Russell, Merlin

From: Curtis, Jeff <Jeff.Curtis@safety-kleen.com>
Sent: Monday, October 14, 2013 10:57 AM
To: Russell, Merlin
Subject: RE: SK Orange Park
Attachments: ET_143 Sampling Hazardous Materials and Waste.pdf; Revisions.pdf

Merlin,

Attached are the revisions requested.

Thanks,

Jeff Curtis EHS Manager | Safety-Kleen | A Clean Harbors Company | Boynton Beach, FL | jeff.curtis@safety-kleen.com
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From: Russell, Merlin [mailto:Merlin.Russell@dep.state.fl.us]
Sent: Friday, October 11, 2013 3:18 PM
To: Curtis, Jeff
Subject: FW: SK Orange Park
Importance: High

Jeff,

Please call me on Monday.

merlin

From: Russell, Merlin
Sent: Thursday, October 10, 2013 10:52 AM
To: Curtis, Jeff
Cc: Tripp, Anthony
Subject: SK Orange Park

Jeff,

We have a few odds and ends to take care of before calling the application complete. Please give me a call and we can walk through these comments. Hopefully, you can provide updates in a couple of days so we can call the application complete. Let's talk.

I will be out for a long lunch today, about 11:30-1:00 but here this afternoon and most of tomorrow.

merlin

Merlin D. Russell Jr.
Professional Geologist II

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safety-kleen®

Sampling Hazardous Materials and Wastes

ET 143

Instructor's Guide

Training Department

Revision Code: 9/07/99 SWM
File: S:\COURSES\ET\ET143\ET 143ig Sampling.doc
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Table of Contents

Objectives

- Describe Safety Issues
- Representative Sampling
- Sampling Equipment and Use

Objectives

After successful completion of this training module, the participant will be able to:

- Describe the health and safety precautions that must be taken prior to and during the sampling of hazardous materials and wastes
- Explain how to accurately determine the size and number of samples that should be collected, and
- Demonstrate safe drum sampling technique.

Policies & Procedures

- Corporate Health and Safety Procedure
- Permitted Facilities
  - Site-specific SOP
- Guidelines for Branch Sales Representatives
- EPA & OSHA Regulations

Introduction

The information contained in this module is intended to be used only for the purpose of sampling hazardous materials whose identity is known. The safety protocol and sampling methods described in this module are not appropriate for the sampling of unknown materials.

Sampling is one of the most hazardous activities performed by Safety-Kleen personnel because of the potential for direct contact between the sampler and hazardous materials being sampled, but it can be performed safely if the proper preparations and precautions are taken.

Most of the sampling supplies that are described in this course are available from S-K Distribution Centers. A list of S-K Part numbers contained in Appendix I.

Sampling Policies & Procedures

Because sampling is an integral part of hazardous waste operations, most of Safety-Kleen's permitted facilities have developed a standard operating procedure (SOP) to cover hazardous waste sampling as a part of permit compliance. Other organizational units, such as Branch Sales, have also developed very strict sampling guidelines. Differences in these procedures make it difficult, if not inappropriate, to train employees uniformly in this activity. Therefore, in instances where different requirements than those identified in this module apply to certain job functions or operating units, those shall take precedence over the guidance provided here.

In addition to facility permit requirements and Guidance for Branch Sales Representatives, the Corporate Health and Safety Department has established Corporate Health and Safety Procedure SAF-22, *Sales Representative Sampling*.

Safety Issues

- Material identification / Unknowns
- PPE
- Protection of bystanders
- Sampling Team
- Site-specific safety issues
- Grounding and bonding
- Opening drums safely

Material Identification

- Identity of material to be sampled must be known in order to select PPE
- ***NEVER SAMPLE UNKNOWNS***
  - Exception: remediation and emergency response
  - Handled by chemists who have received training in HAZCAT Analysis

Personal Protective Equip. (PPE)

- Full-face respirator protection mandatory
  - Medical approval
  - Fit testing

- PPE pre-selected for Branch Sales Reps
  - Hard hat, respirator, saranex-coated suit or apron with sleeves, nitrile gloves, safety glasses with permanently attached side shields, splash guards or chemical splash goggles

Safety Issues

Material Identification

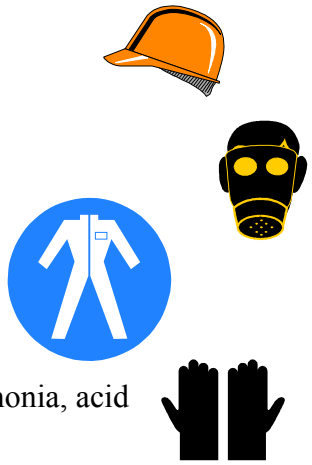
Since there is no universal personal protective equipment (PPE) that protects against all chemical and physical hazards, the identity of the material to be sampled must be known in order to select the appropriate type of PPE. Therefore, the common-sense rule of thumb is:

NEVER SAMPLE UNKNOWNS!

As with any rule, there are exceptions. Remediation and emergency response chemists who have received training in HAZCAT Analysis often work on sites where unknown materials must be sampled, but must take extra precautions, such as the use of remote-controlled or specially shielded equipment, to do so safely. If you have a customer with an unidentified waste material, contact your Customer Service Representative for assistance in scheduling a Technical Field Services team to perform sampling and identification.

Personnel Protective Equipment

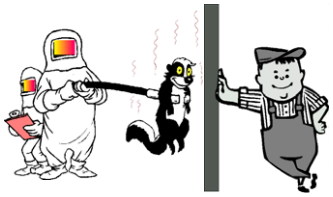
Sales personnel, including managers and sales representatives, do not select personal protective equipment (PPE). Their PPE is pre-selected and fixed. It includes the following items:



- Hard hat (if appropriate or required by client)
- Full-face respirator with choice of cartridges
  - organic vapor cartridges (black)
  - organic vapor/acid gas cartridges (yellow)
  - ammonia cartridges (green)
  - multipurpose cartridges for particulates, ammonia, acid gas, and ammonia (purple)
- Saranex-coated suit or apron with sleeves
- Nitrile gloves

Protection of Bystanders

- Personnel not involved in sampling must be protected by:
  - Distance
  - Barriers
  - Blast shields



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Site-Specific Safety Issues

- Lockout/Tagout of Energized equipment
  - Electrical hazards
  - Mechanical hazards
  - Hydraulic / pneumatic equipment hazards

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Sampling Team

- Never sample alone
- Be accompanied by a representative of the customer Why?
- To ensure help and emergency response is available

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Site-Specific Safety Issues

Preparation: Sampling Site Survey

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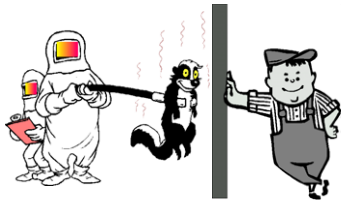
Prior to performing waste material sampling, Branch sales personnel must have a medical examination and receive a medical clearance to wear a respirator. After receiving medical clearance, the employee must be fit-tested for a respirator and must be issued a properly fitting full-face respirator and the other standard PPE listed above.

Operations Personnel

Prior to performing waste material sampling, all personnel must receive a medical clearance to wear a respirator, be fit-tested and issued a respirator. TSRs and operations personnel must also complete the 40-hour or 24-hour HAZWOPER Training course (HS 101 or HS 102), in which PPE selection is covered in depth. The PPE selection process for wastestream sampling is the same as for any other purpose.

Protection of Bystanders



Personnel who are not involved in sampling hazardous materials may be working nearby and not adequately protected from the physical or chemical hazards of the materials that you are sampling. OSHA requires that all personnel who are not engaged in sampling activities be protected by one of the following:

- Separation from the sampling activities by a distance great enough to ensure their safety from chemical sprays, fires, or explosions that could occur during the sampling event. or
- Physical barriers or blast shields between workers and the material being sampled.

Sampling Team

Never sample alone. When sampling at a customer's site, arrange in advance to be accompanied by a representative of the customer. He or she must be present at all times to ensure that help and emergency response is always available in the event of a problem. Predetermine how and who to contact in the event of an emergency.

Site-Specific Safety Issues

Energized Equipment

Other safety issues that can impact sampling include electrical, mechanical, pneumatic, and hydraulic hazards. If sampling is to be done in close proximity to any energized equipment that could threaten the safety of the sampling crew, the customer or facility maintenance supervisor should be asked to determine if Lockout/Tagout is necessary.

Site-Specific Safety Issues

- Confined spaces
  - Sales personnel prohibited from confined space entry
  - Have customer move containers out of confined space
  - Special training ***required*** to enter confined space

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Site-Specific Safety Issues

- Locate:
  - Nearest emergency exit, eye wash, and shower
  - Spill control equipment
  - Fire extinguishers
  - Alarm pulls
- Review facility emergency plan

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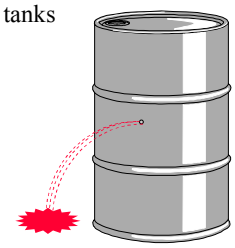
Site-Specific Safety Issues

- Inspect containers or tanks to be sampled:
  - leaks
  - rust
  - dents



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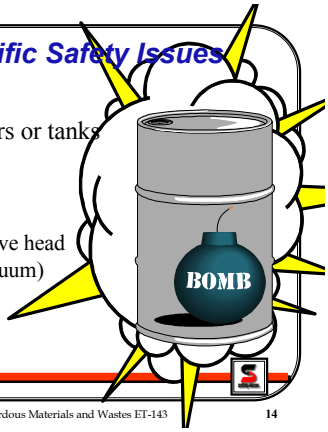
Site-Specific Safety Issues

- Inspect containers or tanks to be sampled:
  - hot or cold
  - bulged or concave head (pressure or vacuum)



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Confined Spaces

Sampling in confined space is prohibited unless done by a full team who has received the appropriate confined space entry training (HS 207 or HS 307). Confined space sampling is strictly forbidden for sales representatives by the Corporate Health and Safety Procedure (SAF-22).

