

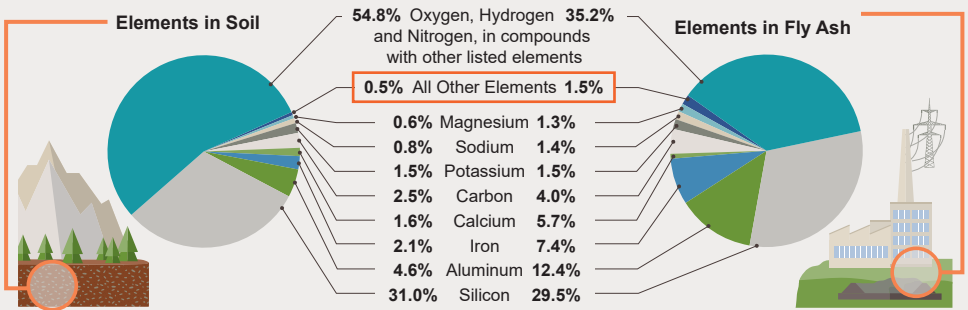
# Coal Ash is Not Hazardous

We are all familiar with soil and rocks in our environment. Coal is one type of rock. When we burn coal to produce electricity, the ash that remains is made up of the parts of the coal that do not burn, in the same way that ash remains after burning a campfire.

Basin Electric Power Cooperative (Basin Electric) is committed to the safe, responsible management of coal combustion residuals (CCR), or what is commonly referred to as coal ash. The EPA classified coal ash as **non-hazardous** solid waste. This designation is based on extensive review and detailed studies of the components of coal ash over many years by regulatory agencies, academic institutions, and expert third parties.<sup>1</sup> This designation is also backed up by rigorous toxicity testing. Further, as illustrated on this fact sheet, the constituents of coal ash are nearly identical to common soil.

## Coal Ash and Soil

The constituents that make up coal ash are the same as soils and rocks. These constituents are naturally occurring and consist mainly of oxygen, hydrogen, and nitrogen that together with carbon make up the building blocks of all life. Other major components in soil and coal ash are silicon (in the form of silicon oxides, or sand), aluminum, iron, calcium, and other common minerals, as shown in the chart below.<sup>2</sup>



## Regulatory Oversight of Coal Ash Management

Basin Electric is committed to the safe, secure management and monitoring of coal ash and there is also extensive regulatory oversight of coal ash sites because of the volume of material to manage and monitor. Regulatory agencies such as the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the Nuclear Regulatory Commission (NRC), state environmental agencies such as the Wyoming and North Dakota Departments of Environmental Quality and others are responsible for implementing laws passed by Congress and the States to manage health and environmental risks associated with air emissions, wastewater discharges, solid waste disposal, and potential exposure from commercial, industrial, and government operations. Constituents of coal ash and the management of coal ash are regulated to protect the environment, public health, and worker health.

## Coal Ash and People

Everything present in coal ash is also naturally present in the soils we encounter at our homes and parks and schools. We're exposed to these constituents every day in our lawns and gardens and in the foods we eat. Coal ash is maintained and managed on access-controlled industrial sites. The chance of anyone from the community coming into contact with the coal ash is remote and, thus, the chance of receiving a significant exposure to any constituents present in coal ash is also remote. Basin Electric's modern air pollution control technologies and dust control activities capture coal ash particulates and reduce human exposures.

1 EPA designated coal ash as a non-hazardous waste in its Reports to Congress in 1988 and 1999, [www.epa.gov/coalash/reports-congress-wastes-combustion-coal-and-fossil-fuels](http://www.epa.gov/coalash/reports-congress-wastes-combustion-coal-and-fossil-fuels); in Regulatory Determinations in 1993, [www.epa.gov/sites/production/files/2015-08/documents/080993.pdf](http://www.epa.gov/sites/production/files/2015-08/documents/080993.pdf), and 2000, [www.federalregister.gov/documents/2000/05/22/00-11138/notice-of-regulatory-determination-on-wastes-from-the-combustion-of-fossil-fuels](http://www.federalregister.gov/documents/2000/05/22/00-11138/notice-of-regulatory-determination-on-wastes-from-the-combustion-of-fossil-fuels); and in the 2015 Final Rule: [www.federalregister.gov/documents/2015/04/17/2015-00257/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric](http://www.federalregister.gov/documents/2015/04/17/2015-00257/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric).

