

i **GEOTECHNICAL** NOV 13 2001

**PRELIMINARY SITE ASSESSMENT
CHARLIE HODGES STORE
100 WEST U.S. HIGHWAY 158
CAMDEN COUNTY, NORTH CAROLINA
STATE PROJECT NO. 8.T020401 (R-2414B)**

**Prepared for:
NCDOT Geotechnical Unit
PO Box 25201
Raleigh, North Carolina 27611-5201**

**Prepared by:
Solutions Industrial & Environmental Services, Inc.
3722 Benson Drive
Raleigh, North Carolina 27609**

Solutions Project No. 0870.01A3.NDOT



Christie Zawlocki
Christie Zawlocki, P.E.
Environmental Engineer

Gary M. Birk 10.13.2001
Gary M. Birk, P.E.
Senior Engineer

November 13, 2001

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	BACKGROUND.....	1
3.0	PREVIOUS INVESTIGATIONS.....	1
4.0	FIELD ACTIVITIES	2
5.0	LABORATORY RESULTS	4
6.0	DISCUSSION.....	4
7.0	CONCLUSIONS AND RECOMMENDATIONS	6
8.0	REFERENCES	6

TABLES

TABLE 1 – SUMMARY OF FIELD SCREENING RESULTS FOR SOIL

TABLE 2 – SUMMARY OF SOIL ANALYTICAL RESULTS

TABLE 3 – SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

FIGURES

FIGURE 1 – SITE LOCATION MAP

FIGURE 2 – SAMPLE BORING LOCATIONS

FIGURE 3 – APPROXIMATE EXTENT OF PETROLEUM IMPACTED SOIL

APPENDICES

APPENDIX A – PREVIOUS REPORTS

APPENDIX B – PHOTOGRAPHS

APPENDIX C – BORING LOGS

APPENDIX D – LABORATORY ANALYTICAL REPORTS

1.0 INTRODUCTION

The NCDOT is planning improvements to U.S. Highway 158 in Camden County which will require acquiring property for new highway construction. On September 26, 2001, Solutions Industrial & Environmental Services, Inc. (Solutions-IES) submitted proposal NC01892P to the NCDOT for conducting preliminary site assessments (PSAs) on seven parcels of land sited within the planned construction area along U.S. Highway 158 in Camden, North Carolina. This report summarizes the results of file review and field activities conducted for one of the parcels, Charlie Hodges Store, located at 100 West U.S. Highway 158, Camden County, Camden, NC.

2.0 BACKGROUND

Charlie Hodges Store is located at 100 West U.S. Highway 158 in Camden, NC (Figure 1). Previous investigation activities have been conducted at the site, as summarized below. Due to the extent of the previous investigations, Solutions-IES' assessment was limited in extent and focused on only the portions of the property that were not previously investigated.

As shown on Figure 2, the site is located at the southwest corner of U.S. Highway 158 and NC 343 in Camden, NC. The property is owned by Charles Hodges, and the site is currently a gasoline station and convenience store. Three 2,000-gallon gasoline underground storage tanks (USTs) are located at the site. The UST Facility ID for the site is 0-031634, and the UST permit number is 2001037310. The UST permit was posted inside the store on the day of the site visit and indicated an expiration date of March 2002. The permit also identified Joel F. Hollowell Oil Co., Inc. as the UST owner. According to Mr. Hodges, the tanks are constructed of fiberglass and were installed around 1990.

3.0 PREVIOUS INVESTIGATIONS

Solutions-IES obtained copies of previous investigation reports and other documents for Charlie Hodges Store from NCDOT and the Washington Regional Office (WaRO) of the North Carolina Department of Environment and Natural Resources (NCDENR). Copies of the reports reviewed by Solutions-IES are provided in Appendix A. Based on our review of available files, an initial PSA was conducted at the site by Environmental Investigations, P.A. (EI), in February 1994 for the NCDOT. Eleven soil samples were

collected as part of the PSA, and the analytical results indicated that there had been a release of petroleum hydrocarbons from the USTs and fuel dispensers located on the Charlie Hodges Store property. The PSA also indicated that groundwater had likely been impacted, since the USTs were potentially located at a depth below the groundwater table; however, no groundwater samples were collected (EI, 1994).