Emergency Equipment

The area in which the sampling will be conducted should be surveyed prior to sampling in order to identify potential hazards and to prepare for appropriate emergency action. This is not necessarily a lengthy survey—for most sales sampling, this can be concluded in only a few minutes. This includes locating the following items:

- Nearest emergency exit, eye wash, and shower
- Spill control equipment
- Fire extinguishers
- Alarm pulls
- Telephone

If extensive sampling is to be performed, you should also ask to review the facility emergency plan.

Container/Tank Inspection

Finally, before sampling, you should don your PPE and inspect all containers or tanks to be sampled. Visually check the top and the sides of each drum for bulges, pinholes, signs of rust, weakened sidewalls, deteriorated drum openings.

If you detect heat or cold, bulging, or hear anything unusual (i.e. hissing, bubbling, crackling noises) coming from the drum, **STOP IMMEDIATELY.** These are signals that a chemical reaction is occurring within the drum(s). At this point, allow the customer to determine what should be done (such as enacting their emergency response plan).

If the head is dished inward, it may pop up when the vacuum is suddenly relieved, spraying you with any material that is on the head.

Grounding and Bonding

- Protects against static discharge (sparks)
- Required for all containers and tanks unless contents are *known* to have flash point > 200° F

Grounding and Bonding

Minute electrical charges, also called static charges, are generated by the movement of fluids and stored in the fluids and their containers. Over time, these charges can build up to a level capable of creating a spark when the container is approached by an oppositely charged (grounded) object, such as a bung wrench or sampling device in the hands of the sampler.

Static charges can be safely dissipated by a procedure known as "grounding and bonding". **Grounding** is the process of draining the positive electrical charges off of the charged object into the ground, or a negatively charged object. For a metal container, tank, or tanker truck, this is accomplished by:

1. attaching a metal cable or strap to the container via a clamp that bites into the metal, and then

2. attaching the other end of the cable or strap to a grounded object in the same manner.

This must be done in the order described, because a static discharge, or spark, could occur at the point where the second connection is made. If the cable is attached to the ground first and then to the container, the spark could be near enough to flammable vapors to ignite them. Disconnection must be done in reverse order.

If the container to be sampled is not metal, connection to the container is not an effective way of dissipating static in its liquid contents. To do this, carefully drop a bonded (see discussion on **bonding** below) conductive chain or rod into the liquid, and then connect the chain or rod by a grounding cable to a grounded object. (If using a COLIWASA with a steel inner rod, insert the COLIWASA into the liquid, attach the grounding cable to the rod, then to the ground.)

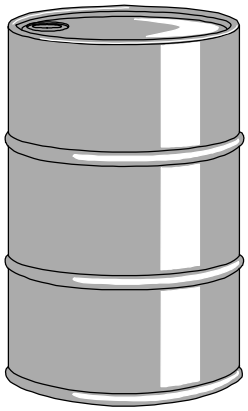
Note: Tankers holding a large volume of liquid can accumulate very large static charge that may take a longer period to dissipate. Therefore, they should remain grounded for at least 15 minutes before opening the hatches to perform sampling.

Bonding is the process of equalizing the static electrical charges between two objects. Like grounding, bonding can create a spark, and must be done carefully and before opening the container, tank, or tanker. The bronze, non-sparking bung wrench (or other opening tool) and the sampling device should be touched to the container at a point away from openings or vents. If the sampler is a COLIWASA (see description below), this should be done with both the outer tube and the inner rod.

Note: Grounding and bonding should be done before sampling any liquid for which the flash point is not known to exceed 200° F.

Opening Drums Safely

- Press down on top of drum
- Place bung wrench in bung and cover with wipe
- If multiple drums loosen bungs but do not remove
- Place absorbent pad on top of drum prior to sampling



Opening Drums Safely

After grounding the drum and bonding the sampling equipment against the grounded drum, you may open the drum:

1. Press down on the top of the drum with the palm of your hand, checking for evidence of pressurization (due to gases or expanded liquids). If there is no "give", the drum may be pressurized.

2. If a drum appears to be pressurized (i.e. bulging drum head), loosen the smaller bung first since it is easier to control the release of pressure through the smaller bung. If the head is dished inward or outward, be careful that when the pressure is equalized, the head does not "pop" and spray you with any material that may be on top of the drum.

3. Place the bung wrench in the bung and cover it with a wipe to control any potential liquid spray.

4. If more than one drum of the same wastestream will be sampled for a composite sample, loosen, but do not remove, the larger bung on all drums that will be sampled. Only one drum may be open at a time.

5. Contain Spills. Before taking the sample, an absorbent pad will be placed on top of the drum that is to be sampled. This will help contain any drips or spillage to your immediate work area and will make cleanup easier.

Representative Sampling

- Definition
- Types of samples
- Random sampling
- How many samples
- Compositing

Representative Sample

A sample that exhibits the average properties of the wastestream as a whole

Types of Samples

- Discrete (Grab) Samples
  - A sample taken from at a specific point and place
  - Single sample not representative

Types of Samples

- Composite Samples
  - Sample created by mixing two or more samples together
  - Used to determine average concentration estimates
  - Reduces analytical costs

Representative Sampling

The primary objective in sampling a waste is to collect samples that allow measurements of the chemical properties of the waste that are both accurate and precise. Such samples are said to be representative—exhibiting average properties of the whole waste. If the chemical measurements are sufficiently accurate and precise, they will be considered reliable estimates of the chemical properties of the waste.

There are two types of samples:

- Grab samples (a.k.a. discrete samples)—samples collected from specific point in time and place
- Composite samples—a sample created by mixing two or more samples together

Either may be representative of the material being sampled, depending upon the uniformity of the material. If a material is uniform, or homogeneous, any and every sample is likely to accurately represent the average composition of the material from which it was collected. Therefore, few samples are needed in order to adequately identify its properties for safe treatment and handling. The more uniform the composition is, the fewer the number of samples needed for this purpose.

This may be demonstrated by mixing a volume of course black sand with an equal volume of course white sand. If the whole mass of the sand is extremely well mixed so that the distribution throughout is nearly uniform, it is likely that any single randomly selected sample will be contain a 50:50 ratio of black and white sand.

However, if the sand is poorly mixed, or heterogeneous, it is likely that any given sample will be predominantly black or white, or perhaps even wholly one or the other. In this case, a single grab sample is highly unlikely to be representative of the sand mixture. Representative sampling of a heterogeneous wastestream is achieved by collecting a number of grab samples from randomly selected locations in the sand mass. If these grab samples were independently analyzed for black and white content, and then the results of all analyses averaged, the resultant calculation would yield approximately a 50:50 ratio of black and white sand. A less laborious (and less costly) way of accurately estimating the ratio would be to composite all of the grab samples and have the single grab sample analyzed. Either way, the result is likely to be representative of the whole mixture.

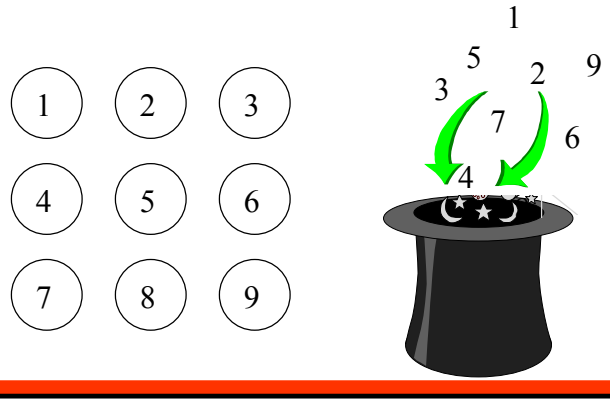
Random Sampling

In general, the more varied the composition and the larger the volume, the greater number of *random* samples will be necessary to representatively sample the waste. The emphasis on "random" is because the biased selection of sampling locations, regardless of intent, could result in a non-representative sample. For example, if your eye is drawn inadvertently to the darker areas of the sand mixture, it is likely that the final composite will contain significantly more black sand than white sand. Likewise, attempts to compensate for a known bias of this sort can bias the result in the opposite direction, leading to a composite that contains significantly more white sand.

Which Drums?

Random Drum Sampling

- EPA SW-846



Types of Random Sampling

There are many approaches to random selection of sampling locations or units. The main factor affecting the appropriateness of one method over another is the way in which the composition varies within the wastestream. In most cases, the heterogeneity is random, meaning the chemical or physical characteristics vary within the mass of the wastestream, but that variability is fairly constant from location to location and from batch to batch. However, many wastestreams are non-randomly heterogeneous, meaning the chemical or physical characteristics vary but the variable characteristics may be clustered, layered or non-uniform in some other way. An example of this would be several drums generated as separate batches of waste from the same oil-water separator, in which the oil volume and concentration of contaminants in the sludge varies considerably from drum to drum.

In *simple random sampling*, all locations or points in all batches of waste from which a sample could be collected are identified, and a suitable number of samples is randomly selected. Simple random sampling is generally used when the physical and chemical characteristics of a waste vary randomly throughout the wastestream. In sampling drums of waste, this is the method most commonly used.

More complex *stratified random sampling* is generally employed when the wastestream can be divided into units of similar characteristics, in which the variability within a unit is less than the variability between units. Each unit is then sampled by a simple random approach and the analytical results from each unit are averaged. The final analytical result is produced by a weighted average of all the units in the sampling program.

A third type of random sampling is *systematic random sampling*, in which the first sampling location is selected at random, but all subsequent samples are taken at regular intervals from the first. This method is easier to use, but does not produce a representative result if the waste varies non-randomly.

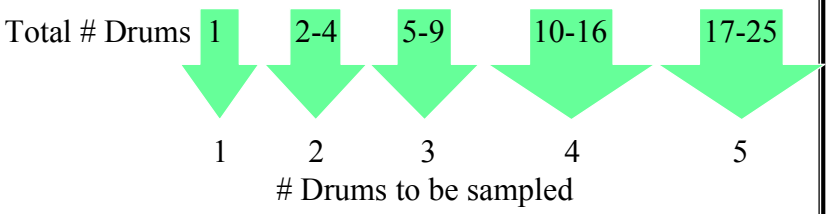
How Many Samples?

The more samples that are collected, the more likely the analytical results will approach the true average for the waste as a whole. Unless specified in the Waste Analysis Plan or in some other permit condition, however, there is no mandatory number of samples that must be collected. (Some S-K facilities do have permits that require sampling of every drum.)

