

Underground Storage Tanks



Inventory control made easy

Introduction

Most of us can appreciate the importance of having quality data and information for things we might be doing at work and home. As a convenience store owner/operator trying to comply with underground storage tank (UST) requirements in Kansas, you already know from experience that it all starts with good inventory control through proper measurements and recordkeeping. This handy guide is intended to help you and your employees understand how to more consistently accomplish good inventory control throughout the year by answering the following questions:

- What equipment do you need?
- How do you manually gauge or “stick” a tank?
- What do you do with the readings?
- Are there any differences between daily and monthly inventory?
- Do you have to take measurements manually?
- What should you do with the forms once completed?
- What do you do if there is a discrepancy in inventory?

Additional information, including downloadable forms and guidance, is available on the Kansas Department of Health and Environment (KDHE) website at www.kdheks.gov/tanks/index.html.

Tank gauging done right

Just remember, inventory control must be performed every operating day for all tank systems that store or dispense fuel. Basically, inventory control involves taking daily tank measurements and using simple math to compare your “stick” inventory (measurement) to your “book” inventory (delivery receipts). You will need a gauge stick, and ideally fuel-finding paste, to manually measure fuel depth in your tank. You will need water-finding paste to check for water in the bottom of the tank, distinguishing it from fuel. Forms are then filled out on a daily and monthly basis to record all readings. Make sure to follow these guidelines to get the best, most consistent results each and every time you “stick” your tank. Keep all inventory control records on file for at least one year.

Manual tank gauging do's and don'ts



- **Do use** a gauge stick made of non-sparking material, such as varnished wood.
- **Do use** a stick marked or notched to 1/8-inch divisions, starting with zero at the bottom end (or “0” end).
- **Do not use** a warped stick, or stick worn or cut off on the “0” end.
- **Do use** fuel-finding paste for a more accurate result.
- **Do “stick”** along the same side of the drop tube each time, and hold the stick vertically straight.
- **Do not round** any stick readings up or down.
- **Do take** all readings at about the same time each day to compare “apples with apples.”
- **Do slowly lower** the stick, gently touch it on the tank bottom, and quickly remove for each reading.
- **Do measure** just before each delivery.
- **Do not add or remove** fuel when sticking a tank or recording amount of fuel pumped.
- **Do wait** at least five minutes after delivery, then measure again.
- **Do record** stick readings right away on a daily inventory worksheet.
- **Do check** monthly for water using water-finding paste.
- **Do record** date of monthly water check and water level on the monthly inventory record.

(Adapted in part from KDHE's inventory control mini-booklet available at www.kdheks.gov/tanks/download/ks_inventory_control_mini_booklet.pdf.)

This is just a “snapshot” of what your daily inventory worksheet will look like based on the blank and example forms in KDHE’s inventory control mini-booklet available at www.kdheks.gov/tanks/download/ks_inventory_control_mini_booklet.pdf. The actual worksheet has room for you to enter information for up to five tanks whereas, in this example, single-tank entries are made in one column. The far right column provides explanation about the type of information to be recorded in each row. Several entries are color-coded to correspond to the monthly inventory worksheet on the next page.

