# FLEMING COUNTY SPECIAL CREW FACILITY LOT ENVIRONMENTAL SITE CHARACTERIZATION KYTC# 370, AI#

Prepared for:

**KENTUCKY TRANSPORTATION CABINET**
**DIVISION OF ENVIRONMENTAL ANALYSIS**
**200 MERO STREET**
**FRANKFORT, KY 40602**

*August 15, 2008*

Prepared by:


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# SECTION I. BACKGROUND

On July 31, 2003, H.C. Nutting Company completed a Phase I Environmental Site Assessment for the KYTC (Kentucky Transportation Cabinet) Fleming County Special Crew Facility Lot in Flemingsburg, Kentucky. Several recognized environmental conditions (RECs) were identified in the Phase I as follows:

- The potential for petroleum contamination from a former tack oil tank located on the property; and
- The potential for contamination associated with sandblasting practices on the property.

On April 22, 2008, the work as set-forth in the workplan was performed. A topographic map and an aerial photograph of the site can be found in Figure 1. and Figure 2. of this report. The workplan is included in Appendix C for easy reference.

# SECTION II. SITE METHODS

Nine soil samples were collected during the sampling event on April 22, 2008. The soil samples were collected using a geoprobe. The Site Map included in Figure 2. of this report shows the location and result of all samples collected. Depending upon the location of sample collection, the samples were analyzed for polyaromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) as diesel range organics (TPH DRO) and RCRA Metals. All samples were collected according to the procedures set forth in sections 10.2.1, 11.2.1, 12.3 and 12.4 the U.S. EPA Environmental Investigations Standard Operation Procedures and Quality Assurance Manual [November 2001]. The samples were analyzed using the following methods:

| Analyte | EPA Method |
|---|---|
| RCRA Metals | US EPA Method 6010B |
| PAH | US EPA Method 8310 |
| TPH | US EPA Method 8015B |

# SECTION III. ANALYTICAL RESULTS

The results of all samples collected are included in summary format in Tables 1 and 2 of this report. Complete analytical results, as provided by CT Laboratories, are included in Appendix B. A Sampling Map showing the sampling location for each sample is included in Figure 2.

## *Solid Sample Results*

Four soil borings taken in the former tack oil tank location (B1F-B4F) exceeded the Region 9 PRG industrial limits for PAHs, as well as the limits for TPH. One boring in this area (B5F) only exceeded residential limits.

All soil borings in the area of visible staining by a newer concrete pad (B6F and B7F) were below regulatory levels.

One soil sample (B9F) collected in the former sandblast area exceeded Region 9 PRG industrial limit for arsenic.

Though the results of other samples were above the detection limits, no other results exceeded regulatory limits, residential or industrial.

