

Beneficial Use of Solid Waste Determination Evaluation Form



State of Oregon
Department of
Environmental
Quality

Applicant: United States Gypsum Company

BUD#: 20150831

Solid Waste: Shredded wallboard

Summary of Proposed Beneficial Use: animal bedding for livestock and then applied on farm land as a soil amendment

Reviewer: Heather Kuoppamaki

Date: 09/16/2015

Tier: One Two Three

Beneficial Use of Solid Waste

Beneficial use of solid waste is a sustainability practice that may involve using an industrial waste in a manufacturing process to make another product or using a waste as a substitute for construction materials.

The environmental benefits of substituting industrial waste materials for virgin materials includes conserving energy, reducing the need to extract natural resources and reducing demand for disposal facilities.

Oregon Administrative Rules (OAR) 340-093-0280 - 0290 establish standing beneficial uses and a process for DEQ review of case-specific beneficial use proposals. Under these rules, DEQ may issue a beneficial use determination as an alternative to a disposal permit for proposals that meet the rule criteria. If approved, once a beneficial use determination is issued, DEQ no longer regulates the waste as a solid waste as long as the waste is used in accordance with the approved beneficial use determination.

Beneficial Use Determination Evaluation Summary

- Yes, the Beneficial Use of this solid waste meets all the case-specific performance criteria listed below and is approved.
- No, the Beneficial Use of this solid waste does not meet all the case-specific performance criteria listed below and is not approved.

Notes: The applicant met the Case-Specific Beneficial Use Performance Criteria. The land application of the used animal bedding waste as a soil amendment must be done in accordance with Oregon Department of Agriculture requirements including application rates at or below agronomic application rates. US Gypsum must provide a list of all proposed farm locations for DEQ approval prior to use at that facility.

**Beneficial Use of Solid Waste Determination
Evaluation Form**

Applicant: US Gypsum

BUD #: 20150831

Solid Waste: Shredded wallboard

Date: 09/16/2015

Case-Specific Beneficial Use Performance Criteria:

DEQ may approve an application for a case-specific beneficial use of solid waste only if all the following performance criteria are addressed: 1) Characterization of the Solid Waste; 2) Productive Beneficial Use of the Solid Waste; and, 3) The affect of the Proposed Beneficial Use on Public Health, Safety, Welfare and/or the Environment.

1) Characterization of the Solid Waste

Did the applicant characterize the solid waste and proposed beneficial use sufficiently to demonstrate compliance with the rules for case-specific beneficial use determinations (OAR 340-093-0280) by submitting required information for the appropriate tier? (See tier sections below for detailed characterization information.)

Yes No

Was the following information submitted for DEQ review and how adequate was it?

Tier 1 Applicable Not applicable

- Did the applicant provide an adequate description of the material proposed for beneficial use, the manner of generation and the estimated quantity to be used beneficially each year? Yes No

Notes: The proposed material is shredded wallboard. The content is approximately 50% wallboard paper and 50% gypsum by weight. The material proposed to be used will be virgin wallboard from the Rainier Wallboard Plant, recycle wallboard collectors, and returned damage board. The Rainier Wallboard Plant recycles its own off-spec product. Roughly 10%-20% of all purchased wallboard becomes unused scrap. Recycle wallboard collectors bring in this clean, unused scrap material which is subsequently tested for trace metals, asbestos, silica, and radiation. Total quantity of shredded wallboard material generated each year is estimated at 6,000 tons.

- Did the applicant provide an adequate description of the proposed beneficial use and justify how the proposed use is beneficial? Yes No

Notes: The material would be used first as animal bedding for livestock and then applied on farm land as a soil amendment. There are other companies that sell recycled wallboard product specifically for animal bedding. Wallboard has been shown in studies to improve soil porosity, reduce acidity, and provide important micronutrients. The EPA has also done research on the benefits of using recycled wallboard in agriculture with respect to emissions. Chemical differences between gypsum/paper and drywall waste can come from minor concentrations of various additives named in the SDS of each drywall product available at USG's website. The state of Washington Department of Ecology has recognized both applications described above as an environmentally beneficial way to keep excess wallboard waste outside of landfills.

