

Gwen Tulley

From: Andy Smith
Sent: Thursday, October 22, 2015 10:19 AM
To: Gwen Tulley
Subject: FW: BBGRR PII Replacement Page
Attachments: EnviroBlend - EnviroMag Product Data.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Alexander (Andy) Smith, P.E. HTRW Project Manager
Matrix Environmental Services, LLC.

283 Rucker Street | Anniston, AL 36205
Office 256.847.0780 ext. 2318 | Fax 256.847.0905
Mobile 205.999.6645
andy_smith@matrixdesigngroup.com
matrixdesigngroup.com



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From: Andy Smith
Sent: Wednesday, October 14, 2015 4:28 PM
To: 'Townsend, Kaneshia' <KTownsend@adem.state.al.us>
Subject: RE: BBGRR PII Replacement Page

Alexander (Andy) Smith, P.E. HTRW Project Manager
Matrix Environmental Services, LLC.

283 Rucker Street | Anniston, AL 36205
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andy_smith@matrixdesigngroup.com
matrixdesigngroup.com



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From: Townsend, Kaneshia [<mailto:KTownsend@adem.state.al.us>]
Sent: Wednesday, October 14, 2015 4:26 PM

To: Andy Smith <Andy_Smith@matrixdesigngroup.com>

Subject: RE: BBGRR PII Replacement Page

Hi Andy,

Please give me a call regarding the Enviromag. Thanks.

From: Andy Smith [mailto:Andy_Smith@matrixdesigngroup.com]

Sent: Wednesday, October 14, 2015 4:08 PM

To: Townsend, Kaneshia

Subject: BBGRR PII Replacement Page

Here are the replacement pages for Appendix C, DQOs. If you have any more questions, please let me know.

Thanks,

Alexander (Andy) Smith, P.E. HTRW Project Manager

Matrix Environmental Services, LLC.

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Office 256.847.0780 ext. 2318 | Fax 256.847.0905

Mobile 205.999.6645

andy_smith@matrixdesigngroup.com

matrixdesigngroup.com



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EnviroBlend[®] Application

EnviroBlend is a dry granular or milled material that can be purchased in 2000# Supersacks or bulk. The single consideration with treatment is making sure product is homogeneously mixed within the matrix (soil, waste, etc.). There is no preferred method for mixing. Generally, clients utilize trackhoes, backhoes, rotary-head mixers, pug-mills, or agricultural tillers.

By weight, amendment is added to matrix and mixed thoroughly, followed by conformational sampling. There no cure time and no additives (e.g. water) or activator(s) need be mixed with the product for treatment. If not using a batch plant or pug mill, it is advisable to parcel out soil if not already residing in cells or piles. This will allow for more careful metering of amendment.

EnviroBlend[®] Handling

Store product in a dry, protected place. Do not allow water to penetrate impoundment, silo, or Supersack. Significant or repeated exposure to precipitation may cause the product to clump or form a crust. If surficial hardening occurs due to moisture exposure, the product can be crushed and used as normal.

With bulk piles of product, ground and top coverage tarps are recommended to keep product dry from precipitation and from wicking moisture from the ground. For Supersacks, even though sacks are water resistant and shrink-wrapped to pallets, tarping or covered storage of Supersacks is recommended to prevent product exposure to precipitation or ponded water – on the ground or on the sack – especially for prolonged (months) product staging time.

For finer products, minimize fugitive particulates during material handling and transfer by carefully discharging product and/or active water mist or curtain.

For additional information about EnviroBlend products for environmental treatment applications, please contact Derek Pizarro at 610-828-6929 x238.

Premier Magnesia

Premier Magnesia is a global market leader in magnesia-based products and solutions for dozens of applications ranging from agricultural to industrial and environmental markets. Premier is one of the world's principal manufacturers and suppliers of high purity calcined magnesium oxide and magnesium hydroxide products, and the largest producer of magnesium sulfate (Epson Salt) in the Western Hemisphere. For over 50 years, the Company and its predecessors have owned and operated a mine and processing plant located in Gabbs, Nevada.

Magnesia-based products and chemistries are Generally-Recognized-As-Safe (GRAS) and non-hazardous, offering environmentally responsible solutions to complex problems across many industries.

