ALUMINUM-BASED DRINKING WATER TREATMENT MATERIAL BENEFICIALLY USED IN SOIL BLENDS

The purpose of this document is to provide guidance on applying for coverage under Ohio EPA General Permit BUGPDWTM01, the beneficial use of aluminum-based drinking water treatment material as a soil blend.

Who is the Applicant?

In general, the Applicant is the individual applying for coverage under the general permit by submitting a Notice of Intent (NOI) form. We designed flexibility into the program so that the Applicant can be the generator of the aluminum-based drinking water treatment material (DWTM), a third party such as a distributor or soil blender or an end user.

Who is the Permittee?

The Applicant becomes the Permittee when the Applicant receives written notification from the Director that coverage under the general permit is granted.

What if you want to beneficially use DWTM from more than one generator?

There is no limit to the number of foundry sand generators that you can include in your coverage for this general permit. The fee is still $200, but you must fill out an NOI form and submit supporting documentation for each generator producing foundry sand being beneficially used.

Can the generator of DWTM apply for this general permit?

Yes, the generator can analyze its DWTM and submit an NOI.

Eligibility

Only DWTM that is generated from the treatment of a public water system's source water supply for drinking or industrial purposes are eligible for beneficial use under General Permit BUGPDWTM001.

Pursuant to General Permit BUGPDWTM001 and Ohio Administrative Code Rule 3745-599-05, prior to applying for a beneficial use permit, you must demonstrate through generator knowledge or through a quantitative evaluation, that the DWTM are not a hazardous waste.

For assistance in understanding how to demonstrate through generator knowledge that your DWTM are not a hazardous waste, please refer to this document.

http://www.epa.state.oh.us/portals/32/pdf/GeneratorKnowledge6.pdf

The Applicant may submit Toxicity Characteristic Leaching Procedure (TCLP) data to demonstrate the DWTM are not a hazardous waste, though that data would include only the

eight RCRA metals and not aluminum, copper, manganese, nickel and zinc. The only accepted method for demonstrating a waste material is not a characteristic hazardous waste is TCLP Method 1311.

Sampling and Analysis

Ohio EPA requires representative sampling of any waste materials proposed for beneficial use. However, the beneficial use rules and general permits were designed to allow flexibility with the approach taken for representative sampling. Not every waste stream or situation is the same. It is not possible to predict the number of samples required to demonstrate that a beneficial use byproduct meets a 95% Upper Confidence Limit (UCL) for each constituent and is less than the limit in the general permit. You should also refer to US EPA's Test Methods for Evaluating Solid Waste SW-846 for evaluating piles of wastes, where different methods and strategies are explained.

The following is a suggested sampling protocol to help you demonstrate that your DWTM meets the constituent limits in the general permit. The reported detection limit for your sample analysis needs to be less than the limit specified for each constituent in Table 1 of the general permit.

a. How the DWTM has been stored and the amount of material could affect the number of samples required to demonstrate the 95% UCL for each constituent is less than the limit in the general permit.

b. When designing your representative sample collection, if the material is dried and piled, you should set up a three-dimensional sampling grid of the entire pile.

c. DWTM that is currently generated and stored as a product should be homogeneous enough that 3-5 samples should be adequate to demonstrate a 95% UCL of the mean for each constituent.

d. Analyze each sample for total metals and for leaching potential using TCLP Method 1311 or the Synthetic Precipitation Leaching Procedure (SPLP) Method 1312 as described in SW 846, for the constituents specified in the general permit. Remember SPLP is NOT appropriate for determining whether the waste material is a hazardous waste

    i. A sample calculation for the 95% UCL is provided in Appendix A.

    ii. Free software from US EPA that will calculate the 95% can be downloaded here: https://www.epa.gov/sites/production/files/2016-05/documents/proucl_5.1_fact_sheet.pdf

e.   The lab cost associated with each sample should be in the $100 - $150 range to run the list of constituents in the general permit. The laboratory should be asked to provide the analytical results with the Tier I Data Validation package, which helps ensure the quality of your data. Essential elements of the Tier I Data Report are provided in Appendix B.

f.   Submit the sample plan and results/analysis, and data quality assurance documentation with the NOI.

