**Preparation and Field Use of the TVA-1000B Toxic Vapor Analyzer**

**Tank Farm Maintenance Procedure**

**Industrial Hygiene**

**USQ # N/A-4**

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<th>Rev-Mod</th>
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<td>C-3</td>
<td>12/14/2017</td>
<td>Industrial Hygiene Request</td>
<td>Re-Inserted the &quot;Setup of the TVA-1000B&quot; and &quot;Perform Span Test&quot; sections of procedure. Inserted &quot;Field Preparation&quot; and &quot;Post-Field Use&quot; sections to procedure to provide clarity on use of instrument.</td>
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<td>C-2</td>
<td>12/05/2017</td>
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<td>Removed the &quot;Perform Span Test&quot; section out of procedure. Revised the Records section in addition to minor editorial changes throughout the entirety of the procedure.</td>
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<td>C-1</td>
<td>10/10/2016</td>
<td>Inconsequential change for Records Management request</td>
<td>Updated records section.</td>
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<td>C-0</td>
<td>12/09/2014</td>
<td>Periodic Review</td>
<td>Updated 2.0, changed &quot;Out of Service&quot; to &quot;scheduled maintenance calibration throughout the procedure, add or time to 5.2.9.3, corrected and deleted notes, updated labels, corrected cross references, deleted section 5.5 and made it attachment 2, deleted table 1</td>
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<td>B-2</td>
<td>07/28/2014</td>
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Attachment 1 - Precautions and Limitations for the Hydrogen Gas Tank

Attachment 2 - Setting Alarms
1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this procedure is to ensure the proper use of the TVA-1000B toxic vapor analyzer in support of field monitoring performed in accordance with TF-OPS-IHT-007 and an industrial hygiene sampling plan.

1.2 Scope

The scope includes function checks, span testing, use and downloading information to a PC.

2.0 INFORMATION

2.1 Terms and Definitions

Zero air cylinder - A gas cylinder that has “pure” air with trace organic and inorganic contaminants and is used for zeroing sensors prior to function or span testing.
- FID - Flame Ionization Detector
- PID - Photo Ionization Detector

2.2 General Information

The TVA-1000B should be operated within the following parameters:
- Temperature: 32 to 104 °F
- T 90 sensor response time: < 3.5 seconds for Photo Ionization Detector (PID) and Flame Ionization Detector (FID)
- Relative humidity: FID - 20 to 95%, PID - 20 to 70%, non-condensing
- Accuracy: ± 25 % or ± 2.5 ppm whichever is greater from 0.5- 500 ppm (PID) & 1.0- 10,000 ppm (FID).
- Power: 8 hours of continuous operation, 16 hours charge time
- Hydrogen tank: ~ 6 hours use @ 2200 psi
- Warm-up time: 30 minutes
- Intrinsically safe: Class 1, Division 1, Groups A, B, C, D and T4.
- FID % O₂ required: > 16% O₂
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 The use of compressed gas presents a potential for personal injury if the compressed gas cylinder were to leak or be otherwise damaged.

3.1.2 Hydrogen and methane gases can be fuel sources, which may result in personal injury. They should be kept away from spark/flame producing and excessive heat-generating sources. See Attachment 1 - Precautions and Limitations for the Hydrogen Gas Tank for more information.

3.2 Radiation and Contamination Control

3.2.1 Planned work in radiological areas must be approved by Radiological Control personnel per the Radiological Risk Screening procedure TFC-ESHQ-RP-RWP-C-01.

3.2.1.1 When performed without a formal work package or approved procedure (i.e., Level 3 or 4 work), this procedure is limited to radiological areas and work activities permitted by a low risk Radiological Work Permit (RWP).

3.2.2 Filtration requirements for air monitoring equipment.

- A radiological particulate pre-filter (1~3 micron pore size, 25 mm diameter) when monitoring in a Contamination Area (CA), High Contamination Area (HCA), or Airborne Radioactivity Area (ARA), if instrument is capable. Not required, but encouraged in posted Radiological Buffer Areas (RBA).

- The “Bacterial Air Vent” filter (manufactured by Pall – Gelman Laboratory) ahead of the radiological filter when monitoring from unfiltered tank systems. This is a sealed filter that cannot be opened for radiological survey purposes, in this case, dispose of as low level radioactive material waste if needed.

