



*Strategic Diagnostics Inc.*

# Sample Extraction Kit User's Guide

## Intended Use

For use in conjunction with the appropriate immunoassay test kit. Each Sample Extraction Kit Contains materials to process twelve (12) soil or wipe samples.

## Principle

The reagents contained in the Sample Extraction Kit have been optimized for fast, efficient removal of compounds from soil or surfaces and convenient preparation of the sample for immunoassay testing at levels of interest to the investigator. The system allows for reliable, convenient and cost effective determinations at the field testing or remediation site.

## Customer Support

If there are any questions regarding this procedure, please call the SDI Technical Services Department at 1-800-544-8881 or (302)-456-6789, before running samples to avoid costly mistakes.

## Extraction Solvents

### **Extraction Solution - 100% Methanol**

per kit: 12 ampules containing 20 mL each for use with:

- EnSys<sup>®</sup> PCB Soil and Wipe Test Systems (Item # 7020301, 7020601, 7021301 or 7021201)
- EnSys Petro Soil Test Systems (Item # 7042301 and 7043001)
- EnSys PAH Soil Test Systems (Item # 7061301 and 7060501)
- EnSys Penta Soil Test Systems (Item # 7000301)
- PCB RaPID Assay<sup>™</sup> (Item # A00133 and A00134)
- PAH RaPID Assay (Item # A00156 and A00157)
- Carcinogenic PAHs RaPID Assay (Item # A00200 and A00201)
- TNT RaPID Assay (Item # A00186)

### **Extraction Solution - 100% Methanol**

per kit: 12 ampules containing 10 mL each for use with:

- EnviroGard<sup>™</sup> PCB in Soil and Wipe Test Kits (Item # 7020800, 7021600, 7021500 and 7021600)
- EnviroGard PAH in Soil Test Kit (Item # 7060600)
- EnviroGard Petroleum Hydrocarbons (BTEX) in Soil Test Kits (Item # 7004000)
- EnviroGard Petroleum Hydrocarbons (TPH) in Soil Test Kits (Item # 7042000)
- EnviroGard DDT in Soil Test Kits (Item # 7310000)

### Extraction Solution - 90% Methanol

per kit: 12 ampules containing 20 mL each for use with:

- EnviroGard Chlordane in Soil test Kit (Item # 7311000)
- EnviroGard Toxaphene in Soil test Kit (Item # 7420000)
- EnviroGard Lindane in Soil Test Kit (Item # 7630000)

### Extraction Solution - 75% Methanol

per kit: 12 ampules containing 10 mL each for use with:

- BTEX RaPID Assay (Item # A00161 and A00162)

### Extraction Solution - 75% Methanol with Sodium Hydroxide

per kit: 12 ampules containing 20 mL each for use with:

- Pentachlorophenol RaPID Assay (Item # A00110 and A00111)

### Extraction Solution - 100% Methanol with Surfactant

per kit: 12 ampules containing 10 mL each for use with:

- Cyclodienes RaPID Assay (Item # A00216)

### Description of Contents



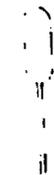
Filtration barrel



Filtration plunger



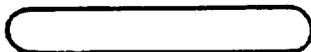
Weigh Boat



Test vials



Extraction jar



Wooden spatula



Ampule Cracker



Template

### Filter Modules

per kit: 12 filter plungers and barrels

### Wooden Spatulas

per kit: 12 each (not in PCB Wipe Kit)

### Weigh Canoes

per kit: 12 each (not in PCB Wipe Kit)

### Disposable Transfer Pipettes

per kit : 12 each

### Extraction Jars

per kit: 12 each with 3 bearings per jar (no bearings in PCB Wipe Kit)

### Ampule Crackers

per kit: 3 each

### Wipe Template

per kit: 12 each 10 cm by 10 cm plastic templates (PCB Wipe Kit only)

### Gauze Wipes

per kit: 12 each (PCB Wipe Kit only)

### Protective Gloves

per kit: 24 each (PCB Wipe Kit Only)

## Sample Dilution

### RaPID Assay Test Systems

- BTEX Extract Diluent: 12 vials containing 4.5 mL each (Item #100654).
- PCB Extract Diluent: 12 vials containing 25 mL each. One (1) 25  $\mu$ L disposable pipet with 12 tips (Item #100538).
- Pentachlorophenol Extract Diluent: 12 vials containing 25 mL each. One (1) 50  $\mu$ L disposable pipet with 12 tips (Item #100479).
- PAH Extract Diluent: 12 vials containing 12.25 mL each (Item #100623).
- Carcinogenic PAHs Extract Diluent: 12 vials containing 9.8 mL each (Item #100798).
- TNT Extract Diluent: 12 vials containing 25 mL each. One (1) 50  $\mu$ L disposable pipet with 12 tips (Item #100745).
- Cyclodienes Extract Diluent: 12 vials containing 12.25 mL each (Item #101024).

### EnSys Soil Test Systems

- Dilution ampules provided dependent upon detection levels of interest.

### EnviroGard Soil Test Systems

- No additional dilution materials required.

## Reagent Storage and Stability

Store all reagents and components in a dry well ventilated area at 2-30°C.

Reagents may be used until the expiration date shown on the vials.

Consult local, state and federal regulations for proper disposal of all reagents.

