

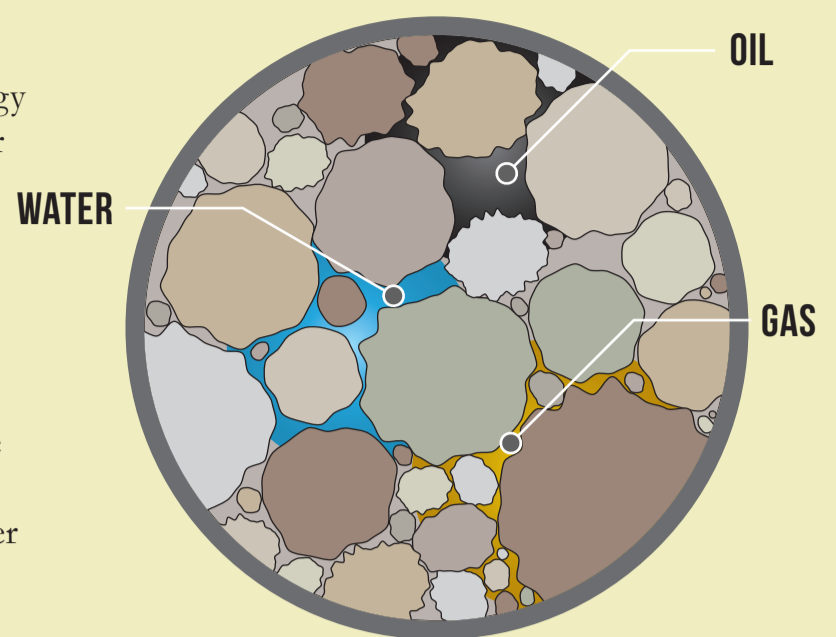
PRODUCED WATER

From Waste to Resource

Water and energy are interdependent—water is used in all phases of energy production and energy is required to drill, extract, pump, treat, and deliver water. Water is closely intertwined with oil and gas production because it exists in the same pore space in the reservoir.

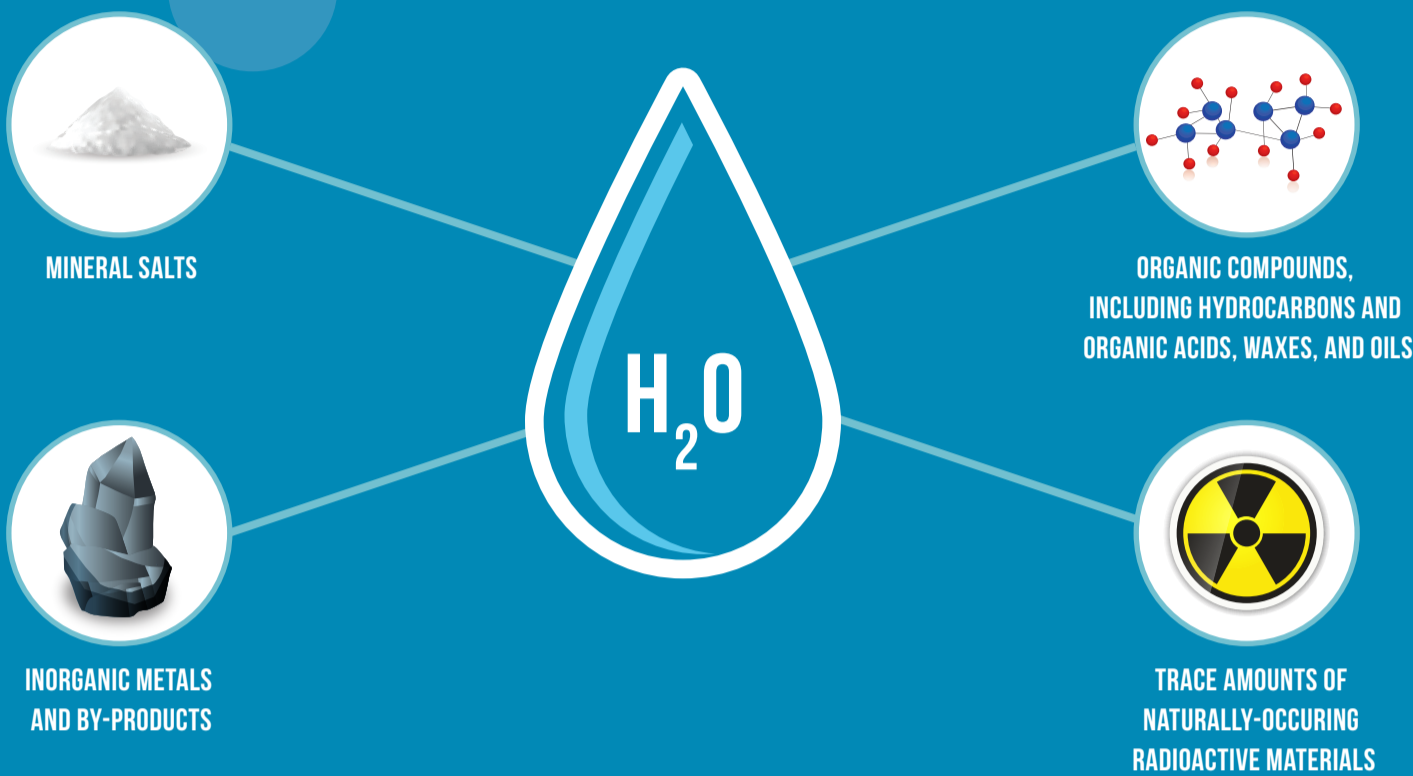
WHAT IS PRODUCED WATER?