A memo dated June 25, 1999 was found on file at the WaRO which recommended that the Charlie Hodges Store site be placed on the Federal Trust Fund/State-Lead status. According to the memo, Mr. Hollowell, the owner of the existing USTs at the site, indicated that Sinclair Oil Company operated a gas station at the site prior to 1990 and that the contamination at the site was due to past UST and pump island operations. The memo also indicated that Mr. Hollowell was not willing to proceed with any further action, since his UST system was not leaking (NCDENR, 1999). No other information regarding the site was available at the WaRO.

4.0 FIELD ACTIVITIES

Due to the limited extent of previous investigation activities conducted at the site, field activities consisted of collecting and analyzing soil and groundwater samples from areas that were not previously investigated at the site. The field activities were conducted by Solutions-IES on October 11, 2001. Photographs were taken to document site conditions during the assessment activities. The site photographs are included in Appendix B.

Prior to beginning subsurface sampling, Solutions-IES personnel contacted Charlie Hodges to notify him of the proposed sampling activities. Solutions-IES also contacted Carolina No-Cuts to identify utilities on the subject property and contracted Taylor Wiseman & Taylor of Raleigh, North Carolina, to further evaluate the site for other USTs, subsurface piping and utilities.

After clearing the utilities on the property, Solutions-IES collected subsurface samples from the proposed highway expansion area. Samples were collected at five Geoprobe® boring locations, identified as GP-1F through GP-5F. The locations of the Geoprobe® borings are indicated on Figure 2.

The Geoprobe® borings were advanced to a total depth of 2.4 m (8 feet) below ground surface (bgs), which was below the groundwater table. Continuous soil cores were collected from each boring using a Macro® Sampler. Upon removal from the ground, the cores were cut into 2-foot lengths. Soil from each 2-foot interval was further split into two identical portions. Each portion was placed in a separate

resealable plastic bag. One bag was placed on ice for possible laboratory analysis, while the other bag was sealed and placed at ambient temperature for field screening with an organic vapor analyzer (OVA).

The soil samples were examined for soil type and the presence or absence of petroleum staining or odor. After a period of approximately 20 minutes, which allowed for the accumulation of volatile organic compounds (VOCs) in the headspace of the bags, each sealed bag left at ambient temperature was scanned with the OVA. A background reading was taken with the OVA prior to measuring VOC concentrations in the bags. The readings of the VOC concentrations in the headspace were then entered on the boring log along with a soil description and any indications of petroleum staining or odor (Appendix C). The results of the OVA field screenings are summarized on Table 1.

Based on field observations and OVA readings, Solutions-IES submitted four soil samples from selected boring locations for laboratory analysis. In general, the split sample stored on ice in the cooler with a corresponding elevated OVA reading was selected for submittal to Prism Laboratories, Inc. in Charlotte, NC. Soil samples were not collected for laboratory analysis from boring locations where there were no field-observable indications of petroleum hydrocarbons (i.e., staining, odor, or OVA readings substantially above background). The samples submitted to the laboratory were analyzed for total petroleum hydrocarbons (TPH) as both gasoline-range organics (GRO) and diesel-range organics (DRO) using EPA SW-846 methods 5030 and 3550, respectively.

Solutions-IES also collected a groundwater sample (GW-1F) from the Geoprobe® boring location that indicated the highest OVA readings, GP-5F. Groundwater samples were collected in 40-mL VOA vials for volatile organic compound (VOC) analysis via EPA Method 8260B plus isopropyl ether (IPE) and methyl *tert*-butyl ether (MTBE). A sample was also collected in a 1-L amber bottle for analysis of semi-volatile organic compounds (SVOCs) via EPA Method 8270C.

Following completion of the soil and groundwater sampling activities, the Geoprobe® borings were abandoned by completely filling each boring with soil and sand. Borings emplaced in paved areas were finished at the surface to match pre-existing conditions.

5.0 LABORATORY RESULTS

The analytical laboratory results for the soil and groundwater samples are summarized in Tables 2 and 3, respectively. Copies of the laboratory reports are provided in Appendix D.