APPENDIX A: Example calculation of the 95% UCL for a normal mean

Ten samples of material are taken to demonstrate that the material meets the beneficial use standards in Table 1. The samples are obtained using a simple random sampling design. 95% UCL must be obtained for each constituent tested. Analysis of the samples for lead generated the following results: 160, 175, 210, 220, 230, 240, 245, 270, 310, and 380 ppm. The limit for lead is 300 ppm.

Step 1: Mean and standard deviation calculation

Assuming a normal model is acceptable (using the Shapiro-Wilk test) the mean and standard deviation should be calculated. The mean and standard deviation can be obtained using statistical software or by hand using the following equations.

Mean: $\dfrac{\text{Sum of data}}{\text{Total number of data points}} = Mean$

$$\frac{(160+175+210+220+230+240+245+270+310+380)}{10} = \boldsymbol{244ppm}$$

Standard deviation for a sample:
1. Subtract the Mean from each data point and square the result.
2. Then divide the sum of those squared differences by the number of data points minus 1.
3. Then take the square root of that number to obtain the standard deviation.

$\sqrt{[((160-224)^2 + (175-224)^2 + (210-224)^2 + (220-224)^2 + (230-224)^2 + (240-224)^2 + (245-224)^2 + (270-224)^2 + (310-224)^2 + (380-224)^2)/(10\text{-}1)]}$
= ***64.4 ppm***

Step 2: T-value and 95% UCL calculation.

1. Find your T-Value from the following table for the number of samples taken.

# of samples minus 1 (n-1)	T Value for 95% UCL	# of samples minus 1 (n-1)	T Value for 95% UCL
1	6.314	11	1.796
2	2.920	12	1.782
3	2.353	13	1.771
4	2.132	14	1.761
5	2.015	15	1.753
6	1.943	16	1.746

7	1.895	17	1.740
8	1.860	18	1.734
9	1.833	19	1.729
10	1.812	20	1.725

2. The UCL is calculated as follows:

UCL= $Mean + \left(T\ Value * \frac{Standard\ Deviation}{\sqrt{\#\ of\ samples}}\right) = 244 + 1.833 * \frac{64.4}{\sqrt{10}} \approx \mathbf{281\_ppm}$

Step 3: Compare 95% UCL to Table 1.

Compare the 95% UCL calculated in Step 3 to the limit in the Table of constituents for that specific constituent. Because the UCL (281 ppm) is less than the limit in the table (300 ppm). By showing that the 95% UCL for the sample is less than 300ppm limit, we can conclude with at least 95 % confidence that the mean concentration of the constituent in the material is less than 300ppm.

APPENDIX B: Tier I Data Report Requirements

1. Site name and Project Manager or Applicant sample control number;
2. Name of Project Manager or Applicant;
3. Field sample numbers cross-referenced to associated laboratory sample numbers (i.e., Contractor and subcontractor(s);
4. Project narrative (a.k.a. case narrative) describing tests used by the Contractor or subcontractor(s);
5. Sample results with units, method detection limits (MDL), reporting limits (RL) and dates (i.e. receipt, preparation, and analysis), as well as, surrogates and quality control (QC) limits for all organic tests,
6. Bench sheets (Note: for characteristic testing only, such as TCLP.)
7. QC narrative discussing QC outliers and corrective actions taken by the Contractor or subcontractor(s).
8. QC samples, including preparation and analysis dates, results, units, and QC limits (where applicable), [Note: Contractor or subcontractor(s) must include blanks, laboratory control spikes, duplicates, spikes, and surrogates for QC samples.]
9. Copy of a completed chain-of-custody form;
10. Copy of cooler receipt form, and;
11. Signed statement by either the Laboratory Manager, Quality Assurance Manager, or Project Manager attesting to the validity of the analytical results.