Attachment 1

WASTE ANALYSIS PLAN

Appendix A

Sampling Plan

MIXED WASTE FACILITY
RCRA/TSCA PERMIT APPLICATION

PERMA-FIX NORTHWEST RICHLAND, INC.

RICHLAND, WASHINGTON

TABLE OF CONTENTS

Page

FIGURES

A-1. SAMPLING STRATEGY

The goal of the sampling program at the MWF is to obtain representative samples capable of providing statistically valid, legally defensible data. This plan identifies the appropriate sampling methodology, sample type, and number of samples to use when sampling mixed waste streams.

The rationale behind the sampling strategy is to obtain a part or piece from a waste stream expected to exhibit the average (representative) properties of the waste stream. Obtaining representative samples is not a problem when sampling an ideal homogenous material; however, most wastes are heterogeneous, making the collection of a representative sample challenging.

Homogeneity and heterogeneity are diametric terms. For the purposes of this plan, heterogeneity of a material is measured according to the ability of an unaltered analytical sample to reproducibly represent the average physical and chemical properties of the waste stream. The analytical sample is the mass or volume of material subjected to analysis. Heterogeneity is thus relative to sampling objectives and perspective. If a representative distribution, (such as concentration) is spread over a greater area or length of time than that represented by the sample, sample to sample heterogeneity will be greater.

Randomness is a critical factor in characterizing material. If the parameter of interest is distributed in a random fashion, a properly designed random sampling program should produce a representative set of samples. If the measured parameter is not randomly distributed, then a simple random sampling plan may not accurately reflect the composition of the material.

Strata are different portions of material separated in time, space, or by component. A landfill may display spatially separated strata since old landfill cells may contain different wastes than new ones. If spatial or temporal stratification are not apparent, yet the target compound distribution is excessively erratic, stratification by component is likely. Stratification is an important concept for understanding properties of waste and designing appropriate sampling and analytical efforts for the most complex heterogeneous wastes.

This section of the plan defines the methodologies and applicability of scientifically credible sampling strategies used for mixed waste. Reliable information regarding chemical properties of hazardous waste is necessary to compare those properties to acceptable criteria and process capability. Incorporating some form of randomness into the selection process achieves accuracy and selecting the appropriate number of samples achieves sufficient precision.

Each mixed waste stream is sampled in accordance with methodologies referenced in WAC 173-303-110(2). Based upon the data objectives, two major sampling approaches, authoritative sampling and random sampling, are employed to collect representative samples of mixed waste at the facility. There are three types of random sampling: simple, stratified and systematic random sampling.

When there is little or no information regarding distribution of chemical contaminants of waste, simple random sampling is most appropriate. When more information on specific waste contaminants is known, stratified random sampling, systematic random sampling and perhaps authoritative sampling are employed. Sampling methodologies and types are described below and the sampling methodology determination process is provided in Figure A-1.

A-1.1. AUTHORITATIVE SAMPLING

Using authoritative sampling methodology, sample locations are selected based on detailed knowledge of the waste streams' physical/chemical properties and concentrations. The method requires in-depth knowledge of properties and constituents of waste streams. When used, this method must be well documented and defensible.

The validity of data collected using authoritative sampling is totally dependent on the knowledge of the sampler. Although valid data can be obtained, authoritative sampling is only to be conducted when there is substantial process knowledge of the physical/chemical properties and concentrations of the waste stream. This allows the sampler to select a sample without regard to randomization.

A-1.2. RANDOM SAMPLING

In random sampling, every location in a waste stream has a theoretically equal chance of being sampled and measured. Random sampling methodology dictates sample selection and location through applied statistical methods. This method is used to collect representative samples where data is insufficient to justify authoritative sampling such as waste streams of unknown or variable concentration. There are three types of random sampling: simple random, stratified random or systematic random.

A-1.2.1. Simple Random Sampling

In simple random sampling, all locations/points in a waste or unit from which a sample can be attained are identified, and a suitable number of samples are randomly selected. Simple random sampling is used to collect representative samples of wastes that are heterogeneous throughout the entire waste stream or unit, such as multiple drums of unknown origin. This method is most appropriate where little or no information is available concerning the distribution of chemical contaminants, but it may misrepresent waste streams with areas of high concentration or stratification.

The simple random sampling method will be used for mixed waste streams that are randomly heterogeneous with regard to their chemical characteristics, where the random chemical heterogeneity remains constant from unit to unit, such as drum to drum. All units in the population are identified using this method and a suitable number of samples are randomly selected from the population. Two simple random methods may be employed to identify containers to be sampled:

For containers not placed in an orderly fashion:

- Assign sequential numbers to each container and
- Use a random number table or computer program to identify the units to be sampled.

