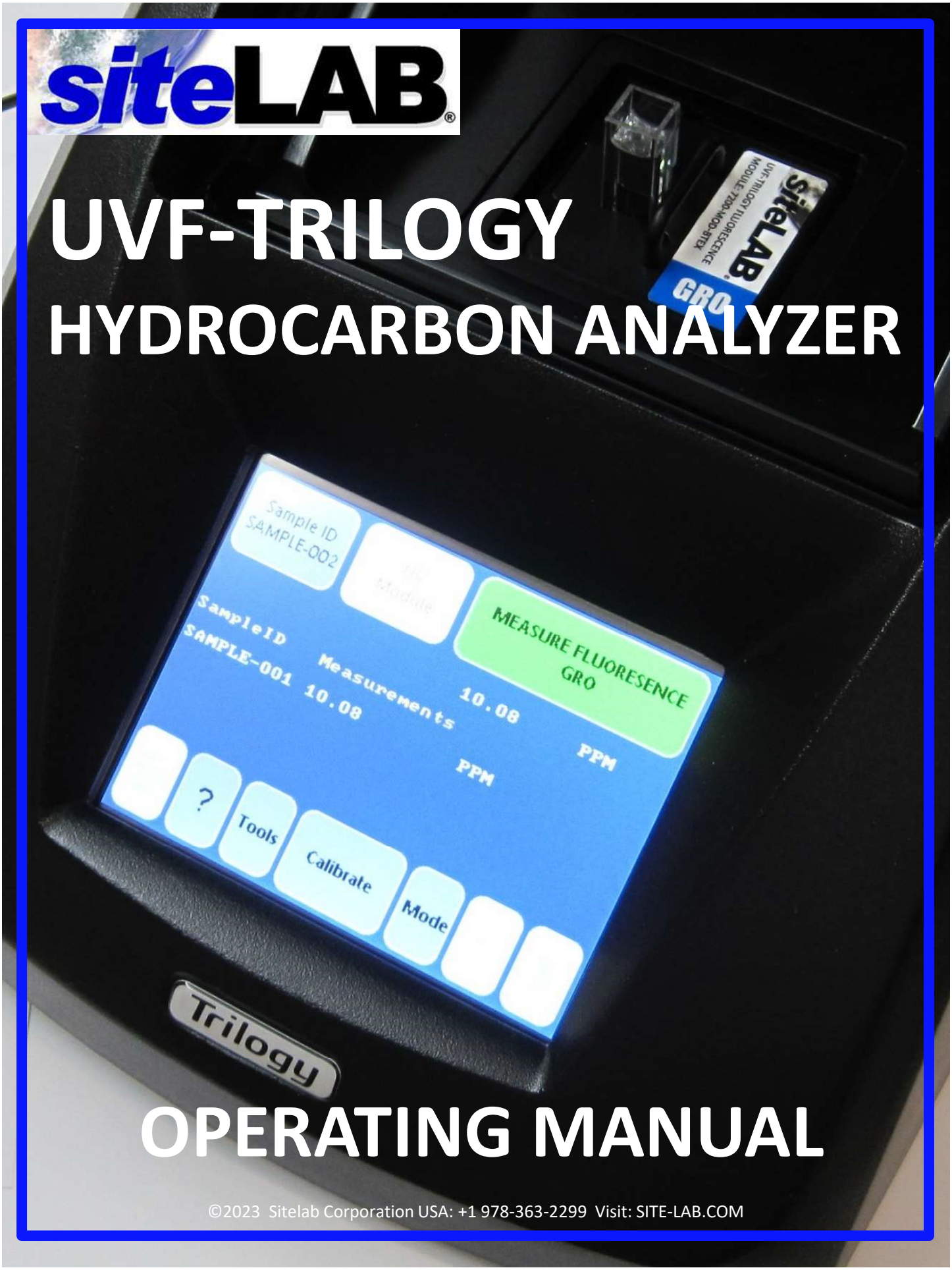


UVF-TRILOGY
HYDROCARBON ANALYZER

OPERATING MANUAL

UVF-TRILOGY OPERATING MANUAL

TABLE OF CONTENTS: **PAGE #**

1.0 INTRODUCTION

1.1 DESCRIPTION

The UVF-Trilogy is a bench top ultraviolet fluorescence spectrophotometer – or fluorometer – used to detect oil, fuel and other petroleum contaminants in soil, sediment, water or oil using solvent extraction. The analyzer can perform both quantitative and qualitative analysis. Results correlate well to certified laboratory methods.

The UVF-Trilogy features a color touch-panel screen with graphical user interface providing intuitive ease of use. The analyzer is factory calibrated using Sitelab calibration kits and can store up to 18 calibrations.

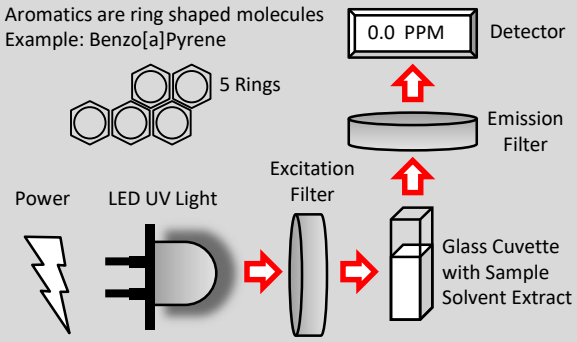
The UVF-Trilogy uses snap in UV modules fitted with ultraviolet LED lights and optical filters sensitive to the hydrocarbons of interest. The analyzer can also perform turbidity, absorbance and other measurements using additional modules available from Sitelab's manufacturer Turner Designs, Inc.

All fluorescence based instruments detect aromatic hydrocarbons only (ring shaped molecules) and are not sensitive to aliphatic hydrocarbons (straight chain molecules). Sitelab's GRO, EDRO and TPH-Oil calibration kits are specially formulated products which contain both aromatic and aliphatic hydrocarbons. Samples contaminated with gasoline, diesel, crude oil and other types of petroleum contain a mixture of both. The aliphatic compounds are inert, but are accounted for when calibrating with these kits or using your own oil standard to calibrate.

The analyzer is calibrated by measuring the fluorescence response - or voltage - that is generated by a known concentration of hydrocarbon. Once calibrated, the analyzer converts fluorescence from an unknown sample into concentration units PPM, PPB, mg/L or mg/Kg.

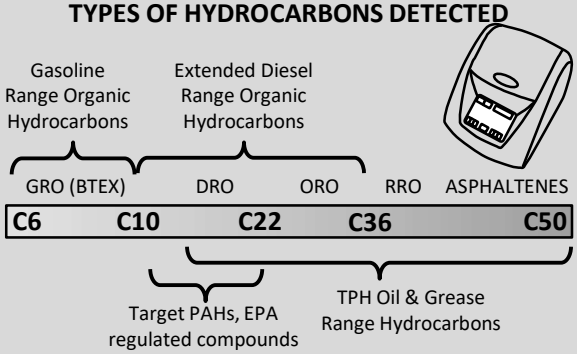
Every hydrocarbon will have a detection limit and a linear limit. The detection limit is the lowest concentration that can be accurately detected. The linear limit varies with each type of hydrocarbon. The linear range is defined by the concentration span from the detection limit to the linearity limit. As the concentration increases beyond the linear range, the slope of the line begins to reduce. At very high concentrations, the slope may become negative. This is called fluorescence "Quenching". This can be avoided by testing sample dilutions.

THE PRINCIPLES OF FLUORESCENCE



Aromatic compounds excite and emit energy at specific wavelengths (in nanometers), which fluoresce and are detected using ultraviolet lights and optical filters sensitive to the hydrocarbons of interest. Voltage - or fluorescence response - is converted to concentration using a photodiode sensor.

TYPES OF HYDROCARBONS DETECTED



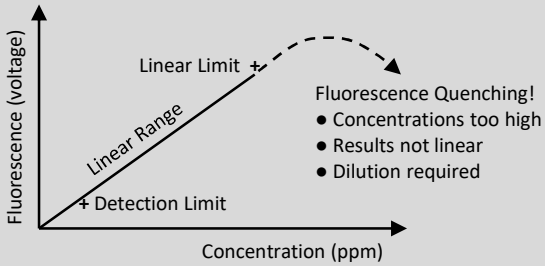
Mono aromatic and poly aromatic hydrocarbons increase in size with carbon weight and fluoresce stronger:

Benzene, C6
Naphthalene, C10
Benzo[a]Pyrene, C20

UVF-Trilogy uses UV fluorescence modules which detect different ranges of hydrocarbons. Four UV modules are available:

- GRO: C6 to C10 Range Hydrocarbons
- EDRO: C10 to C36 Range Hydrocarbons
- PAHS: C12 to C22 Range Hydrocarbons
- TPHOIL: C15 to C50 Range Hydrocarbons

FLUORESCENCE INTENSITY VS. CONCENTRATION



1.2 INSPECTION AND SETUP

Upon receiving your instrument, inspect everything carefully and make sure all accessories are present.

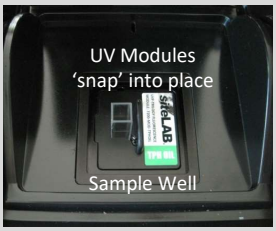
Sitelab UVF-Trilogy models include the following:

- UVF-Trilogy hydrocarbon analyzer.
- AC power supply and computer cable.
- Fluorescence UV module(s).
- Orange tool box with glass cuvette, solvent dispenser bottle, micro-pipette, digital scale, tissue wipes, soil spatulas, Sharpie markers, foam sample rack and shaker can with soil extraction jars.

Printed copies provided:

- UVF-Trilogy Operating Manual
- Equipment Check List with Factory Calibrations
- Brochure with Instrument Specifications
- Soil and Water Quick Reference Guides
- Warranty Information

EQUIPMENT INCLUDED WITH UVF-TRILOGY MODELS



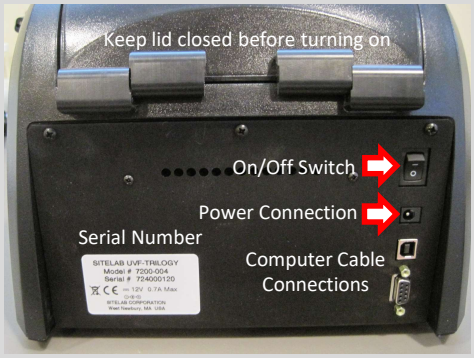
1.3 GENERAL INFORMATION AND PRECAUTIONS

Connect the power supply to the analyzer on the back instrument and plug the adapter to an electrical outlet. Press the ON/OFF button to turn the analyzer on. The analyzer's screen will display "Turner Designs" (Sitelab's manufacturer) for a few seconds and will then instruct you to choose a module to use. If the analyzer beeps when you first turn it on, the lid is open and must be closed. Always select the UV module option. Do not use Turbidity, Absorbance or the other choices listed. Only use UV modules for testing hydrocarbons. The analyzer will then display the home screen. The home screen defaults to "RFU" mode each time it's turned on and displays a green "Measure Fluorescence Raw" button.

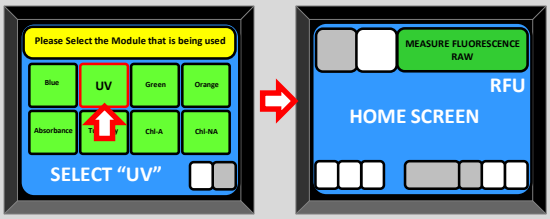
Prior to use, open the lid and insert a UV module into the sample well. Push the module down into position until it snaps into place. Make sure the correct module is used for the test you want or readings will be invalid. Remove the glass cuvette when handling and swapping out the modules or spills or damage to the cuvette could occur.

Avoid spilling samples into the sample well or the UV modules. Never pour or squirt solvent, water or cleaning agents into the well or modules or damage will occur. Use a cotton swap or tissue wipe to clean if necessary.

CONNECT AC POWER SUPPLY IN BACK



INSTRUMENT START UP



Only use Sitelab's UV modules for hydrocarbon analysis. Press "UV" and then choose "OK" when prompted to confirm the module used is UV. The home screen then appears with "RFU" mode (Raw Fluorescence Units) shown on the screen.

1.3 GENERAL INFORMATION AND PRECAUTIONS - *CONTINUED*

Use and store modules in a dry dust free space. Avoid unscrewing the LED board. Only do so if inspection is needed. The light pipe should be flush with the outside wall of the module, do not push it in. The light pipe is not used in the TPHOIL module. The Emission (EM) filter is fitted tight with a rubber o-ring, which should be removed carefully if cleaning the filter is needed. Insert the filter back into the module in the same position, with shiny side of glass facing inward. If cuvette is too tight or too loose, adjust the retention screw on the cuvette adapter.

The glass cuvette must be clean and dry on the outside when used for analysis. Use a tissue wipe to remove any liquids or fingerprints before placing the cuvette into the analyzer. The cuvette needs to be filled at least half way full when testing samples, blanks or calibration standards. Store cuvette in it's case with dust cover when not in use. Avoid using cuvettes that are scratched or broken. Sitelab Part no. QCUV-10MM is available which includes two glass cuvettes, sold separately.

Operate the UVF-Trilogy at room temperature or within these limits: 45° to 105°F (7° to 40°C). The UVF-Trilogy is not explosion proof or intrinsically safe. It is not designed to be used in an explosion proof area.

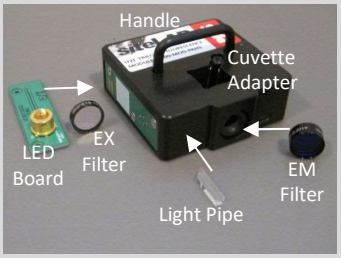
The adjustable pipette is a high quality, high precision positive displacement pipette with a volume range of 25 uL to 250 uL using the pipette tips provided. Avoid air bubbles in pipette tip when diluting samples or making calibration standards. Replace tip between samples or rinse with solvent to clean and reuse.

The UVF-Trilogy is compatible with hexane, methanol and most other popular solvents. The same solvent should be used for sample analysis, testing blanks and making calibration solutions. Purchase solvents in glass bottles only and not in plastic, which can cause interference with readings caused by phthalates.

Use Sitelab's plastic solvent dispenser bottle when testing samples and pour back into solvent bottle when not in use. This squirt bottle is coated with a solvent resistant material. Avoid using cheaper plastic squirt bottles or phthalates will contaminate the solvent and cause poor results.

WARNING! Solvents are highly flammable and should be handled carefully. Dispose solvent waste properly.