DAILY INVENTORY WORKSHEET

FACILITY NAME: **LAST CHANCE #2**

YOUR NAME: **JOHN DOE**

DATE: **09/22/2012**

| | | |
|--|----------------|--|
| TANK IDENTIFICATION | #4 | Create a daily inventory worksheet by filling in information above. List tank(s) by number/name in this row. Be consistent—the same column should correspond with the same tank each day. |
| Type of Fuel | MID UNL | Specify fuel type with simple abbreviation (e.g., REG UNL, PREM UNL, MID UNL, DIESEL, etc.). |
| Tank Size in Gallons | 10,000 | Need tank chart that exactly matches your tank and shows conversion to gallons for each 1/8-inch stick division (provided by tank manufacturer). |
| END-STICK INCHES | 86-1/2 | Measure tank every day that fuel is added or removed. Preferably using fuel-finding paste, measure depth to fuel to nearest 1/8-inch on gauge stick and record in this row. |
| AMOUNT PUMPED | ↓ | Record numbers from each dispenser’s totalizer below. You may have several dispensers and totalizers for one tank. In this example, you have two dispensers for Tank #4. |
| Totalizer Reading | 44,013 | Record totalizer number for first Tank #4 dispenser. |
| Totalizer Reading | 38,974 | Record totalizer number for second Tank #4 dispenser. |
| Totalizer Reading | | |
| Totalizer Reading | | |
| Totalizer Reading | | |
| Totalizer Reading | | |
| Totalizer Reading | | |
| TODAY’S SUM OF TOTALIZERS | 82,987 | Add all totalizer readings above and record result here for Tank #4 (e.g., 44,013 + 38,974 = 82,987). |
| Previous Day’s Sum of Totalizers | 82,584 | Go to yesterday’s (or last) “DAILY INVENTORY WORKSHEET” and enter previous “TODAY’S SUM OF TOTALIZER’S” value in this row. |
| AMOUNT PUMPED TODAY | 403 | Subtract “Previous Day’s Sum of Totalizers” from “TODAY’S SUM OF TOTALIZER’S” to determine difference of “AMOUNT PUMPED TODAY” (e.g., 82,987 – 82,584 = 403). |
| DELIVERY RECORD | ↓ | Check how much fuel has been delivered to your tank each time and record all information below. If no delivery has occurred on a given day, then no information will be recorded in the next six rows. |
| Inches of Fuel Before Delivery | 49-7/8 | Before delivery begins, measure liquid level in tank to nearest 1/8-inch stick division and record beginning fuel level value here. |
| Gallons of Fuel Before Delivery (from Tank Chart) | 5,246 | Using tank chart, convert “before” delivery measurement to the corresponding number of gallons. |
| Inches of Fuel After Delivery | 86-1/2 | Wait at least five minutes after delivery is completed to measure liquid level in tank to nearest 1/8-inch stick division and record “after” fuel level value here. |
| Gallons of Fuel After Delivery (from Tank Chart) | 9,423 | Using tank chart, convert after-delivery measurement to the corresponding number of gallons. |
| GALLONS DELIVERED (STICK) (Gallons “After” - Gallons “Before”) | 4,177 | Subtract gallons of fuel before delivery from gallons of fuel after delivery to determine net gallons delivered based on your stick measurements (e.g., 9,423 – 5,246 = 4,177). |
| GROSS GALLONS DELIVERED (Receipt) | 4,200 | Record gross gallons delivered from your delivery receipt. The value in this row (i.e., 4,200) should be comparable to the row above (i.e., 4,177). If not, contact your supplier. |

This monthly inventory record form is a condensed version based on the blank and example forms in KDHE's inventory control mini-booklet available at www.kdheks.gov/tanks/download/ks_inventory_control_mini_booklet.pdf. Some rows are not shown for illustrative purposes (indicated by the symbol "?"), but are still used in calculation below of "TOTAL GALLONS PUMPED" and "TOTAL GALLONS OVER OR SHORT." The values in those rows can be viewed on KDHE's mini-booklet sample form. The dash symbols used in the "GALLONS DELIVERED" column indicate no fuel was delivered on those dates. On Day 22, several entries are color-coded to show you how the information matches up with your daily inventory worksheet on the previous page.

Determining changes in inventory

- Transfer pertinent information from daily inventory worksheet onto monthly inventory record.
- Prepare one monthly inventory record per tank.
- Subtract "BOOK INVENTORY (GALLONS)" from "END STICK INVENTORY (GALLONS)" to determine "DAILY OVER (+) or SHORT (-)" (e.g., 3,690 - 3,714 = -24).
- Pay attention to positive and negative numbers to get an accurate total.
- Think again if your DAILY OVER (+) or SHORT (-) is always 0 or 1—you are likely doing something wrong!

KDHE Owner #: _____ KDHE Facility #: _____ **30-Day INVENTORY RECORD**
 FACILITY NAME: LAST CHANCE #2 MONTH/YEAR: 09/2012
 TANK IDENTIFICATION AND TYPE OF FUEL: #4 MID UNL
 DATE OF WATER CHECK 09/01 LEVEL OF WATER (INCHES): 0 (or "zero")