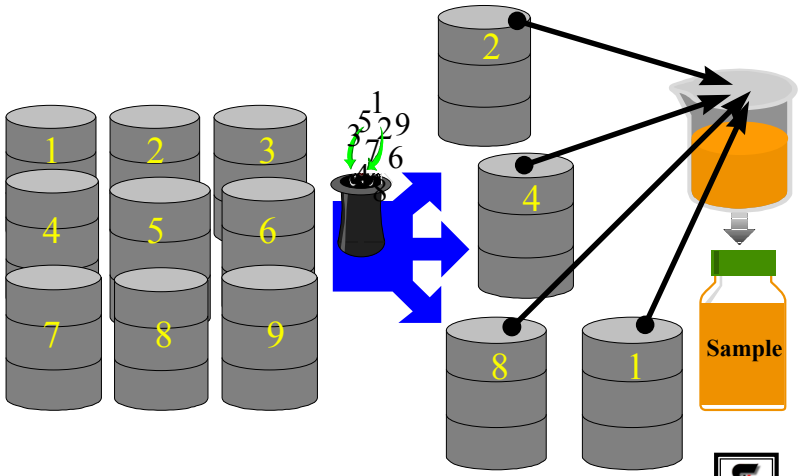
For very large sampling efforts, for which a formal sampling plan is appropriate, it does make sense to calculate the optimum number of sample necessary to achieve the lowest acceptable level of accuracy, thereby reducing overall sampling and analysis costs. Guidance for this determination is provided in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846*.

How Many Samples?

No. of Drums to be sampled = Sq. Root # Drums
(always round up)



Composite Sampling



When sampling drums, a simple and practical method often used to determine the number of samples to be collected is the calculation of **the square root of the total number of drums in the wastestream, rounded up the next whole number**. The following table represents this calculation:

Total number of containers (per wastestream)	Number of containers to be sampled
1	1
2-4	2
5-9	3
10-16	4
17-25	5
26-36	6
37-49	7
50-64	8
65-81	9
82-100	10

Whenever knowledge of the wastestream indicates that there is likely to be great variability between drums, all drums should be sampled.

When to Composite

In some cases, compositing grab samples to produce a single representative sample may not be desirable. This depends on several factors:

- the purpose for which the sampling is being conducted,
- the degree of variability,
- the specific character of the material.

If the purpose of sampling is to properly characterize the material so that it may be assigned to a standard treatment process, great variability in certain characteristics could toggle the decision between two or more treatment processes. An example of this would be a wastestream whose pH varies widely. In cases where the waste material poses such potential, DON'T COMPOSITE. Analysis of the individual grab samples will yield important information about the range of values that would be lost in compositing.

In sampling a batch of drums from the same waste generating process in which pH is highly variable, mixing an acidic sample with a basic sample could cause an extremely hot and potentially violent reaction. In such cases, every drum should be sampled. The decision of whether to composite or not will depend on the pH of each sample, and may be made either on site or in the laboratory, depending on the training of the sampler.

Samples of reactives (e.g. cyanides, sulfides, and isocyanates) and oxidizers should not be composited in the field because of the risk of reaction.

Another case in which compositing is not desirable is when sampling is being conducted to facilitate a treatability study, in which a treatment process will be custom designed to handle the waste. The range of analytical values must be determined during by the study.

In summary, DON'T COMPOSITE:

- corrosive samples whose pH is not very similar
- oxidizers
- cyanides, sulfides, isocyanates, or other reactives
- when sampling for a treatability study.

When creating a composite sample in the field, if more than 3 full COLIWASAs must be mixed, it will be necessary to use a bucket, and then create a representative subsample from the material in the bucket. When doing this, the construction materials of the bucket must be compatible with the waste being sampled. For example, if the sample contains organic solvents, a plastic bucket should not be used (see discussion of sample bias under "Sample Container and Labels", below. In this case, steel would be a better choice. However, if the waste to be sampled is an acid, plastic would be desirable.

Once a bucket has been used, is must be returned to the Branch or other S-K facility and decontaminated for future use or disposed of properly.

Exercise 1

A client has 49 drums of mineral spirits and 3 drums of an oil/water mixture.

How many drums should be sampled and how would you composite them?

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Exercise 2

5 drums of petroleum distillates
7 drums of paint waste
1 drum of unknowns

- 3 samples of pet. distillates mixed in a bucket to prepare 1 sample bottle
- 3 samples of paint waste mixed in a bucket to prepare 1 sample bottle
- Do NOT sample unknowns!!

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Exercise 1

49 drums of mineral spirits
3 drums of an oil/water mixture

- 9 drums sampled, 2 composite samples
- 7 samples of mineral spirits mixed in a bucket to prepare 1 sample bottle
- 2 samples of oil/water mixture composited in 1 sample bottle

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Exercise 2

Another client has 5 drums of petroleum distillates, 7 drums of paint waste, and 1 unidentified drum left behind by a previous tenant on the property, which he is willing to pay to have removed.

How many drums should be sampled and how would you composite them?

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Exercise 1

A client has 49 drums of mineral spirits and 3 drums of an oil/water mixture. Using the chart given on page 23, determine how many drums to sample. Then explain whether you would composite any of the samples; and, if so, how.

Exercise 2

Another client has 5 drums of petroleum distillates, 7 drums of paint waste and one drum of unidentified material abandoned by a previous tenant, for which he is willing to pay for the cost of removal. According to the chart on page 23, many drums should you sample? Would you composite any of the samples; and, if so, how?

Sample Containers

- Container selection
  - Chemical compatibility
  - Analytical interference from some plasticizers
  - Integrity during shipment
  - DOT compliance

Sample Containers and Labels

Generally, wide-mouth jars must be used for solids and liquids containing sludges or slurries, while narrow-mouth bottles should be used for liquids containing volatile components. They must also provide ample integrity during shipment to prevent breakage or leakage and must comply with the U.S. Department of Transportation's packaging standards.

Compatibility

The material being sampled must be compatible with the materials of which the sample container (including lid and seal) is made and must not leach constituents into or otherwise alter the sample in such a way as to affect the analytical results. Examples of container incompatibilities include:

- acids — steel and aluminum
- bases — aluminum
- chlorinated solvents — many plastics
- hydrofluoric acid — glass
- methylene chloride — aluminum
- oxidizers — some plastics, aluminum, some grades of steel
- solvents — neoprene

Sample Bias

Sample bias caused by the sample container construction materials includes:

- losses by permeation, adsorption and volatilization
- cross contamination between samples during storage and shipment
- release of plasticizers and other organic compounds from plastics when sampling solvents
- release of heavy metals from metal alloy sampler parts when sampling acids or bases

Sample Containers

- Labeling essentials
  - Sample ID number
  - Name of material sampled
  - Sampler's name (preferred) or initials
  - Date/time
  - Name and location of facility
  - Identification of sample source

Labels

Labels should be self-adhesive or gummed paper of a size appropriate for the container and should contain, at a minimum, the following information:

- Sample number
- Name of material sampled
- Name of collector (full printed name preferred over initials)
- Date and time of collection
- Place of collection (name and location of facility)

Optional information includes such data as identification number of the container(s) or tank(s) sampled and relevant observations or field data, such as estimated percentage of sludge in the containers or tanks.

Additional sample labeling requirements may be specified by the laboratory performing the analysis or by the facility receiving the waste.

Equipment Selection

- Waste volume
- Physical properties
  - Crushed, powdered, or whole solids
  - Free flowing or viscous liquids
  - Layering, density, cohesion
  - Homogeneous or heterogeneous
- Chemical compatibility with sampler

Selection of Sampling Equipment

The selection of sampling equipment will depend upon several factors: chemical properties, physical characteristics, depth or dimensions of the containment structure, and the purpose for which the sampling is being conducted.

Chemical Properties

The material being sampled must be compatible with the materials of which the sampling device and sample container is constructed and must not leach constituents into or otherwise alter the sample in such a way as to affect the analytical results. Examples of incompatibilities include:

- acids — steel and aluminum
- bases — aluminum
- chlorinated solvents — many plastics
- hydrofluoric acid — glass
- methylene chloride — aluminum
- oxidizers — some plastics, aluminum, some grades of steel
- solvents — neoprene

Examples of sample bias caused by the sampling device or sample container construction materials include:

- losses by permeation, adsorption and volatilization
- cross contamination between samples during storage and shipment
- release of plasticizers and other organic compounds from plastics when sampling solvents
- release of heavy metals from metal alloy sampler parts when sampling acids or bases

Physical Characteristics

Viscosity of liquids, particle size of crushed or granular solids, variability/homogeneity, and density layering are a few examples of the physical parameters that affect the type of sampler that may be used effectively.

These factors affect both the type of sampling equipment and the sample container that must be used. Generally, wide-mouth jars must be used for solids and liquids containing sludges or slurries. Narrow-mouth bottles should be used for liquids containing volatile components.

Depth/Dimensions

COLIWASAs, thieves, triers, and other devices are suitable for shallow containers and tanks, but bottle samplers or other devices must be used to sample deeper tanks, lagoons, or ponds.

Purpose for Sampling

Generally, samples collected for hazardous waste determinations, determination of treatment standards, and approval for recycling/treatment/disposal must contain from one quart to one gallon of liquids or 100 grams of solids. These samples are usually composites of several smaller randomly selected samples to ensure that they are representative and to reduce the analytical costs.

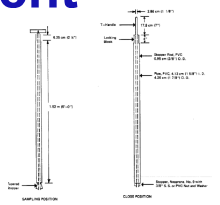
Treatability studies, however, generally require much larger samples and more of them. The need for a larger sample size is due to the number of trials that is usually needed to identify a successful treatment method. Both the average concentration and the range of concentrations (variability and the extremes) are important, which eliminates compositing while necessitating a greater number of grabs to achieve representative sampling.

Ultimately, the minimum sample size is determined by a combination of the number of analyses that must be run and by the quantity required for each test method.

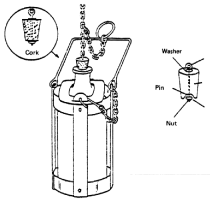
Table 1 at the end of this module summarizes the suitability of each type of sampling device for different types of materials.