EnviroBlend[®] History

A leader in heavy metal treatment stabilization for over twenty-five years, EnviroBlend was originally crafted for waste treatment in metal casting operations, and subsequently adapted for remedial environmental applications. EnviroBlend products address environmental concerns for heavy metal contamination, soil stabilization, pH control, acid gas emissions, and odor emissions. Each unique, tailored blend is designed site-specifically based on waste matrix, contaminants of concern, and regulatory goals. Thus, EnviroBlend products provide low cost-per-treated-unit solutions for a variety of clients and applications, such as foundries, remedial sites, smelters, landfills, TSDFs, and fixed-base installations.

EnviroBlend[®] Chemistry for Site Remediation

Premier has designed EnviroBlend to be a cost-effective and efficient treatment of waste – enabling low dosage rates and low bulking, advantageous for in-place treatment or non-hazardous landfill disposal. Since inception, the EnviroBlend line of metal treatment reagents has expanded to include more complex chemistries since each heavy metal contaminant, or units affected by multiple heavy metals, require different treatment methodologies.

EnviroBlend is a treatment chemistry. It does not conceal metal contamination via encapsulation or solidification. Instead, EnviroBlend chemically stabilizes and/or complexes metals of concern; helping clients achieve regulatory objectives for the minimization of leachable metals. A specific treatment chemistry and dosage rate, individually recommended for each application, is based on the waste matrix, metal(s) of concern, and applicable regulatory standard(s). Since site conditions and regulatory requirements can significantly differ site to site, EnviroBlend chemistries are tested, selected, and developed on a case-by-case basis. This is especially useful when dealing with multiple metals in the soil, groundwater, or waste matrix.

As such, EnviroBlend uses a variable mixture of a magnesium-based buffers and patented or proprietary additives. Each blend is designed to target specific metal(s), alkalinity conditions, or soil/waste type.

Currently, EnviroBlend products are utilized for a variety of metals, notably:

Arsenic- Arsenate, CA, CCA, Arsenite; Antimony; Barium; Cadmium; Chromium (tri and hex); Cobalt; Copper; Lead; Manganese; Mercury; Nickel; Selenium; Vanadium; Zinc

For longevity, reactive magnesia compounds in EnviroBlend products are extremely strong, lasting buffers, typically generating matrix conditions in the 8 to 10.5 pH unit range – an ideal environment for long-term stabilization for heavy metals. As such, EnviroBlend products meet and exceed Toxicity Characteristic Leaching Procedure (TCLP), Synthetic Precipitation Leaching Procedure (SPLP), Multiple Extraction Procedure (MEP), Soluble Threshold Limit Concentration (STLC), Waste Extraction Test (WET), and/or Leaching Environmental Assessment Framework (LEAF) criteria, even at low dosage rates.

Case Studies

Example 1

Former Mill – Massachusetts

Untreated soil sample contained total lead of 190,000 mg/kg leaching at 651 mg/L. A dosage rate (wt./wt.) of 4% EnviroMag Coarse reduced lead leachability to 0.71 mg/L (UTS TCLP standard of 0.75 mg/L).

Sample “02” contained the highest total and leachable lead in the bench scale study. It was utilized to design the upper limit of treatment chemistry and dosage rate. Dosage rate was then scaled back where appropriate in further bench and pilot testing, as soil impacts were delineated onsite to optimize dosage and costs. After treatment, soils were disposed offsite.

Township purchased reclaimed property from the responsible party for Greenspace and nature path.

Leaching Results							
Sample Name	Ursus Lab ID	EnviroBlend® Dosage		Screening Leaching Test Results			
		Chemical	Percentage	Pretest pH	Solution	Final pH	Lead mg/L
02	10-09006	Untreated	-	-	TCLP 1	4.96	651
		EnviroMag® Coarse	3.0%	-	TCLP 1	6.75	8.77
			4.0%	-	TCLP 1	9.04	0.71

Example 2

Confidential Site – Indiana

In bench testing, untreated “9-03” sample returned a total lead concentration of 3,740 mg/kg leaching at 5.63 mg/L and total zinc of 8,570 mg/kg leaching at 49.8 mg/L. A dosage rate of 2% EnviroMag Coarse reduced leachable lead to 0.90 mg/L (TCLP standard of 5.0 mg/L for lead; cleanup criteria of 5.0 mg/L for zinc).