- The use of parallel, sacrificial sorbent tubes or sample media, or multiple filters may be necessary depending on intended use and equipment parameters. A specific radiological Release Survey Plan (RSP) would need to address this allowance.
3.2 Radiation and Contamination Control (Cont.)

3.2.3 Before conducting sampling or monitoring, contact the responsible Radiological Control personnel for the facility or area to determine any specific survey or monitoring requirements.
- Pre, during, and post contamination survey requirements.
- Any applicable RSP’s for your specific equipment or task.
- Alternative survey or monitoring needs to support the radiological release survey process.

3.2.4 Comply with the requirements set forth by the RWP, HPT coverage, Release Survey Plan (RSP), and any other applicable procedures as determined above.

3.2.5 When exiting radiological areas where no HPT coverage was provided, inform the radiological control personnel of the use/history for the equipment being presented (e.g., only sampled air in the Contamination Area, No known history of contamination based on use, etc.) to aid them in properly evaluating the radiological release criteria needed.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Portable hydrogen fuel cylinder: 85 cc volume at 2200 psi.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- TFC-BSM-IRM_DC-C-02, Records Management
- TFC-ESHQ-S_IH-C-46, Industrial Hygiene Reporting and Records Management
- TFC-ESHQ-RP_RWP-C-03, ALARA Work Planning
- TF-OPS-IHT-007, Using Direct Reading Instruments.
4.3 Field Preparation

4.3.1 PERFORM a review of the applicable industrial hygiene sampling plan before execution of this procedure.

4.3.2 LOOK at the battery charger while the instrument is still plugged into the charger AND CHECK that the battery is fully charged by:
- Observing that the light shows green
- the battery has been on charging for about 16 hours,

OR

PRESS “3=Info” at the “MAIN MENU” AND CHECK if “Bat okay” is displayed”.

4.3.3 CHECK maintenance calibration date on sticker is current for the TVA-1000B.

4.3.4 IF calibration is past due, RETURN applicable instrument to equipment custodian with a completed green tag, i.e., “IH Instrument Service Tag” (BT-6004-019) indicating its “Scheduled Maintenance Calibration” is due.

4.3.5 CHECK that both connections on the sampling probe are attached to the monitor AND

IF the sampling probe is not connected to the monitor, CONNECT the sampling probe to the monitor.

4.3.6 CHECK that there is no excessive wear and tear on the probe or the electrical and sampling line connecting the probe to the instrument.

4.3.7 IF there is excessive wear and tear on the probe or electrical and sampling line connecting the probe to the instrument, RETURN applicable instrument to equipment custodian with a completed green tag, i.e., “IH INSTRUMENT SERVICE TAG” (BT-6004-019) indicating it is “Out of Service”.
5.0 PROCEDURE

5.1 Operation of the TVA-1000B

NOTE - Attachment 1 - Precautions and Limitations for the Hydrogen Gas Tank contains precautions and limitations for using a portable hydrogen gas cylinder.

5.1.1 IF using the flame ionization detector (FID), OBTAIN a portable hydrogen cylinder AND CHECK that the tank is reading 500 - 2200 psi at the pressure gauge.

5.1.2 IF the gauge reads less than 500 psi, RETURN the bottle to the equipment custodian with a completed green tag, (i.e., “IH INSTRUMENT SERVICE Tag” (BT-6004-019) indicating it is “Out of Service”).

5.1.3 INSTALL the hydrogen tank into the opening located on the left side of the instrument AND SCREW in counter clockwise until finger tight.

5.1.4 OPEN the red hydrogen valve on the top of the instrument by switching it to the “ON” position (FID use only).

NOTE - The “MAIN MENU” options will be displayed whenever “ON” is pressed.
- When pressing the “ON”, “OFF”, “CONTROL”, “EXIT”, and “ENTER” keys, they need to be held for approximately a half second to activate.

5.1.5 PRESS the “ON” key located on the keypad AND ALLOW the hydrogen gas to flow for 2 to 3 minutes.

5.1.6 PRESS the “CONTROL” key.

NOTE - The FID flame should light as indicated by a popping sound.

