Spill Buddy
Product Recovery System

Operator's Manual
PN 3014

envirotecnics
Teléfono de soporte técnico
Tel: 872 080 542

REVISIONS			
REV	DESCRIPTION	INITIALS	DATE
	Initial Release	DFB	2/26/14

Spill Buddy Limited Warranty

All references to the customer herein shall mean the Purchaser or the Lessee as applicable. CLEAN EARTH TECHNOLOGY, INC. (CET) warrants the Spill Buddy to be free of substantial defects in material and workmanship for one year from the date of shipment. Pumps are warrantied for 90 days. CET's sole responsibility under this warranty shall be to either repair or replace, at its option, any component which fails during the applicable warranty period because of defect in workmanship or material. No other liabilities shall be assumed by the manufacturer or its agents, nor are they expressed or implied.

This warranty is contingent upon proper use of the Spill Buddy by the Customer in accordance with CET's published specifications. This warranty shall not be valid if the alleged defect is the result of abuse, misuse, accident, alteration, neglect, unauthorized repair, or acts of nature. Any repair shall be deemed unauthorized unless it is made by CET or with the written consent of CET. This warranty is the sole warranty made by CET to the Customer and is in lieu of all other warranties or obligations, expressed or implied.

System upgrades will be made available to customers as they are completed. Clean Earth Technology, Inc. is not obligated to provide those upgrades without cost.

WARNING: In the event that equipment is returned to the factory for any reason, a complete decontamination must be done before shipment. See page 27 of this manual for the decontamination procedure. Shipping hazardous materials improperly may be a Federal offense.

WARNING: Unauthorized user modifications or application beyond the published specifications may result in electrical shock hazards or improper operation. Clean Earth Technology, Inc. will not be responsible for any injuries sustained due to unauthorized equipment modifications.

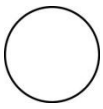
Restrictions and Liabilities

Information in this document is subject to change and does not represent a commitment by Clean Earth Technology, Inc. Changes made to the information in this document will be incorporated in new editions of the publication. No responsibility is assumed by Clean Earth Technology, Inc. for the use or reliability of software or equipment that is not supplied by Clean Earth Technology, Inc. or by its affiliated dealers.

Safety Considerations

Use of this instrument is restricted to qualified personnel who recognize shock hazards and are familiar with safety precautions used when operating electrical equipment. Read the manual carefully before operating the Spill Buddy.

The following warnings and informational symbols may be found on the Spill Buddy and/or in this manual:

Symbol	Description
	Caution: Risk of electric shock
	Direct / Alternating Current
	Direct Current
	Alternating Current
	Protective Earth (ground)
	Warning: Refer to accompanying documentation
	Off (Power: disconnection from Mains)
	On (Power: Connection to Mains)

Hazard Warnings

- **Warning! Explosive Vapors.** The Spill Buddy is not an explosion proof device. Its use within a classified area requires monitoring of the work site to insure explosive vapors are not present. The probe is designed to operate in an explosive atmosphere, i.e. a recovery well. The reel body and recovery container should be positioned outside of any classified hazardous area. CET recommends maintaining a distance of three (3) feet or greater from the wellhead during use.

- **Warning!** Never leave the Spill Buddy operating unattended during recovery events. This devise is not intended to for use without an operator present.

- **Warning! Risk of Grounding Arc!** This device is designed to dissipate potential static charge through its base grounding plate. Never operate this device while it is not in contact with the ground. Portable product containers must also be set on the ground with the discharge tube clamp connected to the container. The clamp is electrically connected to the reel assembly**.**

- **Warning!** Insure the Pump Flooding Procedure has been performed prior to use, see page __.

- **Warning!** Chemical Incompatibility. Do not use this device to pump any Halogenated Hydrocarbon (HHC) solvent containing the following elements: (Examples are not all inclusive)

Flourine (f)	"-flour-"	i.e. Dichloroflouromethane, Trichlorofiouromethane
Bromine (Br)	"-bromo-"	i.e. Methyl bromine, Ethylene dibromide
Chlorine (Cl)	"-chloro-"	i.e. Perchloroethylene, Trichloroehtane, Dichloromethane
Iodine (I)	"-iodi-"	i.e. N-butyl Iodide, Methyl Iodide

Failure to heed this warning may result in severe system damage, personnel injury, and/or site damage.

CET recommends that any chemicals of concern (COC) be disclosed at the time of quote requests and when a system is moved from its original site to another COC site.

Precautions

The following precautions are provided to help you avoid damaging the system:

- Caution: Service. Only authorized service personnel should service the Spill Buddy. Only qualified technical personnel should perform troubleshooting and service procedures on internal components. Call the factory at 802-425-3710 if you believe the Spill Buddy requires servicing beyond normal maintenance procedures.
- Caution: Site Security. Access to the site and to the Spill Buddy must be controlled at all times. The equipment is specialized and must only be operated by qualified and trained personnel. Clean Earth Technology does not warranty damage to

equipment due to vandalism or negligence.

- Caution: Regular Maintenance. The down-well probe and pump should be regularly inspected and maintained, as detailed in Chapter 2, page 13. The frequency of maintenance will depend on your site conditions. Failure to provide regular maintenance will damage your Spill Buddy and may result in unsafe operating conditions. Clean Earth Technology is not responsible for damage to equipment or injury to personnel resulting from improper maintenance practices.

The policy below applies to both equipment sales and repair orders. For a Return Material Authorization number, please call our Service Department. (802) 425-3710

Clean Earth Technology, Inc.

Environmental Equipment Return Policy

This policy refers to ANY EQUIPMENT OR PARTS being returned to Clean Earth Technology, Inc. (CET), whether:

- Customer owned, leased, or rented.
- In warranty or out of warranty

NO equipment or parts should be shipped to CET without first contacting our service department for a Return Material Authorization number (RMA). Contact our service department at (802) 425-3710 to be assigned an RMA number.

- CET reserves the right to refuse delivery of any equipment without a CET RMA number clearly displayed on the exterior of the package(s).
- CET reserves the right to refuse delivery of any equipment improperly decontaminated.
- CET reserves the right to add a fee of $500.00 to the repair invoice of any equipment or parts not decontaminated to the satisfaction of CET.

Environmental Equipment Return Guidelines

- All equipment must be thoroughly cleaned, purged of product and decontaminated prior to shipment to CET. NOTE: CET recommends the use of Personal Protective Equipment, level C or D, as defined in OSHA 29 CFR 1910.120.
- CAREFULLY FOLLOW THE EQUIPMENT DECONTAMINATION PROCEDURES FOUND ON PAGE 27 OF THIS MANUAL

Any equipment or parts shipped to CET must include the following documentation:
CET RMA/Repair Order form completed by customer. An "RMA number/REPAIR ORDER" form to copy is found on page 31.

- Description/name of product pumped.
- Reason for return.
- The CET RMA number clearly marked on the outside of ALL packages and paperwork.

All items being returned (including all warranty-claim shipments) must be sent freight prepaid to our factory location:

Clean Earth Technology, Inc.
445 Long Point Road
N. Ferrisburgh, VT. 05473

When you ship an item to CET, we recommend using UPS, FedEx, or another reputable shipper. We also recommend that you insure your shipment for its actual replacement cost. Clean Earth Technology will not be responsible for lost shipments or instruments that are received in damaged condition due to improper packaging or handling.