For containers placed in an orderly fashion:

- Divide the waste inventory into smaller units by assigning an imaginary grid,
- Assign consecutive numbers to each unit within the grid, and
- Use a random number table or computer program to identify the units to be sampled.

A-1.2.2. Stratified Random Sampling

Stratified random sampling is identifying and stratifying (segregating) areas of non-uniform properties or concentrations, and subsequently collecting simple random samples from each stratum of the waste or unit. Samples are collected using this method from waste or units that are known to have areas of non-uniform properties (strata) or concentration (hot spots), such as a drum with multiple waste layers. This method provides for increased accuracy of waste stream representation if waste is stratified with mixed high and low concentration areas present. Greater knowledge of the waste stream is required than for simple random sampling and sophisticated statistical applications may be required.

If a mixed waste stream is known to have non-randomly heterogeneous chemical properties, and/or non-random chemical heterogeneity is present from unit to unit, more complex stratified random sampling is used. In these instances, the mixed waste stream is stratified to isolate the known sources of non-random chemical heterogeneity. After stratification, which may occur over space and/or time, the units in each stratum are numerically identified, and a simple random sample is taken from each stratum. Both simple and stratified random sampling gives accurate estimates of the chemical properties of the mixed waste stream.

A-1.2.3. Systematic Random Sampling

In systematic random sampling, the first sampling point is randomly selected, but all subsequent samples are collected at fixed space intervals, such as along a transect or time interval. This is an alternative method for collecting representative samples from modestly heterogeneous waste streams that provides for simplified sample identification. This method provides for easier sample identification and collection than other techniques, but it may misrepresent waste streams with unknown areas of high concentration or stratification.

Systematic random sampling will be used only when waste is essentially random or contains, at most, a modest stratification, because this type of sampling yields poor accuracy and precision. In such cases, systematic random sampling will be utilized for the sake of convenience with little expectation of an increase in precision over other random sampling techniques.

A-1.3. SAMPLE TYPE: GRAB

A grab sample is taken from a particular location at a distinct point in time. Grab sampling is the most common type used for random sampling and is useful in determining a waste stream's variability (the range of concentration) when multiple or frequent samples are obtained. Grab sampling is the simplest technique and the best measure of variability, but it may require collecting of a larger number of samples to obtain a representative sample.

Sample types must conform to grab samples as described above or representative samples as defined in WAC 173-303-110(2).

A-2. SAMPLING EQUIPMENT

The possible use of various sampling equipment is described below for different waste types and waste receptacles. Special circumstances or conditions may warrant the use of alternative or modified equipment or methods. Detailed descriptions of the use of each of these sampling devices are presented in SW-846 Volume II, Field Methods, and in Samplers and Sampling Procedures for Hazardous Waste Streams (EPA-600/2-80-018).

A-2.1. FREE-FLOWING LIQUIDS AND SLURRIES

A-2.1.1. Composite Liquid Waste Sampler (Coliwasa)

The Coliwasa is a device used to sample free-flowing liquids and slurries contained in drums, shallow tanks, pits, and similar containers. This device provides a representative sample of both layered (several immiscible phases) and homogeneous liquid materials. The Coliwasa consists of a glass, plastic, or metal tube equipped with an end closure that can be opened and closed while the tube is submerged in the material to be sampled.

Procedures to use a Coliwasa are as follows:

1. Use a clean Coliwasa.
2. Adjust sampler's locking mechanism to ensure that the stopper provides a tight closure. Open sampler by placing stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.
3. Slowly lower the sampler into the waste at a rate that permits the level of liquid inside and outside the sampler to remain the same. If the level of waste in the sampler tube is lower inside than outside, the sampling rate is too fast and will produce a non-representative sample.
4. When the sampler hits the bottom of the waste container, push the sampler tube down to close and lock the stopper by turning the T-handle until it is upright and one end rests on the locking block.
5. Withdraw Coliwasa from waste and wipe the outside with a disposable cloth or rag.

General comments and precautions while using the Coliwasa include the following:

- A plastic Coliwasa is not used unless it is constructed of fluorocarbons (e.g., Teflon), to sample wastes containing organic materials.
- A Coliwasa is not used to sample liquids containing hydrofluoric acid.

- If significant amounts of solid material are present within 2 inches of the bottom of the container to be sampled the Sampling Supervisor will identify an alternative sampling method to obtain a representative sample of this solid phase.