## Materials Not Provided

In addition to the materials provided, the following items will be necessary for the procedure:

- stopwatch or clock with second hand
- permanent marking pen
- protective gloves
- digital balance (available from SDI, Item # A00131)

## Sample Information

This kit was validated for use with soil samples. Other types of sample matrices and solid wastes may require different procedures to efficiently extract compounds of interest. Contact SDI's Technical Services Department for application guidance.

## Procedural Notes and Precautions

Do not use any reagent beyond its stated shelf life.

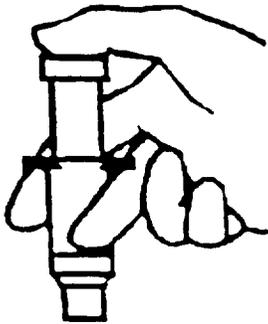
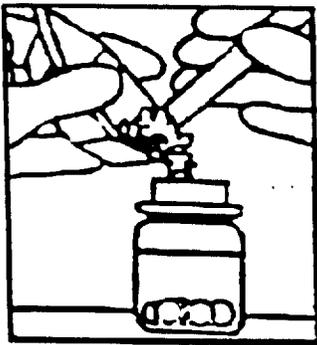
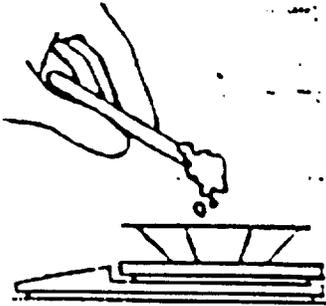
Continuous agitation of the soil sample in the presence of the extraction solution for the prescribed time is important for good extraction efficiency. Use of a timer or stopwatch to assure adequate shaking time is recommended.

Avoid contact of extraction solution (methanol) with skin and mucous membranes. If this reagent comes in contact with skin wash with water.

## Limitations

The Sample Extraction Kit, when used in conjunction with the appropriate test kit, will provide screening results. Results may need to be confirmed by a non-immunological method.

## Soil Extraction Procedure



## WEIGH SAMPLE

1. Place unused weigh canoe on pan balance.
2. Press ON/MEMORY button on pan balance. Balance will beep and display 0.0.
3. Weigh out  $10 \pm 0.1$  grams of sample using the wooden spatula.
4. If balanced turns off prior to completing weighing, use empty weigh canoe to re-tare then continue.
5. Repeat steps 1-4 for each sample to be tested.

## EXTRACTION

1. Uncap extraction jar and place on flat surface. Using a wooden spatula, transfer 10 grams of sample from the weigh boat into the extraction jar.
2. Open solvent ampule and pour the entire contents into the extraction jar.
3. Recap the extraction jar and shake vigorously for one (1) minute.
4. Allow to settle for one (1) minute or until a clear solvent layer is observed above the sample.
5. Repeat steps 1-4 for each sample to be tested.

## FILTRATION

1. Insert bulb pipet into top (liquid) layer in extraction jar and draw up sample. Transfer at least  $\frac{1}{2}$  bulb capacity into the filtration barrel. *Do not use more than one full bulb.*
2. Press plunger firmly into barrel until adequate filtered sample is available or unit snaps together. Place on flat surface.
3. Repeat steps 1-3 for each sample to be tested.

## DILUTION

**EnviroGard** - Use the filtered extract as "SAMPLE" in the User's Guide Procedure.

**EnSys** - If the instructions start with Phase 1 *Extraction and Preparation of the Sample* in the User's Guide, skip to Phase 2 *Sample and Standard Preparation* and follow the remainder of the assay procedure and data interpretation. If the instructions start at Phase 1 *Sample & Standard Preparation*, continue with the instructions, as written.

**Note:** Kit may contain additional ampules in order to achieve your test levels. Always transfer filtered sample to the dilution ampule labeled with the lowest PPM level and then transfer from this ampule to the next higher level dilution ampule.

**RaPID Assay** - Dilute the filtered extract into the appropriate Extract Diluent as described below or follow customized dilution procedure provided by the SDI Technical Services Department.

## RaPID Assay Dilution

Contaminant	Extract Volume ( $\mu\text{L}$ )	Extract Diluent (mL)	Test Range (ppm)
PCB	25	25	0.5 to 10.0 (Aroclor 1254)
PAH	250	12.25	0.2 to 5.0 (Phenanthrene)
caPAH	200	9.8	0.01 to 0.5 (Benzo[a]pyrene)
BTEX/TPH	500	4.5	0.9 to 30 (Total BTEX)
Pentachlorophenol	50	25	0.1 to 10.0 (PCP)
TNT	50	25	0.25 to 5.0 (TNT)
Cyclodienes	250	12.5	0.1 to 2.0 (Dieldrin)

### Wipe Extraction Procedure



### WIPE SAMPLE

1. Wearing the protective gloves provided, uncap the extraction jar.
2. Using an ampule cracker, open solvent ampule and pour the entire contents into the extraction jar.
3. Soak gauze pad in extraction jar containing solvent.
4. Remove gauze wipe from solvent and squeeze excess from pad back into extraction jar.
5. Hold clean template on surface to be wiped.
6. Wipe entire exposed area for 15-20 seconds. Wipe should be damp when finished.
7. Place wipe back into same extraction jar and cap tightly.
8. Remove and discard protective gloves.
9. Repeat steps 1-8 for each sample to be tested.