Sampling Equipment

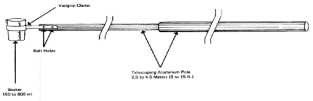
- COLIWASA
  - Free-flowing liquids and slurries



- Weighted bottle sampler
  - Free-flowing liquids and slurries



- Dipper (a.k.a. pond sampler)
  - Free-flowing liquids and slurries



Sampling Equipment and Procedures

COLIWASA

A Composite Liquid Waste Sampler, better know as a COLIWASA, (see Figure 1) is usually the best type of sampler for free-flowing liquids and slurries in drums, totes, tanker trucks, shallow tanks and other containers. COLIWASAs are available or can be constructed in a variety of lengths and design modifications.

The COLIWASA consists of a glass, metal, or plastic tube with an end closure connected to an inner rod. The rod is used to close the tube while it is submerged in the material being sampled. It permits the representative sampling of multiphase wastes of wide range of viscosity, volatility, and solids contents. Its simple design makes it easy to use and allows the rapid collection of samples, thus minimizing the exposure of the sample collector to potential hazards from the wastes. The cone-shaped valve on the lower end is opened and closed by means of the rotating eccentric cam on the top end. An over-center feature on the cam locks the valve closed when desired.

Safety Precautions

New glass or plastic COLIWASA tubes may have a residual static electrical charge due to the material in which they are shipped. Before using a new tube, several important safety precautions must be observed to dissipate a static charge:

1. Wash - The new tube must be cleaned with a damp cloth and then patted dry with a cotton cloth. Do not rub the cloth the length of the shaft as this motion tends to build static electricity.

2. Ground - The COLIWASA must be grounded against a grounded metal surface such as a water pipe.

3. Final Bond - Before sampling a drum with a glass, plastic, or metal COLIWASA, gently touch the outside rim of the drum with the COLIWASA on the opposite side from the open bung. This will equalize any static charge that has been generated on the drum itself.

These steps are essential to the safe use of the unit, especially with a new tube. The final bonding must always be done whether using a new or old tube so that a potential explosion can be avoided.

Sampling Procedure

1. Review the Material Profile and its attachments (such as MSDSs) prior to sampling.

2. Check to make sure that the COLIWASA sampler is functioning properly. If necessary, adjust the cone on the threaded rod to give just enough force to form a good seal. DO NOT OVER TIGHTEN Replace the bottom O-ring if the liquid continues to leak out after properly tightening the cone. Make sure that there are no solids interfering with the seal of the O-ring to the tube.

3. Open your sample bottle and place it securely on the surface of the drum to be sampled.

4. The bungs should already be loosened for those drums that you have selected for sampling.

5. Open the sampler and ground the tube against the drum on the side of the drum away from the large bung.

6. Ensure that the sample tube is not hot from being stored in the car or van. This is necessary to prevent boiling the solvent in the sample tube. (A report was received that a hot sampler was used to take a sample of Freon, which immediately proceeded to boil in the sampler and shoot out of the top of the sampler, spraying the surroundings.)

7. Slowly lower the sampler into the drum. Lower the sampler at a rate that permits the levels of the liquid inside and outside the sampler tube to be about the same. This is especially important for those drums that contain more than one liquid phase. Keep in mind two phrases: You can never go too slowly; and the thicker it is, the slower you go.

8. Repeat Step #6 by lowering and raising three (3) times without closing the bottom valve before actually sampling. This rinses the tube, ensuring a representative sample.

9. When you are ready to take a sample, lower the COLIWASA to the bottom of the drum. Hold the top cam down to ensure that the cone on the bottom stays open. If you hit solid or sludgy material before you reach the bottom, estimate (in inches or percent of the drum) the volume in gallons at which this occurred. Do not force the tube into the solid material.

   NOTE: If sampling for a Prequalification Analysis, be sure that you record on the Material Profile Form the solids content and any other unusual features (color, water, viscosity, etc.) that may be different than initially included on the survey.

Clean Up

- Never leave clean-up materials at customers site.
- Bring all materials back to branch and properly dispose.

10.

11. With the COLIWASA resting on the bottom of the drum (or to the level at which you hit solid material), close the valve on the top of the COLIWASA and slowly withdraw the sample. Allow the liquid on the outside of the sampler to drain back into the drum. If necessary, wipe down the outside of the sampler with a disposable wipe, draining the excess back into the drum.

12. Carefully place the end of the COLIWASA into the opening of the sample bottle, then release the valve on the top of the sampler. Be sure that the end of the sampler is fully inside the jar since the material will spray out sideways as the bottom valve is opened. Three full COLIWASA samplers a 55-gallon drum will fill the sample bottle about 80% full. A minimum of 1 inch of air space must remain in the top of the filled sample jar to allow for thermal expansion during shipment.

13. Clean the outside of the bottle, then label the it with the label provided with the Material Profile Form. Also, place the smaller numbered labels on the drums that were sampled. If more than two (2) drums are sampled per waste stream (the number of pre-printed drum labels provided), then mark the Profile number on the additional drums with a grease or paint pencil. It is important to know exactly which drums were sampled in the event that there is a problem with the analysis and the drums need to be rechecked . Record the information on the sample label with an indelible marker (e.g. “Sharpie”).

14. Package the sample and ship it via UPS per the instructions in the Sample Shipping Guidance 88-1.

Cleanup

Properly completing and leaving the customer's premises is as important as the initial sales call in presenting an image of the best waste handler for the customer. No cleanup materials will be left at the customer's site. All will be cleaned, returned to the Branch, and properly disposed.

All materials will be cleaned using the wipes provided. No solvent may be used to clean the sampler since this would cause the cleanup materials to be classified as a hazardous waste. If residue has dried on the tube, reinsert it back into the drum that the sample came from to moisten it, then immediately wipe it down.

The sample tube will be thoroughly cleaned between samplings of different waste streams. It may be used without cleaning when sampling multiple drums within the same waste stream. The 3-rinse procedure described in steps 5 and 6 above should be used between each and every drum.

Cleaning involves unthreading the cone from the bottom of the tube and separating the center rod from the outer tube. Wipe down the rod and bottom cone with one of the wipes. Make sure to get all possible material off of the rod and cone.

The tube should be cleaned by wiping down the outside with a wipe. The wipe should be folded into a 6-8" square which will allow it to pass through the tube without binding. Push the wipe through the tube with the sampler's center rod. Then, turn the wipe inside out and repeat the procedure to get all final residues out.

Reassemble the sample tube taking care to adjust the tension on the rod through proper cone placement.

Disposal of Contaminated Materials

All materials that are too dirty to use, damaged, or otherwise unusable, will be returned to the Branch for disposal. Nothing will be left at the customer's site.

1. Store the dirty cleanup wipes in a plastic drum liner bag. Also, place damaged gloves, dirty chemical protective suits, and other items to be disposed in this bag.

2. COLIWASA tubes that are damaged should also be placed in this bag for disposal. All sample material must be removed from the tubes before disposal. Remove the cone, rod, and top cam and reuse if possible.

3. The material that is to be disposed must be returned to the Branch and placed in the dry dumpster (trash bin) for disposal at the local sanitary landfill. All items should be placed in the plastic bag before placing in the trash.

4. Spill cleanup material and residue may not be disposed of in the dry dumpster. Pads or other absorbent material that are used in cleaning up a spill should be bagged and returned to the Branch to be put in a drum. This drum must be properly labeled as spill residue of the appropriate material and shipped with other FRS drums to the Recycle Center. Spill residue material must be handled separately from the other dirty sampling supplies.

Weighted Bottle Sampler

The weighted bottle sampler (see Figure 2) is used to sample free-flowing liquids and slurries in deeper tanks, tanker trucks, rail tank cars, and ponds/pits/lagoons. This sampling device collects "grab samples", which may not be representative of the wastestream. Typically, a sample is taken from three equally spaced depths in the tank or pond. These individual samples may be analyzed separately or composited in a bucket to create a representative sample.

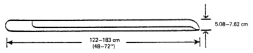
Sampling Procedure

1. The clean bottle is closed with the cork and sunk to the depth at which the sample will be collected.

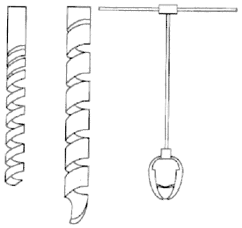
2. Pull out the cork with a sharp jerk of the sampler line or chain and allow the bottle to fill completely (until the bubbles stop rising to the surface).

Sampling Equipment

- Trier
  - Sludges, moist powders or granules, dry powders or granules



- Large trier
  - Large-grained solids



- Auger
  - Sand or packed powders and granules

3. Retrieve the bottle and cap it. The bottle can also serve as the sample container.

4. Clean the outside of the bottle, then label the it with the label provided with the Material Profile Form. Also, place the smaller numbered labels on the drums that were sampled. If more than two (2) drums are sampled per waste stream (the number of pre-printed drum labels provided), then mark the Profile number on the additional drums with a grease or paint pencil. It is important to know exactly which drums were sampled in the event that there is a problem with the analysis and the drums need to be rechecked . Record the information on the sample label with an indelible marker (e.g. "Sharpie").

Cleanup and disposal are similar to that described for COLIWASA sampling.

Dipper (a.k.a. Pond Sampler)

This device (see Figure 3) should only be used to sample free-flowing liquids and slurries in shallow well-mixed tanks and ponds because it is only capable of collecting surface samples. It consists of a telescoping aluminum pole fitted with a Varigrip that is used to grasp a beaker. As with the weighted bottle sampler, it collects grab samples that must be composited if representative sampling is desired.

Trier

A sampling trier (see Figure 4) consists of a tube cut in half lengthwise with a sharpened tip that allows penetration into sludges, moist powders or granules, and dry powders or granules in drums, other containers, truck beds, roll-off bins, and waste piles. It is generally 60 to 100 cm long with a diameter of 1.27 to 2.54 cm (one half to one inch). Particles of the material being sampled must be smaller than the diameter of the trier.

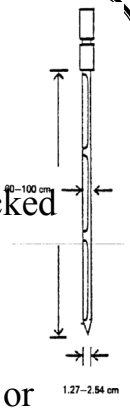
Samples are generally not regarded as representative, but could be, depending upon uniformity, cohesiveness, and depth or thickness of the material to be sampled. Usually, several samples are composited to create a representative sample.