5.1.7 SELECT “3=Ignt” to turn on the pump and light the FID flame.

5.1.8 IF no flame, PRESS the “CONTROL” key AND SELECT “3=Ignt” again.
5.1 **Operation of the TVA-1000B (Cont.)**

NOTE - If the flame goes out during use, an “F” will blink on the display to the right of the FID reading.

5.1.9 PRESS “1=Run” AND

CHECK to see if an “F” is blinking to the right of the FID reading.

5.1.10 IF “F” is blinking to the right of the FID reading, CHECK to see if the hydrogen cylinder is empty, i.e. less than 500 psi.

5.1.11 IF the hydrogen cylinder is empty, REPLACE the hydrogen cylinder.

5.1.12 IF the hydrogen cylinder is full, PRESS the “EXIT” key AND

REPEAT Steps 5.1.6 through 5.1.7 to reignite.

5.1.13 PRESS the “EXIT” key to return to the “MAIN MENU.”

5.1.14 BEFORE conducting any zeroing, function test, span testing, or field use, ALLOW the instrument to warm up for at least 30 minutes after the FID has been lit.

5.1.15 PRESS the 2=Setup” key from the “MAIN MENU” to check AND

ADJUST the meter’s configuration to the sampling plan.

NOTE - “Off” should temporarily appear in the display as “ACCEPTED” after Step 5.1.16 is performed.

5.1.16 IF no background correction is needed, PRESS the following:

5.1.16.1 PRESS “1=Calib”.

5.1.16.2 PRESS “1=Cfg”.

5.1.16.3 PRESS “2=Backgnd corrc”.

5.1.16.4 PRESS “2=None.”
5.1 Operation of the TVA-1000B

5.1.17 PRESS up or down cursor arrows until “1=Accept mode” appears to automatically accept a calibration value.

NOTE - “Auto” should temporarily appear in the display as “ACCEPTED” after Step 5.1.18 is performed.

5.1.18 PRESS “1” AND

THEN “2=Auto.”

NOTE - “Manual” should temporarily appear in the display as “ACCEPTED” after Step 5.1.19 is performed.

5.1.19 PRESS “2=Save mode” AND

PRESS “1=Manual” to manually save a calibration value.

NOTE - “Zeroes” will be displayed temporarily for both the PID and FID background readings along with “ACCEPTED” after Step 5.1.20 is performed.

5.1.20 PRESS the “EXIT” key, “6=Backgnd” AND

PRESS “2=Zero” to ensure the current background value is zero.

5.1.21 PRESS the “EXIT” key, “3=Log” AND

PRESS “3=VOC/FE” to log parameters.
5.1 Operation of the TVA-1000B (Cont.)

NOTE - The set parameters will temporarily appear with the word “ACCEPTED” after Step 5.1.22 is performed.

5.1.22 PRESS the “1=VOC” key AND

5.1.22.1 PRESS up or down arrows to choose “Max”.

5.1.22.2 PRESS digit keys for the logging interval (2-30 seconds).

5.1.22.3 PRESS left and right keys to erase a wrong digit AND PRESS “ENTER” to accept the setting.

NOTE - The date will temporarily appear on the display with the word “ACCEPTED” after Step 5.1.23 is performed.

5.1.23 PRESS the following:

5.1.23.1 PRESS “6=Other”.

5.1.23.2 PRESS “2=Date” (or “3=Time”).

5.1.23.3 PRESS “ENTER” to change the digit keys for the right date or time.

5.1.23.4 PRESS “ENTER” to accept the setting for a date or time change.

5.1.24 IF the date or time is correct, PRESS the “EXIT” key to escape.

NOTE - “Type=Text-Auto” will temporarily appear with the word “ACCEPTED” after Step 5.1.25 is performed.

5.1.25 PRESS the “EXIT” key twice, “4=PCLink/Memory”, “1=PC Link”, “1=Change type”, “3=Text” and “2=Auto” for the correct PC link communications protocol.

5.1.26 PRESS the “EXIT” key twice to get to the “MAIN MENU.”
5.1 Operation of the TVA-1000B (Cont.)

NOTE - To prevent the instrument from being over-pressurized, use a 1 Lpm regulator or a “T” in-line between the gas cylinder and the probe inlet or fill and draw down a Tedlar bag with zero air. If using a demand regulator, an in-line “T” is not necessary.