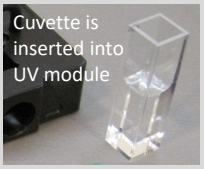
HANDLE UV MODULES WITH CARE

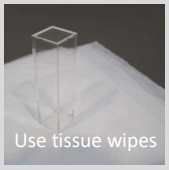


Modules are fitted with LEDs and optical filters which detect different types of hydrocarbons

Part Numbers:
7200-MOD-BTEX
7200-MOD-EDRO
7200-MOD-PAHS
7200-MOD-TPHOIL

GLASS CUVETTES ARE FRAGILE!





The UVF-Trilogy uses 10 mm quartz glass cuvettes. The cuvettes are fragile and should be handled carefully. All four sides are the same; it's position into the UV module makes no difference.

Rinse the cuvette with solvent to clean. Empty solvent waste into a waste cup. Use a tissue wipe to clean the outside surface to remove fingerprints or extra solvent. Place upside down onto clean tissues to remove any residual solvent remaining inside.

PIPETTE TIP INSTALLATION

The pipette uses capillary/piston pipette tips.

Adjust setting to volume desired (uL, micro liters).

Press the push button down to extend the teeth. Push all the way down to eject the pipette tip.

Connect piston stem to teeth until it is firmly seated and snap capillary onto pipette.

SOLVENT DISPENSER BOTTLE

Only use Sitelab's squirt bottle supplied with the UVF-Trilogy!

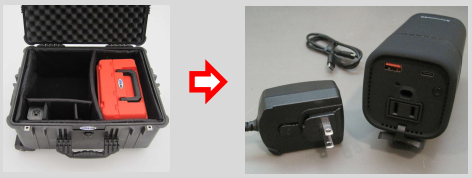
Use methanol for soil analysis. Use hexane for water analysis. Use "HPLC" grade or other high laboratory grade solvents.

Place a waste jar below the dispenser bottle's tip to catch any drips caused by temperature changes. Use the jar for solvent waste when rinsing the cuvette. Use of protective gloves is recommended when handling solvents.

1.4 PORTABLE BATTERY AVAILABLE FOR USE IN FIELD

Sitelab's UVF-Trilogy field case, Part No. 7200-UVFCASE, includes a rugged lithium ion rechargeable battery used to provide electric power to the instrument if using the equipment in the field or a remote location. The analyzer draws very little power allowing days of use without recharging (cable is included). The battery is compatible with laptops, cell phones and other small devices.

ACCESSORY PART NO. 7200-UVFCASE



Turn the battery on and connect to UVF-Trilogy's AC power supply. Turn analyzer on. Recharge the battery using the cable provided if power level is low or out.

2.0 OPERATION AND FEATURES

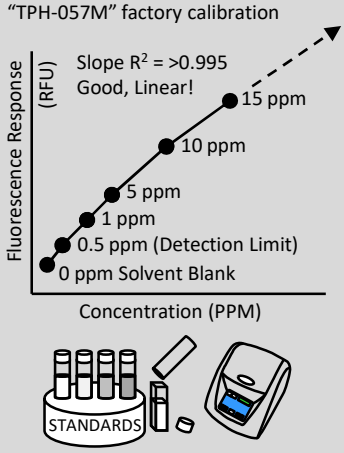
2.1 LINEAR RANGE AND SENSITIVITY

The linear range is the concentration range within which the readout of the UVF-Trilogy is directly proportional to the concentration of the hydrocarbon. If you are not using the factory calibrations stored on the analyzer and are using your own oil standards to calibrate, you must make sure the instrument is calibrated in it's linear range, which can vary depending on the aromatic content in your oil, the concentration of the standard you are using and the UV module selected.

UVF-Trilogy can perform a 1, 2, 3, 4 or 5-point calibration curve plus a solvent blank. The slope of a multi-point curve should be linear, with R^2 value >0.995 (calculate manually). The response in the solvent blank is subtracted out from the sample concentration readings.

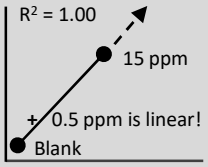
MULTI-POINT CALIBRATION CURVES

Example: 5-Point Curve
"TPH-057M" factory calibration



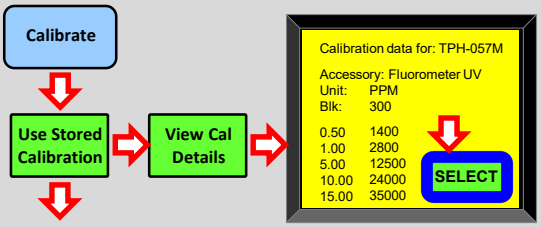
Readings above linear range may quench and give non-linear, low or negative readings

Example: 1-Point Curve



Test the lowest standard to check the detection limit. Readings should be close, within +/- 20%.

VIEW CALIBRATION DATA



Choose a test on the menu screen.

RFU response is displayed for Blank and Calibration Standards

2.2 FACTORY CALIBRATIONS

The UVF-Trilogy is a fixed, multi-wavelength fluorometer and is factory calibrated to GRO, EDRO, PAHS or TPH-Oil which varies depending on the UV modules included with your instrument. The analyzer is factory calibrated by Sitelab using different calibration kits available. The analyzer does not need to be recalibrated each time you use it. Calibration curves are stored in memory and will last forever unless they are deleted. As such, avoid deleting the factory calibrations or purchasing calibration kits will be necessary for you to recalibrate the analyzer.

2.3 STORED CALIBRATION DATA

Press "Calibrate" at any time to view calibrations stored on the analyzer and choose a test on the menu screen. Press "ESC" to escape to go back to the home screen. Sitelab includes a print out of the factory calibrations stored on the analyzer, with curves showing concentration and RFU response for each test.

TESTS AVAILABLE & CALIBRATION LIMITS

Test Name:	Solvent Blank	Lowest Cal Standard	Highest Cal Standard	Upper Linear Limit?
GRO-025M	Methanol	0.5 ppm	10 ppm	15 to 20 ppm
GRO-025H	Hexane	0.5 ppm	10 ppm	
EDRO-042M	Methanol	0.1 ppm	5 ppm	10 to 15 ppm
EDRO-042H	Hexane	0.1 ppm	5 ppm	
PAHS-060M	Methanol	0.05 ppm	1.5 ppm	2 to 3 ppm
PAHS-060H	Hexane	0.05 ppm	1.5 ppm	
TPH-057M	Methanol	0.5 ppm	15 ppm	20 to 30 ppm
TPH-057H	Hexane	0.5 ppm	15 ppm	
TPH-056M	Methanol	5 ppm	100 ppm	400 to 500 ppm
TPH-056H	Hexane	5 ppm	100 ppm	

2.4 HOME SCREEN BUTTONS AND FUNCTIONS

Press the green “Measure Fluorescence” button to test samples. Readings will be displayed after 6 seconds.

MEASURE FLURESCENCE RAW

Home screen with RAW shown is in RFU mode. Readings in fluorescence response (RFU).

MEASURE FLURESCENCE EDRO-042M

Home screen with TEST NAME shown is in concentration mode. Readings in PPM, PPB or other units.

Mode Switches between RFU and concentration mode. Select a calibration first to switch to concentration mode when analyzer is first turned on. Measuring samples in concentration mode is most common. RFU readings can be useful when testing calibration standards and solvent blanks.

Calibrate Press “Calibrate” to select a stored calibration or run a new calibration. Select “Use Stored Calibration” to see the test menu screen with factory calibrations or other calibrations you’ve added.

Sample ID SAMPLE-001 Press “Sample ID” to enter a sample name, if desired, to show on the display with your sample reading. Sample count is displayed in increments by 1 each time a measurement is made.

? Provides access to help and troubleshooting screens.

Tools Provides access to settings and diagnostic screens.

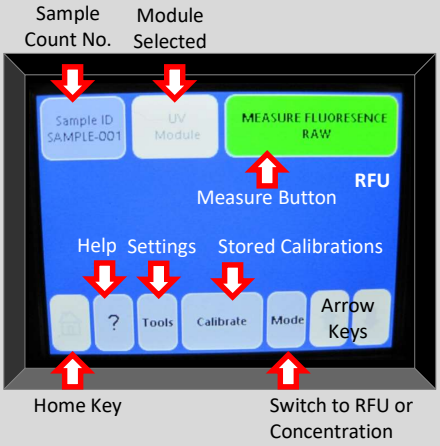
Home key goes back to the home screen from other windows.

Use arrow keys to scroll down screen to see all measurements recorded since turn on.

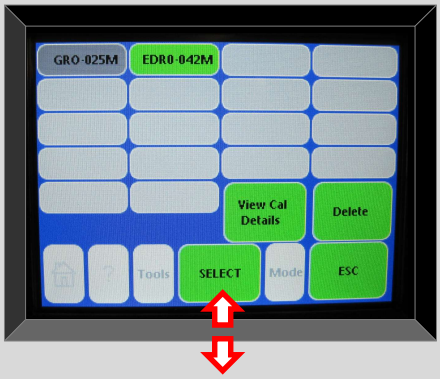
UV Module Indicates module selected on module screen when instrument was turned on.

IMPORTANT!: Be sure the correct UV module is inserted into the analyzer prior to use.

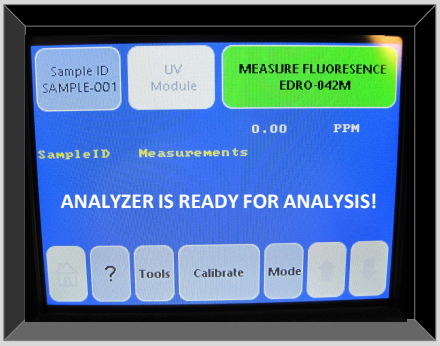
HOME SCREEN WHEN FIRST TURNED ON



PRESS “CALIBRATE” AND SELECT A TEST FROM THE CALIBRATIONS MENU



HOME SCREEN APPEARS WITH TEST NAME IN CONCENTRATION MODE



2.5 SOLVENT SELECTION

Use hexane for water analysis. Hexane CAS# is 110-54-3 (also called n-hexane). Use methanol for soil or sediment analysis. Methanol CAS# is 67-56-1.

For best performance, use “HPLC” grade or other high laboratory grade hexane or methanol solvents. Solvent is not included with Sitelab water or soil test kits.

WARNING! Solvents are flammable! Handle with care, wear gloves and use in a well ventilated area. Dispose solvent waste properly. See material safety data sheets.

3.0 CALIBRATION PROCEDURES

3.1 CALIBRATION OVERVIEW

The UVF-Trilogy uses a single-point or multi-point calibration curve plus a blank. The analyzer can store up to 18 calibrations. The analyzer does not need to be calibrated. All UVF-Trilogies will arrive factory calibrated and the tests available will vary depending on which model you purchased. Sitelab's 7200-004-FNGP model includes up to 8 factory calibrations, allowing you to perform and store up to 10 more calibrations in memory.

Calibrations can be deleted as needed. Never delete the factory calibrations. Even if you don't use them, these can be useful to perform quality control tests, assist with training or troubleshooting your instrument.

3.2 START A NEW CALIBRATION

From the home screen, press "Calibrate" and select "Run New Calibration." Choose the concentration units you wish to use. If, for example, the concentration of your standards are in ppm units, as in most cases, then select "PPM" units to advance to the next screen. The analyzer will then ask to insert a blank. Fill the glass cuvette half full with clean solvent, insert into the UV module, close the lid and then press "OK". Do not press the "SKIP BLANK" button or the solvent you are using will not be measured.

After the analyzer measures the blank, empty out the cuvette and fill half full with your calibration standard. If you are performing a multi-point calibration, always start with the lowest standard first and go up in order. Enter the concentration of the standard as prompted, press "OK" and wait for the measurement to finish. Enter and test more standards as needed. When finished, press "Save Calibration" and give the test a name. The home screen will then appear with the green measure fluorescence button and test name shown below it.

If at any time the lid is not closed, the analyzer will beep and a red warning message appears instructing you to close the lid. This can happen too when testing samples. The lid must be closed during analysis to protect you from harmful ultraviolet light.

When measuring the blank and calibration standards, the screen will display the RFU response for a few seconds. The RFU values can be viewed after a calibration is saved.

Press the "HOME" key at any time during the calibration process to abort or you need to start over. Delete the new calibration if blank is bad or the curve is not linear.

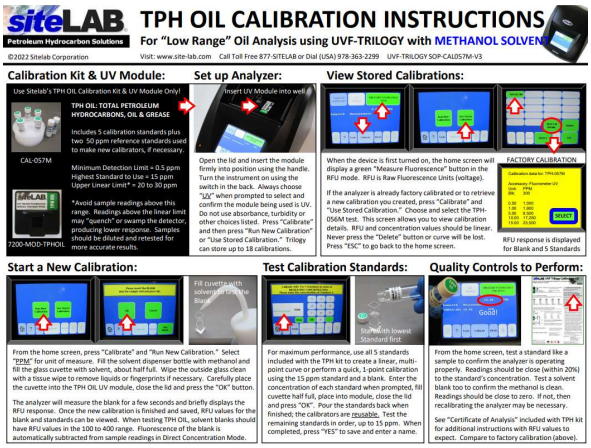
3.3 USE OF SITELAB CALIBRATION KITS

Sitelab's calibration kits include certified, specially formulated, ready-to-use standards that ensure accurate and quality controlled results. Products have a 6-month expiration date and are available in methanol or hexane solvent. Each kit includes the following:

- Certificate of Analysis and MSDS
- Calibration Instructions (SOPs)
- 5 Calibration Standards
- 2 Reference Standards + graduated test tubes and pipette tips used to make new calibrators

3.4 CALIBRATION KIT STANDARD OPERATING PROCEDURES

To recalibrate the analyzer and see equipment required, follow the calibration instructions provided with your kit. Printed copies are included with each product. SOPs can be downloaded on Sitelab's website. See example below:



3.5 TEST STANDARDS FOR QUALITY CONTROL

For quality control, check the factory calibration or a new calibration you made using the calibration kit by testing the standards from time to time. Readings should be close to the standard's concentration, ideally within +/- 10% and no more than +/- 20%.

The standards are reusable, so pour them back into their vials when finished. Rinse cuvette with solvent after use.

Prepare new standards and test if original standards read poorly. Use the reference standards and supplies provided in the calibration kit to make new calibrators with your solvent. Follow the instructions in the Certificate of Analysis sheet included with the kit.

