit - #5; NOT 160

Attempt to DL DATA - No DATA

SAVED IN UNIT - WAS NOT SET  
TO DATA LOG; CHANGEDBATTERY OLD BATT @ 8.0; NEW  
BATTERY AT 8.5. SET UNIT

H+K (10) TO DATA LOG

12:46 - LOCATION #15 Unit #10 NOT-156

12:46 DOWN LOADED DATA EVENT 10+11

RESTORE DATA LOG; BATTERY  
@ 7.9; DID NOT CHANGE

13:20 TOOK PHOTO #1 OF 1/17/07

13:20 - LOCATION #16 Unit #9; NOT 161

DOWN LOADED DATA EVENT 1

RESTORE DATA LOG; BATTERY  
@ 7.9; DID NOT CHANGE

TOOK PHOTO #2 OF 1/17/07

14:14 - LOCATION 7 - REPLACE BATTERY  
OLD BATTERY @ 6.3 NEW @ 8.2  
VOC = 0

14:22 LOCATION 16; VOC = 0 BATTERY @ 7.8

14:26 LOCATION 15; VOC = 0 BATTERY @ 7.7

14:37 LOCATION 2 VOC = 0 BATTERY @ 7.7

LOCATION 3 VOC = BATTERY @ 7.7

K. England 1/17/07

## Bullitt Co. Train Derailed

1/17/07

R. RAGLAND

1633 E ZII ORCHARD BROOK DR. E

MAIL BOX FILLED SUMA

CANISTER SAMPLE; CANISTER

#NR 0000000019696; RESIDENTIAL

SUBDIVISION, UNDER PLUME

ON TOP RIDGE; PHOTO 3 on 1/17/07

LAT: 38.05902

LONG: -85.75054

*[Signature]*  
1/15/07

## Bullitt Co. Train Derailed

01-17-07

1950

RIDE WITH PINO, ROGER, RYAN TO  
CHECK LOCATIONS

2000

MOVED LOC 15 200 YDS. WEST  
UP HILL FOR

NWY 61

2005

CHECKED ~~LOC 15~~ TURNED TRANS ON

NWY 61

UNIT 10 BAT 7.7

2015

CHECKED LOC 2 UNIT 6

TRANS ON BAT 7.7 VOL 0.0

HALLS LN LDC. NWY 44

2020

DENNIS LN NWY 44

SANDY DRIVE

~~UNIT 3~~ UNIT 3 UNIT 2 LOC 3

TRANS ON BAT 7.6 VOL 0.0

SANDY DRIVE; DENNIS

2045

TURNING TRANS FOR UNIT LOC 16  
ON

2050

FOR UNIT 3 LOC 7 BAT 8.1

TRANS ON BODS OK

BROOKS ROAD LOCATION

LOG OK TRANS OK UNIT 2

2100

LOC 20 BAT 8.1

01-18-07

Piney Fork

01-17-07 BULLH CO TRAIN DETAIL

2115 DEPLOY UNIT 4 LOC 21

AT ROGERS &amp; WIGGLEVILLE RD

ON FENCE POST EAST OF INTERSECTION

ON NORTH SIDE OF ROAD

BAT 8.0 TRANS ON LOG OK

BEGIN LOGGING @ 2115

2122 GO TO CHECK UNIT 5 ON  
BLUE WICK2130 UNIT #5 BAT 7.9 TRANS ON  
FRESH AIR CALIBRATION

LOG OK

2137 CHECK SPOT NEAR TRAIN WRECK  
DOWN WIND FOR RECEPTION OF  
TELEMETRY

2, 4, 5 &amp; 12 WORKING

2145 LOC 8 UNIT 8 BAT 7.7.  
TRANS ON LOG OK  
STALLION WAY OFF CORAL RIDGE RD2151 CHECK REPEATER FOR UNIT 8  
AT YEARLING DRIVE & CULY LN

01-18-07

Phil G. Smith

01-17-07 BULLH CO TRAIN DETAIL

2155 FIND STOP UNITS AT 2155

START UP AGAIN TO RE-SYNC  
UNITS

2210 DINO OFF SITE.

KEVIN ALEXANDER TAKES COMPUTER  
FOR TELEMETRY2215 KYLE RUSSEL CALLS. HE IS MONITORING  
SOUTH SET OF AREA RAES.2230 KEVIN ALEXANDER SETS UP AT  
LOCATION NORTHEAST OF WIRELICK  
SITE. TELEMETRY FOR 2, 4, & 8 UNITS  
IS UP.

#5 IS NOT UP.

2237 KEVIN GOES TO CHECK UNIT #5

2255 UNITS #2, 4, 5, 8 & OCCASIONALLY #3  
TELEMETRY VISIBLE FORCED ON BLUE WICK  
NORTH OF ELECTRIC SUB STATION

2312 UNITS 2, 4, 5, 8 ALL VOC. READ 0.0

2322 UNIT 9 IS NOW DOWNLOADING TELEMETRY

01-18-07  
Phil G. Smith

01-17-07

## Bullitt Co. Train Detail

2330	UNIT	VOC
	2	0.0
	4	0.0
	5	0.0
	8	0.0
	9	0.1

1150 ALARM FOR UNIT #4 O<sub>2</sub> METER  
CHRIS DRAPER ADVISED TO CHECK  
ON REGULAR ROUNDS, UNIT WAS  
NOT READING CORRECTLY, EARLIER  
CO, VOC, H<sub>2</sub>S, LEL ALL READ NORMAL

01-18-07

0050 VOC ON ALL UNITS BELOW 1.0 ppm  
UNITS 2, 4, 5, 8

KEVIN ALEXANDER BEGINS TO CHECK  
NEARBY MONITORING UNITS

0053 CHECK UNIT 5 LOC 14  
TRANS, ON; LOG, OK; VOC, 0.0; BAT 7.8

0104 UNIT #4 LOC 21  
TRANS, ON; LOG, OK; VOC, 0.0; BAT, 7.9;

ALARM ON FOR O<sub>2</sub>

01-18-07

file per copy

01-18-07

## Bullitt Co. Train Detail

0108 UNIT 2 LOC 20 TRANS, ON; LOG, OK;  
VOC, 0.0; BAT, 7.8

0130 MEET CHRIS DRAPER AT COMMAND POST  
(ZONETON FIRE STATION) TO GET 4-GAS  
METER TO VERIFY O<sub>2</sub> ALARM ON UNIT #4  
LOC 21

0150 KEVIN ALEXANDER @ COMMAND POST TO  
MEET WITH CHRIS DRAPER

0240 KYLE AT COMMAND POST

- KYLE; KEVIN OFF TO CHANGE BATTERIES

0310 UNIT #8 LOC TRANS, ON; VOC, 0.0;  
LOG, OK; BAT 7.4

0330 UNIT 11 LOC 18 CHANGE BATTERY  
TRANS, ON; LOG, OK; VOC, 0.0 BAT 7.5

0345 UNIT ~~12~~<sup>7</sup> LOC ~~19~~<sup>2</sup> CHANGE BATTERY  
TRANS, ON; LOG, OK VOC, 0.0 BAT, 8.5

01-18-07  
file per copy

01-18-07

BULLITT CO. TRAIN DERAIL

0405 UNIT 10 LOC 15

TRANS ON; LOG OK; VOC 0.0; BAT 7.4

0415 UNIT 9 LOC 16

TRANS ON; LOG OK; VOC 0.1; BAT 7.4

0435 UNIT 4 LOC 21

TRANS ON; LOG OK; VOC 0.0; BAT 7.7

O<sub>2</sub> ALARM ON O<sub>2</sub> SENSOR SUSPECTEDOFF. COMPARED O<sub>2</sub> READINGS WITH UNITS12. O<sub>2</sub> READINGS 20.0 % O<sub>2</sub>

0440 UNIT 2 LOC 20

TRANS ON; VOC 0.0; BAT 7.7 LOG, OK.

0445 UNIT 5 LOC 14 TRANS, ON; VOC, 0.0; LOG OK;  
BAT 7.7.

0510 LOC 2 UNIT 6 CHANGE BATTERY

BAT, 8.4; TRANS, ON; VOC, 0.2;

LOG, OK

01-18-07  
Paul D. Smith

01-18-07 BULLITT COUNTY TRAIN DERAIL

0525 UNIT 1 LOC 3 BATTERY CHANGED

TRANS, ON; LOG, OK; VOC, 0.0; BAT 8.5

0600 KYLE &amp; KEVIN RETURN TO

COMMAND CENTER.