Produced water is water that is brought to the surface as part of the oil and gas production process. Water is associated with the oil and gas in the reservoir, so oil and gas producers have always had to deal with water as a by-product of resource production. Also, some reservoirs have more water associated with the oil and gas than do others, and the amount of water associated with the oil and gas can change over time.



PRODUCED WATER VARIES IN QUALITY

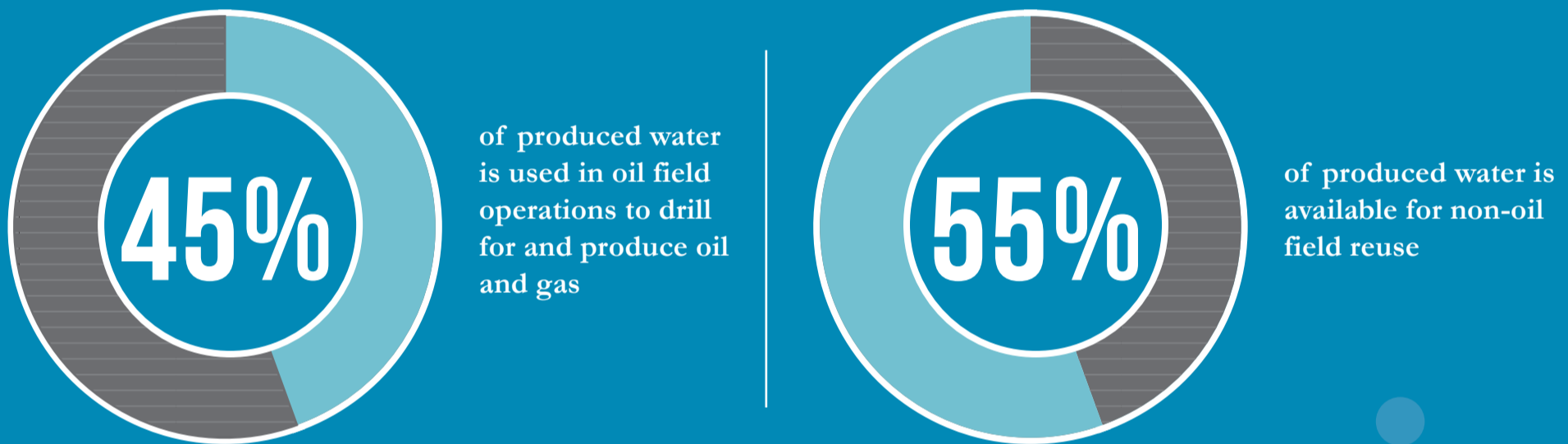
When produced water comes out of the earth, it isn't simply H₂O. Instead, it contains a variety of constituents, including:



In order to be reused in other sectors, produced water needs to be treated to achieve the quality necessary for reuse.