UVF-TRILOGY CALIBRATION KITS AVAILABLE

GRO Calibration Kits
Detects Gasoline Range Hydrocarbons
Use with UV Module: 7200-MOD-BTEX

- CAL-025M in Methanol
- CAL-025H in Hexane

EDRO Calibration Kits
Detects Diesel & Oil Range Hydrocarbons
Use with UV Module: 7200-MOD-EDRO

- CAL-042M in Methanol
- CAL-042H in Hexane

PAH Calibration Kits
Detects Polycyclic Aromatic Hydrocarbons
Use with UV Module: 7200-MOD-PAHS

- CAL-042M in Methanol
- CAL-042H in Hexane

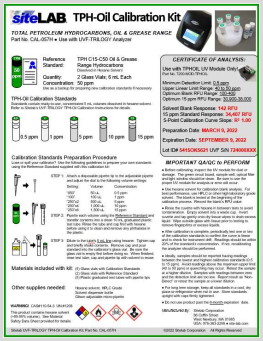
TPH-Oil Calibration Kits
Detects Low Concentrations Oil & Grease
Use with UV Module: 7200-MOD-TPHOIL

- CAL-057M in Methanol
- CAL-057H in Hexane

TPH-Oil Calibration Kits
Detects High Concentrations Oil & Grease
Use with UV Module: 7200-MOD-TPHOIL

- CAL-056M in Methanol
- CAL-056H in Hexane

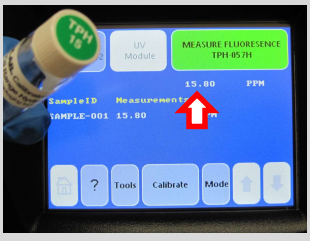
CERTIFICATE OF ANALYSIS PROVIDED



COA INCLUDES:

- QA/QC Test Performance
- Preparation Date
- 6-Month Expiration Date
- Lot ID# and UVF Serial#
- Instructions to make new Calibrators using Reference Standards supplied in kit
- Printed copy of MSDS

CHECK CALIBRATION CURVE



15 ppm TPH-Oil standard = 15.80 ppm. Good (RPD <20%). Analyzer is operating properly and the standard is accurate.

3.6 TEST SOLVENT BLANKS FOR QUALITY CONTROL

Test the solvent you are using to check the blank. Readings should be close to zero, confirming the solvent is clean. Measure the solvent blank in RFU mode to compare to factory calibration RFU response reported in the Certificate of Analysis. Clean the cuvette or use a new cuvette and retest solvent if readings are high.

Measure the solvent blank multiple times to check repeatability. Negative concentration readings indicate the blank reads lower than the calibration's blank, which is normal and your solvent should be fine. High blank readings caused by poor solvent may still be used, by subtracting the background 'interference' from your sample results.

Testing blanks for GRO exhibit more scatter and are less repeatable compared to testing blanks using the EDRO, PAHS or TPHOIL modules. The GRO module has lower sensitivity detecting mono aromatics, like benzene, which are smaller in size compared to poly aromatics. Because of this, recalibrating the analyzer can sometimes fail when the 0.5 ppm GRO standard reads lower or too close to the blank. The 0.5 ppm GRO standard also exhibits scatter because it fluoresces so low. As such, it may take several attempts to go thru the calibration process. As an alternative, perform a 1-point calibration curve using the blank and the 10 ppm GRO standard. This standard fluoresces stronger and exhibits better repeatability.

CHECK REPEATABILITY AND COMPARE TO SOLVENT BLANK ACCEPTANCE CRITERIA

Example testing a Solvent Blank for GRO:

PPM	RFU
0.10	21
0.14	22
-0.40	19
0.05	21
-0.01	20

Mode — Measure in RFU Mode

CERTIFICATE OF ANALYSIS:

Use with GRO UV Module Only
Part No. 7200-MOD-BTEX

Minimum Detection Limit: **0.5 ppm**
Upper Linear Limit Range: **15 to 20 ppm**
Optimum Blank RFU Range: **14-22**
Optimum 10 ppm RFU Range: **80-100**

Solvent Blank Response: **18 RFU**
10 ppm Standard Response: **90 RFU**
5-Point Calibration Curve Slope: **R^2 0.998**
UVF-Trilogy Serial Number: **724000XXX**

- Solvent blank is close to zero ppm. Readings bounce and are less repeatable, which is normal for GRO analysis.
- RFU readings are more repeatable, exhibit less scatter and are within limits vs. factory calibration Blank RFU value reported in the Certificate of Analysis.
- Press the Mode key to switch between PPM and RFU units.

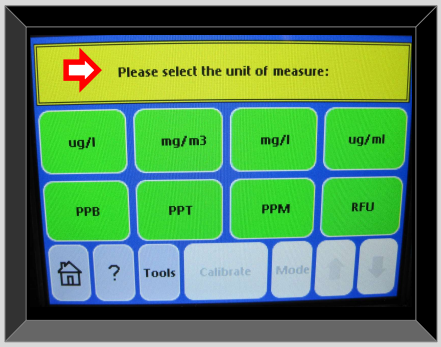
3.7 DECIDING WHICH CONCENTRATION UNITS TO USE

PPM and PPB are the same concentration units as mg/L and ug/L. If you are calibrating the analyzer for testing water samples and wish to report readings in mg/L or ug/L units, press "mg/L" or "ug/L" on the "Please select the unit of measure" screen when starting a new calibration. The RFU response in the blank and the calibration standards will be the same regardless of which concentration unit is selected.

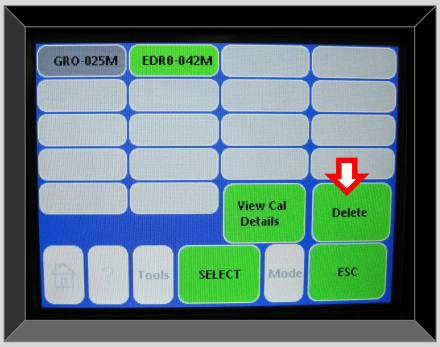
Sitelab's Calibration Kits are labeled in PPM concentrations. If calibrating the analyzer to PPB or ug/L units, remember to enter the standard concentrations in PPB or ug/L. Divide PPM by 1,000 to convert. If calibrating for PAHs in PPB units, for example, the 0.05 ppm standard is the same as 50 ppb, so enter "50" ppb during the calibration process.

To delete a calibration you made, press "Calibrate" and then press "Use Stored Calibration." Choose the test on the menu screen and then press "Delete." By doing so, the test will be removed from memory – forever – so be careful selecting which test you want to remove before deleting. Never delete the factory calibrations! These curves are always linear and provide the best performance.

MEASURMENT UNITS AVAILABLE



BE CAREFUL DELETING CALIBRATIONS!



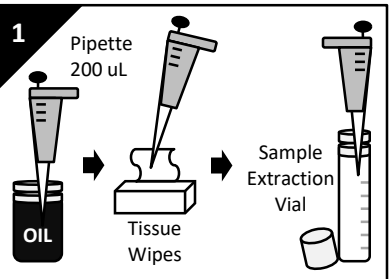
3.8 PREPARE AND USE YOUR OWN OIL FOR CALIBRATION

Oil is diluted in solvent from 1 million ppm down to low, detectable concentrations used to calibrate the analyzer and measure samples. Procedures shown here use the materials included in Sitelab's water extraction kit. Alternatively, use your own bottles and glassware to prepare your standards.

Supplies for 20 Samples: Extraction vials, solvent extract vials, test tubes, filters, syringes, pipette tips, test record sheet & Quick Reference Guide

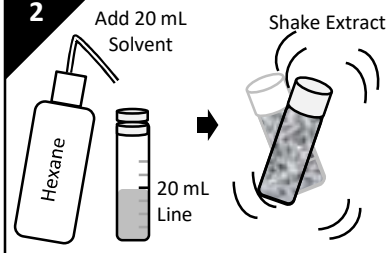
Sample Extraction Kit, Part No. EXTR010-20-WATER

1



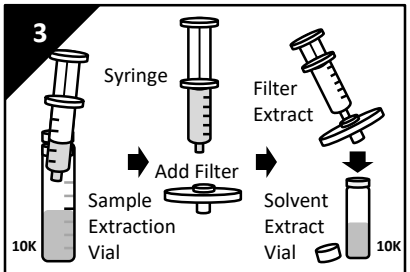
Prepare a 10,000 ppm Oil Extract: Start by using the pipette to suck up 200 uL (micro liters) of oil from your oil sample. Use a tissue to wipe off any oil stuck to the outside of the tip. Dispense contents into glass sample extraction vial.

2



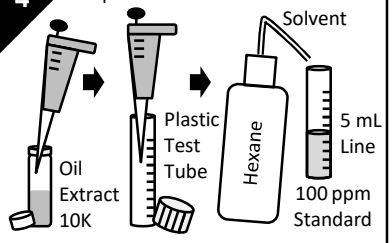
Add Hexane to the solvent dispenser bottle. Squirt hexane into the vial up to the 20 mL line. Be precise! Screw on the cap and shake Extract for several minutes. If the Extract is light in color and not dark, silty or dirty, filtering is not required, go to Step 4.

3



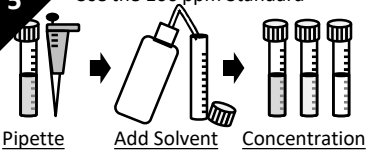
Dip a syringe into the extraction vial and suck up 3-5 mL of Extract into the syringe. Remove from vial and screw on a filter. Push down on the plunger and filter the Extract into a solvent extract vial. Label Extract vials with concentration (10K or 10,000 ppm).

4



Prepare a 100 ppm Standard: Attach a new tip to the pipette and transfer 50 uL of the Extract into a graduated plastic test tube. Squirt hexane into the tube up to the 5 mL line, screw on cap and briefly shake to mix. This creates a 100 ppm standard.

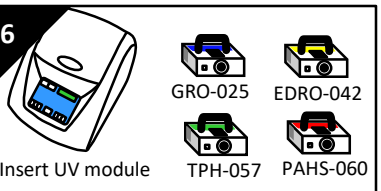
5



Pipette	Add Solvent	Concentration
250 uL x2	to 5 mL Line	= 10 ppm
250 uL	to 5 mL Line	= 5 ppm
50 uL	to 5 mL Line	= 1 ppm

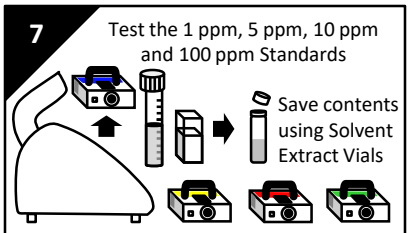
Prepare 1, 5 and 10 ppm Standards: Use the 100 ppm standard to prepare a series of lower concentration standards used for analysis. Pipette the 100 ppm standard using additional test tubes and dilute with solvent using the examples shown above.

6



Test Oils using Factory Calibrations: Measure oil standards first using the UV modules and tests stored on the instrument. This will help determine which concentration is most suitable to use to calibrate. Turn analyzer on, select "UV" then "Calibrate" followed by "Use Stored Calibration" and select the GRO, EDRO, TPH or PAH tests you want to use from the menu screen.

7



Measure the standards from lowest to highest and record the PPM response for each. Test each standard using all four UV modules, if available, to determine which module is most suitable and sensitive to the oil. Some standards will fluoresce too weak or too strong. Only use linear readings.

8

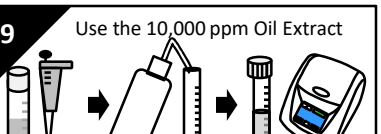
Record and Review Readings, then Calibrate with Oil Standard

Example	GRO	EDRO	PAHs	TPH OIL
1 ppm =	0.3	0.0 L	0.0 L	0.0 L
5 ppm =	1.5	0.25	0.0 L	0.0 L
10 ppm =	3.0	0.5	0.0 L	0.0 L
100 ppm =	24 Q	4.9	0.0 L	0.0 L

Oil fluoresced strongest with GRO module

Use the module which exhibits the highest response to calibrate the analyzer with your oil. Avoid using standards with readings that are too low (L) or quench (Q) and not linear, which occurs in higher concentrations. In example above (Jet Fuel), the 10 ppm standard is suitable to calibrate.

9



Pipette	Add Solvent	Concentration
250 uL x2	to 5 mL line	= 1,000 ppm
250 uL	to 5 mL line	= 500 ppm
100 uL	to 5 mL line	= 200 ppm

Prepare Higher Oil Concentrations? If the 100 ppm oil standard fluoresces too weak, use the 10,000 ppm Extract to make and use higher oil standards. Use the pipette to transfer Extract into a plastic test tube and dilute with solvent using examples shown above.

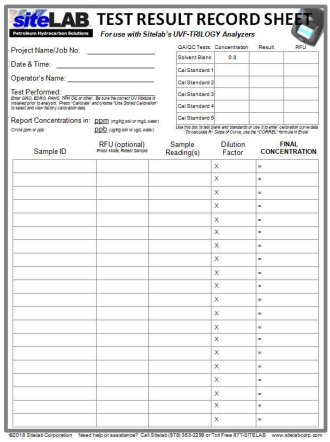
4.0 SAMPLE TEST PROCEDURES

4.1 LABORATORY SUPPLIES USED FOR ANALYSIS

Solvent extraction methods require the use of various laboratory supplies and equipment. For best performance, use the test kits available from Sitelab to analyze your water or soil samples. These kits are easy to use and allow for fast, accurate measurement. Solvent is not included.

Sitelab "Quick Reference Guides" provide easy to follow, step-by-step test instructions for testing soil or water. Printed copies are included with each product. SOPs are available to download on Sitelab's website.

Refer to Sections 4.2 to 4.9 for more detailed soil and water test procedures using these products.


siteLAB TEST RESULT RECORD SHEET
For use with Sitelab's UVF-TRILOGY Analyzers

Project Name / Job No:
Date & Time:
Operator's Name:
Test Performed:
Report Concentrations in: ppm ppb

Sample ID	RFU (optional)	Sample Reading(s)	Dilution Factor	FINAL CONCENTRATION
			X	=

A printed copy of Sitelab's "Test Result Record Sheet" is provided in the test kits. Use to record your sample results or use a notebook to record your results.

- Store extracts or dilutions for future use.
- Dispose used test kit supplies and solvent waste properly.

Set up the analyzer and equipment on a table with plenty of work space. If working indoors, use in a well ventilated room. Record results manually or use the software option to record your results to a computer.