Use the original carton and packaging material for shipment. If they are not available, we recommend the following guide for repackaging:

- Use a double walled carton of sufficient strength for the weight being shipped.
- Use sufficient industry approved, shock-absorbent packing material to protect all surfaces and projecting parts. The items packed should not be able to slide or shift their position within the box.

CONTENTS

Product Introduction

The Spill Buddy is a compact, manually operated product skimming tool based on proven Spill Buster technology. The Spill Buddy is designed to be operated on site to determine the location of the product/water interface and skim small quantities of product or water from recovery wells as small as 2" in diameter.

The Spill Buddy is designed to effectively pump products (both LNAPLs and DNAPLs) with viscosities up to about 10-12 centipoise.

The Spill Buddy consists of a reel outfitted with a down-well probe that is manually lowered and raised by the operator. The down-well probe comes in two lengths: 50 ft. and 100 ft. The Probe is connected inside the reel to 10 ft. of Product Discharge Tubing with a combination valve and support clamp/ground, located at the rear of the reel which can be attached to various types of recovered product containers.

The 1.93" diameter Probe contains the patented ALPHA ARRAY™ interface sensors, as well as a small but powerful 12vdc electric product pump. An audible feedback enables the user to keep the pump positioned in the product layer, resulting in product skimming without also pumping water.

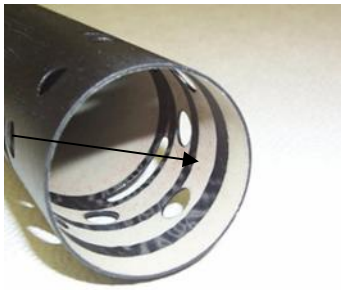
"Exploded" view of the Probe showing the pump, filter, spring and end cap

The rugged, lightweight, and convenient Spill Buddy can skim up to 0.7 gallons of product per minute. Spill Buddy also has a self-contained, rechargeable battery for the sensor electronics and pump. The battery is rechargeable from a 12 VDC source. A wall transformer is provided with the unit; or an optional cigarette lighter adapter may be purchased that enables the Spill Buddy to be charged by a vehicle, as well as an optional battery cable to charge directly from your vehicle's battery. Spill Buddy can operate for up to one hour of continuous pumping (approx. 40 gallons) per charge, depending on the viscosity of the product being pumped.

Alpha Array Sensor Band Location

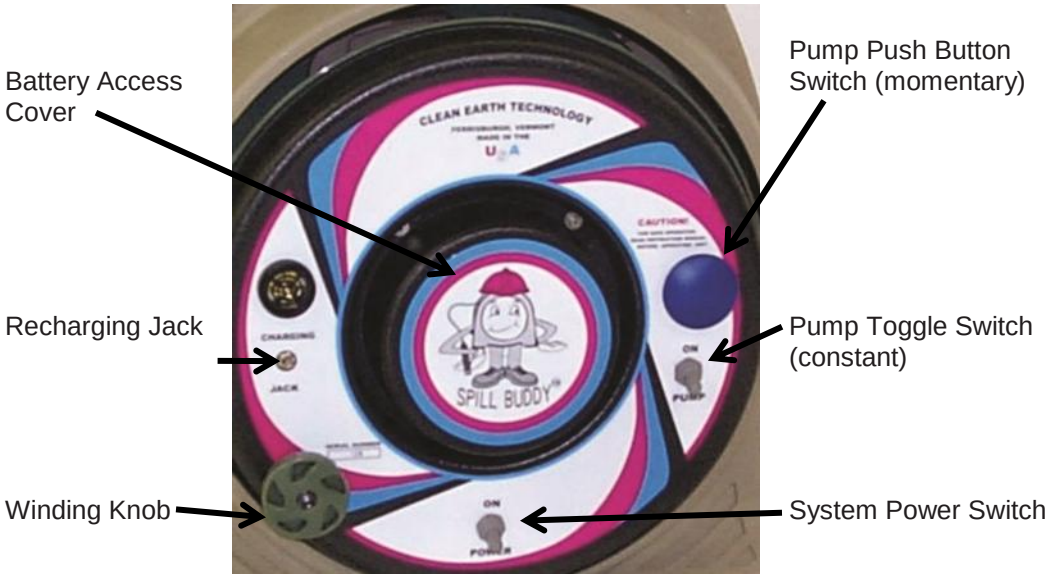
There is an array of sensor bands, internal to the probe, including one dispensing a high limit signal. The sensor uses a low frequency, omni-directional signal to sense the product/water interface. The sensor operates on the principle that signal transmission varies significantly due to the transmission characteristics of the type of fluid surrounding the antenna. The variation in signal transmission is used to accurately determine the interface location relative to the product inlet. The sensor is constructed of "state of the art" polymer materials for corrosion resistance and long life.

ALPHA ARRAY™
SENSOR BAND AREA



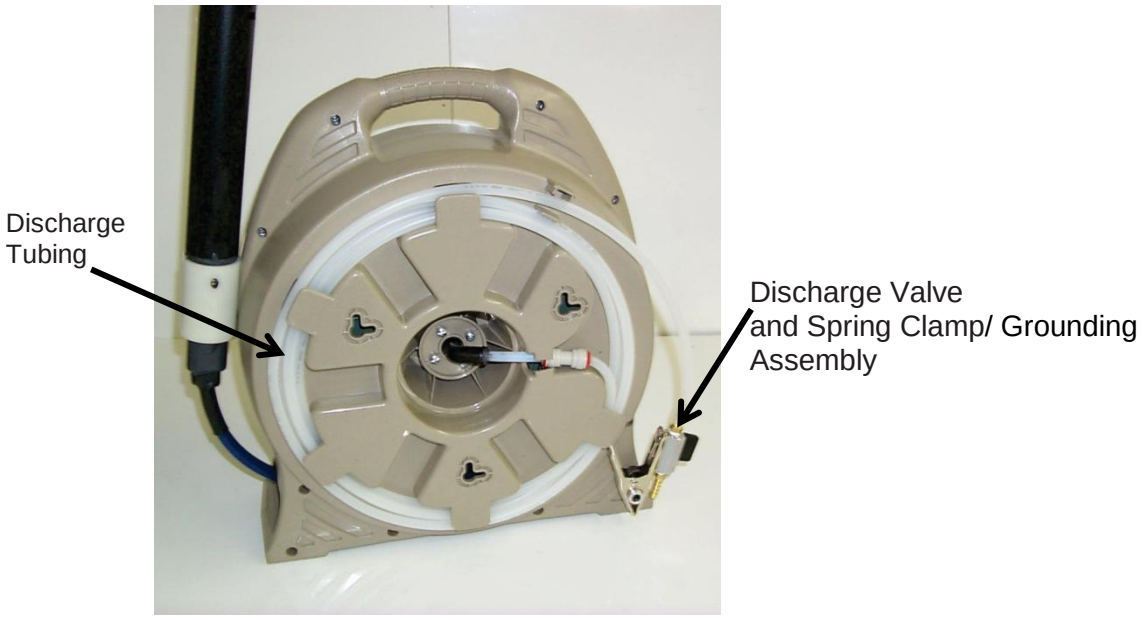
The Front Panel of the Reel includes the System Power ON/OFF switch, the Pump ON push button switch (momentary), the pump ON toggle switch (constant) and the Battery Charging Jack.

NOTE: For maximum performance, allow the Spill Buddy's battery to charge overnight before use.



