



ODOR SUMMARY REPORT

DRT America, Inc. / Springfield Facility

Prepared By:

TRINITY CONSULTANTS

1230 Peachtree St NE
300 Promenade
Atlanta, GA 30309
678.441.9977

July 22, 2024

241101.0016

Overview

DRT America, Inc. (DRTA), retained Trinity Consultants (Trinity) to investigate potential sources of odor at DRTA's Springfield, GA facility located at Governor Treutlen, Dr., Rincon, GA 31326 (Springfield facility). This investigation was intended to assess whether the Springfield facility could be the source of odors affecting the area surrounding the plant. After scoping discussions, Trinity began its work in January 2024, completing its work with the preparation of this report. During Trinity's investigation, DRTA undertook modifications to the Springfield facility intended to reduce the potential for odors from the facility, and Trinity was able to make observations both before and after these modifications. Based on its investigation, Trinity has concluded that the potential for odors from the Springfield facility in its current configuration to extend beyond its boundaries is very limited, and Trinity's modeling indicates that any such odors would not reach nearby residential neighborhoods under typical operating conditions, based on a review utilizing meteorological conditions over five years. Trinity's investigation also confirmed that DRTA's removal from service of its wastewater basins significantly reduced the potential for odors from the facility to extend beyond its boundaries.

The Springfield facility operates under a SIP (State Implementation Plan) synthetic minor permit No. 2869-103-0021-S-01-0 (S-01-0), issued February 11, 2016, by the Georgia Environmental Protection Division (EPD). The operations covered under the permit include chemical manufacturing from the processing of pine derivatives including crude sulfate turpentine (CST) and other materials. The permit includes emissions limitations for particulate matter (PM), sulfur dioxide (SO₂), carbon monoxide (CO), volatile organic compounds (VOC), nitrogen oxides (NO_x), and individual/total hazardous air pollutants (HAP) emissions below the respective major source thresholds for federal construction (New Source Review) and Title V operating permit programs.

In order to complete this investigation, Trinity undertook three different phases of analysis: Trinity conducted a field odor study involving multiple site visits under varying weather conditions; Trinity collected and analyzed odor samples from several potential odor sources at the Springfield facility; and Trinity performed odor modeling to identify the potential for offsite odor using odor sampling results and meteorological data compiled over a five-year period.

