



APPLICATION FACT SHEET

STATIONARY SOURCE EMISSIONS CONTROL | 400 LAPP ROAD | MALVERN, PA | 19355-1212 | USA

T +1 484 320 2136 | F +1 484 320 2152 | WWW.JMSSEC.COM | INFO@JMSSEC.COM

Case No. 801: Controlling NOx from Gas Drilling Rig Engines with Johnson Matthey's Urea SCR System

The state of Wyoming and the Bureau of Land Management (BLM) requested all natural gas companies in the Pinedale Anticline to reduce NOx emissions from their drilling rigs. Shell Exploration & Production Company contacted Johnson Matthey for a solution to this challenging application.

Pollutant	Targeted Emission Level	Achieved
NOx	90% reduction or 0.70 g/hp-hr	91 to 99%
NH ₃	≤10 ppm	Average 2 to 3 ppm

Background

Natural gas drilling activity in the Pinedale Anticline in Wyoming has resulted in the request for environmental emissions reduction for natural gas drilling rigs in Southwestern Wyoming.

Shell Exploration & Production Company wanted to control NOx emissions from their natural gas drilling rigs (each equipped with three Caterpillar 3512BDITA engines). However, the dramatic engine load swings experienced in the drilling operation coupled with the harsh environment led to the failure of all initial SCR systems tested.

To solve the problem, Johnson Matthey and Shell worked closely together to replace the unsuccessful systems provided by other SCR suppliers with Johnson Matthey equipment and its more advanced catalyst technology.

Johnson Matthey provided extensive engineering, project management and complete installation and commissioning support for the project. The modular design of the Johnson Matthey SCR systems also makes them easy to transport and reassemble at a new drilling location with minimal effort.

Figure 1. Natural Gas drilling rig powered by three diesel engines



Summary

- **Product:** Urea SCR system
- **Application:** Three 1476 hp Caterpillar 3512 BDITA diesel engines
- **Customer:** Shell Exploration & Production Company
- **Location:** Pinedale, Wyoming
- **Installed By:** Johnson Matthey SSEC
- **Date Installed:** March 2008
- **Operation:** Drilling rig prime power
- **Emissions:** NOx
- **Comments:** In this harsh environment, the Johnson Matthey SCR system reduced NOx emissions by >90% and maintained ammonia slip of <10ppm throughout the extreme engine load swings of the natural gas drilling operation.

Figure 2. Three JM urea SCR systems installed above the engines