01-18-07  
Paul D. Smith

Bullitt County Train Derailment Sunny 84°F  
1/18/07 - CUBER TRACKLAND

0655 - @ Location 3; Unit 1; Battery 8.4

OK; NOT REPLACE; DOWNLOAD DATA  
EVENTS \*11 THRU \*24; RESTORE

DATA LOGGING + TURN RADIO ON

0710 - @ Location 2; Unit 6; Battery 8.10

OK; NOT REPLACE; DOWNLOAD DATA  
EVENTS \*1 + \*2; RESTORE DATA

LOGGING + TURN ON RADIO

0729 - @ Location #1 1/2 Unit #9; Unit OFF

EXISTING BATTERY 6.3 REPLACE

BATTERY NEW BATTERY 8.3 DOWN  
LOAD DATA EVENT \*1A THRU \*3;

RESTORED DATA LOGGING + TURN  
RADIO ON

0750 - @ Location 15; Unit 10; Unit OFF

EXISTING BATTERY 6.3; REPLACE

BATTERY; NEW BATTERY 8.3;

DOWNLOAD DATA EVENTS 10A THRU

11A + \*12; RESTORED DATA LOGGING;

TURN ON RADIO

0815 - @ Location 7; Unit 3; CK BATTERY

7.7 8.3 OK; NOT REPLACE; DOWN

LOAD DATA EVENTS \*8 THRU \*12

RESTORED DATA LOGGING; TURN

RADIO ON. *Blund 1/18/07*

1/18/07 Bullitt County Train Derailment  
CUBER TRACKLAND

0957 - @ Location 20; Unit 2; Battery 8.7

OK; NOT REPLACE; ATTEMPT TO DOWNLOAD  
DATA - FAILS; SERIAL CONNECTOR ON

UNIT IS MISSING 2 PINS. CAN NOT  
DOWNLOAD TO P.C. W/ THIS ISSUE

RESTORE DATA LOGGING + TURN ON RADIO

LEL ~~OK~~ 5% CALL TO SHERY WEEDMAN  
TO REPORT DOWNLOAD FAILED +  
LEL ~~OK~~ 5%.

1030 - @ Location 21; Unit 4; Battery 8.7

OK; NOT REPLACE; — DOWNLOAD  
EVENTS 7A, 8A, 9 THRU 31; RESTORED

DATA LOGGING + TURN ON RADIO

EPA DEANO JUST FINISHED REPAIRING

O2 SENSOR; HOWEVER HE SAID THERE

WAS STILL A PROBLEM W/ O2 SENSOR

UNIT FOLDER (4) IS GOING TO THE

SHOP NOW. DEANO IS GOING TO

UNIT 2 TO FRESH AIR CAL. FOR

LEL ISSUE AND WILL ATTEMPT TO

FIX CONNECTOR

1046 LOCATION 20; UNIT 2; EPA DEANO

FRESH AIR CALS UNIT; FIXED PIN

CONNECTOR; DOWNLOAD DATA

EVENTS \*1 THRU 6 RESTORE DATA LOGGING;

TURN ON RADIO. *Blund 1/18/07*

Bullitt County Transducer  
Terra Ireland

1/18/07

1136 @ Location 3; Remove Unit 1  
from service.1146 @ Location 2; Remove Unit 6  
from service.1152 - @ Location 18; Unit 11; Battery  
@ 7.1; Replace Battery, New 7.5  
Battery @ 7.5; Download Data  
Events #1 thru #4; Restore Data  
Logging; Turn on Radio.1224 - @ Location 17; Unit 14; Existing  
Battery @ 7.1 Replace Battery;  
New Battery @ 7.6 Download  
Data Events #1 & #2; Restore  
Data Logging; Turn on Radio.1246 - @ Location 19; Unit 12; Existing  
Battery @ 7.1; Replace Battery New  
Battery @ 7.8; Download Data  
Events #1 thru #6 Restore Data  
Logging; Turn on Radio.1334 Location 9A; Unit 7; Battery @ 7.9  
Battery or Not replace; Download  
Data Events #9 thru #11; Restore  
Data Logging; Turn on Radio.

1350 Ireland calls DENNO (EPA)

AND VERIFIES NO AREA REPEAT  
LOCATION 9. 2/2/07 1/18/07Bullitt County Transducer  
Terra Ireland

1/18/07

1454 @ Location 8; Unit 8; Battery @ 8.3  
or Not replace; Download Data Events  
33 thru 41; Restore Data Logging;  
Turn Radio on.1508 - @ Location 14 Unit 5; Battery @ 6.8  
Replace Battery; New Battery @  
Downloaded Data Events #1 thru #3;  
Restore Data Logging; Turn on Radio.1631 - @ Camp Post Fire Station Front  
Door Data RAM 39.5 mg/m<sup>3</sup>  
@ Camp Post Fire Station Entry  
Pole Data RAM 42.3 mg/m<sup>3</sup>  
" MULTIRATE VOL = 0O<sub>2</sub> = 20.9

LEL = 0

CO = 0

Cl<sub>2</sub> = 0START A LOOP TO REMOVE AREA RE  
TIME UNIT REMOVE - ~~ATT~~ Location

17:15 Unit 12 19

17:18 Unit 14 17

17:20 Unit 7 9a

17:25 Unit 11 18

17:35 Unit 10 15

17:45 Unit 9 16

2 1/18/07

1/19/7 Bullitt County Train Wreck  
R. B. Bynner

1020 - # NR 76978 Smith's Corners  
collecting at South end of Middlesboro  
at driveway nearest tracks  
GPS N 38.04954 / W 85.70978  
- No plume visible in area  
Resident is J.G. White @ 370  
Middlesboro. Sample collected on  
right of way. owner resident  
1045 Roger Ragland & Gina  
Bynner at meeting with  
EPA, ARCADIS, STELL CONSULT  
and CSX

DEP	WPI	CSX
- Todd Giles	Harold Hunt	Paul Kurzanek
- Joe Ray	Vinny Monks	
- Mac Cann	Pengap Song	
- Skip Castleman	John Ralston	
- Rob Blair	Dale Hall	

CTEL

Mike Fenster

ARCADIS

Todd Cheltre 317-409-6798

~~Penns Bousert?~~

Penns Balcer 014-778-9771

1/19/7 Bullitt County Train Wreck

1900 photo of vac truck removing  
wash water from ditch next  
to Huber Station Road & tracks (S)  
- 2 more pictures of ditch after  
vacuuming (N). rail equipment  
leveling / checking new track  
1600 Start meeting w/ John Floyd,  
Sherry Woodman, Gina Bynner  
and Roger Ragland - Floyd  
briefed on actions to date  
1800 Meeting w/ Todd Giles & Mac Cann of DEP  
to discuss sampling plans for  
background / impact stream samples  
- Roger Ragland, John Floyd, Sherry Woodman,  
Gina Bynner  
1830 Bynner & Ragland off site

~~R. B. Bynner~~  
1/19/7

1/20/7 Bullitt County Train Wreck  
 415 STARTS Berger, Ragland, and  
 Floyd on site

730 packing sampling equipment  
 830 line down at railroad track  
 near Gorman tent. have to go  
 around to access sampling point

845 Arrive at "Background" location

850 (A) photo - upstream w/ tracks  
 in background (NW)

(A) photo - downstream (SE) to  
 culvert

GPS - N 38.03994  
 W 085.70884

Air Temperature =  $-1^{\circ}\text{C}$

H<sub>2</sub>O Temperature =  $5^{\circ}\text{C}$

Conductivity =  $480\ \mu\text{S}$

Dissolved Oxygen =  $11.4\ \text{ppm}$

Nitrate =  $0.375\ \text{ppm (NO}_3\text{H)}$

pH = 6.5

N-Ni<sub>3</sub> (Nitrate Nitrogen) =  $0.375$   
 conversion factor  $\times 4.4$

$0.375 \times 4.4 = 1.76$

Samples collected - Background

SAMPLES: collected @ 0930

SS W

1/20/7 Bullitt County Train Wreck  
 1000 Return Background Samples  
 to CST for analysis

1040 (1) Overview pic to looking upstream  
 at bridge east of Preston, unnamed  
 road over Blue Lick Creek

(2) Overview photo looking downstream  
 (SW) toward beaver dams  
 under flow dams - Bullitt train wreck  
 using LAC truck - good jobber  
 skimming waste and pumping  
 it to truck. Series of beaver  
 dams out in stream

Sample location - Blue Lick

N 38.02312

W 085.09325

Air Temp =  $6^{\circ}\text{C}$

H<sub>2</sub>O Temp =  $5^{\circ}\text{C}$

Conductivity =  $410\ \mu\text{S}$

Dissolved O<sub>2</sub> =  $9.4\ \text{ppm}$

N-Ni<sub>3</sub> (Nitrate Nitrogen) =  $0.25\ \text{ppm}$

$0.25 \times \text{conversion factor } 4.4 = 1.1\ \text{ppm}$   
 Nitrate (NO<sub>3</sub>)

pH = 7.5

Samples collected @ 11:15

(3) PHOTO - Looking upstream from bridge  
 into creek

SS W

1/20/07 Bullitt County Train Wreck

11:51 Matt Johnson of Arcadis wants to split samples - will return w/ bottles

11:48 PHOTO FROM BRIDGE FACING SOUTH  
LOOKING INTO CREEK AT 600-  
GOBBLER

11:55 SAMPLED COLLECTED AT UNNAMED  
ROAD OF PROTON HWY AT  
BRIDGE OVER CLEAR CREEK BRIDGE  
CROSSING - BELOW BOOMS  
LAT/LONG SAME AS ABOVE  
AIR TEMP = 8°C  
H<sub>2</sub>O TEMP = +6°C  
CONDUCTIVITY = 420 μS  
DISSOLVED O<sub>2</sub> = 9.2 ppm  
N-NH<sub>3</sub> (Nitrate Nitrogen) = 0.375 ppm  
NITRATE (NO<sub>3</sub>) =  $\frac{0.375 \text{ ppm}}{2.14} = 1.75 \text{ ppm}$   
pH = 7.5

12:30 Break for lunch

13:15 To command post to get gear for  
next sampling point

14:00 Meeting w/ Tom Floyd

14:50 Arrive at sampling pt dup  
South of train wreck - #1 at  
corner of 2673 and 1020

