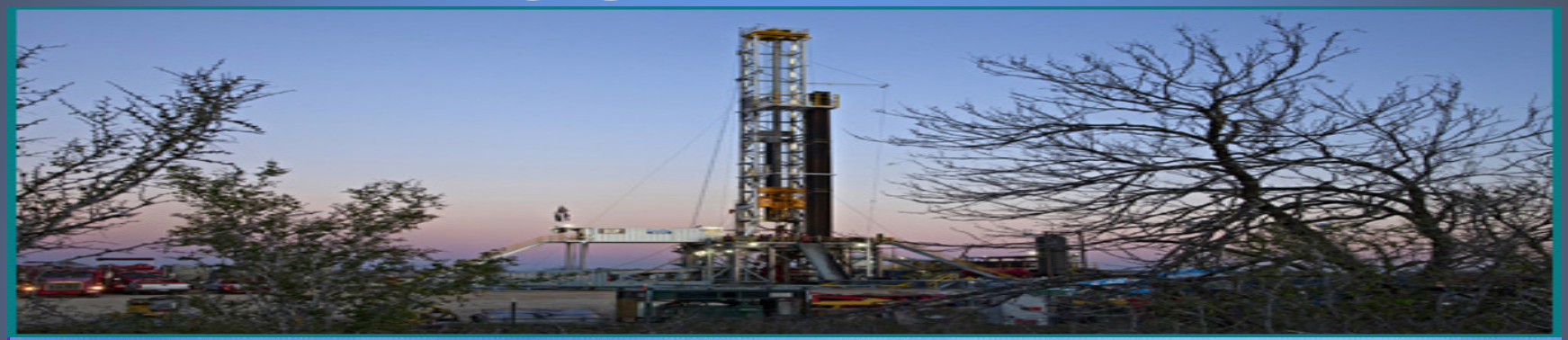
HY-BON ENGINEERING COMPANY.



Setting a New Standard!!

