



**Environmental
Protection Agency**

Ted Strickland, Governor
Lee Fisher, Lt. Governor
Chris Kerasiotes, Director

September 23, 2010

**RE: ARCELORMITTAL CLEVELAND, INC.
ARCELORMITTAL CLEVELAND, INC.
LANDFILL, AREA C
BACKGROUND GROUNDWATER QUALITY
DATABASE
RESPONSE TO NOTICE OF VIOLATION**

CERTIFIED MAIL

Stanley Rihtar
Environmental Engineer
ArcelorMittal Cleveland, Inc.
3060 Eggers Avenue
Cleveland, OH 44105

Dear Mr. Rihtar:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the following document for Area C of the ArcelorMittal Cleveland, Inc. Landfill, an industrial solid waste disposal facility:

Response to Ohio EPA Notice of Violation dated March 29, 2010 regarding Area C June 2009 Background Groundwater Quality Database Update Report, dated April 29, 2010

Response to Ohio EPA comments dated February 25, 2010 and March 1, 2010 regarding Area C Groundwater Quality Database February 2006 Update, dated April 29, 2010

The documents are dated April 29, 2010. They were received on May 3, 2010 and reviewed for compliance with Ohio Administrative Code (OAC) 3745-30-08. Ohio EPA has reviewed the above referenced documents and has noted the following violation.

Violation:

1. OAC rule 3745-30-08(C)(6)(g): Any statistical method chosen in accordance with paragraph (C)(5) of this rule shall comply with the following performance standards as appropriate. Background data can be added only in blocks of data resulting from the analysis of four or more statistically independent samples after the data have been statistically compared to the current background data and no statistical differences are detected, unless another method is deemed acceptable to the director.

The owner/operator remains in violation of this rule because the owner/operator used invalid statistical testing methods to compare the existing background to the data to be updated, and the owner/operator updated data into background that is clearly statistically different from the existing background without receiving prior permission from the director of Ohio EPA per the later clause of rule 3745-30-08(C)(6)(g).

The owner/operator improperly utilized two statistical methods in attempting to fit the new data to the existing background data as follows:

A) Substitution: the owner/operator substituted $\frac{1}{2}$ practical quantitation limit (PQL) for all 50 non-detects among the existing and proposed benzene data, despite the fact that the high percentage of non-detects among the data (87% of all data; 71% if <2's are deleted) is inappropriate for using substitution. The USEPA document EPA 530/R-9-007, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance, March 2009* (Unified Guidance) and several statistical literature sources can be cited to show that using substitution is only appropriate when non-detects make up less than about 15% of the data. For example:

- Unified Guidance page 6-36: "Simple substitution is not recommended in the Unified Guidance unless no more than 10-15% of the sample observations are non-detect."
- Unified Guidance page 15-5 - the Unified Guidance recommends imputation by simple substitution only in select circumstances described below:
 - When the sample size is too small to do anything else.
 - When non-detects comprise no more than 10-15% of the total sample.
 - When non-detects are generated by a different physical process than the detected values, and thus represent a distinct statistical distribution.

Therefore, the owner/operator should cease using substitution when the percentage of non-detects is so high.

B) T-test: the underlying assumption of normality in the t-test was overlooked. As described on page 16-3&4 of the Unified Guidance, "all t-tests assume that the underlying data are approximately normal in distribution." The

benzene data from the facility, whether or not the older higher PQL data (<2) are included, whether per well or pooled is a highly skewed, left-censored, non-normal data set and thus makes it inappropriate for a t-test.

The combined use of substitution and t-test thus produced an inappropriate and invalid statistical comparison.

The owner/operator should have instead utilized a distribution free test such as a simple comparison of the data points to the non-parametric prediction limit based on the existing background or use a rank-based test to compare the two data sets. The Unified Guidance provides further insight on page 6-37:

“When the sample data are non-normal and may contain non-detects, the Unified Guidance provides alternative two-sample tests to the parametric t-test. The Wilcoxon rank-sum test (Section 16.2) requires that the combined samples be sorted and ranked. This test evaluates potential differences in population medians rather than the means. The Tarone-Ware test (Section 16.3) is specially adapted to handle left-censored measurements, and also tests for differences in population medians.”

And, further on page 16-17:

“Because non-detects generally prevent a complete ranking of the measurements, the Wilcoxon rank-sum test is not recommended for most censored data sets. Instead, a modified version of the Tarone-Ware test (Hollander and Wolfe, 1999) is presented in Section 16.3. The Tarone-Ware test is essentially a generalization of the Wilcoxon test specifically designed to accommodate censored values.”

To return to compliance with this rule, the owner/operator needs to re-evaluate the proposed background updates using a valid statistical method(s). If the owner/operator determines that there is a statistically significant difference, and still wishes to add the data to background, the owner/operator will need to request and receive director's approval pursuant to OAC 3745-30-08(C)(6)(g).

Response to More Information Needed to Determine Compliance

1. No further information is required to determine compliance with OAC rules 3745-30-08(E)(6) and 3745-30-08(A)(1). The owner/operator illustrated that MW-31D is upgradient from the landfill.

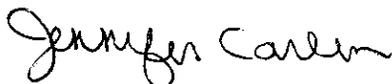
Stanley Rihtar
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Nothing in this letter shall be construed to authorize any waiver from the requirements of any applicable state or federal laws or regulations. This letter shall not be interpreted to release ArcelorMittal from responsibility under Chapters 3704, 3714, 3734, or 6111 of the Ohio Revised Code or under the Federal Clean Water or Comprehensive Environmental Response, Compensation, and Liability Acts for remedying conditions resulting from any release of contaminants to the environment.

Please submit a response within 30 days of receipt of this letter, indicating how the facility has returned to compliance with the OAC rule 3745-30-08(C)(6)(g).

If you have any technical questions regarding this review, please contact Kathryn Epp of the Division of Drinking and Ground Waters at (330) 963-1233. Please submit all correspondence to Jennifer Carlin, Division of Solid and Infectious Waste Management, NEDO, Ohio EPA, 2110 East Aurora Road, Twinsburg, OH 44087.

Sincerely,



Jennifer Carlin
Environmental Specialist
Division of Solid and Infectious Waste Management

JC:cl

cc: Kathryn Epp, NEDO-DDAGW
Dane Tussel, Cuyahoga County General Health District
Gerald Murphy, Cleveland City Health Department
File: [Kurko/LAND/ArcelorMittal, Cleveland Inc. Landfill/Gro/18]
DSIWM ID #766