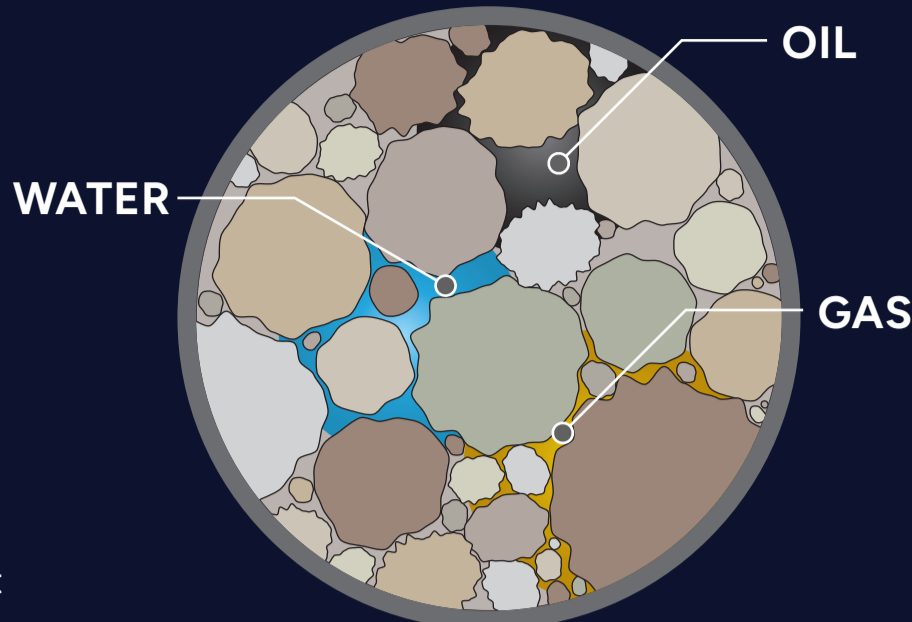


PRODUCED WATER

From Waste to Resource

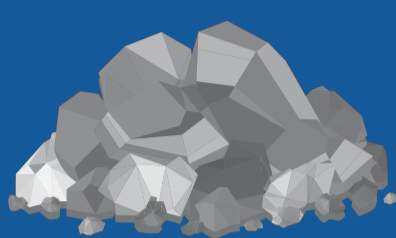
Increasing the production of U.S. oil and natural gas resources is crucial to providing affordable, reliable, and secure energy for all Americans. However, during production large volumes of water are often brought to the surface along with the hydrocarbons. This "produced water" often contains a mixture of components based on the hydrocarbon being extracted as well as the geological formations alongside the hydrocarbons. These may include salts, dissolved gases, critical minerals, and various other materials. The wide variation in the composition of produced water presents unique challenges that can be energy intensive and costly, however its management and treatment is key to ensuring sustainable energy production.



WHY PRODUCED WATER MATTERS



The U.S. generates huge quantities of produced water—22 million barrels per day in the Permian Basin alone (as of 2025)



Produced water is traditionally seen as a waste product, but it may hold valuable critical minerals like lithium, magnesium, gallium, and germanium



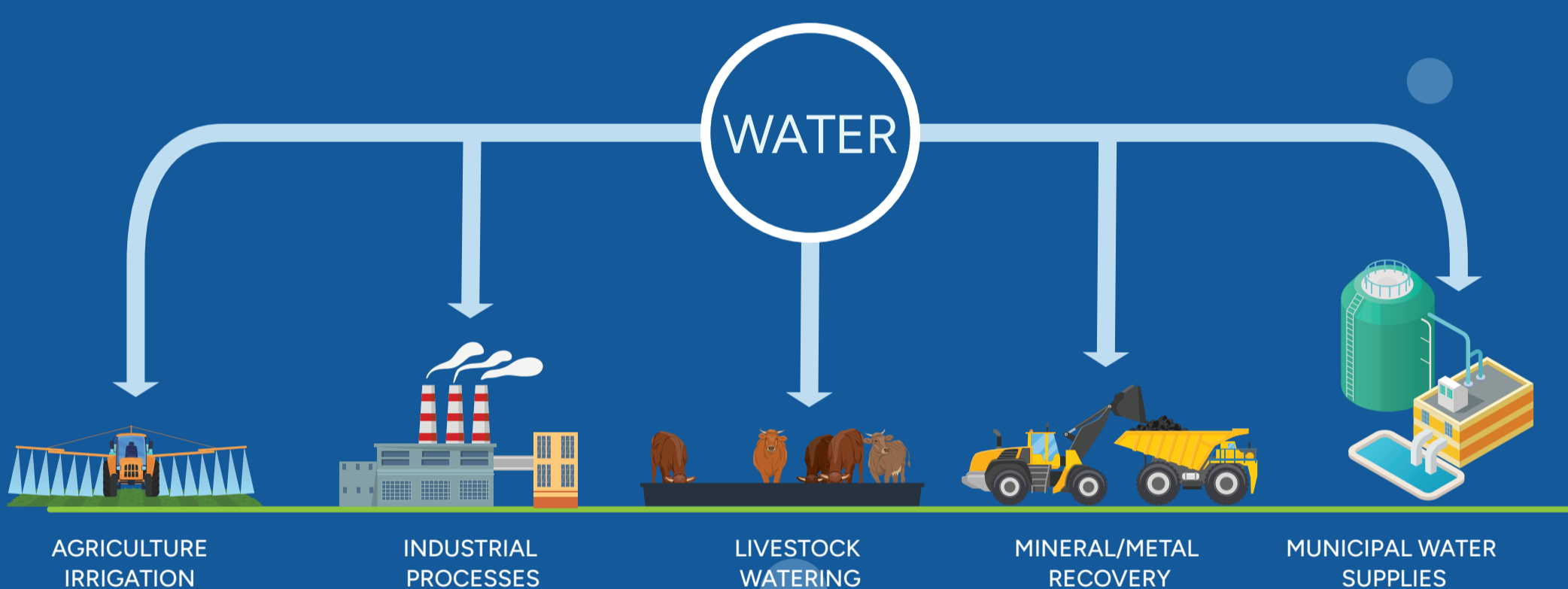
Advancing treatment and reuse technologies can support domestic energy production, reduce freshwater demand, create jobs, and ease water scarcity pressures

HOW IS PRODUCED WATER USED?



Produced water is primarily reused in oil and gas field operations, most commonly for enhanced oil recovery and hydraulic fracturing.

There is growing interest and technological advancement in non-oilfield reuse applications for produced water, driven by the potential economic and environmental benefits of transforming this waste product into a valuable resource.



All these alternative uses require stringent treatment to meet regulatory standards.

WHERE DOES THE DEPARTMENT OF ENERGY COME IN?

The U.S. Department of Energy (DOE) has a long history of research and development to reduce the costs of produced water management, treatment, and reuse and ensure that Americans retain access to a safe, secure water supply.

The goal is to transform produced water from a *waste to a resource*.



WHAT'S BEING DONE NOW?

DOE's Hydrocarbons and Geothermal Energy Office (HGEO) currently supports projects conducted with a multi-disciplinary team that includes DOE's National Laboratories, American universities, industry/technology developers, and state, local, and tribal government entities. These projects focus on improving produced water treatment technologies and evaluating treated produced water for long-term beneficial use opportunities.

By facilitating responsible water management in the energy industry, HGEO is advancing increased domestic energy output, creating jobs, and maintaining America's position as a global energy leader, all while safeguarding vital water resources for other essential uses.

