AISCT® PETRO™ PHC SYSTEM • SPECIFICATION SHEET SS-PETRO-001

Fraction-Specific Hydrocarbon Screening

AI-integrated, solvent-extraction PHC screening that captures the extractable hydrocarbon fraction directly — not a vapour-phase proxy for it.

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

The Kit

Pre-filled solvent extraction tubes with ball bearings for consistent soil-to-solvent ratios, vortex mixers, centrifuge, and an optical measurement cuvette chamber, with temperature monitoring, reference compensation and encrypted data logging.

The Application

Central data hub for field and laboratory information. Sample log, automated QA/QC report covering reference checks and calibration records, and per-sample field metadata capture under an enforced standard procedure.

The AI Engine

User-entered fraction criteria per parameter and location, spatial and depth profiling, fraction-specific outputs, probability-of-exceedance evaluation, laboratory-confirmation tracking, and AI-generated screening summary reports.

TECHNICAL SPECIFICATIONS

Target contaminants	Extractable petroleum hydrocarbons — TPH, F1/VPH, F2/LEPH and F3/HEPH
Measurement principle	Standardized solvent extraction mirroring laboratory PHC methodology, optical measurement
Key differentiator	Fraction-specific extraction — captures what the laboratory measures, not what volatilizes
Laboratory agreement	>90% (r^2) extraction-to-laboratory agreement under standard operating conditions
Laboratory parameters compared	F1 / VPH; F2 / LEPH; F3 / HEPH, each against its own fraction criterion; strongest agreement on C10 and heavier compounds. BTEX is not measured or inferred
Scenario fit	Heavy-fraction impacts, delineation and endpoint confirmation
Data output	Fraction concentrations vs. criteria, with probability of exceedance per sample
Criteria entry	User-entered fraction criteria per parameter and location
QA/QC outputs	Reference checks, calibration records, blanks, duplicates, triplicates
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; best suited to larger programmes driven by extractable hydrocarbon criteria
Regulatory alignment	CCME Vol. 1 (2016) s. 5.5.1 and PHC fraction criteria (F2, F3); CSA Z769; provincial PHC guidelines; Alberta Tier 1
Required protocol	AISCT® Petro Standard Operating Procedure (Petro-SOP-001) — mandatory for every sample
Consumables	Pre-filled extraction tubes and reference materials must be sourced through TRIUM
Data ownership	All system logs, diagnostics and firmware data owned by TRIUM

PERFORMANCE BENCHMARK

Petro consistently achieves solvent-extraction-to-laboratory correlation coefficients exceeding 90%, against <25% — and often <10% — for PID and bag-based vapour screening of extractable hydrocarbons. The advantage comes from using the laboratory's own extraction approach in the field, under a standardized protocol enforced by the kit and the application.

ANALYTICS AND DATA OUTPUTS

Spatial summary	Real-time breakdown of hydrocarbon screening results by depth interval and sample location, enabling rapid identification of spatial trends and anomalies.
Criteria entry	The user selects and enters the applicable fraction criteria for the parameter at each sample location. Results are classified against those criteria directly, in the same units, at the moment of reading.
Fraction-specific outputs	F1, F2 and F3 estimates reported separately, supporting direct comparison against fraction-specific regulatory criteria.
Probability of exceedance	Field duplicate readings capture the natural heterogeneity of the soil and are expressed as a probability that the sample sits above criteria — turning scatter into usable triage information.
Depth profiling	Vertical concentration profiles by location, supporting conceptual site model development and delineation decisions.
Laboratory confirmation	Petro reports fraction concentrations directly against their criteria, so no correlation model is required to interpret a result. Confirmation samples serve the regulatory record and provide ongoing verification of decision performance — sensitivity, specificity and overall accuracy per fraction, computed from the laboratory-paired subset.

DEPLOYMENT ACROSS THE INVESTIGATION LIFECYCLE

Phase II ESA — initial PHC screening	Deploy from the first soil investigation. Establish baseline extraction response data, identify areas of elevated PHC concern, and submit targeted samples to initiate correlation.
Phase III ESA — PHC delineation	Classify every screened sample against the entered F2/F3 criteria as it is read, and use the probability of exceedance to direct targeted delineation and confirmation sampling.
Remediation monitoring	Track remediation performance in real time through continuous solvent-extraction screening against the applicable PHC criteria, with automated progress reporting.
Site closure support	Provide a comprehensive, QA/QC-documented record of all PHC screening performed across the project lifecycle in support of final regulatory submissions.

KEY APPLICATIONS

- Larger remediation programmes (beyond three to four days) driven by extractable hydrocarbon criteria
- Delineation and volume estimation on PHC-impacted sites
- Extractable hydrocarbon scenarios where vapour-phase proxies systematically underestimate impact
- Remediation endpoint confirmation against extractable PHC guidelines
- Heavy-fraction sites — diesel, lubricating oil, bitumen-adjacent — where volatility-based screening underestimates impact
- Stockpile characterization and segregation programmes

REQUIREMENTS AND LIMITATIONS

PROTOCOL COMPLIANCE

Petro-SOP-001 must be followed exactly for every sample. Any deviation — non-approved extraction vials, non-standard soil quantities, alternative extraction durations — invalidates the comparability of results and the reliability of analytics outputs.

MATRIX EFFECTS

In some soil matrices, naturally occurring constituents respond in the heavy hydrocarbon range — a known interaction between soil chemistry and hydrocarbon detection, not a system error. Where present, use F2/LEPH as the primary petrogenic marker and apply the ratio-based interpretation framework in the AISCT® guidance rather than treating an F3 flag as a determination.

EXCLUSIVITY OF THE KIT

The analytics platform, criteria evaluation, probability modelling and laboratory confirmation functions are calibrated to the measurement characteristics of the Petro hardware and the proprietary extraction consumables. The reported correlation performance is achievable only with the Petro kit under the Petro SOP.

PROFESSIONAL RESPONSIBILITY

Petro 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.

IMPORTANT NOTICE

AISCT® Petro™ 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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