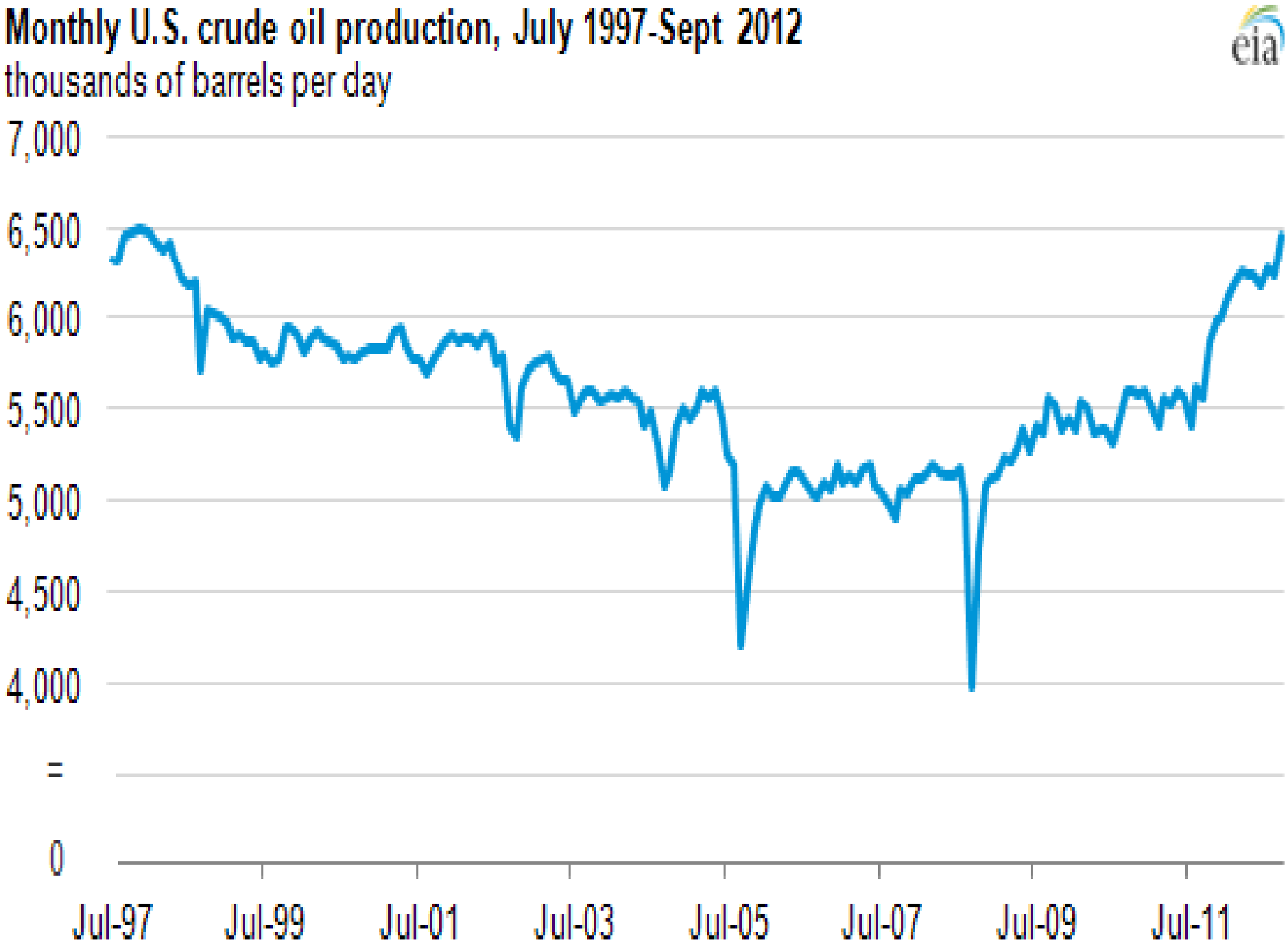

The oil industry is heading into new waters

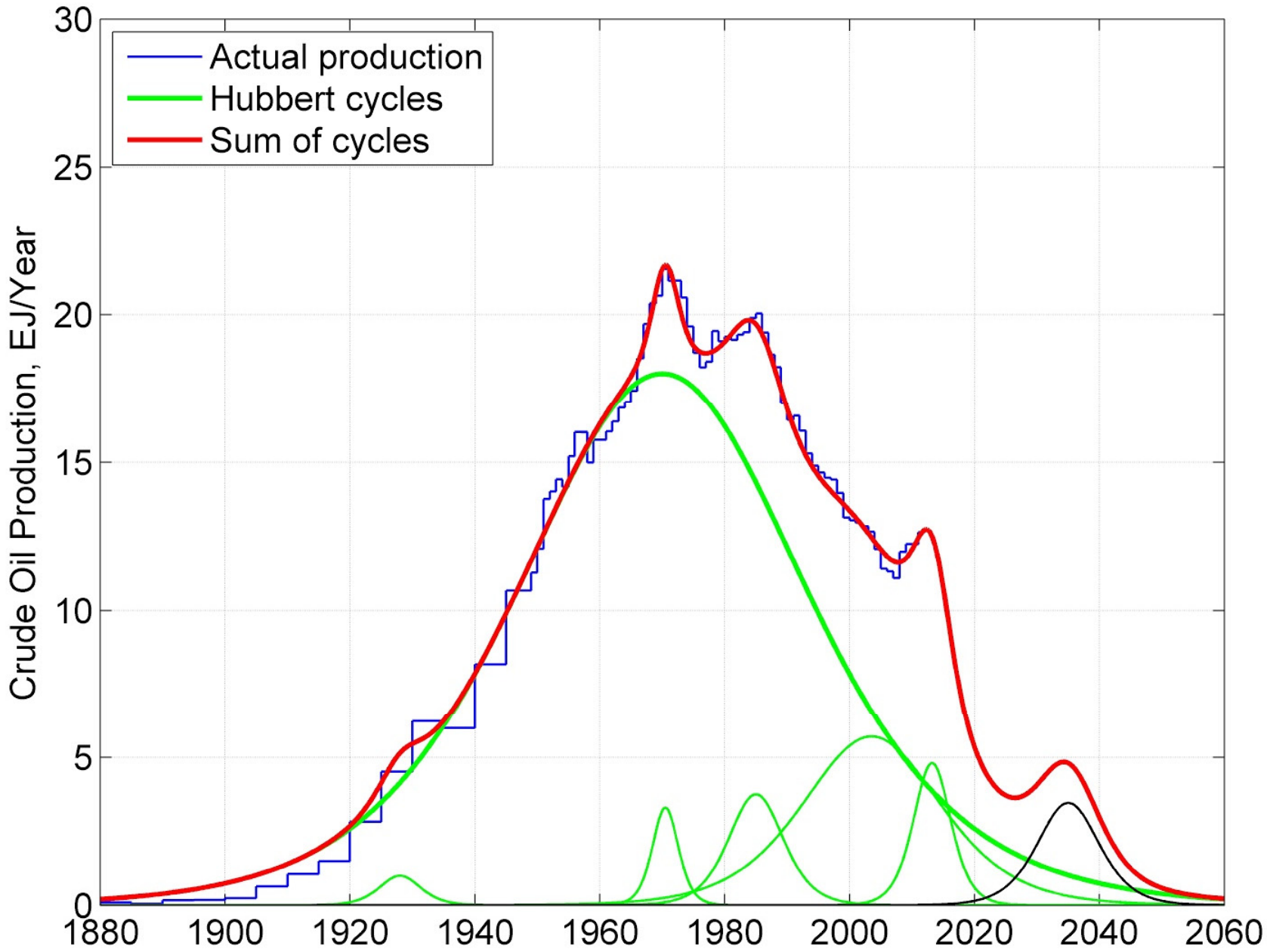

There is concern about Emissions.
© KURT JONES 2003

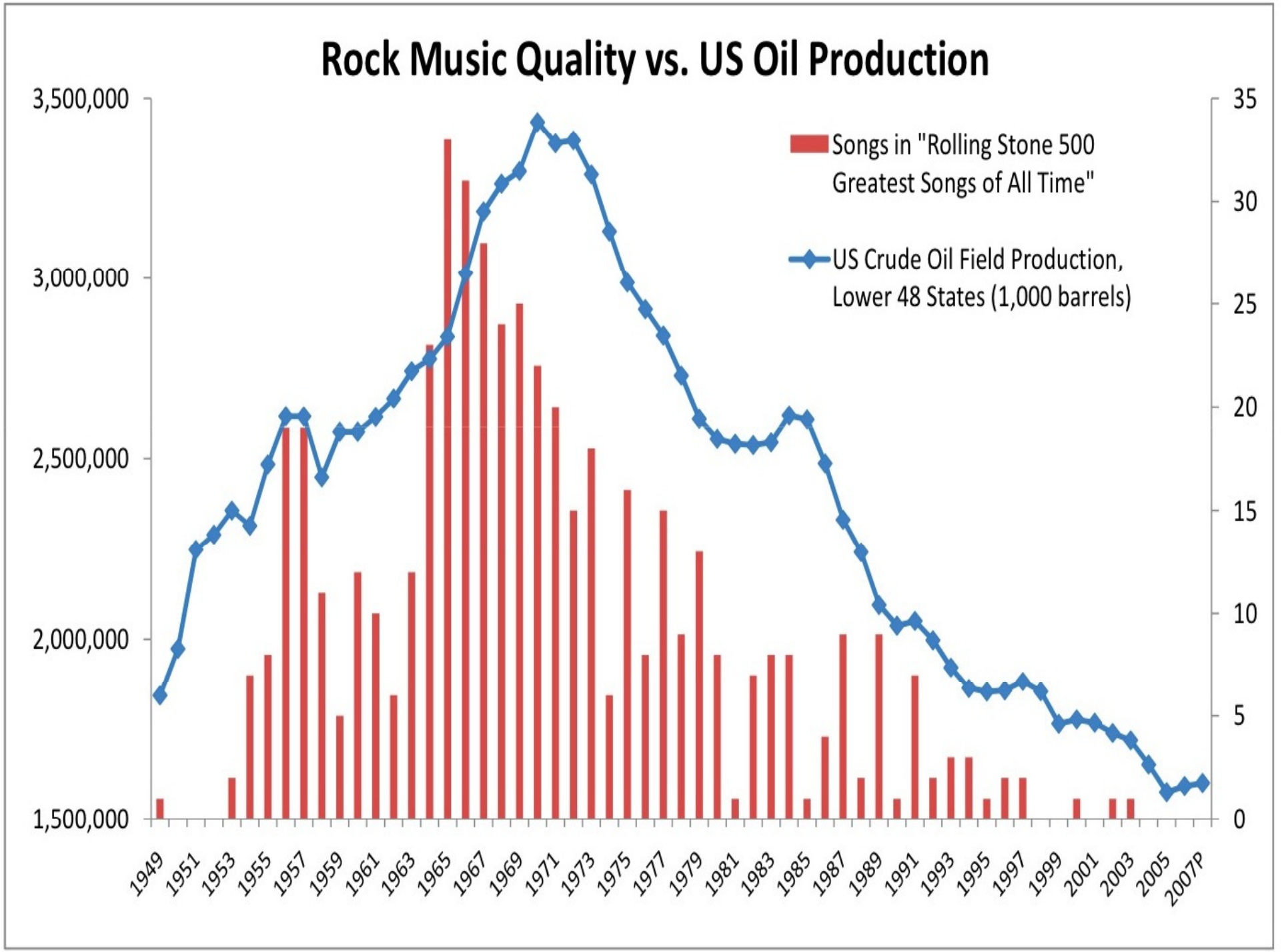
Source: Energy Information Administration based on data from various published studies.
Updated: May 9, 2011

US oil production hits 15-year high: DEC 04, 2012

- Domestic crude oil production in September hit the highest monthly output since 1998, according to the U.S. Energy Information Administration (EIA).
- Oil production yielded 6.5 million barrels per day in September, EIA said. Daily production increased by 900,000 barrels daily compared with last September.