A-2.1.2. Weighted Bottle

The weighted bottle samples liquids and free-flowing slurries; however, stratification effects cannot be adequately handled with this device, so it is more useful for homogeneous materials. This sampler consists of a glass or plastic bottle, sinker, stopper, and line that is used to lower, raise, and open the bottle. The specifications for constructing a weighted bottle sampler are contained in ASTM Methods D270 and E300.

Procedures to use a weighted bottle are as follows:

1. Clean bottle.
2. Assemble weighted bottle sampler.
3. Lower the sampler to desired depth and pull out the bottle stopper by jerking the line.
4. Allow bottle to fill completely as evidenced by cessation of air bubbles.
5. Raise sampler, cap, and wipe off the outside of the bottle with a disposal cloth. The bottle can serve as a sample container.

General comments and precautions while using the weighted bottle sampler include the following:

- Do not use a non-fluorocarbon plastic bottle to sample wastes containing organic materials.
- Do not use a glass bottle to sample wastes that contain hydrofluoric acid.
- Before sampling, ensure that the waste will not corrode the sinker, bottle holder, or line.

A-2.1.3. Open Tube Sampler

The open glass tube is the most versatile of the hazardous liquid samplers because of the wide range of applications, relatively low cost, and ease of preparation. Open tubes made specifically for sampling (i.e., drum samplers) can be purchased. The only difference between these and laboratory glass tubes is that the former have a constricted orifice at the top in order to facilitate plugging the opening to maintain a vacuum in the tube.

Procedures to use an open tube samples are as follows:

1. Slowly lower the tube into the liquid to the desired depth. Slow insertion will prevent the mixture of container contents so that a more representative sample can be collected.
2. When the tube sampler is inserted to the desired depth, stop the tube with a rubber stopper, thumb, or by creasing a piece of flexible tubing attached to the open end of the sample tube. This is done to establish a vacuum in the tube, thereby enabling withdrawal of the sample from the container.
3. Slowly withdraw the tube from the vessel and expel the sample into the sample container. Avoid handling the potion of the sampler that was placed into the liquid.
4. The tube can be disposed of by placing it back into the container that was sampled.

General comments and precautions while using the open tube sampler include the following:

- Sampling depth is limited to the length of the sampler.
- May not collect material in the bottom of the drum. The depth of unsampled material depends on the density, surface tension, and viscosity of the material being sampled.
- Highly viscous materials are difficult to sample.
- May be difficult to retain sample in the tube when sampling liquids of high specific gravity.
- Decontamination is difficult.
- Repeated use of the open tube sampler to obtain an adequate volume of the sample may disturb the drum contents.

A-2.1.4. Dipper

A dipper samples homogeneous liquids and free-flowing slurries. The dipper consists of a glass, plastic, or stainless steel beaker that may or may not be clamped to the end of a pole of suitable length and material that serves as the handle.

Procedures to use a dipper are as follows:

1. Slowly lower the dipper into the liquid to the desired depth. This should be done with the beaker in a slanted position. Slow insertion will prevent the swirling or bubbling of container contents so that a more representative sample can be collected.
2. When the beaker is filled, rotate it to an upright position.
3. Slowly withdraw the beaker from the vessel by maneuvering the handle.

General comments and precautions while using the dipper include the following:

- It is inexpensive and easy to construct and adapt to the sampling scenario by modifying the length of the handle or the type of container.
- It is not appropriate for sampling subsurface layers or to characterize discrete layers of stratified liquids.

A-2.1.5. General Sample Containers and Other Equipment

Laboratory sample containers are used to directly collect samples from process lines, proportional samplers, and sample ports. Additional equipment may be used as required for a variety of specific sampling situations.

A-2.2. SOLIDS

A-2.2.1. Thief

A thief is used to sample dry granules or powdered wastes whose particle diameter is less than one-third the width of the slots. A thief consists of two slotted, telescoping, concentric tubes, usually made of stainless steel or brass. The outer tube has a conical pointed tip on one end, which permits the sampler to penetrate the material being sampled. The inner tube is rotated to open and close the sampler. Thiefs are available at most laboratory supply stores.

Procedures to use the thief are as follows:

1. Use a clean sampler.
2. Insert closed thief into waste material. Rotate inner tube to open thief. Wiggle the unit to encourage material to flow into thief. Close thief and withdraw. Place sampler thief in a horizontal position with slots facing upward. Remove inner tube from thief and transfer sample to a container.

General comments and precautions while using a thief sampler include the following:

- It may be difficult to decontaminate, depending on the matrix.
- Depth of sample is limited by the length of the thief.

