

## Progress in Closing Coal Ash Basins



Duke Energy is committed to safely closing ash basins in ways that protect people, the environment and communities.

Most ash basins in the nation will be safely closed by capping them in place, an approach the U.S. Environmental Protection Agency (EPA) recognizes as protective of human health and the environment.

Safe recycling is the only way to avoid permanent storage of coal ash.

### Safety, science and sound engineering guide the way

We'll comply with state and federal requirements, following these guiding principles:

- Ensure groundwater is protected
- Ensure the long-term safety and stability of coal ash impoundments, including during extreme weather, such as flooding or earthquakes
- Comply with strict state and federal rules and regulations on managing coal ash
- Minimize impacts on communities by seeking solutions that address environmental impacts and stakeholder interests
- Leverage recycling opportunities

### Duke Energy's ash management efforts

More than a century ago, Duke Energy began electrifying communities with reliable and affordable power, some of it generated by burning coal. After combustion, the inorganic matter in the coal becomes coal ash. Less than 1 percent of ash contains trace elements. The EPA has studied coal ash for decades and repeatedly determined it does not warrant regulation as hazardous waste.

The company is committed to closing ash basins safely and responsibly, recycling more ash and transitioning to cleaner fuel sources that don't generate ash. Ash basin closure work is underway at several sites in accordance with state and federal requirements.

### We're closing ash basins in ways that:



Put safety first



Protect the environment



Minimize impact to communities



Manage costs

## Safe ash basin closure options

State and federal laws outline two main options to close ash basins: capping in place or excavation. In either scenario, water will be safely removed from each basin to protect water quality in the nearby lake or river. Both options provide benefits to groundwater, though excavation may be appropriate for certain technical reasons, such as a basin located in a flood plain. Each basin is unique, and the closure plan will be customized to the site to ensure it is most effective.

Capping in place:

- Isolates dewatered ash with a durable, sealed synthetic capping system with layers of soil and vegetation, which is engineered to keep precipitation out
- Protects groundwater and surface water
- Provides broader environmental protection by preventing the need for additional disposal locations, lowering transportation emissions and reducing disruption and other impacts to communities
- Safely closes larger basins much faster, while excavating and relocating ash can require decades to complete
- Protects families' electric bills

Where excavation is required, we first consider whether an on-site landfill is an option to help minimize community impacts. However, not all sites can accommodate a new or expanded landfill. If the ash must be relocated off-site, the material is excavated, transported by truck or train where possible, and stored in a lined landfill that is sealed with a synthetic cover and a layer of protective soil and vegetation.

## Protecting groundwater

Any plan to close ash basins must protect groundwater. To make sure that happens, Duke Energy enlisted the help of national coal ash and water quality experts to predict how groundwater may be affected in the future by different closure scenarios. More than 1,700 additional groundwater monitoring wells informed this work and will allow us to closely monitor conditions for many years.

Numerous scientific studies indicate that ash basins are not influencing neighbors' water supply wells, and the company has been proactive in addressing potential issues.

## Recycling coal ash

Recycling coal ash presents an opportunity to use this valuable material, which provides numerous benefits in construction. More than half of the concrete produced in the United States contains coal ash because it makes roads, bridges and buildings more durable.

Some of the world's most iconic and sustainable structures were built using coal ash, including One World Trade Center in New York City. For every ton of coal ash used as a replacement for Portland cement in concrete, approximately 1 ton of greenhouse gas emissions is avoided. Duke Energy recycled 63 percent of the ash produced in 2015, and we continue to pursue additional opportunities for recycling.

[www.duke-energy.com/ash-management](http://www.duke-energy.com/ash-management)