Attachment 15

AIR MONITORING PLAN

AIR MONITORING PLAN

CLOSURE IMPLEMENTATION PLAN APPENDIX 15

Prepared For:

EXIDE TECHNOLOGIES
Vernon, California

September 29, 2017

This document summarizes air monitoring to be conducted during closure of the Exide facility in Vernon, California.

Visual Performance Standard

The performance standard for closure activities is no visible dust.

Ambient Air – Facility Perimeter

Ambient air monitoring will be conducted daily during closure. The Ambient Air Monitoring will be performed in accordance with the current SCAQMD Title V Permit, the applicable sections of SCAQMD Rule 1420.1, and the applicable Rule 1420.1 Compliance Plan(s). As the ambient air monitor locations were selected for facility operations, perimeter ambient air monitors may be moved to better correspond to locations representative of closure activities. AQMD concurrence will be obtained before moving perimeter air monitors.

In accordance with SCAQMD Rule 1420.1, ambient air concentration shall not exceed 0.150 $\mu g/m^3$ lead averaged over any 30 consecutive days and 10.0 nanograms per cubic meter (ng/m^3) arsenic averaged over a 24-hour time period. From January 1, 2016 to December 31, 2016, the ambient air concentration for lead shall not exceed 0.110 $\mu g/m^3$ averaged over any 30 consecutive days. On and after January 1, 2017, the ambient air concentration for lead shall not exceed 0.100 $\mu g/m^3$ averaged over any 30 consecutive days.

Work Area Perimeter

Continuous real-time particulate (dust) monitoring will be conducted downwind of the work area. Dust monitoring will be implemented by the Dust Mitigation Oversight Contractor when work is conducted within a Temporary Enclosure or in an area of deconstruction conducted after decontamination outside of an enclosure, but not when work is conducted within the HAKI or Total Enclosure buildings. As may be relevant to the particular work aspect at hand, the continuous dust monitors (e.g., Dust Tracks) will be deployed on a stand downwind and potentially upwind of a work function to track and gauge the trending in particulate dust generation during work progress. The number of DustTraks utilized downwind will be in proportion to the degree of wind direction variance with one unit for each 30 degrees of wind direction variance. When the wind direction is outside the capture zone of at least one Dust Trak unit, the work will be stopped until the Dust Trak unit(s) can be relocated. Upwind real-time monitors will also be used for comparison to downwind results. Monitoring will be conducted using an aerosol monitor such as a DustTrak Aerosol Monitor or equivalent. Manufacturer's information for the DustTrak monitor is attached. Readings will be taken every 15 minutes and recorded on the attached form or similar. Data will be downloaded from the datalogger on the monitor at the end of the working period each day. The aerosol monitor will be calibrated and maintained as recommended by the manufacturer.

Personal Air Monitoring

Personal air monitoring will be conducted as discussed in the Contractor's site-specific Health and Safety Plan.

Reporting

Ambient air monitoring data collected by Exide and dust monitoring data collected by the Dust Mitigation Oversight Contractor and/or the Contractor shall be provided to Exide and the Resident Engineer using a searchable/sortable continuously updated summary table (i.e., Excel spreadsheet). The summary table shall include the sample ID, a description of the wind direction, a description of the sample location onsite, a description of the sample location with respect to work activity (upwind or downwind), the sample collection date and time period, the sample collection volume, the sample result, and the calculated air quality value. The updated summary table and a copy of the laboratory analytical report shall be submitted to Exide on the same day that the data is received.

Performance Standard Exceedances

In the event that an ambient air standard set forth in Rule 1420.1 or in the Rule 1420.1 Compliance Plan for Closure Activities is exceeded, the Contractor will be required to increase dust control measures, such as the use of water sprays to control dust, increased housekeeping, spraying paved surfaces adjacent to the work zones, and changing work methods.

As observing personnel note potentially adverse dust evolution using the DustTrak devices (i.e., increasing levels) in conjunction with visual observation and experience, they shall direct work stoppage and then direct adjustments in the work practices and/or the applied control measures as appropriate. In response to adverse visual observations or DustTrak results, the measures discussed in the Engineering Controls Plan will be implemented.

Repeated exceedances will result in shutting down the operation causing the dust until appropriate corrective measures are developed and implemented. The Contractor will not be compensated for down time caused by the inability to meet the performance criteria.

