

The Honorable Charlie Norwood
United States House of Representatives
Washington, D.C. 20515

Dear Congressman Norwood:

This letter follows up on our letter of March 27, 2000 regarding the placement of biosolids on farms in Augusta, GA. It addresses the questions remaining from our March 6, 2000 meeting with your staff and constituents, and your March 14, 2000 letter to Tim Fields, the Environmental Protection Agency's (EPA) Assistant Administrator for Solid Waste and Emergency Response.

This letter clarifies EPA policy on making determinations on whether a waste is a hazardous waste under the Resource Conservation and Recovery Act (RCRA) regulations, and provides the documents you requested regarding this issue. It also responds to questions raised at the meeting about liability under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Our responses to your questions follow.

1. Does EPA presume that waste is a hazardous waste (under 40 CFR 261.24) if 1/20th the total concentrations of Toxicity Characteristic (TC) waste constituents exceed the regulatory value, and no Toxicity Characteristic Leaching Procedure (TCLP) test results of the same waste are available?

No, EPA does not make a broad presumption that a waste is TC hazardous if 1/20th the total constituent concentrations in the waste exceed the TC regulation levels. The RCRA regulations define a waste as a Toxicity Characteristic hazardous waste if TCLP testing of a representative waste sample results in leachate constituent concentrations equal to or greater than the TC regulatory values (40 CFR 261.24(a)). Waste generators are required to determine whether their waste is hazardous. They may do this either by testing or by using their knowledge of constituents in the waste and the process that produces the waste (40 CFR 262.11(c)).

Information on waste constituents can be used as part of a generator's knowledge in determining TC compliance (TCLP Section 1.2; SW-846 Method 1311; enclosure #11), but the use of knowledge must be consistent with the TCLP. The EPA has published a TC regulation compliance screen, which uses data on total constituent concentration in waste to calculate the maximum theoretically possible TCLP leach test result for the waste (enclosure #24). This calculational screen may be used as one type of generator knowledge, in certain circumstances, to determine the RCRA status of a waste, as described in detail in Attachment 1 to this letter.

For waste materials that are solids according to the criteria in the TCLP test¹, the screen does involve comparing 1/20th the total concentration of a waste constituent with the TC regulation value for that chemical. Applied to solids, the calculation can be used to show that a waste is not TC hazardous; but alone, total waste concentration data cannot show that a waste is a TC hazardous waste. When 1/20th the total concentration of a TC constituent in a 100% solid sample is greater than or equal to the TC regulation level for wastes, the result is inconclusive about waste status. It shows only that it is theoretically possible that the waste is TC hazardous, if 100% of the constituent(s) of concern were to leach in the TCLP test. However, the TC metals almost never leach completely from waste during the TCLP test, because of their solubility limits, binding in the waste matrix, and other factors. Therefore, EPA does not and could not presume that a 100% solid waste is hazardous solely because 1/20th of the total concentrations of constituents in the waste exceed the TC levels.

The calculational screen was developed for use with data on waste in the form that it is in when generated or managed. We have not applied the screen to dry weight data derived from waste that has a substantial liquid portion, such as POTW biosolids. As described in Attachment 1, we believe using dry weight data in the calculational screen will produce an estimate of the maximum possible TCLP result, for metals. However, totals data (on solids) cannot by themselves be used to show that a waste is a TC hazardous waste, and biosolids cannot be shown or presumed to be TC hazardous waste based only on dry weight data.

A number of EPA staff letters addressing this issue are publicly available from the RCRA Online website. EPA responds to individual requests for help in applying Agency regulatory requirements in particular cases, and these responses are public documents (under the Freedom of Information Act). Some of these letters may be interpreted as being inconsistent with the above discussion regarding the use of total waste concentration data in hazardous waste determinations. However, EPA explicitly states on this website that the RCRA Online letters do not constitute EPA policy. The materials made available to the public on RCRA Online are presented with the following disclaimer statement: AThis database, ...and the documents cited in this database are not intended to serve as statements of EPA policy.@ We make these documents readily available to the public through RCRA Online because, historically, members of the public have requested a wide variety of documents associated with the RCRA program, and because such access is consistent with the Electronic Freedom of

¹ Attachment 1 describes how the calculational screen can be applied to wastes that are liquid, as determined by the TCLP test, or are part liquid and part solid, such as biosolids.

Information Act Amendments of 1996. Our disclaimer statement is intended to help the public understand the role of these documents in the RCRA program.

