# Safety Data Sheet

## Section 1
## Identification of the Substance and of the Supplier

### 1.1 Product Identifier

| | |
|---|---|
| **Product Name/Identification:** | Reclaimed Coal Ash |
| **Synonyms:** | Bottom Ash, Fly Ash |
| **Product Code:** | Not Applicable |
| **Formula:** | Unknown or Variable Composition/Biological Substance |

### 1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advices Against

| | |
|---|---|
| **Relevant Identified Uses:** | Industrial Use, Concrete Additive, Raw Material |
| **Uses Advised Against:** | Any uses not meeting appropriate engineering specifications |

### 1.3 Details of the Supplier of the SDS

| | |
|---|---|
| **Manufacturer/Supplier:** | Charah Solutions, Inc. |
| **Street Address:** | 12601 Plantside Drive |
| **City, State and Zip Code:** | Louisville, KY 40299 |
| **Customer Service Telephone:** | 502-245-1353 |
| **Website Address:** | www.charah.com |

### 1.4 Emergency Telephone Numbers

| | |
|---|---|
| **Emergency Phone Number:** | 877-314-7724 |
| **Hours Available:** | M-F, 8:00 am – 5:00 pm |
| | |
| **24-Hour Emergency Phone Numbers:** | (800) 424-9300 (24-hour response, Chemtrec) |

# Section 2
# Hazards Identification

## 2.1 Classification of the Substance

**GHS Classification(s) according to OSHA Hazard Communication Standard (29 CFR 1910.1200):**

- Specific Target Organ Toxicity (STOT) - Single Exposure (SE) Category 3 (Respiratory Irritation)
- Specific Target Organ Toxicity (STOT) - Repeat Exposure (RE) Category 2

*Note: The level of respirable crystalline silica (RCS) present in this product has not been determined; however, a conservative classification for STOT-RE, Category 2 has been assigned*

## 2.2 Label Elements

| ***Labelling according to 29 CFR 1910.1200 Appendices A, B and C**** | |
|---|---|
| ***Hazard Pictogram(s):*** |  |
| ***Signal word:*** | Danger |
| ***Hazard Statement(s):*** | May cause respiratory irritation.<br>May cause damage to lungs after repeated/prolonged exposure via inhalation.<br>May cause cancer.<br>May cause skin irritation.<br>Causes serious eye damage. |
| ***Precautionary Statement(s):*** | Do not breathe dust.<br>Use outdoors or in a well-ventilated area.<br>If inhaled: Remove to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell.<br>Wash with plenty of water if on skin.<br>If in eyes, rinse with water for several minutes. Remove contact lenses, if present.<br>Store in a secure area.<br>Dispose of product in accordance with local/national regulations. |

** Reclaimed Coal Ash, Fly Ash, Bottom Ash, and other coal combustion products (CCPs) are UVCB substances (substance of unknown or variable composition or biological). Various CCPs, noted as Ashes; Ash; Ash residues; Ashes, residues, bottom; Bottom ash; Bottom ash residues; Waste solids, ashes under TSCA are defined by the US EPA as: "The residuum from the burning of a combination of carbonaceous materials. The following elements may be present as oxides: aluminum, calcium, iron, magnesium, nickel, phosphorus, potassium, silicon, sulfur, titanium, and vanadium." Ashes including fly ash and fluidized bed combustion ash are identified by CAS number 68131-74-8. The exact composition of the ash is dependent on the fuel source and flue additives composed of many constituents. The classification of the final substance is dependent on the presence of specific identified oxides as well as other trace elements.*

## 2.3 Other Hazards

**Listed Carcinogens:**

- Respirable Crystalline Silica

**IARC:** [Yes] **NTP:** [Yes] **OSHA:** [No] **Other:** [No]

## Section 3
## Composition/Information on Ingredients

| *Substance* | *CAS No.* | *Percentage (%)* | *GHS Classification* |
|---|---|---|---|
| *Aluminosilicates* | *Various; See Note 1* | *50 – 95* | *Single Exposure STOT, Category 3* |
| *Crystalline Silica* | *14808-60-7* | *5 – 10* | *Repeat Dose STOT, Category 2* |
| *Silica, crystalline respirable (RCS)* | *14808-60-7* | *≥0.1; See Note 2* | *Repeat Dose STOT, Category 2* |
| *Calcium oxide (CaO)* | *1305-78-8* | *<1 – 30* | *Single Exposure STOT, Category 3* |
| *Potassium oxide ($K_2O$)* | *12136-45-7* | *≤5* | *Skin Irritant Category 2*<br>*Eye irritant Category 2B* |
| *Iron Mineral Dusts ($Fe_2O_3$, $Fe_3O_4$)* | *1309-37-1* | *<1 – 5* | *Skin Irritant Category 2*<br>*Eye irritant Category 2B* |