# SECTION IV. CONCLUSIONS AND RECOMMENDATIONS

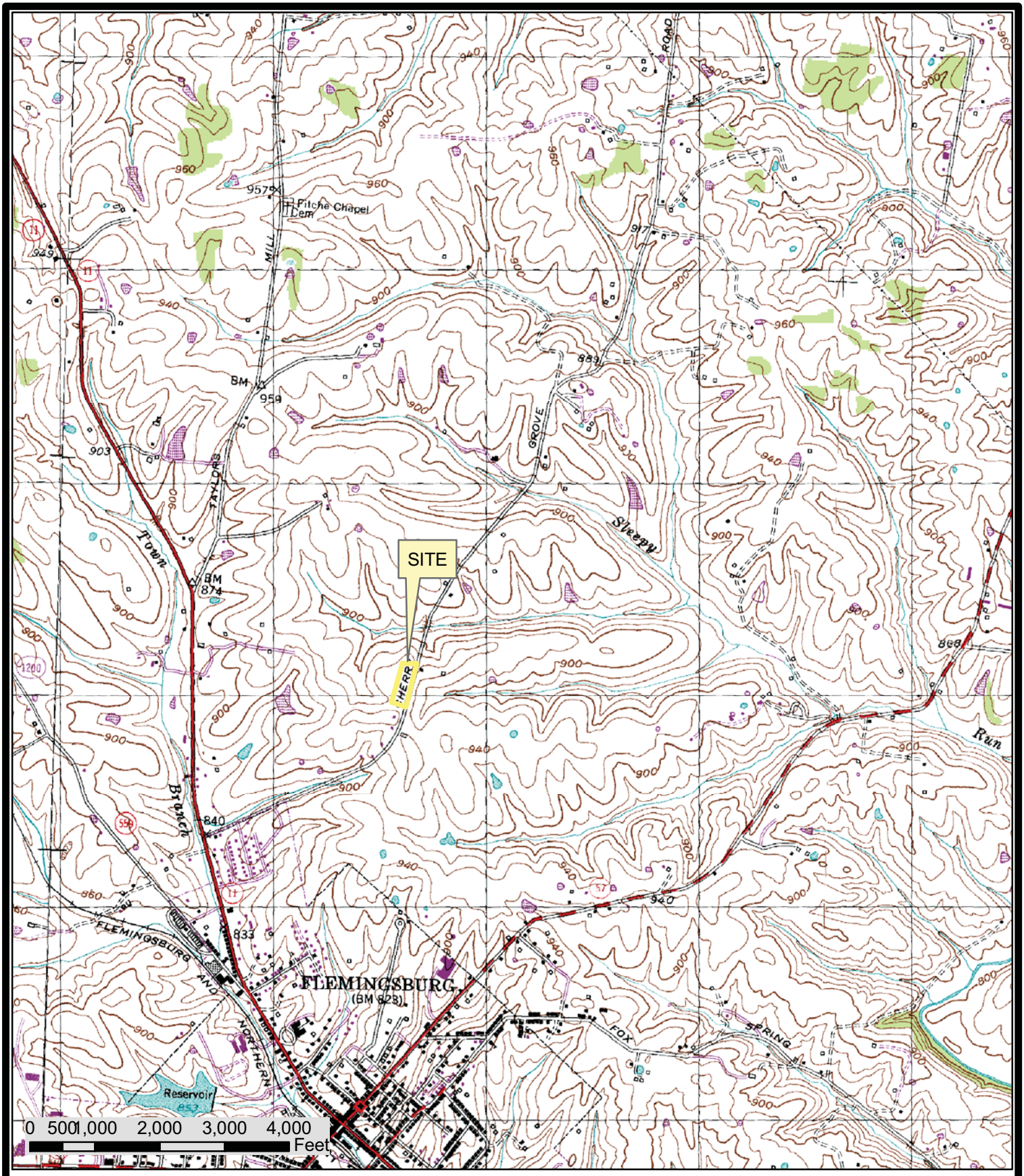
## *PAH/TPH Contaminated Soils*

PAHs found in the soils are believed to originate with tack oil that was used in the past in and around the location of the former tack oil tank. Soil borings collected show that tack oil staining occurs at approximately 2-3 feet. Soils below the tack oil contamination appear to be very tight clays with PAHs/TPH below regulatory levels. It is recommended that the tack oil be removed to clean soils on a visual basis during cooler weather when the material is in a less fluid state. This should eliminate or dramatically reduce the incidence of PAHs in the soils.

## *Arsenic in Soils*

Arsenic in the soil is believed to be the result of natural processes. Nonetheless, as excavation will be necessary to remove the tack oil contaminated soils, the removal of the soils in the area of B9F to a depth of approximately 1.5 feet is recommended when the other area is remediated. This should eliminate elevated arsenic levels in that area.

# FIGURES




**KENTUCKY TRANSPORATION CABINET**
**200 MERO STREET**
**FRANKFORT, KENTUCKY 40622**

FIGURE 1

| USGS QUAD | Scale | | July |
|---|---|---|---|
| Flemingsburg KENTUCKY | 1:24,000 | Lee Engineering, LLC<br>100 North Main Street<br>Lawrenceburg, KY 40342<br>phone (502)859-0190 fax (502)859-3000 | 2008 |

Location on Topographic Map
Environmental Site Characterization
Fleming County Special Crew Facility Lot
Flemingsburg, Fleming County, Kentucky

N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**FRANKFORT, KENTUCKY 40602**

FIGURE 2

Location on Aerial Map
Environmental Site Characterization
Fleming County Special Crew Facility
Flemingsburg, Fleming County, Kentucky

N

| USGS QUAD Flemingsburg KENTUCKY | Scale 1:500 | Lee Engineering, LLC 100 North Main Street Lawrenceburg, KY 40342 phone (502)859-0190 fax (502)859-3000 | July 2008 |
|---|---|---|---|