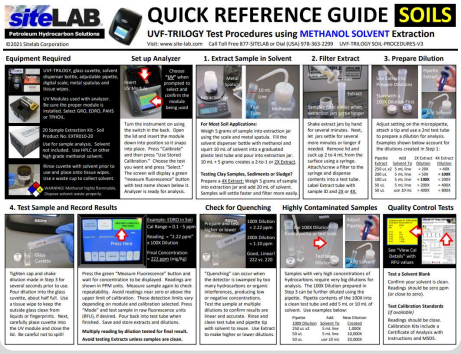
The UVF-Trilogy will display continuous measurements from when it's turned on. Use the arrow keys to scroll down the screen to see readings performed since turn on. Readings will be lost when the analyzer is turned off. The data logger is not stored in memory.

Check repeatability by measuring sample dilutions or extracts multiple times. Press the green "Measure Fluorescence" button and wait for the concentration to be displayed and then measure it again. Readings should be close, within +/- 10%.

Note: GRO has lower sensitivity compared to the EDRO, PAHS and TPHOIL modules and can produce less repeatable readings at the low end of the curve. GRO readings should be within +/- 20%. Testing the sample 5 or more times can help check the scatter. Report the average concentration if preferred.

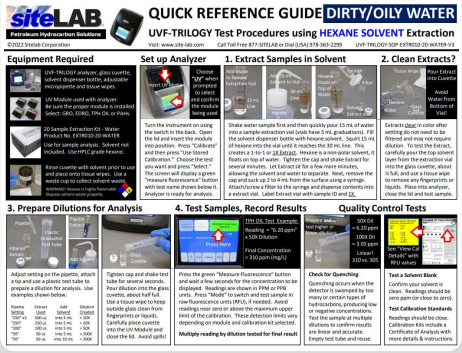
SOIL EXTRACTION KIT

Part No. EXTR010-20-SOIL
- Use for soil or sediment
- Contains supplies for 20 samples
- Use with methanol solvent


siteLAB Petroleum Hydrocarbon Solutions
QUICK REFERENCE GUIDE SOILS
UVF-TRILOGY Test Procedures using METHANOL SOLVENT Extraction
Equipment Required
Set up Analyzer
1. Extract Sample in Solvent
2. Filter Extract
3. Prepare Dilution
4. Test Sample and Record Results
Check for Quenching
Highly Contaminated Samples
Quality Control Tests

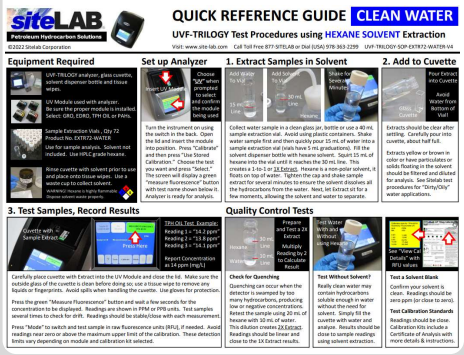
WATER EXTRACTION KIT

Part No. EXTR010-20-WATER
- Use for dirty, oily water
- Contains supplies for 20 samples
- Use with hexane solvent


siteLAB Petroleum Hydrocarbon Solutions
QUICK REFERENCE GUIDE DIRTY/OILY WATER
UVF-TRILOGY Test Procedures using HEXANE SOLVENT Extraction
Equipment Required
Set up Analyzer
1. Extract Samples in Solvent
2. Clean Extracts?
3. Prepare Dilutions for Analysis
4. Test Samples, Record Results
Quality Control Tests

SAMPLE EXTRACTION VIALS

Part No. EXTR72-WATER
- Use for clean, less oily water
- Contains supplies for 72 samples
- Use with hexane solvent


siteLAB Petroleum Hydrocarbon Solutions
QUICK REFERENCE GUIDE CLEAN WATER
UVF-TRILOGY Test Procedures using HEXANE SOLVENT Extraction
Equipment Required
Set up Analyzer
1. Extract Samples in Solvent
2. Add to Cuvette
3. Test Samples, Record Results
Quality Control Tests

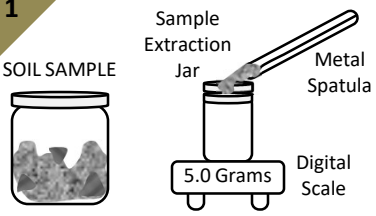
4.2 PROCEDURES FOR OIL IN SOIL ANALYSIS

Soils, clays and sediments are extracted in methanol, filtered and diluted for analysis. Procedures shown here use the materials included in Sitelab's Sample Extraction Kit. The scale, solvent dispenser bottle, pipette and other tools needed are included with all UVF-Trilogy models.

Supplies for 20 Samples: Extraction jars, test tubes, filters, syringes, pipette tips, test record sheet and Quick Reference Guide

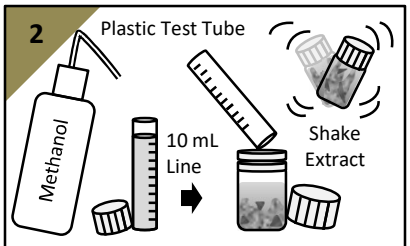
Sample Extraction Kit, p/n EXTR010-20-SOIL

1



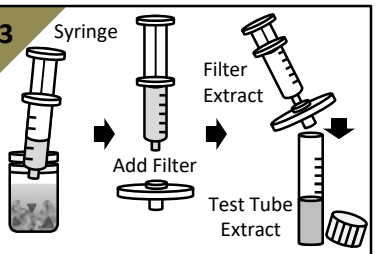
Mix your soil sample prior to use to homogenize contents. Using a plastic sample extraction jar, remove the lid and place the jar onto the digital scale and tare the weight to zero. Scoop out and weigh 5.0 grams of soil into the jar using the spatula. Be precise (within +/- 0.1 g).

2



Add Methanol to solvent dispenser bottle. Squirt 10 mL of methanol into a graduated plastic test tube. Pour contents into the extraction jar. This creates a 2:1 or 2X Extract. Tighten cap and shake for 2 minutes. Use 20 mL methanol for clay or highly contaminated samples for 4X Extract.

3



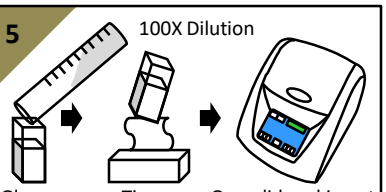
Let the extraction jar settle for several minutes after shaking. Gently remove the lid, dip a syringe into the top surface layer and suck up 3-5 mL of Extract into the syringe. Screw on a filter, push down on the plunger and filter the Extract into a test tube. Label test tube with "2X" or "4X."

4

Pipette Extract	Add Solvent To	2X Extract Dilution	4X Extract Dilution
250 uL x2	5 mL line	= 20X	= 40X
200 uL	5 mL line	= 50X	**= 100X**
100 uL	5 mL line	**= 100X**	= 200X
50 uL	5 mL line	= 200X	= 400X
50 uL	use 10 mL	= 400X	= 800X

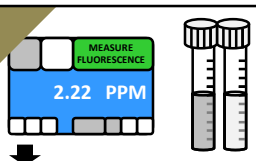
Use the pipette to transfer Extract into a second test tube and dilute with methanol using examples shown above. We recommend starting with a 100X Dilution first to use for analysis

5



Turn analyzer on, select "UV" then "Calibrate" followed by "Use Stored Calibration" and select the test you want to use for analysis. Fill glass cuvette about ½ full with the Dilution made in Step 4. Clean cuvette using a tissue to remove any fingerprints or liquids and place into the UV module.

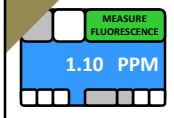
6



Multiply by "100X," Final Result = 222 ppm

Close the lid and press the green "Measure Fluorescence" button. The concentration is displayed after a few seconds. Measure again to check repeatability. Multiply reading by dilution made to report the sample's final concentration. Rinse and clean glass cuvette, test tube and pipette tip with solvent to prepare and test higher or lower dilutions, if needed.

7 Check for Quenching

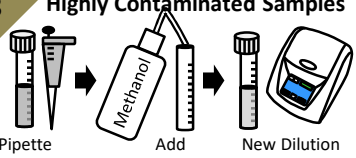


200X Dilution Result = 220 ppm

vs. 100X Dilution Result = 222 ppm Linear, Close Results!

"Quenching" can occur when the detector is swamped by too many hydrocarbons or organic interferences which can produce low or nonlinear concentrations. Test the sample at multiple dilutions to confirm results are linear and accurate. Rinse and clean test tube and pipette tip with solvent to reuse. Use Extract to make higher or lower dilutions in Step 4.

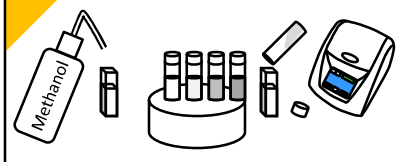
8 Highly Contaminated Samples



Pipette 100X Dilution	Add Solvent To	New Dilution Created
250 uL x2	5 mL line	1,000X
50 uL	5 mL line	10,000X
50 uL	use 10 mL	20,000X

Soils with very high concentrations require very big dilutions for analysis. The 100X Dilution prepared in Step 4 can be further diluted using the pipette. Pipette contents of the 100X into a clean test tube, add solvent and analyze. Use examples above.

QC Quality Control Tests



Fill the cuvette with methanol and test a blank to make sure the solvent is clean. Readings should be close to zero ppm. If the calibration kit is available, test the standards to check for drift and accuracy. Readings should be close to each standard's concentration (within +/- 20%).

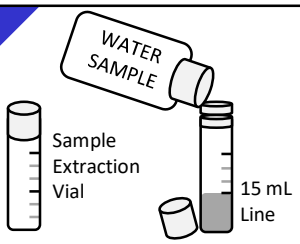
4.3 PROCEDURES FOR DIRTY OR HIGHLY CONTAMINATED WATER

Use for dirty, oily or highly contaminated water samples which require filtration and/or dilution for analysis. Procedures shown here use the materials included in Sitelab's Sample Extraction Kit. The solvent dispenser bottle, pipette and other tools needed are included with all UVF-Trilogy models.

Supplies for 20 Samples: Extraction vials, solvent extract vials, test tubes, filters, syringes, pipette tips, test record sheet & Quick Reference Guide

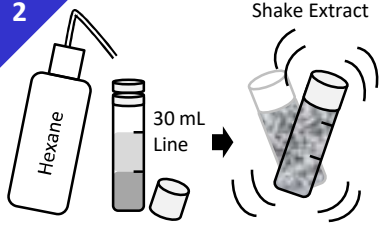
Sample Extraction Kit, p/n EXTR010-20-WATER

1



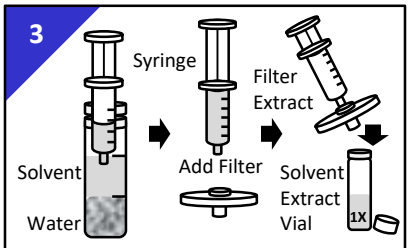
Shake water sample prior to use to mix contents thoroughly. Quickly pour 15 mL of water into a glass sample extraction vial. The vials have 5 mL graduations, be precise. If you do not have a container or bottle to collect your water sample, use an extraction vial to collect sample.

2



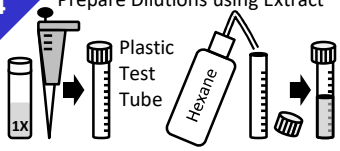
Add Hexane to the solvent dispenser bottle. Add 15 mL of hexane into the vial. Hexane will float on top of the water, so squirt up to the 30 mL line. Be precise. This creates a 1:1 or "1X" Extract. Screw and tighten the cap. Shake Extract for two minutes. Allow time to settle when finished.

3



Dip a syringe into the top solvent layer from vial and suck up 3 to 5 mL of Extract into syringe. Avoid water from bottom of vial! Remove from vial and screw on a filter. Push down on the plunger and filter the Extract into a glass solvent extract vial. Add cap and label vial with ID and "1X."

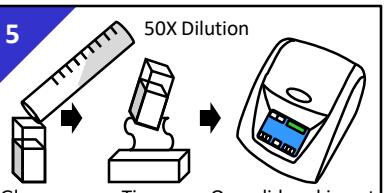
4 Prepare Dilutions using Extract



Pipette Extract	Add Solvent To	Dilution Created
250 uL x2	5 mL line	= 10X
250 uL	5 mL line	= 20X
100 uL	**5 mL Line**	**= 50X**
50 uL	5 mL Line	= 100X
50 uL	use 10 mL	= 200X

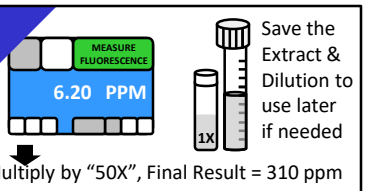
Use the pipette to transfer Extract into a graduated test tube and dilute with hexane using examples shown above. We recommend starting with a 50X Dilution first to use for analysis.

5 50X Dilution



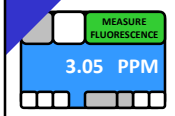
Turn analyzer on, select "UV" then "Calibrate" followed by "Use Stored Calibration" and select the test you want to use from the menu. Fill glass cuvette about ½ full with the Dilution made in Step 4. Clean cuvette using a tissue to remove any fingerprints or liquids and place into the UV module.

6



Close the lid and press the green "Measure Fluorescence" button. The concentration is displayed after a few seconds. Measure again to check repeatability. Multiply reading by dilution made to report the sample's final concentration. Rinse and clean glass cuvette, test tube and pipette tip with solvent to prepare and test higher or lower dilutions, if needed.

7 Check for Quenching

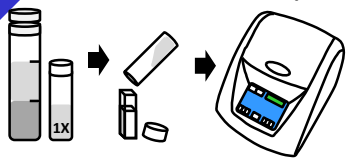


100X Dilution
Result = 305 ppm

vs. 50X Dilution
Result = 310 ppm
Linear, Close Results!

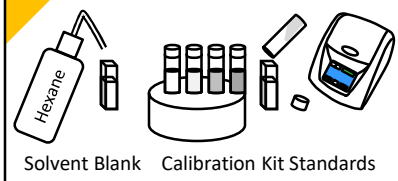
"Quenching" can occur when the detector is swamped by too many hydrocarbons or organic interferences which can produce low, nonlinear concentrations. Test the sample at multiple dilutions to confirm results are linear and accurate. Rinse and clean test tube and pipette tip with solvent to reuse. Use Extract to make higher or lower dilutions in Step 4.