1/20/07

photo #1 (N) view of booms in unnamed  
tributary - upstream

photo #2 (S) last boom before tributary goes  
into culvert; enters Clear Run  
Sample collected downstream of last  
boom before culvert

N 38.0313  
W -85.70867

Air T = 11°C

H<sub>2</sub>O T = 8°C

conductivity = 570 μS

Dissolved O<sub>2</sub> = 6.1

Nitrate-Nitrogen (N-NH<sub>3</sub>) = 0.25  
conversion factor 4.4

Nitrate (ppm) (NO<sub>3</sub>) = 1.1

pH 7.5

\*photo → N on 1020 showing heavy  
equipment scraping stream bed and  
filling in with rock ballast

\*photo → crews working on other side  
of culvert pulling var hoses;

-made booms on other side of culvert  
photo (NE) burned vegetation in  
stream channel

55 W 1

1/24/07 BULLITT CO. TRAIN DERAILMENT

## FIELD TEST METHODS:

DISSOLVED O<sub>2</sub> - Winkler Titration

Method w/ a LAMOTTE DISSOLVED

O<sub>2</sub> KIT

NITRATE - LA MOTTE - NITRATE TEST KIT

PH - LA MOTTE - WIDE RANGE

Indicator Field Kit (Polymerex)

Conductivity - ECTESTR Low 0 to 1990  $\mu$ S

1/24/07  
G. A. Bergman

1/21/7 Meeting at Command Post

ARCADIS - Joe Frederick Dayne

- Dennis Balcer (614) 778-9171

- Joe Quinnan (614) 778-9171

CTEN - Randall Woodlee (615) 210-1270

- John Condon? John Kine

- Jay Gandy

KY DEP - Todd Giles

- Mac Cann

EPA - Art Smith

EPA ETO - John Gilbert

TE - Gina Bergner

John Floyd

Anna Purvis

CSX - Paul Kur Zanski (904) 923-5013

S S W

Surface Water Response → Arcadis lead

Subcontractors { - Summit Environmental

- RJ Corman

- SWS

- Huicher

- Pettit

CTEN supporting sampling &amp; hazmat issues

S S W

1/21/7

Meeting w/ ALL PARTIES

~~Oversight of Aquatic Environmental Investigation -~~~~Tuesday/Wednesday~~~~MEK — to Salt River~~~~— Springs feeding to Clear Run,  
but possibly overflow~~~~PRBumpers 1/21/7~~

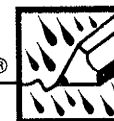
# CONTENTS

PAGE

REFERENCE

DATE

"Rite in the Rain"  
ALL-WEATHER WRITING PAPER



## ALL-WEATHER HORIZONTAL LINE BOOK

Name BULLITT CO.  
TRAIN DEPARTMENT  
 Address TETRA TECH  
2000 Warrington Way, Suite 245  
 Phone 502-568-6688  
 Project TTEMI-05-01-0030

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

Page Pattern		Cover Options	
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
Lined	Lined	Item No. 390N	Item No. 390NF

1/27/07

40°

0800 - Spiking onsite continuing to manage database & prepare maps/figures for EPA and public meeting to be held on Wednesday.

0900 - Weedman onsite to assist EPA in preparation for public meeting and ongoing field operations.

1000 - CTEH, Kind, onsite at EPA command center to discuss what CTEH can provide for public meeting.

- see later notes today for list compiled for meeting needs

1135 - Rhame and Weedman at wreck site to document today's activities.

- Walk area to locate test pit areas.

- Test pit areas in residential area and on the southeast side of the track, and pits have been filled in.

Sy W  
1/27/07

1/27/07

40° 3

- Cyclohexane transfer taking place today

- Walk to Wigglesville Rd., South of wreck site to observe drainage issue a resident, Bud White, has with CSX. ~~He~~ Mr. White claims that CSX ~~either~~ conducted cutting operations on the border of his property and the rail property, and did not clear the debris.

The debris blocked flow of surface water runoff and flooded his hay fields, which caused the field (~17 acres) to not produce hay. START/EPA visually observed this area, and confirmed that area ~~that~~ contained debris that may have caused flooding on his property.

\*Note this event does not have any connection w/ wreck or contamination from the wreck.

Sy W  
1/27/07

1/27/07

40°

- 1330 - EPA/START off site and travel back to convention center
- EPA/START continue to prepare for Public Meeting
- 1730 - Command meeting
  - Cyclohexane transfer completed today
  - CSX still waiting for information from malrec anhydride manufacturer regarding whether or not manufacturer can take the product back
  - Ecological data has been received by CSX, but is only preliminary data
  - CSX will offer state police to supervise cleaning operations to ensure property is secure
  - EPA carbonaro reviews needs/ plans for Public meeting.

1/27/07

1/27/07

2800-

2930-

- 1400 - Weedman & Rhame begin walking unnamed tributary to observe contamination, dead organisms, and live organisms.
- Rhame observes dead worms and bugs just downstream of culvert at wreck site in tributary
- Dead minnow retrieved by Rhame @ SWCR-DN-UT, at confluence of tributary and clear run. Photo taken

1/27/07

SW  
1/28/07

1/28/07

15°<sup>7</sup>

1730 - Command meeting

- continuing air monitoring (24hr) at the site
- Pet management team continuing to work with home owners to maintain pet care
- Booms in two locations remain. CSX reports that very little sheen / product is observed at boom locations. Vac truck on standby to vac sheen / product. CSX also reports that sheen is not observed breaching the booms.
- CSX will have someone address goopy product EPA / START observed on Clear Run just north of I 65.
- Sifting operations continue on site
- Continuing sampling work plan activities.
- Installed 4 of 6 outer casings for bedrock wells

Sy W

1/28/07

<sup>8</sup> 1/28/07

15°

- 19 access agreements obtained in area of concern, leaving only 2 more to obtain.
- 47 truck loads residential soil offsite as non-hazardous
- met with health dept. concerning leach fields in residential area tomorrow
- Belfor house cleaning has begun, and county and state police continue to maintain security at the site.
- CSX will rescape east side of ditch line of track at site and line with rock. KDEP, Giles noticed that staining existed in this area
- Reline pipe
- Review figures for Public Meeting
- EPA/CSX review first draft and discuss area of concern and improvements for maps

1/28/07

1/28/07

<sup>9</sup> 10°

- Arcadis plans to have draft final figures ready for last review Tuesday afternoon.
- Final figures will be completed Tuesday evening.
- 1900 - Meeting ends.
- 1930 - START PEPA offsite

~~5  
1/28/07~~

1/28/07  
SHW

1/28/07  
SHW

1/29/07

200

~~1700~~

1730 - Command Meeting

- CSX deployed teams to clean stringy, peanut butter contamination at @ in creek on algae and foliage just north of I65 in
- Sifting operations are complete
- Bedrock well installation continued
- CSX will not be conducting onsite treatment. All waste will be hauled offsite for disposal.

1100 - START offsite

- EPA offsite to evacuated resident meeting at Zoned Five District.

S  
1/29/07

1/30/07

200

0800 - START/ERT onsite

0900 Weedman & Carbonaro depart to North Bullitt High School to conduct preparation activities for public meeting.

1000 - Conference Call concerning Public Health. On the call:

Marj Ann	- BCHD
Bob Satay	- ATS OR
Dr. Gandhi (Jay)	- CTEH
Ruddie Clark/Son	- Arcadis
	- Arcadis
Scott Rice	- Senior ER coordinator OX
Ken Rhame	- EPA
Sherry Carbonaro	- EPA
Sherry Weedman	- START
Gary	- CSX (PR)
Lori B	- PR hire

S  
1/30/07

1/30/07

200

- Discuss readings for air, water, soil, etc.
- Mary Ann, BCHD will discuss that ATSDR & BCHD agree that there is no concern for short term or long term health effects in the public meeting on 1/31/07
- discuss community advisory planned panel that CSX plans to put in place from this point forward.
- discuss using the zone for fire web page & EPA web page for information going forward, including results from laboratory.
- 1100 - Call is over
- 1500 - OSC Smith on site to discuss public meeting preparations and activities on site and progress.

5 3  
1/30/07

200

1/30/07

ACTIONLEVELSAirCL<sub>2</sub> =

1,3-butadiene = 670 ppm, ATSDR = 100 ppm

(50)

2002  
KVPRE'S

Human Health for soil &amp; drinking water

(50)

Sediment levels from KDEP  
will be discussed w/ Arcadis by  
Request of Arcadis

(50)

PM = 0.254

5 3  
1/30/07

16  
1/30/07

20°

- 1700- Command meeting
- Safety stand down this morning because of two vehicle accidents. One accident was onsite and involved unsecure signal line. The other occurred offsite and involved subcontractor vehicle and civilian van.
  - Safety will continue to be stressed throughout the remainder of activities
  - Continuing to inspect booms (2)
  - Continue to clean homes
  - Air monitoring at the site continues
  - NTSB relieves CSX from mandatory soil sifting
  - 1020 ~~is~~ is scheduled to ~~open~~ reopen tomorrow pending inspection.
- CSX will have a 10 ft fence surrounding ~~all~~ the work area east of 1020 to prevent civilian access in CSX work area there.
- CSX requested to transportation

1/30/07

20° 17

- to have a speed limit of 10 mph while construction activities are being conducted.
- One bedrock well of six is complete
  - Track flagman will be onsite through weekend.
  - Geoprobings was conducted north of Huber station & on the west side of track in ditchline
  - \* EPA recommends to have KDEP, local health dept., and EPA review letters CSX is submitting to residents prior to releasing any more to residents.
  - \* EPA requests analytical from material extracted from French drain sumps.
- 1730- meeting transfers to public meeting preparation meeting
- 1819- meeting ends
- 1830- START / EPA offsite

~~S 2 W~~  
~~1/30/07~~

1/31/07

200

0800 - EPA/START onsite

- START Summer preparing figures for public meeting & working w/ CTEH in the preparation of the figures

1230 - START Weedman & KDEP Gies depart convention center to conduct documentation of bedrock well installation.

