STANDARD OPERATING PROCEDURES

SKC
Leland Legacy Pump for PCBs

AMBIENT AIR MONITORING PROGRAM
for the
130 LIBERTY STREET
DECONSTRUCTION PROJECT

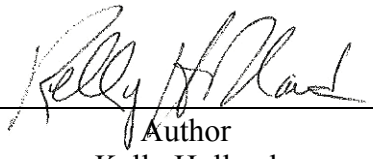
LOWER MANHATTAN DEVELOPMENT CORPORATION
1 Liberty Plaza
New York, New York

Prepared by:
TRC Corporation
Boott Mills South
116 John Street
Lowell, MA 01852
(978) 970-5600

Standard Operating Procedures

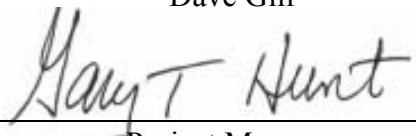
SKC
Leland Legacy Pump for PCBs

Revision 1
February 2006



Author
Kelly Holland

Technical Reviewer
Dave Gill



Project Manager
Gary Hunt

QA Officer
Liz Denly

TABLE OF CONTENTS

1.0 PURPOSE OF SOP

This SOP was designed to describe the procedures used to sample PCB Aroclors in ambient air using EPA Method TO-10A.

2.0 EQUIPMENT DESCRIPTION

The Leland Legacy dual diaphragm sample pump is designed specifically to provide constant airflows from 5 to 15 L/min with minimum power requirements and low noise. The pump's internal flow sensor measures flow directly and acts as a secondary standard, constantly maintaining the set flow rate. The built-in sensors automatically correct flow for variations in temperature and atmospheric pressure.

3.0 EQUIPMENT OPERATION

In order to operate the Leland Legacy pump, it is necessary to set up the pump.

3.1 Pump Setup

Keypad Basics

* Scrolls through run time data and setup options
▲ Increases values such as flow rate
▼ Decreases values such as flow rate
[▲▼] When pressed simultaneously, displayed item is selected or entered
***▲▼ *** Security code that must be pressed in sequence to enter Setup.

Turning the Pump On/Off

- Press any button to turn on the power.
- Press [▲▼] to run the pump or to place a running pump in Hold.
- Manual Off: from Hold, press and hold *.
- Auto Off turns off the pump after 5 minutes in Hold.

Entering and Navigating Setup

Entering: Press [▲▼], then press the security code in sequence ***▲▼ *.** Setup should appear briefly on the LCD.
Navigating: Press * to scroll through parameters. Once the LCD shows End, parameters will repeat until the user exits Setup.
Exiting: Press * until End appears on the LCD. Press [▲▼]. The pump is now in Hold.

Setup Options

After entering Setup, go to:

1. Flow Set: Press ▲ or ▼ to increase or decrease to the desired pump flow rate. Pump will start running. Press * to move to the next parameter.
2. ADJ: After attaching calibrator to pump, press ▲ or ▼ to increase or decrease flow adjustment until desired flow reading is indicated on calibrator. Press * until End appears. Press [▲▼] to save new flow adjustment settings and exit Setup.
3. CALCh: Pressing [▲▼] initiates single-point calibration. Pressing ▲ seven times initiates a full calibration. (Note: Full calibration is done once a year or after maintenance.)
4. 12Hr/24Hr Clock and Delayed Start: Press ▲ or ▼ to move between standard (12 hr), military (24 hr) and Dela (delayed start). Press * to select.
5. Time of day: Press ▲ or ▼ to increase or decrease flashing hour. Press * to move from hours to minutes. Press ▲ or ▼ to increase or decrease flashing minutes. Press * to move to next parameter.
6. ST (Sampling Time): Allows the user to program a specific run time. Press ▲ or ▼ to increase or decrease the time in minutes. Press * to move to next parameter.
7. Temperature: Press ▲ or ▼ to toggle between Fahrenheit (F) and Celsius (C). Press * to move to next parameter.
8. Atmospheric Pressure: Press ▲ or ▼ to toggle between mercury (In), millibars (mb) and millimeters of mercury (mm). Press * to move to next parameter.
9. CLr: Press [▲▼] to clear accumulated run time and volume data to zero.
10. ESC: Press [▲▼] to exit Setup without saving new settings.
11. End: Press [▲▼] to save new settings and exit Setup.

Resetting Run Time Data

To reset accumulated volume and run time data to zero:

1. Press [▲▼], then press the security code in sequence ***▲▼ *.** Setup will display briefly.
2. Press * until Clr appears, then press [▲▼].
3. Press * until End appears, then press [▲▼] to exit Setup. The pump is now in Hold.

3.1.1 Setting the Sampling Time

Program the pump from the integral keypad or a PC using DataTrac software to sample from 1 to 99999 minutes.

1. Press [▲▼], then press the security code in sequence ***▲▼ *.** Setup will display briefly.
2. Repeatedly press * until ST L/min and a flashing time and Set appear on the display.
3. Set the sampling time by pressing ▲ or ▼ to increase or decrease it to the desired time in minutes. (NOTE: For the 130 Liberty Street ambient air program, the desired sampling time is 24 hours or 1440 minutes.)