8 Test Extract in Clean Samples



Extracts clear in color after settling do not need to be filtered and may not require dilution. Test the Extract if the dilutions are reading close to zero ppm or are below the detection limit. Extracts are not diluted (1X), so no multiplier is used to calculate results. Pour the Extract back into the vial after analysis and save for future use. Extracts have a 6 month shelf life.

QC Quality Control Tests



Fill the cuvette with hexane and test a blank to make sure the solvent is clean. Readings should be close to zero ppm. If the calibration kit is available, test the standards to check for drift and accuracy. Readings should be close to each standard's concentration (within +/- 20%).

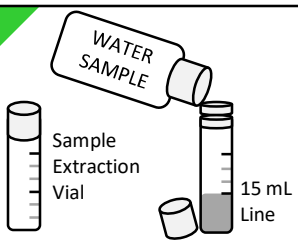
4.4 PROCEDURES FOR CLEAN, LESS OILY WATER ANALYSIS

Use for clean, less oily water samples which do not require filtration or dilution for analysis. Procedures shown here use the materials included in Sitelab's Sample Extraction Vials. The solvent dispenser bottle, tissue wipes and cuvette are included with all Trilogy models.

Supplies for 72 Samples: Extraction vials, test result record sheets and Quick Reference Guide

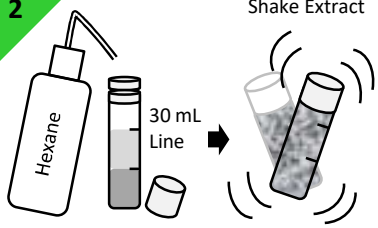
Sample Extraction Vials, p/n EXTR72-WATER

1



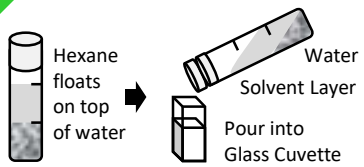
Shake water sample prior to use to mix contents thoroughly. Quickly pour 15 mL of water into a glass sample extraction vial. The vials have 5 mL graduations, be precise. If you do not have a container or bottle to collect your water sample, use an extraction vial to collect sample.

2



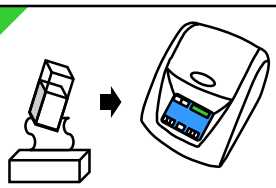
Add Hexane to the solvent dispenser bottle. Add 15 mL of hexane into the vial. Hexane will float on top of the water, so squirt up to the 30 mL line. Be precise. This creates a 1:1 or "1X" Extract. Screw and tighten the cap. Shake Extract for two minutes. The oil will dissolve into the solvent.

3



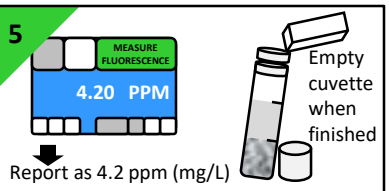
After shaking, allow time to settle so the solvent and water separate. Remove cap and pour top solvent layer into the glass cuvette about ½ full. Avoid water from bottom of vial! The Extract should be clear in color. If the Extract is yellow, readings may quench and a dilution is required.

4



Turn analyzer on, select "UV" then "Calibrate" followed by "Use Stored Calibration" and select the test you want to use from the menu. Clean cuvette using a tissue to remove any fingerprints or liquids and place into the UV module. Be sure not to spill the cuvette in the UV module.

5



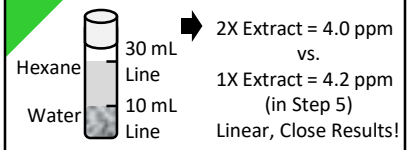
Close the lid and press the green "Measure Fluorescence" button. The concentration is displayed after a few seconds. Measure again several times to check repeatability. 1X Extracts are not diluted, no multiplier is used to calculate results, so record the concentration as is. When finished, pour back into the extraction vial after analysis to save for future use.

6 **Non Detect Sample Results**

Test	Cal Kit Used	Min. DL
PAHs	PAH-060H	0.05 ppm
EDRO	EDRO-042H	0.1 ppm
GRO	GRO-025H	0.5 ppm
TPH-Oil Low	TPH-057H	0.5 ppm
TPH-Oil High	TPH-056H	5 ppm

Readings close to zero ppm, negative readings or readings below the test's minimum detection limit should be reported as "ND" for Non Detect. The UVF-Trilogy detection limits vary depending on which calibration is used for analysis. Examples shown above are Sitelab factory calibrations.

7 **Check for Quenching**

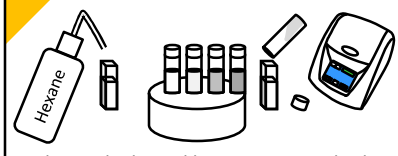


"Quenching" can occur when the detector is swamped by too many hydrocarbons or organic interferences which can produce low, nonlinear concentrations. Extract and test the water at a 2:1 or "2X" Dilution to confirm results are linear & accurate. Extract 10 mL of water with 20 mL of hexane, shake and analyze. Multiply reading by "2" to report final result.

8 **Test Without Solvent?**

Really clean water may contain hydrocarbons soluble enough in water without the need for hexane solvent. Simply fill the cuvette with water and analyze. Results should be close to sample readings using solvent extraction. If results are not close, report the concentration performed using the solvent (more accurate).

QC **Quality Control Tests**



Fill the cuvette with hexane and test a blank to make sure the solvent is clean. Readings should be close to zero ppm. If the calibration kit is available, test the standards to check for drift and accuracy. Readings should be close to each standard's concentration (within +/- 20%).

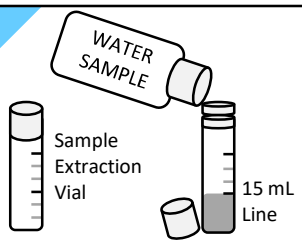
4.5 PROCEDURES TESTING DRINKING WATER FOR GASOLINE RANGE ORGANIC HYDROCARBONS

Use for clean water applications with low concentrations of GRO. Procedures shown here use materials included in Sitelab's Sample Extraction Vials, EXTR72-WATER. The solvent dispenser bottle, tissue wipes and cuvette are included with all Trilogy models.

EXTR72-WATER

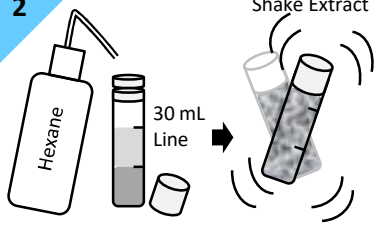
GRO UV MODULE

1



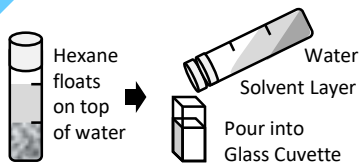
Shake water sample prior to use to mix contents thoroughly. Quickly pour 15 mL of water into a glass sample extraction vial. The vials have 5 mL graduations, be precise. If you do not have a container or bottle to collect your water sample, use an extraction vial to collect sample.

2



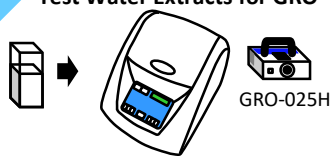
Add Hexane to the solvent dispenser bottle. Add 15 mL of hexane into the vial. Hexane will float on top of the water, so squirt up to the 30 mL line. Be precise. This creates a 1:1 or "1X" Extract. Screw and tighten the cap. Shake Extract for two minutes. The oil will dissolve into the solvent.

3



After shaking, allow time to settle so the solvent and water separate. Remove cap and pour top solvent layer into the glass cuvette about ½ full. Avoid water from bottom of vial! The Extract should be clear in color. Clean cuvette using a tissue wipe to remove any fingerprints or liquids.

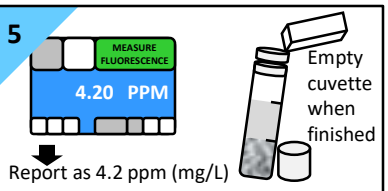
4 Test Water Extracts for GRO



Use the GRO UV module only! Test samples using the GRO-025H calibration

Turn analyzer on, select "UV" when prompted, then "Calibrate" followed by "Use Stored Calibration". Select the "GRO-025H" factory calibration from the menu screen. The home screen then appears and the analyzer is ready for analysis. Carefully insert the cuvette into the GRO Module.

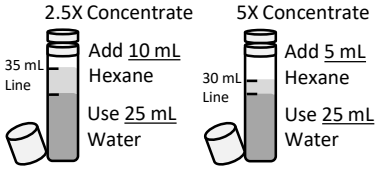
5



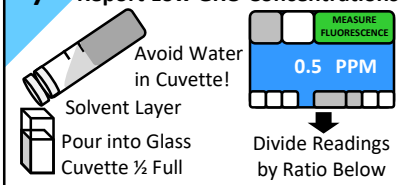
Close the lid and press the green "Measure Fluorescence" button. The concentration is displayed after a few seconds. Measure again several times to check repeatability. 1X Extracts are not diluted, no multiplier is used to calculate results, so record the concentration as is. When finished, pour back into the vial after analysis to save for future use.

6 Sample Readings <0.5 ppm? Prepare "Concentrated" Extracts

Readings close to zero ppm, negative readings or readings below the GRO 0.5 ppm minimum detection limit should be reported as "ND" for Non Detect. To achieve lower detection limits, extract the sample using more water with less solvent. Use the two examples below and go to Step 7.

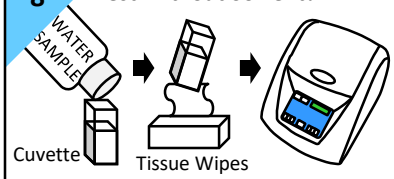


7 Report Low GRO Concentrations



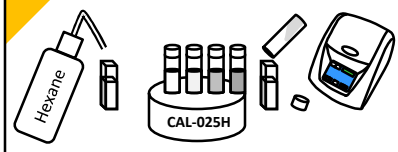
Analyze the 2.5X or 5X Concentrated Extracts for GRO. Divide the readings by 2.5 or 5 to calculate the final result. If the readings are below the 0.5 ppm GRO detection limit, report the 2.5X Concentrate as ND <0.2 ppm. Report the 5X Concentrate as ND <0.1 ppm. Measure and record the Extracts multiple times to check repeatability.

8 Test Without Solvent?



Really clean water may contain hydrocarbons soluble enough in water without the need for hexane solvent. Simply fill the cuvette with water and analyze. Results should be close to sample readings using solvent extraction. If results are not close, report the concentration performed using the solvent (more accurate).

QC Quality Control Tests



Fill the cuvette with hexane and test a blank to make sure the solvent is clean. Readings should be close to zero ppm. If the calibration kit is available, test the standards to check for drift and accuracy. Readings should be close to each standard's concentration (within +/- 20%).

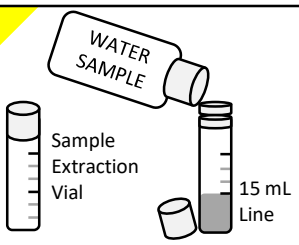
4.6 PROCEDURES TESTING DRINKING WATER FOR EXTENDED DIESEL RANGE ORGANIC HYDROCARBONS

Use for clean water applications with low concentrations of EDRO. Procedures shown here use materials included in Sitelab's Sample Extraction Vials, EXTR72-WATER. The solvent dispenser bottle, tissue wipes and cuvette are included with all Trilogy models.

EXTR72-WATER

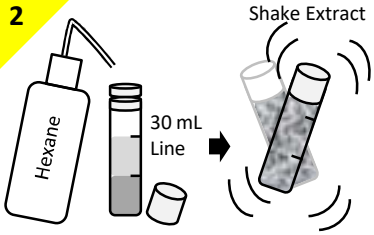
EDRO UV MODULE

1



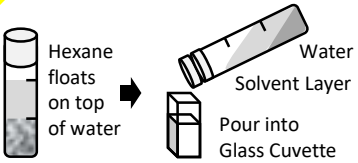
Shake water sample prior to use to mix contents thoroughly. Quickly pour 15 mL of water into a glass sample extraction vial. The vials have 5 mL graduations, be precise. If you do not have a container or bottle to collect your water sample, use an extraction vial to collect sample.

2



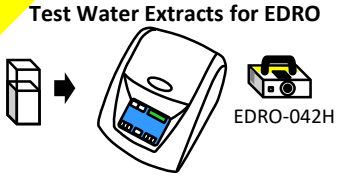
Add Hexane to the solvent dispenser bottle. Add 15 mL of hexane into the vial. Hexane will float on top of the water, so squirt up to the 30 mL line. Be precise. This creates a 1:1 or "1X" Extract. Screw and tighten the cap. Shake Extract for two minutes. The oil will dissolve into the solvent.

3



After shaking, allow time to settle so the solvent and water separate. Remove cap and pour top solvent layer into the glass cuvette about ½ full. Avoid water from bottom of vial! The Extract should be clear in color. Clean cuvette using a tissue wipe to remove any fingerprints or liquids.

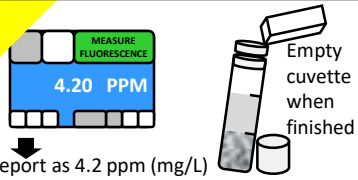
4 Test Water Extracts for EDRO



Use the EDRO UV module only! Test samples using the EDRO-042H calibration

Turn analyzer on, select "UV" when prompted, then "Calibrate" followed by "Use Stored Calibration". Select the "EDRO-042H" factory calibration from the menu screen. The home screen then appears and the analyzer is ready for analysis. Carefully insert the cuvette into the EDRO Module.

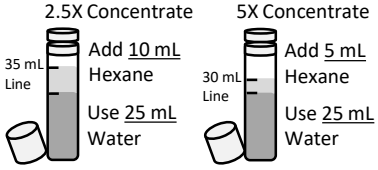
5



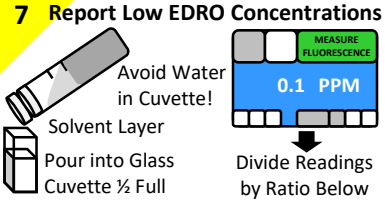
Close the lid and press the green "Measure Fluorescence" button. The concentration is displayed after a few seconds. Measure again several times to check repeatability. 1X Extracts are not diluted, no multiplier is used to calculate results, so record the concentration as is. When finished, pour back into the vial after analysis to save for future use.

6 Sample Readings <0.1 ppm? Prepare "Concentrated" Extracts

Readings close to zero ppm, negative readings or readings below the EDRO 0.1 ppm minimum detection limit should be reported as "ND" for Non Detect. To achieve lower detection limits, extract the sample using more water with less solvent. Use the two examples below and go to Step 7.