The specific letters cited in your March 14, 2000 letter provide staff advice on prudent practice for waste generators in particular situations; they do not set policy or legally binding requirements, as exist in regulation. Gail Hansen, author of the 1987 letter, clearly differentiates between her advice on prudent practice and RCRA regulatory requirements in her February 5, 1991 letter. Ms. Hansen's 1991 letter states that, even when TCLP results are inconclusive, generators are not required by either regulations or policy to assume that the waste is hazardous, but rather may use their full knowledge of the waste to make a determination, including a determination that the waste is not hazardous. This statement is consistent with EPA regulations on waste determinations (262.11(c)(1)&(2)) established in 1980 and unchanged since then.

Your letter also asked us to identify documents that are consistent with the March 6, 2000 discussion paper and inconsistent with the 1987 letter from Ms. Hansen. One example of a document that is consistent with the March 6 paper is Ms. Hansen's 1991 letter. For your information I have enclosed an indexed set of relevant documents. The documents discussing the TCLP calculational screen indicate that the screen is an acceptable means of using knowledge of the waste to potentially show that a waste is not a TC hazardous waste. However, these explanatory documents do not address the case where 1/20th the total concentration of dry weight samples, that are derived from waste that is part liquid, exceeds the TC regulation value. My letter today clarifies Agency policy on these matters.

2. Please explain whether the RCRA domestic sewage exclusion (ADSE) would affect the potential CERCLA liability of sewage generators discharging wastewater to POTWs for response costs or damages arising from land application of biosolids from the POTWs.

Sewage generators could potentially be liable as persons who arranged for the disposal of the hazardous substances they generated under CERCLA ' 107(a)(3). The DSE would not affect the potential liability of the generators under CERCLA if the generators' discharges include CERCLA hazardous substances. However, you should be aware that other statutory provisions may affect the generators' liability.

The determination of CERCLA liability would be a fact-specific one which would turn on a range of factors, including whether the generator is shielded from liability due to the federally permitted release provisions of the statute, and whether the application of biosolids constitutes the normal application of fertilizers.

There is no liability under CERCLA for response costs or natural resource damages resulting from a federally permitted release. CERCLA ' 107(j). CERCLA specifies a number of federally permitted releases. Most importantly, the introduction of any pollutant into a POTW is a federally permitted release when such pollutant is specified in, and in compliance with, applicable Clean Water Act pretreatment standards and enforceable requirements in a state or municipal pretreatment program. CERCLA ' 101(10)(J).

Liability may also be affected by the exclusion from the definition of a release for the normal application of fertilizer. CERCLA ' 101(22)(D). Placement of biosolids on the land may constitute the normal application of fertilizer, in which case it would not be a release under CERCLA and would not give rise to liability. In evaluating whether the placement of biosolids constituted the normal application of fertilizer, EPA would consider, among other things, compliance with the Clean Water Act ' 405 (d) sludge requirements and use of appropriate application rates. 58 Fed. Reg. 9248, 9262 (Feb. 19, 1993).

Other factors may also affect CERCLA liability, and it is difficult to generalize further about whether a generator would be liable for response costs or natural resource damage resulting from the application of biosolids.

I hope this discussion and enclosed material addresses your questions on EPA's implementation of regulations for determining whether or not waste is hazardous under RCRA, and potential CERCLA liability for indirect industrial dischargers. We will look forward to the opportunity to discuss this with you and your staff in the near future.

Sincerely Yours,

Michael Shapiro
Principal Deputy Assistant Administrator

Attachment 1: Use of the TC Calculational Screen in Determining the RCRA Status of a Waste.

Attachment 2: Index of Enclosed Documents Related to Waste Identification and the TCLP Calculational Screen

**Attachment 1 to July 5, 2005, Letter to Congressman Norwood on Biosolids:
Use of the TC Calculational Screen in Determining the RCRA Status of a Waste.**

Regulations at 40 CFR 262.11 give generators of waste the obligation to determine whether or not the waste is a hazardous waste under RCRA. For potentially characteristic waste, generators may use either their knowledge of the waste, or testing, to make this determination. A part of this obligation is that generators make correct determinations about waste status. The Agency does believe that when a waste generator has substantial doubts about the true status of a waste, it would be prudent practice to either collect more information on the waste, or failing that, manage the waste as a hazardous waste. Although the decision whether to test a waste or rely on process knowledge is up to the generator, EPA believes the possibility of enforcement if the waste is later found to fail the TC (or other characteristics) regulation(s) provides a strong incentive for waste generators to make correct determinations as to whether their waste is hazardous.