- Teflon-coated tubing is needed when applying zero gas.

5.1.27 PRESS the following to zero the meter:

5.1.27.1 PRESS “2=Setup”.
5.1.27.2 PRESS “1=Calib”.
5.1.27.3 PRESS “3=Zero”.
5.1.27.4 PRESS “1=Both”.

5.1.28 CHALLENGE the meter with a zero air sample AND PRESS “ENTER” to start.

NOTE The FID “zero” readings should be less than 5,000 counts and the PID “zero” readings should be less than 20,000 counts if using a 10.6 eV lamp.

5.1.29 WAIT for the zero air to be analyzed by the instrument and when the reading (in counts) has stabilized, PRESS “1=Yes” or “2=Again” to either save or reject the zero counts, respectively.

5.1.30 RECORD the FID and PID values.
5.1.31 PRESS “Exit” key.
5.1.32 IF pressing “2=Again” does not yield valid “zeroes”, ATTEMPT to re-zero, troubleshoot,

OR

RETURN meter to equipment custodian with a completed green tag, (i.e., “IH Instrument Service Tag” (BT-6004-019) indicating it is “Out of Service”).
5.1 Operation of the TVA-1000B (Cont.)

NOTE - Teflon-coated tubing should be used when performing monitoring as some organic gases/vapors can be absorbed into plastic tubing, resulting in an inaccurate reading.

5.1.33 INITIATE data logging with the monitor as follows:

5.1.33.1 ACCESS the “MAIN MENU” and run mode at the “Press char key” prompt, ENTER a location code for the area to be surveyed AND

PRESS “ENTER.”

NOTE - The sampling interval will countdown to zero.

5.1.33.2 PRESS either the “ENTER” key or the “LOG” button on the sampling wand to start logging data.

5.1.33.3 PRESS either “1=Yes” to save the value(s) or “2=Again” to sample again at the same location.
5.2 Set Up of the TVA-1000B

5.2.1 PRESS the 2=Setup” key from the “MAIN MENU” to check AND ADJUST the meter’s configuration to the sampling plan.

NOTE - “Off” should temporarily appear in the display as “ACCEPTED” after Step 5.2.2 is performed.

5.2.2 IF no background correction is needed, PRESS the following:

5.2.2.1 PRESS “1=Calib”.

5.2.2.2 PRESS “1=Cfg”.

5.2.2.3 PRESS “2=Backgnd corrct”.

5.2.2.4 PRESS “2=None.”

5.2.3 PRESS up or down cursor arrows until “1=Accept mode” appears to automatically accept a calibration value.

NOTE - “Auto” should temporarily appear in the display as “ACCEPTED” after Step 5.2.4 is performed.

5.2.4 PRESS “1” AND THEN “2=Auto.”

NOTE - “Manual” should temporarily appear in the display as “ACCEPTED” after Step 5.2.5 is performed.

5.2.5 PRESS “2=Save mode” AND

PRESS “1=Manual” to manually save a calibration value.

NOTE - “Zeroes” will be displayed temporarily for both the PID and FID background readings along with “ACCEPTED” after Step 5.2.6 is performed.

5.2.6 PRESS the “EXIT” key, “6=Backgnd” AND

PRESS “2=Zero” to ensure the current background value is zero.

5.2.7 PRESS the “EXIT” key, “3=Log” AND

PRESS “3=VOC/FE” to log parameters.
5.2  Set Up of the TVA-1000B (Cont.)

NOTE - The set parameters will temporarily appear with the word “ACCEPTED” after Step 5.2.8 is performed.

5.2.8  PRESS the “1=VOC” key AND

5.2.8.1  PRESS up or down arrows to choose “Max”.

5.2.8.2  PRESS digit keys for the logging interval (2-30 seconds).

5.2.8.3  PRESS left and right keys to erase a wrong digit AND PRESS “ENTER” to accept the setting.

NOTE - The date will temporarily appear on the display with the word “ACCEPTED” after Step 5.2.9 is performed.

