



South Carolina Department of Health
and Environmental Control

MEMORANDUM

TO: Laboratories/Generators/Consultants/Others

FROM: Waste Assessment Section
Bureau of Land and Waste Management

DATE: March 6, 2013

SUBJECT: Method 1311, TCLP Extract, Correlated with Variable
Detection Levels According to Rationale for Testing

REFERENCE: A revision of the January 4, 2001 memorandum. An Inquiry- Why Does
the Department Require Different Reportable TCLP Detection Levels,
PQL's and RL's for Solid Wastes?

INTRODUCTION

The referenced question still requires a response. This response is based on the revised Solid Waste Regulations that were published on May 23, 2008 and the Land Application Regulations that were published on July 26, 1996. The referenced question involves Waste Characterization by sample analysis for the determination of disposal fate in accordance with the State of South Carolina Regulations.

The Toxicity Characteristic Leaching Procedure (TCLP: SW-846 Method 1311) is the primary analytical preparation method for waste characterization. The primary regulations for waste characterization are:

- 1) The South Carolina Pollution Control Act: Title 48 – Environmental Protection and Conservation, Chapter 1, Section 48-1-10 et sec.
- 2) R.61-79.262 of the South Carolina Hazardous Waste Regulations.
- 3) R.61-107.19 (SWM: Solid Waste Landfills and Structural Fill) Subpart C and Subpart B III and IV (a) (1). (This revision combined the previous regulations R.61-107.258 SWM: Municipal Solid Waste Landfills published on June 23, 1995, R.61-107.11 SWM: Construction, Demolition and Land Clearing Landfills published on July 28, 1995 and R.61-107.16 SWM: Industrial Solid Waste Landfills published on June 26, 1998.)
- 4) R.61-107.15 (SWM: Land Application Regulations).

Discussion

- 1) The South Carolina Pollution Control Act established a mandate for the protection of the Air, Land and Waters of the State of South Carolina from chemical discharges or releases and the improper and un-permitted disposal of generated waste debris. This Act is the driving force behind all of the SCDHEC Environmental Quality Control Regulations.
- 2) On May 24, 1988 the USEPA proposed an analytical preparation method for waste, soil and water samples known as the Toxicity Characteristic Leaching Procedure that is used for the determination of the leachability of various inorganic and organic chemical contaminants that may be found in wastes, soils or water. This Method was adopted by SCDHEC in 1990.

R.61-79.262 defines a Solid Waste and what makes a Solid Waste a Hazardous Waste. Subpart C of 262 defines the Characteristics of a Hazardous Waste which includes Ignitability, Corrosivity, Reactivity and Toxicity. Ignitability and Corrosivity primarily involve liquids while Reactivity involves chemicals that explode, spontaneously combust or violently react and can give off toxic fumes.

The toxicity of a chemical contaminant is determined by the TCLP and involves 8 metals and 49 organic compounds that include Volatile Organics, Semi-Volatile Organics, Pesticides and Herbicides.

- 3) On May 23, 2008 a revision of the Solid Waste Landfill Regulations, (updates to previous waste and landfill characterization versions which were issued in 1995 and 1998), was published (as mentioned in point 3 in the above Introduction). The citation is R.61-107.19 "SWM: Solid Waste Landfills and Structural Fill". The section of this regulation referred to as Subpart C is entitled Waste Characterization. In this regulation are the requirements for landfill classes and requirements for structural fill. Subpart B sections III and IV (a) (1) state the established analytical limits as compared to the MCLs in R.61-58 Drinking Water Regulations. [Where no published MCL is available, the USEPA – Regional Screening Levels, RSL's, *tap water values*, may be substituted in place of the MCL value. Where no MCL value, or equivalent, can be determined for the waste stream, which has been determined not to be **hazardous**, the stream will be disposed of as Class Three or MSW waste].

Solid Waste - waste characterization involves generator knowledge of the generated waste concerning potential chemical waste contamination. By using the TCLP and associated and applicable analytical methods, a determination of overall inertness of the waste stream can be made, indicating the appropriate means of disposal available.

