



SAMPLING AND ANALYSES PLAN
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TDSL Roll-off Bin Waste Classification
October 20, 2004

BACKGROUND

There are currently 99 roll-off bins staged at the Texas Disposal Systems Landfill, Inc. (TDSL) municipal solid waste (MSW) facility near Creedmoor, Travis County, Texas. It is estimated that the bins contain approximately 1,600 cubic yards of waste materials that were excavated by TDSL from the TDSL landfill. The waste materials comprise a mixture of MSW, daily soil cover, and possibly a relatively small amount of accident debris from an October 9, 1997 vehicle accident involving a Penske truck that was carrying Zenith Corporation (Zenith) color television cathode ray tubes (CRT). TDSL excavated the 1600 cubic yards of materials in early 2004 and placed them in the 99 roll-off bins.

For purposes of waste classification for disposal, the mixed waste materials currently stored in the bins have been sampled and tested for Toxicity Characteristic Leaching Procedure (TCLP) lead on two past occasions. In January and February 2004, SKA consultants implemented a sampling and analyses program on behalf of Zenith and Penske that resulted in 49 composite samples being tested for TCLP. In July 2004, the TCEQ implemented their own sampling and analyses program which resulted in another 20 composite samples being tested. Both of these past sampling and analyses efforts resulted in the wastes being classified as non-hazardous based on all TCLP test results being less than the RCRA TCLP lead characteristic level of 5.0 milligrams per liter (mg/l).

The current plan is to transport the wastes for disposal at the U.S. Ecology of Texas (USET) landfill facility in Robstown, Texas. Despite the past waste classification findings, Penske has agreed, for transportation purposes only, to manifest the wastes as TCLP lead (i.e. D008) hazardous. Once at the USET facility, however, additional sampling and TCLP testing will be conducted under this Sampling and Analyses Plan (SAP) for a final determination of the proper waste classification for disposal.

SAMPLING AND ANALYSES PLAN OBJECTIVE

The specific objective of this SAP is to provide representative waste samples and analytical testing to properly characterize the waste materials for disposal at the USET, Robstown facility. The sampling and testing protocol have been designed specifically to satisfy all applicable Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) requirements, including SW-846, as well as applicable USET and TCEQ requirements. This SAP has also been designed to meet and exceed the *sampling and testing standards that are routinely applied to waste classification efforts* within the environmental industry.



As detailed in the following sections, and based on my more than 20 years of experience (see resume attached), the number of samples that will be collected and analyzed under this SAP far exceed the typical number of samples that are routinely accepted by landfills, as well as the TCEQ, for purposes of classifying wastes for disposal. As stated in the TCEQ's enclosure to their July 23, 2004 letter to State Representative Eddie Rodriguez, the TCEQ describes that "...if a large number of roll-offs are present, sampling and characterizing a fraction of the roll-offs has been acceptable for making characterization decisions." Under this SAP, 100 percent of the roll-off bins will be sampled.

SAMPLING METHODOLOGY

Because the waste materials in the roll-off bins represent three-dimensional mixtures (i.e., waste piles), specialized protocols have been incorporated into this SAP to ensure that regulatory and industry standards for proper waste classification are met. The sampling protocols have been developed in conformance with published guidelines, including American Society for Testing Materials (ASTM) D6009-1 - Standard Guide for Sampling Waste Piles, EPA's publication 230/02-89-042 entitled "Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media", and EPA's Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846, 1986.

The sampling method to be used for each bin of waste will be *stratified random sampling*, modified slightly to provide a conservative bias with regard to the primary characteristic of interest (i.e., TCLP lead). The modification involves the selective elimination of large constituents of MSW from the randomly selected sampling locations. Support for the selected sampling methodology is provided as follows:

- Consistent with SW-846 guidelines, the use of stratified random sampling techniques is appropriate to address the potential for distinct strata to exist within the roll-off bins. It is noted, however, that given the degree of mixing that has occurred since the materials were first placed into the landfill and then aggressively mixed with daily cover and MSW, pushed to a second location within the landfill, and then finally excavated and loaded into the roll-off bins, the wastes of primary interest (i.e., CRT and CRT-impacted soils/materials, if any) are likely distributed randomly throughout the waste.
- Given prior actions to remove visible pieces of CRT from the landfill, and the multiple aggressive mechanical mixing events that have occurred, it is highly unlikely that CRT could be present as large pieces. Instead, any CRT that could possibly remain would exist as tiny shards that would be captured by our sampling methodology. Eliminating large constituents of MSW (e.g. beer bottles, bicycle wheels, etc.) for sampling purposes will further maximize the opportunity for testing actual CRT wastes or soils/materials that could contain CRT wastes (if any are present), thus resulting in a conservatively biased sampling program.
- The planned sampling method takes into account random variability that may exist within a given "waste pile". Important to utilizing this procedure is the fact that,