Hand Auger

Augers (see Figure 5) are used to sample sand or packed powders and granules. They are of several designs, but all consist of sharpened spiral blades of varying lengths attached to a metal shaft and handle used to twist the point and blades into the material. If the material being sampled is cohesive, it usually is extracted as a core sample that can be used to examine stratification of the material. A complete core may in some instances be deemed to be a representative sample, but usually several samples are collected and either analyzed separately or composited.

Sampling Equipment

- Thief (a.k.a. grain sampler)
  - Dry powders or granules and sand or packed powders and granules
- Scoop
  - Moist powders or granules, dry powders or granules, sand or packed powders and granules, and large-grained solids



Thief (a.k.a. Grain Sampler)

A thief (see Figure 6) consists of two concentric tubes which are slotted at regular intervals. The outer tube is pointed so that it may be driven into the dry powders or granules and sand or packed powders and granules which it is intended to sample. The inner tube is rotated as the thief is inserted, allowing the material being sampled to be enter the slots. This device is not suitable for sampling moist or compact solids or materials that contain particles with a diameter larger than one third the width of the slots. Thieves vary in length from 60 to 100 cm and usually have a diameter of 1.27 to 2.54 cm.

As with the auger and trier, samples collected with a thief are usually regarded as grab rather than representative samples unless the waste material is known to be homogeneous.

Scoop and Shovel

Scoops and shovels are suitable for sampling moist powders or granules, dry powders or granules, sand or packed powders and granules, and large-grained solids. Unless the material being sampled is known to be homogeneous, all samples must be regarded as grab samples.

Exercise 3

An electronic components manufacturer has two drums of an unused product, Handi-Foam High Density A-Component, represented by the attached Material Safety Data Sheet (see Attachment 1). Use the S-K Sampling Guide to determine if the material is safe to sample using your standard-issue PPE (Saranex-coated apron with sleeves, nitrile gloves, and full-face respirator). Also identify the type of respirator cartridges that you must use.

Chemical Constituents	CAS #	Concentration	OK to sample? (Yes / No)

Exercise 4

A lumber company has a drum of mixed process waste (F034 & F035), containing:

Benz(a)anthracene	5-10%
Benzo(k)anthracene	2-4%
arsenic	< 2%
chromium	< 4%

Use the S-K Sampling Guide to determine if the material is safe to sample using your standard-issue PPE (Saranex-coated apron with sleeves, nitrile gloves, and full-face respirator). Also identify the type of respirator cartridges that you must use.

Chemical Constituents	CAS #	Concentration	OK to sample? (Yes / No)