Monthly U.S. crude oil production, July 1997-Sept 2012
thousands of barrels per day
eia
7,000
6,500
6,000
5,500
5,000
4,500
4,000
=
0
Jul-97
Jul-99
Jul-01
Jul-03
Jul-05
Jul-07
Jul-09
Jul-11


Actual production
Hubbert cycles
Sum of cycles
Crude Oil Production, EJ/Year
0
5
10
15
20
25
30
1880
1900
1920
1940
1960
1980
2000
2020
2040
2060


Rock Music Quality vs. US Oil Production
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
35
30
25
20
15
10
5
0
Songs in "Rolling Stone 500 Greatest Songs of All Time"
US Crude Oil Field Production, Lower 48 States (1,000 barrels)
1949
1951
1953
1955
1957
1959
1961
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007P

2013 Regulatory Changes

Regulatory Changes 2013

Drivers:

- FLIR GasFinder camera/ Flyovers
- Realization that existing inventories understated
- Vent gas controversy in the Barnett Shale (Benzene)
- Public more aware than ever

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

Regulatory Changes 2013

EPA Amendments to Oil and Gas Air Regulations- Quad O

On March 28, 2013, EPA proposed updates to its 2012 VOC performance standards for storage tanks used in crude oil and natural gas production to facilitate compliance with the standards and clarify requirements. The proposed changes reflect recent information showing that more higher-volume storage tanks will be coming on line than the agency originally estimated.