TPH-GRO and TPH-DRO compounds were detected at concentrations above the laboratory method detection limits in only one soil sample. The soil sample collected from boring GP-5F at a depth of 0.6 to 1.2 m bgs indicated concentrations of 3.3 mg/kg and 12mg/kg for TPH-GRO and TPH-DRO, respectively.

The groundwater sample indicated concentrations of benzene (4200 µg/L), ethylbenzene (1500 µg/L), naphthalene (300 µg/L), 2-methylnaphthalene (40 µg/L), and MTBE (380 µg/L) above the 15A NCAC 2L.0202 groundwater standards (NC 2L standards). Total xylenes were also detected at a concentration of 260 µg/L; however, this concentration is below the NC 2L standard of 530 µg/L.

6.0 DISCUSSION

Previous assessment activities conducted at the site indicated that there had been a historical release of petroleum hydrocarbons from the USTs and fuel dispensers that had impacted soils at the Charlie Hodges Store site. Groundwater was suspected to have been impacted, but was not sampled.

Solutions-IES advanced five soil borings to further assess subsurface conditions in areas that were not previously investigated at the Charlie Hodges Store site. During the sampling activities, Solutions-IES personnel encountered staining and strong odors at one Geoprobe® boring location (GP-5F), which was consistent with high OVA readings at this location (greater than 1000 ppm). The laboratory analytical results indicated the presence of TPH-GRO and TPH-DRO in the soil at this location at concentrations just above the laboratory method detection limits. Neither TPH-DRO nor TPH-GRO concentrations in GP-5F exceed the action levels for soil as identified in the NCDENR, Groundwater Section *Guidelines for the Investigation and Remediation of Soil and Groundwater* (NCDENR, July 2000). However, the TPH-DRO concentrations exceed the UST closure level of 10 mg/kg.¹ Soil samples collected from the other soil borings at the site did not indicate detectable concentrations of TPH-GRO or TPH-DRO compounds.

The groundwater sample (GW-1F) collected at boring location GP-5F indicated concentrations of several VOCs and SVOCs above the NC 2L standards. These included benzene, ethylbenzene, naphthalene, 2-methylnaphthalene, and MTBE. The presence of phase-separated hydrocarbons on the groundwater surface was not observed.

The current assessment was limited to evaluating the presence or absence of petroleum contamination in the areas of the site that were not previously investigated. Based on the previous and current data, Solutions-IES attempted to estimate the volume of soil that may be impacted at the site. Solutions-IES established a TPH threshold value of 10 mg/kg as a conservative indicator concentration of soil contamination that would likely have to be remediated with the understanding that:

- any detectable TPH concentrations are reportable;
- additional assessment activities may be required to define the nature and extent of the releases; and
- additional testing using Massachusetts Department of Environmental Protection (MADEP) Methods for the determination of Volatile and Extractable Petroleum Hydrocarbons (VPH and EPH) would be required to establish the Maximum Soil Contaminant Concentrations (MSCCs) for each of the hydrocarbon fractions²

Figure 3 shows our estimate of the lateral extent of soil impact defined by previous and current TPH analyses. In general, the lateral extent was estimated as the midpoint between impacted and non-impacted boring locations. As shown on Figure 3, soils in two areas of the site appear to be impacted. Solutions-IES attempted to estimate the volume of affected soil in each area. Additional sampling would be required to better estimate the extent of petroleum impact at the site.

The first area is near the USTs at the site. One previous soil sample near the USTs indicated TPH-GRO and TPH-DRO above 10 mg/kg. Based on limited available data, Solutions-IES estimated that an area approximately 2.5 m by 3 m in this area is impacted from a depth of 0.5 m to the top of the water table at approximately 1.6 m bgs, resulting in a volume of approximately 8.25 cubic meters (10.8 cubic yards).

The second area is near the fuel dispensers. Based on previous and current data, this area indicated the highest concentrations observed at the site. The estimated area of impacted soil is approximately 12 m by

¹ NCDENR, Division of Waste Management, UST Section *Guidelines for Tank Closure*, December 2000.

