

CASE STUDY FIRESTONE INJECTION WELL

Northern Colorado is growing and who doesn't want to live in this beautiful state? With growth, comes increased potable water demand and the Town of Firestone elected to supplement their water system by capturing alluvial water and treating with reverse osmosis. Many Northern Colorado towns have similar water system growth needs.

THE CHALLENGE

Reverse osmosis creates high salinity wastewater that must be disposed via deep underground injection. The town's selected reverse osmosis contractor did not have underground injection experience.



THE APPROACH

With four previous Front Range municipal reverse osmosis wastewater injection wells constructed, the Town of Firestone logically partnered with IPT Well Solutions. After completing a thorough reservoir evaluation, IPT proposed permitting a deep Paleozoic stratum well, 9500 to 11000 feet deep, that afforded approximately 500,000 disposal gallons per day and supported a five million gallon per day reverse osmosis system.

IPT's scope included a reservoir analysis, the EPA Class I disposal permit, the well design, drilling and completing the well, and designing, installing, and commissioning the injection pump system.



THE SOLUTION

Located within the St. Vrain River Floodway; IPT and the civil engineering partners created a site design and injection well design that kept all the critical equipment above the floodway.

Additionally, EPA permits require rigorous geologic analysis ensuring the injected waste remains confined within the targeted injection zone thereby protecting all underground drinking water sources. The permit applicant must also demonstrate how the injected plume will move with time and propose a plume movement monitoring plan throughout the well's projected life.

IPT's design team used the highly micro fractured injection zone and an un-cemented slotted liner that maximized wastewater injectivity, thereby minimizing early life injection pressure and adding years to the well's life.

Finally, IPT specified and supervised the horizontal centrifugal pump system design, complete with centrifugal charge pumps, filtration and tank capacity that handles a full day's wastewater production. The completely automated system constantly monitors tank levels and injection pressures such that the system never spills wastewater or exceeds the designed injection pressure. Also, as the town's needs grow, the system's design can accommodate a third horizontal injection pump.

THE RESULTS

IPT Well Solutions accepted the challenge; provided an application that exceeded the EPA's requirements and generated an EPA drilling permit. Post drilling, IPT continued working with the EPA and obtained final injection approval. While IPT and the EPA worked through final approvals, IPT developed, and the EPA approved, a spectral log analysis that gathered high resolution in-situ water salinities from all drilled formations.

This IPT project is expected to be operational in the Fall of 2022.

500k Gallons/Day of Disposal Water



Mile Injection Below Surface



Disposal Water into Our Lakes, Rivers, and Streams

ABOUT IPT

IPT Well Solutions is an independent engineering consulting and wellsite supervision firm in business for 30 years. We serve clients in oil and gas, municipal and industrial wastewater, and carbon capture & storage.