5.2.9  PRESS the following:

5.2.9.1  PRESS “6=Other”.

5.2.9.2  PRESS “2=Date” (or “3=Time”).

5.2.9.3  PRESS “ENTER” to change the digit keys for the right date or time.

5.2.9.4  PRESS “ENTER” to accept the setting for a date or time change.

5.2.10 IF the date or time is correct, PRESS the “EXIT” key to escape.

NOTE - “Type=Text-Auto” will temporarily appear with the word “ACCEPTED” after Step 5.2.11 is performed.

5.2.11 PRESS the “EXIT” key twice, “4=PCLink/Memory”, “1=PC Link”, “1=Change type”, “3=Text” and “2=Auto” for the correct PC link communications protocol.

5.2.12 PRESS the “EXIT” key twice to get to the “MAIN MENU.”
5.2 **Set Up of the TVA-1000B (Cont.)**

**NOTE** - To prevent the instrument from being over-pressurized, use a 1 Lpm regulator or a “T” in-line between the gas cylinder and the probe inlet or fill and draw down a Tedlar bag with zero air. If using a demand regulator, an in-line “T” is not necessary.

- Teflon-coated tubing is needed when applying zero gas.

5.2.13 **PRESS** the following to zero the meter:

5.2.13.1 **PRESS** “2=Setup”.

5.2.13.2 **PRESS** “1=Calib”.

5.2.13.3 **PRESS** “3=Zero”.

5.2.13.4 **PRESS** “1=Both”.

5.2.14 **CHALLENGE** the meter with a zero air sample AND **PRESS** “ENTER” to start.

**NOTE** The FID “zero” readings should be less than 5,000 counts and the PID “zero” readings should be less than 20,000 counts if using a 10.6 eV lamp.

5.2.15 **WAIT** for the zero air to be analyzed by the instrument and when the reading (in counts) has stabilized, **PRESS** “1=YES” or “2=Again” to either save or reject the zero counts, respectively.

5.2.16 **RECORD** the FID and PID values.

5.2.17 **PRESS** “EXIT” key.

5.2.18 **IF** pressing “2=Again” does not yield valid “zeroes”, **ATTEMPT** to re-zero, troubleshoot,

**OR**

**RETURN** meter to equipment custodian with a completed green tag, i.e., “IH INSTRUMENT SERVICE TAG” (BT-6004-019) indicating it is “Out of Service”.
5.3 Perform the Span Test

5.3.1 **PRESS** “2=SpanConc” to check that the span gas concentration matches that on the gas cylinders.

5.3.2 **PERFORM** the following to change a value:

5.3.2.1 **SELECT** the sensor(s) to change (“1=Both”, “2 PID”, “3 FID”)

5.3.2.2 **USE** the up and down cursors **AND**

**SELECT** the measurement unit.

5.3.2.3 **USE** the digit keypad **AND**

**ENTER** the span concentration.

5.3.2.4 **PRESS** the “ENTER” key.

5.3.3 **WHEN** finished, **PRESS** the “EXIT” key **AND**

**OBSERVE** the “CALIB MENU” is displayed.

5.3.4 **PRESS** “4=Span” **AND**

**PRESS** “2Pid.”

**NOTE** - To prevent the instrument from being over-pressurized, use a 1 Lpm regulator or a “T” in-line between the gas cylinder and the probe inlet or fill and draw down a Tedlar bag with zero air. If using a demand regulator, an in-line “T” is not necessary.

5.3.5 **APPLY** the isobutylene span gas **AND**

**PRESS** “ENTER” to start the span test.
5.3 Perform the Span Test (Cont.)

5.3.6 WAIT for the readings to stabilize AND PRESS “1=Yes” to accept.

5.3.7 RECORD the value.

5.3.8 PRESS “3Fid.”

5.3.9 APPLY the methane span gas AND PRESS “ENTER” to start the calibration.

5.3.10 WAIT for the readings to stabilize AND PRESS “1=Yes” to accept.

5.3.11 RECORD the value.

5.3.12 PRESS the “EXIT” key AND PRESS then “5=RF”, the response factor option.

5.3.13 CHECK that the “response factor” screen says “RF0: DEFAULT” AND PRESS “ENTER” to accept.

5.3.14 IF the response factor screen does not say “RF0: DEFAULT” PRESS the up or down cursor arrows until the screen displays “RFO: DEFAULT” AND PRESS “ENTER.”

