INTRODUCTION

Significant volumes (> 2 million barrels) of produced water are generated daily during production operations of oil and gas wells in North Dakota. Most produced water is a brine (saltwater), with very high concentrations of total dissolved solids. Produced water has historically been considered a waste in the oil and gas industry. However, injection has been considered a potential solution for produced water disposal. However, the current methods of produced water disposal with wells are limited to an effective disposal depth of approximately 1500 ft (457 m) below ground level.

THE DAKOTA GROUP

Detailed knowledge of the aquifer in the area is the major factor in determining if injection is a viable option for produced water disposal. North Dakota’s 1927 North American Datum is an important reference point and is utilized at present for all produced water disposal sites. The water system in North Dakota is ephemeral, and the extent and location of the producing aquifers can be attributed to the interaction of base and ground water. The Colorado Plateau and Great Plains are the primary mappable hydrologic units in North Dakota.

The Dakota Group is a major sedimentary sequence that consists of a series of sandstone, siltstone, and shale beds. The Dakota Group is composed of four formations: the Merchant, Shell Creek, Geyser, and Cretaceous marine sediments. The Dakota Group is important in the oil and gas industry because it is a major source of water for injection. The Shell Creek Formation is a major aquifer in North Dakota and is used for water injection. The Geyser Formation is an important aquifer in North Dakota, and it is used for water injection. The Dakota Group is important in the oil and gas industry because it is a major source of water for injection. The Shell Creek Formation is a major aquifer in North Dakota and is used for water injection. The Geyser Formation is an important aquifer in North Dakota, and it is used for water injection. The Dakota Group is important in the oil and gas industry because it is a major source of water for injection. The Shell Creek Formation is a major aquifer in North Dakota and is used for water injection. The Geyser Formation is an important aquifer in North Dakota, and it is used for water injection.