- Not recommended for use when volatiles are of interest. It collects a somewhat disturbed sample, which may cause loss of some volatiles.

A-2.2.2. Trier

A trier samples moist or sticky solids with a particle diameter less than one-half the diameter of the trier. Triers consist of a tube cut in half lengthwise with a sharpened tip that allows the sampler to cut into sticky solids and to loosen soil. Triers 61 to 100 cm long and 1.27 to 2.54 cm in diameter are available at laboratory supply stores.

Procedures to use the trier are as follows:

1. Use a clean trier.
2. Insert trier into waste material 0° to 45° from horizontal. Rotate trier to cut a core of the waste. Remove trier with concave side up and transfer sample to container.

General comments and precautions while using the trier sampler include the following:

- Generally very good for sampling moist or sticky materials.
- Trier is not recommended for sampling dry, unconsolidated materials.
- It is lightweight, easy to use, and easy to decontaminate.

A-2.2.3. Auger

An auger samples hard or packed solid wastes or soil. Augers consist of sharpened spiral blades attached to a hard metal central shaft. Augers are generally available at hardware and laboratory supply stores.

Procedures to use the auger are as follows:

1. Use a clean sampler.
2. Bore a hole through the middle of an aluminum pie pan large enough to allow the blade of the auger to pass through. The pan catches the sample brought to the surface by the auger.
3. Place pan against the sampling point. Auger through the hole in the pan until the desired sampling depth is reached. Back off the auger and transfer the sample in the pan adhering to the auger to a container. Spoon out the rest of the loosened sample.

General comments and precautions while using the auger sampler include:

- Not recommended for use in gravel, large particle sediments, or sludges.
- It is reusable and easy to decontaminate.

A-2.2.4. Spoons, Scoops, Trowels, and Shovels

Spoons, scoops, trowels, and shovels are used to sample granular or powdered material in bins, shallow containers, and conveyor belts. They are also used to sample sludges, soils, and solid wastes.

Procedures for use of spoons, scoops, trowels and shovels are as follows:

1. Use a clean sampler.
2. Obtain a full cross section of the waste material that is large enough to contain the waste collected in one cross section sweep.

General comments and precautions while using the spoons, scoops, trowels and shovels sampler include:

- These samplers are reusable and easy to decontaminate.
- These samplers are limited to collect shallow and surface samples.

A-2.2.5. Dipper and Other Equipment

Dippers are also used to retrieve solids from the bottom of the containers. Additional equipment may be used as required for a variety of specific sampling situations.

A-2.3. MATERIALS OF CONSTRUCTION

As noted in the descriptions of the various types of sampling equipment, there are numerous materials of construction available (e.g., stainless steel, glass, plastics). In most circumstances, the material of construction is dictated by the properties of the waste being sampled. In general, the materials that provide the greatest chemical compatibility are stainless steel, glass, and Teflon. Stainless steel is most suitable for sampling solids and in situ soils, whereas glass and Teflon are highly suitable for sampling liquids.

Choice of material is accomplished through published compatibility information (equipment catalogs or materials compatibility charts), equipment vendor technical support, or analytical laboratory technical support.

A-3. SAMPLING PROCEDURES

A-3.1. SAMPLE FREQUENCY

The appropriate number of containers to be sampled from a waste stream to obtain a representative sample is determined using several methodologies. The appropriate methodology is determined for each waste stream on a case-by-case basis depending on the process information available for the mixed waste stream and the end use of the sampling data.

A-3.1.1. Sampling Frequency Per Waste Stream Shipment

The MWF staff will initially perform verification sampling on at least 10 percent (e.g., one container in ten or a fraction of thereafter) of the containers of each waste stream received per generator. If a generator's waste stream fails acceptance, then facility management will contact the generator to resolve the acceptance discrepancy and will require that 25 percent (e.g., one container in four or fraction of thereafter) of the containers in the next shipment of the generator's waste stream that failed acceptance at the 10 percent level be sampled. If the generator's waste fails at the 25 percent level, facility management will contact the generator to resolve the acceptance discrepancy and will require 50 percent (e.g., one container in two or fraction of thereafter) of the containers in the next shipment of the generator's waste stream that failed acceptance at the one in four level to be sampled. If the generator's waste stream fails at the 50 percent level, then facility management will contact the generator to resolve the acceptance discrepancies and will notify the generator that a moratorium will be placed on the non-compliant waste stream until facility management and the generator have further characterized the waste. Once the non-conforming waste has been further characterized, facility management will notify the generator that the waste stream is approved for shipment to the MWF. The MWF will perform verification sampling on 50 percent of the containers received.