- Co wells total will be installed in the vicinity of the derailment.

- BMW-01 and BMW-04 installation complete. Wells are each 100' in depth

- Today, according to Arcadis, activities will be conducted at location BMW-02 and BMW-06.

- START/KDEP do not see any activities regarding Bedrock well installation occurring.

Grew may be at lunch.

- ~~X~~ START locate driller at location BMW-05

1/31/07

1/31/07

200

- Casing being installed at BMW-05
- START/KDEP observe the creek west of the railroad where booms and pads are in place to collect material. Very small amount of tan scum type of material observed

- EPA Rhame onsite to observe the creek as well.

- START/EPA/KDEP observe excavation activities being conducted for water line installation

1350 - START/EPA/KDEP offsite

~~1/31/07~~

2/1/07

25°

★ NOTE ★ see John Floyd's  
log book for site activities  
2/1/07 - 2/2/07.

S

2/1/07

W

2/6/07

25°

1345- START Weedman  
onsite to document  
activities.

- met w/ Hadley Stamm  
(Arcadis) to review  
activities for the day
- Hadley reports that  
french drain is being  
extended on both sides  
of rail road in ditchline  
for product recovery
- ~~Fluoride / conductivity~~ (SW)  
Velocity testing is being conducted  
on bedrock well #4 & #5  
today
- Geoprobe of soil in  
the immediate area of  
residences being conducted
- Private well sampling  
continuing to be conducted  
as residents call in the  
request. To date results (SW)
- Surface water sampling  
continues.

2/6/07

S W W

2/6/07

- Met with Kevin Wilson (Arcadis) <sup>25°</sup> who is in charge of bedrock well activities. He gave me the field contact, Chris Wilson to speak to if there are any questions on site.

- Hadley reports that the Malaisic Anhydride cars are in preparation for transfer, but it will probably be 3-4 days from today.

1444- START Weedman arrives at Bedrock Well #5 to document activities.

- Met with Ian from Fluor at Albuquerque, NM.

- Ian explained that the velocity testing will be conducted on Well #5 today, and has already been conducted on 3 other wells.

- The velocity testing is a geophysical study to determine the areas and depths that water flow is occurring subsurface.

SUN 2/6/07

2/6/07

20°

- Photos taken of velocity testing setup.

1545- START Weedman offsite

~~2/6/07~~

2/8/07

25°

1030 - START Weedman, ERT Lam, EPA ERT Gilbert on site to meet w/ Tyron (Arcadis)

- ERT requests parcel data
- Arcadis is also going to update the parcel information for information they submit for input to SCRIBE. Related samples to parcels
- ERT requests PDF's of maps created for public meeting
- Figures depicting residential well and surface water sampling and trends requested.

- ERT tells Arcadis that he will send the EPA ERT database ~~to~~ to Arcadis when it is complete for information purposes.

1110 - Arcadis begins downloading information (parcel & PDF maps) to EPA external hard drive

1130 - START Weedman, EPA, ERT off site

*Sydney*  
2/8/07

2/13/7

34° RAINING STADILY

0815 TL START Berger on site at default ment area. Two maleic anhydride cars emptied at 1 am; crews continue cleanup operations. Dave Stawson of CSK indicates that the only unknown haz waste was the maleic anhydride and he is waiting for confirmation of cleanup/purging activities. Other cars staged in fenced area, including one w/ spilled slashcizer (the peanut butter-looking stuff)

\* Pictures listed on following page - Documentation of car remediation yard

- CTEK conducting air monitoring at edge of hotzone

1000 Ongoing residential work on east side of tracks including scraping yards and regrading lots (pictures listed next page)

1030 photos of unnamed tributary of RR Culvert down stream of derailment. Workers skimming off floating material behind berm; that clarity good despite bare ground upstream and steady rain

## 2/13/7 PHOTOLOG syn

1. West - Shutter, rolloff, berms, fencing in SW corner of car yard
  2. East - truck entrance to car yard from 1020
  3. NE - (x4) maleic anhydride cars
  4. E - Workers on top of " "
  5. W - " " " " " "
  6. W - Cylinders staged next to MA cars
  7. N - Tank cars empty & ready for scrap
  8. E - Rolloff boxes of mishaz materials emptied from tank cars
  9. E - Empty scrap cars
  10. E - " " " " w/ rolloff boxes
  11. N - Scrap cars - empty (x2)
  12. NE - fence line, soil mounded into berms w/ plastic sheeting, and empty scrap car
  13. SE - Overview of car yard
  14. W - Vac pipe extending from fill hole in empty tank car (x2)
  15. W - Overview of car yard
  16. S - fence line along 1020 w/ berm of cars and gravel road way for access
  17. W - Plasterer spilled from tank car
  18. NE - Residential neighborhood / scrap
  19. E - " " " "
  20. SE - " " " "
- (east of 1020 & the RR tracks)

## 2/13/7 PHOTOLOG

- 21 - N - Crushed gravel placed in unnamed tributary
- 22 - N - Overview of berms in trib
- 23 - S - Workers skimming floaters from upstream end of berms in trib
- 24 - S - Burned stream banks - looking downstream to RR culvert
- 25 - SE - Culvert & berms - water cloudy good despite rain & bare gravel upstream
- 26 - N - Up stream from culvert
- 27 - SE - Up stream view of Blue Lick at private road bridge off Preston - yellow berm is only thing remaining from earlier absorbent booms & googobblers

RR Berms 2/13/7

2/13/7

38° Raining steadily

11:40 Met w/ Hadley Strawn - prominent activities happening today have been documented, except for water sampling requested by KDEP as a result of overnight rains; ground water OKC investigation being planned; water sampling & seep sampling may continue w/ rain

11:40 Photo of Blue Lick at Preston from private road-bridge; yellow surface boom remaining left no more gophers; water is high & turbid; boom appears to be collecting only driftwood & trash

12:10 Spoke w/ Randall Woodie about site activities

12:20 Spoke w/ Sherry Weidman to give her an update on progress of activities

12:30 TE of site & will return & vehicle to gauge; plan to return on Thursday to document Groundwater investigations

~~RN Bergman 2/13/7~~

**APPENDIX D**  
**PHOTOGRAPHIC LOG**

(24 Pages)



**OFFICIAL PHOTOGRAPH NO. 1**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Command Post at the Louisville Gas & Electric substation on East Blue Lick Road		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	16 January 2007
<b>Orientation:</b>	North	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	U.S. Coast Guard (USCG)	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 2**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	View of burning railcars, from KY Route 1020		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	16 January 2007
<b>Orientation:</b>	East	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Roger Ragland, Tetra Tech	<b>Witness:</b>	Ryan Engelbrecht, Tetra Tech





**OFFICIAL PHOTOGRAPH NO. 3**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	View of fire-fighting efforts at burning railcars, from Huber Station Road		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	16 January 2007
<b>Orientation:</b>	South	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	USCG	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 4**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**Description:** View of burning rail cars and deformed railroad track, from KY Route 1020

**Location:** Bullitt County Train Derailment

**Date:** 16 January 2007

**Orientation:** South

**TDD No.:** TTEMI-05-001-0030

**Photographer:** Hank Cox, CSX

**Witness:** Unknown





**OFFICIAL PHOTOGRAPH NO. 5**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Heavy smoke from the burning rail cars surrounds fire fighters near KY Route 1020		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	17 January 2007
<b>Orientation:</b>	South	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	HEPACO	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 6**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	View from KY Route 1020 of the controlled burn and flaring of the first railcar containing butadiene		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	17 January 2007
<b>Orientation:</b>	Southwest	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	HEPACO	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 7**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Fire fighters apply water to smoldering rail cars near KY Route 1020		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	18 January 2007
<b>Orientation:</b>	Southeast	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Regina Bergner, Tetra Tech	<b>Witness:</b>	Randy Mayer, Tetra Tech





**OFFICIAL PHOTOGRAPH NO. 8**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	View from Huber Station Road of the controlled burn and flaring of the second rail car containing butadiene		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	18 January 2007
<b>Orientation:</b>	Southwest	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Regina Bergner, Tetra Tech	<b>Witness:</b>	Randy Mayer, Tetra Tech