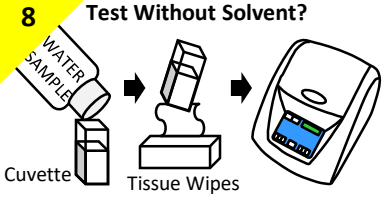


7 Report Low EDRO Concentrations



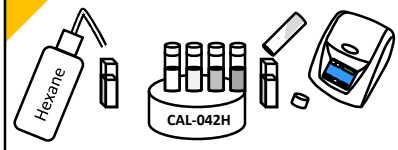
Analyze the 2.5X or 5X Concentrated Extracts for EDRO. Divide the readings by 2.5 or 5 to calculate the final result. If the readings are below the 0.1 ppm EDRO detection limit, report the 2.5X Concentrate as ND <0.04 ppm. Report the 5X Concentrate as ND <0.02 ppm. Measure and record the Extracts multiple times to check repeatability.

8 Test Without Solvent?



Really clean water may contain hydrocarbons soluble enough in water without the need for hexane solvent. Simply fill the cuvette with water and analyze. Results should be close to sample readings using solvent extraction. If results are not close, report the concentration performed using the solvent (more accurate).

QC Quality Control Tests



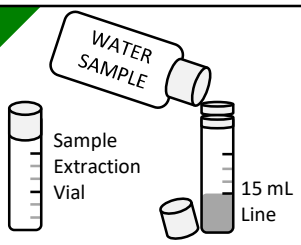
Fill the cuvette with hexane and test a blank to make sure the solvent is clean. Readings should be close to zero ppm. If the calibration kit is available, test the standards to check for drift and accuracy. Readings should be close to each standard's concentration (within +/- 20%).

4.7 PROCEDURES TESTING DRINKING WATER FOR TPH OIL & GREASE RANGE HYDROCARBONS

Use for clean water applications with low concentrations of TPH-Oil. Procedures shown here use materials included in Sitelab's Sample Extraction Vials, EXTR72-WATER. The solvent dispenser bottle, tissue wipes and cuvette are included with all Trilogy models.

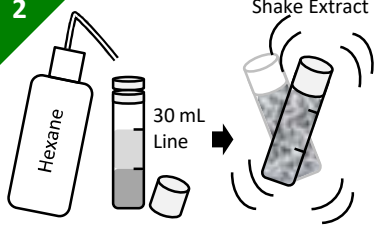
EXTR72-WATER TPHOIL UV MODULE

1



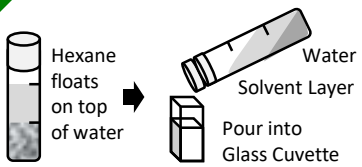
Shake water sample prior to use to mix contents thoroughly. Quickly pour 15 mL of water into a glass sample extraction vial. The vials have 5 mL graduations, be precise. If you do not have a container or bottle to collect your water sample, use an extraction vial to collect sample.

2



Add Hexane to the solvent dispenser bottle. Add 15 mL of hexane into the vial. Hexane will float on top of the water, so squirt up to the 30 mL line. Be precise. This creates a 1:1 or "1X" Extract. Screw and tighten the cap. Shake Extract for two minutes. The oil will dissolve into the solvent.

3



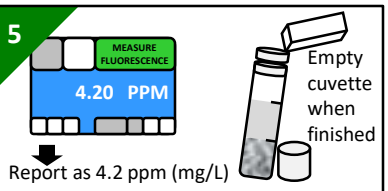
After shaking, allow time to settle so the solvent and water separate. Remove cap and pour top solvent layer into the glass cuvette about ½ full. Avoid water from bottom of vial! The Extract should be clear in color. Clean cuvette using a tissue wipe to remove any fingerprints or liquids.

4 Test Water Extracts for TPH Oil

Use the TPHOIL UV module only! Test samples using the TPH-057H calibration

Turn analyzer on, select "UV" when prompted, then "Calibrate" followed by "Use Stored Calibration". Select the "TPH-057H" factory calibration from the menu screen. The home screen then appears and the analyzer is ready for analysis. Carefully insert the cuvette into the TPHOIL Module.

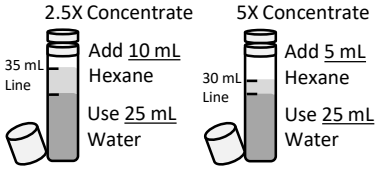
5



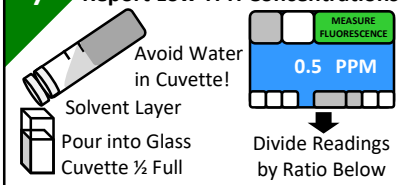
Close the lid and press the green "Measure Fluorescence" button. The concentration is displayed after a few seconds. Measure again several times to check repeatability. 1X Extracts are not diluted, no multiplier is used to calculate results, so record the concentration as is. When finished, pour back into the vial after analysis to save for future use.

6 Sample Readings <0.5 ppm? Prepare "Concentrated" Extracts

Readings close to zero ppm, negative readings or readings below the TPH 0.5 ppm minimum detection limit should be reported as "ND" for Non Detect. To achieve lower detection limits, extract the sample using more water with less solvent. Use the two examples below and go to Step 7.

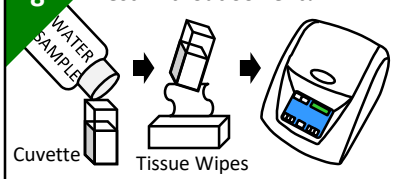


7 Report Low TPH Concentrations



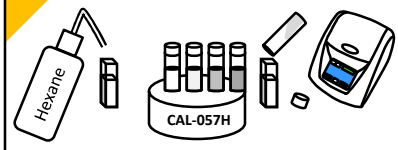
Analyze the 2.5X or 5X Concentrated Extracts for TPH. Divide the readings by 2.5 or 5 to calculate the final result. If the readings are below the 0.5 ppm TPH detection limit, report the 2.5X Concentrate as ND <0.2 ppm. Report the 5X Concentrate as ND <0.1 ppm. Measure and record the Extracts multiple times to check repeatability.

8 Test Without Solvent?



Really clean water may contain hydrocarbons soluble enough in water without the need for hexane solvent. Simply fill the cuvette with water and analyze. Results should be close to sample readings using solvent extraction. If results are not close, report the concentration performed using the solvent (more accurate).

QC Quality Control Tests



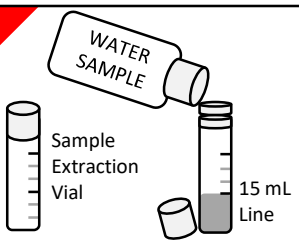
Fill the cuvette with hexane and test a blank to make sure the solvent is clean. Readings should be close to zero ppm. If the calibration kit is available, test the standards to check for drift and accuracy. Readings should be close to each standard's concentration (within +/- 20%).

4.8 PROCEDURES TESTING DRINKING WATER FOR POLYCYCLIC AROMATIC HYDROCARBONS

Use for clean water applications with low concentrations of Target PAHs. Procedures shown here use materials included in Sitelab's Sample Extraction Vials, EXTR72-WATER. The solvent dispenser bottle, tissue wipes and cuvette are included with all Trilogy models.

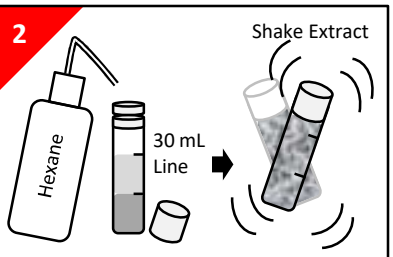
EXTR72-WATER PAHS UV MODULE

1



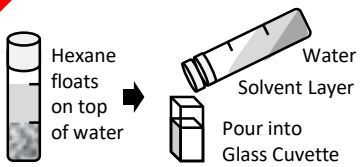
Shake water sample prior to use to mix contents thoroughly. Quickly pour 15 mL of water into a glass sample extraction vial. The vials have 5 mL graduations, be precise. If you do not have a container or bottle to collect your water sample, use an extraction vial to collect sample.

2



Add Hexane to the solvent dispenser bottle. Add 15 mL of hexane into the vial. Hexane will float on top of the water, so squirt up to the 30 mL line. Be precise. This creates a 1:1 or "1X" Extract. Screw and tighten the cap. Shake Extract for two minutes. The oil will dissolve into the solvent.

3



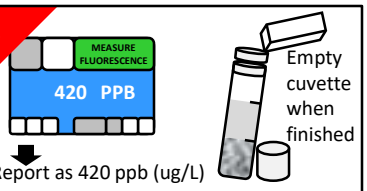
After shaking, allow time to settle so the solvent and water separate. Remove cap and pour top solvent layer into the glass cuvette about ½ full. Avoid water from bottom of vial! The Extract should be clear in color. Clean cuvette using a tissue wipe to remove any fingerprints or liquids.

4 Test Water Extracts for PAHs

Use the PAHS UV module only! Test samples using the PAHS-060H calibration

Turn analyzer on, select "UV" when prompted, then "Calibrate" followed by "Use Stored Calibration". Select the "PAHS-060H" factory calibration from the menu screen. The home screen then appears and the analyzer is ready for analysis. Carefully insert the cuvette into the PAHS Module.

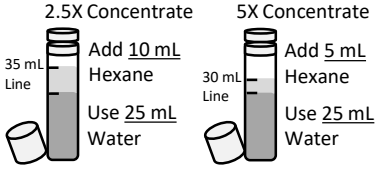
5



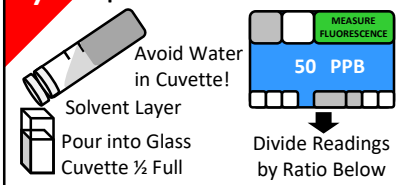
Close the lid and press the green "Measure Fluorescence" button. The concentration is displayed after a few seconds. Measure again several times to check repeatability. 1X Extracts are not diluted, no multiplier is used to calculate results, so record the concentration as is. When finished, pour back into the vial after analysis to save for future use.

6 Sample Readings <50 ppb? Prepare "Concentrated" Extracts

Readings close to zero ppm, negative readings or readings below the PAH 50 ppb minimum detection limit should be reported as "ND" for Non Detect. To achieve lower detection limits, extract the sample using more water with less solvent. Use the two examples below and go to Step 7.

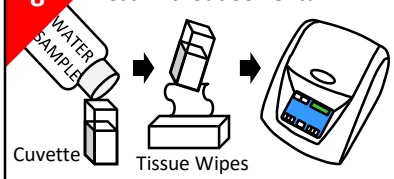


7 Report Low PAH Concentrations



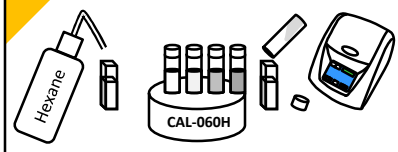
Analyze the 2.5X or 5X Concentrated Extracts for PAHs. Divide the readings by 2.5 or 5 to calculate the final result. If the readings are below the 50 ppb PAH detection limit, report the 2.5X Concentrate as ND <20 ppb. Report the 5X Concentrate as ND <10 ppb. Measure and record the Extracts multiple times to check repeatability.

8 Test Without Solvent?



Really clean water may contain hydrocarbons soluble enough in water without the need for hexane solvent. Simply fill the cuvette with water and analyze. Results should be close to sample readings using solvent extraction. If results are not close, report the concentration performed using the solvent (more accurate).

QC Quality Control Tests



Fill the cuvette with hexane and test a blank to make sure the solvent is clean. Readings should be close to zero ppm. If the calibration kit is available, test the standards to check for drift and accuracy. Readings should be close to each standard's concentration (within +/- 20%).

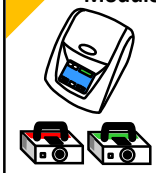
4.9 PROCEDURES USING LABORATORY CONTROL SAMPLES FOR QUALITY CONTROL ANALYSIS

QC

Use Sitelab's LCS products to perform daily or routine quality control tests to confirm the UVF-Trilogy is performing properly and test results are accurate. These are custom made to match the fuel or oil on your site. See example below.

Sitelab's CAL-JP5-LCS product contains 3 ready-to-use JP-5 Jet Fuel standards dissolved in hexane solvent at low (4 ppm), medium (20 ppm) and high (40 ppm) concentrations. Each vial contains 30 mL of liquid and will last longer compared to frequently testing the calibration standards, supplied in smaller 5 mL volumes. Test one, two or all three LCS standards plus a Blank daily or for every batch of samples, consistent with U.S. EPA test methods performed by certified laboratories.

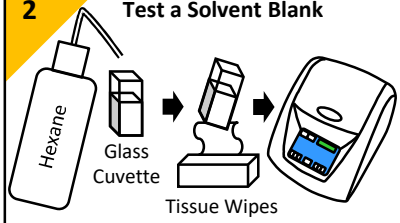
1 Use the GRO and EDRO UV Modules & Factory Calibrations



JP-5 has no response using PAH and TPHOIL Modules

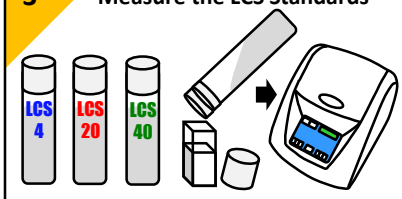
JP-5 contains aromatic hydrocarbons mostly in the GRO range (about 18%) with fewer hydrocarbons detected in the EDRO range (about 4%). Test the LCS standards using the GRO-025H and EDRO-042H factory calibrations stored on the analyzer. Be sure the correct UV module is installed.

2 Test a Solvent Blank



Rinse the cuvette with solvent prior to use and then fill it ½ full with hexane to test a Blank. Measure the Blank using the GRO-025H and EDRO-042H tests and measure it multiple times to check repeatability. Readings should be close to zero ppm. GRO readings will bounce a little, EDRO will not.

3 Measure the LCS Standards



Pour the 4, 20 or 40 ppm standard into the cuvette ½ full and measure it using the GRO-025H and EDRO-042H tests. Measure each LCS multiple times to check repeatability. Record readings in a log book. Pour back into vial when finished. Rinse cuvette with hexane to avoid cross-contamination.

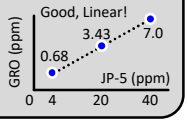
4 Examples showing Solvent Blank Analysis & LCS Readings using UVF-Trilogy

GRO BLANK PPM	GRO BLANK RFU	EDRO BLANK PPM	EDRO BLANK RFU
0.10	21	0.00	14
0.14	22	0.01	18
-0.40	19	-0.00	11
0.05	21	0.00	13
-0.01	20	-0.00	12

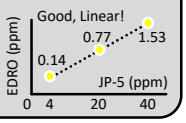
Close to zero ppm. RFUs within limits vs. factory calibration Blank RFU value.