Based on EPA's analysis it believes that there are on the order of 970 storage vessels per month being installed at this time and expected in the future, and over 20,000 affected storage vessels constructed, modified or reconstructed between the August 23, 2011, proposal date of the NSPS

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

Tanks Subject to the Rule:

The proposed rule clarifies the type of storage tank that is subject to the NSPS. Tanks that are considered "affected sources" would have VOC emissions of 6 or more tons per year and are used to store crude oil, condensate, unrefined petroleum liquids known as "intermediate hydrocarbon liquids," and produced water. Fuel tanks, for example, are not covered by these rules.

Storage tanks located at refineries are not covered by this rule.

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

Proposed Alternative Emissions Limit

EPA also is proposing an alternative emissions limit for storage tanks that would allow owners/operators to either:

1) **Reduce VOC emissions at a tank by 95 percent, as required in the original rule; Storage tanks with VOC emissions of <u>6 tons a year or more must reduce VOC emissions by at least 95 percent</u> or**

2) Demonstrate emissions from a tank have dropped to less than 4 tons per year of VOCs without emission controls.

6 tons per year sounds like a lot, but is it .....

Threshold based on potential to emit VOCs - 6 tons per year or more

Daily *equivalents could be as low as:*

- **33 pounds emission**
- **About 1 mcf emission**
- **1 barrel of condensate produced**
- **20 barrels of oil produced**
- **2000 barrels of water with 1% oil carryover processed**

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

This alternative limit would reflect the decline in emissions that occurs at most tanks over time and allow owners/operators to shift control equipment to higher-emitting tanks.

To qualify for this emissions limit, owners/operators would have to document that emissions had been below 4 tons for at least 12 consecutive months.

If emissions increase (at or above the 4 ton-per-year limit), owners/operators would have 30 days to meet the 95 percent reduction requirement.

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

Group 1 Tanks: ***Emissions from tanks generally decline over time, because the amount of liquid that moves through the tank declines as production from a well slows. For tanks constructed between Aug. 23, 2011 and the date March 28 proposal is published in the Federal Register, EPA is proposing a two-part requirement:***

Tank owners/operators would have until Oct. 15, 2013 to report that the tank is on line and provide the tank's geographic coordinates.

If there is a change that potentially would increase the tank's emissions-- such as the addition of a well supplying the tank or the refracture of an existing well -- the owner/operator would have to install controls to reduce VOC emissions by 95 percent within 60 days of the change or by April 15, 2014, whichever is later.

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

Group 2 Tanks: ***Tanks that come online after March 28 proposal is published in the Federal Register would have to have controls to reduce VOC emissions by 95 percent in place by April 15, 2014 or within 60 days after startup, whichever is later.***

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

Clarifying test protocols for control equipment

The 2012 NSPS allows owners/operators to use manufacturer-tested emission control device models (combustors) that have been demonstrated to reduce VOC emissions from storage tanks by 95 percent, rather than requiring field performance testing of these devices.

March 28 proposal aligns the protocol that emission control manufacturers must use in testing the controls with the testing protocol required in EPA's 2012 air toxics regulations for storage tanks.

EPA also is proposing to allow tank owners/operators to use control devices that are designed to reduce VOC emissions by 95 percent, while the agency reviews issues raised in the reconsideration petitions related to field testing protocol requirements. EPA expects to address this issue by the end of 2014.

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

Reviewing Monitoring Requirements/Proposed Requirements for Tanks That Already Have Controls

EPA is proposing to streamline compliance and monitoring requirements for tanks that have already installed VOC controls while the agency completes its evaluation of the monitoring issue.

For tanks with controls, the proposal would require monthly inspections of covers, closed-vent systems and control devices. This step is expected to minimize VOC emissions by leading to prompt repairs, while requiring little or no specialized monitoring training or equipment. Records of these inspections, which can be conducted by personnel visiting the tank site for other work, must be kept on site.