Real Time Air Monitoring Form

DTSC Third-Party Oversight Contractor

REAL TIME AIR MONITORING RESULTS

Project Name: _____ Technician: _____

Date: _____ Wind Direction (start of day): _____

Weather Conditions: _____ Wind Direction (noon): _____

Work Area Type (circle one): Decon Equipment Removal Deconstruction Excavation Backfill

Description of Activities in Work Area: _____

Monitor Location (circle one): Enclosure Entrance Opposite End

Monitor Number: _____

Monitor Location Sketch: (provide north arrow, Work Area, fences,distances to property line)

Time Interval	Actual Time	Reading (µg/m^3)	Performance Standard (µg/m3)	Is reading less than standard (circle yes or no)?	
0700 to 0715				YES	NO
0715 to 0730				YES	NO
0730 to 0745				YES	NO
0745 to 0800				YES	NO
0800 to 0815				YES	NO
0815 to 0830				YES	NO
0830 to 0845				YES	NO
0845 to 0900				YES	NO
0900 to 0915				YES	NO
0915 to 0930				YES	NO
0930 to 0945				YES	NO
0945 to 0930				YES	NO
0930 to 0945				YES	NO
0945 to 1000				YES	NO
1000 to 1015				YES	NO
1015 to 1030				YES	NO
1030 to 1045				YES	NO
1045 to 1100				YES	NO
1100 to 1115				YES	NO
1115 to 1130				YES	NO
1130 to 1145				YES	NO
1145 to 1200				YES	NO
1200 to 1215				YES	NO
1215 to 1230				YES	NO
1230 to 1245				YES	NO
1245 to 1300				YES	NO
1300 to 1315				YES	NO
1315 to 1330				YES	NO
1330 to 1345				YES	NO
1345 to 1400				YES	NO
1400 to 1415				YES	NO
1415 to 1430				YES	NO
1430 to 1445				YES	NO
1445 to 1500				YES	NO
1500 to 1515				YES	NO
1515 to 1530				YES	NO
1530 to 1545				YES	NO
1545 to 1600				YES	NO
1600 to 1615				YES	NO
1615 to 1630				YES	NO
1630 to 1645				YES	NO
1645 to 1700				YES	NO

Real Time Air Monitoring Equipment

DUSTTRAK™ Aerosol Monitor

The DUSTTRAK™ Aerosol Monitor measures aerosols in a wide variety of environments, from offices and industrial workplaces to outdoor environmental and construction sites. TSI's DUSTTRAK provides reliable exposure assessment by measuring particle concentrations corresponding to PM10, PM2.5, PM1.0 or respirable size fractions.

The DUSTTRAK is a portable, battery-operated laser photometer which gives you a real-time digital readout with the added benefits of a built-in data logger. Suitable for clean office settings as well as harsh industrial workplaces and outdoor applications, the DUSTTRAK detects potential problems with airborne contaminants such as dust, smokes, fumes and mists.

The DUSTTRAK is easy to use, too. You can perform quick spot checks or you can program the advanced logging modes for long-term sampling. You can program the start/stop times, recording intervals and other parameters. You can even set up the instrument for continuous unattended operation.

The DUSTTRAK's new continuous analog output and adjustable alarm output allow remote access to real-time particle concentration data. Applications include site perimeter monitoring, ambient monitoring, process area monitoring and other remote uses. The alarm output with user-defined setpoint alerts you when upset or changing conditions occur. This feature allows you to program a switch closure at a concentration value of your choosing.

The DUSTTRAK provides a real-time measurement based on 90° light scattering. A pump draws the sample aerosol through an optics chamber where it is measured. A sheath air system isolates the aerosol in the chamber to keep the optics clean for improved reliability and low maintenance.

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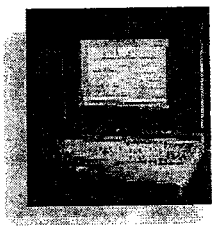
Specifications

Model 8520 DustTrak Aerosol Monitor

Sensor Type	90° light scattering
Range	0.001 to 100 mg/m³ (Calibrated to ISO 12103-1, A1 test dust)
Resolution	±0.1% of reading or ±0.001 mg/m³, whichever is greater
Zero Stability	±0.001 mg/m³ over 24 hours using 10-second time-constant
Particle Size Range	0.1 to approximately 10 micrometers
Flow Rate	Adjustable 1.4 to 2.4 l/min (1.7 nominally)
Temperature Coefficient	+0.001 mg/m³ per °C (for variations from temperature at which the DustTrak was zeroed)
Operating Temperature	32° F to 120° F (0°C to 50°C)
Storage Temperature	-4° F to 140° F (-20°C to 60°C)
Operating Humidity	0 to 95% rh (non-condensing)
Time Constant	Adjustable from 1 to 60 seconds
Data Logging	31,000 data points (21 days of logging once/minute)
Logging Interval	Adjustable from 1 second to 1 hour
Physical	
External Dimensions	8.7 in. × 5.9 in. × 3.4 in. (221 mm × 150 mm × 87 mm)
Instrument Weight	3.3 pounds with batteries (1.5 kg)
Serial Interface	RS-232 1200 baud
Power	
AC	AC adapter (included)
Battery	Four C-size alkaline batteries (included)
Battery Run-time	Alkaline 16 hours

Analog Output Specifications	
Analog Output Voltage	0 to 5 VDC
Analog Output Scaling[1]	0 to 100 mg/m³ 0 to 10.0 mg/m³ 0 to 1.00 mg/m³ 0 to 0.100 mg/m³
Output Impedance	0.01 ohm
Maximum Output Current	15 mA



The DustTrak comes complete with TSI's TrakPro™ Data Analysis Software to allow you to perform a more comprehensive analysis of your measurement results. This exclusive Windows®-based program helps you generate the detailed graphs and reports needed to effectively communicate your findings.