Facility management may reduce the verification frequency of a generator's waste stream if after two consecutive shipments the waste stream passes acceptance. However, the minimum verification frequency will be at least 10 percent of the containers of each waste stream received per generator.

For bulk waste, 50 percent of the first ten loads will be sampled. In addition, every load will be visually inspected, and any load showing visible variations in color, texture, or wetness will be subject to sampling. If there is no variation among the sampled loads, the sampling regime will be reduced to 20 percent of the loads thereafter. If the sampled loads do show variation, the 50 percent sampling frequency will be re-instituted for the next 10 loads. If those do not show variation, then the frequency will return to 20 percent sampling.

A-3.1.2 Sampling Frequency Per Treatment Run

A treatment run is the amount of processing required to treat all the waste material or residue (e.g., from the treatment of hazardous debris) of a single waste or commingled waste streams. A treatment run consists of a number of treatment batches that are required to treat all of the material in the treatment run. The number of treatment batches per treatment run is solely dependent on the total volume in the waste run (and accounting for volume increases or reductions through the specific treatment process).

Process parameters are evaluated or measured throughout each treatment run as needed to ensure that the process performed its function. Process parameters evaluated may include the specific treatment formulation; process parameters that are measured may include mixing and curing times, temperature, or particle size.

If there is a treatment run subsequent to the first run with a disruption or change in the treatment process such that process parameters have deviated and cannot be relied on to verify RCRA compliance, an additional post-treatment waste sample will be collected and analyzed for RCRA constituents to ensure compliance with LDR.

A-3.2. SAMPLING PROCEDURES

Sampling procedures will vary depending on the type and form of waste received and the sampling equipment used. Waste may be received in bulk shipments or containers.

Procedures used to collect a sample with specific equipment are outlined in Section A-2 of this plan. Initially each waste shipment received is visually inspected as outlined in the Waste Analysis Plan.

A-3.2.1 Bulk Sampling

A tank truck or railcar delivering bulk liquid is generally sampled through one of the top access hatches using a Coliwasa, open tube sampler, or other appropriate sampling device.

A-3.2.2 Container Sampling

Containers include drums and other small to medium sized receptacles that are designed for transporting materials. If a shipment includes less than ten (10) containers, at least one container will be sampled. At a minimum, 10% of the containers in each waste stream from each generator are sampled.

Standard documentation procedures are provided in Section A-6. These procedures detail the proper labeling and handling of samples when transferring them to the laboratory.

A-3.2.3 Miscellaneous Materials Sampling

When sampling contaminated items such as rags, protective equipment, and other miscellaneous materials, sampling is aimed at retrieving a portion of the material that exhibits the highest degree of contamination. Consequently, decisions concerning the disposition of contaminated materials are often based on the worst case situation.. These situations vary widely and a common sense approach to the sampling is necessary.

A-3.2.4 Alternative Sampling Methods and Waiver of Incoming Analysis

Some wastes do not lend themselves to sampling or to the incoming-shipment analyses. These wastes include, but are not limited to:

- Lead bricks
- Wood
- Concrete
- Building debris
- Bricks
- Lead/acid batteries
- Metal
- Wood pallets
- Wire
- Soft waste (gloves, suits, boots, paper towels)
- Tree stumps
- Lead shielding
- Construction debris
- Other debris
- Sheet metal
- Discarded containers
- Drywall (sheet rock)
- Plastic waste
- Glass

Alternative sampling methods, where possible, are used when a shipment arrives with wastes of the type listed above. Debris wastes can be sampled using alternative sampling methods. Based upon visual inspection, if material is similar to material indicated in Table 4 of the Waste Analysis Plan, waste will be managed as TSCA regulated PCB wastes or sampled and analyzed to determine TSCA classification.

In the event that alternative sampling is used, the methods employed will be recorded, and the reasons for the alternative or waiver documented. Where reasonably possible, samples that can be analyzed will be obtained and run; however, when the analysis is waived the action is documented and justified in the operating record. Additionally, pre-shipment samples of such material may be similarly waived.

Trucks and rail cars delivering bulk solid materials are sampled by obtaining samples using the sampling equipment indicated in Section A-2. Generally, random grab samples are taken from the following three points: (1) the front 1/3 area of waste in the load, (2) the middle 1/3 area of waste in the load, and (3) the rear 1/3 area of waste in the load. The three individual grab samples will be composited into one representative sample of the bulk shipment. Other methods may be employed should the bulk load present other heterogenic properties or issues.