Spill Buddy Front Panel

`



Spill Buddy- Back View

Operator Safety

The National Electric Codes (NEC) does not certify portable electrical systems such as the Spill Buddy. However, Clean Earth Technology has used the NEC as a guideline for the Spill Buddy's design, developing the operating instructions, and in our definitions of classified areas. Please note that what we have written here is not meant to supersede anything that may be written in detail in the NEC codes or applicable local codes. ***It is your responsibility*** **and the responsibility of the Authority Having Jurisdiction** to study and follow these codes.

The Spill Buddy's probe is designed to operate in a recovery well, which is a Class 1, Div 1 area, whereas the reel itself is not rated for use in a classified area. Therefore, it is important to understand and follow the instructions in this manual for using the Spill Buddy in a manner consistent with safe practices. Make certain that you have read the Hazard Warnings section on page iii, as well as other notes and warnings written throughout the manual and the safety labels located on the Spill Buddy itself.

Since this is such an important topic, in the next section we will present a few basics to help you or your customers understand the meaning of the various terms defining safe use when operating our equipment.

Intrinsic Safety 101

Intrinsic safety (IS) is a protection technique for safe operation of electrical equipment in hazardous areas by limiting the energy available for ignition of explosive well gases. The concept of (IS) circuits was originally driven by some devastating coal mine explosions in Europe due to “firedamp” gases being ignited by “electrical shorts” in the wiring of early communication devices such as the electric telegraph.

In signal and control circuits that can operate with low currents and voltages, the intrinsic safety approach simplifies circuits and reduces installation costs over other protection methods. High-power circuits such as electric motors or lighting cannot use intrinsic safety methods for protection.

Approval standards for intrinsic safety barriers require that the barrier maintains only approved levels of voltage and current flowing out to the specified components located in a classified area. This is accomplished by preventing ignition of the protected device, and also by stopping any ignition level sparking of damaged wiring to the protected components.

Many safety barriers are commercially available and may utilize a buss fuse, one or more resistors, and one or more Zener diodes. These devices are certified and provided in a package form where they can be easily inserted mechanically and electrically in the circuit branch going into a classified area.

An example of an Intrinsically Safe (IS) certified Zener barrier is shown here. Signals going to an electrical device located in a classified zone are wired into one end of the modular barrier and then wired out into the classified zone. These can be purchased off the shelf and are certified Intrinsically Safe by various 3rd body testing laboratories.

We have utilized a certified Zener barrier such as this in the Spill Buddy’s sensor circuits.

Flammability and Combustible Liquids Definitions 101

When using a Spill Buddy system it is important to understand the difference between the definition of flammable liquids and combustible liquids. All flammable and combustible liquids will vaporize into flammable gases at certain temperatures and pressures. The temperature point at which a liquid turns to a gas vapor is referred to as the “flashpoint” of the liquid. The determination of the flashpoint for each flammable or combustible liquid is done by performing what is commonly known as the “closed cup” flashpoint test.

It should be mentioned that flashpoint was selected as the basis for classification of flammable and combustible liquids because it is directly related to a liquid's ability to generate vapor, i.e., its volatility. ***Since it is the vapor of the liquid, not the liquid itself that burns, vapor generation becomes the primary factor in determining the fire or explosive hazard.*** Furthermore, the liquid’s vapor pressure is an important factor and is a measure of a liquid's propensity to evaporate. The higher the vapor pressure, the more volatile the liquid and, thus, the more readily the liquid gives off flammable or explosive vapors.

Clean Earth Technology has designed the Pump Flooding procedure described on page 8 to mitigate the risk of vapor ignition in flammable liquids recovered by the Spill Buddy.

The results of flashpoint testing have been used to help regulating bodies determine the temperatures at which potentially combustible liquids turn into a vapor, creating a flammable or explosive gas.

Hazardous locations are further defined by means of the class/division system and have been formulated by the NEC, CSA, OSHA, and the National Fire Protection Association (NFPA).

These definitions are as follows:

Flammable Liquids

Flammable fluids are defined as liquids having closed cup flash points below 100°F (37°C). Flammable liquids are referred to as Class I liquids.

◆ A class IA flammable liquid is a liquid with a flashpoint below 73ºF (22.8ºC) and a boiling point below 100ºF (37.8ºC). An example of a class IA liquid is n-pentane, since its flashpoint and boiling point are 56ºF (49ºC) and 97ºF (36ºC), respectively.
◆ A class IB flammable liquid is a liquid with a flashpoint below 73ºF (22.8ºC) and a boiling point at or above 100ºF (37.8ºC). An example of a class IB liquid is acetone, since its flashpoint and boiling point are 0ºF (18ºC) and 133ºF (56ºC), respectively.
◆ A class IC flammable liquid is a liquid with a flashpoint at or above 73ºF (22.8ºC) and below 100ºF (37.8ºC). An example of a class IC liquid is turpentine, since its flashpoint lies in the range from 95 to 102ºF (35 to 39ºC).

Combustible Liquids

Combustible fluids are defined as liquids having closed cup flash points at or above 100°F (37°C). Combustible liquids are referred to as Class II or Class III liquids.

◆ Class II liquids - flash points at or above 100°F (37.8°C) and below 140°F (60°C).
◆ Class IIIA liquids - flash points at or above 140°F (60°C) and below 200°F (93.4°C). c.
◆ Class IIIB liquids - flash points at or above 200°F (93.4°C).

An example of a Combustible liquid is the Lamplight® Ultra Pure Red Paraffin Lamp Oil that CET uses for testing new and repaired units before shipment. This material has a flashpoint of 250F (121C) making it a class III liquid. Furthermore, its low toxicity makes it a safe testing fluid due to its high ignition temperature and the lack of chemicals that are listed in the CERCLA Hazardous Substance list. CET uses a red colored fluid but it also can be found in clear, or colored green or blue.

This fluid is easily found and can also be used as a pump flooding fluid as defined on page 8.

Chapter 1- System Operation

STANDARD EQUIPMENT LIST:

Spill Buddy, 50 ft. or 100 ft., as ordered, with battery installed

Battery wall charger

Pump Fill Kit

Pump Removal Tool

Operator's Manual

Optional Items:

Roller with well head adapter

Cigarette lighter adapter battery charger

Battery charger cable with battery "alligator" clips

Additional product pumps

Extra battery

Warning! Explosive Vapors. The Spill Buddy is not an explosion proof device. Its use within a classified area requires monitoring of the work site to insure explosive vapors are not present. The AHJ may require a valid HOT WORK permit, with testing of the LEL and HEL at intervals. The probe is designed to operate in an explosive atmosphere, i.e. a recovery well. The reel body and recovery container should be positioned outside of any classified hazardous area. CET recommends maintaining a distance of three (3) feet or greater from the wellhead during use.

Warning! Never leave the Spill Buddy operating unattended during recovery events. This devise is not intended to for use without an operator present.

Warning! Risk of Grounding Arc! This device is designed to dissipate potential static charge through its base grounding plate. Never operate this device while it is not in contact with the ground. Portable product containers must also be set on the ground with the discharge tube clamp connected to the container. The clamp is electrically connected to the reel assembly**.**

Warning! Insure the Pump Flooding Procedure has been performed prior to use, see page 8.

NOTE: Personal Protective Equipment, Level C or D, as defined in OSHA 29 CFR 1910.120, shall be worn as a minimum while operating or cleaning the Spill Buddy unit. A suitable container should be used to contain product.