within the regulating and regulated communities, it is understood that classification of mixtures of wastes (i.e. waste piles, building demolition debris, etc.) does not require discrete sampling and testing of individual materials within the pile. This fact is evident in the EPA's own waste pile sampling guidance which allows for "representative sampling". Representative is defined by the EPA in SW-846 as "...exhibiting average properties of the whole waste". This fact is also readily apparent from the sampling protocol implemented by the TCEQ on the very waste materials that are the subject of this SAP, wherein they collected 20 three-part composite samples from only a fraction of the roll-off bins.

- Discrete sampling, as opposed to composite sampling, will eliminate the potential for masking randomly occurring "hot spots" that could be encountered. This, again, provides for a conservative approach to characterizing the wastes. As noted above, however, given the degree of aggressive mixing that has been imposed on these wastes, it is unlikely that hot spots of any significance still exist.
- To implement stratified random sampling, Dr. Robert D. Gibbons Ph.D. (see resume attached) has conservatively determined on a statistical basis that four discrete waste samples will be collected from each bin. This approach therefore, will result in approximately 400 discrete samples being collected for TCLP analyses. Based on my personal experiences over the past 20 years, this number of samples significantly exceeds industry standards.

The exact locations to be sampled within a given bin will be pre-determined by Dr. Gibbons using a random number generator to identify discrete three dimensional "cells" from which the samples are to be collected. Field procedures that will be utilized to implement the sampling are described in the following sections.

ROLL-OFF BIN SAMPLING PROCEDURES

To reduce potential health and safety and/or odor concerns, each roll-off bin will be opened at least 30 minutes prior to sampling. Opening a bin will involve removing an outer tarp and opening and peeling back an interior plastic liner. The tarp and plastic liner should be removed from the surface of the waste materials to the maximum extent practicable to allow for maximum ventilation. The sampling technicians will be equipped with a photo-ionization detector (PID) to test for the presence of volatile organic vapors. The bin will not be entered for sampling until breathing zone PID readings are non-detect, or respiratory protection is utilized in accordance with the site-specific Health and Safety Plan.

Locating and Marking Pre-Determined Sample Locations

Discrete sample locations will be located and marked as follows:

- Each bin will be assigned a sequential number, beginning with 1, in the order in which they arrive at the USET facility. The bin number will then be utilized to assign the pre-determined sampling locations.



- After assigning the bin number, each bin will be partitioned into four main quadrants and each of the main quadrants will then be further sub-divided into four sub-quadrants. These divisions will result in the surface of the wastes (i.e. the x and y components) being divided into 16 approximately equal two-dimensional "Sections".
- The main quadrants will be established by measuring the bin dimensions to determine the approximate mid-points along the bin's length and width. Ropes will then be pulled across the mid-points so as to divide the bin into four approximately equal main quadrants. Weights secured at the ends of the ropes, or other equivalent means, will be used to keep the ropes in place. Using this same general approach, the four main quadrants will then be further sub-divided into four sub-quadrants of approximately equal dimension.
- After establishing the 16 approximately equal two-dimensional Sections, the four Sections from which samples will be collected (i.e. as determined by the random number generator) will be marked with spray paint. The spray paint will be applied to the surface of the waste, at the approximate center of the specified Sections.
- After marking the four sampling locations, duct tape will be applied to the edge of the bin, directly across from the painted Sections. Using a black permanent ink marker, the duct tape will be used to identify the vertical (i.e. the z component) sample interval for each sample. As determined by the random number generator, the duct tape will be marked with the words top, middle, or bottom. Top refers to the upper approximate 1/3 of the waste column at the individual sample Section, middle refers to the middle approximate 1/3, and bottom refers to the lower approximate 1/3.
- The height of the waste column at any given sample Section will be determined by measuring down to the waste from the top of the bin, and then subtracting the measured number from the total bin height. For instance, if the distance to the top of the waste is 3 feet from the top of the bin, and the bin is 6 feet tall, then the waste column would be 3 feet (6ft - 3 ft). A "middle" sample would, therefore, be collected from within the 1 to 2 ft depth interval.
- After the sampling locations have been properly marked, the ropes will be removed for use on the next bin.

Waste Sampling Procedures

After a bin has been opened and all sampling points within a given bin have been pre-marked in accordance with the procedures described above, the sampling technician will enter the bin to begin the sampling activities. Access into the bin will be by ladder, or other available structure, that provides for safe entry and exit.