### EXTRACTION

1. Shake each jar vigorously for one (1) minute.
2. Repeat step 1 for each sample to be tested.

### FILTRATION

1. Disassemble filtration plunger from filtration barrel.
2. Insert bulb pipet into top (liquid) layer in extraction jar and draw up sample. Transfer at least  $\frac{1}{2}$  bulb capacity into the filtration barrel. *Do not use more than one full bulb.*
3. Press plunger firmly into barrel until adequate filtered sample is available or unit snaps together. Place on flat surface.
4. Repeat steps 1-3 for each sample to be tested.

## DILUTION

EnviroGard - Use the filtered extract as "SAMPLE" in the User's Guide Procedure.

EnSys - If the instructions start with Phase 1 *Extraction and Preparation of the Sample* in the User's Guide, skip to Phase 2 *Sample and Standard Preparation* and follow the remainder of the assay procedure and data interpretation. If the instructions start at Phase 1 *Sample & Standard Preparation*, continue with the instructions, as written.

Note: Kit may contain additional ampules in order to achieve your test levels. Always transfer filtered sample to the dilution ampule labeled with the lowest PPM level and then transfer from this ampule to the next higher level dilution ampule.

RaPID Assay - Dilute the filtered extract into the appropriate Extract Diluent as described below or follow customized dilution procedure provided by the SDI Technical Services Department.

### RaPID Assay Dilution

Contaminant	Extract Volume ( $\mu\text{L}$ )	Extract Diluent (mL)	Test Range ( $\mu\text{g}/100\text{cm}^2$ )
PCB	25	25	5 to 100 (Aroclor 1254)

### Assistance

For ordering or technical assistance contact:

Strategic Diagnostics Inc.

111 Pencader Drive

Newark, Delaware 19702-3322

(800)544-8881

(302)456-6789

Fax(302)456-6782

[www.sdix.com](http://www.sdix.com)

[techservice@sdix.com](mailto:techservice@sdix.com)



**ENSYS INC.**  
ENVIRONMENTAL PRODUCTS

# **PETRO RISC<sup>®</sup>** **SOIL TEST** **SYSTEM**

**RAPID IMMUNOASSAY SCREEN**

## ***User's Guide*** Multiple Level Test

This method correctly identifies 95% of samples that are petroleum fuels-free and those containing 10 ppm gasoline and 15 ppm for other petroleum fuels. A sample that develops less color than the standard is interpreted as positive. It contains petroleum fuels. A sample that develops more color than the standard is interpreted as negative. It contains less than 10 ppm gasoline or 15 ppm other petroleum fuels.

### **IMPORTANT NOTICE**

This test system should be used only under the supervision of a technically qualified individual who is capable of understanding any potential health and environmental risks of this product as identified in the product literature. The components must only be used for the analysis of soil samples for the presence of petroleum hydrocarbons. After use, the kits must be disposed of in accordance with applicable federal and local regulations.

# PETRO RISC SOIL TEST TROUBLESHOOTER GUIDE

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

**Wash Step** - Lack of vigorous washing may result in false positives or negatives depending on whether the wash error was committed on standard or sample tubes.  
*Solution:* make sure that the operator washes four times vigorously.

**Pipet Calibration** - An out-of-calibration pipet may result in false positives or negatives depending on whether the amount is greater or less than the specified transfer volume.  
*Solution:* check the calibration at least daily and after any extreme mechanical shock (such as dropping). An indication that the pipet is out of calibration is if the gold barrel is loose and will turn. (When set on 30 $\mu$ l there should be about 1/4 of an inch between the white plunger and the end of the clear pipet tip.)

**Air bubbles in the pipet** - The presence of air bubbles in the pipet tip when transferring extracts may result in false positives or negatives depending on whether the error was committed on standard or sample tubes.  
*Solution:* quickly examine the pipet tip each time an aliquot is withdrawn and go back to the source and take another aliquot to displace the air bubble if necessary.

**Mixing** - Lack of thorough mixing, when instructed, can cause inconsistent results.  
*Solution:* observe the mixing times in the instructions and mix with sufficient force to ensure that the liquid is homogeneous.

**Timing** - It is important to follow the timing steps in the instructions carefully. The incubations step in the antibody tubes can vary a bit without harm to the test. The color development step timing is critical and should be no less than 2 minutes and no greater than 3 minutes.

**Wiping the Tubes** - Wiping of the tubes should be done before they are read in the spectrophotometer because smudges and fingerprints on the tubes can give potentially false negative readings.

**Mixing Lot #'s** - Never mix lots! Each kit's components are matched together for optimal performance and may give inaccurate results with the components from other kits, that are not the same lot #. Also, the user must NEVER mix components from different types of kits (ex: Petro kit buffer can't be used with a PAH kit.)

**Storage and Operating Temperatures.** - Temperature requirements are very important and should be strictly adhered to. This test kit should be stored at less than 80°F/27°C and operated between 60°F/15°C and 100°F/39°C.

**Shelf Life** - Each kit label contains the kit expiration date. To achieve accurate results, kits must be used prior to expiration.