Specifications are subject to change without notice.
Windows is a registered trademark of the Microsoft Corporation.

Alarm Output Specifications	
Type	Non-latching, MOSFET solid state (polarized)[2] analog switch
Setpoint Range[1]	0.010 to 100 mg/m³
Maximum Voltage	15 VDC
Maximum Current	1 Amp
Deadband	-5% of alarm setpoint
Connector	4-Pin, Mini-DIN connector

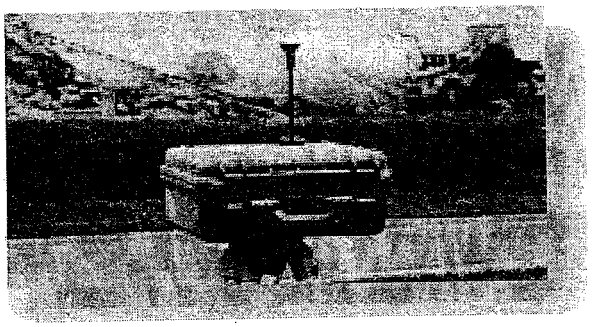
1 User selectable through TrakPro™ Data Analysis Software.
2 See TSI Application Note ITI - 074 for important wiring information.

Ordering Information

Model	Description
8520	The DustTrak Aerosol Monitor and accessories includes: Auxiliary Analog and Alarm Outputs, Carrying Case, Alkaline Batteries, TrakPro™ Data Analysis Software, Filter, Computer Cable, 25-pin to 9-pin Adapter, Operation Service Manual, Calibration Certificate, 10 mm Nylon Dorr-Oliver Cyclone, Inlet Conditioning Kit 1.0 and 2.5 µm, Sampling Extension Tube, Miscellaneous Service Tools and Two-Year Warranty.

Optional Accessories

Model	Description
8520-1	Environmental Enclosure



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CERTIFIED ISO 9001

P/N 2980077 Rev. C

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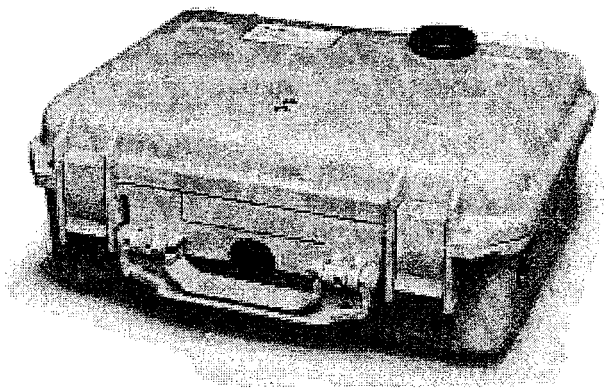
DUSTTRAK®
Environmental Enclosure

The DUSTTRAK™ Aerosol Monitor is a portable, battery-operated, laser-photometer that measures and records airborne dust concentrations. The DUSTTRAK has been used to measure aerosols in a wide variety of environments, from offices to industrial workplaces. Now the DUSTTRAK has a weatherproof Environmental Enclosure accessory for making the same accurate and precise measurements outdoors.

The Environmental Enclosure can be used in conjunction with the DUSTTRAK for many different applications. While its primary use is in outdoor applications, the enclosure and extended-life battery may also be advantageous in indoor industrial applications to provide additional security and protection to the instrument.

The Environmental Enclosure comes with a sampling inlet specifically designed to sample efficiently in a broad range of wind conditions. The enclosure also contains a water trap that prevents precipitation from entering the instrument. The extended-life, lead acid batteries that are included with the enclosure permit continuous, 24-hour operation. Two batteries are supplied with the unit, allowing one battery to be charged while the other is in operation. The rugged enclosure provides a secure method of storing and transporting the DUSTTRAK and its accessories.



The DUSTTRAK Aerosol Monitor has an easy-to-read digital display showing real-time concentrations in milligrams per cubic meter (mg/m^3) while simultaneously logging data into memory. The DUSTTRAK has enough memory to record weeks worth of data...even at one-minute intervals. The unique sheath air system provides consistent performance in the dirtiest environments. Critical lenses are isolated from particle-laden flows by surrounding the sample with filtered air. Particles can't collect on surfaces they never touch!

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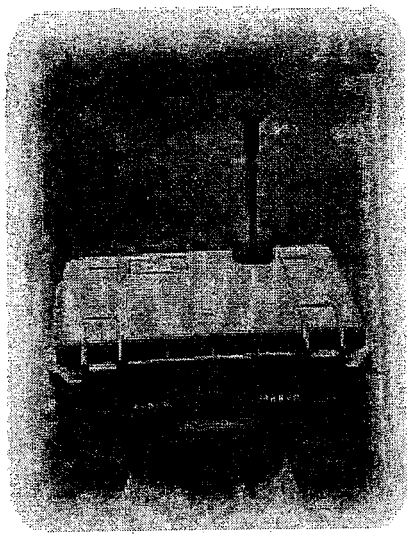
The Environmental Enclosure may be mounted to a standard surveyor tripod equipped with a 5/8"-11 threaded stud. The enclosure should be set up in a location where it can easily sample the particles of interest. It should be placed away from obstructions which may affect wind currents. The sampling inlet on the Environmental Enclosure samples most efficiently from 0 to 22 mph.



