



*Case Study*

# SCANDRILL INC.





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EPA registered  
Section: 40 CFR 79.23  
Reg no: 266920002

OCTCET Registered trademark:  
Serial number 85893483  
OCTCET35 Registered trademark:  
Serial number 85893527



## BACKGROUND

Scandrill Inc. is a proven leader in the drilling industry and has provided land contract drilling services to independent and major oil and gas exploration companies since 1977. Scandrill operates in the Ark-La-Tex, Permian Basin Region and bordering States such as Louisiana and New Mexico. Their operational efficiency and flexibility, to align with their customers' business objectives, due to the current oil price climate, makes them an innovative and competitive driller contractor.

The management of Scandrill has established a set of Core Values that mandate behavioral expectations for all employees. Their Core Values include a commitment to work safety and the prevention of the environment. Scandrill recognizes that there are inherent risks involved in their daily work responsibilities and believe these risks can be eliminated or mitigated to an acceptable level by the application of sound management policies and the commitment of all employees.

Scandrill is further committed to enhance their operational competitiveness, increase reliability, improve efficiency, optimize resources and performance by continuously evaluating and implementing innovative technology, services and products.

## RIG INFORMATION

Number of drilling rigs:	16
Rig names:	Scan Victory*, Scan Discoverer*, Scan Producer, Scan Spirit,



Scan Cross\*, Scan Gold,  
Scan Freedom, Scan Texas,  
Scan Patriot\*, Scan Liberty\*,  
Scan Star\*, Scan Endeavor\*,  
Scan Vision\*, Scan Pride\*,  
Scan Glory, and Scan Energy\*.

(\*Rigs that have used  
OCTCET35 treated diesel).  
Caterpillar (CAT) D3512-C and  
3508 with dual fuel capability.

Type of engines:  
Runtime per year:  
Well drilled per year:

258,000  
225

**OBJECTIVE OF THE PRACTICAL NON-ROAD TEST**

To determine if OCTCET35 treated diesel (at a treatment ratio of 1:400/one gallon of OCTCET35 to 400 gallons of diesel), will:

- Reduce maintenance cost.
- Bring about mechanical benefits.
- Improve fuel economy.
- Reduce running and operational expenses.

**TESTING AND IMPLEMENTATION PHASES**

These activities can be divided into four phases:

- Phase 1: Initial Testing
- Phase 2: Initial Implementation and Additional Testing
- Phase 3: Additional Implementation
- Phase 4: Further Testing



## Phase 1: Initial Testing

Scandrig decided to introduce OCTCET35 treated diesel into the Scan Energy Rig in May 2014. A baseline was calculated based on all gallons used and the total runtime logged for 14 wells, drilled by this rig during the period June 2013 and April 2014. All data and information related to drilling activities, used in these calculations, are logged on the Well-Data System. The average gallons per hour, that is the baseline, was 32.27. Three wells were drilled between May and August 2014 using OCTCET35 treated diesel with a runtime of 1,427 hours. The baseline was reduced by 4.8 gallons per hour to 27.47 gallons per hour – a savings of 14.88% or 6,850 gallons.

## Phase 2: Initial Implementation and Additional Testing

Based on the success achieved in this rig, Scandrig decided to expand the usage of the treated diesel to the Scan Pride rig.

Engines:	3 x CAT (Caterpillar) D3512 C
Period:	June 2014 – July 2015
Hours run:	20,981
Wells drilled:	11
Region:	East Texas
Baseline:	32.27 gallons per hour
With OCTCET35:	25.34 gallons per hour
Reduction in fuel usage:	6.93 gallons per hour
Gallons used:	538,905
Gallons saved:	115,757
Percentage:	21.48% gross/14.70% net
Savings in monetary value:	\$231,514.00 gross/\$158,419.00 net



Notes and remarks:

Savings in monetary value is based on diesel priced @ \$2.00 per gallon.

Net savings mean after the price of OCTCET35 was deducted from the gross savings. 1,329 gallons of OCTCET35 were used @ \$55.00 per gallon.

Scandrill decided to run further test in this rig to determine what the effect of OCTCET35 treated diesel was on oil quality and integrity. Oil samples from the Scan Pride rig were taken monthly from January to May 2015 – six samples in total. For the same period, oil samples were taken from the Scan Discoverer rig, who was not using OCTCET35 treated diesel at the time.

Results were analyzed and tested by ALS Tribology Labs and the following results were measured:

- Reduction in Soot = 23.64% (extension of the oil life)
- Reduction in Iron = 34.86%
- Reduction in Tin = 24.62%
- Reduction in Sodium = 27.29%
- Reduction in fuel content = 47.09%

### Phase 3: Additional Implementation

Based on the above results, Scandrill, together with their operators and lease owners introduced OCTCET35 into seven more rigs in November of 2014. Fuel efficiency were improved but several of these rigs, because of a dramatic drop in the oil price, were stacked by April 2015.



## Phase 4: Further Testing

**Objective (General):** To monitor the rates of wear, contaminants and additives in used engine oils.

**Objective (Specific):** Determine the effect and influence OCTCET35 (treated diesel) has on oil properties, integrity and quality irrespective of the CAT engines being fitted with an advanced and sophisticated engine oil bypass filtration system.