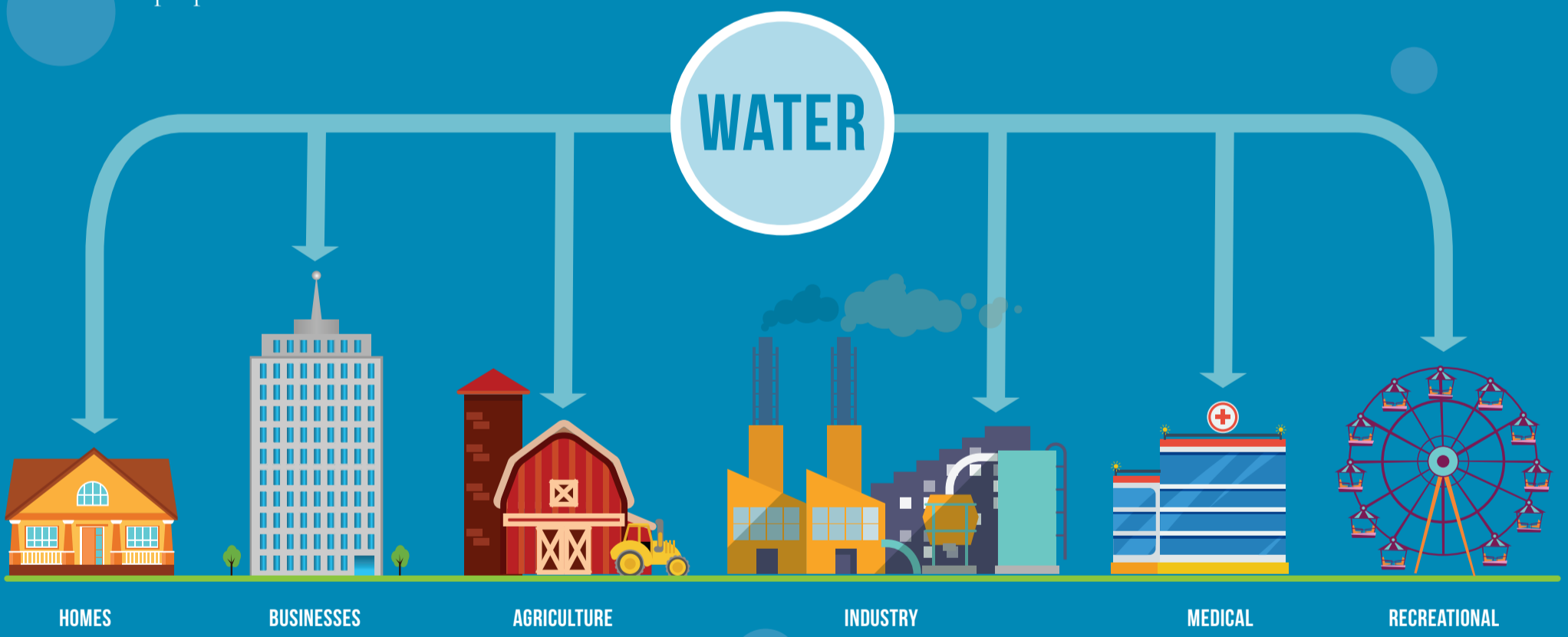
WHAT DO WE DO WITH PRODUCED WATER?

According to a 2015 Ground Water Protection Council report



WATER IS A PRECIOUS RESOURCE

All life depends on water. Water is used in many settings, from homes and businesses to the larger energy, agriculture, industry, commerce, medical, and recreational sectors. If produced water can be treated and reused, reducing the cost of it will supply a substantial volume of water available to supplement or offset fresh water demand in some areas. Also, the inorganic metals and other precious metals found in produced water can be recovered and used for other industrial purposes.



WHERE DOES THE DEPARTMENT OF ENERGY COME IN?

There is a cost to dispose of unused produced water, and produced water can be valuable if it is treated and reused. Because water is too precious a commodity to let 55% of produced water be disposed, the Office of Fossil Energy has a long history of research and development aimed at reducing the cost of treating and reusing produced water. The goal is to transform produced water *from a waste to a resource*.



WHAT'S BEING DONE NOW?

Addressing the energy-water nexus is a major priority for the nation. As a result, the U.S. Department of Energy recently launched the Water Security Grand Challenge, a White House-initiated framework to advance technology and innovation to meet the global need for safe, secure, and affordable water. One of the goals of that Challenge is focused on transforming produced water from a waste to a resource.

On top of that, the Office of Fossil Energy continues to conduct research to reduce the cost of produced water treatment and reuse. Recently, Fossil Energy selected four new projects to pre-treat produced water prior to desalination, so that all the constituents and by-products that can negatively affect desalination efforts are removed from the water before treatment.