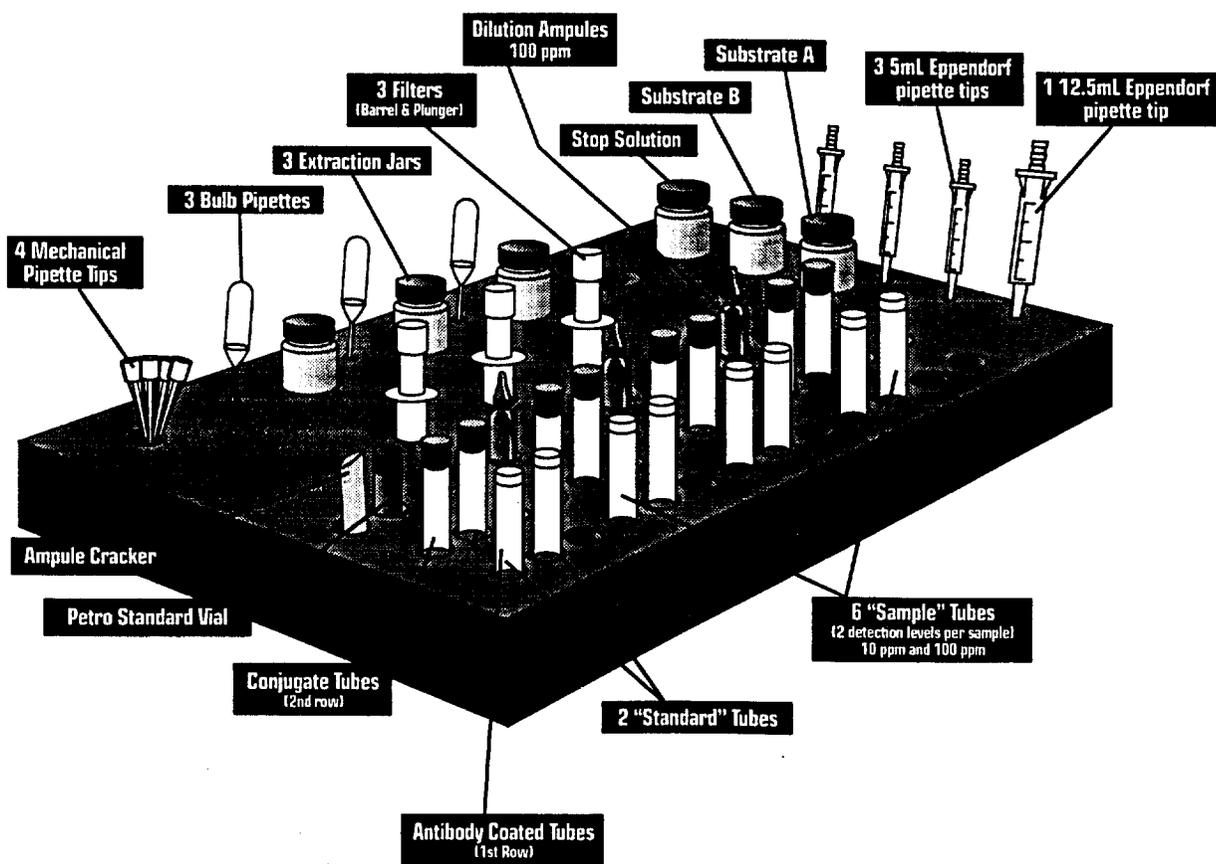
# WORKSTATION SET-UP

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

## WORKSTATION SET-UP

- Mechanical pipet tips
- Filter Barrels & Plungers
- PETRO standard vial
- Conjugate tubes
- Ampule Cracker
- Substrate A
- Bulb pipets
- 100 ppm dilution ampules
- Antibody coated tubes
- 3 5mL Eppendorf Pipet Tips
- Substrate B
- Extraction Jars
- Stop solution
- 1 12.5 mL Eppendorf Pipet Tip

Workstation shows components for 3 samples tested at 2 levels



# TEST PREPARATION

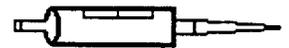
**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

## READ BEFORE PROCEEDING

- Do not attempt to run more than 12 tubes at once, two of which must be standards.
- Items that you will need that are not provided in the test kit include:  
a permanent marking pen, laboratory tissue (or paper towels), a liquid waste container, and disposable gloves.
- This User's Guide was written for analyzing soil samples for gasoline at 10 and 100 ppm. The detection level for diesel is 15 ppm. See table on page 13 for sensitivity to other compounds.

## TEST PREPARATION

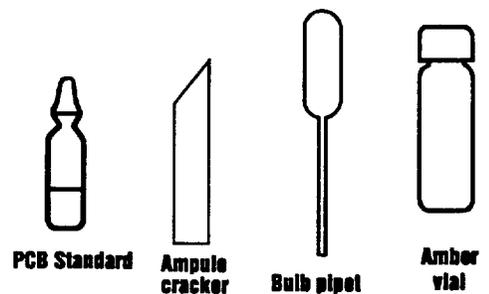
- Label all Eppendorf repeater tips. Tips can be reused for future analyses. Label the first 5mL tip "A", the second 5mL tip "B" and the third 5mL tip "Stop".
- Label the 12.5 mL tip "Buffer".



Eppendorf Tip

## STANDARD PREPARATION

- Open PETRO Standard ampule by slipping ampule cracker over top, and then breaking tip at scored neck. Transfer solution to empty vial with Bulb Pipet.
- Label vial with current date. Standard is usable for 2 weeks. Always cap tightly when finished using standard.
- A new PETRO Standard should be opened for every 4 samples.