Pump Flooding Procedure

Before the Spill Buddy Probe can be lowered down a well, the pump must be flooded with a non-flammable fluid. (See page 6 for the definitions of flammable versus combustible liquids.) The purpose of this procedure is to displace oxygen and vapors from within the pump body. Once the Probe begins pumping product from the well, the added fluid will be pumped out to the recovery container during the first recovery cycle. **Note:** CET does not ship new or serviced systems with the pump pre-flooded.

Required Equipment:

- A suction device, such as syringe pictured at right. **NOTE:** If purchasing device separately, any O-ring included should be replaced with a Viton ® O-ring to prevent swelling.
- Suitable container for the fluid
- Approximately 8 fl oz of flooding fluid, such as Ultra-Pure Paraffin Lamp Oil, mineral oil, or similar non flammable fluid. DO NOT USE WATER, the pump internals are NOT corrosion resistant.
- Approximately 12”of 3/8 fuel line
- A product pump, CET P/N 90-1318-019

Flood the pump

- Attach the fuel line to the discharge side of the pump.
- Attach the other end of the fuel line to the suction device.
- Place the pump inlet in the container of fluid.
- Pull the fluid into the pump until it is observed in the fuel line.
- Remove the fuel line from the pump.
- Install (or re-install) the flooded pump into the Probe (reference the “Pump Installation” section of the Maintenance Operations chapter of the Operator’s Manual).
- If the pump is not immediately installed in the Probe, replace the red intake and discharge caps. The pump can then be bagged for later use or storage.

Note: Always save the red caps from installed pumps for future use.

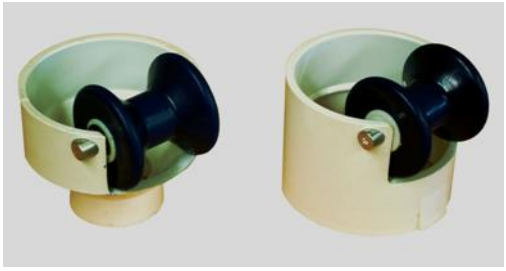
Once the flooded pump has been replaced in the Probe (See “Pump Installation” on page19), you are ready to begin operating the Spill Buddy.

Using the Spill Buddy to Pump LNAPLS (Floaters)

Warning! Explosive Vapors. The Spill Buddy is not an explosion proof device. Its use within a classified area requires monitoring of the work site to insure explosive vapors are not present. The AHJ may require a valid HOT WORK permit, with testing of the LEL and HEL at intervals. The probe is designed to operate in an explosive atmosphere, i.e. a recovery well. The reel body and recovery container should be positioned outside of any classified hazardous area. CET recommends maintaining a distance of three (3) feet or greater from the wellhead during use.

NOTE: Always perform the Pump Flooding procedure found on page 8 before lowering the Probe into the well.

1) For operation compliant with standard safety practices, always use a roller (grooved wheel or pulley) mounted on the well head to enable the operator to lower the Spill Buddy's probe down the well from a distance at least three feet away. You can order a roller and well head adapter from Clean Earth Technology, or else supply your own.



Rollers mounted to well head adapters for a two inch well and a four inch well.

2) Place the roller and adapter on the well head

3) To recover product, clip discharge tube end to the product discharge container and *open the petcock*. LNAPL or DNAPL product can be pumped out of the well and into the open Container. NOTE: The container should be located 3 feet or more from the reel body.

4) Perform the Pump Flooding Procedure on page 8.

5) Remove the probe from its receptacle and rest it carefully over the roller. Start to lower the probe by unreeling it into the well (use caution to avoid scraping the tubing on sharp edges).

6) Once the operator and any other personnel present are located at least three feet from the well head, turn the unit on using the SYSTEM POWER switch on the Front Panel (See page 2). Spill Buddy will respond with one beep every three seconds, which indicates that *the unit is ON, and the battery is charged and functional.*

7) Continue to lower the probe slowly into the well. *When the Probe ALPHA-ARRAY™ sensor contacts water,* Spill Buddy will respond with a continuous beep.

8) To recover product raise the depth of the probe to a point *just above the product/water interface.* (The continuous tone changes to one beep every three seconds). In the case of a DNAPLE product when the solid tone stops then the pump intake is in the DNAPL product and the pump can be turned on to recover product.

WARNING: Always position the product recovery container more than 3 feet (1 Meter) from the Spill Buddy reel.

Press the push button (momentary) PUMP ON switch or flip the PUMP ON toggle switch (constant) for continuous operation. Both switches are located on the Front Panel.
Use "fishing" motion. Once the tone changes from one beep/three seconds to continuous, *release the pump switch or raise the probe so that the water will not be pumped into the discharge.*

9) As water recharges the well, the interface level may change. To avoid pumping water, it is recommended that the operator continue the "fishing" motion to reestablish the interface level, then find product and restart the pump. Repeat this process several times to pump off the maximum amount of product.

NOTES:
a) The pump will operate as long as the constant PUMP toggle switch is in the ON position. Spill Buddy will pump water or product depending upon the elevation of the probe in the well relative to the product/water interface. The operator selects the fluid to be pumped by listening to the tones. The pump will not automatically turn itself off when it senses water.

b) If, during the course of the day, the pumping rate slows down, check the filter screen first. Use large adsorbent pad to wrap probe between wells to prevent spillage.

Using the Spill Buddy to Pump DNAPLS (Sinkers)

Warning! Explosive Vapors. The Spill Buddy is not an explosion proof device. Its use within a classified area requires monitoring of the work site to insure explosive vapors are not present. The AHJ may require a valid HOT WORK permit, with testing of the LEL and HEL at intervals. The probe is designed to operate in an explosive atmosphere, i.e. a recovery well. The reel body and recovery container should be positioned outside of any classified hazardous area. CET recommends maintaining a distance of three (3) feet or greater from the wellhead during use.

NOTE: Always perform the Pump Flooding procedure found on page 8 before lowering the Probe into the well.

1) For operation compliant with standard safety practices, always use a roller (grooved wheel or pulley) mounted on the well head to enable the operator to lower the Spill Buddy's probe down the well from a distance at least three feet away. You can order a roller and well head adapter from Clean Earth Technology, or else supply your own.

2) Place the roller and adapter on the well head

3) Perform the Pump Flooding Procedure on Page 8.

4) To recover product, clip discharge tube end to the product discharge container and *open the petcock*. LNAPL or DNAPL product can be pumped out of the well and into the open Container. NOTE: The container should be located 3 feet or more from the reel body.

5) Remove the probe from its receptacle and rest it carefully over the roller. Start to lower the probe by unreeling it into the well (use caution to avoid scraping the tubing on sharp edges).

6) Once the operator and any other personnel present are located at least three feet from the well head, turn the unit on using the SYSTEM POWER switch on the Front Panel (See page 2). Spill Buddy will respond with one beep every three seconds, which indicates that *the unit is ON, and the battery is charged and functional.*

7) Continue to lower the probe slowly into the well. *When the Probe ALPHA-ARRAY™ sensor contacts water,* Spill Buddy will respond with a continuous beep. Product can be pumped out of the well by the following procedure: lower the Probe down through the water to reach the product. When the probe sensor contacts the DNAPL, Spill Buddy will respond with one beep every three seconds.

> **WARNING:** Always position the product recovery container more than 3 feet (1 Meter) from the Spill Buddy reel.