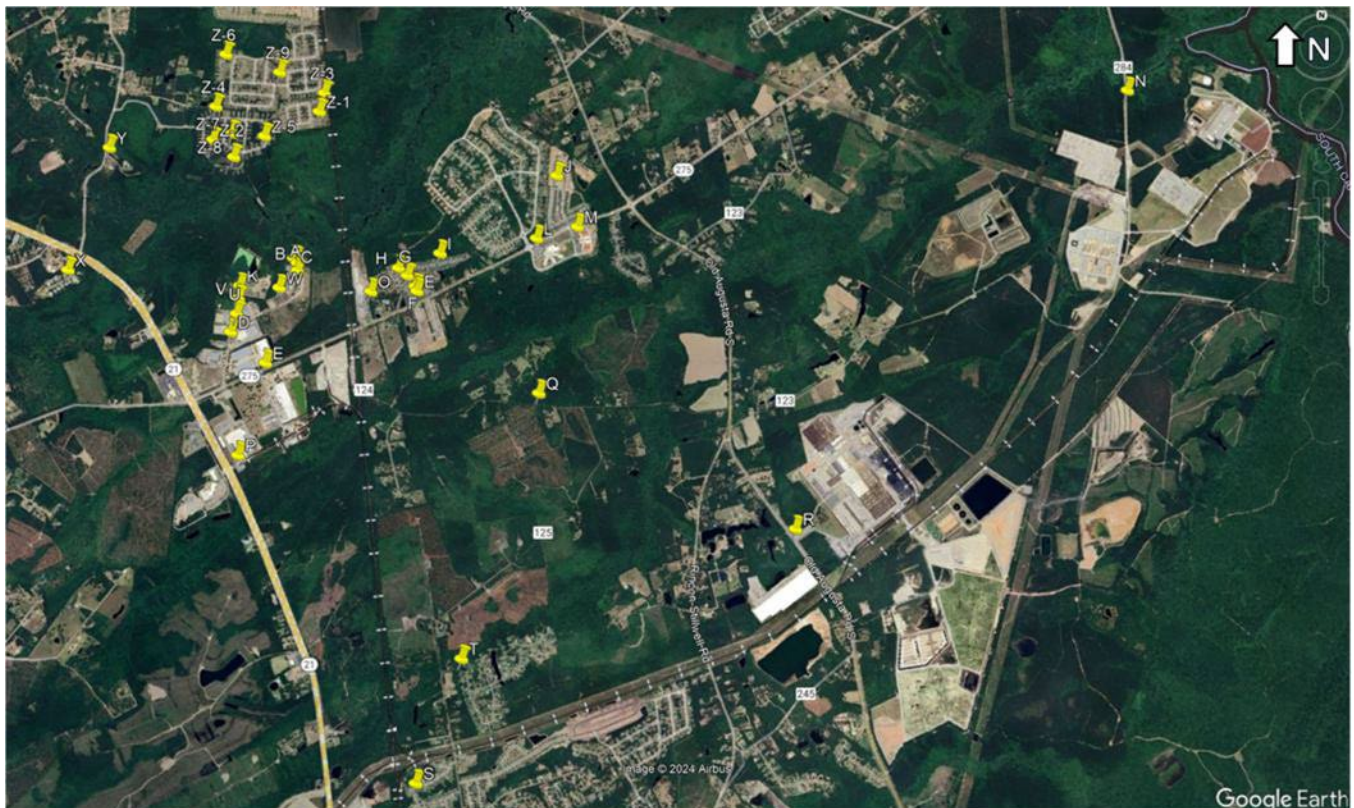
Field Odor Study

The field odor study involved the collection of odor measurements by Trinity's trained odor assessors, using specialized equipment to allow for quantification and characterization of odors at the Springfield facility property as well as in the surrounding community. Trinity's team familiarized itself with the potential odor sources at the Springfield facility and in the surrounding area. Trinity's team visited the facility and surrounding areas on several occasions in the first quarter of 2024 to assess any detectable odors under different operating and weather conditions, both before and after the modifications to the Springfield facility. Figure 1 shows the locations at which Trinity's team collected field odor observations. Trinity's study evaluated the potential for odor not only from the Springfield facility, but also from other potential odor sources in the area.

Odor measurements were collected at the Springfield facility property as well as in the surrounding community. Measurements were taken using a Nasal Ranger device, which allows for quantification and characterization of odors in an objective manner. The Nasal Ranger allows the assessor to assign a numerical odor strength of observed odors. An odor descriptor wheel is also used to define the descriptors of scents identified in the field (e.g., Chemical Odors such as Turpentine/Pine or Sulfur, Offensive Odors such as Sewer, Rotten Eggs, Fecal, Septic, Manure, Rancid, or Earthy Odors such as Musky, Swampy, Woody, Chalk-like, Smoky). The odor assessors recorded detection threshold (DT) and recognition threshold (RT) readings as applicable at each location. Odor assessors also recorded the relative intensity and offensiveness of the odors on scales of 1 to 5 and -5 to 5, respectively (where 1 means least intense and -5 means most offensive). Weather conditions at the time of the odor observations were also recorded and compared to meteorological data obtained using weather station data.

Odor assessors adhered to best practices to ensure high quality measurements. These included refraining from eating food 30 minutes before conducting field work, refraining from spicy food, caffeine, mints, gum, and flavored drinks until the odor assessment was completed. Assessors also were equipped with a carbon filter mask to avoid desensitization in the field. In instances where a carbon filter mask could not be worn, the assessors "zeroed" out their noses by breathing into the Nasal Ranger while it is on a blank setting (i.e., exposed to carbon filtered air only) for at least one minute before proceeding with each measurement.

Figure 1. Evaluated Odor Field Study Locations



- a. The locations selected included potential alternative odor sources, residential communities or schools. Locations shifted based on wind direction on the day of sampling. Locations evaluated were limited by access to private property.