Leaching Results									
Sample Name	Ursus Lab ID	EnviroBlend® Dosage		Screening TCLP Test Results					
		Chemical	Percentage	Pretest pH	Solution	Final pH	Cadmium mg/L	Lead mg/L	Zinc mg/L
9-03	10-09008	Untreated	-	2.20	TCLP-1	6.04	<0.24	5.63	49.8
		EnviroMag® Coarse	2.0%	-	TCLP-1	6.92	<0.024	0.20	1.95

Example 3

Golf Course Reclamation – Mid-West

Suburban golf club was constructed on a former firing range. Site soil mainly impacted with handgun and rifle rounds. During course construction, urban fill and firing range soils were introduced to native site soils for ground leveling and physical improvement.

For reclamation, soils were not screened to remove bullets or urban fill inclusions. Untreated soil composite sample “Bulk 2” contained 37,100 mg/kg of total lead leaching at 1,900 mg/L. A dosage rate of 4% EnviroMag Coarse reduced lead leachability to 0.47 mg/L (TCLP standard of 5.0 mg/L). Soil was disposed off-site in a Subtitle D landfill.

Leaching Results							
Sample Name	Ursus Lab ID	EnviroBlend® Dosage		Screening Leaching Test Results			
		Chemical	Percentage	Pretest pH	Solution	Final pH	Lead mg/L
Bulk 2	10-07025	Untreated	-	1.82	TCLP 1	4.77	1,900
		EnviroMag® Coarse	3.0%	-	TCLP 1	7.82	1.77
			4.0%	-	TCLP 1	9.25	0.47

Example 4

Confidential Site – Asheville, NC

Untreated soil contained lead totals of 3,740 mg/kg and antimony totals of 187 mg/kg. Lead was leaching at 1,660 mg/L and antimony at a concentration of 1.71 mg/L. TCLP site standards for antimony and lead were 0.5 mg/L and 5 mg/L, respectively. Dosage rates of 4% to 5% EnviroBlend 80/20 Coarse reduced antimony to acceptable leachable levels. The client selected 4% dosage.

Leaching Results								
Sample Name	Ursus Lab ID	EnviroBlend® Dosage		Screening TCLP Test Results				
		Chemical	Percentage	Pretest pH	Solution	Final pH	Antimony mg/L	Lead mg/L
{sic}	10-09008	Untreated	-	2.20	TCLP 1	5.34	1.71	1660
		EnviroBlend® 80/20 Coarse	3.0%	-	TCLP 1	7.81	0.085	130
			4.0%	-	TCLP 1	9.62	0.098	1.99

Example 5

Former Incinerator Site – Mid-West

Untreated, “Soil 1” sample contained total lead of 14,800 mg/kg leaching at 1,900 mg/L; slag fragments were present in the soil unit and sample. A 3% dosage of EnviroBlend CS reduced lead leachability to 0.21 mg/L (TCLP standard of 5.0 mg/L for lead). A 2% dosage of EnviroBlend FG reduced leachable lead to 0.20 mg/L.

Costs for both products with regards to dosage rates were similar. Client’s technical advisor selected EnviroBlend FG due to less soil bulking – regarding mixing, transport, and disposal costs.

Leaching Results								
Sample Name	Ursus Lab ID	EnviroBlend® Dosage		Screening Leaching Test Results				
		Chemical	Percentage	Pretest pH	Solution	Final pH	Arsenic mg/L	Lead mg/L
Soil 1	13-02001	Untreated	-	2.20	TCLP 1	5.77	<0.030	1,900
		EnviroBlend® FG	1.5%	-	TCLP 1	7.29	<0.030	161
			2.0%	-	TCLP 1	9.62	<0.030	0.20
		EnviroBlend® CS	2.0%	-	TCLP 1	7.46	<0.030	100
			3.0%	-	TCLP 1	9.85	<0.030	0.21

Example 6

Seymour Johnson AFB – Goldsboro, NC – A&D Environmental

For an onsite firing range, remediation contractor excavated and screened almost 4,000 tons of lead impacted soil. Soil was mixed *in-situ* in 100 ton batches utilizing 3% wt./wt. admix of EnviroBlend 90/10 Coarse. Confirmation samples were collected every 200 cubic yards of treated soil generated.

100% of the soils were rendered RCRA non-hazardous on the first treatment pass.

Post-treatment and disposal, contractor demolished range concrete retaining walls and graded former firing range berm areas to match surrounding grades. Resulting effect to the project bottom line – by utilizing a bench-scale treatability study and selecting an appropriate cost-performance efficient admix and dosage rate – was a savings of over \$600,000 versus hazardous disposal.