8) Press the push button (momentary) PUMP ON switch or flip the PUMP ON toggle switch (constant) for continuous operation. Both switches are located on the Front Panel. The exact level of the ground water/DNAPL interface may change as the product is being pumped off, requiring the Probe to be lowered slightly. Keep Probe off the bottom of the well to avoid pumping silt-laden product.

CAUTION: If the well contains both floating product and DNAPLS, pump off both products as described above, but into separate containers for appropriate disposal.

NOTES:

a) The pump will operate as long as the constant PUMP toggle switch is in the ON position. Spill Buddy will pump water or product depending upon the elevation of the probe in the well relative to the product/water interface. The operator selects the fluid to be pumped by listening to the tones. The pump will not automatically turn itself off when it senses water.

b) If, during the course of the day, the pumping rate slows down, check the filter screen first. Use large adsorbent pad to wrap probe between wells to prevent spillage.

Chapter 2- Maintenance Operations

Removing Moisture from the Pump

The most essential maintenance operation for the Spill Buddy is removal of all moisture from the pump *at the end of each day's use*. Since the pump shutoff is a manual operation, some amount of water is inevitably pulled into the pump during operation. Allowing *any* amount of water to remain in the pump motor WILL damage the pump, even if only for a short period of time. **Moisture must be displaced from the pump motor even if the unit has not been used to pump water.** Displacing moisture can be accomplished by following these simple procedures:

1. Place the Probe in a container of pure Lamp Oil, so that the pump intake is fully submersed in product. Make certain there is no water in the container.

2. Activate the pump, by using the toggle switch or large blue button, on the side of the Spill Buddy. Run pump for at least two seconds. This will ensure that an adequate amount of product flows through the pump motor, thereby displacing the moisture. Store the unit in a dry but ventilated place. **NOTE: You will need to remove the pump from the Spill Buddy and perform the Pump Flooding procedure on page 8 just before the Spill Buddy is next used.**

3. If no Lamp Oil is available, remove the pump motor from the probe (see page 16) and lubricate the pump internals with a **non-flammable** commercially available lubricant such as 3-In-One® oil . To lubricate, hold the pump upside down (intake hole up) and squirt lubricant into intake hole. This will allow lubricant to flow into working parts of the pump. Also, squirt lubricant into the product discharge nipple of the pump.

4. The lubricated pump can be stored in a sealed plastic bag until just prior to the next use of the Spill Buddy. At that point, make sure to perform the Pump Flooding procedure on page 8 before reinstalling the pump into the Probe.

PLEASE NOTE: Leaving moisture in the pump, thereby damaging it, voids the pump warranty.

Field Shutdown Procedure

The Spill Buddy should be cleaned after each use:

1. Reel in the Probe while wiping off tubing with a rag. Roll tubing evenly onto the reel, guiding the tubing from side to side.

2. Wipe off the Probe with an absorbent pad. Make sure the product inlet slot is free of debris.

3. While ensuring that the discharge tube is still clipped to the discharge container *with the petcock open*, hit the PUMP ON switch repeatedly until most of the product is purged from the tubing. Then hold the unit on its side and turn on the PUMP switch a few more times to continue purging.

4. When you have purged as much product as possible, turn the petcock off. Unclip the discharge valve from the container and wind the discharge tubing back onto the rear side of the Spill Buddy. Clip the discharge valve to its post.

5. In a clean, dirt-free area, remove the pump and filter screen from the Probe and clean the filter (See page 18).

6. Remove all moisture from the pump as described on page13.

6. Wrap the Probe in a large, absorbent pad between sites to avoid spillage.

Shop Cleaning Procedure

Additional cleaning and purging of the Spill Buddy should be performed upon its return to your maintenance department, and **is also required before shipping the unit to the factory for service** (See Chapter 5- Equipment Decontamination Procedure on page 27). This can be accomplished by pumping a cleaning product **compatible with the product being skimmed** through the Spill Buddy. Pump a quantity of the cleaning product through the pump and product tubing.

After purging this fluid as described in the Field Shutdown Procedure above, open the petcock and apply pressurized air to the petcock end of the discharge tubing. Use LOW pressure (less than 20 lbs. psi) to blow out excess product. Make sure that the Probe end is in a discharge container **and that the pump assembly is removed** before turning on the air.

Next, follow the procedures below for cleaning the Probe and pump.

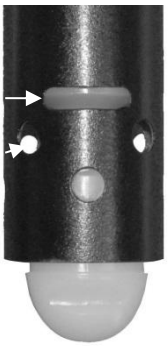
Cleaning the Probe

Probe Inlet slots and holes in the sensor band area of the probe body allow the product and water to freely enter into the interior of the probe. These slots must be kept clean and free of debris in order for the system to function properly. Care must be taken when cleaning the inlet slots and holes to avoid damaging the probe and sensor band area. Avoid using sharp tools such as screwdrivers, knives, etc. to clean the probe inlet slots and holes. **Remove the pump assembly before cleaning the Probe (see page 16).**

The product inlet slots lie toward the end of the probe, which allows the product to flow into the pump filter. There are also several round holes, which allow water and product to freely flow into the inside of the probe pump cavity where the sensor bands are located. These holes must all be kept clean.

PRODUCT INLET SLOT

PRODUCT/WATER INLET HOLES



ALPHA ARRAY™ SENSOR BAND AREA

END CAP

If the Probe sensors become coated with a very heavy layer of biological growth, emulsions, or other materials, the Probe will not function properly. The Probe can be cleaned, as shown below, using spray cleaner or mild dish liquid in warm water and a cloth or soft bristled brush. Care must be taken to avoid damaging the Probe and sensor bands, either by brushing too hard or by using a very hard tool to perform cleaning.

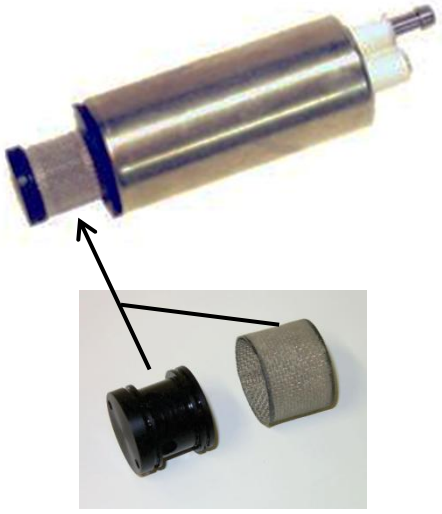
Make sure that the Product Inlet Slots and holes are clear, and the interior Alpha Array™ Sensor Band area is free of coating and debris

If persistent residue sticks inside the sensor area, a soft brush or tooth brush is recommended to fully clean sensors.