Monitoring applications include:

- Environmental site perimeters
- Fugitive dust emissions
- Dust control
- Construction sites
- Harsh industrial environments
- Urban pollution

Specifications

Environmental Enclosure Model 8520-1

Sampling Conditions	
Operating Temperature	32 to 120°F (0 to 50°C)
Wind Speed	0 to 22.5 mph (0 to 10 m/s)
Aerosol Concentration Range	0.001 to 100 mg/m³ (Calibrated to ISO 12103-1, A1 test dust)
Storage Temperature	-4 to 140°F (-20 to 60°C)
Zero Stability	±0.001 mg/m³ over 24 hours using 10-second time-constant
Particle Size Range	0.1 to approximately 10 micrometers (Upper limit is dependent on flow rate)
Flow Rate	1.7 L/min
Temperature Coefficient	+0.001 mg/m³ per °C (for variations from temperature at which DUSTTRAK was zeroed)
Physical	
External Dimensions	16 in. × 13 in. × 7.5 in. (406 mm × 330 mm × 191 mm)
Weight (with battery and DUSTTRAK)	15.8 lb (7.2 kg)

User Maintenance	
Maintenance Check/ Data Collection	Recommended daily, but longer intervals allowed based on battery usage.
Clean Inlet	Weekly, under normal conditions, or daily if concentrations are over 30 mg/cm³
Re-grease O-rings	As needed
Power Requirements	
External Battery Pack	6 VDC, 10 Ah
Battery Run-time	24 to 60 hours (typical)
Battery Charge Time	13 hours at 72°F (22°C) (New battery, deep discharge to 95% charge)

Ordering Information

Model	Description
8520-1	Environmental Enclosure includes: Two Battery Packs, Battery Charger, Omni-directional Sampling Inlet, Dust Caps, Tubing, Plug, and O-rings.

Specifications are subject to change without notice.

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CERTIFIED ISO 9001

P/N 2980098 Rev. C

Printed in U.S.A.

DUSTTRAK™ Aerosol Monitor
Model 8520

Frequently Asked Questions

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Related Items
» Application Notes
» Technical Notes
» Service
» Support

Print This Page

General

1. **How often is calibration required?**
   TSI recommends returning the instrument to the factory for cleaning and calibration on an annual basis. Turnaround time is typically 2 to 3 working days after receipt of the unit with proper documentation. Recommended user maintenance schedules for routine cleaning, filter replacement, and zero check is covered in the Operation and Service Manual.

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2. **What U.S. standards or guidelines apply to ambient particulate levels in buildings?**

   ASHRAE 62-1989 states:
   "Indoor air quality shall be considered acceptable if the required rates of acceptable outdoor air are provided for the occupied space." ASHRAE 62-1989 references the national primary ambient-air quality standard for outdoor air as set by the U.S. EPA.

   Long term–50 µg/m³ concentration average over 1 year (0.05 mg/m³)
   Short term–150 µg/m³ concentration average over 24 hours (0.150 mg/m³)

   Although this standard was developed for outdoor air, current thinking by industry experts is that indoor air quality should be as good as that of the outdoor air.

   Exposure values for specific substances are published by OSHA (Occupational Safety and Health Administration), NIOSH (National Institute for Occupational Safety and Health), and ACGIH (American Conference of Governmental Industrial Hygienists).

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3. **Can I measure other particle size ranges with the DUSTTRAK?**
   Yes. The DUSTTRAK is supplied with inlet conditioners (impactors) that limit the upper size to 2.5 or 1.0 microns. Additionally, the DUSTTRAK is supplied with a 10-millimeter Nylon Dorr-Oliver Cyclone for respirable sampling with a cut-off at 4 microns.

4. **What type of device is the DUSTTRAK aerosol monitor?**
   The DUSTTRAK is a laser photometer. The sensing mechanism consists of a laser diode directed at the aerosol stream. Scattered light is collected with optics and a photodetector at 90° to the light beam. The intensity of the scattered light is a function of the particle mass concentration.

5. **Can I use the DUSTTRAK outdoors?**

   Yes. The DUSTTRAK has been used outdoors but it is no considered weatherproof, so it is not suitable for long-term, unattended operation. However, the optional Environmental Enclosure is designed to protect the DUSTTRAK from harsh weather conditions. It is also sometimes used indoors if the environment is particularly demanding. Click here for details on the Environmental Enclosure.

6. **How long will the DUSTTRAK monitor operate before the internal filter overloads in an environment containing 3-5 mg/m³ dust?**

   At a 5 mg/m³ concentration, the internal nozzle requires cleaning at 70-hour operation intervals and the internal filter must be replaced after 140 hours of operation. This subject is covered in the Operation and Service Manual.