| DATE | START-STICK INVENTORY (GALLONS) | GALLONS DELIVERED | GALLONS PUMPED | BOOK INVENTORY (GALLONS) | END-STICK INVENTORY | | DAILY OVER (+) OR SHORT (-) ["END" - "BOOK"] | INITIALS |
|------------------------|---------------------------------|-------------------|----------------|-------------------------------|---------------------|-----------|--|----------|
| | | | | | (INCHES) | (GALLONS) | | |
| 1 | 4,047 (+) | --- (-) | 333 (=) | 3,714 | 38-1/4 | 3,690 | -24 | JD |
| 2 | 3,690 (+) | --- (-) | 44 (=) | 3,646 | 38 | 3,658 | +12 | JD |
| ⋮ | ⋮ (+) | --- (-) | ⋮ (=) | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 7 | 2,790 (+) | 6,134 (-) | 117 (=) | 8,807 | 80 | 8,866 | +37 | JD |
| 8 | 8,844 (+) | --- (-) | 127 (=) | 8,717 | 78-7/8 | 8,732 | +15 | JD |
| ⋮ | ⋮ (+) | ⋮ (-) | ⋮ (=) | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 21 | 5,869 (+) | --- (-) | 205 (=) | 5,664 | 53-1/8 | 5,639 | -25 | JD |
| 22 | 5,639 (+) | 4,177 (-) | 403 (=) | 9,413 | 86-1/2 | 9,423 | +10 | JD |
| 23 | 9,423 (+) | --- (-) | 87 (=) | 9,336 | 85-1/2 | 9,343 | +7 | JD |
| ⋮ | ⋮ (+) | ⋮ (-) | ⋮ (=) | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 30 | 7,811 (+) | --- (-) | 116 (=) | 7,695 | 68 | 7,690 | -5 | JD |
| 31 | (+) | (-) | (=) | | | | | |
| TOTAL GALLONS PUMPED > | | 6,594 | | TOTAL GALLONS OVER OR SHORT > | | -74 | | |

DROP LAST TWO DIGITS from TOTAL GALLONS PUMPED number and enter first numbers on line below. TOTAL GALLONS PUMPED amounts less than 100 gallons round to zero (0).



Compare these numbers



***LEAK CHECK: 65 + 130 = 195 gallons

Is "TOTAL GALLONS OVER OR SHORT" larger than "LEAK CHECK" result? YES NO (circle one)

If answer is "YES" for TWO MONTHS IN A ROW, notify KDHE as soon as possible.

Call UST Program Staff in Topeka at 785-296-8061.

KEEP THIS PIECE OF PAPER ON FILE FOR AT LEAST ONE YEAR.

Why is inventory control important?

The primary purpose of daily inventory control is to provide for a frequent check of what you think you have in inventory versus what you actually have on hand. If these numbers are not in agreement, it might mean you measured incorrectly, misread your gauge stick, or made an error in your addition or subtraction. Something may be so out of balance with your tank inventory that, as a worse case, it may be an indicator a release (leak or spill) has occurred.



If no fuel is dispensed from a tank on a regular basis, you must reconcile your inventory a minimum of once each month. Staying on top of your inventory on a daily and monthly basis provides you the opportunity to react quickly before a release situation gets out of hand. Minimally, after you have done all the adding and subtracting on your monthly inventory record, a release must be reported to KDHE if a shortage (or “TOTAL GALLONS OVER OR SHORT” value larger than leak-check result) is indicated two months in a row.

Not maintaining good inventory control or not addressing a potential problem immediately can have catastrophic consequences for you, your neighbors, and the environment.



Automated gauging option

Instead of using a gauge stick, you may use an automatic tank gauge (ATG) to measure the amount of fuel in the tank in inches and gallons of product. Whichever device or method is used must be capable of measuring the product level over the full range of the tank's height to the nearest 1/8-inch. Just record the inches of product and gallons of product directly from the ATG's printed tape, or staple the tape with this information onto the daily inventory worksheet.

Even if you have an ATG, you are still required to check for water at the bottom tank. Many ATGs can detect water

at the bottom of the tank, but if yours does not, you will need to determine this the “old-fashioned” way by manually sticking the tank. Just smear water-finding paste on the bottom few inches of the gauge stick and hold at the bottom of the tank for 10 seconds for gasoline or 30 seconds for diesel. Remove the gauge stick and note any color changes to determine depth to water. If you find more than one inch of water, you should arrange for immediate removal and do further testing to determine if the tank is leaking.

Related tips

Although not the subject of this guide, it is interesting to note how inventory control relates to tank-tightness testing and overall leak-detection requirements for the entire UST system, including piping.

Tip #1—Manual gauging will provide a substitute to inventory control requirements for 2,000 gallons or less capacity waste-oil storage tanks.

Tip #2—Inventory control alone can never be used as a method of leak detection.

Tip #3—Under certain conditions, five-year tightness testing with inventory control can be used as a leak-detection method.

Tip #4—Inventory control combined with tank-tightness testing does not meet your tank system's leak-detection requirements for piping.

Go to the KDHE website for information on leak-detection requirements at www.kdheks.gov/tanks/index.html.

Other resources

If you need help in understanding these UST inventory control requirements, you may contact the Kansas Small Business Environmental Assistance Program (SBEAP) at K-State by calling our toll-free hotline at 800-578-8898, or by visiting our website at www.sbeap.org for confidential and free technical assistance.

If you need assistance or need to report a problem, KDHE district office addresses and telephone numbers are available at www.kdheks.gov/befs/dist_office.html. You may also contact UST program staff in KDHE's Topeka office at 785-296-8061.

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