



AISCT® AURORA™ VAPOUR SYSTEM • SPECIFICATION SHEET SS-AURORA-001

Vapour Screening That Correlates

AI-integrated headspace vapour screening for VOCs, CVOCS, BTEX and volatile petroleum hydrocarbons in soil — standardized, temperature-controlled, and correlated to the laboratory.

THE SYSTEM — HARDWARE, APPLICATION AND AI ENGINE OPERATE AS ONE

The Kit

Standardized sampling chamber holding a fixed headspace volume, temperature monitoring and compensation, AI-assisted signal processing, integrated calibration and bump-test logging, and encrypted data logging for TRIUM diagnostics and QA oversight.

The Application

Mobile and web data hub. Site details, sample metadata, field observations and every screening result are entered in real time. The app enforces the Aurora sampling procedure on every entry, so all data is statistically comparable.

The AI Engine

Percentile population analysis, threshold selection, spatial and depth profiling, automatic laboratory correlation, predictive concentration estimation, and AI-generated screening summary reports.

TECHNICAL SPECIFICATIONS

Target contaminants	VOCs, CVOCS, BTEX, gasoline- and diesel-range hydrocarbons (F1 fraction and volatile F2)
Measurement principle	Temperature-controlled headspace vapour extraction with AI predictive modelling
Equilibration temperature	30–35 °C, controlled and logged for every sample
Correlation performance	>90% (r^2) vapour-to-laboratory correlation under standard operating conditions
Laboratory parameters correlated	Total BTEX; F1 / VPH; F2 / LEPH
Population analysis	Percentile distribution — 1–10, 11–20, 21–30, 31–40, 41–50, >50th percentile
QA/QC outputs	Calibration records, bump tests, blanks, duplicates, triplicates
Data output	Real-time field results, exceedance flags, confidence metrics, DSS-integrated site dataset
Reporting parameters	User-defined: date range, location, sample subset, regulatory criteria
Operating temperature	Above 0 °C — units must not be exposed to freezing conditions
Deployment	Day 1 of site investigation; all phases through delineation and remediation confirmation
Regulatory alignment	CCME Guidance Manual Vol. 1 (2016), Sections 2.2, 3, 2.8 and 5.5.1; U.S. EPA field analytical guidance
Required protocol	AISCT® Aurora Standard Operating Procedure (Aurora-SOP-001) — mandatory for every sample
Data ownership	All system logs, diagnostics and firmware data owned by TRIUM

PERFORMANCE BENCHMARK

Aurora consistently achieves vapour-to-laboratory correlation coefficients exceeding 90%, against <25% — and often <10% — for conventional bag-based headspace screening. The advantage comes from the standardized, reproducible protocol enforced by the kit and the application, which removes the primary sources of error in traditional headspace methods.

62

samples in a head-to-head comparative field study

0.94

Aurora R² to laboratory Total BTEX (0.82 for Total PHC)

0.002

conventional bag-method R² on the same samples

ANALYTICS AND DATA OUTPUTS

Spatial summary	Real-time breakdown of vapour screening results by depth interval and sample location, for rapid identification of spatial trends and anomalies.
Population analysis	Automatic breakdown of the data population into percentile groups, providing statistical context for threshold setting.
Threshold selection	User-selectable screening threshold — percentile-based or manually defined — classifying samples as Impacted or Satisfies Criteria before laboratory data arrives.
Sample flagging	Automatic flagging of samples exceeding the selected threshold, updating live as the threshold is adjusted.
Depth profiling	Vertical concentration profiles by location, supporting conceptual site model development and delineation decisions.
Laboratory correlation	Automatic regression of field vapour response against laboratory Total BTEX, F1/VPH and F2/LEPH. Where a strong relationship is established (typically $r^2 > 0.80$), the system enables laboratory-grounded threshold selection, reclassification of all screened samples, and predictive concentration estimation for samples never submitted to the laboratory.

DEPLOYMENT ACROSS THE INVESTIGATION LIFECYCLE

Phase II ESA — initial screening	Deploy from the first soil investigation. Establish baseline vapour response data, identify areas of elevated concern, generate QA/QC-compliant field records, and submit targeted samples to initiate correlation.
Phase III ESA — delineation	Apply laboratory-correlated thresholds to classify all screened samples. Use population analysis and spatial summaries to direct targeted delineation sampling and reduce laboratory cost through predictive estimation.
Remediation monitoring	Track remediation performance in real time. Apply established thresholds to monitor progress against site criteria and generate automated progress reports for clients and regulators.
Site closure support	Provide a comprehensive, QA/QC-documented record of all screening performed across the project lifecycle in support of final regulatory submissions.



KEY APPLICATIONS

- Phase II site characterization for BTEX, gasoline- and diesel-range hydrocarbons
- High-density delineation programmes requiring real-time go / no-go decisions
- Chlorinated solvent sites — the physics of headspace partitioning is the same
- Remediation progress monitoring and excavation endpoint confirmation
- Sampling selection support — identifying which field samples warrant laboratory submission
- QA/QC confirmation of laboratory data trends

REQUIREMENTS AND LIMITATIONS

PROTOCOL COMPLIANCE

Aurora-SOP-001 must be followed exactly for every sample. Any deviation — non-approved consumables, non-standard headspace volumes, alternative equilibration times — invalidates the comparability of results and the reliability of analytics outputs.

EXCLUSIVITY OF THE KIT

The analytics platform, population analysis, threshold calibration and laboratory correlation functions are calibrated to the measurement characteristics of the Aurora hardware. They cannot be replicated with data from other instruments. The reported correlation performance is achievable only with the Aurora kit under the Aurora SOP.

PROFESSIONAL RESPONSIBILITY

Aurora is a decision-support tool. All professional judgments regarding site characterization, risk assessment, remediation design and regulatory submissions remain the responsibility of the qualified environmental professional overseeing the investigation.

IMPORTANT NOTICE

AISCT® Aurora™ provides field screening information only. Results are not accredited laboratory data and must not be used as a substitute for accredited laboratory analysis for regulatory compliance purposes. Results should be interpreted by qualified environmental professionals. TRIUM is not responsible for any decisions, interpretations, actions or project outcomes arising from the use of AISCT® data.

Get Started

Request a demonstration

All AISCT® equipment, consumables and supplies must be ordered through TRIUM. Procurement from unauthorized sources constitutes non-compliance with the AISCT® operating agreement.

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