Figure 1

COLIWASA

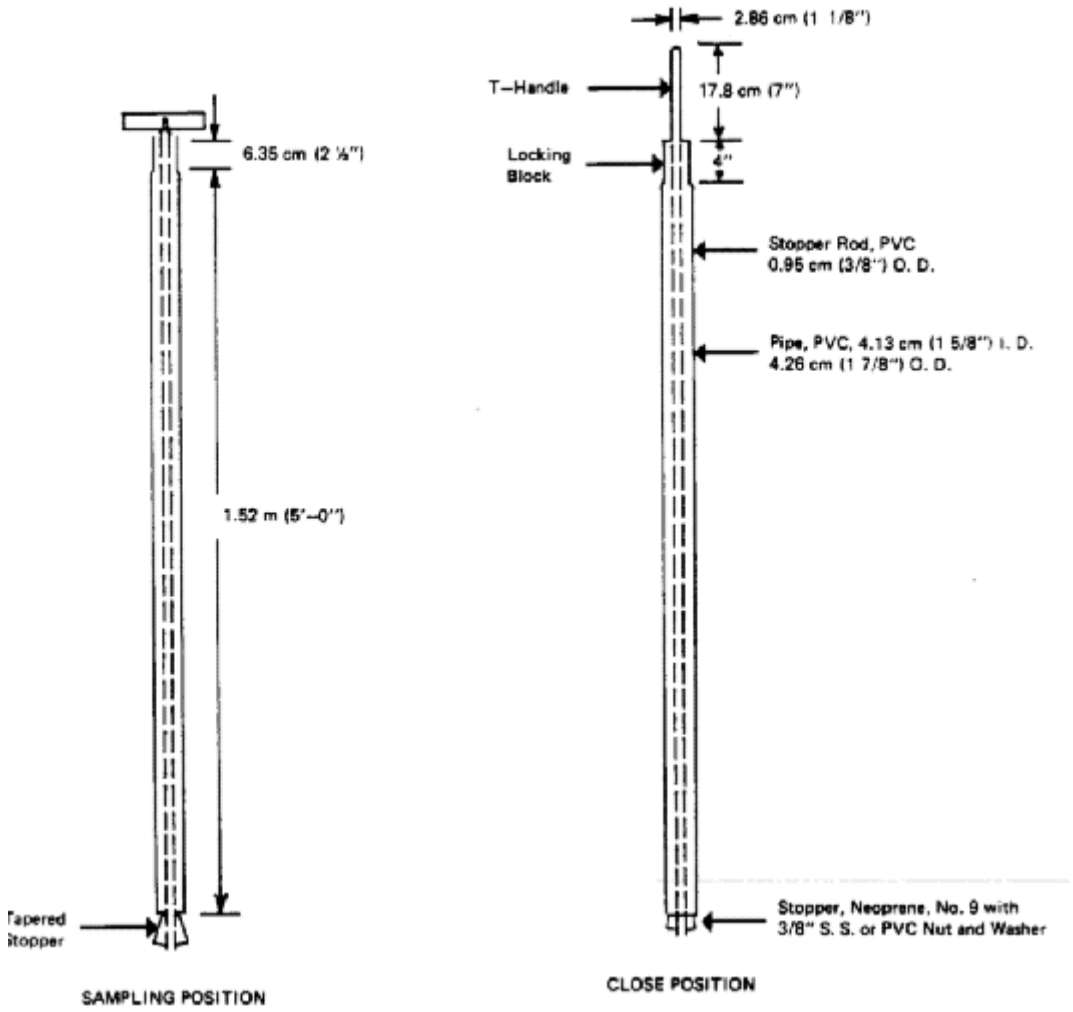


Figure 2

Weighted Bottle Sampler

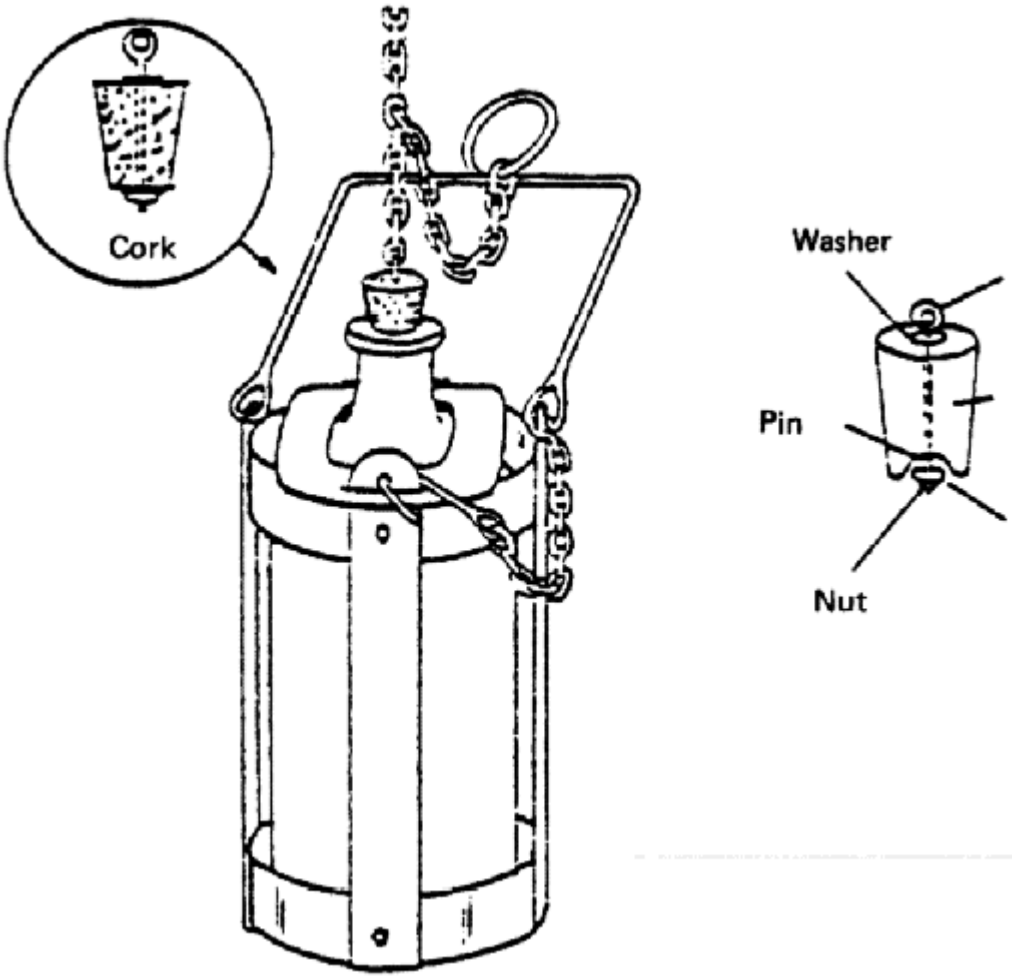


Figure 3

Dipper or Pond Sampler

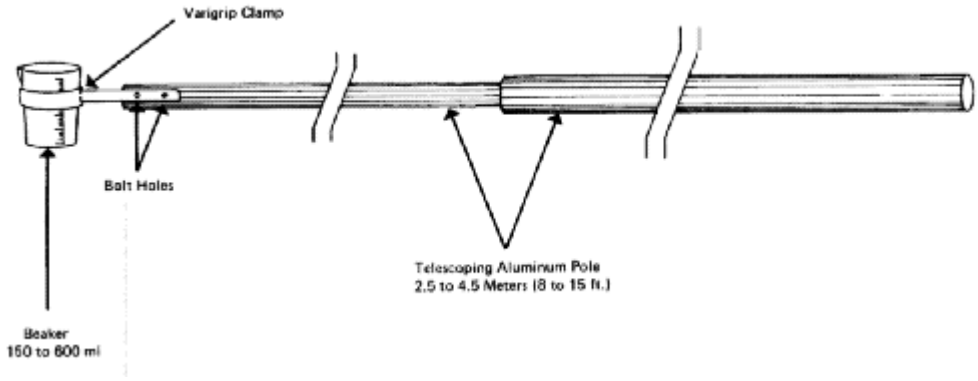


Figure 4

Sampling Trier

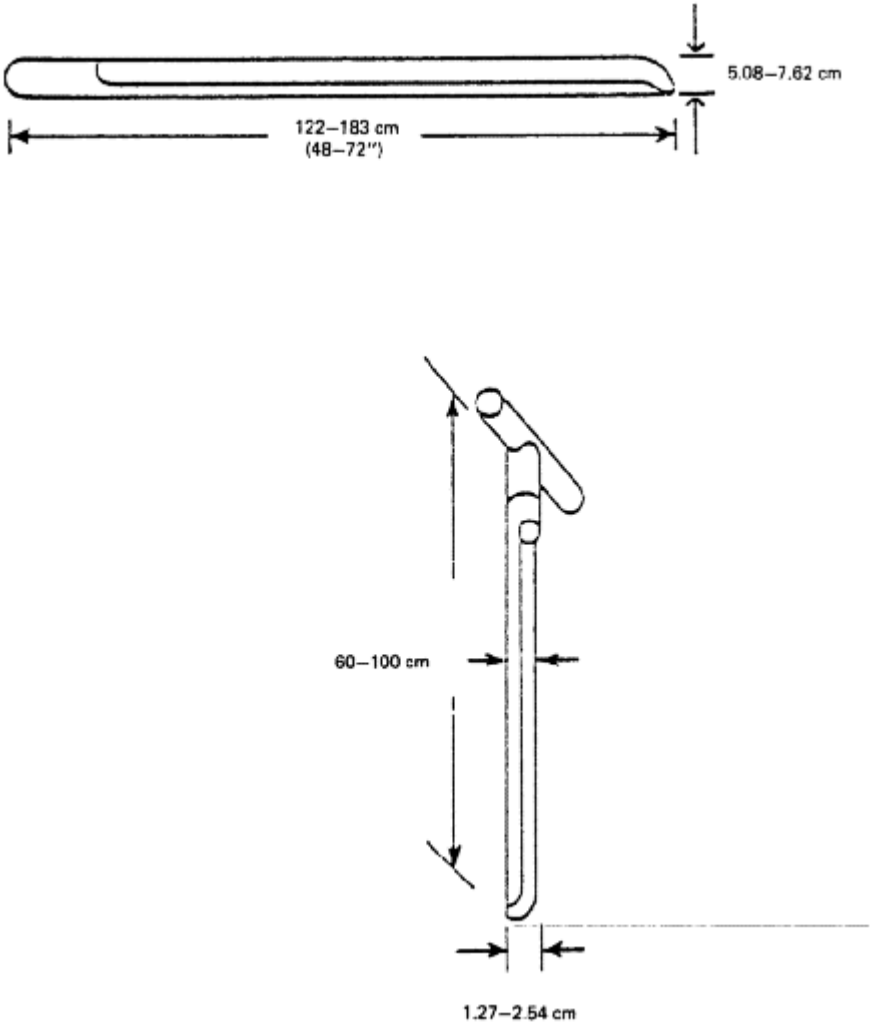
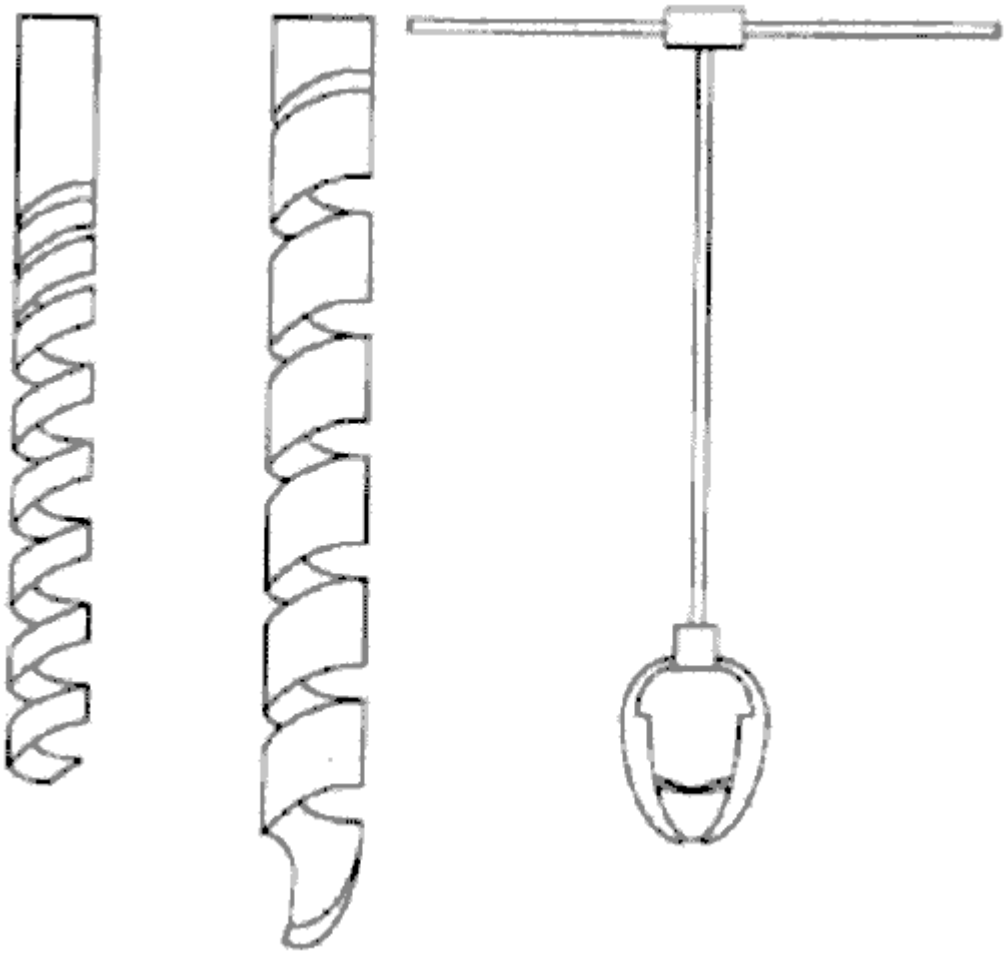


Figure 5

Hand Augers



Closed-Spiral Auger **Open-Spiral Auger** **Iwan Auger**

Figure 6

Thief or Grain Sampler

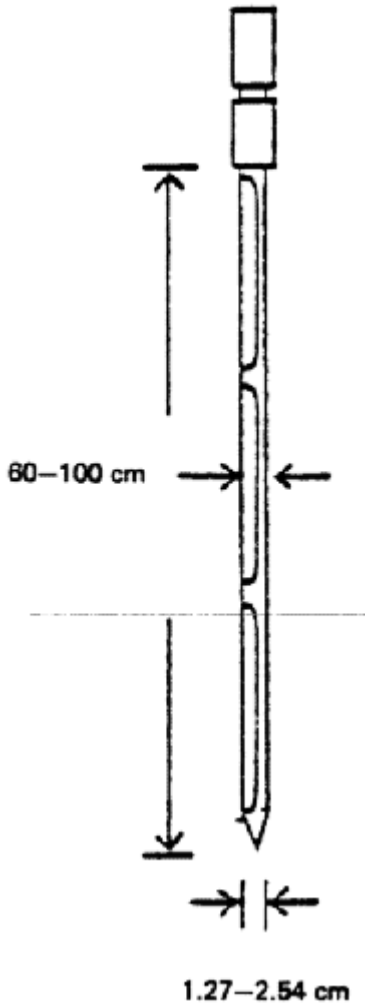


Table 1

Applicability of Sampling Equipment to Wastestreams

Waste Type	Drums	Sacks and Bags	Open-bed Trucks	Tanker Trucks	Storage Tanks, Rail Tank Cars, Bins	Waste Piles	Pits, Ponds, and Lagoons	Conveyer Belts	Pipes
Free-flowing liquids and slurries	COLIWASA	N/A	N/A	COLIWASA	Weighted Bottle	N/A	Dipper	N/A	Dipper
Sludges	Trier	N/A	Trier	Trier	Trier	*	*	*	*
Moist powders or granules	Trier	Trier	Trier	Trier	Trier	Trier	Trier	Shovel	Dipper
Dry powders or granules	Thief	Thief	Thief	Thief	*	Trier	Thief	Shovel	Dipper
Sand or packed powders and granules	Auger	Auger	Auger	Auger	Thief	Thief	*	Dipper	Dipper
Large-grained solids	Large Trier	Large Trier	Large Trier	Large Trier	Large Trier	Large Trier	Large Trier	Trier	Dipper

*This type of sampling situation can present significant sampling problems, and sampling equipment must be specifically selected or designed based on site and waste conditions. No general statement about sampling equipment can be made.