7. **Can I measure respirable aerosol mass concentration with the DUSTTRAK monitor?**
   Yes. The DUSTTRAK is supplied with a 10 millimeter Nylon Dorr-Oliver Cyclone which provides a particle size cut-off at 4 microns (internationally accepted as the 50% cut-off size for respirable aerosol mass).

8. **What is the measurement range of the DUSTTRAK monitor?**
   The mass concentration range is 0.001 to 100 mg/m³. The particle size range is 0.1 to 10 microns.

9. **Can I change the calibration constant to correspond to a different aerosol such as coal dust or oil mist?**
   Yes. Factory calibration to the standard ISO Test Dust is assigned a calibration constant of 1.00. You may change the calibration constant using the procedure outlined in the DUSTTRAK manual. Factory calibration can be restored by resetting the calibration to 1.00.

10. **How does sampling in high humidity affect the readings obtained from the DUSTTRAK?**
Relative humidity higher than 80 percent can cause particle concentration readings to be biased high from the actual concentration of dry particles. The amount that an aerosol's mass concentration increases due to water absorption is a complex function of the particle's material and the atmosphere's absolute humidity (i.e. specific humidity). This humidity effect can bias the DUSTTRAK's readings up to 60 percent high in the most extreme conditions of high temperature and high relative humidity.

11. **What are the differences between Log 1, Log 2, and Log 3 modes?**

Log 1 mode requires a manual start/stop action. Logging interval and time constant may be set from the keypad.

Log 2 and Log 3 modes provide automatic start/stop logging for unattended operation. The two modes are identical in their basic operation, but may be programmed individually using a PC compatible computer and TRAKPRO software. The following items may be defined:

- Start date
- Start time
- Test length
- Logging interval
- Number of tests
- Time delay between tests

After Log 2 and Log 3 protocols have been defined using TRAKPRO software, the Q-TRAK Plus/DUSTTRAK will retain the programmed information.

12. **Is the DUSTTRAK aerosol monitor intrinsically safe?**
No. The DUSTTRAK has not been tested or certified for operation in a hazardous area where intrinsic safety is required.

13. **Do statistics relate to the total time the instrument is turned on or only to the time sampling is taking place?**
Statistics are collected only during the time sampling is taking place. This is true whether you are operating in the Survey mode or Logging mode.

14. **Will the DUSTTRAK measure liquid aerosols such as water and oil?**
Yes. A major advantage of using the DUSTTRAK is its ability to measure volatile aerosols such as water and oil. These cannot be measured accurately gravimetrically because of evaporation from the collection filter.

15. **What are the traceability specifications?**
There is no National Institute of Standards and Technology (NIST)

standard for optical mass measurements. Calibration of the DUSTTRAK is performed by TSI using Emery oilmist aerosol and nominally adjusted to the respirable mass of standard ISO 12103-1, A1 test dust (formerly called Arizona test dust).

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16. **What batteries are used in the DUSTTRAK, and how long do they last?**
The DUSTTRAK is shipped with four standard C-size alkaline batteries. Quality alkaline batteries will provide about 16 hours of operation. Nickel cadmium (NiCd) batteries may be used in the DUSTTRAK, but must be recharged in an external charger provided by the user. Operating time using fully charged NiCd batteries will be about 6 hours. For long-term measurement, the DUSTTRAK may be operated on AC power using the adaptor supplied with the instrument. If the DUSTTRAK is powered by the batteries included with the optional Environmental Enclosure, the battery life is at least 24 hours in very cold weather extremes. Click here for details on the life of the batteries included with the Environmental Enclosure.

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17. **What happens if my batteries die during a measurement?**
Low battery charge is indicated by a battery symbol on the display. The DUSTTRAK will continue to operate for approximately 60 minutes before measurement and logging functions stop. Power will shut off automatically, but the logged data will be retained by an internal lithium backup battery.

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18. **Can I use a different cyclone filter on the DUSTTRAK?**
Yes. The flow rate of the DUSTTRAK may need to be adjusted to the rate specified with the new cyclone. Flow rate can be adjusted between 1.4 and 2.4 L/min using the flow meter provided with the DUSTTRAK.

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19. **Can I connect a computer to the DUSTTRAK for continuous monitoring?**
Yes. An enhancement made in November 1996 allows the DUSTTRAK to do serial data acquisition using simple ASCII commands. The DUSTTRAK can be set up to provide a reading once per interval (from 0 to 60 seconds) or to output a single concentration reading. Request Application Note ITI-044 for more information.

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20. **What length of sample tube can be used with the DUSTTRAK monitor?**
The DUSTTRAK is supplied with a 4 foot sampling tube. Using a sampling tube longer than 4 feet is not recommended because particle transport losses in the tube may adversely affect the measurement.

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21. **Where can I get a connector to mate with the 4-pin, mini-DIN output connector on the back of the DUSTTRAK?**
Connectors are commercially available. Just specify a male, 4-pin, mini-DIN connector.