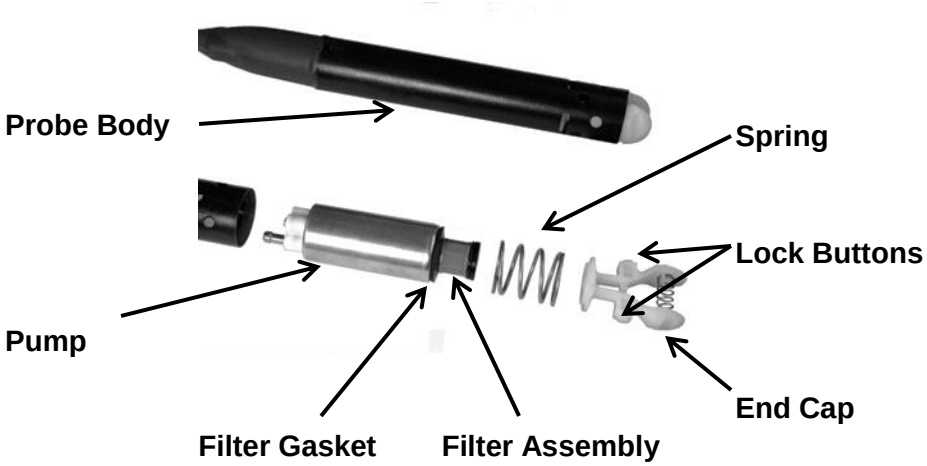
How To Remove the Pump

The product pump is a rugged and chemically resistant roller vane unit. When used in the Spill Buddy, it is capable of pumping up to 40 gallons (151liters) per hour of low viscosity liquids (up to 10 Cp) and to reliably recover product out of wells up to 100 feet in depth. In addition, it can withstand a certain amount of small solids such as dirt or sand passing through it.

The Product Pump is located near the bottom of the probe and is easily accessible. The pump is inserted into the bottom of the probe body and is held in place by the spring and end cap.



Filter Screen & Adapter



The Product Pump is located near the bottom of the probe and is easily accessible. The pump is inserted into the bottom of the probe body and is held in place by the end cap.

To remove pump, push end cap firmly into probe to loosen the locking buttons. While pushing end cap in, press locking buttons into probe.

Releasing First Lock Button

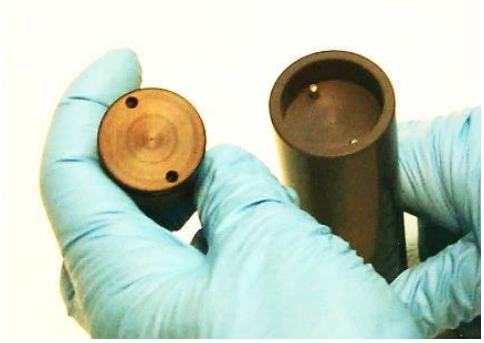
Releasing Second Lock Button

Removing End Cap

The Pump is removed from the Probe using a Pump Removal Tool supplied with the system. One end has two pins which are used to spin the filter & filter top off. The second end has a threaded hole, which is screwed onto the inlet end of the Pump. The Pump then is pushed out of the Probe.

Pump Removal/Insertion Tool

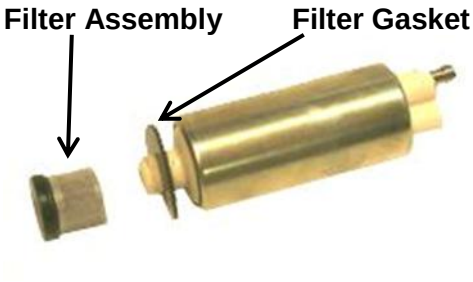
Threaded Hole



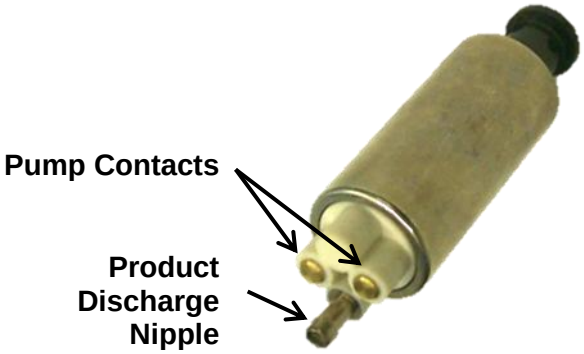
Filter Adapter Pins

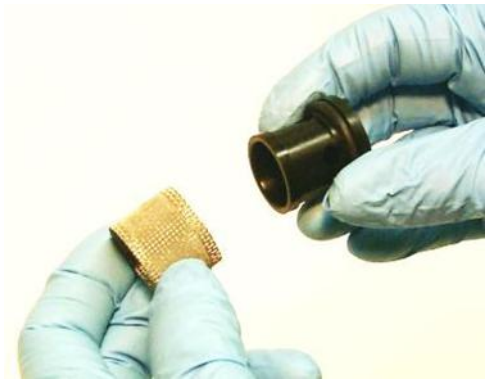
Remove the Pump

Pump Maintenance



The pump product nipple and the pump electrical contacts should be kept clean.



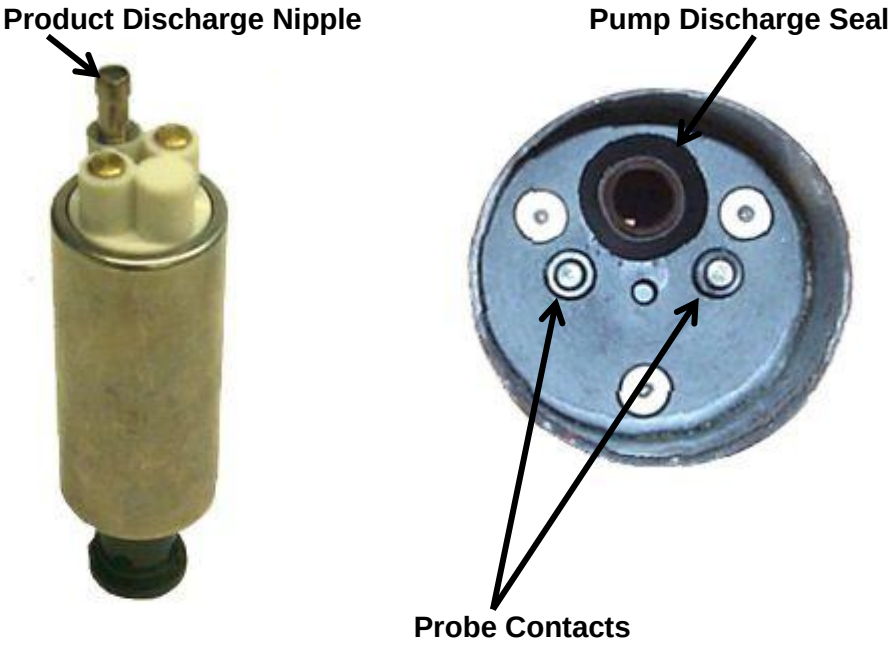


The pump inlet screen and inlet holes should be checked and cleaned during inspection.

After the filter is cleaned, clean pump contacts with brush. Make sure that the contacts are free of any corrosion. If the pump will be reinstalled in the probe for immediate use, proceed to the Pump Flooding procedure on page 8. If the Spill Buddy will be stored for any period of time, lubricate the pump as described on page 13 and then seal it in a plastic bag to be kept with the system. The Pump Flooding procedure must then be performed before the pump is reinstalled in the Probe.

How to Install/Reinstall the Pump

If it was removed for cleaning, reinstall pump filter assembly. Don't forget to install filter gasket between filter and Pump. Make sure that the filter assembly is tight. When installing the Pump make sure the product discharge nipple is aligned with the Pump discharge seal.



Drop Pump into Probe and push Pump until the Pump contacts are seated firmly against Probe contacts. The Pump Tool can be used to align the Product Discharge Nipple with the seal. If firm contact is not made, the Pump may not function. Finally, insert the end cap such that both lock buttons snap in place.