Source: Adapted from *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846*

Attachment 1

Material Safety Data Sheets for FOMO PRODUCTS, INC's Handi-Foam High Density A-Component and B-Component™

Appendix I— Sampling Supply List

Item	Part #	Available from:
Absorbent Pad, New Pig 4-in-1 Mat, 18” x 18”	8890	Distribution Center
Bucket, Plastic	None	Household Product
Bucket, Stainless Steel		
Clor-D-Tect Kit, Dexsil Chemical Corp.	8856	Distribution Center
COLIWASA, Disposable, for non-TCLP samples	8845	Distribution Center
COLIWASA, for TCLP samples	None	Technical Center Tech. Support Dept.
Eyewash, Saline Solution	8892	Distribution Center
Gloves, Nitrile, 16 mil	8738	Distribution Center
Gloves, Nitrile, N-Dex, 8 mil	8737	Distribution Center
Grounding & Bonding Strap	3730	Distribution Center
Hardhat	7012	Distribution Center
pH Test Strips	1400	Distribution Center
Sample Kit, for TCLP analysis	None	Technical Center Tech. Support Dept.
Sample Packaging Kit, for air shipment		
Sample Packaging Kit, for ground shipment		
Sample Packaging Kit, for non-hazardous material		
Saranex-Coated Tyvek Apron with Sleeves	8747	Distribution Center
Scoop, Large Plastic COM Service	3605	Distribution Center
Scoop/Spatula, Small Plastic (for sampling dry granular solids)	H-06283-30	Cole-Parmer (800) 323-4340
Scraper, Non-sparking	11424	Lab Safety Supply (800) 356-0783
S-K Material Profile	1382	Distribution Center
Wipes	8876	Distribution Center
Wrench, Torque, Combination Bung & Bolt		

ET 143 Test: Hazardous Waste Sampling

1. Never sample:

   a) unknowns

   b) in confined spaces

   c) alone

   d) all of the above

   e) b and c only

2. Drums whose contents are unknown must be sampled using grounding and bonding procedures, since they could contain flammable liquids.

   True

   False

1. Your pre-sampling site survey must include a survey of emergency equipment, which includes the following items:

   Nearest emergency exit, eye wash, and shower

   Spill control equipment

   Fire extinguishers and alarm pulls

   Telephone

1. A drum that is warmer than would normally be expected, given the ambient conditions, may indicate one of two things:

   The contents of the drum are undergoing chemical reaction, or

   the drum was recently filled with hot material

1. Besides conducting the sampling site survey, what 2 things should be done prior to sampling a hazardous waste?

   Complete a Material Profile

   Don PPE

1. When should you follow the grounding and bonding procedure?

   a) only when the contents are unknown

   b) whenever the flash point of the contents is known to be below 200° F

   c) whenever the flash point of the contents is not known to be below 200° F

   d) always

   e) any time the drum contains a hydrocarbon

2. What is the proper order for connection of a grounding cable?

   a) Connect the cable to the ground first, then to the container.

   b) Connect the cable to the container first, then to the ground.

   c) Any order is OK as long as the connection is secure and the "ground" is truly grounded.

3. What is the proper order for disconnection of a grounding cable?

   a) Disconnect the cable from the ground first, then from the container.

   b) Disconnect the cable from the container first, then from the ground.

   c) It does not matter.

4. If a drum has two bungs, which one should be slightly loosened first, and why?

   Loosen the small bung first to relieve excess pressure. The smaller bung will have less total force exerted on it than the larger one.

1. To representatively sample a batch of 17 drums from a single non-corrosive wastestream, how many drums must be sampled?

   5 drums must be sampled (Square Root of 17 = 4 + a fraction; therefore, rounded up to the next whole number, the number to be sampled is 5.)

   How would you select which drums to sample?

   Number each drum; then number 17 small pieces of paper, mix them up and draw 5 of them out of a "hat".

4. Attach a topographic map which shows all the features indicated in the instructions for this part.

5. Is the facility located in a 100-year flood plain? ☐ Yes ☒ No

6. The facility complies with the wellhead protection requirements of Rule 62-730.521, F.A.C. ☒ Yes ☐ No

C. Land Use Information

1. The present zoning of the site is Light Industrial.

2. If a zoning change is needed, what should the new zoning be? N/A.

D. Operating Information

1. Is waste generated on-site? ☒ Yes ☐ No

2. List the NAICS codes (5 to 6 digits) 562112 _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

3. Use the codes and units provided in the instructions to complete the following table. Specify:

   a. Each process used for treating, storing or disposing of hazardous waste (including design capacities) at the facility, and

   b. The hazardous waste(s) listed or designated in 40 CFR Part 261, including the annual quantities, to be treated, stored, or disposed by each process at the facility.

PROCESS CODE	PROCESS DESIGN CAPACITY AND UNITS OF MEASURE	HAZARDOUS WASTE CODE	ANNUAL QUANITY OF HAZARDOUS WASTE AND UNITS OF MEASURE
See Attached			

- If the assessment indicates that evacuation of local areas may be advisable, the coordinator must immediately notify appropriate authorities. The coordinator must be available to help appropriate officials decide whether local areas should be evacuated.

- The coordinator must immediately notify the State Warning Point at (850) 413-9911 (24 hours).

- The coordinator must immediately notify the Northeast District of the FDEP, (904) 256-1700 during regular business hours, and if a release equals or exceeds the Reportable Quantity (RQ) the National Response Center (800) 424-8802 must immediately (within 15 minutes) be contacted.

The report must include:

(1) Name and telephone number of notifier;
(2) Name and address of facility;
(3) Time and type of incident (e.g., release, fire);
(4) Name and quantity of material(s) involved, to the extent known;
(5) The extent of injuries, if any; and
(6) The possible hazards to human health, or the environment outside the facility.

Immediate assistance in assessing and responding to an emergency is obtained by the emergency coordinator by calling the 24-hour Safety-Kleen emergency number ((800) 468-1760). The 24 hour emergency number is used by Safety-Kleen to respond to all reports of spills or chemical emergencies. All Safety-Kleen facilities in the state use this 24-hour emergency number. This allows Safety-Kleen to respond to any emergency with a maximum of effort, thereby reducing the threat to human health or the environment.

Part II

K. CLOSURE PLAN

Safety-Kleen constructed the Orange Park Branch with the intent that it will be a long-term facility for the distribution of Safety-Kleen products. No on site disposal activity occurs at the facility and, hence no disposal capacity will be exhausted that will necessitate closure of the facility. Based on current business and facility conditions, the Orange Park facility is expected to remain in operation at least until the year 2035. In the event that some presently unforeseen circumstance(s) would result in the discontinuance of operations and permanent closure or sale of the facility, this closure plan identifies the steps necessary to close the facility at any point during its intended life. This plan should be applied to the tanks system, container storage areas, and equipment used by the facility for hazardous waste management to accomplish the closure performance standard of 40 CFR 264.111. It is intended that all closures will be complete and final with removal of waste and decontamination of the facility and associated equipment. This will eliminate the need for maintenance after closure and the possibility of escape of hazardous waste constituents into the environment. Because closure is not anticipated for some time Safety-Kleen agrees to notify the Department when this decision is made to work with FDEP to update the closure plan using the current requirements and FDEP guidance documents.

FACILITY DATA

1. Waste Management Facility Descriptions
    a. Aboveground Storage Tank: The tank is a 15,000-gallon steel tank. This tank is located within a containment system consisting of a 49'7" x 18'8" foundation slab with 4' perimeter walls.
    b. Solvent Return/Fill Station: The station is a 40' x 25' concrete portion of the building located between the warehouse and paint waste shelter. It contains two wet dumpsters and a Continued Use Vat. The two active dumpsters are used to receive returned solvent from containers and pump it to the used parts washer solvent tank. These dumpsters are not intended for storage, but can

hold a max. of 216 gallons (108 gallons each).

c. Container Storage Area: The container storage area has a 25'5" x 24' concrete floor with 6-inch curbing on exposed sides, and two collection trenches with a combined containment capacity of 255.3-gallons. The maximum storage capacity of this area is 2,553-gallons. Wastes allowed for storage are parts washer solvent dumpster mud, tank bottoms, dry cleaning wastes, spent immersion cleaner, and oil filters.

d. Paint Waste Storage Area: The paint waste shelter consists of a 45' x 68' concrete pad underlying a 15.5' x 20' shelter with metal containment pans. This shelter is divided into a paint waste storage area and an allied product storage area. Allied products are unused or virgin materials. The storage shed consists of six metal containment pans each measuring 5' x 10'. The pans have overlapping lips, which prevent liquids from migrating between pans and onto concrete. Total containment capacity is 1,122 gallons; therefore, the maximum storage capacity is 11,200 gallons. Due to space constraints the maximum actual capacity is 4,800 gallons.

2. Maximum Inventory of Wastes

   a. Used Parts Washer Solvent: 15,000 gallons

   b. Wet Dumpsters: 216 gallons

   c. Containerized Waste: 2,553 gallons in the container storage area and 4,800 gallons in the paint waste storage area, for a total of 7,353 gallons. (Note: This includes any combination of 5, 16, 30, 55, 85-gallon containers, and 350-gallon totes used for various management purposes).

All wastes will be disposed offsite in accordance with appropriate hazardous waste regulations.

CLOSURE PROCEDURES

Container Storage Areas

- At closure, all containers present at the facility will be sent to a Safety-Kleen TSDF, or third party facility where the contents in the containers will be reclaimed and the containers cleaned for reuse. The containers will be removed and transported with proper packaging, labeling, and manifesting.
- The concrete floor, spill containment area, and walls will be scrubbed with a detergent solution and rinsed with clean water to remove waste residuals from the surface. A final rinsate sample will be collected and analyzed to determine the effectiveness of decontamination. Unless otherwise designated in the formal closure plan, one rinsate sample will be collected from the container storage area. The rinsate sample will be analyzed by EPA method 6010 for petroleum constituents, the eight RCRA metals and nickel, and for volatile and semi-volatile organics by EPA methods 8015, 8260, and 8270. The area will be decontaminated to meet FDEP's guidance at the time of closure. The pans, grating, and floor beneath the pans in the pans in the paint waste shelter will be cleaned by appropriate means to remove visible contamination. Safety-Kleen intends to recycle the metal components (e.g., pans and grating) in accordance with 40 CFR 261.6(a)(3)(ii) or to reuse them at another Safety-Kleen facility. Accordingly, decontamination of these components is required only to the extent necessary for safe demolition, storage, and transportation of the scrap. Decontamination of the mercury-containing lamps and devices storage area will be conducted at the time of closure as part of the overall decontamination of the container storage areas. No additional, special decontamination of the mercury-containing lamps and devices storage area will be conducted at the time of closure, because any decontamination associated with releases from mercury-containing lamps and devices will be conducted at the time of release.

