



Beneficial Use of Drinking Water Treatment Residuals

Drinking water treatment facilities generate residuals by treating raw water to create drinkable water. The residuals primarily consist of saturated sediment, cations, anions, treatment chemicals, naturally occurring elements such as radionuclides removed from the raw water. Water treatment facilities use different methods to manage these residuals including: diverting them to on-site waste impoundments, injecting them deep beneath the ground surface, discharging the combined liquid and solid residuals to a publicly owned wastewater treatment plant, landfilling dried residuals onsite, sending dried residuals to an off-site disposal facility, or sending the residuals off-site for composting or beneficial use. Beneficial uses typically include land application for agricultural benefits or soil amendments for horticultural benefits.

The Hazardous Materials and Waste Management Division (the Division) is the agency responsible for implementing the “Regulations Pertaining to the Beneficial Use of Water Treatment Sludge and Fees Applicable to the Beneficial Use of Sludges,” 5 CCR 1003-7 (the Regulations) and ensures the beneficial use complies with the Regulations. The regulation, noted above, governing the beneficial use of water treatment residuals is separate from Section 8, Recycling and Beneficial Use, of the Regulations Pertaining to Solid Waste Sites and Facilities, 6 CCR 1007-2, Part I.

Beneficial Use Plan Content

In accordance with the Regulations, each producer of water treatment residuals must submit a Beneficial Use Plan to the Division for review and approval prior to selling, distributing or supplying the residuals to a user. The plan must include:

1. A legal description of the planned application site.
2. The name and address of the producer, any contractor (if applicable), and the user.
3. The application rate in pounds per acre.

4. The types of crops to be grown at the application site (if applicable).
5. The number of acres per crop type (if applicable).
6. Landowner approval for the land application of water treatment residuals and permission to enter the site to perform monitoring as identified in the plan.
7. Analyses of the water treatment residuals for the parameters defined in Table 1 of the Regulations.
8. A detailed monitoring plan along with measures to identify and remediate any detrimental impacts from application of the residuals.
9. Documentation that comments from the local health department were solicited.
10. Any other information the Department deems appropriate to evaluate potential impacts to human health and the environment (e.g., analyses for speciated radionuclides Radium-226, Radium-228, Uranium-235, Uranium-238, and Thorium-232).

Speciated Radionuclide Testing

Section 5(B) of the Regulations provides the Division the opportunity to request additional monitoring information if the Division has reason to believe the residuals may contain constituents of concern that are not included in Table 1 of the Regulations. The Division currently requests speciated radionuclide tests because years of testing and analyses by the water treatment industry indicate that the radionuclide levels present in water treatment residuals can become concentrated (i.e. the residuals have the potential to become technologically enhanced naturally occurring radioactive materials (TENORM)).

Once the water treatment plant has established a baseline profile, composite sampling and analyses for Table 1 parameters must be performed on the water treatment residuals annually or prior to disposal or beneficial use pursuant to the Regulations if disposal occurs less frequently. Water treatment plants are

required to characterize their residuals prior to disposal under Section 12 of the Solid Waste Regulations (6 CCR 1007-2), regardless of the disposal method used, and should already have a baseline characterization of their residuals.

The water treatment plant must characterize the water treatment residuals and submit a new Beneficial Use Plan to the Division for review if there has been a change to their treatment process or a change in the raw water source prior to beneficially using the residuals.

TENORM Guidance

The “Interim Policy and Guidance Pending Rulemaking for Control and Disposition of Technologically-Enhanced Naturally Occurring Radioactive Materials in Colorado” (“TENORM guidance”) was developed to clarify radionuclide analytical requirements for water treatment residuals prior to land application or disposal. Differences between the Regulations and the TENORM guidance can be a source of confusion for the regulated community. If there is a discrepancy between the Regulations and the guidance, then the Regulations must be followed. The TENORM guidance supplements the Regulations. For instance, the Solid Waste Regulations establish an upper limit of 40 pCi/g on the gross alpha activity that drinking water treatment residuals may exhibit and still be eligible for land application for beneficial use on agricultural land. However, gross alpha is not a health-based number and the TENORM guidance provides levels of speciated radionuclides that are considered protective of human health and the environment for various disposal or beneficial use options, including land application. Speciated radionuclide test results may be compared to the chart at the bottom of page 18 of the “Implementing Guidance” section of the TENORM guidance document. The TENORM guidance document can be found on the Water Quality Control Division’s website under the Safe Drinking Water Program.

Documentation of Benefits Associated with the Use of Water Treatment Residuals

Benefits associated with the use of water treatment residuals vary depending on the application site soils, the nutrient and structural characteristics of the

residuals, and potential plant nutrient needs. The Division’s analytical testing requirements for the drinking water treatment residuals in Table 1 include nutrient testing. The Division also requires nutrient testing on application site soils as well.

The Division considers land application of drinking water treatment residuals without a demonstrated soil, agricultural or horticultural benefit to be land disposal of solid waste. Land disposal of solid waste is regulated as a solid waste disposal site and facility under the Solid Waste Regulations, which have more restrictive requirements than those found in these Regulations.

Distance to Groundwater

The beneficial use plan should include the distance to the seasonally high groundwater table. Beneficial use of drinking water treatment residuals cannot have negative impact on groundwater and the Division expects a minimum separation of three feet from the deepest application elevation to seasonally high groundwater. The Division’s experience demonstrates that this separation has been protective of groundwater given the types and amounts of materials applied, but the placement distance may need to be evaluated on a case-by-case basis.

Beneficial Use Plan Submittal

The Division will determine whether or not a beneficial use plan is complete within 30 days after receipt of the plan. Once the Division determines the plan is complete, every effort will be made to issue an approval or denial within 30 days. The beneficial use plan should also be sent to the local governing authority for notification purposes. The local governing authority controls land use within its jurisdiction, and may deny the beneficial use of drinking water treatment residuals even if the Division approves the plan. However, the beneficial use plan may not be implemented if the Division denies plan certification.

Issuance of Beneficial Use Certification

The Division issues a Beneficial Use Determination (“BUD”) or Certification after final review and approval of the beneficial use plan. The certification

approves the beneficial use of specific water treatment residuals at the specific location indicated in the plan. Separate beneficial use plans should be submitted to the Division for each location where water treatment residuals may be applied.

Fees

The applicant is responsible for costs incurred by the Division during the completeness review and comprehensive technical review of the beneficial use plan, site visits, and attendance by Division staff at meetings and hearings concerning the plan or amendments. The document review and activity fees assessed can be found in the Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2 Section 1.7.2.)

For more information:

**Colorado Department of
Public Health & Environment
Hazardous Materials and
Waste Management Division
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530**

*Customer Technical Assistance (303)-692-3320
(888) 569-1831 ext. 3320 toll-free*

Division Website: <http://www.colorado.gov/cdphe/hm>

E-mail cdphe.hmrecycling@state.co.us

the appropriate management of wastes based on Colorado solid and hazardous waste statutes and regulations only. The wastes described in this guidance may also be regulated under other statutes, regulations or local ordinances.

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This Compliance Bulletin is intended to provide guidance on

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