**OFFICIAL PHOTOGRAPH NO. 9**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Aerial view of the controlled burn site and railcar scrap operations west of KY Route 1020		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	18 January 2007
<b>Orientation:</b>	North	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Unknown	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 10**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Aerial view of the railroad tracks and construction operations adjacent to the staging area		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	19 January 2007
<b>Orientation:</b>	North	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Unknown	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 11**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Retention dam and booms along KY Route 1020 south of the derailment		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	19 January 2007
<b>Orientation:</b>	South	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	USCG	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 12**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Air sampling location along Huber Station Road adjacent to the derailment		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	19 January 2007
<b>Orientation:</b>	East	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	USCG	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 13**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Tank car flaring operations in the staging area west of the derailment		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	19 January 2007
<b>Orientation:</b>	Southwest	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	USCG	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 14**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	CSX uses a leveling car to replace and align tracks deformed during the derailment		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	19 January 2007
<b>Orientation:</b>	Northwest	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Regina Bergner, Tetra Tech	<b>Witness:</b>	Randy Mayer, Tetra Tech





**OFFICIAL PHOTOGRAPH NO. 15**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Boom and skimming operations to remove floating polymerized material and immiscible liquids in Blue Lick Creek south of the bridge on Blue Lick Creek Road		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	20 January 2007
<b>Orientation:</b>	South	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Regina Bergner, Tetra Tech	<b>Witness:</b>	Roger Ragland, Tetra Tech





**OFFICIAL PHOTOGRAPH NO. 16**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**Description:** Vacuum truck operations in the ditch line east of the derailment area along Huber Station Road

**Location:** Bullitt County Train Derailment

**Date:** 20 January 2007

**Orientation:** North

**TDD No.:** TTEMI-05-001-0030

**Photographer:** USCG

**Witness:** Unknown





**OFFICIAL PHOTOGRAPH NO. 17**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**Description:** Crane operations moving tank cars from the derailment

**Location:** Bullitt County Train Derailment

**Date:** 20 January 2007

**Orientation:** West

**TDD No.:** TTEMI-05-001-0030

**Photographer:** USCG

**Witness:** Unknown





**OFFICIAL PHOTOGRAPH NO. 18**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**Description:** Worker examining the inside of one of the tank cars from the derailment.

**Location:** Bullitt County Train Derailment

**Date:** 20 January 2007

**Orientation:** West

**TDD No.:** TTEMI-05-001-0030

**Photographer:** USCG

**Witness:** Unknown





**OFFICIAL PHOTOGRAPH NO. 19**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**Description:** START collects a background water sample from Clear Run Creek where it crosses East Blue Lick Road north of the derailment

**Location:** Bullitt County Train Derailment

**Date:** 20 January 2007

**Orientation:** Northeast

**TDD No.:** TTEMI-05-001-0030

**Photographer:** Roger Ragland, Tetra Tech

**Witness:** Regina Bergner, Tetra Tech





**OFFICIAL PHOTOGRAPH NO. 20**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Replaced track and soil venting system in the derailment area.		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	25 January 2007
<b>Orientation:</b>	Southeast	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Sherry Weedman, Tetra Tech	<b>Witness:</b>	Ken Rhame, EPA





**OFFICIAL PHOTOGRAPH NO. 21**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Boom in the ditch line west and south of the derailment along KY Route 1020.		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	25 January 2007
<b>Orientation:</b>	Northwest	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Sherry Weedman, Tetra Tech	<b>Witness:</b>	Ken Rhame, EPA





**OFFICIAL PHOTOGRAPH NO. 22**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Tanker transfer operations in the staging area for rail cars removed from the derailment site		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	12 February 2007
<b>Orientation:</b>	West	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	USCG	<b>Witness:</b>	Unknown





**OFFICIAL PHOTOGRAPH NO. 23**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Vacuum truck operations in the unnamed creek located south of the derailment. View shows the ditch line located west and south of the derailment along KY Route 1020.		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	13 February 2007
<b>Orientation:</b>	North	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Regina Bergner, Tetra Tech	<b>Witness:</b>	None





**OFFICIAL PHOTOGRAPH NO. 24**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>Description:</b>	Booms in the unnamed creek located south of the derailment, just south of the ditch line located west and south of the derailment along KY Route 1020		
<b>Location:</b>	Bullitt County Train Derailment	<b>Date:</b>	13 February 2007
<b>Orientation:</b>	South	<b>TDD No.:</b>	TTEMI-05-001-0030
<b>Photographer:</b>	Regina Bergner, Tetra Tech	<b>Witness:</b>	None



**APPENDIX E**  
**TABLE OF WITNESSES**

(3 Pages)

**TABLE OF WITNESSES**  
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**CONTINUED**  
**TABLE OF WITNESSES**  
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**SHEPHERDSVILLE, BULLITT COUNTY, KENTUCKY**

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**CONTINUED**  
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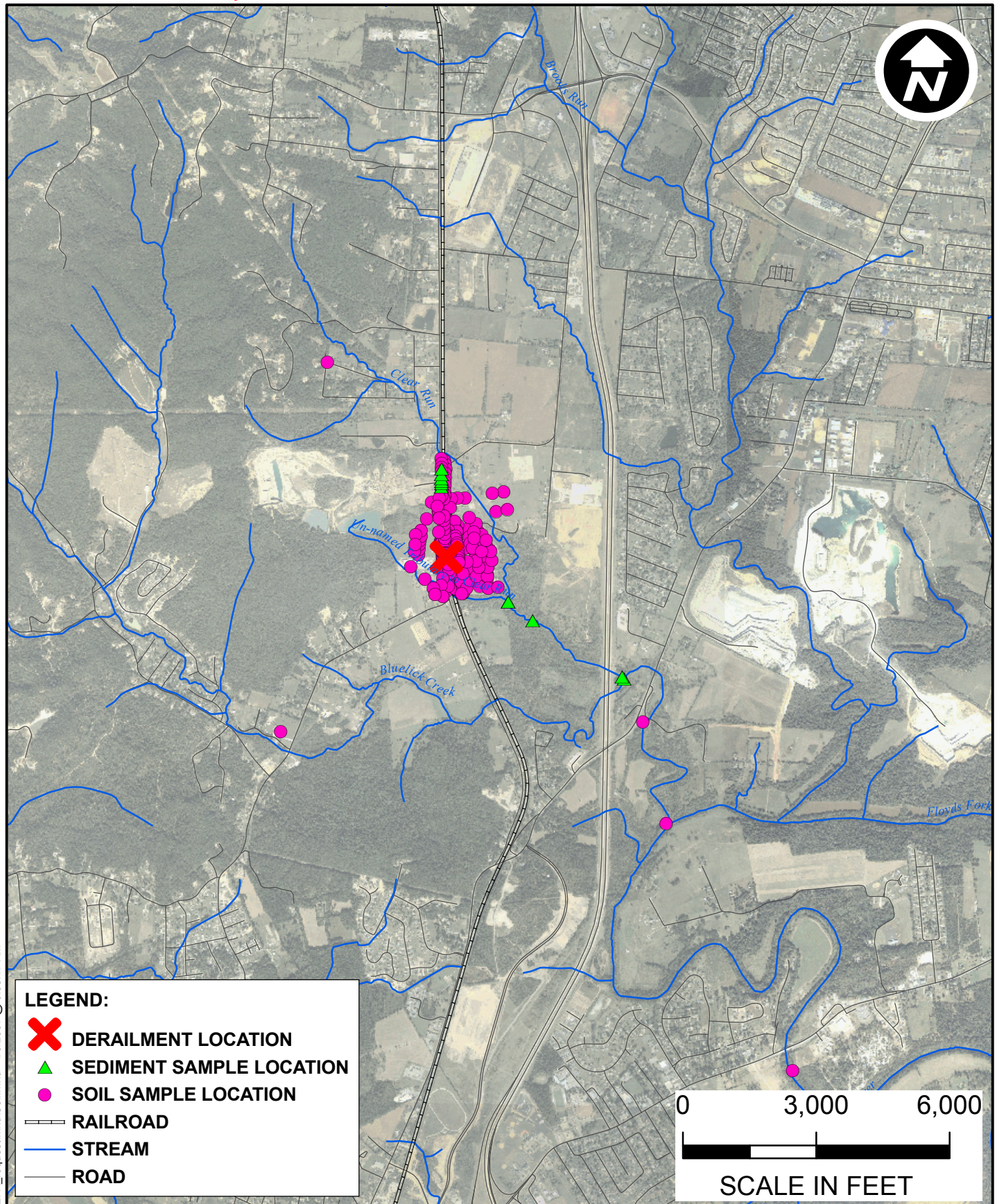
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(904) 359-3101

**APPENDIX F**  
**SCRIBE DATABASE**

(1 compact disc, provided under separate cover)

**ATTACHMENT 1**  
**ARCADIS SAMPLE LOCATION MAPS**

(4 Pages)


 Q:\CSX\Derailment\_Brooks\USEPA\_request\mxd\Soil.mxd - 4/3/2007 @ 9:55:17 AM  
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Area Manager J. REID
Project Director T. RUBIS
Task Manager B. RUST
Technical Review Technical Review
Drawn By K. WOOD