- Decontamination (i.e., detergent wash and clean rinse) fluids will be collected and contained for proper management. One representative sample of the contained fluids will be collected to determine whether the water is hazardous. This determination will be made by laboratory analysis of the sample for the metals and organics (excluding pesticides/herbicides) on the TCLP list. (Note: This wash water will be from all areas undergoing decontamination, not just from the container storage areas.)
- If the wash water or other wastes generated in the closure process are determined to be hazardous, they will be disposed of properly as a hazardous waste. Otherwise, the material will be disposed of as an industrial waste. Assumptions of wash water generation are based on Safety-Kleen's past experience from other facility closures. The generated wash water is expected to be non-hazardous based on Safety-Kleen's experience from other facility closures.
- Equipment to be used to clean this area includes mops, pails, scrub brushes, a wet/dry vacuum, and containers. The mops, pails, and scrub brushes will be containerized and disposed of as hazardous waste. The wet/dry vacuum and containers used will be washed with a detergent solution and rinsed to decontaminate them.

Solvent Return/Fill Station

- At closure, any sludge in the wet dumpsters ("dumpster mud") will be cleaned out and containerized, labeled, and manifested for proper disposal.
- The metal superstructure components of the station (i.e., the wet dumpsters and the dock grating) will be cleaned by appropriate means to remove visible contamination. Safety-Kleen intends to recycle these components as scrap metal in accordance with 40 CFR 261.6(a)(3)(ii), or to reuse them at another Safety-Kleen facility. Accordingly, decontamination of the components is required only to the extent necessary for safe demolition, storage, and transportation of the scrap.

- The concrete floor in the return/fill station will be scrubbed with a detergent solution and rinsed with clean water to remove waste residuals from the surface. A final rinsate sample will be collected and analyzed to determine the effectiveness of decontamination. Unless otherwise designated in the formal closure plan, the rinsate sample will be analyzed for the same constituents as the container storage area rinsate sample. The area will decontaminated to meet FDEP's guidance at the time of closure.

Aboveground Storage Tank System

Note: The product solvent & used oil tanks will be closed in accordance with Chapter 62-762, F.A.C.

Metal Components of the Tank Storage System

- At closure, the contents of the tank will be removed to a tanker truck using existing unloading equipment and subsequently transported to a Safety-Kleen recycle center, or 3rd party facility.
- Once the contents have been drained, the tank will be opened by removing the manways and vented by supplying fresh air to the interior space of the tank. Any residual wastes will be removed via vacuum for recycling with the previously drained wastes.
- The interior of the tank as well as all associated piping and appurtenant equipment will then be cleaned by appropriate means to remove visible contamination. Safety-Kleen intends to recycle the tank, piping, and appurtenant equipment as scrap metal in accordance with 40 CFR 261.6(a)(3)(ii), or to reuse them at another Safety-Kleen facility. Accordingly, decontamination of the metal components is required only to the extent necessary for the safe demolition, storage, and transportation of the scrap.

Concrete Containment System

- Final disposition of the concrete containment system where the waste tank is located will depend in part upon the presence or absence of underlying soil contamination. To make that determination, the upper six inches of soil immediately below the concrete slab will be sampled at the following locations, as follows:
    1. Under the waste tank, and at the containment system pumps;
    2. Beneath the most prominent of any cracks observed in the slab, and under the tanker connections.
- Sampling locations, and the number of samples required will ultimately be determined after consultation with the Department
- These sample locations may be adjusted as actual field conditions warrant, but a minimum of two samples will be retrieved. These samples will be analyzed for petroleum constituents, and by EPA Method 6010 for the eight RCRA metals and nickel, and for volatile and semi-volatile organics by EPA Methods 8015, 8260, and 8270.
- The perimeter walls and foundation slab of the secondary containment area will be scrubbed with a detergent solution and rinsed with clean water to remove waste residuals from the surface. A final rinsate sample will be collected and analyzed to determine the effectiveness of decontamination. Unless otherwise designated in the formal closure plan, the rinsate sample will be analyzed for the same constituents as the container storage area rinsate sample. The area will be decontaminated to meet FDEP's guidance at the time of closure. Safety-Kleen anticipates that proper maintenance of the concrete containment system will allow the slab to remain in place at closure.
- Safety-Kleen will proceed with demolition of the perimeter walls. If it is determined that soil contamination exists beneath the foundation slab, Safety-Kleen will demolish the entire concrete structure and complete a further delineation of the extent of soil contamination to be removed to complete closure. Any site assessment, interim measures, or corrective action that may be required will be conducted in accordance with Chapter 62-780, F.A.C. and permit requirements.

- Prior to demolition of the perimeter walls, one representative composite sample of the construction materials will be collected and submitted for analyses (by TCLP) of metals and organics (excluding pesticides and herbicides) unless an alternate analytical protocol is required by the selected disposal facility. The representative composite sample will include biased grab samples collected from areas of staining. If no stained areas are evident, the grab sample locations will be randomly selected. If the construction materials are classified as non-hazardous using TCLP, then they will be disposed of as construction debris in an appropriately permitted disposal facility. In the event the construction materials are identified as hazardous using TCLP, the construction materials will be disposed of as a hazardous waste in accordance with RCRA regulations.
- If the foundation slab must be removed, it will be demolished and the construction materials tested using TCLP in the same manner as that described above for the walls of the secondary containment system.
- If soil removal becomes necessary, Safety-Kleen will backfill the excavated area with clean, compacted general fill material graded to match existing surfaces and to preclude ponding of water. To ensure backfill is clean (i.e., is not contaminated with constituents at concentrations above Florida soil cleanup goals or site background (whichever is higher)), one representative composite sample of the backfill sample will be analyzed by EPA Method 6010 for the eight RCRA metals and nickel, and by EPA Methods 8015, 8260, and 8270.

All sampling and analyses will be done in accordance with FDEP Standard Operating Procedures (SOPs) and the requirements of a Sampling and Analysis Plan (SAP) per subsection 62-730.225(3), F.A.C.

- Safety-Kleen may amend the closure plan at any time during the active life of the facility. The active life of the facility is that period from initial receipt of hazardous waste to certification of final closure. Safety-Kleen will amend the plan any time changes in operating plans or facility design affect the closure plan or whenever a change occurs in the expected year of closure of the facility. The plan will be amended within 60 days of the changes.
- Safety-Kleen will notify the FDEP of its intent to close the facility in accordance with Chapter 62-730.240, F.A.C.
- Safety-Kleen will remove from the site all hazardous wastes in accordance with the approved closure plan. The Regional Administrator may approve a longer period if Safety-Kleen demonstrates that:
    1. The activities required to comply with this paragraph will, of necessity, take longer than 90 days to complete; or
    2. The following requirements are met:
        a) The facility has the capacity to receive additional wastes;
        b) There is a reasonable likelihood that a person other than Safety-Kleen will recommence operation of the site;
        c) Closure of the facility would be incompatible with continued operation of the site; and
        d) Safety-Kleen has taken and will continue to take all steps to prevent threats to human health and the environment.
- Safety-Kleen will complete closure activities in accordance with the approved closure plan within 180 days after receiving the final volume of wastes or 180 days after approval of the closure plan, whichever is later. When closure is completed, all facility equipment and structures shall have been properly disposed of, or decontaminated by removing all hazardous waste and residues.
- Within 60 days of closure completion, Safety-Kleen will submit certification by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

Figure 10.3-1 presents a typical closure schedule anticipated for the Orange Park facility.

CONTINGENT POST-CLOSURE PLAN

The tank system at the Orange Park facility meets the secondary containment requirements of 40 CFR 264.193, and is, therefore, not required to have a contingent post-closure plan under 40 CFR 264.197(c). In addition, Safety-Kleen intends to remove or decontaminate all tank system components, associated containment systems, and contaminated soils (if any) at the time of closure. However, should future conditions indicate that all contaminated soils and tank system components cannot practicably be decontaminated or removed, then a plan to perform post-closure care in accordance with the post-closure care requirements that apply to landfills (40 CFR 264.310) will be prepared for implementation upon FDEP approval.

CLOSURE COST ESTIMATE

The cost for closure of the facility is estimated in the CCE worksheets and summarized as follows:

• Project Coordination and Scheduling	$3,860
• Mobilize to Site and Prepare for Closure	$57,482
• Storage Tank Decontamination and Removal	$16,288
• Decontaminate Return/Fill Station	$16,356
• Decontaminate Container Storage Area	$5,858
• Decontaminate Flammable Storage Shelter	$7,783
• Containerize, Stage, Transport and Dispose of Decon Wastes	$12,637
• Closure Certification Report	$5,157
Subtotal	$125,421
Location Factor for RS Means Rate	0.81
Total Closure Cost Estimate (Adjusted for Location)	$108,589
Closure cost thru 2012 with inflation adjustments	$115,815
15% Contingency	$17,372
2013 Total Closure Cost Estimate	$133,187

Part II

Q. INFORMATION REQUIREMENTS FOR SOLID WASTE MANAGEMENT UNITS

Part II.Q. of the Florida Department of Environmental Protection's (FDEP's) Application for a Hazardous Waste Permit outlines the information requirements for solid waste management units (SWMU's) at the facility. This section provides the required information.

On February 25, 1987, the facility received a HSWA permit exemption from Region 4 of the USEPA. However, the Florida Department of Environmental Protection requested a HSWA Permit Application to be included into the RCRA Permit Application Renewal on January 15, 2003. All HSWA corrective action conditions were incorporated into the state permit issued on December 22, 2003

Ten solid waste management units have been identified at the facility in the RCRA Facility Assessment Report of October 1991. In addition, four additional SWMU's have been identified at the facility during this permit renewal. These SWMU's were identified after review of previous Safety-Kleen permit renewals due to the similarity of operations at the facilities. The complete list of SWMU's is found on the next page.

SWMU NUMBER	DESCRIPTION
1	Warehouse Container Storage Area
2	Paint Waste Building
3	FRS Waste Building
4	Former Restaurant Filter Building
5	Return and Fill Area
6	Spent Mineral Spirits Tank
7	Used Oil Tanks
8	Loading/Unloading Areas
8A	Inside Warehouse
8B	Tank Farm Area
8C	Warehouse Dock
8D	Return/Fill Dock
9	Pallet Accumulation Area
10	BFI Dumpster
11	Above Ground Storage Tank Farm
12	10-Day Transfer Waste Area
13	Mercury Lamps Storage Area (Inside SWMU-1)
14	Used Antifreeze Tank (Inside SWMU-5)
15	Satellite Container (Inside SWMU-5)