



Customer-Focused Solutions

**Omya Inc., Florence, VT
Odor Study Work Plan
Phase 2: Odor Testing and Dispersion Modeling**

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1.0 Background

Residents in the neighboring communities of the Omya Florence, VT facility have experienced odor episodes in the past and claimed that the emissions from the Omya facility are the source of these odor episodes. As a responsive corporate citizen, Omya has conducted numerous investigations to evaluate the potential sources of these odor episodes and has modified process emission stacks at its East Plant to reduce potential odor impact in the community.

In the summer of 2004, the Environmental and Natural Resources Law Clinic of the Vermont Law School, on behalf of Residents Concerned About Omya (RCO), a newly formed residents group in Florence, prepared an odor complaint in a letter to the State of Vermont, Agency of Natural Resources, Department of Environmental Conservation (DEC), Air Pollution Control Division, that, in addition to raising concerns over odors, raised concerns about potential health impacts associated with airborne chemicals that were causing the odors. As a result of the complaint, DEC met with Omya and a plan to study odors was formulated.

In conjunction with its work with DEC, Omya has asked TRC Environmental Corporation (TRC) to develop and implement a work plan that consists of three parts: (1) Primary Study; (2) Odor Testing and Dispersion Modeling, and (3) Air Testing and Health Assessment. In April 2005, TRC conducted the Primary Study, and concluded that the originally suspected sources appear to be the origin of the odor episodes in the neighboring community. TRC also recommended that the second part of the Work Plan, Odor Testing and Dispersion Modeling, be carried out.

The purpose of this second phase study is to determine the odor emission rates of the odor sources and their impacts in the downwind locations, as well as to recommend odor abatement technologies to reduce the odor impacts in neighboring communities.

2.0 Odor Sampling and Odor Threshold Value Determination

Up to eight (8) samples will be collected at the East Plant, with which the odors appear to be connected. Triplicate samples will be collected at the facility's Flash Dryer #4 and Flash Dryer #5 stacks, to obtain sample data over different time periods. Samples will be collected in Tedlar[®] sampling bags using a bag-in-box sampler (Figure 1).

All samples will be transported to TRC's Olfactory Laboratory in Windsor CT, where they will be evaluated for odor threshold, odor character, and odor intensity following ASTM procedures:

- ASTM E 679-91 (re-approved 1997) Standard Practice for Determination of Odor and Taste Thresholds by a Forced-Choice Ascending Concentration Series Method of Limits
- ASTM E 544-99 Standard Practice for Referencing Supra-threshold Odor Intensity

Air flow rate of each emission source also will be estimated or measured using EPA or industry standard procedures. The odor emission rate (OER) of each emission source then will be derived by multiplying the odor threshold value and the air flow rate. As rule of the thumb, ground level emission sources with an OER of 2 million CFM or greater usually have the potential to cause an odor episode at downwind locations. The results of the odor emission evaluation will be input to a dispersion model that estimates numeric odor impacts at designated downwind locations as discussed below.