Battery Maintenance and Charging

Battery Access

To access the battery remove the Battery Cover located on the center of the front reel, disconnect Connecter Jack and pull the battery out.

Charging the Battery

Spill Buddy's battery should only be charged with the AC adaptor supplied with the unit or the optional cigarette lighter cable or automotive battery charging cable, if purchased. The battery is a lead/acid type, and all precautions should be used as with any lead/acid battery. The charge on the battery can be "topped off" at any time between uses without damage to the battery. When charging the battery, always plug the jack into Spill Buddy first, then plug into the power source. When disconnecting charger from source, always disconnect the power source first, then the Jack.

To charge Spill Buddy, insert jack into Front Panel. For initial use, charge the battery overnight. Following the initial charge, battery charging times will vary depending upon how much Spill Buddy's pump is used. (A fully charged battery can provide up to an hour of continuous pumping of a low viscosity product such as gasoline.)

NOTE: Do not charge the Spill Buddy's battery overnight in the cigarette lighter receptacle to avoid draining your vehicle's battery.

WARNING: If the battery is to be replaced in the field with a freshly charged battery then the operator MUST move the Spill Buddy to a nonhazardous area before disconnecting or reconnecting the batteries.

Optional In Field Battery Charging Methods

Clean Earth can supply optional cables to charge Spill Buddy batteries in the field. One cable can be plugged directly into a cigarette lighter outlet, with the other end plugged directly into the

charging port of the Spill Buddy, (or directly into the battery connector of an extra battery to allow it to charge separately from the Spill Buddy).

Spill Buddy Cigarette Lighter Battery Charging Cable

Spill Buddy Automotive Battery Charging Cable

The Automotive Battery Charging Cable can be hooked directly to automotive battery terminals via the alligator clips. It is important to plug the cable into the Spill Buddy or the Spill Buddy battery BEFORE hooking up the alligator clamps on the car battery.

WARNING: If the battery is to be charged in the field with one of these cables then the operator MUST move the Spill Buddy to a nonhazardous area before connecting or disconnecting the batteries.

Chapter 3- Troubleshooting

Problem	**No "beep" sounds after flipping the POWER ON switch.**
Possible Causes & Solutions	1. The battery may not be charged. Whenever possible, charge the battery overnight before using the Spill Buddy. 2. If you confirm that the battery is fully charged and the problem persists, call CET Service at 802-425-3710 to consult on other possible causes and solutions.
Problem	**The pump runs, but no product is being pumped.**
Possible Causes & Solutions	1. Check to make sure that the discharge valve petcock is open. 2. Make sure there is enough product in the well for the Spill Buddy to operate. There must be at approximately ½ inch (12mm) of product present. The Probe inlet slots and holes may be plugged. Follow the procedures on page 14 of Chapter 2- Maintenance Operations to check and clean the inlet slots. 3. The pump filter screen may be clogged. Follow the procedures on page 18 of Chapter 2- Maintenance Operations to check and clean the filter screen.
Problem	**The pump is not running or pumping.**
Possible Causes & Solutions	1. The battery may not be charged. Whenever possible, charge the battery overnight before using the Spill Buddy. 2. If you confirm that the battery is fully charged and the problem persists, test the pump by connecting it to an auxiliary 12 volt battery, using short jumper wires. 3. If it still doesn't run, try hooking the pump up to the battery with connection polarity reversed to help break it loose. You should try this several times if needed. 4. If the pump still fails to run, it should be replaced. Please call CET Service at 802-425-3710 to order a replacement pump. **NOTE: Incomplete maintenance is the most frequent cause of pump failure. Please be sure to follow the procedure detailed on page 13 every time the Spill Buddy is used. Please note that failure to properly maintain the pump voids the pump's warranty.**

Problem	**Interface sensor is not sensing water.**
Possible Causes & Solutions	1. Make sure there is enough water in the well for the Spill Buddy to operate. There must be at least 3" of water in the well below the product. 2. Make sure that the probe cable is not damaged. 3. Make sure that the sensor bands in the probe head are not fouled. If needed, perform a probe cleaning (See page 14 of Chapter 2- Maintenance Operations) to check and clean the sensor bands
Problem	**Product leaks from the elbow connector on the back of the Spill Buddy.**
Possible Causes & Solutions	1. Please call CET Service at 802-425-3710 if you notice any product leaks. **Do not** attempt to tighten the elbow connector as that may damage internal wiring. **Please note that attempting to perform service on a Spill Buddy under warranty without authorization from CET will void the warranty.**

Chapter 4- System Specifications

Size	18.5 x 14.25 x 8.25 in. (470 x 362 x 210 mm).
Weight	19 lbs. (8.6 kg) including battery.
Well Diameter:	2 inch minimum.
Max Pumping rate	Approximately 0.5 g.p.m. (1.9 L./min.) Of low viscosity NAPL..
Minimum skimming thickness	0" (will pump some water in this condition).
Pumping head	50 ft. (15.24 m) standard unit. 100 ft (30.48 m) optional.
Pumping time	1 hour continuous pumping per battery charge - approx. 35 gal. (133 L.) of low viscosity NAPL.
Viscosity ranges	The pump handles water and most hydrocarbons, “floaters (LNAPLS) or “sinkers” (DNAPLS)- viscosities up to 10 cp
Battery	12 V dc, 5 Amp-hours, sealed lead acid battery. (We recommend a second battery for a backup on site.)
Battery charger	Optional accessory cigarette lighter socket cable for charging between sites. Optional accessory car battery cable with alligator clips for charging on site.
Probe holder	Holds probe when not in use. Prevents dripping.
Operating temperature	0º to 130º F ambient temperature (-18º to 55º C).

Chapter 5- Equipment Decontamination Procedures

Prior to return to Clean Earth Technology, Inc., all equipment must be thoroughly cleaned and decontaminated. Please follow your organization's prescribed decontamination procedures, and also carefully observe each step of the following procedure. During decontamination, make sure personnel are wearing the appropriate protective clothing and observing all safety precautions.

Please Note: CET reserves the right to add a fee of $500.00 to the repair or rental invoice of any equipment or parts not decontaminated to the satisfaction of CET.

1. Use the Spill Buddy to pump through a good quantity of a cleaning fluid compatible with the product it was used to recover. Make sure that the discharge tube is clipped to an appropriate container, and that the petcock is open.
2. After it is apparent that you have flushed out any product remaining in the tubing, purge the tubing by turning the PUMP ON switch on and off repeatedly until as much product as possible has been removed. Then hold the Spill Buddy on its side and turn on the PUMP ON switch a few more times to continue purging.
3. Remove the pump assembly from the probe as described on page 16.
4. With the petcock open, apply pressurized air to the petcock end of the discharge tubing. Use LOW pressure (less than 20 lbs. psi) to blow out excess product. Make sure that the Probe end is in a discharge container **and that the pump assembly has been removed** before turning on the air.
5. Clean the Probe as described on page 14, washing it thoroughly to remove contamination while taking care not to damage the sensor bands by avoiding the use of sharp tools or stiff brushes.
6. Lubricate the pump by turning it upside down such that the intake hole is up and spraying a **non-flammable** commercially available lubricant such as 3-in-One® oil into the intake hole. Also squirt lubricant into the product discharge nipple of the pump.
7. You may then either replace the pump into the Probe (see page 19) or place the pump inside a sealed plastic bag to send with the Spill Buddy.
8. If you have not already done so, call CET at (802) 425-3710 to request an RMA number AND an RMA form, if needed.
9. ***Completely*** fill out the RMA form (page 31). If at all possible, fax the form to us or scan it to attach to an email so that our service department has it ahead of your equipment's arrival. Make sure to include a copy with your return- preferably in a packing slip pouch on the outside of the box, or else placed inside the box.
10. Pack the equipment with care to ship to CET. If possible, use the original box and packing material that came with the system; otherwise use a sturdy box and a **generous** amount of packing material. MAKE SURE that the RMA number is clearly written on the outside of all boxes. **CET reserves the right to refuse delivery of any equipment without a CET RMA number clearly displayed on the exterior of the package(s).**

Chapter 6- Equipment Return Policy

Any equipment return must be authorized by Clean Earth Technology (CET) prior to shipment. Call or FAX CET. A Return Material Authorizations (RMA) number will be issued upon receipt of your request to return parts or equipment. An "RMA Number/ REPAIR ORDER" form must be completed by the user and the RMA number should appear on the form along with reasons for the return. Your shipment to CET must have the RMA number clearly marked on the outside of each packaged item.

