



# ProTechnology

## When the Going Gets Tough ...

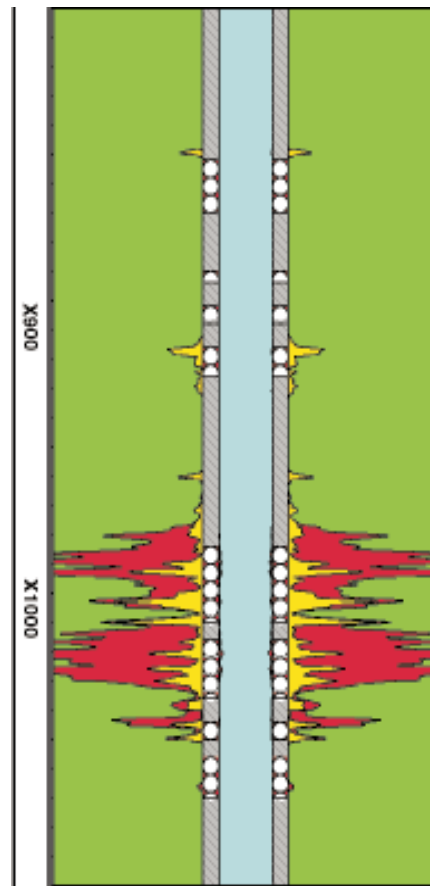
In these times of oilpatch uncertainty where marginal economics, low activity levels, and reductions in force dominate the news from our industry, it is important to revisit the basics of profitability.

### REVENUE – COST = PROFIT.

With oil prices at a 12-year low as of this writing, it is, in many cases, cheaper to acquire replacement reserves than to explore for them. Acquisitions are the outgrowth of that philosophy in both the service and operating company sectors. The cost-cutting measures of megamergers and downsizing are being used in an attempt to lower the cost per barrel produced.

We at ProTechnics believe that the most effective method for increasing the bottom line is to apply cost-efficient technologies that increase hydrocarbon recovery rates at minimal incremental cost. The cheapest incremental reserves are those that have already been discovered and are behind pipe. Our tracer diagnostics have helped clients achieve lower recovery costs for more than 15 years. In some cases, a field's future may be affected by poor recovery rates from early wells that were

incompletely stimulated, thus killing a project when in fact, the completion procedures could have been modified to achieve commercial success.



This case history illustrates a southeastern Oklahoma well with an initial production that was slightly less than expected. Fortunately, our customer routinely

employs tracers during fracturing treatments. 300,000 lb of proppant were pumped in this upper stage with Sc-46 Zero Wash® (yellow) in the 1 to 4 lb/gal ppg and Ir-192 Zero Wash (red) in the 4 to 5 ppg. This stage was commingled with a lower stage and produced at a stabilized rate of 1,241 Mcf/D.

Notice how the upper four sets of perforations are largely unstimulated in this stage. Subsequently the operator set a bridge plug at X960 ft and pumped a smaller (140,000-lb) treatment. After cleanup, the well stabilized at 2,130 Mcf/D, more than 70% higher than the rate before the refrac.

The incremental production on this well will pay for the tracers and the refrac within 50 to 60 days and added reserves are estimated at 0.5 to 0.75 Bcf or about \$1,200,000 in revenue. "Finding costs" for these incremental reserves were about \$95,000 (refrac + tracers + SpectraScan Imager®), or about \$0.13 to \$0.19/Mcf – a very cost-efficient application of technology indeed. The value of routine application of tracer diagnostics helps **the tough get going!**



# What Is Zero Wash?

**Since Zero Wash® tracers were introduced in 1993, our customers have asked “What makes your tracer materials better?”**

Zero Wash (both the product and the application) is a patented family of tracer products that received Petroleum Engineer International’s Meritorious Award for Engineering Innovation at the Offshore Technology Conference in 1993 (our first of three awards). Since its invention, Zero Wash has revolutionized the tracer industry, with unparalleled improvements in handling, safety, and environmental issues as well as making a quantum leap toward providing more quantitative information about stimulation treatments.

Zero Wash tracers are manufactured by a major proppant manufacturer with strict quality control guidelines under ProTechnics supervision. Various heavy metals are mixed in a stable, powdered form into the clay mixture forming an intermediate-strength (8,000-psi) ceramic proppant. These proppant “beads” are then formed, kiln-fired, washed, sieved, and sent to a nuclear reactor. There, neutrons bombard the particles and activate the heavy metals within. Leaving the reactor are ceramic particles of uniform gamma activity which have no surface coating or residue to wash off or abrade – the tracer isotope is part of the matrix of the particle. Simple in concept, this particle has transformed tracers into a widely used and respected tool to understand well completions. Since its introduction in 1993, more than 15,000 treatments have benefited from the quantitative information available from Zero Wash technology. Today, about 15 to 20% of all

stimulation procedures worldwide include Zero Wash tracers.