² *Guidelines for Corrective Action, North Carolina Underground Storage Tank Section, Effective July 1, 2001*, State of North Carolina, Department of Environment and Natural Resources, DWM, UST Section, April 2001.

15 m with an average thickness of approximately 1.5 m, resulting in a volume of approximately 270 cubic meters (353 cubic yards).

No effort to delineate the vertical or lateral extent of contamination in the groundwater was proposed or conducted. Without additional monitoring points, the direction of groundwater flow could not be determined. However, based on the shallow topographic relief and apparent contamination toward the intersection, it is inferred that groundwater is flowing to the east.

During the field activities, Solutions-IES personnel also observed a private cemetery located on the northeast side of the site along NC 343. The cemetery appears to be within the proposed NCDOT construction area. Photo #6 in Appendix B shows this area of the site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This PSA was performed on behalf of the NCDOT for Charlie Hodges Store located at 100 West U.S. Highway 158, Camden County, NC. Based upon our file review, field observations, and laboratory results, we offer the following conclusions:

- Historical and current data indicate that soils near the USTs and fuel dispensers at the site have been impacted by petroleum hydrocarbons. The highest concentrations were detected near the fuel dispensers. Based on the limited previous and current sampling results, the volume of impacted soil was estimated to be approximately 8.25 cubic meters near the USTs and approximately 270 cubic meters near the fueling island. Additional sampling would be needed to better estimate the horizontal and vertical extent of affected soil.
- Shallow groundwater (~1.6 m bgs) near the fuel dispensers is impacted with benzene, ethylbenzene, naphthalene, 2-methylnaphthalene, and MTBE at concentrations above the NC 2L standards within the proposed highway expansion area. The horizontal and vertical extent of contamination was not defined by the scope of this assessment. However, it is inferred that shallow groundwater further east and west in the vicinity of the fueling island may also be impacted. Remediation of the groundwater contamination may be required in the future.

8.0 REFERENCES

Environmental Investigations, P.A. (1994) Preliminary Site Assessment Report, Site 5: Charlie Hodges Store; Widening of US 158 from Elizabeth City to Belcross.

NCDENR Division of Waste Management, Underground Storage Tank Section, Memorandum, Recommendation for Federal Trust Fund/State-Lead, Charlie Hodges Store, June 25, 1999.

Fox, Terry W

To: Pittman, Michelle A
Subject: R-2414B Parcel 29 Camden Co

Michelle,

I reviewed Preliminary Site Assessments made on the Charles Hodges Parcel in November 2001, and again in September 2007. Although contamination levels have dissipated within the proposed right of way, high petroleum values remain within the central portion of the property. The UST's and contaminated soils delineated during the 2001 study have not been removed. Since contamination presently exists, and policy is that the Department should not take ownership of UST's (3 tanks), we recommend against acquisition of this remnant.

Sincerely,

Terry W. Fox
GeoEnvironmental Project Manager

Fox, Terry W

From: Parker, Cyrus F
Sent: Thursday, July 17, 2008 1:54 PM
To: Fox, Terry W
Subject: FW: 34430.2.5 R-2414B Parcel 029 Camden County

Terry,

We did a PSA on this parcel already but may need to do additional work to determine if the remnant is contaminated. If it is contaminated, we will recommend the remnant not be purchased. Michelle is in a hurry for this one so see what you can do.

Cyrus F. Parker, LG, PE
GeoEnvironmental Supervisor

Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

919-250-4088 (Phone)
919-250-4237 (Fax)

Web Page

<http://www.ncdot.org/doh/preconstruct/highway/geotech/contractserv/geoenvironmental>

From: Pittman, Michelle A
Sent: Thursday, July 17, 2008 11:50 AM
To: Parker, Cyrus F
Subject: 34430.2.5 R-2414B Parcel 029 Camden County

Hi Cyrus - This email is to follow up on our phone conversation. I am requesting further investigation on the above mentioned parcel, as it has a uneconomic remnant involved. I am not sure if we can settle this or it will be condemned on but I would like to know all the options as the clock is ticking on the schedule for the project. I also believe that the UT (which is on the eastern side of the old store) is part way in the TCE. Thanks in advance for you help. Let me know if you have any questions - Michelle