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22. **Can I use the DUSTTRAK aerosol monitor to**

determine when air system filters need to be changed or cleaned?

Yes. If you have established the particle level at which the filters need service, you can use the DUSTTRAK to monitor current operating conditions. Since no alarm or set point capability is provided in the DUSTTRAK, it would be necessary to observe conditions manually.

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23. **Can I use the DUSTTRAK for remote monitoring applications?**

Yes. The DUSTTRAK can be used to monitor aerosol mass concentrations in real-time by transmitting data from remote locations via the analog or serial output features. This real-time information can be used for a variety of remote monitoring applications such as environmental site perimeter monitoring, ambient work area monitoring, and process area monitoring.

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24. **Can the Log 1, Log 2, and Log 3 modes be operating at the same time?**

No. Only one logging function can be activated at a time.

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25. **If I need to have laboratory analysis performed to obtain independent data, how can the DUSTTRAK aerosol monitor help me?**

The DUSTTRAK can be used for real-time evaluation of aerosol concentration during sample collection for laboratory analysis. Gravimetric samples only provide an average of concentration over the total collection period.

The DUSTTRAK also provides assurance and a record of conditions during the periods between laboratory analysis tests. The DUSTTRAK can be a valuable tool in troubleshooting suspected problem areas or monitoring changing conditions.

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26. **How do I tell if my DUSTTRAK has the analog and alarm output features?**

All DUSTTRAKS have the analog output and alarm functions as of 10/18/00 beginning with serial number 22499. You can visually verify if your DUSTTRAK is equipped with these features. Look for the 4-pin, mini-DIN connector labeled "Analog/Alarm Output". It is located on the backside of the instrument. All DUSTTRAKS with serial numbers from 21960 to 22498 can be upgraded to incorporate these functions for a nominal fee. Older DUSTTRAKS with serial numbers lower than 21960 cannot be upgraded to incorporate this new feature. Click here for upgrade information.

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27. **How much data can be logged before the DUSTTRAK runs out of memory?**

The DUSTTRAK can log over 31,000 data points, or 21 days of data stored at 1-minute intervals. Logging intervals may be longer or shorter as set by the user.

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28. **Can I adjust the alarm setpoint without using TRAKPRO software?**

No. TRAKPRO software version 3.1 or higher is required to control the

alarm and analog output functions. The DUSTTRAK is shipped from the factory with the alarm setpoint at 0.100 mg/m³ and with the alarm function turned "off".

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29. **Can logged data be transferred to another database or spreadsheet for reporting or data analysis?**
Yes. Using TRAKPRO software, data can be exported in standard comma-delimited ASCII format. Most spreadsheet and database programs can read this format.

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30. **What happens to the analog output signal if the measured aerosol concentration exceeds the programmed scaling limit?**
If the DUSTTRAK measures aerosol mass concentrations that are greater than the selected scaling range, the analog output voltage will remain fixed at the maximum of 5.0 volts.

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31. **I purchased my DUSTTRAK before the analog and alarm features were available. Can I upgrade my DUSTTRAK?**

All DUSTTRAKS with serial numbers from 21960 to 22498 can be upgraded to incorporate these functions for a nominal fee. Older DUSTTRAKS with serial numbers lower than 21960 cannot be upgraded to incorporate this new feature. Click here for upgrade information.

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32. **What is the warm-up time of the DUSTTRAK?**
When the DUSTTRAK is first turned on, it takes about a minute for the instrument to settle down to a stable reading. After warm-up, stable readings can be obtained in 10-15 seconds.

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33. **How long can the cable be for transmitting the DUSTTRAK'S 0-5 VDC analog output?**

We have successfully transmitted the 0-5 VDC signal 100 feet using 22 gauge wire without any degredation (voltage drop) in the signal. However, if signal transmission is required over distances greater than 100 feet (30 meters), then a 0-5 VDC to 4-20 mA signal converter should be considered. See TSI Application Note ITI-073 for additional information.

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34. **Where do I find technical information on interfacing and using the DUSTTRAK analog output and alarm functions?**

This technical information can be found in TSI Application Note ITI-073 and Application Note ITI-074 for the analog and alarm output functions, respectively.

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35. **How can I convert the DUSTTRAK'S 0-5 VDC analog output to a current output such as 4-20 mA?**

By using a standard signal converter that converts 0-5 VDC to 4-20 mA. See TSI Application Note ITI-073 for additional information.

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36. **What happens if the data logger memory becomes full?**

If the data logger becomes full, the test in progress will stop. Information stored up to that point will be retained in the data logger.

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37. **Is logged data retained if I change the instrument batteries?**

Yes. There is an internal backup battery that protects all stored data. The battery is designed to last for more than 10 years.

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38. **How long is the warranty on the DUSTTRAK monitor?**

The DUSTTRAK is warranted to be free from defects in workmanship and material for a period of twenty-four months from the date of shipment to the customer. See the Operation and Service Manual for detailed warranty terms and conditions.