 CSX TRANSPORTATION, INC  
 CSXT #R028270

## SOIL AND SEDIMENT SAMPLE LOCATIONS

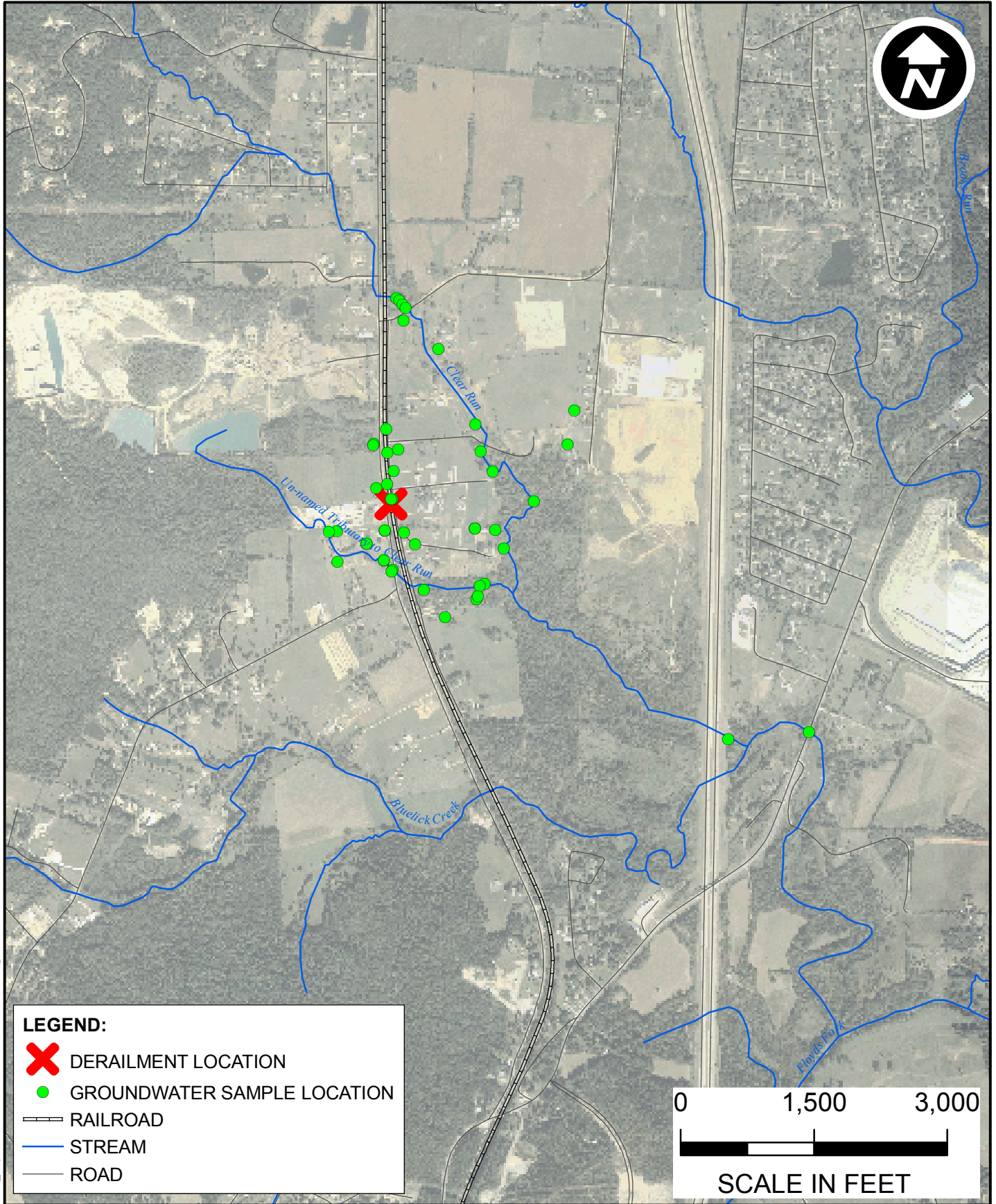
 DERAILMENT 1-16-07  
 BROOKS, KENTUCKY

 Project Number  
 OH000990.01.CGL1

 Date  
 02-APRIL-07

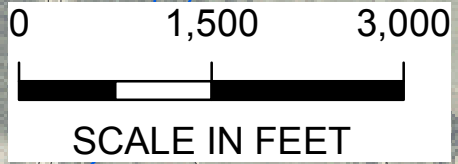
Figure Number

# NA



**LEGEND:**

- DERAILMENT LOCATION
- GROUNDWATER SAMPLE LOCATION
- RAILROAD
- STREAM
- ROAD



Q:\CSX\Derailment\_Brooks\USEPA\_request\mxd\Groundwater.mxd - 4/2/2007 @ 4:49:17 PM

Area Manager	J. REID
Project Director	T. RUBIS
Task Manager	B. RUST
Technical Review	Technical Review
Drawn By	K. WOOD

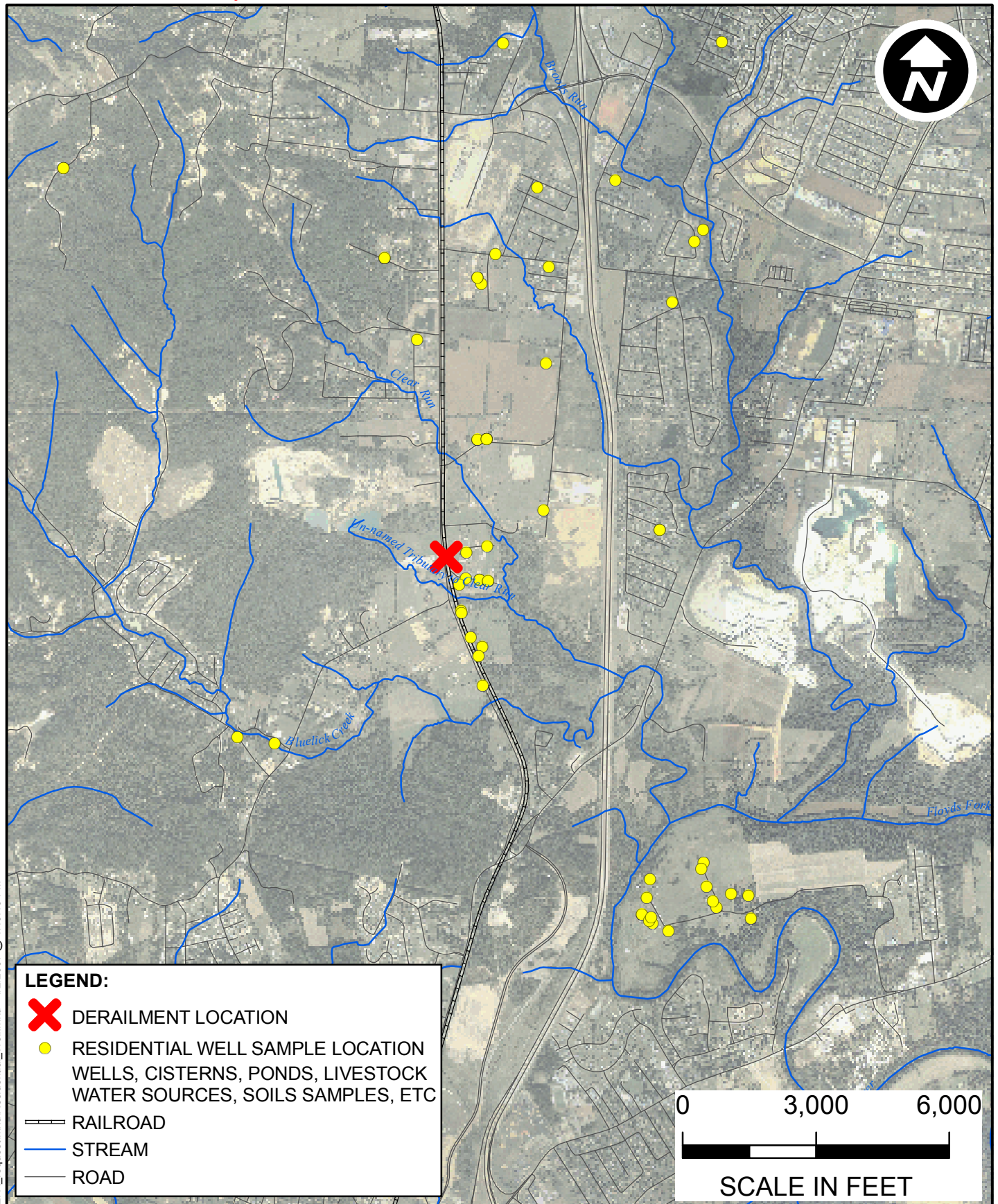


CSX TRANSPORTATION, INC  
CSXT #R028270

**GROUNDWATER SAMPLE LOCATIONS**

DERAILMENT 1-16-07  
BROOKS, KENTUCKY

Project Number	OH000990.01.CGL1
Date	02-APRIL-07
Figure Number	NA



Q:\CSX\Derailment\_Brooks\USEPA\_request\mxd\Residential\_Well.mxd - 4/2/2007 @ 4:49:46 PM

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Area Manager J. REID
Project Director T. RUBIS
Task Manager B. RUST
Technical Review Technical Review
Drawn By K. WOOD



CSX TRANSPORTATION, INC  
CSXT #R028270

## RESIDENTIAL SAMPLE LOCATIONS

DERAILMENT 1-16-07  
BROOKS, KENTUCKY






Project Number  
OH000990.01.CGL1

Date  
02-APRIL-07


Figure Number

**NA**

**LEGEND:**

-  DERAILMENT LOCATION
-  SURFACE WATER SAMPLE LOCATION
-  RAILROAD
-  STREAM
-  ROAD

0 1,500 3,000



**SCALE IN FEET**

Q:\CSX\Derailment\_Brooks\USEPA\_request\mxd\Surface\_Water.mxd - 4/2/2007 @ 4:59:00 PM

Area Manager  
J. REID  
Project Director  
T. RUBIS  
Task Manager  
B. RUST  
Technical Review  
Technical Review  
Drawn By  
K. WOOD



CSX TRANSPORTATION, INC  
CSXT #R028270

## **SURFACE WATER SAMPLE LOCATIONS**

DERAILMENT 1-16-07  
BROOKS, KENTUCKY

Project Number  
OH000990.01.CGL1

Date  
02-APRIL-07

Figure Number

**NA**

**ATTACHMENT 2**  
**ASPECT SORTIE DATA EVALUATION REPORT**

(3 Pages)

**ASPECT Sortie Data Evaluation**  
**15 January 2007**  
**With technical revisions**

The purpose of ASPECT sortie conducted on 15 January 2007 was to collect airborne chemical data in the vicinity of the CSX railcar derailment and fire near Brooks, KY. Several airborne data runs were conducted with subsequent data analysis. This assessment is conducted to generate a broad view of the situation and provide further input into how the overall response action should be conducted.