This policy applies to both equipment sales and repair orders. For a Return Material Authorization, please call our Service Department at (802) 425-3710.

Clean Earth Technology, Inc.
Environmental Equipment Return Policy

This Policy refers to any equipment or parts being returned to Clean Earth Technology (CET), whether:

- Customer owned, leased or rented.
- In warranty or out of warranty.

NO equipment or parts should be shipped to CET without first contacting our service department for a **Return Materials Authorization number (RMA).** Contact our service department at (802) 425-3710 to be assigned an RMA number.

- CET reserves the right to refuse delivery of any equipment without an RMA number clearly displayed on the package(s).
- CET reserves the right to refuse delivery of any equipment improperly decontaminated.
- CET reserves the right to add a fee of $500.00 to the repair invoice of any equipment or parts not decontaminated to the satisfaction of CET.

Environmental Equipment Return Guidelines:

- All equipment must be thoroughly cleaned, purged of product and decontaminated prior to shipment to CE, as detailed in Section 8 of this manual- Equipment Decontamination Procedures. NOTE: CET recommends the use of Personal Protective Equipment, level C or D, as defined in OSHA 29 CFR 1910.120.

Return Materials Authorization Form

RMA Number: _____

Customer Name and Address:

_____
_____
_____
_____

Phone Number:_____

Fax Number:_____

Clean Earth Technology, Inc.
445 Long Point Road
N. Ferrisburgh, VT 05473
T: (802) 425-3710 F: (802) 425-2896

Date: _____

Contact Name:_____

Contact Email:_____

Qty.	Items Being Returned (eg. Auto Seeker, Spill Buddy, etc.)	Serial Number(s)

Reason for Return:

_____
_____
_____
_____

Type of product(s) this equipment has been used to pump: _____

System Decontamination Date:_____

The undersigned confirms that the equipment or parts being returned to Clean Earth Technology have been properly and thoroughly decontaminated **using the approved procedure described on page 2 of this document.**

Name _____ *Signed:_____

(printed)

***No evaluation or repair work will be performed unless this form is signed.**

Clean Earth Technology (CET) reserves the right to add a fee of $500.00 to the repair of any equipment or parts not decontaminated to the satisfaction of CET.

Clean Earth Technology, Inc.
Environmental Equipment Return Policy

This policy refers to any equipment or parts being returned to Clean Earth Technology (CET), whether customer owned, leased, or rented; in warranty or out of warranty. NO equipment or parts should be shipped to CET without first contacting our service department for a **Return Materials Authorization Number (RMA)**. Contact our service department at **(802) 425-3710** to be assigned an RMA number.

- **CET reserves the right to refuse delivery of any equipment without a CET RMA number clearly displayed on the exterior of the package(s).**
- **CET reserves the right to refuse delivery of any equipment improperly decontaminated.**
- **CET reserves the right to add a fee of $500.00 to the repair invoice of any equipment or parts not decontaminated to the satisfaction of CET.**

Environmental Equipment Return Guidelines

- All equipment must be thoroughly cleaned, purged of product and decontaminated prior to shipment to CET. **NOTE: CET recommends the use of Personal Protective Equipment, Level C or D, as defined in OSHA 29 CFR 1910.120.**
- Any equipment or parts shipped to CET must include this RMA form, **completely** filled out by the customer; and the CET RMA number clearly marked on the outside of all packages and paperwork.

Equipment Decontamination Procedure For the Spill Buddy

(Also found in Section 5 of the manual)

The following procedures are aimed at protecting people and the environment from potential contact with hazardous materials. **Please be aware that CET reserves the right to refuse delivery of any equipment improperly decontaminated. CET also reserves the right to add a fee of $500.00 to the repair invoice of any equipment or parts not decontaminated to the satisfaction of CET.**

Please follow your organization's prescribed decontamination procedures, and then carefully observe each step of the following procedure prior to shipping anything back to CET (check each step off as you go). During decontamination, make sure personnel are wearing the appropriate protective clothing and observing all safety precautions.

1. Use the Spill Buddy to pump through a good quantity of a cleaning fluid compatible with the product it was used to recover. Make sure that the discharge tube is clipped to an appropriate container, and that the petcock is open.
2. After it is apparent that you have flushed out any product remaining in the tubing, purge the tubing by turning the PUMP ON switch on and off repeatedly until as much product as possible has been removed. Then hold the Spill Buddy on its side and turn on the PUMP ON switch a few more times to continue purging.
3. Remove the pump assembly from the probe as described on page 16.
4. With the petcock open, apply pressurized air to the petcock end of the discharge tubing. Use LOW pressure (less than 20 lbs. psi) to blow out excess product. Make sure that the Probe end is in a discharge container **and that the pump assembly has been removed** before turning on the air.
5. Clean the Probe as described on page14, washing it thoroughly to remove contamination while taking care not to damage the sensor bands by avoiding the use of sharp tools or stiff brushes.
6. Lubricate the pump by turning it upside down such that the intake hole is up and spraying a **non-flammable** commercially available lubricant such as 3-in-One® oil into the intake hole. Also squirt lubricant into the product discharge nipple of the pump.
7. You may then either replace the pump into the Probe (see page 19) or place the pump inside a sealed plastic bag to send with the Spill Buddy.
8. If you have not already done so, call CET at (802) 425-3710 to request an RMA number AND an RMA form, if needed.
9. ***Completely*** fill out the RMA form. If at all possible, fax the form to us or scan it to attach to an email so that our service department has it ahead of your equipment's arrival.

Make sure to include a copy with your return- preferably in a packing slip pouch on the outside of the box, or else placed inside the box.

10. Pack the equipment with care to ship to CET. If possible, use the original box and packing material that came with the system; otherwise use a sturdy box and a **generous** amount of packing material. MAKE SURE that the RMA number is clearly written on the outside of all boxes. **CET reserves the right to refuse delivery of any equipment without a CET RMA number clearly displayed on the exterior of the package(s).**

Envirotecnics Global Service SL
Oficinas y Fabricación: Calle dels Pirineus s/n (esquina Espinau)
17460 - Celrà - Girona Tel: 872 080 542 Fax: 872 080 543
Delegación Madrid: Avda. de Castilla 28 - 28830 - Tel: 916 780 039
Servicio al cliente: **envirotecnics@envirotecnics.com**

www.envirotecnics.com