Oilfield tracers are used to track fluid movement both under and above ground. Underground tracers are used for IOR (field flood) evaluation, cement evaluation, marking of downhole tubulars, mechanical integrity testing, and in completion and stimulation (fracturing and acidizing) procedures. To be effective, any tracer must meet the following criteria:

**A tracer must be safe to handle and environmentally friendly.**

Zero Wash tracers used in well completions are extremely inert, and laboratory tests have proven that tracer wash-off is well below detectable limits. Zero Wash is the only oilfield tracer product licensed by the NRC or state agencies for burial as a method of disposal. Our personnel exposure rates were reduced by more than 54% as a result of the introduction of Zero Wash.

**A tracer must match the physical characteristics of the media being traced.**

The family of Zero Wash products includes particles in a wide range of mesh sizes and densities that match the proppants and slurries employed today. From 20 microns through 16-mesh, and from 0.9 g/cc through 2.8 g/cc, there is a Zero Wash particle to fit every tracer application.

**A tracer must be uniformly injected and statistically representative.**

The introduction of Zero Wash tracers allowed oilfield tracers to be injected safely through low-pressure pumping equipment for

the first time. A peristaltic pump similar to what Dr. Michael DeBakey invented in 1931 for ventricular and kidney bypass applications is used today. This system allows very precise control over injection rates and concentrations to ensure a uniformity of injection that is impossible to achieve with any high-pressure system.

**A tracer must be economically feasible.**

Zero Wash tracer procedures typically add less than 2% to the cost of a stimulation treatment. For less than the cost of many common additives or the cost of state sales tax on materials, you can trace every procedure. The cost of evaluating your frac job as a percentage of job cost is much less than the cost of evaluating a cement job as a percentage of that job’s cost and may be more critical in determining a well’s productivity.

**A tracer must be useful.**

Other types of tracer materials are less than useful — they are environmentally unsound, create handling problems, and are misleading when used to evaluate completions. Zero Wash tracers, with their consistent gamma activity per particle, physical characteristics matched to the job, and precision injection techniques, are well suited for making quantitative measurements. It is possible to estimate localized proppant concentrations and fracture width from Zero Wash-traced completions (SPE 31105).

## Another Acquisition

ProTechnics has purchased Isotag Specialists of Midland, TX. Welcome aboard Fred Calaway and Rob Johnson in Midland, Blaine Calaway in Kilgore and Mike Mathis, who is moving to Lafayette as sales engineer.

## Putting the “S” in Service

It is important to recognize the major service companies for their contributions to the success of our industry. The R&D effort of the entire energy community is increasingly borne by the service and supply sector and with truly remarkable results. In well completions and stimulations, companies such as Halliburton, DS, BJ Services, OSCA, and FracMaster, working hand-in-hand with operating companies, outside laboratories, and consultants, have continued to pioneer new fluids and techniques that have led to dramatic improvements in productivity and reductions in formation damage, improving profitability for our customers. Some parties have “erroneously” RESponded that these service companies have goals “different” from oil and gas operators: which are truly to create better products and services that help to improve well productivity and/or reduce costs. For the efforts of our service company partners, I say, “good job, keep up the good work, and thank you.” Happy Holidays!



## Breakthrough Technology

Our R&D guys are at it again! We’ve developed a high-temperature version of the SpectraScan Imager® that is tested at 400°F (200°C) and is 2 1/16-in. OD. This temperature rating is the highest of any spectral gamma ray tool in the industry.

## ProTechnics People

Tom Balogh recently joined ProTechnics as Sr. Design Engineer coming from Baker Hughes Inteq. He has more than 20 years’ experience in the design of high-temperature downhole tools for wireline and MWD applications. Tom related, “I got tired of the big company life and really enjoy the people and attitudes here at ProTechnics.”

Ian McConnell joined ProTechnics as Country Manager in Canada after spending 18 years with Newsco and 2 years with Well-Flow Technologies. Ian brings a worldwide perspective with experience in Canada, the U.S., Africa, Europe, the Middle East, and South America.


## Toys for Tots

ProTechnics, in conjunction with the U.S. Marine Corps Reserve and the SPE Gulf Coast Section along with the assistance of industry partners Halliburton, Schlumberger-Dowell, Vastar, BJ Services, Michael Petroleum, and Chisholm Energy Partners is conducting our fifth annual Houston “Toys for Tots” drive. Thousands of underprivileged area youth have benefited from this campaign.

# ProTechnology

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for  
Improved Well  
Performance

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