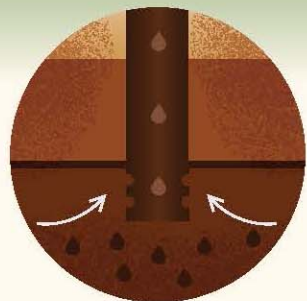


CO₂ ENHANCED OIL RECOVERY: GREENER OIL

As global energy demand continues to increase, energy producers aim to produce more and “greener” oil—that is, oil with a reduced carbon footprint—through a process called CO₂ enhanced oil recovery (EOR).

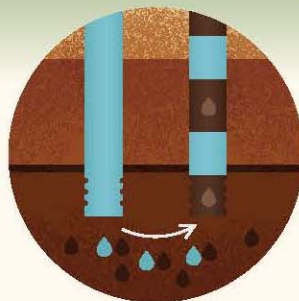
PRODUCING OIL FROM RESERVOIRS

Stages of oil production



PRIMARY RECOVERY

Natural pressure of the reservoir pushes some of the oil to producing wells where pumps bring the oil to the surface.

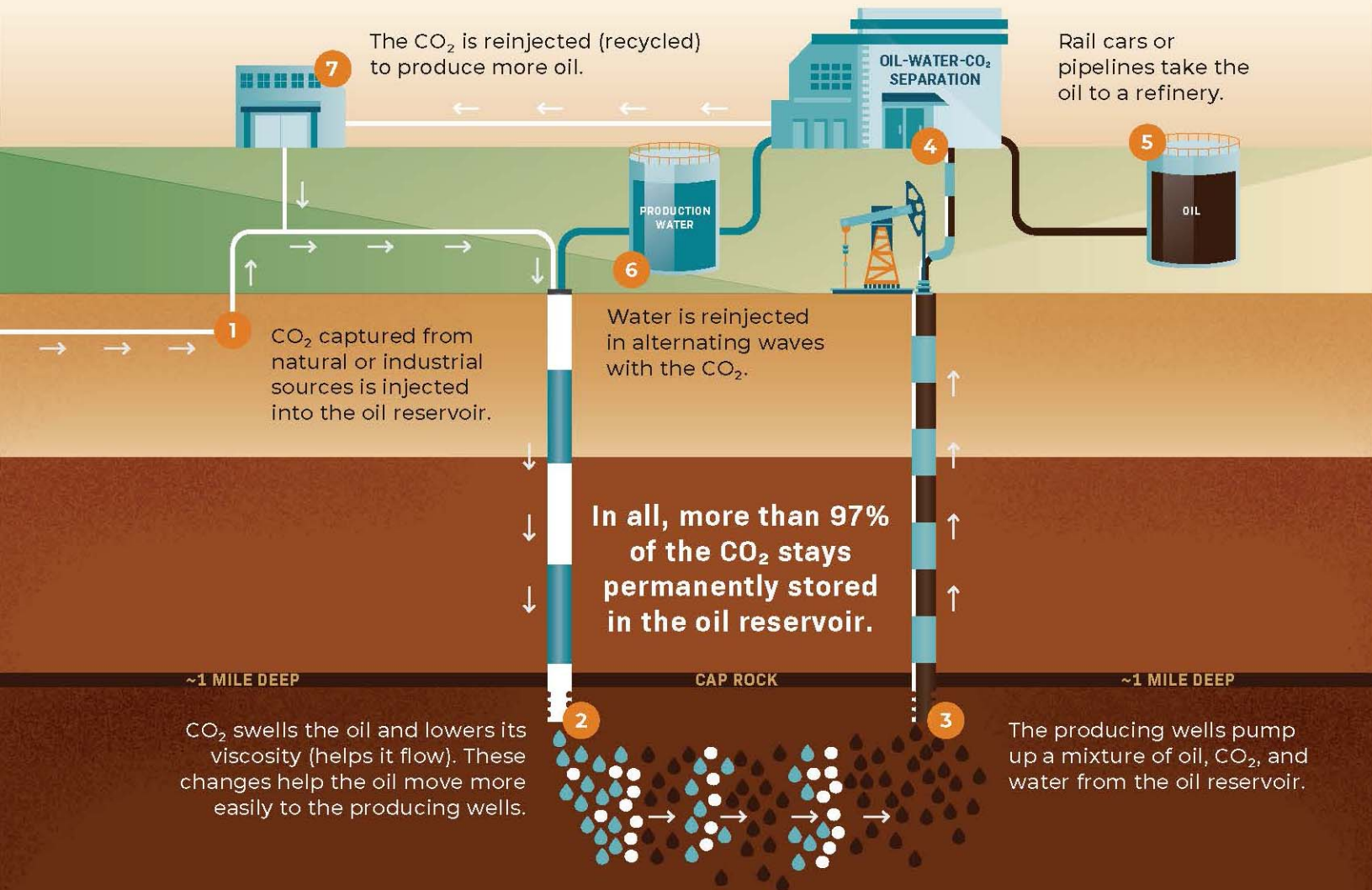


SECONDARY RECOVERY (WATER FLOODING)

Water injected into the reservoir increases pressure and pushes more oil to producing wells.

TERTIARY RECOVERY (CO₂ EOR)

Injected CO₂ mixes with oil and causes more of the oil to flow to the producing well.



7 The CO₂ is reinjected (recycled) to produce more oil.

5 Rail cars or pipelines take the oil to a refinery.

1 CO₂ captured from natural or industrial sources is injected into the oil reservoir.

6 Water is reinjected in alternating waves with the CO₂.

In all, more than 97% of the CO₂ stays permanently stored in the oil reservoir.

2 CO₂ swells the oil and lowers its viscosity (helps it flow). These changes help the oil move more easily to the producing wells.

3 The producing wells pump up a mixture of oil, CO₂, and water from the oil reservoir.

BENEFITS