4. Press * repeatedly until End appears.
5. Press [▲▼] to save the new sampling time and exit Setup.

3.1.2 Setting the Pump Flow Rate

1. Press [▲▼], then press the security code in sequence ***▲▼ *.**
2. The flow rate and setup will flash on the LCD. Press ▲ to increase flow rate. Press ▼ to decrease flow rate. The pump will run while the flow is set. (NOTE: For the 130 Liberty Street ambient air program, the desired flow rate is 5 liters per minute which will allow for collection of approximately 7.2 m^3 over a 24-hour period.)
3. Once the desired flow rate is displayed, press * until End appears. The pump will stop running.
4. Press [▲▼] to save the new flow rate and exit Setup.

4.0 CALIBRATION

A flow system must be audited following initial setup of the Leland Legacy Pump and prior to sampling and periodically, as defined by the project specific QAPP, during the sampling event.

4.1 Verifying Flow Rate Using a Primary Standard Calibrator

1. Verification of the flow rate is performed twice a day, at the beginning and end of the sampling period.
2. Connect the pump inlet to a calibrator (i.e., primary source dry- cell calibrator) with or without representative media in-line.
3. Press [▲▼], then press the security code in sequence ***▲▼ *.** The flow rate and Set will flash.
4. Set the flow on the pump display by pressing ▲ or ▼ to increase or decrease flow to the desired rate.
5. Press *. Adj will appear.
6. If the calibrator reads a higher flow rate than the pump is set for, press ▼ until they are in agreement (within ±20%). If the calibrator a reads lower flow rate, press ▲ until they are in agreement (within ±20%). When pressing ▲ or ▼, the pump display will indicate the adjustment (or correction) made in L/min.
7. Press * until End appears.
8. Press [▲▼] to save the new flow rate and Adj and exit Setup. Reset the run time data.

5.0 SAMPLING

Note: During handling of sample media, nitrile and/or cotton gloves will be used.

1. Following the setup and calibration procedures, remove plastic caps from pre-cleaned cartridge assembly and return to the jar for later use. Attach cartridge to the pump using tygon tubing. (NOTE: Sampling medium for PCB Aroclors

consists of a glass cylinder containing a polyurethane sorbent [i.e., PUF plug]. All sampling media will be supplied, pre-cleaned and pre-certified by the analytical laboratory. The laboratory will insert the PUF plugs into the glass sampling cartridge.)

2. To begin sampling, press [▲▼] to run the pump. Record the start time and pump flow rate.
3. Sample for the time specified in the QAPP. (NOTE: For the 130 Liberty Street ambient air program, the desired sampling time is 24 hours or 1440 minutes).
4. To stop sampling, press [▲▼] to place the pump in Hold. Record the stop time and final volume.
5. When sampling is complete, pump data are retained in memory for recovery. Data can be viewed on the LCD by using the * button to scroll through it.
6. Remove PUF cartridge from the pump and replace the plastic caps on the cartridge.
7. Put the cartridge back in its original sealed and labeled container.
8. Place in a cooler on ice (4°C ± 2°C) for transport to a analytical laboratory.

Note: If flow drops by more than 5%, the pump goes into Hold and retains historical data. The flow fault icon flashes during flow fault. The pump will restart in 20 seconds and try to continue sampling. If the flow remains restricted, the pump returns to flow fault. Auto-restart is attempted every 20 seconds up to 10 times. Flow fault time is not added to the displayed run time or cumulative volume display.

6.0 BATTERY OPERATION

Installing the Battery

1. Align connector of battery pack with connector of pump body.
2. Gently press battery pack into pump body until it is flush with the pump case. Insert and tighten three screws. **Note:** Make sure the longest of 3 screws is placed in the top screw hole.

Charging the Battery

1. Insert the plug on the Charging Unit into the battery-charging jack on top of the pump (underneath the protective cover).
2. Insert the plug on the Power Supply into the jack on the Charging Unit.
3. Slide the appropriate wall plug into the Power Supply and plug the Power Supply into a wall outlet.

Note: The battery will recharge in approximately 15 hours.

Removing and Replacing the Battery Pack

1. Turn off pump before removing battery. Removing the battery while in operation may corrupt pump history.
2. Position pump with belt clip facing upward.

3. Use a Philips head screwdriver to remove 3 screws on bottom half of pump.
4. Grasp and remove battery pack by pulling it up and away from pump body.
5. Align connector of new battery pack with connector of pump body.
6. Gently press battery pack into pump body until it is flush with the pump case. Insert and tighten three screws. **Note:** Make sure the longest of 3 screws is placed in the top screw hole.

7.0 MAINTENANCE

If maintenance is required, return the pump to the manufacturer for repair.

8.0 ADDITIONAL INFORMATION

A more detailed equipment manual is available from SKC and is located in the site office for any other questions about the Leland Pump.