

WELLTRACER

WellTracer® creates a snapshot of well performance by introducing a small volume of CO2 into the injection stream and then measures the CO2 concentration via a sensor connected to the wellhead tree, flowline or well test separator. Typical tracer return times are between 1 hour and 7 hours. Injection pressure and injection rate during the trace integrate with the well and valve modeling to determine the depths of each injection observed.

TECHNOLOGY APPLICATIONS

Non-invasive wellbore analysis

Sweet or Sour applications

Detection of operating lift depth

Detection of multi-pointing injection

Commonly perform multiple surveys daily

Ability to locate holes in tubing, including leaks passing small amounts of gas

Identifying lift gas rates through each injection point

WELLTRACER ADVANTAGES

No production Deferment – Survey is performed under normal operations with no production deferment.

Safe - No tools are introduced into the Wellbore

Accurate - Lift depth determination directly related to surface casing pressure and lift gas rate measurements

Inexpensive - Suitable for inclusion into regular operation procedures and maintenance programs

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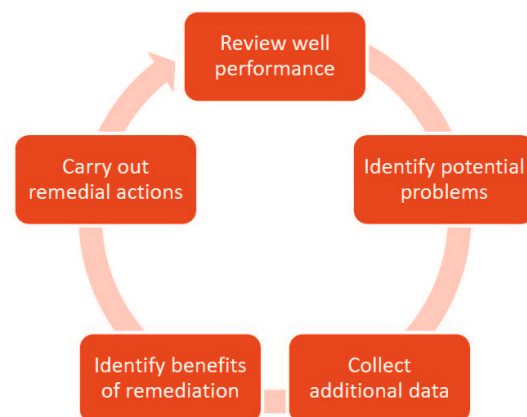


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SURVEILLANCE PROCESS



Description	WellTracer	FGS*
Identify primary point of gas injection	●	●
Identify tubing leaks, including leaks passing small amounts of gas	●	○
Verify gas-lift models	●	●
Identify injection rates and how much lift gas is injecting into each point of injection	●	○
Reasonable results in high GOR or low-injection rate well	●	○
Accurately determine flowing bottom-hole pressure	○	●
Does not require well intervention	●	○
Easily handles highly deviated or horizontal wells	●	○

*Flowing Gradient Survey

WELLTRACER EQUIPMENT IS RATED

Class 1 Division 2

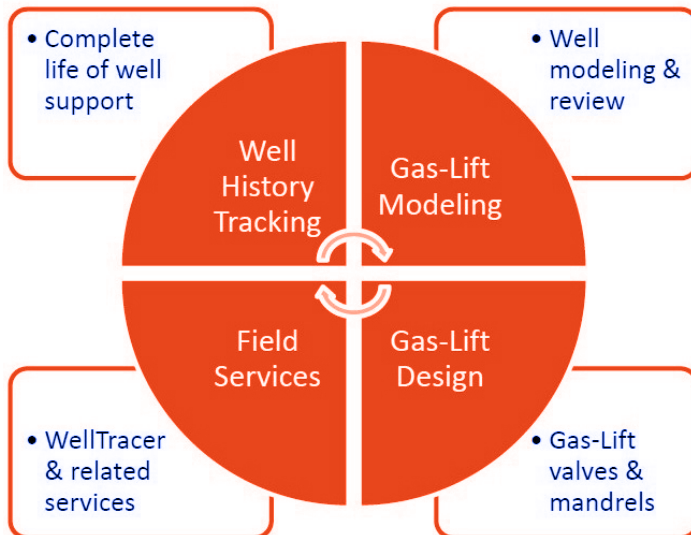
Groups A, B, C, D with type Z purge

Temperature T6 for use in hazardous areas



Confidential Report

HOW CAN KAIZEN HELP?



WHAT COMES WITH A WELLTRACER SURVEY?

Qualified field technicians

Detailed report summarizing predictive vs measured results

Echometer fluid level results

Redesign recommendations if requested

Background

- Oilfield 1001/01-01-001-01W1/00 is a gas lifted well operated by Excellent Resources, Inc.
- Kaizen Well Solutions conducted a Gas Lift System Health Check to understand the performance of the well's gas lift system.
- The Gas Lift System Health Check was performed on January 1st, 2000.

Health Check Results

Oilfield 1001/01-01-001-01W1/00	
Gas Lift Injection from Bottom Mandrel	No
Gas Lift Injection from Unloading Valve(s)	Yes
Multipoint Injection	Yes
Tubing Leak Detected	No
Echometer	Echometer was not performed.
Injection from Mandrel #	Mandrel #6 (8% return) Mandrel #7 (23% return) Mandrel #8 (19% return) Mandrel #9 (50% return)
CO ₂ Baseline	0.95%
In-Depth Engineering Analysis Recommended?	Yes

Concentration vs. Time Plot