3.0 Odor Dispersion Modeling

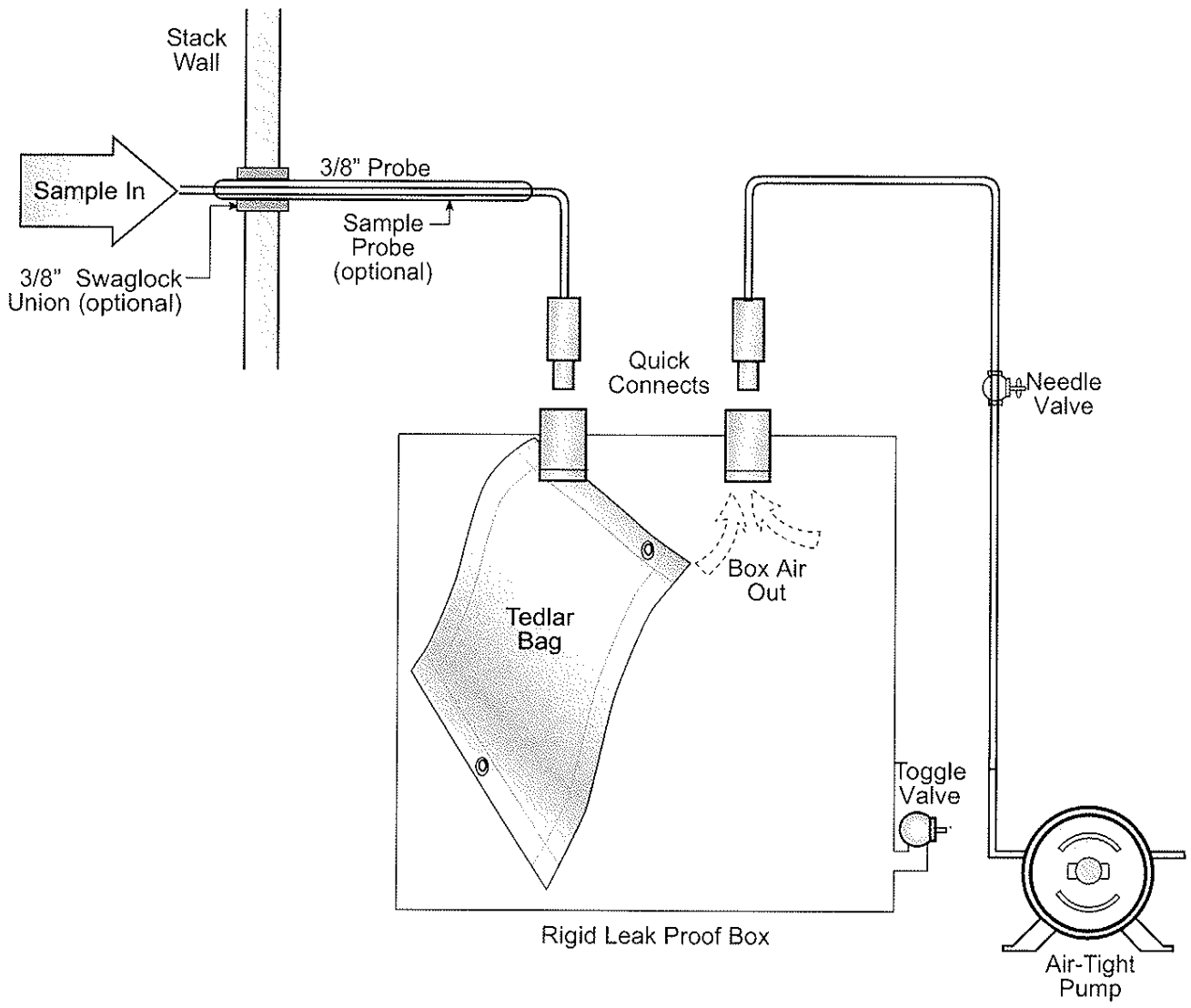
Odor emission rate data and source physical dimensions, such as stack height, surrounding buildings, and weather conditions, will be input into Industrial Source Complex, Short Term version 3 (ISCST3), a dispersion model developed by US EPA to quantitatively estimate odor impacts at downwind locations. The results of the dispersion modeling will establish the source-receptor relationship required to identify the odor emission source or the odor episodes. This information then is used to determine type of control required for each emission source.

4.0 Odorous Compounds Characterization

Up to four (4) of the samples collected will be sent to Mayfly Laboratory in Mystic, CT (860-536-7431) for odorous compounds identification analysis. Mayfly will identify and quantify odorous compounds, in mixture samples, using gas chromatography (GC) with mass spectrometer (MS) or other suitable compound specific detectors. The results of the odorant identification will be used in the development of abatement approaches.

5.0 Odor Abatement Recommendations

Based on the odor sampling, dispersion modeling and odor characterization results, TRC will study the feasibility of several odor abatement methodologies, compare pro and con of each method, and select a most appropriate abatement method. That information will be provided to Omya and the DEC for further review and consideration.



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FIGURE 1
SAMPLING SYSTEM SCHEMATIC