For each incoming bulk solid load, additional sampling is performed as necessary to ensure that samples are collected in a manner representative of the vertical composition of the waste in the load. If the physical characteristics of the waste are such that a full vertical section of the load cannot reasonably be sampled with standard sampling equipment, specified in Section A-2, then a sample is taken at a minimum depth of one foot at each sampling point. Each load then will be visually inspected during unloading to ensure a representative sample was obtained from the surface sample.

In addition to the sampling method described above, all areas of the load which are visually noted to be significantly different in color, texture, or wetness are identified during the routine load inspection process. Sampling and analyses of such areas are done as part of the incoming load procedures before the load is emptied.

A-4. SAMPLE PRESERVATION, VOLUMES, AND HOLDING

Sample aliquots for composite samples must be a minimum mass of 100g each. For the incoming shipment parameters, a minimum sample mass of 150g-1,000g is needed to perform the incoming shipment parameters for either composite or discrete samples depending on the order in which the parameters are run and whether the sample material is used for more than one parameter. However, more samples may be obtained during the collection phase.

SW-846 guidelines are used for sample containers, preservatives, and holding times. In general, wide-mouth sample containers are used for solids. However, compatibility of the container and the waste materials must be taken into account.

Prior to the actual sampling event, sample labels (see Section A-6) should be prepared and affixed to the appropriate sample container. In many cases, sample containers will arrive from the laboratory with sample labels already on the container. These labels will identify the analytical parameters and any added preservatives. If an alternative sample label will be used, it should be completed and placed on the sample container directly over the laboratory label.

The outside of the container is dried and clear plastic tape wrapped around the container to protect the label and prevent the cap from loosening during handling. For samples shipped off-site for analysis, the sample container is then placed immediately in a shipping container (e.g., cooler) with ice (in bags or blue ice packages) to keep the sample cool. At the end of the day, the shipping container is filled with sufficient packing material to prevent damage to the sample containers. The necessary paperwork is completed (see Sections A-6.1. Sampling Notes, and Section A-6.3. Chain-of-Custody Record) and also placed in the shipping container. The shipping container should then be sealed (i.e., custody seal - Section A-6.4.) and shipped for overnight delivery to the designated analytical laboratory. This off-site laboratory will use the analytical methods published in:

- Test Methods for Evaluating solid Waste, Physical/Chemical Methods (EPA SW-846, Third Edition), or its later update;
- Chemical Testing Methods for Complying with the State of Washington Dangerous Waste Regulations (WDOE 82-13, May 1993).

Analyses of constituents for which analytical methods are not available in the above publications may be handled with an alternative method.

A-5. EQUIPMENT DECONTAMINATION

Sampling equipment that can be re-used (i.e., non-disposable) is generally decontaminated by scrubbing with a biodegradable commercial detergent (e.g., Alconox or equivalent), followed by a de-ionized water rinse. The washing and rinsing are performed twice. If management wishes to confirm that the decontamination process is successful, a decontamination sample may be collected by rinsing the equipment again with de-ionized water and collecting the rinsate into a sample container. Analytical parameters for the decontamination sample are the same as those for the sampled material for which the device was previously used.

The following decontamination procedure is used to decontaminate sampling equipment:

- Wipe down the accessible surface of the sampling equipment.
- Wash the sampling equipment using a wash solution approved by the Sampling Supervisor (e.g., Alconox).
- Rinse the sampling equipment.
- Wash the sampling equipment.
- Rinse the sampling equipment.
- Rinse the sampling equipment again this time collecting a sample of the rinsate to verify cleanliness, if needed.

A-6. SAMPLING DOCUMENTATION

The procedures described in this section are used to document and control samples collected and shipped to an off-site laboratory for analyses in support of regulatory compliance (e.g., waste characterization, LDR certification). Samples collected for on-site analysis (e.g., process control) are exempt from the requirements of this section.

A-6.1. SAMPLE LABELING

The Environmental Sample Label (see example in Figure A-2) is affixed to the sample container prior to or at the time of sampling. It is used to prevent misidentification of samples and provides sufficient information to identify the sample without reference to the Sample Notes. The sample label contains the following information:

- Company Name or Project Number
- Sample Identification
- Sampler's Initials
- Date Sampled
- Time Sampled
- Parameters to be Analyzed
- Preservatives Used

A-6.2. CHAIN-OF-CUSTODY RECORD

The Chain-of-Custody Record (see example in Figure A-3) documents the history of the sample. Chain-of-custody elements address all aspects of sample collection, laboratory analysis, and final analytical data files. A copy of the pertinent pages of the Sampling Notes may accompany the Chain-of-Custody Record to the laboratory. The Chain-of-Custody Record contains the following:

- Analysis requested
- Sampler's initials
- Sampler's signature
- Sample identification

- Date sampled
- Time sampled
- Signature(s) of other custodians
- Type of sample container (e.g., laboratory cooler)

Samples are considered to be in a person's custody if they:

- are in your possession;
- are in your view, after being in your possession; or
- are placed in a secured location.