5.3.15 PRESS “EXIT” two times to return to the “MAIN MENU.”

NOTE - For the PID sensor, a valid range for detector sensitivity is 3,500 to 6,000 counts/ppm. For the FID, a valid range is 175 to 250 counts/ppm.

5.3.16 USE the formula: \( \frac{\text{span counts} - \text{zero counts}}{\text{span gas concentration ppm}} = \text{detector sensitivity} \) \ AND \ CALCULATE this value for the FID and PID detectors.
5.3 **Perform the Span Test (Cont.)**

5.3.17 IF the sensors do not fall within the acceptable range, **ATTEMPT** to re-span that sensor, troubleshoot,

**OR**

**RETURN** the meter to the equipment custodian for repair and tag it out of service indicating “Calibration Failure.”

5.3.18 IF the sensors fall within the acceptable range, **CONDUCT** a “function test” as outlined in Steps 5.3.19 through 5.3.22.

5.3.19 **FROM** the “MAIN MENU”, **PRESS** “1=Run” key.

5.3.20 **APPLY** an isobutylene gas sample of known concentration to the probe.

5.3.21 **WAIT** two or three minutes **AND**

**CHECK** to see if it is within tolerance i.e., \( \pm 25\% \) or \( \pm 2.5 \text{ ppm} \) whichever is greater.

5.3.22 IF the probe is not within tolerance, **RE-ZERO AND RE-SPAN** the affected sensor,

**OR**

**RETURN** to the equipment custodian for repair with a completed green tag, (i.e., “IH INSTRUMENT SERVICE TAG” (BT-6004-019) indicating it is a “Function Check Failure”).

5.3.23 **REPEAT** Steps 5.3.20 through 5.3.22 using a methane gas sample.

5.3.24 **RECORD** the following in accordance with TFC-ESHQ-S_IH-C-46:

- Gas lot numbers
- Expiration dates and span gas values
- Date and time the span and function test were performed.
5.4 Setting Up the Monitor with Computer

NOTE - Other than changing the time or date using the software, other parameters should be changed through the meter’s setup menu.

5.4.1 ATTACH the serial cable from the PC to the port labeled “PC HOST” to download data or the meter’s configuration.

5.4.2 DOWNLOAD data by pressing “4 = PCLink/Memory” on the “MAIN MENU” screen, “1 = PC Link” and “2 = Establish link”

5.4.3 On the PC, DOUBLE CLICK on the program “ThermoConnect” (once opened should indicate “ThermoConnect-TVA-1000” above the toolbar), SELECT “Transfer” on the toolbar, next “Receive to file” AND SELECT “Logged Data.”

5.4.4 NAME the file AND CLICK “Save”.

5.4.5 AFTER download is completed, PERFORM the following:

5.4.5.1 CLEAR the logged data on the TVA by pressing the “EXIT” key twice.

5.4.5.2 PRESS “2 = Clear Route & Logging Memory.”

5.4.5.3 PRESS “ENTER.”

5.4.6 To view the logged data, HIGHLIGHT the name of the file AND DOUBLE CLICK it.

5.4.7 To view the meter’s configuration, PRESS “1=PC Link,” then “2=Establish link.”

5.4.8 CLICK on “Transfer” command, THEN CLICK on “Receive to file,” and “Setup.”

5.4.9 NAME the file AND CLICK “Save.”
5.4 Setting Up the Monitor with Computer (Cont.)

5.4.10 To view the configuration, **HIGHLIGHT** the name of the file **THEN**
**DOUBLE CLICK** it.

5.5 Post-Field Use of TVA-1000B Toxic Analyzer

5.5.1 **REPEAT** steps 5.3.19 through 5.3.24 for “Post-Function Check.”

5.5.2 **TURN OFF** the monitor by performing the following:

5.5.2.1 **PRESS** the "EXIT" button to return to the “MAIN MENU.”

5.5.2.2 **PRESS** the “OFF” button **AND**

**TURN** the red hydrogen gas valve to “OFF” (if using the FID).

5.5.3 **REMOVE** the hydrogen gas tank from the side of the instrument (if using the FID).