Close to zero ppm. RFUs within limits vs. factory calibration Blank RFU value.

4 PPM GRO	20 PPM GRO	40 PPM GRO
0.66	3.43	7.18
0.72	3.48	6.86
0.85	3.37	7.10
0.64		
0.54		
Avg 0.68		



4 PPM EDRO	20 PPM EDRO	40 PPM EDRO
0.14	0.77	1.52
0.15	0.77	1.53
0.14	0.77	1.53



- Readings exhibited for GRO and EDRO are linear in all three LCS concentrations. The LCS standards are in good condition and the analyzer is performing properly.
- The Blank and 4 ppm LCS readings 'bounce' at bottom of the GRO-025H curve. This is normal and is due to low/poor sensitivity for readings close to zero or below the 0.5 ppm GRO detection limit. Measure the Blank and 4 ppm five or more times to check repeatability thoroughly and account for scatter.
- Alternatively, test the Blank in RFU mode and compare to factory calibration for better accuracy, RFU has less scatter. Refer to the "Optimum Blank RFU Range" in the Certificate of Analysis included with the calibration kits for your analyzer.
- The 20 ppm and 40 ppm LCS exhibits more repeatable GRO readings and require less frequent measurements; a minimum of three times is sufficient.
- The EDRO-042H readings for the Blank, 4 ppm, 20 ppm and 40 ppm LCS are more repeatable and require less frequent measurements; a minimum of three times is sufficient. The EDRO Module has better sensitivity compared to the GRO Module.

Performance & Acceptance Criteria

The LCS readings should be linear and close each time they are analyzed. Record the average concentration for each standard. Results should be within the ranges specified below. If readings are outside of these limits, new LCS standards should be used.

Low JP-5 Concentration 4 ppm Readings

GRO Range = 0.5 to 0.9 ppm

EDRO Range = 0.13 to 0.17 ppm

Medium JP-5 Concentration 20 ppm Readings

GRO Range = 3.0 to 3.8 ppm

EDRO Range = 0.6 to 1.0 ppm

High JP-5 Concentration 40 ppm Readings

GRO Range = 6.0 to 8.0 ppm

EDRO Range = 1.4 to 1.9 ppm

Note: Fresh standards will perform better than older standards used frequently. LCS standards have a 6-month expiration date.

5.0 HYDROCARBON FINGERPRINTING

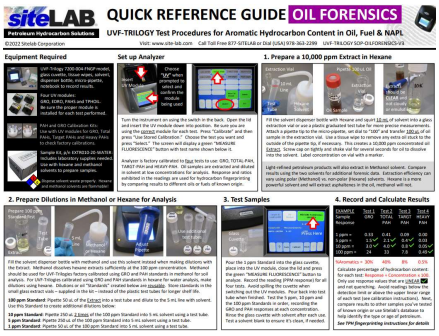
5.1 OVERVIEW

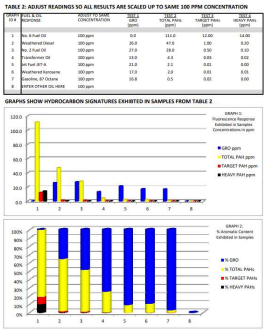
The UVF-Trilogy 7200-004-FNGP model includes four UV modules used to perform hydrocarbon fingerprinting in soil, water and for oil forensic analysis. Different types of petroleum contaminants fluoresce differently from one another. The GRO and PAH ratios or "signatures" exhibited in the four tests performed can be used to help identify the type or age of petroleum in a sample.

Other test combinations can also work. Testing GRO and EDRO, for example, is often used on fuel sites. The ratios exhibited in the two tests varies depending on how fresh or weathered the contamination is or if the site is commingled with different fuels.

5.2 INSTRUCTIONS AVAILABLE

The "Quick Reference Guide Oil Forensics" SOP is available on Sitelab's website. Sitelab also has Excel files to use for oil and soil forensic analysis. Data is entered manually and results are computed in graphical format. See Section 5.5 for more details.





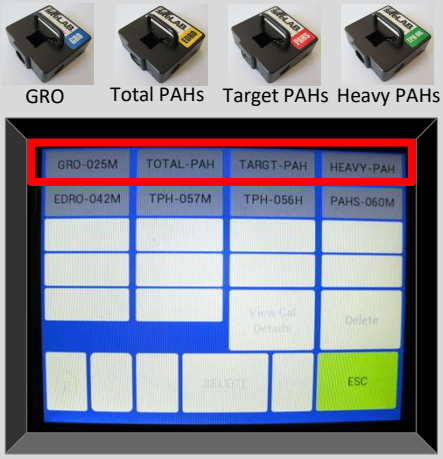
5.3 USE OF FORENSIC RATIOS

Ratios are calculated by dividing the concentration from one test to another. Compare the ratios in your samples or to different fuels and oils you've also tested. Sitelab has an extensive database and can provide assistance with your data.

5.4 ADVANCED FINGERPRINTING APPLICATIONS

Extract and test samples using methanol and hexane solvents. Extraction efficiency comparing polar vs. non-polar solvents in the two sets of results can vary depending on the type of contaminant. Use for oil, soil, sediments or other solids.

In general, hexane will extract more hydrocarbons in samples with high PAH content, like crude oils, compared to methanol. Methanol will extract more hydrocarbons in samples with high GRO content, like gasoline, compared to hexane.



Use these four factory calibrations from the menu screen to test samples for GRO and PAH content. PAHs are tested using the EDRO, PAHS and TPHOIL modules. The analyzer is calibrated using the same PAH calibration kit for all three PAH tests.

RECORD & CALCULATE OIL TEST RESULTS

EXAMPLE Oil Sample Response	Test 1 GRO	Test 2 TOTAL PAH	Test 3 TARGT PAH	Test 4 HEAVY PAH
1 ppm =	0.33	0.41	0.09	0.00
5 ppm =	1.5 ✔	2.1 ✔	0.4 ✔	0.03
10 ppm =	3.0 ✔	4.0 ✔	0.8 ✔	0.05 ✔
100 ppm =	24	33	6.8	0.49 ✔
%Content =	30%	40%	8%	0.5%

Calculate percentage of hydrocarbon content for each test: Response ÷ Concentration x 100.

- Only use response values that are LINEAR ✔
- Avoid low readings below the detection limit or high readings above the calibration's upper linear limit to avoid quenching.
- Prepare and test other concentrations as needed.

COMPARE SOIL RESULTS USING RATIOS

EXAMPLE Sample Results	Test 1 GRO	Test 2 TOTAL PAH	Test 3 TARGT PAH	Test 4 HEAVY PAH
Soil (PPM) =	2,300	3,300	600	100

Ratios Exhibited	Test 1 ÷ Test 2	Test 2 ÷ Test 3	Test 2 ÷ Test 4
Soil Sample =	0.70	5.5	33
vs. Oil Sample =	0.75	5.0	80

Soil collected from this fuel oil site is similar to oil collected from the site's NAPL recovery well.

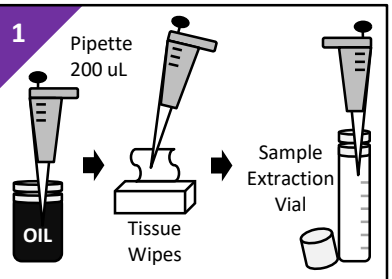
5.5 PROCEDURES FOR OIL FORENSICS ANALYSIS

Oil is diluted in solvent from 1 million ppm down to low, detectable concentrations used to measure the GRO and PAH content for hydrocarbon fingerprinting. Procedures shown here use the materials included in Sitelab's extraction kit. The four UV modules and other tools needed are included in the FNGP model.

Supplies for 20 Samples: Extraction vials, solvent extract vials, test tubes, filters, syringes, pipette tips, test record sheet & Quick Reference Guide

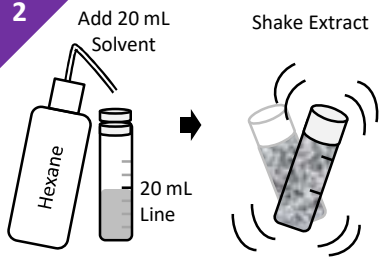
Sample Extraction Kit, p/n EXTR010-20-WATER

1



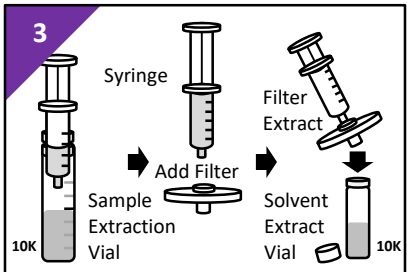
Prepare a 10,000 ppm Oil Extract: Start by using the pipette to suck up 200 uL (micro liters) of oil from your oil sample. Use a tissue to wipe off any oil stuck to the outside of the tip. Dispense contents into glass sample extraction vial.

2



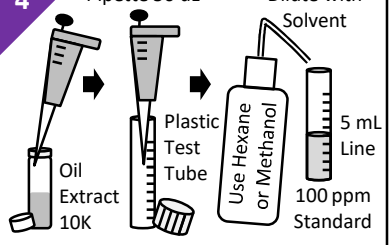
Add Hexane to the solvent dispenser bottle. Squirt hexane into the vial up to the 20 mL line. Be precise! Screw on the cap and shake Extract for several minutes. If the Extract is light in color and not dark, silty or dirty, filtering is not required, go to Step 4.

3



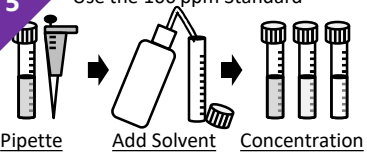
Dip a syringe into the extraction vial and suck up 3-5 mL of Extract into the syringe. Remove from vial and screw on a filter. Push down on the plunger and filter the Extract into a solvent extract vial. Label Extract vials with concentration (10K or 10,000 ppm).

4



Prepare a 100 ppm Standard: Attach a new tip to the pipette and transfer 50 uL of the Extract into a graduated plastic test tube. Add 5 mL solvent, screw on cap and briefly shake to mix. Use methanol or hexane solvent to make standards.

5



Pipette	Add Solvent	Concentration
250 uL x2	to 5 mL Line	= 10 ppm
250 uL	to 5 mL Line	= 5 ppm
50 uL	to 5 mL Line	= 1 ppm

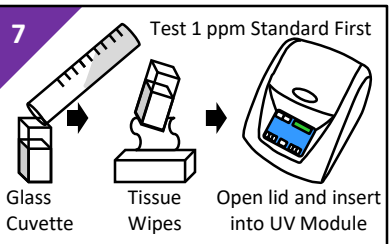
Prepare 1, 5 and 10 ppm Standards: Use the 100 ppm standard to prepare a series of lower concentration standards used for analysis. Pipette the 100 ppm standard using additional test tubes and dilute with methanol or hexane. Use examples shown above.

6

GRO Module (BTEX)
EDRO Module (Total PAHs)
PAHS Module (Target PAHs)
TPHOIL Module (Heavy PAHs)

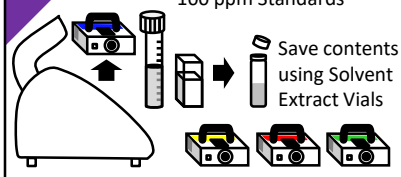
Set up Analyzer for Analysis
Turn analyzer on, select "UV" then "Calibrate" followed by "Use Stored Calibration" and select the test you want to use from the menu screen. Use the GRO, Total PAH, Target PAH and Heavy PAH calibrations. Make sure the correct UV module is used for each test performed.

7



Fill the glass cuvette about ½ full with the 1 ppm standard. Clean cuvette using a tissue to remove any liquids or fingerprints and place into the UV Module. Close the lid and press the green "Measure Fluorescence" button and record the PPM response. Pour back into test tube when finished.

8



Measure the other standards from lowest to highest and record the PPM response for each. Test each standard for it's GRO, Total PAH, Target PAH and Heavy PAH content by swapping out the UV Modules. Some standards will fluoresce too weak or too strong. Only linear readings should be used.

9 **Record Readings, Calculate Results**

Example	GRO (BTEX)	Total PAHs	Target PAHs	Heavy PAHs
1 ppm =	0.33 L	0.41	0.09	0.00 L
5 ppm =	1.5	2.1	0.4	0.03 L
10 ppm =	3.0	4.0	0.8	0.05
100 ppm =	24 Q	33 Q	6.8 Q	0.49
Calculate %Hydrocarbon Content: Response ÷ Concentration x 100	30%	40%	8%	0.5%

The hydrocarbon content exhibited is the oil's "fluorescence signature." Do not apply readings that are too low (L) or quench (Q) and not linear, which occurs in higher concentrations. Use Sitelab's Oil Forensics Excel program to report and view data.

6.0 DATA QUALITY

6.1 CALCULATING AND REPORTING RESULTS

Accuracy and validity of your test results is dependent on a number of factors. It is very important to follow the procedures and record your results clearly. When testing dilutions, make sure you use the correct multiplier to report the final concentration. As such, save and store your extracts if retesting is necessary. Results are in 'wet' weight. Sediments or soils with high water content can contribute to lower concentrations.

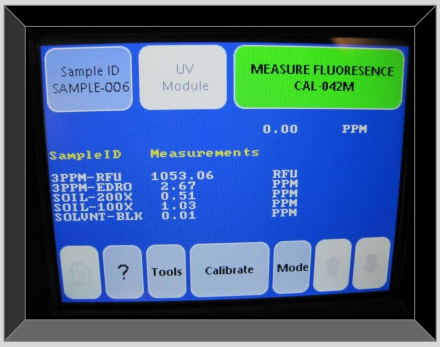
Remember too calibration is key! If analyzer is (1) not calibrated correctly, (2) if the wrong test is selected or (3) the wrong UV module is used, it will perform poorly and produce wrong results.

6.2 REPORTING "NON-DETECT" SAMPLE RESULTS

Samples with readings between zero and the minimum detection limit are too low and should be reported as ND or "Non Detect". If using Sitelab's calibration kits, the detection limit (or reporting limit) is always dictacted by the lowest calibration standard.