Odor Sampling

Trinity also performed odor sampling at the Springfield facility. Trinity’s team collected air samples based on its assessment of potential odor sources at the Springfield facility. The samples were delivered to an accredited odor laboratory and analyzed with a dynamic olfactometer. The results of this sampling program quantified key odor parameters that were necessary for the modeling Trinity performed in the third phase of its investigation. Trinity’s sampling confirmed that the most potent odor source at the Springfield facility was the wastewater treatment system which was decommissioned, emptied and cleaned out during the course of Trinity’s investigation.

Odor sampling was conducted by two Trinity personnel on February 6-7, 2024, while the Springfield facility was operating under normal operating conditions prior to the decommissioning of the wastewater basins. Odor samples are simply process air which is collected in 10-L Tedlar bags and analyzed in an odor laboratory with a dynamic olfactometer. Best practices were used when collecting odor samples (e.g., once samples were collected, Tedlar bags were immediately placed in opaque bags to avoid photochemical deterioration of the sample; samples were shipped overnight to the odor laboratory and processed within

30 hours of sample collection time to minimize sample degradation, etc.). Samples were shipped to an accredited odor laboratory for analysis.

At the laboratory, the odor sample air is diluted as necessary and presented to 4-8 odor panelists, who are trained individuals prescreened for odor sensitivity to evaluate odor samples. The dilution of the odor sample is reduced until the odor panelists can provide the detection threshold, recognition threshold, and hedonic tone of the observed odors.

- ▶ **Detection Threshold (DT)** as determined by ASTM Standard E679 (Standard Practice for Determination of Odor and Taste Thresholds By a Forced-Choice Ascending Concentration Series Method of Limits) and European Standard EN13725 (Determination of odour concentration by dynamic olfactometry and odour emission rate). Result is the dimensionless dilution ratio at which half the assessors detect the diluted air as different from the blank air. Odor units (OU) or Odor units per cubic meter (OU/m³) are commonly used as pseudo-units.
- ▶ **Recognition Threshold (RT)** as determined by E679 and EN13725. Result is dimensionless dilution ratio at which half the assessors recognize a character in the diluted odorous air. OU or OU/m³ are commonly used as pseudo-units.
- ▶ **Hedonic Tone (HT)** value is average rating of assessor's opinion of odor pleasantness on scale of -10 (most unpleasant) to +10 (most pleasant).

For purposes of our investigation, Trinity determined that an odor standard of 2 OU/m³ is an appropriate benchmark to assess the Springfield facility based on our professional judgment and odor expertise.

The sampling locations chosen and the collection methodology employed are shown in Figure 2. Duplicate odor samples were collected for each of the odorous sources/conditions pre-determined with site personnel:

- ▶ **Wastewater basins**
- ▶ **Secondary containment basins**
- ▶ **Truck loading area**
- ▶ **Scrubber/thermal oxidizer (TO) stack**

Figure 2. Odor Sampling Locations and Methodologies



The sampling results demonstrated that the wastewater basins were the most significant sources of odor sampled at the Springfield facility. The next highest odor samples were collected from the secondary containment basin.