2 Chart modified from: Electric Power Research Institute (EPRI). Report #3002018059, available at: [www.epri.com/research/products/000000003002018059](http://www.epri.com/research/products/000000003002018059)

# Decades of Studies Have Demonstrated That Coal Ash is Not Hazardous

The news media frequently describes coal ash as “toxic,” but this demonstrates a misunderstanding of toxicology, risk assessment, the roles of regulatory agencies, and the processes those agencies follow in developing and implementing policies and regulations.

When subjected to toxicity testing, coal ash is not considered toxic because the constituents within it are not present at high enough levels, alone or in combination, to be toxic. We know this from available published studies that assess the overall risks of coal ash to humans and the environment.

## The U.S. Approach to Chemical Evaluation

In the U.S., EPA evaluates a material based on the constituents present in the material. Thus, the EPA’s national risk assessment for coal ash evaluated the constituents present in coal ash. The Toxic Substances and Control Act (TSCA) administered by the EPA also regulates on a per chemical basis. This per-constituent approach has led to questions about whether there is a risk if someone is exposed to all of these constituents in coal ash (or soil) at once. The U.S. does not have a program to conduct testing on coal ash as a whole product, however, Europe does. It is a program called REACH, and such testing has been conducted on coal ash.

## REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals



The European Chemical Agency’s REACH program regulates a comprehensive program of toxicity testing of materials and has registered coal ash for commerce in Europe. That registration is based on testing whole coal ash using a variety of 47 different human health-based toxicity tests and 39 different aquatic toxicity tests. All of those 86 test results support characterizing coal ash as non-hazardous.<sup>3</sup>

These toxicity studies have been conducted on coal ash as a whole material. All of the constituents present in ash are present together, thus, these studies answer the question of what additive effects the constituents may have on health.

### REACH Coal Ash Human Health-Based Toxicity Studies

Toxicity Test	Publications and Reports	Conclusion
Acute Oral Toxicity	3	No Hazard
Acute Inhalation Toxicity	1	No Hazard
Acute Dermal Toxicity	2	No Hazard
Skin Irritation	12	No Hazard (11) Inconclusive (1)
Eye Irritation	6	No Hazard (5) Inconclusive (1)
Skin Sensitization	4	No Hazard
Repeated Dose Inhalation Toxicity	3	No Hazard
Repeated Dose Oral Toxicity	2	No Hazard
Genetic Toxicity	7	No Hazard
Reproductive Toxicity	2	No Hazard
Worker Epidemiology	5	No Hazard

### REACH Coal Ash Aquatic Toxicity Studies

Toxicity Test	Publications and Reports	Conclusion
Acute Toxicity to Fish	4	No Hazard
Acute Toxicity to Aquatic Invertebrates	8	No Hazard
Toxicity to Aquatic Algae and Cyanobacteria	16	No Hazard
Toxicity to Microorganisms	8	No Hazard
Chronic Toxicity to Fish	1	No Hazard
Chronic Toxicity to Aquatic Invertebrates	2	No Hazard



**39** aquatic toxicity studies



**47** toxicity studies relevant to humans

**No adverse effects were identified in any of the studies for both short-term and long-term exposure durations for:** Inhalation, ingestion, and dermal contact

**No adverse effects were identified in any of the studies for both short-term and long-term exposure durations for:** Fish, invertebrates, and micro-organisms

**All of the 86 studies concluded “no hazard”**

<sup>3</sup> “Ashes (residues), coal,” registration number EC# 931-322-8, is available on-line: [www.echa.europa.eu/brief-profile/-/briefprofile/100.151.318](http://www.echa.europa.eu/brief-profile/-/briefprofile/100.151.318)