Information on waste constituents can be used as part of a generator's knowledge in determining TC compliance, but the use of knowledge must be consistent with the TCLP². The TCLP test applies to wastes in the form in which they are generated or are being managed. Wastes may be all liquid, all solid, or part liquid and part solid. Wastes having less than 0.5% solids (dry weight) are considered liquid wastes in the TCLP, and the filtered liquid (less the solid portion) is considered the waste extract. It is directly analyzed for constituent concentration and comparison with the TC regulation values to determine compliance. All-solid wastes (in the TCLP, those wastes releasing no liquid under pressure filtration, also described as being A100% solid²) are mixed with 20 times their weight of leaching fluid, and after 18 hours of mixing, the filtered extract is tested for constituent concentration and comparison with the TC values. For wastes that are part liquid and part solid, the liquid and solid portions are separated by pressure filtration. The solid portion is then leached with 20 times its weight in leaching fluid, and the filtered extract combined with the liquid portion of the original waste for analysis of constituent concentration and comparison with the TC values.

Because some generators routinely collect totals data on their waste, the Agency has developed a calculational screen (based on the TCLP) using total constituent concentration to determine the maximum theoretical TCLP result for the waste. The TCLP test requires that 1 part of a solid sample of waste be leached with 20 parts

² This paragraph describes the TCLP test very briefly. Refer to the complete test procedure (SW-846 Method 1311) for details on how the test addresses issues such as the presence of volatile organic chemicals, waste particle size, non-miscible waste fractions, and other topics.

leachate solution, so for solids (in the TCLP), the calculation involves dividing the total constituent concentration by 20 and comparing the result with the TC regulatory value for the constituent.

For waste that is 100% solid, data on total concentrations of TC waste constituents can be used to show that a waste is not TC hazardous; but alone, these data cannot show that a waste is a TC hazardous waste. When 1/20th the total concentration of a constituent is less than the TC regulation level for an all-solid waste, the waste could not exceed the TC regulation value in the TCLP if the test were performed. However, the screen is definitive for 100% solid waste materials only when 1/20th the total is less than the TC value. When 1/20th the total concentration of a TC constituent in a 100% solid sample is greater than or equal to the TC regulation level for wastes, the result is inconclusive about waste status. It shows only that it is theoretically possible that the waste is TC hazardous if 100% of the constituent(s) of concern were to leach in the TCLP test. However, the TC metals almost never leach completely from waste during the TCLP test, because of their solubility limits, binding in the waste matrix, and other factors. Therefore, EPA does not and could not presume that a 100% solid waste is hazardous solely because 1/20th of the total concentrations of constituents in the waste exceed the TC levels.

For wastes such as biosolids that have a liquid and a solid phase as-generated or as-managed, the calculational screen (as does the TCLP) requires separation of the two phases for evaluation³ (see ATest Methods Frequently Asked Questions@, enclosure #24). Constituent concentration in each phase is determined, and the results combined to determine the maximum theoretical TCLP result for the waste as a whole. As above, the calculation can show definitively that a waste is not hazardous, if the maximum theoretical TCLP result is less than the TC regulation value. For some of these wastes, the data on concentration in the liquid portion alone may show that a waste is a TC hazardous waste, if the liquid portion is a high percentage of the total waste and has a high enough concentration of the constituent of concern dissolved in it. This evaluation can only be performed on the waste itself, as-generated or as-managed, by filtering the sample, measuring constituent concentrations in the liquid portion and the solid portion, and measuring the fraction of each portion in the whole waste.

Constituent concentration data on biosolids intended for land application, however, are typically not reported on the biosolids in their as-generated or as-

³ Data on the Augusta biosolids appear to show greater than 0.5% solids as-generated, and so cannot be evaluated using the method for TCLP liquid wastes. Some of the Augusta data appear to be presented in both mg/kg and mg/l, with the measured percent solids used to relate the two concentrations. It is our current understanding that the data expressed in mg/l represent concentrations in samples that have been digested in the laboratory to bring all the solids into solution, and are not analyses of the liquid portion of the biosolids as-generated.

managed form. Rather, they are reported on a dry weight basis, as required by the 40 CFR Part 503 regulations (and predecessor 40 CFR Part 257)⁴. Pressure filtered solids in the TCLP are different than dry weight samples. The TCLP solids will contain some residual water (and may contain volatile organics), and dry weight samples will not. Also, dry weight samples will contain some amount of constituents that were dissolved in the liquid portion of the as-generated waste, and that would not be in the TCLP solid phase of the sample.

Because of these differences in sample types, use of dry weight data to assess the RCRA status of biosolids must be qualified. Dry weight data cannot be used in the part liquid/part solid approach because these data do not indicate what portions of the waste were TCLP filtered solid and liquid, nor do they show constituent concentrations in each portion of the original waste. Also, dry weight analysis will not include data on volatile TC constituents, and so no conclusions about compliance or non-compliance with the TC regulations can be made with regard to the TC volatiles based on dry weight data (including elemental mercury, a volatile metal).