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39. **What is the analog output resolution in volts per milligram/m³?**

The analog output resolution is a function of the scaling range selected. See TSI Application Note ITI-073 for more detailed information.

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TrakPro/Data Logging

1. **Can we copy the software for use on other computers?**

Yes. The software is copyrighted, but may be copied to enable use of TSI products with several computers.

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2. **What does the TRAKPRO software allow me to do?**

TRAKPRO Data Analysis Software has numerous functions:

- Download (receive) stored data from the Q-TRAK Plus, DUSTTRAK, PROTECTAIR, and P-TRAK data logger.
- Store test data to disk.
- Display data in table or graphical form.
- Send table or graphical information to a monochrome or color printer.
- Combine multiple data sets into a single graph for comparison purposes. Up to six channels of data may be presented from tests run at the same time or at different times.

- Create graph titles, annotate graphs, change scales.
- Print graphs on monochrome or color printers.
- Export data to other database or spreadsheet software via comma-delimited ASCII data file.
- Set date and time functions in the Q-TRAK Plus, DUSTTRAK, PROTECTAIR, and P-TRAK.
- Alter the selection of logging intervals and time constants available for Log 1 in the Q-TRAK Plus/DUSTTRAK/P-TRAK.
- Define & upload data logging protocols (log 2 & log 3) used by the Q-TRAK Plus/DUSTTRAK/P-TRAK for unattended operation.

- **What is the cost of the TRAKPRO software?**
  TRAKPRO Data Analysis Software is provided at no additional charge.

- **I'm not a computer expert. What is the easiest way to understand the software?**
  TRAKPRO software delivered with the Q-TRAK Plus IAQ Monitor or DUSTTRAK aerosol monitor includes example data. These files contain test examples useful for learning how the software operates independent of the instrument.

- **What are the computer requirements for TRAKPRO Data Analysis Software?**
- Windows® 95, 98, ME, NT, or 2000
- RS-232 Serial Port

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DUSTTRAK™ Environmental Enclosure

Model 8520-1

Frequently Asked Questions

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1. **Can I leave the Environmental Enclosure out in the rain?**
   Yes. The case is weather resistant. It can tolerate all weather conditions. *It should not be placed in direct contact with the ground.*

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2. **What is the maximum particle concentration that the Environmental Enclosure can handle?**

   The Environmental Enclosure adds no constraints on the DUSTTRAK and can be used in particle concentrations up to the DUSTTRAK's maximum of 100 mg/m^3.

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3. **Which DUSTTRAK size-conditioning inlets can I use in conjunction with the Environmental Enclosure?**
   The Environmental Enclosure is compatible with the 1.0, 2.5, and 10.0 micrometer size-conditioning inlets (impactors) supplied with the DUSTTRAK. The TSI-supplied cyclone (P/N 800665) is not compatible with the Environmental Enclosure.

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4. **Where is the best place to set up the Environmental Enclosure?**
   The Environmental Enclosure can be set up and operated effectively in most outdoor locations. Rooftops, bench tops, fields, and ditches are all examples of places you could place the Environmental Enclosure. The inlet tube must be oriented substantially perpendicular to the ground and in a place where there are no obstructions that will disturb the air flow around it. Lood for a location with consistent, stable wind conditions, and without swirling turbulence. Trees, buildings, or other large objects will cause flow distrubance around the aerosol inlet and adversely affect readings. The best rule of thumb is to put it in the most open area available.

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5. **Does direct sunlight cause a heat problem within the Enclosure?**
   No. The light gray color acts as a thermal insulator. This will prevent an increase of the temperature inside the Enclosure above the ambient

temperature. The thermal mass of the Enclosure will also dampen temperature fluctuations normally experienced outdoors.

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6. **Can I use another battery charger to charge my battery packs?**
This is not recommended. The charger provided with the Environmental Enclosure (part no. 801564) has been designed to match the needs of this battery pack. Using another charger could result in severe damage to the battery. The charger charges at 7.5 volts, 850 mA and automatically stops when full charge is reached. The battery is a 6-volt sealed lead-acid type with a rating of 10 amp-hours.

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7. **How often do I need to clean the aerosol inlet?**

The inlet does not easily clog with debris and can be operated confidently for an extended period of time without cleaning under most conditions. If the Environmental Enclosure is being operated in high concentrations (more than 20 mg/m^3 the inlet may need frequent cleaning. The inlet should be kept clean to prevent debris from constricting the flow. The best way to clean the inlet is to unscrew it from the Enclosure and blow it out from its threaded end (base). If readings are abnormally low make sure that the inlet is clean, and blow it out periodically as a precautionary measure.

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8. **What is the aspiration efficiency of the Environmental Enclosure?**

Please refer to TSI Application Note ITI-060 *Inlet Aspiration Efficiency of the DUSTTRAK™ Environmental Enclosure Model 8520-1*.