When doing so, make sure to account for any dilution performed. For example, if testing for EDRO using the factory calibration, the minimum detection limit is 0.1 ppm. If a 1X water extract reads below 0.1 ppm, report the result as "ND <0.1 ppm." If a 20X water dilution reads below 5 ppm, report the result as "ND <100 ppm," calculated by multiplying 5 by 20X.

EXAMPLE SHOWING TEST DATA

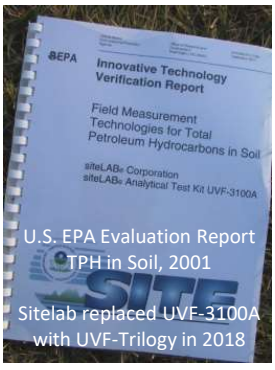


Soil sample was analyzed for EDRO using Sitelab EDRO calibration kit CAL-042M.

- A solvent blank was tested first (shown last). Reading = 0.01 ppm. Good, close to zero.
- Soil tested at 100X dilution = 1.03 ppm. Report result as 103 ppm.
- Soil tested again at 200X dilution = 0.51 ppm. Report result as 102 ppm. Good, close to 103 ppm. No quenching in readings.
- 3 ppm EDRO standard tested = 2.67 ppm. Good, close to 3 ppm (RPD <20%).
- 3 ppm EDRO standard measured in RFU mode. Reading = 1,053 RFU. Good, close to factory calibration value of 1,150 RFU (not shown).

6.3 CORRELATION TO LABORATORY METHODS

Sitelab's UVF test methods should correlate to most other laboratory test methods. This includes U.S. EPA Gas Chromatography (GC) methods and gravimetric methods used in the environmental remediation, oil and gas and other industries. If testing split samples sent to a certified laboratory do not directly correlate 1 to 1, the results should trend well and be proportionate to the laboratory results. If this is the case, use a response factor to adjust your test results so the results correlate more directly. Or, if the source oil is available from your site, use it to calibrate and test your samples. If results do not improve, poor correlation may be due to the method used for comparison or the laboratory made an error. Testing samples with multiple labs should be considered.



U.S. EPA Pub No. 600/R-01/080
Available on SITE-LAB.COM

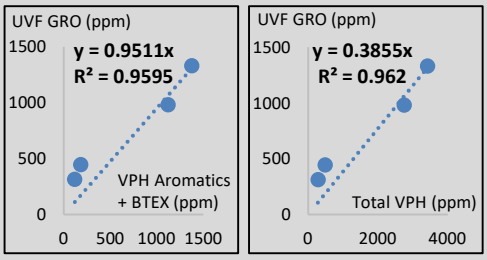
HYDROCARBON TEST METHODS

UVF-Trilogy:	U.S. EPA and Other Methods:
GRO	8015, VOCs, VPH, other lab TPH-GRO GC methods
EDRO	8015M, EPH, other lab TPH-DRO GC methods
PAHs	8270D, SVOCs, other lab GC/MS methods
TPH-Oil	1664, 9071B, other gravimetric TPH oil and grease methods

Note: GRO and EDRO results may be lower than lab results if samples are high in aliphatic content

ACCURACY vs. LAB RESULTS

Example Site: Former gasoline station, UST spill
Test Performed: GRO vs. Lab VPH in soil samples



Results in graph 1 correlate closer to results in graph 2. Total VPH method detects aromatics plus aliphatics

7.0 SOFTWARE AVAILABLE

Software is free and provided by Sitelab's manufacturer, Turner Designs, Inc. (San Jose, CA). The software records results to a computer using the cable included with all UVF-Trilogy models.

VISIT THIS WEBPAGE TO DOWNLOAD:

TURNER DESIGNS
www.turnerdesigns.com

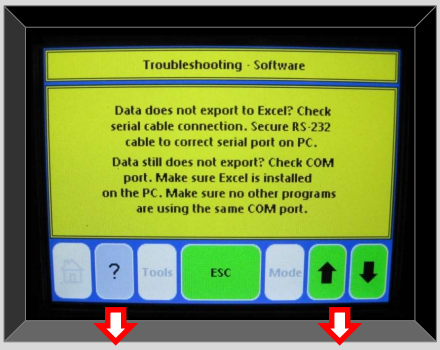
https://www.turnerdesigns.com/trilogy-downloads

The analyzer can be connected to a PC for streaming data directly into Excel spreadsheets. To connect via USB you will need:

- UVF-Trilogy, power supply and standard USB printer cable
- Microsoft Windows PC
- Microsoft Excel
- Trilogy Software
- Trilogy USB Drivers

To use this feature, specific drivers will need to be installed on your computer (not available for MACs). Download the "Trilogy USB Driver Folder" by clicking the link above. Click the "Easy to Download – Installation Instructions" link provided to download instructions that will help guide you through the Driver and Software installation process.

Connect analyzer to a computer using the software cable provided (100% ASCII format).



Press "?" key to see help topics. Use arrow keys to see other help screens for exporting data to MAC or PCs. Use of a RS-232 cable may be needed.

8.0 TROUBLESHOOTING

The UVF-Trilogy displays different error screens informing you of a problem. Follow the instructions when prompted to correct the problem. Please contact Sitelab Corporation if you need assistance, have questions or require training. Common problems include the following:

1. Sample readings are in RFU units, not PPM units? Press the "Mode" key to switch from RFU to PPM mode.

2. Solvent blanks are high? Make sure the glass cuvette is clean or use a new cuvette. Use new solvent if necessary.

3. Solvent blanks produce negative concentrations? This is normal and occurs if the reading is lower than the factory calibration blank.

4. Sample readings are too high or too low? Make sure the correct UV module is installed and the correct test is selected.

5. Calibration standard readings are too high or too low? Order new standards or make new calibrators using the reference standard supplied with your calibration kit.

ERROR SCREENS

CALIBRATION FAILURE ?

- Red warning message appears if a standard reads lower or too close to the blank when starting a new calibration. This occurs more often when calibrating to GRO.
- This message appears briefly and then goes back to the home screen. The calibration is canceled.
- Start a new calibration. Try using new solvent or a new standard to correct the problem.

9.0 WARRANTY

9.1 TERMS

Sitelab Corporation warrants the UVF-Trilogy benchtop hydrocarbon analyzer and accessories to be free from defects in materials and workmanship under normal use and service for a period of 12 months from the date of shipment, with the following restrictions:

● Sitelab Corporation is not responsible for replacing parts damaged by accident or neglect. Damage from corrosion is not covered. Damage to the Trilogy touch screen or UV modules is not covered. Damage caused by customer modification of the instrument is not covered. Damage incurred in shipping is not covered.

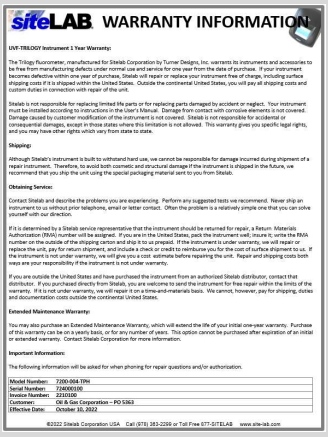
● This warranty covers only Sitelab's products and is not extended to other equipment used with our products. We are not responsible for incidental or consequential damages, except in those states or countries where this limitation is not allowed. This warranty gives you specific legal rights and you may have other rights which vary from state to state or country to country.

9.2 WARRANTY SERVICE

To obtain service during the warranty period, locate the warranty information sheet and serial number and take the following steps:

1. Email or call Sitelab Corporation and describe as precisely as possible the nature of the problem. Phone (USA) +1 978-363-2299. Email: support@site-lab.com

2. Carry out any adjustments or tests as suggested by Sitelab Corporation. Often the problem is a relatively simple one that you can solve yourself with our direction.


siteLAB WARRANTY INFORMATION

UVF-TRILOGY Instrument 1 Year Warranty:

The Trilogy fluorometer, manufactured for Sitelab Corporation by Turner Designs, Inc. warrants its instruments and accessories to be free from manufacturing defects under normal use and service for one year from the date of purchase. If your instrument becomes defective within one year of purchase, Sitelab will repair or replace your instrument free of charge, including surface shipping costs if it is shipped within the United States. Outside the continental United States, you will pay all shipping costs and custom duties in connection with repair of the unit.

Sitelab is not responsible for replacing limited life parts or for replacing parts damaged by accident or neglect. Your instrument must be installed according to instructions in the User's Manual. Damage from contact with corrosive elements is not covered. Damage caused by customer modification of the instrument is not covered. Sitelab is not responsible for accidental or consequential damages, except in those states where this limitation is not allowed. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Shipping:

Although Sitelab's instrument is built to withstand hard use, we cannot be responsible for damage incurred during shipment of a repair instrument. Therefore, to avoid both cosmetic and structural damage if the instrument is shipped in the future, we recommend that you ship the unit using the special packaging material sent to you from Sitelab.

Obtaining Service:

Contact Sitelab and describe the problems you are experiencing. Perform any suggested tests we recommend. Never ship an instrument to us without prior telephone, email or letter contact. Often the problem is a relatively simple one that you can solve yourself with our direction.

If it is determined by a Sitelab service representative that the instrument should be returned for repair, a Return Materials Authorization (RMA) number will be assigned. If you are in the United States, pack the instrument well; insure it; write the RMA number on the outside of the shipping carton and ship it to us prepaid. If the instrument is under warranty, we will repair or replace the unit, pay for return shipment, and include a check or credit to reimburse you for the cost of surface shipment to us. If the instrument is not under warranty, we will give you a cost estimate before repairing the unit. Repair and shipping costs both steps are your responsibility if the instrument is not under warranty.

If you are outside the United States and have purchased the instrument from an authorized Sitelab distributor, contact that distributor. If you purchased directly from Sitelab, you are welcome to send the instrument for free repair within the limits of the warranty. If it is not under warranty, we will repair it on a time-and-materials basis. We cannot, however, pay for shipping, duties and documentation costs outside the continental United States.

Extended Maintenance Warranty:

You may also purchase an Extended Maintenance Warranty, which will extend the life of your initial one-year warranty. Purchase of this warranty can be on a yearly basis, or for any number of years. This option cannot be purchased after expiration of an initial or extended warranty. Contact Sitelab Corporation for more information.

Important Information:

The following information will be asked for when phoning for repair questions and/or authorization.

Model Number:	7200-004-TPH
Serial Number:	7240D0100
Invoice Number:	2210100
Customer:	Oil & Gas Corporation – PO 5363
Effective Date:	October 10, 2022

©2022 Sitelab Corporation USA Call (978) 363-2299 or Toll Free 877-SITELAB www.site-lab.com

A printed copy of Sitelab's "Warranty Information" is provided with your analyzer with more detailed information.

● The analyzer's serial number is listed.

● The serial number can also be found on the back of the analyzer.

● Your serial number is needed to enquire about service or support

3. If proper performance is not obtained you will be issued a Return Authorization number (RMA). Package the unit safely, write the RMA number on the outside of the shipping carton, and ship the instrument, prepaid, to Sitelab Corporation. If the failure is covered under the warranty terms, the instrument will be repaired and returned free of charge. Customer pays for shipping to Sitelab, while Sitelab pays for return shipment. Custom duties, taxes and fees are the responsibility of the customer.

9.3 EXTENDED MAINTENANCE WARRANTY

You may also purchase an Extended Maintenance Warranty, which will extend the life of your initial one-year warranty. Purchase of this warranty can be on a yearly basis, or for any number of years. This option cannot be purchased after expiration of an initial or extended warranty. Contact Sitelab for more information.

9.4 OUT-OF-WARRANTY SERVICE

Follow steps for Warranty Service as listed above. Contact Sitelab and describe the problems you are experiencing. Perform any suggested tests we recommend. Never ship an instrument to us without prior telephone, email or letter contact. Repair service will be billed on a fixed price basis, plus any applicable duties and/or taxes. Shipment to Sitelab should be prepaid. Your bill will include return shipment freight charges. Address for shipment: Sitelab Corporation, 86 Coffin Street, West Newbury, MA 01985 USA.

10.0 PRODUCTS AND ACCESSORIES AVAILABLE

All products used in this manual can be found on the SITE-LAB.COM website. Use this manual for all Sitelab UVF-Trilogy models. Price list is available upon request.

11.0 UVF-TRILOGY INSTRUMENT SPECIFICATIONS

Models Available & Part Number:	● UVF-Trilogy GRO analyzer, 7200-004-GRO ● UVF-Trilogy EDRO analyzer, 7200-004-EDRO ● UVF-Trilogy PAH analyzer, 7200-004-PAHS ● UVF-Trilogy TPH-OIL analyzer, 7200-004-TPH ● UVF-Trilogy analyzer, 7200-004-FNGP, with all 4 UV Modules
Weight & Dimensions:	8.1 lbs (3.7 Kg); 12.9" x 10.4" x 8.4" (33 cm x 27 cm x 21 cm)
Power Requirements:	External power supply, Input 100-240V, Output 12V, 0.7A Max
Operating Temperature:	45˚F to 105˚F; 7˚C to 40˚C Relative Humidity 75% Max
Principle of Operation:	Ultraviolet fluorescence spectrophotometer (fixed wavelength)
Results Produced:	Performs both quantitative and qualitative measurements
Detector:	Photodiode sensor
Light Source:	Light Emitting Diodes (LEDs): 255 nm and 365 nm
UV Module Optics:	Four modules available each fitted with LED, excitation and emission optical filters sensitive to hydrocarbons of interest
Min. Detection Limits:	Varies depending on module and calibration used; GRO = 0.5 ppm, EDRO = 0.1 ppm, PAHs = 0.05 ppm, TPH-OIL = 0.5 ppm
Display:	Intuitive color touch screen user interface
Readout:	Direct concentration (PPM, PPB, etc.) or raw fluorescence units (RFU) mode
Data Output:	100% ASCII format through a USB port, software available online
Cuvettes:	Uses quartz glass cuvettes. Replacement, spare cuvettes available, sold separately
Calibration:	Can perform and store up to 18 multi-point calibrations. Analyzer is factory calibrated using 5-point calibration curves set up for GRO, EDRO, PAHs and/or TPH OIL.
Blank:	Reads and subtracts blank using methanol or hexane solvents
Response Time:	Measures samples in 6 seconds
Automatic Power Down:	After 20 minutes of inactivity
Other Capabilities:	Turbidity, absorbance and other non-UV applications
Portable Battery Power:	Charger available to power analyzer for days with quick recharge
Warranty:	One-year warranty, parts and labor
Approvals:	CE, UL and C-UL. ISO 9001 manufacturing. Made in USA 

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86 Coffin Street
West Newbury, MA 01985
USA
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