- Did the applicant provide a sufficient comparison of the chemical and physical characteristics of the material proposed for beneficial use with the material it will replace? Yes No

**Beneficial Use of Solid Waste Determination
Evaluation Form**

Applicant: US Gypsum

BUD #: 20150831

Solid Waste: Shredded wallboard

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Notes: Many different products are used for animal bedding such as wood shavings, paper, sand, and gypsum. Because paper and gypsum are both already used as animal bedding there would be no chemical difference between what is currently used and the proposed use.

- Did the applicant successfully demonstrate compliance of the proposed beneficial use with the performance criteria in OAR 340-093-0280 based on knowledge of the process that generated the material, properties of the finished product, or testing? Yes No

Notes: The waste product satisfies all conditions in OAR 340-093-0280. The use is productive with demonstrated benefits and customers as an effective substitute for animal bedding and soil amendments. It is not a hazardous waste under ORS 466.005. The additives in the wallboard are in low enough concentrations such that the risk levels for persistence or bioaccumulation is minimal. There is not any foreseeable unsightliness or nuisance conditions that would come from using wallboard as animal bedding or soil amendment.

- If required, did the applicant provide any other DEQ required information to evaluate the proposal? Yes No

Notes: DEQ requested additional information on the source of gypsum, the use of fungicides in the wallboard, and hydrocarbons and borates / boric acid in the wallboard.

a. Gypsum Sourcing: The Rainier Wallboard Plant uses gypsum mined from the ground. Other company's sources may vary and are unknown to the Rainier Wallboard Plant. They could be mined or synthetic. Synthetic gypsum comes from coal power plants which scrub the sulfur out of the air leaving the stacks producing gypsum with a purity that approaches 99%. Regardless, all incoming material is tested by USG which shows the trace metal concentrations are below clean fill/background soil concentrations.

b. Fungicide: The Rainier Wallboard plant uses Sodium Pyrithione (CAS # 3811-73-2) as a fungicide in its Mold Tough® panels. The fungicide is less than 0.25% by weight according to USG's SDS. Mold Tough® panels represent approximately 4.2% of sales by square footage. Therefore, total fungicide content in USG products is approximately 0.0105%. USG does not have information on competitor fungicides or concentrations but it would be reasonable to assume they are similar in nature to USG's values.

It would be reasonable to assume the actual contaminant levels in the paper/gypsum product are close to half the values stated in the testing. This is because the material tested is 94% gypsum and 6% paper while the product USG is submitting as a beneficial resource is approximately 50% rock and 50% paper.

c. Hydrocarbons: There are no hydrocarbons such as oils, gasoline, kerosene, etc. in the production of drywall. There should not be any hydrocarbons from the scrap drywall because it is all clean, unpainted, and unused.

e. Borates/Boric Acid/Borax: The Rainier Wallboard Plant does not use any type of Boric Acid, Borax, or Borate in the wallboard products. Rainier makes no claims of knowledge regarding usage of borates and their derivations by competitors.

Beneficial Use of Solid Waste Determination Evaluation Form

Applicant: US Gypsum

BUD #: 20150831

Solid Waste: Shredded wallboard

Date: 09/16/2015

Tier 2 Applicable Not applicable

- Did the applicant submit all the information required for a Tier 1 application? Yes No

Notes: See Tier 1 summary above.

