

QLN-II™ Steam Flood Burner Readily Meets Single Digit NOx

Coen Company Meets Strict Emission Requirements Delivering **5–7 ppm NOx Results** with Conventional Controls

○ THE SITUATION

Oil field steam flood units in Bakersfield, California are required to meet the San Joaquin Valley Unified Air Pollution Control District's emission requirements, Rule 4306 and 4320, of single digit NOx levels and 400 ppm CO. An oil producing company near Bakersfield decided to retrofit their fleet of steam flood generators with Coen's QLN-II burner. The user wanted a burner that would meet strict NOx levels with low fan horsepower requirements, while operating with low excess air levels and using conventional burner controls.

Location:	Bakersfield, California
Capacity:	62.5 Million Btu/hr each
New Burner:	Coen Model QLN-II
Fuels:	Natural Gas
Results:	5 to 7 ppm NOx; <10 ppm CO

○ THE SOLUTION

Coen engineered and delivered a QLN-II burner as a complete integrated package. The QLN-II burner is loosely based on Coen's established QLN™ Quantum Low-NOx burner (over 500 installations worldwide); however, the QLN-II burner utilizes innovative Ultra-Low-NOx technology to further reduce NOx emissions. The QLN-II burner delivered low-NOx performance with low excess air, low burner pressure drop, low FGR rates, and used conventional burner controls.

The primary benefit of the QLN-II burner is that it can meet single digit NOx requirements using low excess air and *minimal* flue gas recirculation. Low FGR rates and low excess air mean increased thermal efficiency and reduced overall operating costs.

Another important benefit of the QLN-II burner is the compatibility with conventional control systems. Coen Company's Ultra-Low-NOx techniques enhance the overall stability of the burner, making it equivalent to a conventional (non low-NOx) burner. Others supplied industry standard combustion controls, making the burner solution economical for any retrofit installation.

○ THE RESULTS

The startup results were substantially below the new emission regulated limits of 7 ppm NOx and 400 ppm CO after only a couple of days of commissioning.

The conversion resulted in:

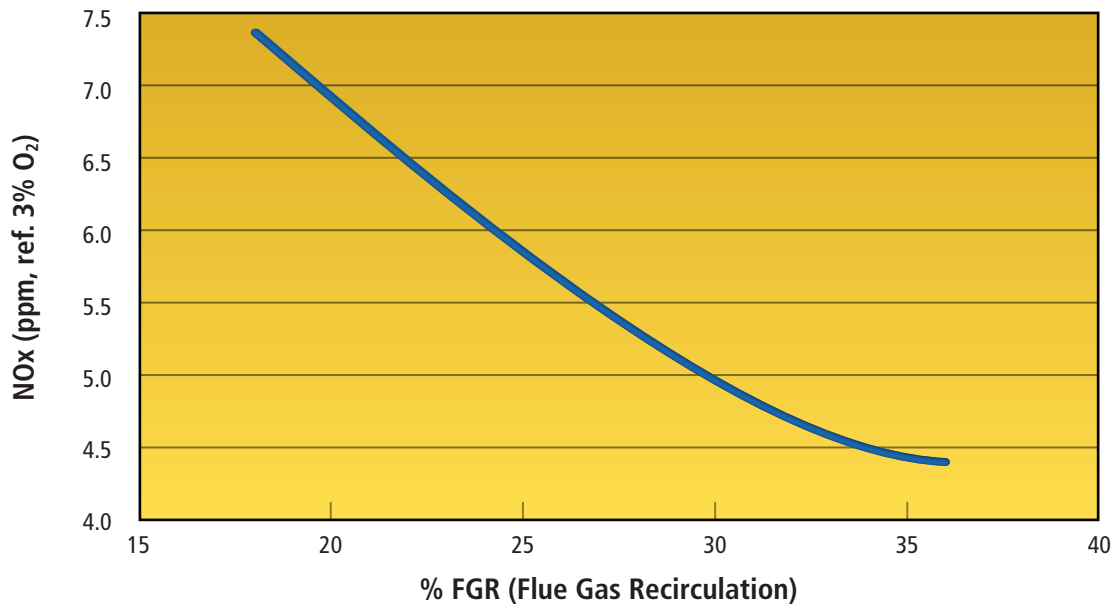
- ✓ **LOW-NOx** – NOx was easily set for less than 7 ppm over the operating range and demonstrated as low as 4 ppm (corrected to 3% O₂).
- ✓ **LOW-CO** – CO emissions were less than 10 ppm (corrected to 3% O₂).
- ✓ **LOW EXCESS AIR** – NOx and CO emissions were easily met with 15% excess air or lower.
- ✓ **LOW FGR RATE** – 7 ppm NOx required just 20% FGR and higher amounts of FGR were used to further reduce NOx emissions (while maintaining 15% excess air).
- ✓ **CONVENTIONAL CONTROLS** – Emissions were met using customer's conventional PLC-based control system. *No proprietary controls were required.*



QLN-II Burner
for Steam Flood

QLN-II™ Steam Flood

NOx Performance



QLN-II Burner Results

- ✓ Met Emission Limits
- ✓ Easy Retrofit
- ✓ Quick Startup
- ✓ Local Supply
- ✓ Simple Controls
- ✓ Low Burner Draft Loss
- ✓ Low FGR
- ✓ Low Fan Horsepower
- ✓ Low Operating Cost
- ✓ High Efficiency
- ✓ Single-digit NOx
- ✓ Single-digit CO
- ✓ Low Excess Air
- ✓ No Refractory Throat Required
- ✓ Low Maintenance Cost

Strict Federal air pollution regulations trickling down to the district level are creating great economic challenges to remain competitive in a fierce global environment. It is no longer an option, but a necessity for industry to pursue and implement the latest technology that provides economic and environmental benefits.

Coen Company, engineers and manufacturers of combustion equipment since 1912, understands this trend. Coen Company is committed to providing the latest in combustion and emission control technology to meet the needs of the oil production, refining and related industries.

Contact Your Coen Representative

today about designing a dependable, integrated system engineered to your specifications using the QLN-II burner or any of Coen's outstanding combustion products.



951 Mariners Island Blvd., Suite 410 • San Mateo, CA 94404 USA

Tel: +1-650-522-2100 • Fax: +1-650-522-2147

www.coen.com