PCB Standard

Ampule cracker

Bulb pipet

Amber vial

# PHASE ONE

## EXTRACTION & PREPARATION OF THE SAMPLE

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

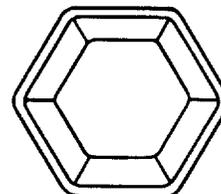
### WEIGH SAMPLE



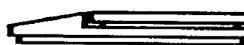
- 1a** Open 20mL methanol ampule and pour the entire contents into the extraction jar.
- 1b** Place unused weigh boat on pan balance.
- 1c** Press ON/MEMORY button on pan balance. Balance will beep and display 0.0.
- 1d** Weigh out  $10 \pm 0.1$  grams of soil.
- 1e** If balance turns off prior to completing weighing, use empty weigh boat to retare, then continue.



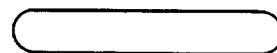
Methanol Ampule



Weigh Boat



Pan balance



Wooden spatula

### EXTRACT PETROLEUM HYDROCARBONS

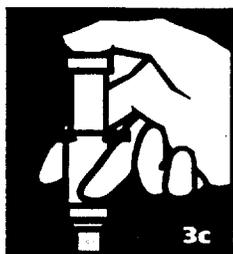


- 2a** Using wooden spatula, transfer 10 grams of soil from weigh boat into extraction jar.
- 2b** Recap extraction jar tightly and shake vigorously for one minute.
- 2c** Allow to settle for one minute. Repeat steps **1a - 2c** for each sample to be tested.



Sample extraction jar

### FILTER SAMPLE



- 3a** Disassemble filtration plunger from filtration barrel.
- 3b** Insert bulb pipet into top (liquid) layer in extraction jar and draw up sample. Transfer at least  $\frac{1}{2}$  bulb capacity into filtration barrel. Do not use more than one full bulb.
- 3c** Press plunger firmly into barrel until adequate filtered sample is available (place on table and press if necessary). Repeat steps **3a - 3c** for each sample to be tested.



Filtration plunger



Filtration barrel



Bulb pipet

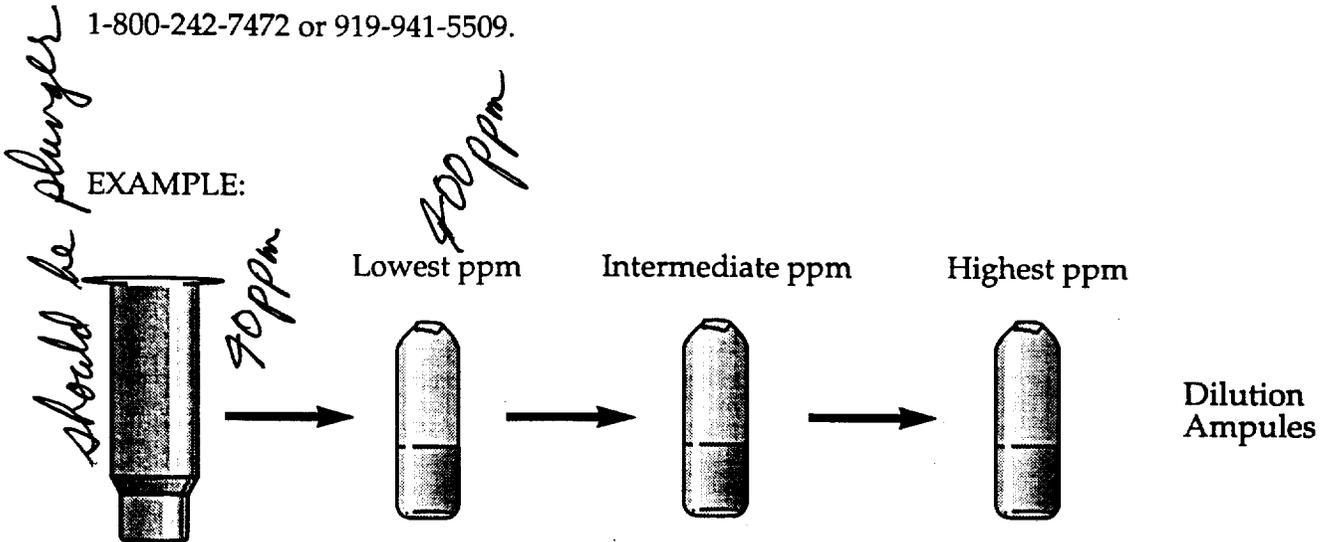
# READ TO AVOID COSTLY MISTAKES

## SAMPLE DILUTION PROGRAM

1. The sample dilution procedure in the instructions is for standard detection levels. The following diagram represents the sample dilution procedure for all other detection levels.
2. Your kit may include extra dilution ampules to reach high detection levels.
3. EVERY AMPULE PROVIDED MUST BE USED!

If there are any questions concerning the dilution procedure please call Technical Services before running the samples to help avoid costly mistakes.

1-800-242-7472 or 919-941-5509.



