

**FIELD TRIP REPORT  
IN SUPPORT OF  
REMOVAL SITE EVALUATION**

**WESCOTT PLANTATION  
SUMMERVILLE, DORCHESTER COUNTY, SOUTH CAROLINA**

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## 1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) tasked the T N & Associates, Inc., (TN&A) Superfund Technical Assessment and Response Team (START) to perform support activities for a Removal Site Evaluation (RSE) at Wescott Plantation located in Summerville, South Carolina, under Contract Number (No.) EP-W-05-053, Technical Direction Document (TDD) No. TNA-05-003-0043.

Specifically, TN&A was tasked to conduct the following activities:

- Obtain, review, and summarize previous investigations conducted at the site;
- Perform field investigation activities including air monitoring and sampling at designated properties at the site;
- Provide photographic and written documentation of all field activities;
- Develop a site-specific Health and Safety Plan (HASP) prior to the site visit (Ref. 1);
- Develop and implement a Sampling and Analysis Plan (SAP) to identify the nature and extent of contamination, which would be used to help determine the need for federal intervention under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 (Ref. 2);
- Interpret available historical aerial photographs to determine the timeframe of specific site developments and improvements;
- Compile and document any media coverage of the site;
- Utilize the Rapid Assessment Tool (RAT) to assist in field investigation.

This comprehensive Field Trip Report describes support activities conducted by TN&A in execution of this TDD and summarizes findings. All activities and procedures described in this report were performed in accordance with the EPA Region 4 *Environmental Investigation Standard Operating Procedures and Quality Assurance Manual* (EISOPQAM), and the TN&A Quality Assurance Project Plan (QAPP) (Refs. 3, 4).

The following sections provide the details of this Field Trip Report:

- Section 2 – Describes the site and previous investigations.
- Section 3 – Describes the field investigation activities.
- Section 4 – Describes the historical aerial photograph interpretation.
- Section 5 – Describes the analytical results of field samples.
- Section 6 – Describes the media coverage.
- Section 7 – Provides the summary and conclusion.

Figures and tables are provided in Appendices A and B, respectively. References are cited throughout the Field Trip Report to substantiate site-specific statements. A reference list is provided at the end of the text.

## **2.0 SITE BACKGROUND**

This section discusses the site characteristics and previous investigations conducted at Wescott Plantation.

### **2.1 SITE DESCRIPTION**

Wescott Plantation (Wescott) is a 1600-acre planned residential development and golf course community located within the city limits of Summerville, Dorchester County, South Carolina (see Figure 1, Appendix A). Construction of the development began in 2000 and continues presently. Currently, Wescott is comprised of over 2,300 homes located within subdivided “villages” or neighborhoods constructed by a host of builders. A review of available historical aerial photographs indicates that Wescott was built on a previously heavily wooded, swamp-like area. According to topographic data, Wescott is located approximately 32 feet above mean sea level (amsl) and is bordered on the south by Coosaw Creek, a tributary of the Ashley River. Figures 2 and 3, located in Appendix A, illustrate the previous and current site conditions, respectively. While the Field Trip Report commonly refers to Wescott, the area of concern is the Pebble Creek community of Wescott.

### **2.2 SITE HISTORY**

In late August 2006 and early September 2006, homeowners of 5240 and 5242 Lenora Drive located within the Pebble Creek subdivision at Wescott, complained to Lennar Homes, builders of the residences at Pebble Creek, of strong sewer-like odors and irritation of the throat and mouth. Pressure testing performed by the plumbing company responsible for installing the homes’ sanitary sewer systems indicated leaking pipe sections beneath the bathroom floor of 5240 Lenora Drive and beneath the bathroom and kitchen floors at 5242 Lenora Drive. The pipes were repaired and subsequent pressure testing indicated no other leaks. Follow up investigations, conducted by consultants’ for Lennar Homes, indicated that explosive levels of methane were present in the two homes located in Pebble Creek subdivision (see Section 2.3).

In May 2007, local media outlets covered the story extensively. A summary of the media coverage is presented in Section 6.0 of this report and copies of available news reports are provided in Appendix E.

In June 2007, the South Carolina Department of Health and Environment Control (SCDHEC) requested that the EPA Emergency Response and Removal Branch (ERRB) perform a RSE at Wescott. Based on a meeting held on June 26, 2007 with SCDHEC, the EPA On-Scene Coordinator (OSC) determined that it was necessary to conduct in-home air monitoring for methane on a citizen requested basis as part of the RSE.

