

# NASAL RANGER® FIELD OLFACTOMETER

## APPLICATION GUIDE FOR FIELD OLFACTOMETRY

### ODOR MONITORING

Field olfactometry with the Nasal Ranger® Field Olfactometer is a cost effective means to quantify odor strength in terms of “Dilution-to-Threshold” (D/T) ratios. Facility operators, community inspectors, and neighborhood citizens can confidently monitor odor strength at specific locations around a facility’s property line and within the community.

The following “**protocols**” are presented in brief form as an application guide:

- (1) **On-Site Monitoring** – Operators have the unique ability to monitor odors throughout the day with field olfactometry. Operator monitoring can include odor observations of arriving materials, outdoor process activities, and fugitive air emissions. Monitoring with a Nasal Ranger® Field Olfactometer on-site may include odor observations at predetermined locations, i.e. open doorways, driveways, storage areas, and fence lines.
- (2) **Random Monitoring** – A frequently used method for ambient odor monitoring is the “random inspection” approach. Random monitoring leads to a compilation of data that can be correlated with meteorological information and on-site activities. Managers and regulators alike find that random odor monitoring with a Nasal Ranger® Field Olfactometer is a cost effective protocol.
- (3) **Scheduled Monitoring** – Well-planned scheduled monitoring can be limited to a daily “walk-about” or “drive around”, or structured with several visits to predetermined monitoring locations. Data from a Nasal Ranger® Field Olfactometer can be used to correlate the many parameters that influence odor episodes, including meteorological conditions and on-site operating activities.
- (4) **Intensive Odor Survey** – An in-depth evaluation of on-site odor generation and off-site odor impact may be needed for permit renewal or facility expansion. Extensive data collection with the Nasal Ranger® Field Olfactometer will identify which sources or operations cause odor and which ones do not cause odor off-site. All potential odor sources and operations could be ranked and their relative contributions determined. Short term trials or tests of odor mitigation measures, e.g. odor counteractants, would also require an intensive period of data collection using a Nasal Ranger® Field Olfactometer.
- (5) **Citizen Monitoring** – The implementation of citizen odor monitoring with Nasal Ranger® Field Olfactometers can be part of an interactive community outreach program. The primary function of citizen odor monitoring is to collect information, through accurate record keeping, which represents real conditions in the community. Citizens recruited and trained to measure odors using Nasal Ranger® Field Olfactometers would also report odor descriptors. Citizen odor monitoring will assist in determining prevalent times and prevalent weather conditions of odor episodes. Citizen odor monitoring with Nasal Ranger® Field Olfactometer will also help in understanding the odor strength at which an odor first becomes a nuisance.
- (6) **Complaint Response** – The use of “Odor Compliant Hot Lines” is a common method used by facilities and communities to respond to odor episodes. A complaint response plan, with designated “on-call” responders, creates opportunities for verifying odor episodes, tracking odor sources, and quantifying odor strength with a Nasal Ranger® Field Olfactometer.
- (7) **Plume Profiling** – Standard and specialized air dispersion modeling predicts the transport and dilution of odors by the wind. A protocol, known as plume profiling, supplements and “calibrates” air dispersion modeling. Several inspectors with Nasal Ranger® Field Olfactometers, spaced cross wind and down wind from an odor source, would measure and record the odor strength as “D/T” values. The odor plume profile would then be documented and overlaid on the local terrain map. Therefore, the air dispersion modeling and the local topography would be integrated with actual odor measurements from the Nasal Ranger® Field Olfactometer.

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### ODOR REGULATIONS

A field olfactometer device (“scentometer”) is referenced in a number of existing state odor regulations. The “Dilution to Threshold” (D/T) terminology and the method of calculating the D/T are also referenced.

The criteria of an odor regulation often defines compliance as

**“...ambient air that is less than 7 D/T”** (7 used for exemplary purpose only).

The exact wording in a regulation is important and may be stated in two ways:

**Compliance criteria:** “...compliance if...less than 7 D/T.”

**Nuisance criteria:** “nuisance if...equal to or greater than 7 D/T.”

In these two examples, if an air pollution inspector observed “odor” with the field olfactometer set at a 7 D/T

**The “odor” would meet the criteria for nuisance or**

**The ambient air would be “non-compliant”.**

Odor regulations that utilize field olfactometry and a calibrated field olfactometer, e.g. Nasal Ranger Field Olfactometer, also define the number of observations needed and the time frame of the observations.

For example, a regulation may read:

**“...Two field olfactometer observations in a one-hour period separated by 15 minutes each...” OR**

**“...Two field olfactometer observations not less than 15 minutes apart within a 1-hour period...”**

The “protocols” in this Application Guide for Field Olfactometry are presented in brief example form and are not mutually exclusive, often being integrated into a comprehensive odor management program. Likewise, the “odor regulation” criteria for compliance and nuisance are presented as examples only and are taken from actual odor regulations.

**Please contact St. Croix Sensory, Inc. at 1-800-879-9231 (+651-439-0177), or visit [www.NasalRanger.com](http://www.NasalRanger.com), if you have any questions about the use and application of the Nasal Ranger® Field Olfactometer or if you need additional information or referral to industry or regulatory specialists.**