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

Timing of Annual Reports

The 2012 final NSPS required that owners/operators submit an annual report on well completions, along with information on storage tanks and other equipment constructed or modified during the year. The rule gave owners/operators 30 days to submit the report, which must be certified by a senior company official. Several of the reconsideration petitions noted that 30 days is not enough time to compile the required information and have the report signed by the senior official.

EPA is proposing to give owners/operators 90 days to submit this report.

Regulatory Changes 2013

EPA Amendments to Oil and Gas Air Regulations- Quad O

- New storage tanks with VOC emissions **of 6 tons a year or more must reduce VOC emissions by at least 95 percent.** EPA expects this will generally be accomplished by routing emissions to a combustion device and/or using emission reduction technologies (VRU)

- Note: 6 tons of emissions could be as low as 1 mcf /day depending on gas analysis

- Proposed rule was Published August 16, 2012; Final rule in effect 60 days from Publication in Federal Register (October 15, 2012)

EPA Air Regulations for Oil & Gas- New Source Performance Standards (NSPS) Quad O requirements: April 15, 2014

EPA anticipates taking final action on the March 28 proposal by July 31, 2013. The agency is continuing to evaluate other issues raised in the petitions and intends to address those by the end of 2014.

Not always the Answer
IF YOU CAN MAKE MONEY

From EPA

- We agree that it is better to recover resources than to burn them. (However, by law, if someone meets the 95 percent control requirement, we cannot specify how they must meet it. In other cases, where we cannot set a numerical limit, we can set work practice or equipment standards, but there are specific criteria we must meet in order to do so.)

A Barrel of Crude Oil is Worth $164,000 – The Human Labor Equivalent of a Barrel of Oil

A single barrel of oil there is the energy equivalent of 23,000 human labor hours. This amounts to 12 years (40 hours per week)

United States Environmental Protection Agency

Office of Enforcement and Compliance Assurance (2201A)

EPA 325-F-012-002

Enforcement Alert

Volume 10, Number 5 | Office of Civil Enforcement | August 2012

EPA Enforcement Targets Flaring Efficiency Violations

Purpose

EPA is devoting significant enforcement resources to correcting regulatory noncompliance at flares. This Alert is intended to inform flare owners and operators of this enforcement initiative and to educate them on proper flare operation. EPA hopes this Alert will spur improvement of flare operating practices, including better control and monitoring of supplemental gas, air, and steam, and thereby reduce harmful emissions to the environment. Better flare operation practices will have the potential to improve public health by: 1) reducing emissions of toxic air pollutants that may pose a health risk; and 2) reducing volatile organic compound emissions which will in turn reduce the formation of ozone which is potentially harmful to vulnerable populations including the young, elderly, and those with respiratory problems. Moreover, improving flare combustion efficiency can result in cost savings due to reduced steam usage.

Introduction

Chemical and petroleum facilities generate waste gases that need to be controlled safely, economically, and in a manner that protects the public health and the environment. The law requires facilities to use good air pollution control practices to minimize the emission of waste gases, see EPA's October 2009 Enforcement Alert, http://www.epa.gov/compliance/resources/newsletters/civil/enfalert/flaring.pdf.

Because, not all waste gases can be prevented or recovered, various control technologies are used to reduce the impact of these waste streams on the environment; one common technology is flaring. A flare is a mechanical device used to combust and thereby destroy volatile organic compounds, toxic compounds, and other pollutants at refineries and other industrial sites.

EPA investigations have found flares that were operated so poorly that there was likely no combustion taking place at all. In these circumstances the flare was merely venting pollution directly to the atmosphere.