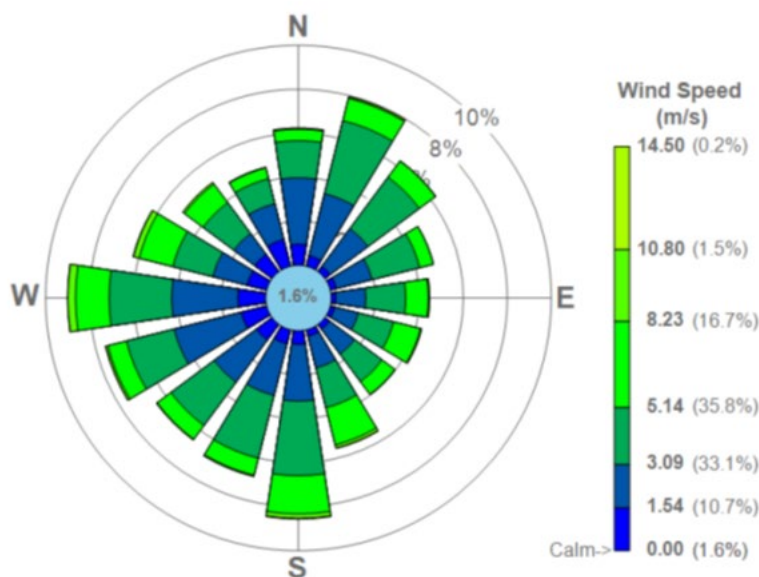
Odor Modeling

Trinity performed odor modeling based on the information collected during the odor sampling phase of its investigation. The goal of the odor modeling was to use those data to evaluate potential future off-site odor levels under normal operating conditions, given the remaining odor sources at the Springfield facility and considering five years of meteorological data. The modeling confirms that the decommissioning of the wastewater system at the Springfield facility was very effective in reducing the potential for off-site odor transmission, and demonstrates that as currently configured the Springfield facility does not have the potential for transmission of odors to any residential area above the odor benchmarks identified by Trinity.

Odor samples were obtained from the facility wastewater area, truck loading area, secondary containment areas, and from the thermal oxidizer/scrubber stack, because these sources were identified to be the most potentially odorous sources at the site based on discussions with DRTA and as confirmed during the pre-sampling site visit on February 1, 2024. The results of the odor sampling were then taken and incorporated into an air dispersion modeling analysis, to approximate the off-site odor impacts potentially caused by the facility. Trinity utilized the maximum DT (detection threshold) in the odor dispersion modeling analysis for all areas except secondary containment #1. As that area was not directly sampled, the average sampling data from secondary containment #2 was utilized in the modeling analysis for secondary containment #1. In the modeling process, the DT result (OU/m^3) is multiplied by the volumetric flowrate (or source area) to generate an OU/s emission rate.

The site was digitized using the US EPA model AERMOD. The odorous emission points, buildings, fence line, ground level receptors (i.e., locations where odorous concentrations are calculated), meteorological datasets, terrain information, model options, and output selections were set up. For example, the modeling uses wind speed and direction readings from the nearest weather station that meets the model's data requirements (as determined by EPA and EPD). Figure 3 presents a wind rose for the five years of meteorological data utilized in this analysis. As depicted, the winds are predominantly from the south and west. It is also worth noting, that the location of the Springfield facility is approximately 30 miles from the ocean, and there is therefore the potential for shoreline fumigation conditions to, at times, drive atmospheric conditions towards situations that could effectively hamper dispersion of odors from facility sources (e.g., "inversion" conditions), thereby potentially increasing the ground level detection of odors off-site.

Figure 3. Wind Rose for the Savannah International Airport Surface Data



The objective of the odor modeling analysis was to understand how potential off-site odor impacts may have changed after decommissioning of the wastewater basins, and to estimate potential impacts of remaining odor sources at the Springfield facility. Figure 4 represents the output of the model. This figure depicts the maximum odor readings under the five-year meteorological lookback that would be expected based on the existing configuration of the Springfield facility during normal operations. Even under this worst-case modeling approach, off-site odors from the Springfield facility would not be expected to exceed the 2 OU/m³ threshold beyond the adjacent industrial areas marked in yellow-green on Figure 4.

Figure 4. Modeling Results Without Facility Wastewater System



Conclusions

Over the six-month course of this project, Trinity's team carefully assessed the Springfield facility, nearby sources of odor and potential odor impacts on sensitive receptor populations in residential areas. Based on this investigation, Trinity has concluded that by decommissioning the wastewater basins DRTA has eliminated the most significant source of odors at the Springfield facility, and that that facility, as it is currently configured, does not present a threat of odors to any residential area under normal operating conditions and a typical range of meteorological conditions. Any offsite odor impacts above 2 OU/m³ can be expected to be confined to the Springfield facility itself or to the areas depicted on Figure 4 that are very close to the fence line of the facility, and confined to industrial areas.