Using CO₂ captured from industrial sources like power plants, ethanol plants, and gas processing plants for enhanced oil recovery:



Produces greener oil with a smaller carbon footprint because CO₂ is permanently stored in the process



Provides economic incentive to capture the industrial CO₂, as the CO₂ is sold to offset the cost of capture



Enhances energy security with homegrown oil production



Generates and maintains well-paying jobs, tax base, and viable communities



Reduces industrial CO₂ emissions to the atmosphere

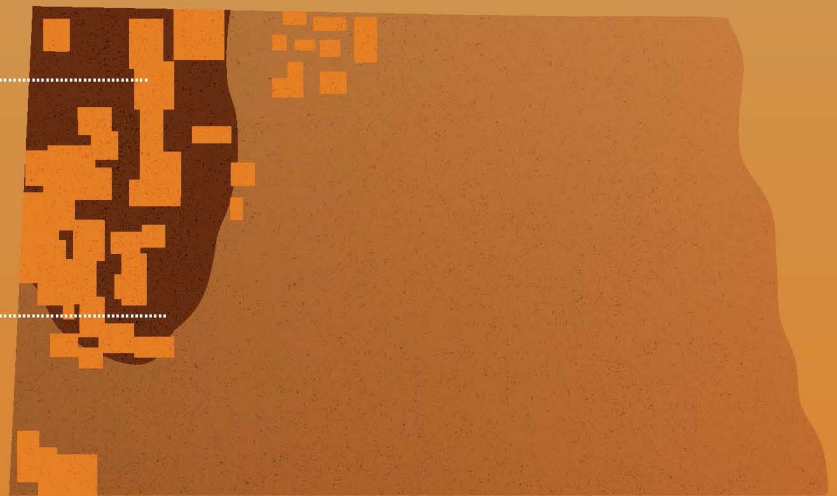
LOCATION

North Dakota's older (conventional) oil fields

When the market is ready, CO₂ EOR will revitalize older oil fields that are in declining stages of production.

North Dakota's Bakken (unconventional) oil fields

When the technology is ready, CO₂ EOR can be applied to declining Bakken oil wells to improve production.



SAFETY



Oil reservoirs can hold CO₂ the same way they've been holding oil and gas for millions of years.



The oil industry has 40+ years of CO₂ EOR experience.



4,000+ miles of CO₂ pipelines in North America move CO₂ every day without incident.



North Dakota's stable geology is ideal for CO₂ EOR.



Millions of additional barrels of oil have been safely produced (Texas, Saskatchewan, Montana, Mississippi).

Support the development of CCUS and CO₂ EOR in North Dakota as a clean energy strategy.

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