

GYPSUM WALLBOARD: PROBLEMS, RECOMMENDATIONS, & THE CURRENT STATE OF RECYCLING WEBINAR

JANUARY 9, 2023

The Problems Created by Gypsum Wallboard Waste for Landfills and C&D Processors

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What is Gypsum Wallboard?

Commonly Known As: Drywall
Approximately 90% gypsum encased in 10% paper

What is Gypsum?



Type
Mineral

Mineral Classification
Sulfate

Chemical Formula
 $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$



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How Much Comes To A Landfill?

a. 7% of Construction & Demolition Material

b. DSWA's Southern Solid Waste Management Center

Construction & Demolition Material= 1/3 Of All Waste

Total Waste	325,850 Tons
C&D	108,710 Tons
Gypsum (7% C&D)	7,610 Tons

Recovered= 728 Tons/ 9.6%

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How Does Gypsum Wallboard Arrive At The Landfill?

CLEAN GYPSUM FROM
TRANSFER STATIONS

RT. 5 & MILFORD

CLEAN GYPSUM
AT LANDFILL

MIXED IN
WITH C&D



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The Problems It Creates At Landfills

Minor Problem

Takes up valuable Landfill space

Major Problems

Gypsum and Landfill environment produces
H₂S Gas which is:

- | | |
|--------------|--------------|
| 1) toxic | 3) corrosive |
| 2) flammable | 4) odorous |



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The Problems It Creates At Landfills

Major Problems Cont.

If not effectively collected it can cause:

- 1) hazardous working conditions
- 2) damage to infrastructure
- 3) nuisance odors

If effectively collected it can still cause problems:

- 1) damage to landfill gas to electric generators
- 2) air permit violations



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How DSWA Has Dealt With These Problems?

No charge for clean separate loads of gypsum at Transfer Stations or Landfills

Try to recover clean gypsum wallboard at Landfill working faces:

Recovered clean gypsum wallboard sent to USA Gypsum in PA for recycling at a cost of:

\$17.00	Recycling Fee
\$33.00	Transportation Fee
\$ 5.71	Fuel Surcharge
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\$55.71	/ Ton



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How DSWA Has Dealt With These Problems? Continued

Accelerate the collection of Landfill Gas

Treat LFG with Sulfur Removal Media

Media Costs:

2017- \$1,400,000

2022- \$300,000



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How Much C&D Comes to C&D Processing Revolution Recovery

Year	Total C&D In (tons)	Gypsum In (5% C&D) (tons)	Gypsum Recovered (tons)	% Recovered
2019	147,541	7,377	3,979	54%
2020	126,062	6,303	1,970	31%
2021	125,157	6,258	1,711	27%
2022 (Projected)	125,777	6,289	2,269	36%

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How Does Gypsum Wallboard Arrive at Revolution Recovery?



Rolloff loads of mixed C&D Waste



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The Problems It Creates At A C&D Processing Facility

- a. Is difficult to recover from mixed loads that have less than 30% gypsum

- b. It breaks into small pieces and fines
 - 1. this contaminates fines and limits end markets for fines
 - 2. many landfills will not accept contaminated fines for disposal



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How Has Revolution Recovery Dealt With Sorting Problems?

- a. They only sort loads with more than 30% gypsum

- b. They encourage customers to presort their loads and use the LEED program

- c. If they are short on sorters, they focus on sorting out money generating material instead



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How Has Revolution Recovery Dealt With Gypsum And End Markets

- a. The best end market is USA Gypsum in Pennsylvania

- b. Constantly looking for end use or disposal markets for fines
 - 1. End uses include fill material or landfill capping
 - 2. Disposal to out of state landfills, with the fines mixed with other residuals



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Recommendations

- a. Require wallboard manufacturers to have a minimum percentage of recycled content in their wallboard
- b. Require all new building construction to collect scrap clean wallboard separately and direct it to a recycling outlet.
- c. Improve the Infrastructure
 - 1) Transfer Stations
 - 2) C&D processing centers
 - 3) Gypsum wallboard processing centers
- d. Establish more markets for gypsum
 - 1) replace virgin gypsum in making new wallboard
 - 2) replace virgin gypsum in cement manufacturing
 - 3) adding to soil as a conditioning element
- e. Establish Extended Producer Responsibility (EPR) laws on gypsum wallboard manufacturers



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Informative References

- 1) EPA/600/R-14/039/August 2014/www.epa.gov/research
"Best Management Practices to Prevent and Control Hydrogen Sulfide and Reduced Sulfur Compound Emissions at Landfills That Dispose of Gypsum Drywall"
- 2) Construction and Demolition Recycling Association
"Standard Specifications for the Production of Recycled Gypsum from Scrap Gypsum Drywall"
- 3) NEWMOA Policy Options White Paper
"Promoting Greater Recycling of Gypsum Wallboard from Construction and Demolition (C&D) Projects in the Northeast" September 2010

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**THANK
YOU**

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