1. *Aluminosilicates may be in the form of mullite (CAS#1302-93-8); aluminosilicate glass, or pozzolans (CAS#71243-67-9). The form is dependent on the source of the coal and or the process used to create the CCP. Pulverized coal combustion would be more likely to create high levels of pozzolans. Aluminosilicates may have inclusions of calcium, titanium, iron, potassium, phosphorus, magnesium and other metal oxides.*
2. *The percentage of RCS in the CCP has not been determined.*

## Section 4
## First Aid Measures

### 4.1 Description of First Aid Measures

| | |
|---|---|
| **Inhalation:** | If product is inhaled and irritation of the nose or coughing occurs, remove person to fresh air. If breathing is difficult, give oxygen. If breathing stops, apply artificial respiration. Seek medical attention as necessary. |
| **Skin Contact:** | If skin exposure occurs, wash with soap and water. Remove contaminated clothing. Seek medical attention if irritation develops and persists. |
| **Eye Contact:** | If product gets into the eye, rinse cautiously with water for several minutes. Do not rub eyes. Remove contact lenses, if present and easy to do. Seek medical attention/advice if irritation occurs or persists. |
| **Ingestion:** | Rince mouth thoroughly with water. Consult a physician. |

### 4.2 Most Important Health Effects, Both Acute and Delayed

**Acute effects:** Direct exposure may cause respiratory irritation, eye irritation and skin irritation. The product dust can dry and irritate the skin and cause dermatitis and can irritate eyes and skin through mechanical abrasion.

**Chronic effects:** Chronic exposure may cause lung damage from repeated exposure. Chronic inhalation of dust containing respirable crystalline silica may result in silicosis.

### 4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Seek first aid or call a doctor or Poison Control Center if contact with eyes occurs and irritation remains after rinsing.

## Section 5
## Firefighting Measures

### 5.1 Extinguishing Media

| | |
|---|---|
| **Suitable Extinguishing Media:** | Product is not flammable. Use extinguishing media appropriate for surrounding fire. |
| **Unsuitable Extinguishing Media:** | Not applicable, the product is not flammable. |

### 5.2 Special Hazards Arising from the Substance or Mixture

| | |
|---|---|
| **Hazardous Combustion Products:** | None known. |

### 5.3 Advice for Firefighters

| | |
|---|---|
| **Special Protective Equipment and Precautions for Firefighters:** | As with any fire, wear self-contained breathing apparatus (NIOSH approved or equivalent) and full protective gear. |

**Other Information**: Refer to Section 9 for flammability properties.

## Section 6
## Accidental Release Measures

### 6.1 Personal Precautions, Protective Equipment and Emergency Procedures

| | |
|---|---|
| **Personal precautions/Protective Equipment:** | See Section 8.2.2 Personal Protective Equipment. For concentrations exceeding Occupational Exposure Levels (OELs), use a self-contained breathing apparatus (SCBA). |
| **Emergency procedures:** | Use scooping, water spraying/flushing/misting or ventilated vacuum cleaning systems to clean up spills. Do not use pressurized air. |

### 6.2 Environmental precautions

| | |
|---|---|
| **Environmental precautions:** | Prevent contamination of drains or waterways and dispose according to local and national regulations. |

## 6.3 Methods and Material for Containment and Cleaning Up

| | |
|---|---|
| **Methods and materials for containment and cleaning up:** | For Containment: Scoop or vacuum the product to recover it. Vacuum must be fitted with HEPA filter to prevent release of particulates during clean-up.<br><br>For Clean-up: Do not use brooms or compressed air to clean surfaces. Use dust collection vacuum and extraction systems.<br><br>Large spills of dry product should be removed by a vacuum system. Dampened material should be removed by mechanical means and recycled or disposed of according to local and national regulations. |

*See Sections 8 and 13 for additional information on exposure controls and disposal.*

# Section 7
# Handling and Storage

## 7.1 Precautions for Safe Handling

Practice good housekeeping: Use adequate exhaust ventilation, dust collection and/or water mist to maintain airborne dust concentrations below permissible exposure limits (note: respirable crystalline silica dust may be in the air without a visible dust cloud).

Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. In cases of insufficient ventilation, wear a NIOSH approved respirator for silica dust when handling or disposing dust from this product. Avoid contact with skin and eyes. Wash or vacuum clothing that has become dusty. Avoid eating, smoking, or drinking while handling the material.

## 7.2 Conditions for Safe Storage, Including any Incompatibilities

**Technical Measures**: Comply with applicable regulations.

**Storage Conditions**: Store in a dry, cool and well-ventilated place. Keep/Store away from incompatible materials. Minimize dust produced during loading and unloading.

**Incompatible Materials**: Strong acids. Strong bases. Strong oxidizers.

# Section 8
# Exposure Controls/Personal Protection

## 8.1 Control Parameters

| OCCUPATIONAL EXPOSURE LIMITS | | | | | |
|---|---|---|---|---|---|
| **SUBSTANCE** | | **OSHA PEL TWA ($mg/m^3$)** | **NIOSH REL TWA ($mg/m^3$)** | **ACGIH TLV TWA ($mg/m^3$)** | **CA - OSHA PEL ($mg/m^3$)** |
| **Calcium oxide** | | 5 | 2 | 2 | 2 |
| **Particulates Not Otherwise Regulated** | Total | 15 | 15 | - | 10 |
| | Respirable | 5 | 5 | - | 5 |
| **Crystalline Silica** | Total Quartz | 30 ÷ (%$SiO_2$+2) (Total Quartz) | - | - | 0.3 |
| | Respirable Crystalline Silica | 10 ÷ (%$SiO_2$+2) | 0.05 | 0.025 (α-quartz & cristobalite) | 0.1 |
| | Cristobalite | 0.05 | 0.05 | 0.025 (α-quartz & cristobalite) | 0.05 (respirable) |

## 8.2 Exposure Controls

**Appropriate Engineering Controls**: Ensure adequate ventilation, especially in confined areas. Maintain the ambient workplace atmosphere below the occupational exposure limit(s). Use general and local exhaust ventilation and dust collection systems as necessary to minimize exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of potential exposure. Ensure all federal, state, and local regulations are observed.

### 8.2.1 Personal Protective Equipment (PPE)

| | |
|---|---|
| **Respiratory protection:** | Wear a NIOSH approved particulate respirator if exposure to airborne particulates is unavoidable and where occupational exposure limits may be exceeded. If airborne exposures are anticipated to exceed applicable PELs or TLVs, a self-contained breathing apparatus or airline respirator is recommended. |
| **Eye and face protection:** | If eye contact is possible, wear protective glasses with side shields, goggles, or face shields. Avoid contact lenses. |
| **Hand and skin protection:** | Wear gloves and protective clothing. Wash hands with soap and water after contact with material. |

## Section 9
## Physical and Chemical Properties

### 9.1 Information on Basic Physical and Chemical Properties

| Property: Value | Property: Value |
|---|---|
| **Appearance (physical state, color, etc.):** Fine gray/tan/black particulate | **Upper/lower flammability or explosive limits:** Not applicable |
| **Odor:** Odorless[1] | **Vapor Pressure (Pa):** Not applicable |
| **Odor threshold:** Not applicable | **Vapor Density:** Not applicable |
| **pH (25 °C):** 7-12[2] | **Specific gravity or relative density:** 2.2 - 2.8 |
| **Melting point/freezing point (°C):** >1,093.33 °C | **Water Solubility:** Slight |
| **Initial boiling point and boiling range (°C):** Not applicable | **Partition coefficient: n-octane/water:** Not determined |
| **Flash point (°C):** Not determined | **Auto ignition temperature (°C):** Not applicable |
| **Evaporation rate:** Not applicable | **Decomposition temperature (°C):** Not determined |
| **Flammability (solid, gas):** Not combustible | **Viscosity:** Not applicable |

*[1] The use of urea or aqueous ammonia injected into the flue gas to reduce nitrogen oxides (NOx) emissions may result in the presence of ammonium sulfate or ammonium bisulfate in the ash at less than 0.1%. When ash containing these substances becomes wet under high pH (>9), free ammonia gas may be released resulting in objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces.*
*[2] This is a typical range. There are rare cases where fly ash has pH in water of less than 7.*

### 9.2 Other Information

No additional information available.