Previous EPA statements were not referring to dry weight samples when they discussed the use of total data. We believe that for inorganic constituents where the waste has low total solids, as appears to be the case in the biosolids data from Augusta (see NewFields Memorandum of March 6, 2000, Tab 4), dividing the dry weight concentration data by 20 will nonetheless estimate the maximum possible TCLP result. Like the calculational screen results on TCLP 100% solids, however, this calculation using dry weight data can only be used to determine that a waste is not TC hazardous (for non-volatiles). Dry weight data alone cannot show that a waste is a TC hazardous waste, for two reasons. First, the constituent concentrations in the liquid portion of the original biosolids waste were not measured, and cannot be reliably reconstructed from the dry weight data. Second, it cannot be assumed that 100% of the TC metals present in a dry weight sample derived from biosolids were dissolved in the liquid portion of the original waste, or would leach out of the solid portion if a TCLP test were done. For example, a 1991 EPA study of TCLP leaching of metals from POTW biosolids found a median leaching rate of less than 1% of total metals present.

⁴ Guidance from the Georgia EPD in 1983 also required reporting on a dry weight basis for metals in biosolids being land applied. See "Guidelines for Land Application of Municipal Sludges", September 1983, issued by the Georgia Department of Natural Resources, Environmental Protection Division, page 1.

**Attachment 2: Index of Enclosed Documents
Related to Waste Identification and the TCLP Calculational Screen**

Documents Related to Waste Identification and Generator Obligations

- (1) Regulatory Text 40 CFR 262.11
- (2) Final Regulation on Generator Regulations (45 FR 12726-27; February 26, 1980)
- (3) Final Regulation on Identification and Listing of Hazardous Waste (45 FR 33084, 33105; May 19, 1980)
- (4) Final Regulation on Toxicity Characteristic (55 FR 11798, 11829; March 29, 1990)
- (5) Letter 9/4/84
To: Ms. K. T. Allford; From: Alan S Corson
- (6) Letter 4/16/91
To: Mr. Michael H. Oberg; From: Sylvia K. Lowrance
- (7) Letter 5/1/91
To: Mr. James C. Maes ; From: Sylvia K. Lowrance
- (8) Letter 5/21/91
To: Commanding Officer, Dept. of the Navy; From: Sylvia K. Lowrance
- (9) Letter 10/9/91
To: Dr. Irving M Kipnis; From: Gail Hansen
- (10) Letter 4/12/94
To: Mr. Mark Clements; From: David Bussard

Documents Related to the TCLP Calculational Screen

- (11) SW-846, Method 1311 -Toxicity Characteristic Leaching Procedure; Sections 1.2 and 2.1
- (12) Proposed Toxicity Characteristic Regulation: 51 FR 21648, 21656 (June 13, 1986)
- (13) Response to Comment Document, Final Toxicity Characteristic Regulation
U.S. EPA, A Technical and Response to Comments Background Document for the

TCLP (Method 1311),@ 1989

- (14) Proposed HWIR Regulation: 60 FR 66388-89 (December 21, 1995)
- (15) Selection from Region 2 Enforcement Guidance: Technical Assistance Document for Complying with the TC Rule and Implementing the Toxicity Characteristic Leaching Procedure, May 1994. Page 2-4
- (16) Letter 4/28/86
To: Ms. Dejong; From: Todd A. Kimmell
- (17) Letter 12/31/87
To: Ms. Cole; From: Gail Ann Hansen
- (18) Letter 1/27/89
To: Ms. Karen Heyob; From: David Friedman
- (19) Letter 11/8/90
To: Mr. Art Coleman; From: Gail Hansen
- (20) Letter 2/5/91
To: Mr. Art Coleman; From: Gail Hansen
- (21) Letter 9/21/92
To: Mr. Joseph R. Storrs; From: Oliver M. Fordham, Jr.
- (22) Memorandum #36 Date 1/12/93; From: Gail Hansen
Title: Notes on RCRA Methods and QA Activities
Note: The RCRA-Online version of this document contains a typographical error in the formula for the screen calculation. The formula should read:
$$\frac{[AxB] + [CxD]}{B + [20 L/Kg \times D]} = E$$

A copy of the correct original document is attached. The RCRA Online version is being corrected.
- (23) January 1994 Monthly RCRA Hotline Report
- (24) ATest Methods Frequently Asked Questions,@ Office of Solid Waste,
<http://www.epa.gov/epaoswer/hazwaste/test/faqs.htm>; Last updated April 9, 1998