**Note: Your order may include additional ampules in order to achieve your test levels. Always transfer filtered sample to the dilution ampule labelled with the lowest ppm level and then transfer from it to the next higher level dilution ampule.**

# PHASE TWO

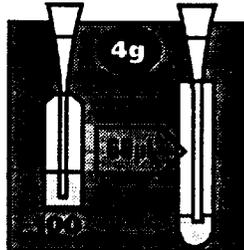
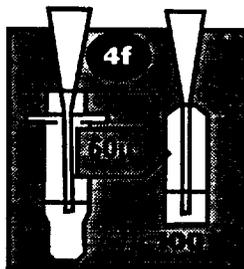
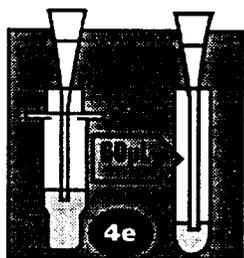
## SAMPLE AND STANDARD PREPARATION

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

### READ BEFORE PROCEEDING

- Label the conjugate and antibody coated tubes with a permanent marking pen.
- "Shake tubes" means to thoroughly mix the contents with special care not to spill or splash.

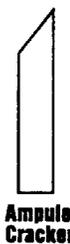
### DILUTE AND BUFFER SAMPLE FOR 10 PPM AND 100 PPM DETECTION LEVELS



- 4a** Uncap enough conjugate, and antibody coated tubes for Samples and Standards.
- 4b** Set the Eppendorf Repeater on 5, assemble the "buffer" tip & fill with buffer.
- 4c** Dispense 1.25 mL of buffer into each conjugate tube.
- 4d** Open dilution ampule by slipping ampule cracker over top, and then breaking top at scored neck.
- 4e** Assemble new tip onto mechanical pipet.
- 4f** Withdraw 60  $\mu$ L of sample from filter unit using mechanical pipet and dispense below the liquid level in 10 ppm conjugate tube. Wipe mechanical pipet tip.
- 4g** Withdraw 60  $\mu$ L of filtered sample from the filter unit and dispense below the liquid level in the 100 ppm dilution ampule. Shake ampule for 5 seconds.
- 4h** Withdraw 60  $\mu$ L of diluted sample from 100 ppm dilution ampule and dispense below the liquid level in 100 ppm conjugate tube.
- 4i** Discard mechanical pipet tip. Repeat steps 4d - 4h for each sample to be tested.



Dilution ampules (100 ppm)



Ampule Cracker



Conjugate tubes



Antibody coated tubes (contained in resealable "zip-seal" aluminized pouch)



Mechanical pipet



Mechanical pipet tip

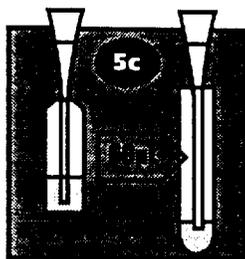
*label @ top*

# PHASE TWO

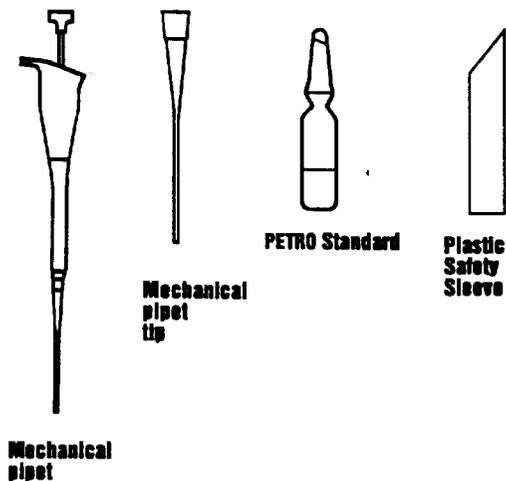
## SAMPLE AND STANDARD PREPARATION

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

### BUFFER STANDARDS



- 5a** Assemble new tip onto mechanical pipet.
- 5b** Open PETRO Standard ampule.
- 5c** Withdraw 60  $\mu$ L of PETRO Standard and dispense below the liquid level in Standard conjugate tube. Wipe mechanical pipet tip.
- 5d** Repeat step **5c** for the 2<sup>nd</sup> Standard.
- 5e** Shake all conjugate tubes for 5 seconds.



# PHASE THREE

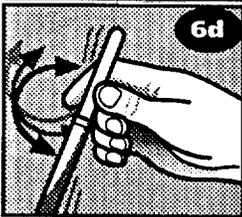
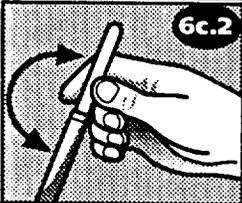
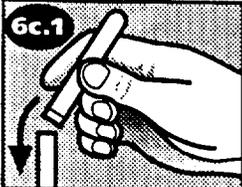
## THE IMMUNOASSAY

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

### READ BEFORE PROCEEDING

- This phase of the procedure requires critical timing and care in handling the antibody coated tubes.

### INCUBATION



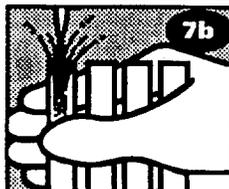
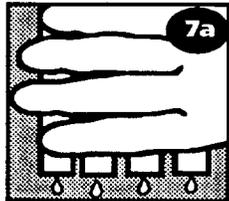
- 6a** Label the antibody coated tubes with sample identification.
- 6b** Set timer for 10 minutes.
- 6c** Working left to right in the workstation:
- Fit all antibody coated tubes firmly on top of all corresponding conjugate tubes.
  - Start timer and immediately invert all connected tube pairs so that the liquid is poured into the antibody coated tubes. Return the tube pairs to the appropriate workstation row, making sure the larger (antibody coated) tube is on the bottom.
- 6d** Invert all tube pairs several more times to mix, making sure the pair is returned to the workstation with the larger (antibody coated) tube on the bottom.
- 6e** Disconnect and discard the smaller glass conjugate tubes. [It is not important to worry about drops of liquid adhering to lips of tubes.]