5.5.4 **REATTACH** the charger to the instrument using the port labeled “CHRG.”

5.5.5 **RECORD** all sampling data in accordance with TFC-ESHQ-S_IH-C-46
“Industrial Hygiene Reporting and Records Management.”

5.5.6 **PROVIDE** the completed sampling forms and associated field records to the
Project IH within 2 working days.

5.6 Records

Data and attachments are entered into the Site-Wide Industrial Hygiene Database and
when reviewed and completed by the Industrial Hygienist, are uploaded to IDMS via an
automated interface. The record custodian identified in the Company Level Records
Inventory and Disposition Schedule (RIDS) is responsible for record retention in
accordance with TFC-BSM-IRM_DC-C-02.
Attachment 1 - Precautions and Limitations for the Hydrogen Gas Tank

FID instruments are supplied with an 85 cc hydrogen gas tank. This tank, which may be pressurized to 2200 psi maximum at 25 °C, will provide approximately 6 hours of operation when fully charged. The tank has an integrally mounted high pressure gauge that can be easily read when the tank is in or out of the instrument. Install the tank in the instrument by inserting it into the receptacle on the left side and tightening - left hand threads, tighten counterclockwise - until the rubber tank boot is flush with the instrument sidepack and a slight resistance is felt. Do not over-tighten.

**CAUTION:** Do not fill hydrogen tank to a pressure greater than 15.2 MPa (2200 psig).

The major hazard associated with the handling of hydrogen is flammability. The following specific rules apply when handling hydrogen:

a. Never use cylinders of hydrogen in areas where flames, excessive heat, or sparks may occur.

b. Use only explosion-proof equipment and spark-proof tools in areas where hydrogen is handled.

c. Ground all equipment and lines used with hydrogen.

d. Never use a flame to detect hydrogen leaks, use soapy water.

e. Do not store reserve stocks of hydrogen with cylinders containing oxygen or other highly oxidizing or combustible materials.

f. Store hydrogen tanks in a well-ventilated area.

g. Follow all regulatory safety and labeling precautions when shipping hydrogen in the TVA-1000B.

h. When transporting the instrument, remove the hydrogen tank and place it in its normal location in the carrying case.

i. Always remove the tank from the instrument before storing.
Attachment 2 - Setting Alarms

NOTE - See table below for a description of alarms.

[1] PRESS the “ON” key.
[4] SELECT either “1=STEL”, “2=Low Ceiling”, or “3=High Ceiling.”
[5] SELECT either “1=Both”, “2=PID”, or “3=FID.”
[6] CHOOSE first the measurement units by using the up/down keys and then the value using the numbers on the keypad.
[7] PRESS “ENTER” to accept changes,
OR
[8] IF values are correct, PRESS “EXIT.”
[10] PRESS “EXIT” repeatedly to return to the “MAIN MENU.”

The TVA 1000B is supplied with three user-configurable alarms: high ceiling, low ceiling, and STEL (short term exposure limit). When any of these alarms are exceeded, an alarm message appears on the instrument display and probe display (enhanced version only) and an alarm tone is generated. Press “EXIT” to acknowledge the alarm message and tone. Once acknowledged, the display returns to the live measurement with an upper case letter representing the alarm or alarm combination appearing to the right of the display. The three types of user configurable alarms are:

<table>
<thead>
<tr>
<th>Alarm Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Ceiling:</td>
<td>This alarm is a warning that the lowest level threshold has been exceeded. Once acknowledged, the letter “L” appears to the right of the live measurement for the appropriate detector.</td>
</tr>
<tr>
<td>High Ceiling:</td>
<td>This alarm is a warning that a second, higher level threshold has been exceeded. Once this alarm is acknowledged, the letter “H” appears to the right of the live measurement for the appropriate detector.</td>
</tr>
<tr>
<td>STEL:</td>
<td>The Short Term Exposure Limit alarm indicates that measurements averaged over a 15-minute interval have exceeded the set alarm limit. Once this alarm is acknowledged, the letter “S” appears to the right of the live measurement for the appropriate detector.</td>
</tr>
</tbody>
</table>