# TABLES

# TABLE 1. SUMMARY OF ORGANIC ANALYTICAL RESULTS - SOLID SAMPLES[1]
## FLEMING COUNTY SPECIAL CREW FACILITY LOT
## FLEMINGSBURG, KENTUCKY
## KYTC # 370, AI #

| | | Analytes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | % Solids | 1,2 Dichloroethane-d4 | 1,2,4-Trimethylbenzene | 1,3,5-Trimethylbenzene | 1-Methylnapthalene | 2-Methylnaphthalene | Acenaphthene | Aldrin | Anthracene | Alpha-BHC | Alpha-Chlordane | Beta-BHC | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenzo(a,h)anthracene | Endosulfan II | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | p-isopropyltoluene | Naphthalene | n-Butylbenzene | sec-Butylbenzene | n-Propylbenzene | Phenanthrene | Methylene Chloride | Pyrene | m & p-Xylene | TPH [4] |
| CAS No. | | | 107-06-2 | 95-63-6 | 108-67-8 | | | | 309-00-2 | 120-12-7 | | | | 56-55-3 | 50-32-8 | 205-99-2 | | 207-08-09 | 218-01-9 | 53-70-3 | | 206-44-0 | 5934-46- | 193-39-5 | | 91-20-3 | 104-51-8 | 135-9-88 | 103-65-1 | | 75-09-2 | 129-00-0 | 1330-20-7 | | |
| UNIT | | N/A | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | ppm |
| Regulatory Limits[2,3] | Residential limit | --- | .28 | 52 | 21 | 56 | 56 | 3700 | .029 | 22000 | .09 | 1.6 | .32 | .62 | .062 | .62 | 2300 | 6.2 | 62 | .062 | 370 | 2300 | 3700 | .62 | 570 | 56 | 240 | 220 | 240 | 3700 | 9.1 | 2300 | 270 | 100 |
| | Industrial limit | --- | .60 | 170 | 70 | 190 | 190 | 29000 | .10 | 100000 | .36 | 6.5 | 1.3 | 2.1 | .21 | 2.1 | 29000 | 21 | 210 | .021 | 3700 | 22000 | 37000 | 2.1 | 2000 | 190 | 240 | 220 | 240 | 29000 | 21 | 29000 | 420 | 250 |
| SAMPLE ID | B1F | 80.3 | | | | 4.8 | | | | 0.56 | | | | **2.6** | **0.38** | 0.33 | 0.35 | | 0.91 | | | 6.2 | 1.4 | 0.38 | | 2.0 | | | | 2.8 | | 2.1 | | 80.3 |
| | B2F | 80.0 | | | | | | | | 0.087 | | | | 0.39 | **1.0** | ***1.1*** | 1.1 | 0.28 | 0.61 | | | 0.70 | | ***1.1*** | | | | | | 0.28 | | 0.77 | | 75 |
| | B3F | 80.6 | | | | | | | | | | | | **15** | **10** | ***8.6*** | 6.6 | 5.2 | | | | 51 | 39 | **8.9** | | 26 | | | | 77 | | 24 | | ***2900*** |
| | B4F | 79.2 | | | | 3.9 | 3.4 | | | 0.58 | | | | | | | | | | | | 5.4 | | | | | | | | 2.8 | | | | ***2000*** |
| | B5F | 75.8 | | | | | | | | | | | | | | | | | | | | 0.050 | | | | | | | | 0.061 | | | | ***110*** |
| | B6F | 80.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | B7F | 74.4 | | | | 0.64 | | | | | | | | 0.16 | 0.037 | | | | | | | .21 | 0.30 | | | 0.26 | | | | 0.35 | | 0.12 | | |
| | B8F | 81.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | B9F | 81.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

1 Complete analytical results are included in Appendix B.

2 Regulatory limits are those published in the Environmental Protection Agency's Region 9 Preliminary Remediation Goals (PRGs) Table, October 2004. In the event that a PRG for an analyte was not available, an EPA Region 4 recommended surrogate was used.

3 Results exceeding industrial regulatory limits are highlighted in yellow and noted in bold red print. Those exceeding residential standards are italicized in bold print.