### READ BEFORE PROCEEDING

### WASH PROCEDURE

- Washing must be done vigorously and with force.
- Place nozzle just above antibody coated tube, squeeze bottle to fill each tube with a vigorous stream and empty into liquid waste container.
- The wash solution is a harmless, dilute solution of detergent. Do not hesitate to wash vigorously even if the solution contacts gloved hands.

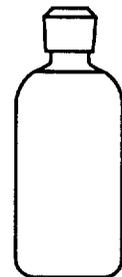
### WASHING



- 7a** After the 10 minute incubation, empty antibody coated tubes into liquid waste container.
- 7b** Wash antibody coated tubes by vigorously filling and emptying a total of 4 times.
- 7c** Tap antibody coated tubes upside down on paper towels to remove excess liquid. Residual foam in the tubes will not interfere with test results.



Antibody coated tubes (contained in resealable "zip-seal" aluminized pouch)



Wash Bottle

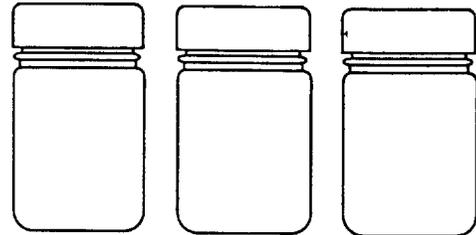
# PHASE THREE

## THE IMMUNOASSAY

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

### COLOR DEVELOPMENT

- 8a** Set the Eppendorf Repeater on 2, assemble the "A" tip and fill with Substrate A (TMB, yellow label).
- 8b** Dispense once (200 $\mu$ l) into each antibody coated tube.
- 8c** Set timer for exactly 2 <sup>1</sup>/<sub>2</sub> minutes.
- 8d** Assemble "B" tip, fill with Substrate B, (H<sub>2</sub>O<sub>2</sub>, green label) start timer, and dispense once (200  $\mu$ l) into each antibody coated tube.
- 8e** Assemble "Stop" tip, fill with Stop Solution (red label), and stop reaction at end of 2 <sup>1</sup>/<sub>2</sub> minutes by dispensing once (200 $\mu$ l) into each antibody coated tube.



Substrate A

Substrate B

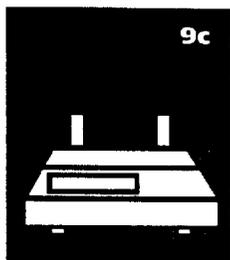
Stop

# PHASE FOUR

## INTERPRETATION

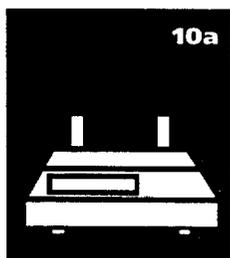
**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

### SELECT CONSERVATIVE STANDARD



- 9a** Wipe outside of all antibody coated tubes.
- 9b** Place both **Standard** tubes in photometer.
- 9c** Switch tubes until the photometer reading is negative or zero. Record reading. If reading is greater than - 0.3 in magnitude, results are outside of QC limits. Retest the sample(s).
- 9d** Remove and discard tube in right well. The tube in the left well is the conservative standard.

### INTERPRET RESULTS



- 10a** Place **10 ppm** tube in right well of photometer and record reading.

If photometer reading is **negative** or zero, petroleum hydrocarbons are present.

If photometer reading is **positive**, concentration of petroleum hydrocarbons is less than **10 ppm**.

See table on page 13 for specific detection levels.

- 10b** Place **100 ppm** tube in right well of photometer and record reading shown on display.  
If photometer reading is **negative** or zero, petroleum hydrocarbons are present.  
If photometer reading is **positive**, concentration of petroleum hydrocarbons is less than **100 ppm**.

# QUALITY CONTROL

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

## How It Works

Standards, Samples, and color-change reagents are added to test tubes coated with a chemical specific to petroleum fuels. The concentration of petroleum fuel in an unknown Sample is determined by comparing its color intensity with that of a Standard.

**Note:** petroleum fuel concentration is inversely proportional to color intensity; the lighter the color development of the sample, the higher the concentration of petroleum fuel.

## Quality Control

Standard precautions for maintaining quality control:

- Do not use reagents or test tubes from one Test System with reagents or test tubes from another Test System.
- Do not use the Test System after its expiration date.
- Each analysis must include 2 Standards, with no more than a total of 12 antibody coated tubes.
- Do not exceed incubation periods prescribed by the specific steps.
- Results may not be valid if photometer reading for Standards exceeds 0.3 in magnitude.

## Storage and Handling Precautions

- Wear protective gloves and eyewear.
- Store kit at room temperature and out of direct sunlight (less than 80°F).
- Keep aluminized pouch (containing unused antibody coated tubes) sealed when not in use.
- If liquid from the extraction jar, or PETRO Standard comes into contact with eyes, wash thoroughly with cold water and seek immediate medical attention.
- Operate test at temperatures greater than 15° C/60° F and less than 39° C/100° F.
- After use, dispose of kit components in accordance with applicable federal and local regulations.