- Did the applicant submit adequate sampling and analysis to make a determination of suitability for beneficial use? (Note: The analysis must provide chemical, physical, and biological characterization of the material proposed for beneficial use and identify potential contaminants in the material or the end product, as applicable.) Yes No

Notes: US Gypsum provided a chemical analysis of the recycled wallboard content. Physical characteristics would be identical to that of a commercially available gypsum/paper product. Metal concentrations were all below clean fill criteria for the coast range, Portland basin, and general clean fill levels. Gamma spectroscopy analysis of the material showed nuclide total for each element at less than 1×10^{-6} $\mu\text{Ci/g}$

- When applicable, did the applicant provide a risk screening comparing the concentration of hazardous substances in the material to existing, DEQ approved, risk-based screening level values, and demonstrate compliance with acceptable risk levels? Yes No

Notes: Trace metal concentrations are below clean fill screening criteria.

- When applicable, did the applicant supply the location or type of land use where the material will be applied, consistent with the risk scenarios used to evaluate risk? Yes No

Notes: Current land use target would be livestock operations requiring bedding material and agricultural lands needing gypsum soil amendments in the state of Oregon. Due to shipping cost constraints the material would likely stay near farms in the Portland Basin or Coastal region.

- When applicable, did the applicant supply contact information of property owner(s) if this is a site-specific land application proposal, including name, address, phone number, e-mail, site address and site coordinates (latitude and longitude)? Yes No

Notes: US Gypsum currently has an end user at a farm in Astoria, Oregon interested in the product; however, USG does not want to restrict the application of this product to one site. USG believes there are multiple locations throughout Oregon that would benefit from the paper/gypsum product as an animal bedding and soil amendment product.

- Did the applicant supply an adequate description of how the material will be managed to minimize potential adverse impacts to public health, safety, welfare, or the environment? Yes No

Notes: Wallboard manufactured at the Rainier Wallboard Plant is highly controlled to keep additives along with the gypsum and paper under tight quality tolerances. Materials coming from outside sources are tested using the procedures described in Appendix A. This should ensure that no foreign contaminants are present in the product above acceptable levels. There should not be any concerns with usage of animal bedding as it will be contained inside a sheltered area. When used in the same manner as commercially available gypsum soil supplements the risk of potential adverse effects from applying USG's product to soil would be minimal. Storage would be kept dry under

Beneficial Use of Solid Waste Determination Evaluation Form

Applicant: US Gypsum

BUD #: 20150831

Solid Waste: Shredded wallboard

Date: 09/16/2015

a roof until the time of application and transport would occur via a covered truck to minimize runoff and dust nuisance.

Tier 3 Applicable Not applicable

2) Productive Beneficial Use of the Solid Waste

Has the applicant demonstrated that the proposed beneficial use is a productive use of the material by providing information substantiating the criteria listed below?

Yes No

Notes: Scrap wallboard is proposed to be used as animal bedding followed by land application.

- Did the applicant successfully identify or demonstrate a reasonably likely proposed beneficial use for the material that is not speculative? Yes No

This criterion consists of three parts.

1. Identified Use:

Has the applicant clearly stated what the waste is going to be used for, that the waste is compatible with that use and the proposed quantity is necessary?

Yes No

2. Reasonably Likely Use:

Has the applicant identified, with supporting documentation, the timeframe within which this use is likely to occur (e.g., zoning info, master plan for development, letters from local jurisdictions, etc)?

Yes No

3. Not Speculative:

For Land application - has this material been used at other sites for the same purpose, is the material feasible for use at this site for this purpose, or has the applicant identified a known potential for this use at this site?

Yes No N/A

For uses other than land application - has the material been used in a product before, is the material feasible for use in a product, or has the applicant identified a known potential for use in this product?

Yes No N/A

Notes: The identified use is animal bedding followed by land application. This use will occur as wallboard scrap is available and farmers who would like to use the material are identified. Chemical differences between gypsum/paper and drywall waste can come from minor concentrations of various additives named in the SDS of each drywall product available at USG's website. The state of Washington Department of Ecology has recognized both applications described above as an environmentally beneficial way to keep excess wallboard waste outside of landfills.