- As appropriate, sample depths may be accessed using any hand tool (e.g. shovel, post-hole digger, hand-auger, etc.) that allows for efficient removal of overburden.



- Once the sample depth is reached, grab samples of the waste materials will be collected by gloved hand (typically for "Top" samples), or by using a decontaminated hand bucket-auger device, where depth requirements dictate (i.e. typically for Middle and Bottom samples).
- At each sample node, large constituents of MSW (i.e. MSW that will not readily fit into the sample jars) that may be present will not be sampled. For "Top" samples, however, if large MSW is present, it will be inspected for evidence of CRT (e.g. glass shards), before discarding. If CRT or suspect material is observed to be contained in, or attached to, the MSW, the CRT or suspect material will be incorporated into the sample. For Middle and Bottom samples, where visual observations will not be possible, large pieces of MSW will automatically be eliminated from sampling by the mechanical nature of the sampling device (i.e., approximately 3-inch diameter auger bucket).
- At pre-determined sample locations that are comprised entirely of large MSW, or where the presence of large MSW prevents efficient access to the pre-determined sample depths, an alternate location will be selected for sampling. Under these conditions, the alternate location will be determined by the field Team Leader and will be located within the boundaries of the original sample Section.
- If a condition exists where a sample can not be collected from the pre-determined sampling Section due to the anomalous presence of large MSW, the Field Team leader will temporarily delay sampling from that main quadrant until a new randomly generated sampling point can be provided. The new number will be generated and provided to the field sampling Team by the Project Manager.
- Once collected, the samples will be placed directly into laboratory supplied sample jars, labeled, and placed into a pre-cooled sample shuttle for delivery to the environmental laboratory. Chain-of-custody forms will be completed to accompany each shipment of samples to the analytical laboratory. Samples will be analyzed for TCLP lead by EPA SW-846 Method 1311/6020. The samples will be submitted for a 72-hour turnaround.
- Following sample collection, gloves worn by the sampler, and all other investigation derived wastes, will be discarded within the waste bin. After sampling is complete at a given waste bin, the plastic liner will be placed back into the bin and the tarp will be placed over the bin.

CLASSIFICATION FOR DISPOSAL

Final classification for disposal will be made on a bin-by-bin basis, as follows:

- If any individual sample analysis from a given bin is determined to exceed 5.0 mg/l TCLP lead, all wastes within that bin will be classified for disposal as D008 hazardous. Additional assessment to determine the actual source of the lead (i.e. CRT related or otherwise) will not be conducted.



- If any individual sample analysis from a given bin is determined to exceed 1.5 mg/l TCLP lead, all wastes within that bin will be classified for disposal as Class 1 non-hazardous. Additional assessment to determine the actual source of the lead (i.e. CRT related or otherwise) will not be conducted. Appropriate documentation of the proper classification will be attached to the hazardous waste manifest for the roll-off and signed on behalf of Penske prior to disposal.
- If all sample analysis from a given bin are determined to be below 1.5 mg/l TCLP lead, all wastes within that bin will be classified for disposal as Class 2 non-hazardous. Appropriate documentation of the proper classification will be attached to the hazardous waste manifest for the roll-off and signed on behalf of Penske prior to disposal.

DECONTAMINATION

Prior to use, all sampling equipment and hand tools will be decontaminated by hand scrubbing with an Alconox™ soap (or equivalent) and water solution followed by a rinse with distilled or de-ionized water. Geomatrix will utilize two hand augers which will be alternated during sampling. While one auger is in use by the technician sampling in the waste bin, the other will be cleaned by a technician stationed outside the bins:

Decontamination waters will be containerized in labeled 55-gallon drums, and placed on wooden pallets for transport to an on-site staging location. It is anticipated that these waters will be placed in the facility's wastewater treatment system for disposal.

SITE HEALTH AND SAFETY

All field activities will be conducted in accordance with the Site Specific Health and Safety Plan (HASP) prepared by Geomatrix. Safety meetings will be held prior to beginning each work shift, and will be documented in a Project Health and Safety (H&S) Form. These meetings will be used to discuss the planned activities, associated safety concerns, and correction of any unsafe practices. All individuals directly involved in the sampling activities will be required to attend the meetings and sign the H&SM Forms.

FIELD DOCUMENTATION

Geomatrix personnel will provide written documentation of all pertinent field activities. Completed documentation will be filed and maintained by Geomatrix. Field documentation will include completion of the following:

- Project H&S forms
- Daily Field Record forms
- Sampling Log(s) and Laboratory Chain-of-Custody Forms
- Photographs of pertinent observations