Each Landfill, by its design, can only accept wastes at their designed inertness level. The term **Regulatory Threshold** is used by the department for the purpose of understanding those wastes which when tested are acceptable for disposal in a specific Class of landfill. The regulatory threshold for any landfill class is simply the MCL value times the landfill class number. All classification data must have a **Practical Quantitation Limit**, PQL, or

Reporting Limit, RL, which is less than the Regulatory Threshold, RT, for your waste at the desired disposal site or landfill. When an analytical **Detection Limit**, DL or MDL is provided, then the Department may be able to use **estimate or J-Values** in its determinations,

- a. If the analytical results are below the established TCLP Limits (R.61-79.262) and the waste is a non-listed material with no free liquids, then disposal in a Class Three Landfill is acceptable.
- b. If the analytical results are < 10 times the MCL (or equivalent) as listed in R.61-58.5 per R.61-107.19 B IV (a) (1), then disposal in a Class Two or Three Landfill is acceptable.
- c. If the analytical results are at or below the MCL and are considered to be construction and demolition debris or otherwise inert, then disposal in a Class One Landfill or as Structural Fill is acceptable.
- d. If the material is capable of being tilled into soil and the TCLP results are at or below the MCLs as stated in R.61-58.5 and if the material meets the standards as stated in R.61-107.15 for Land Application material, then the material is acceptable by SCDHEC Standards for use as soil enhancement pending approval by the Clemson Agricultural Extension Service and the SC Department of Agriculture.

In order to further explain the above discussion, various quotations from some of the mentioned regulations are included below.

R.61-107.19 C (Waste Characterization)

Paragraph 1b. “Waste Characterization Report”(p.12): “The toxicity characteristic leaching procedure (TCLP) (USEPA Method 1311) shall be used to obtain all extracts for the purpose of characterizing a solid waste proposed for disposal in a solid waste landfill.”

Paragraph 1c. (p.12): “The analytical results of the TCLP shall be compared to the MCLs in South Carolina R.61-58 State Primary Drinking Water Regulation to determine the appropriate class landfill in which the waste stream may be disposed. If no MCL exists for a parameter, then those drinking water risk-based concentrations recognized by EPA Region IV shall be used to determine the appropriate class landfill for the waste. For those parameters where no MCL or Region IV number exists, the Department, using input from the permittee, will develop an appropriate number for determining the landfill class for disposal of that waste stream. “

Paragraph 2b. “Waste Testing and Waste Stream Determination” (p.13):

“For the initial characterization of solid waste to be disposed in a solid waste landfill, a minimum of two (2) representative samples of the waste shall be collected and tested in accordance with the TCLP procedure. TCLP testing of additional samples of the industrial solid waste may be required by the Department, based on a high degree of variability in the concentration of a parameter at or near the maximum allowable concentration for a particular landfill class. The Department may allow, with prior approval, the testing for selected constituents based on the Generator’s knowledge of the process.”

These paragraphs, in summary, document that regardless of which constituents are chosen for analytical testing of representative samples, the TCLP extract is used and the Detection Level is less than the MCL. Note: An example (representing Paragraph 2b.) would be the Department allowing the use of the RCRA TCLP constituents (for characterization of solid waste landfill for applicable classification) in lieu of the R.61-58.5 drinking water constituents (i.e. SCDHEC Form 3661 which contains more analytical constituents than the RCRA-TCLP SCDHEC Form 3658) or other constituents deemed necessary by the Department.

- 4) Analytical Data Reporting Forms are interchangeable, according to which constituents are selected via the rationale for sampling and testing wastes.

Understand that the Forms can be interchangeable, as mentioned in the “Note” above. For example, the Form DHEC 3658 Industrial RCRA – TCLP Volatile is applicable to RCRA Volatile Organic Constituents whereas Form DHEC 3661 Industrial Volatile TCLP R.61-58.5 is applicable to Drinking Water Volatile Organic Constituents. However, one may use either the DHEC 3658 or 3661 Forms for Volatile Organic Constituents, according to whether the generator (through knowledge-R.262.11) determines the additional constituents on Form 3661 are necessary for proper, accurate testing of solid waste.

The PQL/RL may be the same for either form (i.e. SCDHEC Form 3658 & SCDHEC Form 3661) according to the rationale for testing.

- 5) Pollution Control Act:

Also, additional constituents should be added to the Analytical Testing portion of the Sample Plan based on knowledge of the process when the potential exists for violation of the Pollution Control Act (i.e. anything that is harmful to human health and the environment exists at the sample site). The same forms are used, but expanded to include those extra constituents of concern. Also, the RL’s remain the same as the other constituents applicable to the MCL’s or concentrations based on health concerns.

It is requested that anyone (Facility/Laboratory/Consultant/Others) considering testing for an unknown reason contact the permit engineer, enforcement personnel, or whichever SCDHEC personnel are responsible for the facility or site to be sampled. Questions and/or comments may be directed to personnel in the Waste Assessment Section of the Bureau of Land and Waste Management.

We will work with all parties to help in any manner we possibly can to assist in the development of acceptable Sample and Analysis plans, SAPs, and any regulatory interpretation and/or explanation for the use of any Forms (DHEC 3657, 3658, 3659, 3660, 3661, 3662, 3732 and 3733).

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