ENVIROMAG® COARSE: Specification Sheet

EnviroMag Coarse is a coarse-sized magnesium oxide. It is typically used for remediation and stabilization of heavy metal(s) contaminated soil or waste. EnviroMag Coarse has a high buffering capability for pH neutralization. Also utilized for acidic soil/groundwater.

Specifications

Chemical Analysis (loss-Free basis)

MgO:	73.0% typical
CaO:	7.2% typical
Acid Insolubles:	17.3% typical
Fe₂O₃+Al₂O₃:	2.5% typical
Specific Gravity:	60-65 lbs per cu.ft.
Appearance:	Light grey to tan powder

Domestic Shipping Information

DOT Proper Shipping Name	Not Regulated
DOT Hazard Class	Not Regulated
DOT ID Number	Not Regulated

Shipment Options

DOT Approved Tank Cars or Trucks

Issue Date 02-Dec-2014

Revision Date 19-Aug-2014

Version 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name ENVIROMAG fi Coarse

Other means of identification

Product Code ENVIROMAG fi Coarse

Synonyms Light Burned Magnesium Oxide, Caustic Calcined Magnesia, MgO, Magnesium Oxide,

Recommended use of the chemical and restrictions on use

Recommended Use Heavy metals remediation product.

Uses advised against No information available

Details of the supplier of the safety data sheet

Manufacturer Address

Premier Magnesia, LLC, 300 Barr Harbor Drive, Suite 250, West Conshohocken, PA 19428

Emergency telephone number

Company Phone Number 610-828-6929

24 Hour Emergency Phone Number Chemtrec 1-800-424-9300

Emergency Telephone Chemtrec 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

Product dust is classified as a "nuisance particulate, not otherwise regulated" as specified by ACGHI and OSHA. The excessive, long-term inhalation of mineral dusts may contribute to the development of industrial bronchitis, reduced breathing capacity, and may lead to the increased susceptibility to lung disease. This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.122)

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Label elements

Emergency Overview

The product contains no substances which at their given concentration, are considered to be hazardous to health

Appearance Granular

Physical state Solid

Odor Odorless

Causes mild irritation to the eyes

Low toxicity by skin contact.

Chronic overexposure by inhalation of airborne particulate may irritate upper respiratory system as well as the throat.

Ingestion is an unlikely route of exposure. If ingested in large amounts it may cause irritation, nausea, vomiting, diarrhea, abdominal pain, black stool, pink urine, coma and possibly death.

Hazards not otherwise classified (HNOC)

Other Information

Unknown Acute Toxicity

100% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Common name Magnesium Oxide # 1309-48-4.
Synonyms Light Burned Magnesium Oxide, Caustic Calcined Magnesia, MgO, Magnesium Oxide,

Chemical Name	CAS No.	Weight-%	Trade Secret
Magnesium Oxide	1309-48-4	100	

4. FIRST AID MEASURES

First aid measures

Eye contact Rinse thoroughly with plenty of water, also under the eyelids. (Get medical attention immediately if irritation persists.)

Skin Contact Wash skin with soap and water.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately.

Ingestion Not an expected route of exposure. Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. Immediate medical attention is required.

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media Water reacts with magnesium oxide producing magnesium hydroxide and heat. Do not allow water to get inside containers: reaction with water will cause product to swell, generate heat, and burst its container. If contact is unavoidable, use sufficient water to safely absorb the heat that may be generated.

Specific hazards arising from the chemical

No information available.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation, especially in confined areas.

Environmental precautions

Environmental precautions See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Carefully clean up and place material into a suitable container, being careful to avoid creating excessive dust. If conditions warrant, clean up personnel should wear approved respiratory protection, gloves and goggles to prevent irritation from contact and/or inhalation.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Use personal protective equipment as required.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place. Avoid generation of dust. Do not allow contact with water.

Incompatible materials Interhalogens, bromine pentafluoride, chlorine trifluoride. Contact with aluminum metal may release hydrogen gas. Incandescent reaction with phosphorus pentachloride. Water will react with magnesium oxide to form magnesium hydroxide and release heat and steam.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Magnesium Oxide 1309-48-4	TWA: 10 mg/m ³ inhalable fraction	TWA: 15 mg/m ³ fume, total particulate (vacated) TWA: 10 mg/m ³ fume and total particulate	IDLH: 750 mg/m ³ fume

NIOSH IDLH Provide workers with NIOSH approved respirators in accordance with requirements of 29 CFR 1910. 134 for level of exposure incurred.