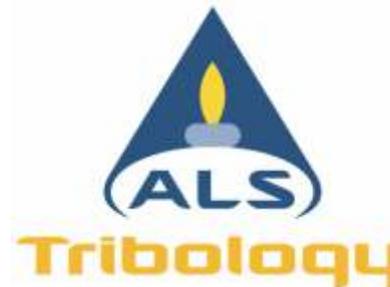
**Methodology:** Compare an oil sample from the same rig before the introduction of OCTCET35 into the diesel with an oil sample from the same rig after the introduction of OCTCET35.

**Rig:** Scan Victory  
**Engine/s:** CAT 3512C engine no E199  
**Oil brand:** Mobil  
**Type:** Fleet (for heavy duty and off-road)  
**Grade:** SAE 15W40  
**Test method:** ASTM-D  
**Sample date:** February 15, 2015  
**Tested by:** ALS Tribology (*in ULSD untreated diesel*)  
**Sample date:** March 15, 2016  
**Tested by:** Polaris Labs (*in OCTCET35 ULSD diesel*)

Oil results from the same rig, when untreated diesel was used, were compared with the results where OCTCET35 treated diesel was used.

The following improvements, benefits and positive outcomes have been measured because of the usage of **OCTCET35** treated diesel:

**Iron:** -5.55%  
**Chromium, Tin, Aluminum, Nickel, Silver, Titanium, and Vanadium:** -50.00%



Copper:	-54.55%
Potassium:	-53.30%
Soot:	-33.00%
Magnesium:	+41.80%
Phosphorus:	+16.50%
Zinc:	+17.70%
Molybdenum:	+43.20%

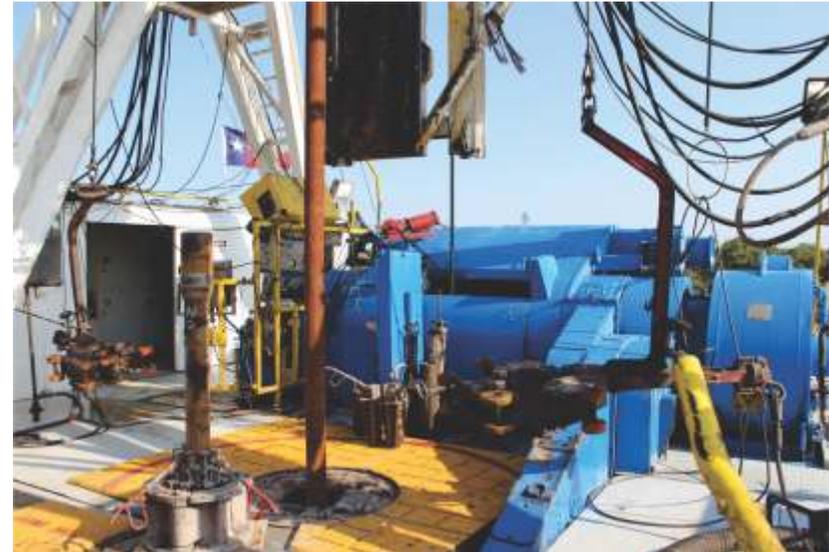
OCTCET35 treated diesel clearly demonstrated an ability to improve the quality and integrity of and extend oil life significantly. The quality and integrity of the oil implies the following:

- A reduction in wear metals indicates a trend to reduce engine wear and friction.
- An increase in multi-source metals such as Magnesium, Phosphorus, Zinc, Molybdenum, indicates an ability to remove, hold and suspend dirt, an improvement of the anti-wear which works as “buffer zone” between surface areas and parts for increased anti-oxidation capabilities – which assists oil thermal and viscosity stability.
- A reduction in Soot means improved engine combustion efficiency and oil drain intervals can be extended by hours run or distance traveled.

The reductions, decreases, improvements and increases respectively indicates a reduction in friction and wear in the engines resulting in improved engine reliability.

Although percentages and numbers will differ from sample to sample and engine to engine, Scandril has observed a clear positive tendency as reflected in the results.

The evaluation and interpretation of the analysis of the oil test



provided Scandrill with more insight on how to improve performance and efficiency.

Because of these test results, Scandrill has introduced a fuel sampling and fuel quality standard test to pro-actively identify a low or below standard quality fuel, to avoid any potential negative impact it could have on engine performance and reliability.

### SYNOPSIS

Total wells drilled with OCTCET35	-	63
Total runtime	-	82,000 hours

The following benefits and positive outcomes were experienced by Scandrill:

- Improvement in efficiency and reliability.
- Extension of maintenance intervals and cycles.
- Increase in performance.
- Reduction in running cost and related expenses.



*“These lab test results, practical tests and extensive usage demonstrated OCTCET35’s ability to increase all-round efficiency, improve performance, and bring about several maintenance, operational and financial benefits. All these factors contribute to Scandrill’s ability to be a reliable and more innovative driller of choice.”*

Paul Mosvold  
President, Scandrill, Inc.