## **2.3 PREVIOUS INVESTIGATIONS**

Following the repair of the sanitary sewer system pipes at 5240 and 5242 Lenora Drive, two independent environmental consulting agencies were contracted by Lennar Homes to conduct indoor and outdoor air screening and sampling at the affected homes. On September 11, 2006, Trident Environmental Services (TES) conducted indoor air monitoring for methane using a Photovac MicroFid instrument [an organic vapor analyzer/flame-ionizing detector (OVA/FID)]. TES screened the air from the breathing zone of several rooms, the cracks in the concrete slab, and around the plumbing line penetrations in the slab. The screened air indicated levels of methane gas ranging from 50 parts per million (ppm) to 200 ppm in the breathing zone of the interior of the homes and levels exceeding 3,000 ppm in the openings in the floor slabs around sewer pipes and vent pipe risers.

On September 14 and 15, 2006, Professional Services Industry (PSI) conducted subsurface soil exploration at the recommendation of TES at the homes located at 5240 and 5242 Lenora Drive. The study was performed to determine the levels of organic material in the soil and also to monitor the soils for vapors exceeding the lower explosive limit (LEL) for methane. Nineteen borings were augered to the depth of the water table [approximately 5 feet below ground surface (bgs)] along the exterior perimeter of the two homes and three cores were drilled through the concrete slab of each residence. Boring and core samples were visually assessed for decomposing vegetation and organic material; screened using a Q-RAE Multi-Gas detector for the LEL for methane, hydrogen sulfide (H<sub>2</sub>S), oxygen (O<sub>2</sub>), and carbon monoxide (CO); and, sampled for laboratory analysis of organic material by American Standards and Testing Method (ASTM) D-2974-00. Air screening at the homes indicated that explosive levels of methane were present in the two homes.

On October 4, 2006 to November 29, 2006, PSI conducted air monitoring at 91 of the 129 homes in the Pebble Creek subdivision. PSI did not perform testing in the remaining 38 homes due to the unavailability of access agreements with those homeowners.

On October 11, 2006, PSI conducted further air sampling at several locations in the residences at 5240 and 5242 Lenora Drive. Samples were collected using vacuum air canisters over an 8-hour interval. Air samples were submitted to a laboratory for volatile organic compounds (VOC), methane gas, H<sub>2</sub>S, and CO analysis.

In November 2006, based on the recommendation of PSI, a Methane Gas Passive Venting System was installed at the home located at 5240 Lenora Drive. Additionally, a Methane Gas Active Venting System was installed at the home located at 5242 Lenora Drive. The systems were designed, installed, and are currently monitored by PSI.

The PSI reports, including conclusions, are available for review on the EPA OSC.NET website (Ref. 5).

### **3.0 FIELD INVESTIGATION ACTIVITIES**

This section summarizes field investigation activities conducted by TN&A START on June 27, 2007 to June 29, 2007 at Wescott in support of the RSE. TN&A START and EPA conducted air screening at 19 residential properties at the Pebble Creek subdivision of Wescott. Table 1 in Appendix B lists the properties screened during the field investigation. Overall, homes were screened for methane gas and other organic vapors using a TVA-1000 photoionization detector (PID)/FID; and, the LEL for methane, H<sub>2</sub>S, CO, and O<sub>2</sub> using a MultiRAE four gas meter. Continuous readings of the breathing zones, cracks in the concrete slab, and along the plumbing line penetrations were taken with each instrument within each room of the properties screened. The highest concentration observed in each room was recorded in the logbook (Appendix F) and presented in Table 3 in Appendix B. All of the homes screened during the field investigation, including the homes located at 5240 and 5242 Lenora Drive, indicated the LEL for methane gas significantly below explosive levels. Other screened parameters (H<sub>2</sub>S, CO, and O<sub>2</sub>) were also measured below applicable EPA levels of concern.

In addition to the screenings conducted using the TVA-1000 and MultiRAE, one air sample was collected from each of the two previously installed methane gas venting systems at the Pebble Creek subdivision using Summa<sup>®</sup> air canisters. Table 2 in Appendix B presents the air samples collected and

Figure 5 in Appendix A illustrates the sample locations. The samples were collected by inserting sample intake lines 5 to 6 inches into pre-drilled holes in each venting system and allowing the air to collect over a two minute period. Air samples were submitted to a fixed laboratory for VOC and methane gas analysis. Table 4 in Appendix B presents the laboratory analytical results for the air samples collected. Analytical results are summarized in Section 5.0 of this report.