The Chain-of-Custody Record is completed after the samples have been taken and are being prepared for shipment to the laboratory. The record is placed in the shipping container (e.g., cooler) in a large zip-lock plastic bag (to protect the forms from water damage).

A-6.3. CUSTODY SEAL

The Custody Seal (see example in Figure A-4) maybe used to detect tampering of the samples during shipment to an off-site analyzing laboratory. When necessary or desired, a single custody seal is placed on a shipping container (e.g., cooler) such that opening the lid would destroy the seal. It is not necessary to put custody seals on individual sample containers within a larger shipping container provided the samples are always in the custody of the responsible personnel prior to shipment. Custody seals must be signed, initialed, and dated.

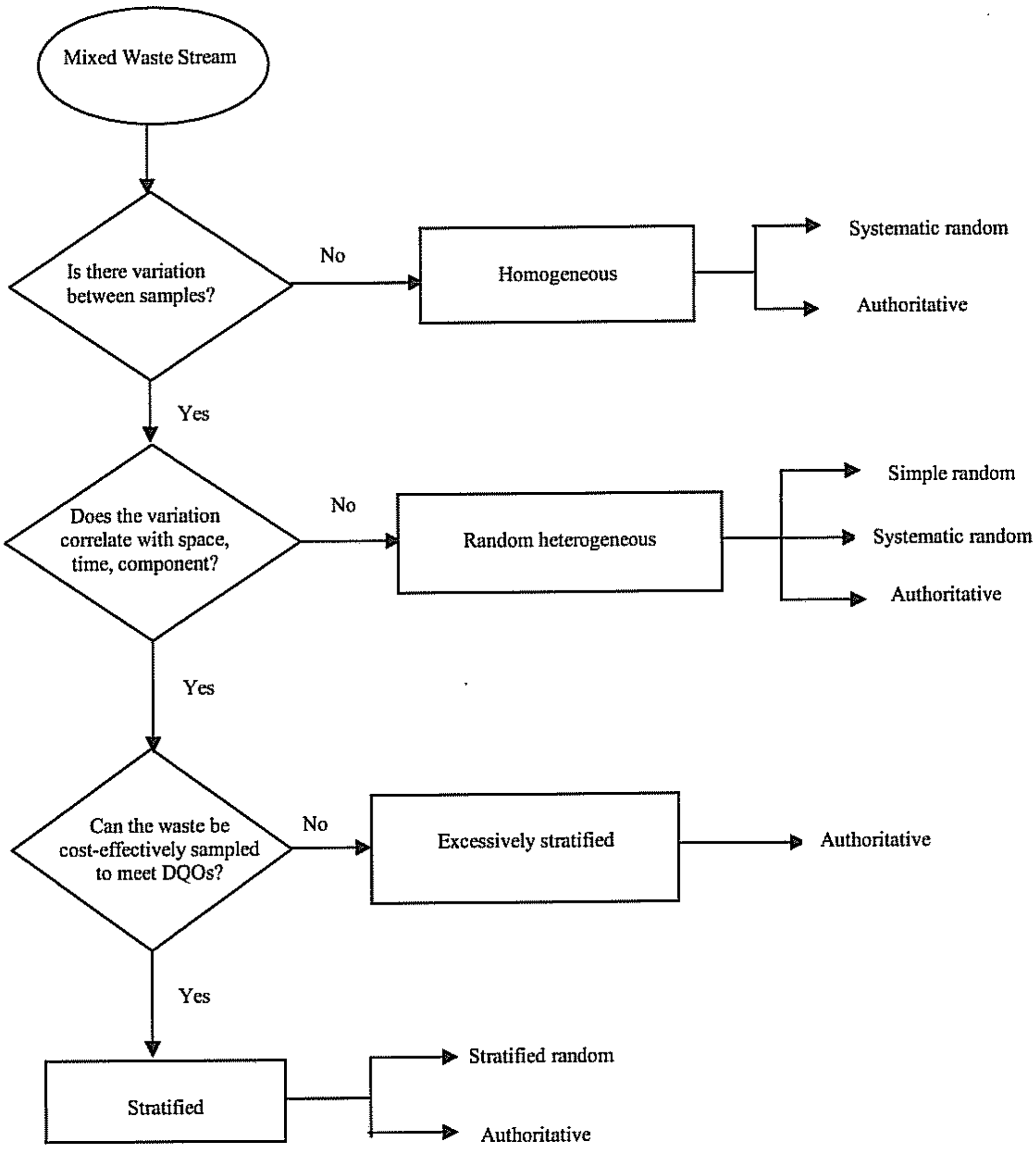

Figure A -1 **Sampling Methodology Determination**

<table>
<tr><td colspan="2">PermaFix®
Northwest, Inc.</td><td colspan="2">SAMPLE I.D.</td></tr>
<tr><td colspan="3">PROJECT #</td><td>DATE</td></tr>
<tr><td>SAMPLE TYPE
☐ Soil/Sediment
☐ Water</td><td colspan="2">COLLECTION MODE
☐ Composite