Appropriate engineering controls

Engineering Controls Provide sufficient ventilation, in both volume and air flow patterns to control mist/dust concentrations below allowable exposure limits. Showers. Eyewash stations.

Individual protection measures, such as personal protective equipment

Eye/face protection Avoid contact with eyes. The use of eye protection is recommended.

Skin and body protection The use of eye protection, gloves and long sleeve clothing is recommended.

Respiratory protection Provide workers with NIOSH approved respirators in accordance with requirements of 29 CFR 1910. 134 for level of exposure incurred.

General Hygiene Considerations Wash hands thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Solid

Appearance	Granular	Odor	Odorless
Color	Brownish	Odor threshold	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	10-11	
Melting point/freezing point	>2100 °C >3800 °F	
Boiling point / boiling range	No information available	
Flash point	No information available	
Evaporation rate	Not Applicable	
Flammability (solid, gas)	No information available	
Flammability Limit in Air		
Upper flammability limit:	No information available	
Lower flammability limit:	No information available	
Vapor pressure	No information available	
Vapor density	No information available	
Specific Gravity	3.56	
Water solubility	Slight <1%	
Solubility in other solvents	No information available	
Partition coefficient	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	

Other Information

Softening point	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Density	No information available
Bulk density	70-90 lb/ft3

10. STABILITY AND REACTIVITY**Reactivity**

No data available

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Hazardous polymerization	Hazardous polymerization does not occur.
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Conditions to avoid

Extremes of temperature and direct sunlight.

Incompatible materials

Interhalogens, bromine pentafluoride, chlorine trifluoride. Contact with aluminum metal may release hydrogen gas. Incandescent reaction with phosphorus pentachloride. Water will react with magnesium oxide to form magnesium hydroxide and release heat and steam.

Hazardous Decomposition Products

Heat and steam.

11. TOXICOLOGICAL INFORMATION**Information on likely routes of exposure**

Product Information	Magnesium Oxide # 1309-48-4
Inhalation	Inhalation of fume (not MgO dust particulate) produced upon decomposition of magnesium compounds can produce a febrile reaction and leukocytosis in humans.
Eye contact	No data available.
Skin Contact	No data available.
Ingestion	No data available.

Information on toxicological effects

Symptoms No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization No information available.
Germ cell mutagenicity No information available.
Carcinogenicity No information available.
Reproductive toxicity No information available.
STOT - single exposure No information available.
STOT - repeated exposure No information available.
Aspiration hazard No information available.

Numerical measures of toxicity - Product Information

Unknown Acute Toxicity 100% of the mixture consists of ingredient(s) of unknown toxicity

12. ECOLOGICAL INFORMATION**Ecotoxicity**

No data available on any adverse effects of this material on the environment

100% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Persistence and degradability

No information available.

Bioaccumulation

No information available.

Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS**Waste treatment methods**

Disposal of wastes This produce does not exhibit any characteristics of a hazardous waste. The product is suitable for landfill disposal once the free water component is evaporated or absorbed by a suitable absorbent (earth). Follow all applicable federal, state and local regulations for safe disposal.

Contaminated packaging Do not reuse container.

14. TRANSPORT INFORMATION

DOT Not regulated Not regulated by DOT as a hazardous material. No hazard class, label or placard required, no UN or NA number assigned.

15. REGULATORY INFORMATION

International Inventories

Chemical Name	Complies							
	TSCA	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Magnesium Oxide	X	X	X	X	X	X	X	X

X - Listed

- TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List
- EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
- ENCS** - Japan Existing and New Chemical Substances
- IECSC** - China Inventory of Existing Chemical Substances
- KECL** - Korean Existing and Evaluated Chemical Substances
- PICCS** - Philippines Inventory of Chemicals and Chemical Substances
- AICS** - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313

This product does not contain any substances reportable under Sections 302, 304 or 313. Sections 311 and 312 do apply. (Routine Reporting and Chemical Inventories)

SARA 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65

This product does not contain chemicals known to the State of California to cause cancer, birthdefects or other reproductive toxins.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania

Magnesium Oxide 1309-48-4	X	X	X
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U.S. EPA Label Information

EPA Pesticide Registration Number Not Applicable

16. OTHER INFORMATION

NFPA	Health hazards 1	Flammability 0	Instability 0	Physical and Chemical Properties -
HMIS	Health hazards 0	Flammability 0	Physical hazards 0	Personal protection X