#### **4.0 HISTORICAL AERIAL PHOTOGRAPH INTERPRETATION**

This section describes the historical aerial photograph interpretation conducted to determine the approximate timeframe when the natural state of Wescott was disturbed and if dirt roads had been constructed that could have been used to access any refuse disposal sites within the field investigation area. Eleven aerial photographs of the site area dated 1938 to 2006 were reviewed. Copies of the aerial photographs obtained for this survey are included in Appendix A.

Based on the review of available aerial photographs, the natural state of the area was first disturbed in 1951 when a dirt road was constructed from Dorchester Road and extended northeast into the property boundary, crossing over Coosaw Creek. The aerial photograph dated 1955 shows that the dirt road led to a clearing north of the Pebble Creek subdivision, in the area south of where Chisolm Court is now located. The aerial photograph dated 1971 shows a second road from the southeast and intersects the previously mentioned dirt road in the area where Folklore Drive is now located. This road and the previously mentioned dirt road comprise the boundaries of the field investigation area. Based on the Coosaw Creek surface water drainage pathways, it is highly unlikely that material from this cleared area would have migrated toward the Pebble Creek subdivision. Figure 4 in Appendix A highlights this cleared area.

Little or no change to the site is discernable in the aerial photographs dated 1984 to 1999. The 2003 aerial photograph shows the fully constructed golf course framing the Pebble Creek subdivision. The 2005 aerial photograph shows construction operations including newly cleared land in the area of the homes with prior elevated readings of methane gas. Soils appear darker in color possibly representing relatively higher soil moisture conditions, which correlate with the subsurface exploration of the area conducted by PSI, during which heavy organic matter was noted in select subsurface soil borings (Ref. 4).

## 5.0 ANALYTICAL RESULTS

This section summarizes the fixed laboratory analytical results, including applicable quality control and quality assurance (QA/QC) measures taken to ensure that the quality of the data is satisfactory. Analyses for the air samples were performed by Enthalpy Analytical, Inc. (Enthalpy), a commercial laboratory located in Durham, North Carolina. The analytical laboratory report can be found in Appendix D. Analytical data from Enthalpy was reviewed and validated by a START chemist. Data qualifiers were applied as necessary according to the Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Organic Data Review. In the absence of other QC guidance, method-specific QC limits were also utilized to apply qualifiers to the data.

A total of three air samples (WSP-01, WSP-02, and WSP-BG) were collected for the investigation at the Pebble Creek subdivision of Westcott and submitted for methane analysis by EPA Method 18 and full scan VOC analysis by EPA Method TO-14/15. Data evaluation was based on the following parameters:

- Data Completeness
- Holding Times
- Blanks
- Calibrations/Internal Standards
- Surrogate Recoveries

The overall quality of this data package was acceptable. Holding times were met for the analyses submitted. The laboratory blank was non-detect for all reported compounds. Initial and continuing calibrations, along with the internal standard data and surrogate recoveries were within QC limits.

For the TO-14/15 Method, a 500-milliliter (mL) aliquot of sample was analyzed for each of the samples, which resulted in no analytical dilution. However, various dilutions were also performed on all three samples in order to quantify the results that exceeded the calibration range (i.e. samples that were flagged “E”). In sample WSP-01, acetone, methylene chloride, 2-butanone, and tetrahydrofuran was re-analyzed at a higher dilution to bring the target analytes within the calibration range. Sample WSP-02 was diluted in order to quantify the results for acetone, toluene, and propylene. Sample WSP-BG was diluted in order to quantify the results for acetone, carbon disulfide, benzene, heptane, toluene, and chlorobenzene. All E-flagged result values were disregarded in favor of the unflagged results in the more dilute analyses.



Analytical results for each analyte were reported down to the method detection limits. Sample results detected above the method detection limit, but below the limit of quantification, were qualified as estimated and flagged “J”. Tabulated results can be found in Table 4 in Appendix B.

## **6.0 MEDIA COVERAGE**

This section summarizes media coverage reports involving Wescott in the local and national news media outlets. Appendix D contains several news articles relating to the methane issues at Wescott.

