



# Radial Drilling Delivers Productivity Increase for ENAP Chile in low producing and depleted wells.

Lateral jetting technique used as a cost effective method to revitalize & stimulate depleted and low producing wells.

## CHALLENGE

Escape the near well bore damage zone and stimulate wells with depleted formations and declining production. Access areas of hydrocarbons stranded through normal completion methods. Increase injection rates by opening up fresh formation beyond the near well bore.

## SOLUTION

Apply a sequence of laterals placed to escape the near well bore zone and penetrate previously inaccessible pockets of hydrocarbons.

## RESULTS

Stimulated 3 oil wells & 2 gas wells, all achieving an increased annual production rate of oil & gas. Injector well was able to achieve a 25% increase in rate with a reduction in surface pressure and no additional surface equipment required.

### Work-over depleted & under performing wells. Address injection rate decline.

Operating in the Tierra Del Fuego, Cullen field, ENAP, Chile, needed to regenerate production in the depleted Springhill sand formation.

Formation analysis indicated good response to a KCL stimulation fluid, opening additional flow channels, allowing access to stranded hydrocarbons not normally produced thru conventional completion method.

### Effective solution through sequenced lateral placement.

The operator decided to evaluate the effectiveness of sequential placement of laterals in addressing zero to low production rates as a result of conventional completions and production methods.

The operator also required the work-over of an injector well that was experiencing a declining injection rate and an increasing surface pressure requirement.

The laterals were systematically placed to: allow delivery of maximum natural flow returns to the main wellbore and to surface; to penetrate previously stranded pockets of hydrocarbons; to escape the effects of the near wellbore.

Laterals were achieved using specifically designed fluids sensitive to formation parameters. Volumes of no more than 1,000 liters per lateral were used at pressures configured for zero formation invasion.

### Higher production without loss of efficiency or added cost.

Following lateral placement, the production wells flowed back and produced using similar choke sizes. Placement of the laterals increased production in what were depleted & abandoned wells. Injection rates in the injector well were increased. This far exceeded the operator's original expectations.

