CASE STUDY

Enviro-Syn® HCR-7000-110 Increases Water Injection Rates by 24% and saves 75% in Treatment Costs

DJ Basin, Colorado

CHALLENGE

A disposal company operating in the DJ basin had water injection wells operating at the maximum rate achievable due to pump pressure capabilities. They chose to complete a stimulation treatment with Enviro-Syn® HCR-7000-110 Modified Acid™ technology to remove downhole scale deposits. The objective was to increase the injection rate in order to sustain demand from the incoming water pipeline.

SOLUTION

Enviro-Syn HCR-7000-110 is a strong modified acid specially designed for low temperature applications. In concentrate, HCR-7000-110 has similar solubilizing abilities to 15% HCl, while minimizing the hazardous exposure levels, corrosion rates and negative HSE properties. Additionally, HCR-7000-100 will not reprecipitate solubilized scale at pH levels up to 7.0, carrying the minerals further into the formation versus depositing them near wellbore like HCl.

Samples of produced water were tested for compatibility with HCR-7000-110 as well as key metallurgy components within the injection system without issue. Concentrated HCR-7000-110 was delivered to the work site and slipstream diluted to 25-33% concentration with produced water upstream of the charge pump and downstream of the clean water tanks (Fig. 1). The diluted HCR-7000-110 was displaced with the injection system already in place at the facility, replacing a typical treatment of 15% HCl using a pressure truck.

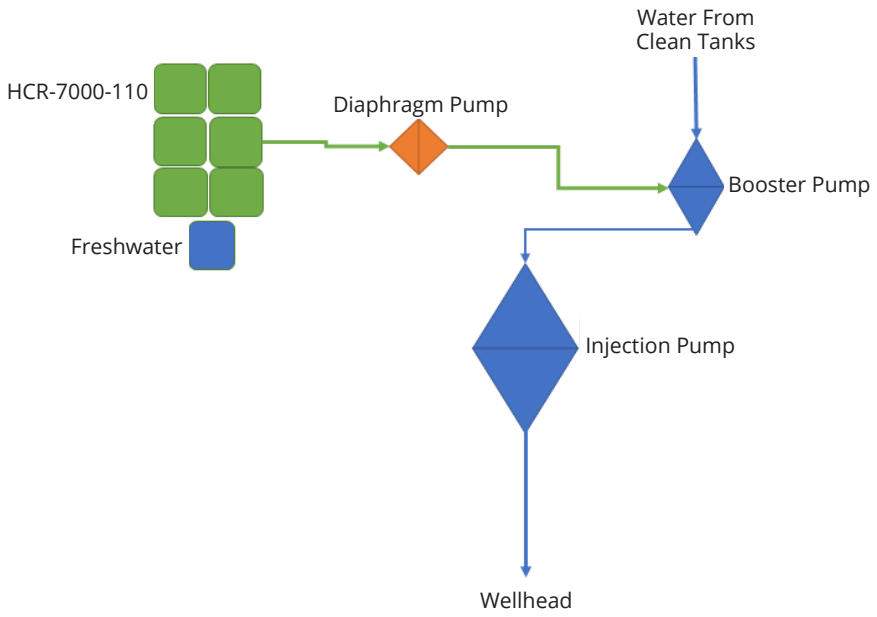

Figure 1. Water injection diagram.

RESULTS

1,600 gal of HCR-7000-110 was injected into the disposal well. The flowline pressure decreased from 1520 psi before the acid job down to 1164 psi, allowing the pump hertz to be increased resulting in a higher injection rate (Fig. 2). The average injection rate for the 10 days prior to the acid job was 8,581 bbl/day at the maximum injection pump pressure and 10,657 bbl/day for the 10 days after the acid job – an increase of 24% (Fig. 2).

In addition to improvement in injection rate, the disposal company achieved a 75% cost savings compared to previous treatments. Using the injection system in place at the facility meant a pump down crew was not required for the treatment, reducing both the cost and risks associated with additional equipment and onsite personnel. Further cost savings were realized by using existing produced water on location to dilute the HCR-7000-110.

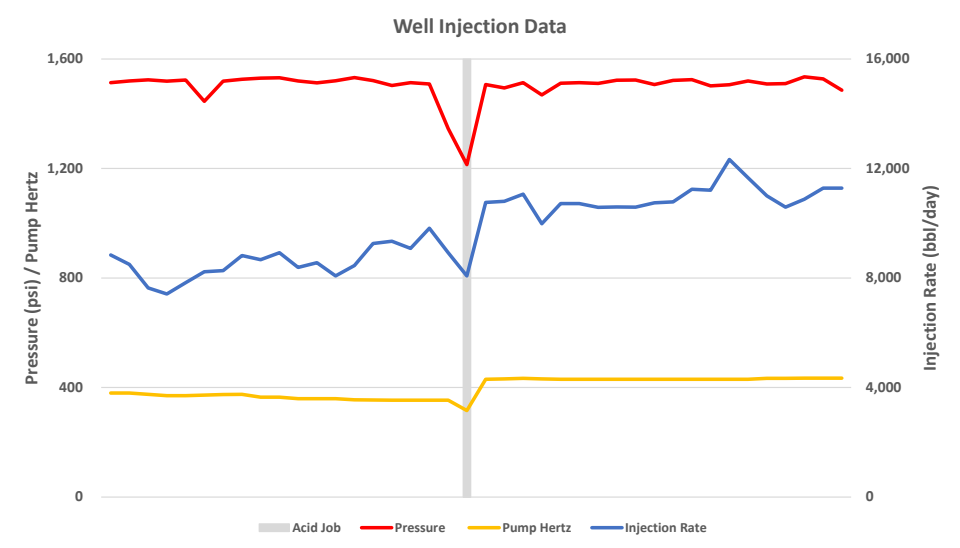

Figure 2. Disposal well pump pressure and injection rate.

In conclusion, the disposal company was able to sustain the incoming water pipeline volumes from surrounding wells while greatly reducing the costs associated with past hydrochloric acid jobs while minimizing or eliminating HSE concerns.