- Is the use a valuable part of a manufacturing process, an effective substitute for a valuable raw material or commercial product, or otherwise authorized by the Department and does not constitute disposal? Yes No

Notes: The use is an effective substitute for animal bedding commercial products and soil amendments.

**Beneficial Use of Solid Waste Determination
Evaluation Form**

Applicant: US Gypsum

BUD #: 20150831
Solid Waste: Shredded wallboard
Date: 09/16/2015

- Is the use in accordance with applicable engineering standards, commercial standards, and agricultural or horticultural practices? Yes No

Notes: Wallboard has been shown in studies to improve soil porosity, reduce acidity, and provide important micronutrients. The EPA has also done research on the benefits of using recycled wallboard in agriculture with respect to emissions.

3) Effect of Proposed Beneficial Use on Public Health, Safety, Welfare and/or the Environment

Has the applicant demonstrated the proposed beneficial use will **not** create an adverse impact to public health, safety, welfare, or the environment, by providing information substantiating compliance with the criteria listed in the bullet list below?

Yes No

- Has the applicant demonstrated that the material is not a hazardous waste under ORS 466.00? Yes No

Notes: Trace metal concentrations are all below clean fill screening criteria.

- Has the applicant demonstrated that until the time this material is used according to a beneficial use determination, the material will be managed, including any storage, transportation, or processing, to prevent releases to the environment or nuisance conditions?

Yes No

Notes: Wallboard manufactured at the Rainier Wallboard Plant is highly controlled to keep additives along with the gypsum and paper under tight quality tolerances. Materials coming from outside sources are tested using the procedures described in the application. This should ensure that no foreign contaminants are present in the product above acceptable levels. There should not be any concerns with usage of animal bedding as it will be contained inside a sheltered area. When used in the same manner as commercially available gypsum soil supplements the risk of potential adverse effects from applying USG's product to soil would be minimal. Storage would be kept dry under a roof until the time of application and transport would occur via a covered truck to minimize runoff and dust nuisance.

- Has the applicant demonstrated that hazardous substances in the material, if any, meet one of the criteria in the bulleted list below? Yes No

- Hazardous substances do not significantly exceed the concentration in a comparable raw material or commercial product;
- Hazardous substances do not exceed naturally occurring background concentrations; or
- Hazardous substances will not exceed acceptable risk levels, including persistence and potential bioaccumulation, when the material is managed according to a beneficial use determination.

Notes: The material does not contain any hazardous substances.

- Has the applicant demonstrated that the proposed beneficial use will not result in the increase of a hazardous substance in a sensitive environment, such as a park, wildlife refuge or wetland?

Yes No

Notes: The material does not contain any hazardous substances. Trace metals are below clean fill screening criteria.

**Beneficial Use of Solid Waste Determination
Evaluation Form**

Applicant: US Gypsum

BUD #: 20150831

Solid Waste: Shredded wallboard

Date: 09/16/2015

- Has the applicant demonstrated that the proposed beneficial use will not create objectionable odors, dust, unsightliness, fire, or other nuisance conditions?

Yes No

Notes: There should not be any concerns with usage of animal bedding as it will be contained inside a sheltered area. When used in the same manner as commercially available gypsum soil supplements the risk of potential adverse effects from applying USG's product to soil would be minimal. Storage would be kept dry under a roof until the time of application and transport would occur via a covered truck to minimize runoff and dust nuisance.

- Has the applicant indicated that the proposed beneficial use will comply with any other applicable federal, state, and local regulations?

Yes No

Notes: Any uses must be done in accordance with Oregon Department of Agriculture requirements.

4) Public Involvement Evaluation (Note: this is not a Beneficial Use evaluation criterion)

Determine a public involvement recommendation using the current, **Guidance to DEQ Solid Waste Program Staff and Managers on Public Notice & Participation.**

- Is public notice and participation being recommended for this application? Yes No