On May 6, 2007, ABC news published an article where a resident cited specific health issues that were believed to have been caused by high levels of methane inside homes in the Pebble Creek subdivision. The report cited air samples collected in the home that exceeded EPA standards for indoor air quality.

On June 29, 2007, ABC news published another article stating that EPA had conducted indoor air monitoring over a three day period at Wescott. The article stated that the initial readings indicated dramatically low levels of methane gas.

On July 17, 2007, Business Wire published an article stating that Lennar Homes announced that after an EPA methane gas investigation at Wescott, the homes were now deemed safe. EPA determined that levels of methane gas were well below what the EPA considers permissible. The article states that methane levels and indoor air sampling performed in June 2007 showed that none of the samples collected and analyzed reached the government mandated hazardous level, the threshold for safety concerns.

On August 19, 2007, The Post and Courier identified a small group of homeowners that criticized the homebuilder in several televised reports, citing construction defects and potentially harmful levels of methane gas seeping into some homes. However, even after Lennar Corporation offered to repair the problems and EPA determined the methane levels did not pose a health hazard, some residents still feel their neighborhood has been tainted, and hurts their home resale values.

## **7.0 SUMMARY AND CONCLUSIONS**

A RSE was conducted at the Pebble Creek subdivision of Wescott in order to identify conditions which would trigger a removal action by EPA to remove or minimize any potential threats to human health or

the environment. TN&A START conducted a review of historical information including aerial photographs and independent reports; performed air monitoring and sampling; and, provided written and photographic documentation in support of this RSE.

In late August 2006 and early September 2006, homeowners of two residences located in the Pebble Creek neighborhood at Wescott complained to the builders of strong sewer-like odors and adverse health effects. Testing conducted by the plumbing company responsible for installing the sanitary sewer systems indicated leaking pipe sections beneath the two residences. The pipes were repaired; however, follow-up indoor air sampling conducted around the sewer pipes and in the floor slab cracks of the two properties indicated explosive levels of methane. The builder installed venting systems at the two residences and, based on available file material, the methane levels decreased significantly.

The site received a substantial amount of media coverage with regards to the methane gas levels at the two homes at Pebble Creek and other complaints regarding the construction of Lennar Homes.

In June 2007, SCDHEC requested that the EPA perform a RSE at Wescott in and around the Pebble Creek residences. TN&A START conducted a field screening investigation of 19 residences using a TVA-1000 PID/FID and a Q-RAE Multi-Gas instrument from June 27, 2007 to June 29, 2007. Field screening results did not indicate methane gas levels exceeding the LEL. Additionally, two air samples were collected from the methane gas venting systems located at 5240 and 5242 Lenora Drive and submitted for laboratory analyses of methane gas and VOCs. According to the Agency for Toxic Substances Disease Registry (ATSDR), both the historical air sampling data of October 2006 and the RSE field investigation analytical results indicated no total organic compounds or individual organic constituents that would present a public health threat. The homeowners were notified of ATSDR's findings and they were posted on the EPA OSC website (Ref. 5).

Lennar Homes of Charleston has agreed to conduct periodic air monitoring to ensure dangerous levels of methane gas do not reoccur.

This report details all available data relevant to the activities conducted in support of the RSE for Wescott. No further actions are anticipated at this site.

## 8.0 REFERENCES

1. T N & Associates, Inc. (TN&A). Wescott Plantation – Health and Safety Plan. June 2007.
2. TN&A. Wescott Plantation – *Removal Site Evaluation Combined Work Plan and Sampling Plan*. July 2007.
3. U.S. Environmental Protection Agency (EPA). Region 4 Science and Ecosystems Support Division. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual. November 2001.
4. TN&A. Quality Assurance Project Plan. January 2006.
5. EPA. On-Scene Coordinator Website. Internet address:  
[http://www.epaossc.org/site\\_profile.asp?site\\_id=3271](http://www.epaossc.org/site_profile.asp?site_id=3271) Last accessed July 20, 2007.

**APPENDIX A**

**FIGURES**

## **APPENDIX B**

### **TABLES**

**APPENDIX C**  
**LABORATORY ANALYTICAL REPORT**

**APPENDIX D**  
**MEDIA COVERAGE**

## **APPENDIX E**

### **PHOTO LOG**



**APPENDIX F**  
**FIELD LOG NOTES**