4 TPH regulatory limits are based on the TPH DRO method [EPA 8015B]. The results include diesel range organics.

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# TABLE 2. SUMMARY OF INORGANIC ANALYTICAL RESULTS
# FLEMING COUNTY SPECIAL CREW FACILITY LOT
# FLEMINGSBURG, KENTUCKY
# KYTC #370 , AI #

| | | ANALYTES | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Arsenic | Barium | Cadmium | Chromium | Lead[2] | Selenium | Silver | Mercury | TCLP Lead [5] | pH | | | | | | | | |
| CAS No. | | 7440-38-2 | 7440-39-3 | 7440-43-9 | | 7439-92-1 | 7782-49-2 | 7440-22-4 | 7487-94-7 | | | | | | | | | | |
| UNIT | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | S.U. | | | | | | | | |
| Regulatory Limits[3,4] | Residential limit | .39 | 5400 | 37 | 210 | 400 | 390 | 390 | 23 | 5.0 | | | | | | | | | |
| | Industrial limit | 1.6 | 67000 | 450 | 450 | 750 | 5100 | 5100 | 310 | 5.0 | | | | | | | | | |
| SAMPLE ID | B8F | | 84.8 | 2.0 | 17.7 | 28.6 | | 66.1 | 0.078 | | | | | | | | | | |
| | B9F | 5.4 | 160 | 3.0 | 22.8 | 13.5 | | 25.3 | 0.032 | | | | | | | | | | |

1 Complete analytical results are included in Appendix B.

2 The Cal-Modified PRGs for Lead (residential goal) is 150 mg/kg.

3 Regulatory limits are those published in the Environmental Protection Agency's Region 9 Preliminary Remediation Goals (PRGs) Table, October 2004. In the event that a PRG for an analyte was not available, an EPA Region 4 recommended surrogate was used.

4 Results exceeding industrial regulatory limits are highlighted in yellow and noted in bold red print. Those exceeding residential limits are italicized and in bold print.

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# TABLE 3. BORING RECORDS
# FLEMING COUNTY SPECIAL CREW FACILITY LOT
# FLEMINGSBURG, KENTUCKY
# KYTC # 370, AI #

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| SAMPLE ID | Analytes: Sample submitted to lab? | Percent (%) Recovery | Soils Description | Interval, ft. | Refusal? |
|---|---|---|---|---|---|
| B1F | X | 100 | 0-8" FILL; 8"-4' BROWN/GRAY CLAY (STAINING/ODOR @2.5-3' INTERVAL) | 0-4 | |
| | | 100 | 4-8' YELLOW BROWN TIGHT CLAY | 4-8 | N |
| B2F | | 100 | 0-4' DARK BROWN CLAY; | 0-4 | |
| | X | 80 | 4-6' OLIVE BROWN CLAY; | 4-6 | Y |
| B3F | X | 100 | 0-8" FILL; 8"-4' BROWN CLAY (OBVIOUS TACK OIL AT 2-3' INTERVAL) | 0-4 | |
| | | 100 | 4-8' YELLOW BROWN TIGHT CLAY | 4-8 | N |
| B4F | X | 100 | SAME AS B3F FOR 0-8' | 0-8 | N |
| | | | | | |
| B5F | X | 100 | SAME AS B2 FOR 0-8' | 0-8 | N |
| | | | | | |
| B6F | X | 100 | 0-4' BROWN GRAY CLAY | 0-4 | N |
| | | | | | |
| B7F | X | 100 | 0-4' YELLOW BROWN TIGHT CLAY | 0-4 | N |
| | | | | | |
| B8F | X | 100 | 0-4' YELLOW BROWN TIGHT CLAY | 0-4 | N |
| | | | | | |
| B9F | X | 100 | SAME AS B8F FOR 0-4' | 0-4 | N |
| | | | | | |

# APPENDIX A – PHOTOGRAPHIC JOURNAL

**Photo No. 1: Former tack oil tank area (B1F-B5F)**

**Photo No. 2: Visible staining (B6F-B7F)**

**Photo No. 3: Sandblast area (B8F-B9F)**

**No Photo**

# APPENDIX B – ANALYTICAL RESULTS

CT LABORATORIES

*delivering more than data from your environmental analyses*

***ANALYTICAL REPORT***

**This package contains 24 page(s).**
**(including the cover page)**

This report at a minimum contains the following information:

- Analytical Report of Test Results
- Description of QC Qualifiers
- Chain of Custody (copy)
- Quality Control Summary
- Case Narrative (if applicable)
- Correspondence with Client (if applicable)

*For analyses that require NELAP accreditation, all analytes, by matrix and method, are accredited following current NELAP standards unless specifically noted in this document.*

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