The ASPECT aircraft is an EPA asset which provides chemical information for emergency responses and rapid needs assessment (RNA) activities. For the RNA process ASPECT produces three data products including aerial photographs, infrared (IR) imagery, and information on chemical detections. Aerial photographs are collected to provide the RNA with visible situational data. Damage, fires, petroleum discharges, and other similar events can be documented and assessed from these photographs. Each photograph is linked to the geographical position of collection. IR imagery provides data concerning the radiance (thermal signature) of the scene. Many compounds have a signature in the IR spectrum and plumes of these compounds can be imaged and mapped. Chemical information is collected using an IR spectrometer and permits many compounds to be identified. Air IR imagery provides the RNA with chemical situational data which can be forwarded to response personnel.

Chemical Detections and Qualitative Risk Assessment

Chemicals detected during the 15 January 2007 sortie include 1,3-butadiene and maleic anhydride. Toxicological characteristics of these chemicals are provided below:

**1, 3-Butadiene (CAS#106-99-0)**

**Concentrations detected based on extrapolation for likely plume thickness: 0-0.1 ppm**

Produces irritating vapors and may be a CNS depressant.

Likely routes of exposure include inhalation or dermal contact.

Effects of short-term exposures include irritation to the eyes and the respiratory tract. Rapid evaporation of the liquid may cause frostbite. 1, 3-Butadiene may cause effects on the central nervous system, including a loss of consciousness (narcosis).

Effects of long term exposure, through inhalation or dermal contact, may be carcinogenic to humans and may be associated with the development of leukemia.

OSHA PEL: 1.0 ppm (2.21 mg/m<sup>3</sup>)

NIOSH REL: ca (carcinogen)  
IDLH: 2000 ppm (2210 mg/ m<sup>3</sup>) – based on 10% Lower Explosive Limit  
ERPG-1: 10 ppm  
ERPG-2: 200 ppm  
ERPG-3: 5,000 ppm

\*\*\*\*\*

## **Maleic anhydride (CAS#108-31-6)**

**Concentrations detected based on extrapolation for likely plume thickness: 0-0.1 ppm**

Combustible, strong oxidizer

Likely routes of exposure include inhalation or dermal absorption.

Effects of short term exposures include severe irritation to the eyes, skin, and respiratory tract. Inhalation may cause asthma-like symptoms.

Effects of long term or repeated exposure, either by contact to skin or by inhalation, may cause skin sensitization or asthma.

OSHA PEL: 0.25 ppm (1 mg/m<sup>3</sup>) – same as NIOSH REL  
IDLH: 2.5 ppm (10 mg/ m<sup>3</sup>)  
ERPG's not available.

### Discussion of Findings

The 15 January sortie was initiated following the CSX derailment and fire in the vicinity of Brooks, KY. The infrared scanning tools onboard ASPECT identified two prominent chemicals within the combustion plume emanating from the accident site: 1,3-butadiene and maleic anhydride. The concentrations of these chemicals, after extrapolation based on an estimate of the plume thickness, were estimated to be approximately 0-0.1 and 0-0.1 ppm, respectively. While these concentration estimates are averages and may not reflect the true concentrations at any specific localized point, particularly very near the yet unconsumed materials, they provide a credible estimate of the air concentrations that might be present as the plume of chemicals migrates away from the point of release.

Based on these assumptions, the concentrations of 1,3-butadiene and maleic anhydride measured by ASPECT are both below the OSHA and NIOSH occupational exposure limits for a 40-hour work week. While the carcinogenic potential of exposure to 1,3-butadiene warrants an additional degree of caution, the observed sharply upward trajectory and continuing dispersal of the combustion plume into the atmosphere should

be anticipated to grossly reduce any further exposure risks at ground level. As long as combustion continues, however, the conditions warrant a continued observant and cautionary approach, especially for those nearest the site.

Personal protective equipment decisions for response workers should be based on an ongoing assessments at the site, preferably including personal breathing zone measurements, and should remain conservative.

Notes:

- a Time weighted average (TWA) concentrations for OSHA Permissible Exposure Limits (**PEL's**) and NIOSH Recommended Exposure Limits (**REL's**) are based on a 40-hour workweek consisting of 8-hour workdays and are intended to be applied within an occupational setting.
- b Immediately Dangerous to Life and Health (IDLH) values represents a maximum airborne concentration of any substance that poses an immediate threat to life or would cause irreversible or irreversible adverse health effects or would interfere with a worker's ability to escape within a 30 minute time frame. The lower explosive limit of a gas may be used as a criteria for determining an IDLH.
- c Emergency Response Planning Guidelines (ERPG's) have been developed by the American Hygiene Association (AIHA) for specific substances. The values are generally based on limited human data and include data from animal and other study sources.

ERPG-1 is the maximum air concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing other than mild transient adverse health effects or perceiving an objectionable odor.

ERPG-2 is the maximum air concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which would impair their ability to take protective action.

ERPG-3 is the maximum air concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects.

**ATTACHMENT 3**  
**ARCADIS SAMPLING ACTIVITY OVERVIEW REPORT: CSX TRAIN DERAILMENT**  
**BROOKS, KY**

(5 Pages)



## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

### REGION 4

Enforcement and Investigations Branch  
980 College Station Road  
Athens, Georgia 30605-2720

4SESD-EIB

### MEMORANDUM

DATE: 04/05/2007

SUBJECT: ARCADIS Sampling Activity Overview Report: CSX Train Derailment  
Brooks, KY  
SESD Project No. 07-0285

FROM: Kevin Simmons  
Science and Ecosystem Support Division, Enforcement Section

TO: Art Smith  
OSC Emergency Response and Removal Branch

Attached is the report for the overview conducted during sample collection activities associated with the CSX train derailment in Brooks, KY the week of January 22, 2007. If you have any questions or comments regarding this report please contact me at 706.355.8730 or [simmons.kevin@epa.gov](mailto:simmons.kevin@epa.gov).

Attachments:

cc: M Bowden

# **Overview Report of ARCADIS CSX Train Derailment Brooks, KY**

## **INTRODUCTION**

On January 25-26, 2007, personnel from the United States Environmental Protection Agency (EPA), Science and Ecosystem Support Division (SESD), conducted an overview of sample collection activities associated with the January 16, 2007, CSX train derailment in Brooks, KY. This overview was requested by Art Smith, EPA On-Scene Coordinator (OSC). Kevin Simmons from EPA SESD, Athens, GA conducted the overview.

## **OVERVIEW DISCUSSION**

At 0800 on the morning of January 25 a briefing of the incident was given to SESD by Art Smith, OSC followed by a site tour led by Ken Rhame, EPA Emergency Response. The tour included the primary spill area, railcar storage area, and soil screening operation. The tour also included walking one of the small streams for several hundred yards to observe effects caused by the stream bank cleaning operation. Oily sheens and a layer of “scum” were visible behind the absorbent booms that had been placed in the stream. **See photos 1 and 2.** Sheens were also visible in the water that filled depressions from footsteps in the creek.

At approximately 1100, SESD met with Hadley Stamm, Liaison Officer with ARADIS, to arrange overviews of the following sampling activities: groundwater (seeps), surface water and soil.

Stephen Vassas was the team leader for the seep sampling. SESD met his team at approximately 1340, and followed them to 2 seeps on Clear Run. The seeps had been previously identified and marked. The team measured the temperature, specific conductance and pH at each seep location using a Horiba multi-parameter meter. Due to the nature of the water flowing out of the ground, they placed aluminum foil at the mouth of each seep and channeled the flow to allow filling of the sample containers. **See photo 3.** The team also calculated an approximate flow using a graduated cylinder. Proper sampling protocols were observed as they collected samples for semi-volatile (1-1L amber) and volatile organics (2-40ml vials) scans plus malaeic acid (1-250ml amber) analysis.

At 1700, an end of the day meeting was held with representatives from EPA, ARCADIS, CSXT and Kentucky DEP. CSX provided a waste inventory as of 1/25/07 and a railcar inventory. The railcar inventory listed only the hazardous placarded cars which included chlorine, methyl ethyl ketone, butadiene, fatty alcohol, ethoxylated alcohol and malaeic anhydride. CSX indicated that not all cars leaked or spilled.