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9. **Can I substitute different tubing to connect the Enclosure's aerosol inlet to the DUSTTRAK inlet?**
Using alternate tubing is not recommended. The tubing provided with the Enclosure is special electrically conductive tubing designed to minimize particle transport losses. Use of tubing made from other materials may result in low readings. The Environmental Enclosure Accessory Kit (P/N 801566) includes a replacement tube along with other components.

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10. **Can the Environmental Enclosure perform PM10, PM2.5, or PM1.0 sampling?**
Yes. The external inlet will effectively sample particles up to 10 microns. Your choice of DUSTTRAK inlet (impactor) will determine which PM sample is taken.

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11. **What kind of tripod do I need to mount the Enclosure?**

Any style of sturdy industrial tripod will work as long as it utilizes a connector with a 5/8 inch x 11 thread (flat). This type of tripod is often used for surveying instruments. One possible vendor is:

Sokkia Measuring Systems

Look on their web site at http://www.sokkia.com for the nearest distributor.

Although tripod mounting the Environmental Enclosure is recommended for most applications, other mounting options are acceptable. Mounting on a pole/rail/table/etc. will work suitably.

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12. **What happens if the battery becomes fully discharged while sampling?**
When the voltage of the external battery pack reaches 5.1 volts or less, the battery pack will automatically shut off. If the DUSTTRAK does not have an auxiliary power source (internal C-cell size batteries), it will turn off and the sample will be terminated. All data stored in the internal memory will be left intact due to the DUSTTRAK's internal lithium battery back-up feature.

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13. **How high should I have my Enclosure off the ground when sampling?**
The Enclosure should be kept a reasonable distance off the ground to prevent any major air flow disturbances caused by the ground from affecting the sample obtained. TSI recommends mounting the Environmental Enclosure 3 to 4 feet off the ground.

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14. **How long can I run the DUSTTRAK on the external battery pack without charging it?**
A fully charged battery will run for up to 60 hours under ideal conditions. The battery pack has an automatic voltage cut-off which prevents the battery from becoming deeply discharged. To prolong the life of your battery, you should recharge it every 24 hours.

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15. **Can I use an AC power source to run the DUSTTRAK inside the Enclosure?**
There are currently no options available from TSI for using an AC adapter along with the Environmental Enclosure. The DUSTTRAK AC adapter (P/N 2613033) is not rated for outdoor use.

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16. **Will running the flow through the additional aerosol inlet (impactor) change the flow rate to the DUSTTRAK?**
No. The pressure drop is minimal through the omnidirectional aerosol inlet on the Environmental Enclosure and causes no change in the volume of air that the DUSTTRAK is sampling. Be sure to set the DUSTTRAK flow rate to 1.7 L/min before installing it in the enclosure. The sampling inlet on the Enclosure is specifically designed for a flow rate of 1.7 L/min.

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17. **Can I turn the DUSTTRAK On/Off without opening the Enclosure through the RS-232 port in the Enclosure?**
Although the DUSTTRAK will respond to remote queries through the RS-232 port, it cannot be switched On/Off remotely. The instrument can, however, be set to record data a predetermined times through the Log 2 or Log 3 modes. Refer to the DUSTTRAK Operation and Service manual for information on how to do this.

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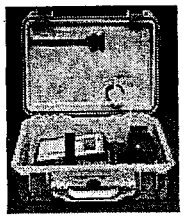
Innovative Measurement Solutions

DUSTTRAK™ Environmental Enclosure

Model 8520-1

Product Information



The DUSTTRAK™ has a Environmental Enclosure accessory for use outdoors and in harsh environments.

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The weatherproof Environmental Enclosure protects the DUSTTRAK™ Aerosol Monitor when used outdoors and in harsh industrial environments. Primarily used in outdoor settings, the wind- and rain-proof enclosure features an extended-life battery for long-term unattended sampling.

The Environmental Enclosure comes with an omni-directional sampling inlet specifically designed to sample efficiently in a broad range of wind conditions. The inlet on the enclosure samples most efficiently from 0 to 22 mph.

The high-capacity battery included with the the enclosure permits continuous, 24-hour operation. Two high-capacity batteries are included with the enclosure, allowing one battery to be charged while the other is in operation.

The enclosure can be mounted to a standard surveyor tripod (using a 5/8" thread).

Features and Benefits

- Omni-directional sampling inlet
- Efficient sampling in a broad range of wind conditions (up to 22 mph)
- Extended-life battery for continuous 24-hour monitoring
- Protection from wind and rain
- Field portable
- Enclosure provides additional protection and security to the instrument

Applications

- Environmental site perimeter monitoring
- Fugitive dust emissions
- Construction site monitoring
- Urban pollution monitoring
- Dust control
- Harsh industrial environments

Included Items

- Environmental enclosure
- Battery charger
- Water trap, sample tubing and O-rings

Literature

⊞ Brochures

⊞ Spec Sheets

News

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Have Questions?

Contact TSI Sales at 1-800-874-2811 or +1-651-490-2811 from 8 a.m. to 4 p.m. (CST), Monday through Friday, or email answers@tsi.com.

- Two high-capacity battery packs

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