Issue Date 02-Dec-2014

Revision Date 19-Aug-2014

Revision Note

No information available

Disclaimer

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet



Lab Number: 15- 2070

Certificate of Analysis

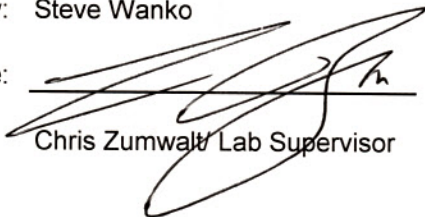
Customer: Coyote/Kmac
 Date Sampled: September 28, 2015
 Product: Enviromag Coarse
 Car Number: SIRX475617

Bin or Silo: 7NEWS
 Mesh:
 Lot Number: /15

Chemical			Particle Size	
The following chemical results are reported on an ignited basis.			Screen mesh sizes are reported in U.S.A. series sizes.	
TEST	Result		Mesh	Percent
Loss	<u>6.96</u>	%	<u>12</u>	<u>29.5</u>
Insol.	<u>13.25</u>	%	<u>20</u>	<u>13.8</u>
R2O3	<u>2.26</u>	%	<u>40</u>	<u>8.8</u>
CaO	<u>9.03</u>	%	<u>70</u>	<u>22.4</u>
MgO	<u>75.46</u>	%	<u>100</u>	<u>10.2</u>
Mg		%	<u>-100</u>	<u>15.4</u>
P2O5		%		
The following chemical results are reported on an "as is" basis.				
Reactivity (TP 52)		min:sec		
Sulfur		%		
Blend Ratio		TSP:LBM		
Railcar Seal Numbers:	<u>390-398</u>			
Tapped bulk density	<u>84.8</u>	lbs/cu ft		

Analyzed By: Steve Wanko

Signature:



Chris Zumwalt Lab Supervisor

Date: September 29, 2015



MAGNESIA, LLC

Non-Negotiable Bill of Lading

B/L No. GA56282
Date: 9/28/15

RECEIVED, subject to the "COMMON CARRIER RATE AGREEMENT" or the CONTRACT between the Shipper and Carrier in effect on the date of shipment, the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below. This Bill of Lading is not subject to any tariffs or classifications whether individually determined or filed with any federal or state regulatory agency, except as specifically agreed to in writing by the shipper and the carrier

Consignee: Access America Transport / Coyote Logistics 3101 27 th Avenue North Birmingham, AL 35207	Shipper: Premier Magnesia, LLC State Route 361 Gabbs, NV 89409
Bill To : Premier Magnesia LLC Attn: Logistics Department 300 Barr Harbor Drive, Suite 250 West Conshohocken, PA 19428	Carrier : UP Route: Car Number: <i>SIRX 475617</i>
PO# XO31532	Seal # <i>390-398</i>

No. Pkgs.	⊖ HM	Description of Articles, Packages, Markings, Exceptions	Weight	Rate *	Freight Charges <input checked="" type="checkbox"/> Prepaid <input type="checkbox"/> Collect
1 C/L		Enviromag Coarse 672900 The description and weight indicated on this bill of lading are correct:: Subject to verification by the WESTERN WEIGHING AND INSP BUREAU According to agreement	<i>N</i> <i>196,560</i> NT <i>98.28</i>		Subject to Section 7 of the Terms and Conditions of Carriage, if the shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges. Premier Magnesia <small>(Signature of consignor)</small> C.O.D. amount \$ _____ Remit C.O.D. amount to: _____ Carriers C.O.D. fee to be paid by <input type="checkbox"/> Shipper <input type="checkbox"/> Consignee

Rate is individually determined and NOT subject to filed tariffs unless stated in Common Carrier Rate Agreement.

Shipper's Certification: [If any required] Premier Magnesia, LLC , Shipper Per HUGO RAMIREZ Date 09/09/15	OPTIONAL -- ON BROKER MOVEMENTS: Carrier hereby designates (Broker) as its agent for the collection of freight charges. When paid to broker, Carrier agrees not to hold shipper or consignee liable for said charges. Accepted in good order and condition, unless otherwise stated herein, <p style="text-align: center;">1 C/L</p> Exceptions: _____, Carrier per _____ <small>(Driver's Signature)</small> Time & Date tendered _____ AM PM
Carrier's liability is for actual loss unless otherwise agreed in Common Carrier Rate Agreement, or stated below. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ _____ per pound. _____, Shipper per _____	