SESD met the surface water sampling team at approximately 0800 on January 26 near Clear Run and observed sampling procedures at two locations. Bill Copeland and Greg Mason

with ARCADIS were the samplers. The locations on Clear Run were marked by flags with the sample identification written on each one. Proper sampling protocols were observed as they collected samples for semi-volatile (1-1L amber) and volatile organics (2-40ml vials) scans plus malaeic acid (1-250ml amber) analysis. ARCADIS personnel indicated that their operating procedure called for them to fill the 40ml vials from the 250ml bottle, which they followed. **See photo 4.**

At 0930, SESD went to observe the Geoprobe crew collecting soil samples. Soil sampling was being conducted along 2 transects running behind the houses closest to the railroad track. Jeff Bonsteel with ARCADIS was the Geoprobe operator. The sample depth for the location observed was 3.5 feet. Samples were collected for semi-volatile (1-4oz jar) and volatile organics (1-40ml vial w/methanol, 2-40ml vials w/sodium bisulfite and 1-40ml vial w/deionized water) and malaeic acid (1-2oz jar) analyses. The sample was not homogenized before the semi-volatile aliquot was collected and the sampler packed soil into the 40ml vial for percent moisture with his gloved fingers. The Geoprobe tooling was decontaminated after the sample was collected. Other than the two issues mentioned above, proper procedures were used to collect the soil samples.

After overviewing ARCADIS sampling activities, SESD returned to the Paroquet Springs Conference Center, which served as the command center for the project. SESD met with Hadley Stamm and briefly discussed the issues mentioned above concerning the soil sampling and requested laboratory contact information for the QA Section at SESD.

## **SUMMARY**

Overall, the sampling procedures used by ARCADIS personnel were adequate for the scope of the project at this particular stage. ARCADIS indicated they were preparing to transition from an initial response mode to a more methodical approach.

## PHOTOS





Photo 3



Photo 4

**ATTACHMENT 4**  
**REVIEW OF ANALYTICAL DATA AND RELATED DOCUMENTS RESULTING FROM THE**  
**KY CSXT TRAIN DERAILMENT**

(4 Pages)

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION 4**  
**Science and Ecosystem Support Division**  
**980 College Station Road**  
**Athens, Georgia 30605-2720**

April 4, 2007

4SESD-MTSB-QAS

**MEMORANDUM**

**SUBJECT:** Review of analytical data and related documents resulting from the KY CSXT train derailment

**FROM:** Wayne Turnbull, Chemist-Region 4  
Quality Assurance Section  
Science and Ecosystem Support Division  
980 College Station Road  
Athens, GA 30605-2720

**THRU:** William R. Bokey, Branch Chief  
Management Technical Services Branch  
Science and Ecosystem Support Division

**TO:** Mr. Art Smith, OSC  
Emergency Response Section

I have reviewed the analytical data from 13 samples collected from the 8 locations in the Huber Station area. These analyses were performed as a result of the KY CSXT train derailment incident. The data were provided to SESD by ARCADIS, a CSX contractor. The reviewed samples were collected on January 27 and 28, 2007. The volatiles and semi-volatiles were analyzed at STL in Savannah, GA and the maleic acid was analyzed by STL in Tallahassee, FL. I did not review the data from the 34 other well samples collected by ARCADIS within the first week after the derailment (January 18 to January 27). These samples were not included in the data package. Two samples not included in the submitted package were from the Huber Station area (452 Huber Station on 1-28-07 and 892 Huber Station on 1-21-07).

Based on my review of the data, I have the following additional questions: Were other laboratories used to analyze the additional 34 well samples collected? Are data packages available for any of these samples? Have the data from these samples collected been through a data validation process? If so, who performed the data validation? What level of data review was undertaken prior to decisions being made and the letters being sent by CSXT to the home owners?

In the attached report are the findings resulting from my review of the data from the thirteen samples and supporting documents sent to me by ARCADIS. My assessment and comments on the quality of data are incorporated into the report.

cc: Marilyn Maycock

## SUMMARY OF ANALYTICAL DATA REVIEW GENERATED AT THE KY CSXT TRAIN DERAILMENT

The purpose of this report is to address the analytical data quality resulting from the environmental monitoring at a CSX train derailment that recently occurred in Brooks, Kentucky. ARCADIS is an environmental consulting firm retained by CSXT to perform sampling and to procure analytical support for samples collected during the incident. ARCADIS representative, Ms. Jane Kennedy, Principle Scientist, provided information related to the sampling and analytical procedures performed for the derailment. ARCADIS sub-contracted analytical work to various laboratories including other STL laboratories. The laboratory data reviewed for this report was submitted by STL Laboratories in Savannah, Georgia and Tallahassee, Florida.

Laboratory data were provided for the listed addresses and sample dates and was reviewed by Wayne Turnbull of the Quality Assurance Section, SESD. The list is as follows:

327 Angelia Drive	1/27/07
327 Angelia Drive	1/28/07
546 Huber Station	1/27/07
546 Huber Station	1/28/07
556 Huber Station	1/27/07
556 Huber Station	1/28/07
576 Huber Station	1/27/07
576 Huber Station	1/28/07
734 Huber Station	1/27/07
734 Huber Station	1/27/07 (Duplicate)
882 Huber Station	1/27/07
892 Huber Station	1/27/07
942 Huber Station	1/27/07

Other supporting documentation was provided to the data reviewer to more adequately assess the data provided. The following information was requested for the assessment.

- Identification of all laboratories used for the analyses of the well samples
- SOPs and/or methods used for sample preparation, instruments used, and the laboratories' analytical methods
- All final results from each of these wells
- The CSX / ARCADIS study plan (sampling and analysis plan, QAPP) for the derailment
- analyte detection levels and reporting levels for each laboratory for the water samples
- required detection levels for these analytes
- CSX action level for each target analyte
- all field, trip and laboratory blank information
- data deliverables agreed upon between ARCADIS and the contract laboratories
- SOP used by ARCADIS for data review and validation of data from the various laboratories

Other information obtained from the On-Scene-Coordinator (OSC) included a letter that was sent to home owners whose wells had been sampled. The letter stated that: "The levels are protective of human health as use for tap water for drinking and any other domestic purpose (e.g., bathing, washing clothes and watering livestock, etc.)." Included in the letter was a list of potential contaminants and the reporting limits for those contaminants. The draft letter *implied* that these analyses were performed using drinking water methods and the wells were deemed safe to use as source of tap (drinking) water. However, not all drinking water regulated contaminants had been assessed. An Excel spreadsheet which identified residential sample locations was provided by the EPA OSC. This spreadsheet indicated that several wells were re-sampled but data from these sampling events were not provided for this data review. None of the reported data received had been validated, but letters giving clearance to the home owners for use of their well had been sent by CSXT.

CSXT identified the main constituents of concern from the derailment as methyl ethyl ketone, cyclohexane, 1,3-butadiene and maleic acid/maleic anhydride. A target reporting compound list of 145 organic compounds was developed by using a partial listing of the drinking water regulated contaminants and a small portion of the compounds found in Region 9's Preliminary Remediation Goals (PRG) list for tap water. The draft work plan for the derailment included a provision for enumerating the tentatively identified compounds (TICs) with the 10 highest concentrations. No TICs were identified in the data reports received.

The methods used for the analyses were SW-846 8260 B for volatiles and 8270 C for semi-volatiles. SW-846 Method 9040 was conducted for pH. A high performance liquid chromatography procedure (STL LC65) using a ultraviolet detector had been developed by the STL Laboratory in Tallahassee for analyzing phthalic and maleic acids. These methods may be applied to various types of environmental matrices including waste, soils and waters but are not approved methods for determining drinking water compliance under regulations found in 40 CFR 141. For most organic compounds, these methods can achieve a sensitivity of at least the maximum contamination levels (MCL) for the regulated drinking water contaminants. The reporting concentration for benzo(a)pyrene was about 50 times greater than the DW MCL and for bis(2 ethyl-hexyl) phthalate a reporting concentration of about 2 times higher than the MCL was noted. However, neither of these compounds were identified as contaminants of concern from the derailment. Other regulated drinking water contaminants that were not analyzed included (2-ethyl-hexyl) adipate as well as a number of other regulated drinking water organic compounds including pesticides, some herbicides, polychlorinated biphenyls, carbamates, trihalomethanes, haloacetic acids and all of the regulated inorganic drinking water contaminants including nutrients, minerals and metals, etc. Again, none of these were considered to be contaminants of concern.

The summary provided by ARCADIS stated that some city water samples had been identified after they were received at the laboratory. A sample collected at the 556 Huber Station (1/27/07), was reportedly not analyzed for maleic acid based on the case narrative but analytical results for maleic acid were found in the data package. Notes were made in the data package for the use of manual integration of peaks almost two weeks after preliminary data had been reported for a couple of samples. This appeared not to make any difference in the final results. There were QC failures on at least one matrix spike

and matrix-spike duplicate. Even though there were no positives detected in the sample, the analytes with low recoveries should be appropriately qualified.

For the eight wells evaluated, the data from these methods showed that the organic compounds reported were under the MCL and Region 9's PRG concentration limits. This assessment only address the organic analyses described above provided by the STL laboratories. This report does not address any of the other 34 well samples collected and analyzed or any other laboratories that may have been used. Any statement or implication that these analyses met all drinking water criteria would be misleading since they were not analyzed for all drinking water contaminants or analyzed using drinking water analytical methods. Proper clarification of sample results must be stated in order to minimize the risk of misinterpretation. The data reviewed are technically sound but must be represented to the stakeholders with their limitations clearly stated.