## Section 10
## Stability and Reactivity

| | |
|---|---|
| **10.1 Reactivity:** | The material is an inert, inorganic material primarily composed of silica and elemental oxides. |
| **10.2 Chemical stability:** | The material is stable under normal use conditions. |
| **10.3 Possibility of hazardous reactions:** | The material is a relatively stable, inert material; however, when ash containing ammonia becomes wet under high pH (>9), free ammonia gas may be released resulting in an objectionable/nuisance ammonia odor and potential exposure to ammonia gas especially in confined spaces. |
| **10.4 Conditions to avoid:** | Product can become airborne in moderate winds. Dry material should be stored in silos. Materials stored outdoors should be covered or maintained in a damp condition. |
| **10.5 Incompatible materials:** | Strong acids. Strong bases. Strong oxidizers. |
| **10.6 Hazardous decomposition products:** | None known. |

# Section 11
# Toxicological Information

## 11.1 Information on Toxicological Effects

| Endpoint | Data |
|---|---|
| Acute oral toxicity | LD50 > 2000 mg/kg<br>Component Data:<br>Quartz: LD50 > 5000 mg/kg<br>Aluminum oxide: LD50 > 15900 mg/lg (rat)<br>Iron oxide: LD50 > 10000 mg/kg (rat)<br>Calcium oxide: LD50 > 2000 mg/kg (rat) |
| Acute dermal toxicity | LD50 > 2000 mg/kg |
| Acute inhalation toxicity | LC50 > 5.0 mg/L<br>Component Data:<br>Aluminum oxide: LC50 > 2.3 mg/L/4-hour |
| Skin corrosion/irritation | Not irritating to skin. |
| Eye damage/irritation | Slight but reversible eye irritation. |
| Respiratory/skin sensitization | Not a respiratory or dermal sensitizer. |
| Germ cell mutagenicity | Not mutagenic in *in vitro* and *in vivo* assays with or without metabolic activation. |
| Carcinogenicity | NTP: Probable carcinogen<br>OSHA: Not listed as a carcinogen<br>IARC Monographs: Group 1 Carcinogen<br>California Proposition 65: Known carcinogen |
| Reproductive toxicity | An animal study with a CCP has indicated some effects on male and female reproductive organs and parameters without a clear dose response, while studies with other CCPs have not shown reproductive effects. Therefore, there is not enough evidence available to classify according to reproductive toxicity. No developmental toxicity has been observed in available animal studies. |
| STOT-SE | No specific target organ toxicity after a single exposure to the substance is expected; however, presence as a nuisance dust may result in respiratory irritation. |
| STOT-RE | NOAEC = 4.2 mg/m$^3$ fly ash dust; as no effects were observed at the highest dose tested during the 180-day inhalation study, it is not possible to assess the level at which toxicologically significant effects may occur.<br><br>Repeated inhalation exposures to high levels of respirable crystalline silica may result in lung damage (i.e., silicosis). |

## Section 12
## Ecological Information

### 12.1 Toxicity

The product is not classified as environmentally hazardous.

### 12.2 Persistence and Degradability

Not relevant for inorganic materials. The product is not biodegradable.

### 12.3 Bioaccumulative Potential

The product is not bioaccumulating.

### 12.4 Mobility in Soil

None known.

### 12.5 Mobility in General

The product is immiscible with water and will spread on water surfaces.

### 12.6 Results of PBT and vPvB Assessment

No data available.

### 12.7 Other Adverse Effects

None known.

## Section 13
## Disposal Considerations

See Sections 7 and 8 above for safe handling and use, including appropriate hygienic practices.

Dispose of all waste products and containers in accordance with federal, state and local regulations.

## Section 14
## Transport Information

| | | |
|---|---|---|
| **Regulatory entity:** U.S. DOT | Shipping Name: | Not Regulated as Dangerous Goods |
| | Hazard Class: | Not Regulated as Dangerous Goods |
| | ID Number: | Not Regulated as Dangerous Goods |
| | Packing Group: | Not Regulated as Dangerous Goods |

## Section 15
## Regulatory Information

### 15.1 Safety, Health, and Environmental Regulations/Legislation Specific for the Mixture

- **TSCA Inventory Status**

  All components are listed on the TSCA Inventory.