## System Description

Each PETRO RISC<sup>®</sup> Soil Test System contains enough material to perform twelve complete tests, each at 10 and 100 ppm.

The PETRO RISC<sup>®</sup> Soil Test is divided into four phases. The instructions and notes should be reviewed before proceeding with each phase.

## Hotline Assistance

If you need assistance or are missing necessary Test System materials, call toll free: 1-800-242-RISC (7472).

## Validation and Warranty Information

Product claims are based on validation studies carried out under controlled conditions. Data has been collected in accordance with valid statistical methods and the product has undergone quality control tests of each manufactured lot.

Gasoline-free soil and soil containing 10 ppm of gasoline were tested with the EnSys PETRO RISC<sup>®</sup> analytical method. The method correctly identified 95% of these samples. A sample that has developed less color than the standard is interpreted as positive. It contains gasoline.

Diesel fuel-free soil and soil containing 15 ppm of diesel fuel were tested with the EnSys PETRO RISC<sup>®</sup> analytical method. The method correctly identified 95% of these samples. A sample that has developed less color than the standard is interpreted as positive. It contains diesel fuel.

The company does not guarantee that the results with the PETRO RISC<sup>®</sup> Soil Test System will always agree with instrument-based analytical laboratory methods. All analytical methods, both field and laboratory, need to be subject to the appropriate quality control procedures.

EnSys, Inc. warrants that this product conforms to the descriptions contained herein. No other warranties, whether expressed or implied, including warranties of merchantability and of fitness for a particular purpose shall apply to this product.

EnSys, Inc. neither assumes nor authorizes any representative or other person to assume for it any obligation or liability other than such as is expressly set forth herein.

Under no circumstances shall EnSys, Inc. be liable for incidental or consequential damages resulting from the use or handling of this product.

# MECHANICAL PIPET

**READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST**

## TEST SENSITIVITY

The PETRO RISC<sup>®</sup> Soil Test System has sensitivities to the following chemicals at the stated levels.

Concentration necessary to  
give a positive result greater  
than 95% of the time (ppm)

### Petroleum Fuels:

Gasoline	10
Diesel	15
#2 Fuel Oil	15
Kerosene	15
Jet Fuel A	15
Jet Fuel JP-4	15
#6 Fuel Oil	25

### Other Compounds:

Mineral Spirits	40
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For a complete table of sensitivities, consult the PETRO RISC<sup>®</sup> Soil Test System Technical Guide.

# REPEATER PIPET & MECHANICAL PIPET

READ ALL INSTRUCTIONS BEFORE PROCEEDING WITH THE TEST

## HOW TO OPERATE THE REPEATER PIPET

### To Set Or Adjust Volume

To determine the pipetting volume, the dial setting (1-5) is multiplied by the minimum pipetting volume of the tip.

### To Assemble Pipet Tip

Slide filling lever down until it stops. Then raise the locking clamp and insert the tip until it clicks into position. Be sure the tip plunger is fully inserted into the barrel before lowering the locking clamp to affix the tip in place.

### To Fill Tip

With tip mounted in position on pipet, immerse end of tip into solution. Slide filling lever upward slowly.

### To Dispense Sample

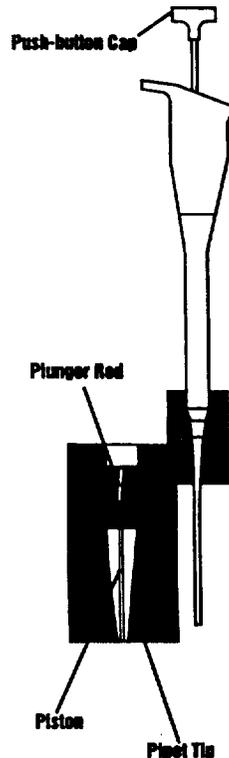
Check the volume selection dial to ensure pipetting volume. Place tip inside test tube so that tip touches the inner wall of tube. Completely depress the pipetting lever.

### To Eject Tip

Empty tip of any remaining solution into appropriate container. Raise locking clamp upward, and remove the tip.

For additional information regarding operation and use of repeater, please refer to your Repeater pipet manual.

## Mechanical Pipet



## HOW TO OPERATE THE MECHANICAL PIPET

### To Set Or Adjust Volume

Remove push-button cap and use it to loosen volume lock screw. Turn lower part of push-button to adjust volume up or down. Meter should read "060". Tighten volume lock screw and replace push-button cap.

### To Assemble Pipet Tip

Slide larger mounting end of pipet tip onto end of pipet. Holding tip in place, press push-button until plunger rod enters pipet tip. Ensure no gap exists between piston and plunger rod.

### To Withdraw Sample

With tip mounted in position on pipet, press push-button to first stop and hold it. Place tip at bottom of liquid sample and slowly release push-button to withdraw measured sample. Ensure that no bubbles exist in liquid portion of sample. If bubbles exist, dispense sample and re-withdraw sample.

### To Dispense Sample

Place tip into dispensing vessel (immersing end of the tip if vessel contains liquid) and slowly press push-button to first stop. (Do not push to second stop or tip will eject).

Remove tip from vessel and release push-button.

### To Eject Tip

Press push-button to second stop. Tip is ejected.

For additional information regarding operation and use of pipet, please refer to your pipet manual.

## Repeater Pipet