☐ Grab</td><td>TIME</td></tr>
<tr><td colspan="4">ANALYSIS</td></tr>
<tr><td colspan="2">SAMPLER(S)</td><td colspan="2">PRESERVATIVE</td></tr>
</table>

Figure A-2 **EXAMPLE ENVIRONMENTAL SAMPLE LABEL**
Mixed Waste Facility
Richland, Washington

Page ___ of ____

CHAIN-OF CUSTODY RECORD

Project Number ____________
Project Location ____________
Laboratory ____________
Sampler(s) ____________

SAMPLE IDENTITY	Date/Time Sampled	SAMPLE / CONTAINER DESCRIPTION										TOTAL
											Total No of Containers	

Relinquished by: ________	Organization ________	Date ___/___/___	Time: ______	Seal Intact?
Received by: ________	Organization ________	Date ___/___/___	Time: ______	Yes No N/A
Relinquished by: ________	Organization ________	Date ___/___/___	Time: ______	Seal Intact?
Received by: ________	Organization ________	Date ___/___/___	Time: ______	Yes No N/A

Special Instructions/Remarks ________________________

Delivery Method ☐ In Person ☐ Common Carrier ☐ Lab Cooler ☐ Other

EXAMPLE CHAIN-OF-CUSTODY RECORD
Mixed Waste Facility
Richland, Washington

Figure A-3

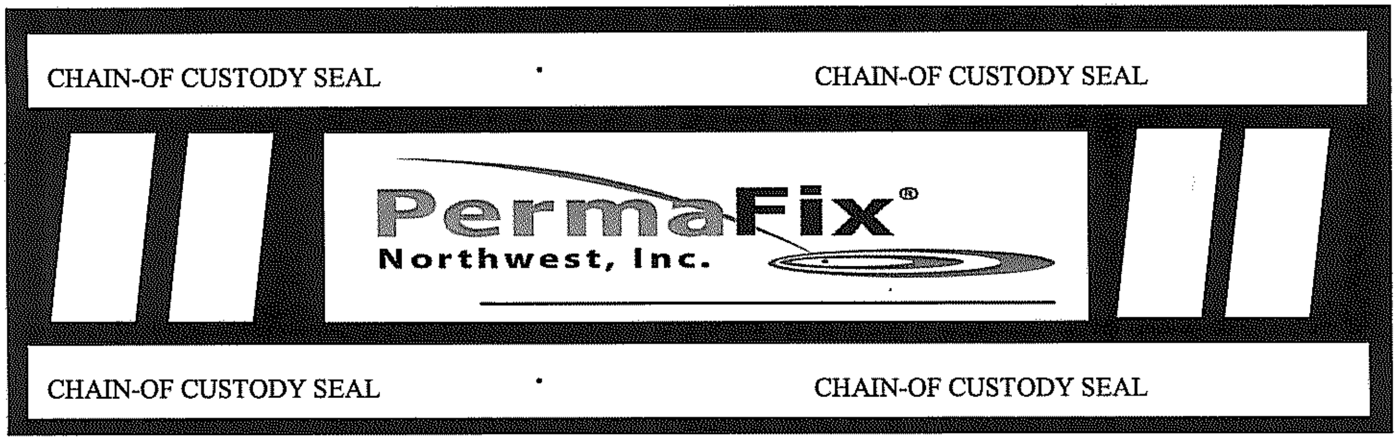

Figure A-4

EXAMPLE CUSTODY SEAL
Mixed Waste Facility
Richland, Washington