- **California Proposition 65**

  The following substances are known to the State of California to be carcinogens and/or reproductive toxicants:

  - Respirable crystalline silica
  - Titanium dioxide (airborne particles)

- State Right-to-Know (RTK)

| Component | CAS | MA[1,2] | NJ[3,4] | PA[5] | RI[6] |
|---|---|---|---|---|---|
| Calcium oxide | 1305-78-8 | Yes | Yes | Yes | No |
| Iron oxide | 1309-37-1 | Yes | Yes | Yes | No |
| Potassium oxide | 12136-45-7 | No | Yes | No | No |
| Silica-crystalline (SiO2), quartz | 14808-60-7 | Yes | Yes | Yes | No |

[1] Massachusetts Department of Public Health, no date
[2] 189th General Court of The Commonwealth of Massachusetts, no date
[3] New Jersey Department of Health and Senior Services, 2010a
[4] New Jersey Department of Health, 2010b
[5] Pennsylvania Code, 1986
[6] Rhode Island Department of Labor and Training, no date

- **Coal ash is not a SARA 313 substance**.

  Coal ash is required for SARA Tier II (311/312) reporting when in sufficient quantities. Trace elements in coal ash should be considered in TRI reporting.

## Section 16
## Other Information, Including Date of Preparation or Last Revision

### 16.1 Indication of Changes

Date of preparation or last revision: October 20, 2025.

### 16.2 Abbreviations and Acronyms

- ACGIH: American Conference of Industrial Hygienists
- ANSI: American National Standards Institute
- CA: California
- CAA: Clean Air Act

- CAS: Chemical Abstract Services
- CCP: Coal Combustion Product
- CFB: Circulating Fluidized Bed
- CFR: Code of Federal Regulations
- CWA: Clean Water Act
- EPA: Environmental Protection Agency
- GHS: Globally Harmonized System of Classification and Labelling
- HMIS: Hazardous Materials Identification System
- IARC: International Agency for Research on Cancer
- LC50: Concentration resulting in the mortality of 50 % of an animal population
- LD50: Dose resulting in the mortality of 50 % of an animal population
- LEL: Lower explosive limit
- MA: Massachusetts
- NA: Not Applicable
- NJ: New Jersey
- NOEC: No observed effect concentration
- NIOSH: National Institute of Occupational Safety and Health
- NOx: Nitrogen oxides
- NTP: US National Toxicology Program
- OEL: Occupational Exposure Limit
- OSHA: Occupational Safety and Health Administration
- PA: Pennsylvania
- Pa: Paschal
- PBT: Persistent, Toxic and Bioaccumulative
- PEL: Permissible exposure limit
- PPE: Personal Protective Equipment
- REL: Recommended exposure limit
- RI: Rhode Island
- RCS: Respirable Crystalline Silica
- RTK: Right-to-Know
- SARA: Superfund Amendments and Reauthorization Act
- SCBA: Self-contained breathing apparatus
- SDS: Safety Data Sheet
- STEL: Short-term exposure limit
- STOT-RE: Specific target organ toxicity-repeated exposure
- STOT-SE: Specific target organ toxicity-single exposure
- TLV: Threshold limit value
- TSCA: Toxic Substances Control Act
- TWA: Time-weighted average
- UEL: Upper explosive limit
- UVCB: Unknown or Variable Composition/Biological
- U.S.: United States
- U.S. DOT: United States of Department of Transportation
- vPvB: Very Persistent and Very Bioaccumulative

## 16.3 Other Hazards

Table 1: Bottom Ash

| **Hazardous Materials Identification System (HMIS)**<br>Degree of hazard (0= low, 4 = extreme) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Health:** | 1* | **Flammability:** | **0** | **Reactivity:** | **1** | **Personal protection:** | - |

** Chronic Health Effect*

**DISCLAIMER:**

*This SDS has been prepared in accordance with the Hazard Communication Rule 29 CFR 1910.1200. Information herein is based on data considered to be accurate as of date prepared. No warranty or representation, express or implied, is made as to the accuracy or completeness of this data and safety information. No responsibility can be assumed for any damage or injury resulting from abnormal use, failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.*