Federal requirements for flares are found in the New Source Performance Standards (NSPS) in § 60.18 and National Emission Standards for Hazardous Air Pollutants (NESHAP) in § 63.11. At a minimum, these rules require flares to be:

- Designed and operated with no visible emissions using EPA Method 22 (except for periods not to exceed 5 minutes in 2 hours);
- Operated with a flame present at all times, confirmed by the use of a thermocouple or equivalent device;
- Used only when the net heating value of the gas to be combusted is 300 BTU per standard cubic foot (BTU/scf) or greater (if the flare is steam- or air-assisted), or 200 BTU/scf or greater (if the flare is nonassisted); and
- Designed for and operated with an exit velocity less than 60 feet per second (ft/sec). An exit velocity of greater than 60 ft/sec but less than 400 ft/sec may be used if the net heating value of the gas being combusted is sufficiently high.

Through its inspection and enforcement programs, EPA has identified many instances where flares have been improperly monitored and operated. The consequences are lower combustion efficiency and potentially significant quantities of excess emissions of volatile organic chemicals, sometimes including hazardous air pollutants.

Flare Design Characteristics

Flares are specifically designed to combust gases. Many flares employ steam or air to promote mixing of oxygen within the Vent Gas to ensure combustion occurs without smoke.

Smoke is an indication that hydrocarbons are not being combusted completely.

There are many parameters that affect the combustion efficiency of a flare. One important parameter is the heating value of the gases that are to be combusted, often measured in BTU/scf. The heating value is a measure of the combustibility of the gas. Generally, it is easier to maintain a stable flame and achieve high efficiency for gas streams with higher heating

STATEWIDE RULE 32 EXCEPTION DATA SHEET

(05/2012)
Revised

(FILING FEE REQUIRED)

$ 375.00 PER RRC LEASE NUMBER OR $375.00 PER RRC GAS ID NUMBER. IF SEVERAL LEASES ARE SURFACE COMMINGLED AND FLARED AT THE BATTERY, FEE IS $375.00 PER COMMINGLING PERMIT NUMBER.(STATEWIDE RULE 78 AMENDMENT EFFECTIVE MAY 1, 2012)

Operator Number: _____ _____
Operator Name & Address: _____ 24 hr Emergency # (___)_____
_____ RRC DISTRICT_____
_____ COUNTY_____

Well/Lease/Plant/System Name _____ Field _____

Identification by ID# (Indicate Type):
_____API# _____Gas ID# _____Lease ID#_____Drilling Permit#_____Commingle Permit#_____Plant ID#
Number(s)_____

Type of gas to be flared/vented (mark box): ____ Casinghead Gas ____Gas Well Gas

Is this well/lease/plant subject to Statewide Rule 36 (H_2S Area)? ____ Yes ____ No

If yes*, Form H-9 Certificate # _____ H_2S Concentration _____ ppm

***Proximity to populated areas-(Highways, Roads, Towns, House or Homes, Etc.) LOCATE ON MAP**

Disposition of gas (mark box): ____ Flare ____ Flare Stack/ Height ____ Flare Pit ____ Vent

Time period requested (days,months): _____ Effective __/__/__ Expiration __/__/__

Volume to be flared/vented during time period requested:

_____ MCF/D per well or _____ MCF/D per lease or _____ MCF/D per plant/system or _____ MCF total for time period

Method of Measurement: _____

Purpose of Filing (circle): No Pipeline* System Upset Clean Up/Test Well Size Compressor Other

*If no, distance to nearest pipeline _____mile(s) - attach map showing location of site and nearest pipeline(s).

Explanation: _____
_____
_____

Before an exception can be granted, the following information must be submitted with this data sheet:

* Explanation as to why the operations cannot be shut-in and the gas must be vented or flared
* If gas is vented, explain why the gas cannot be safely and continuously burned and that the gas can be safely vented
* Explanation of how all legal uses for casinghead gas have been investigated and exhausted
* Distance to nearest pipeline and operating conditions (e.g.sweet or sour, line pressure etc.)

OPERATOR'S CERTIFICATION
I declare under penalties prescribed in Sec.91.143, Texas Natural Resources Code, that I am authorized to request this exception, that this data sheet and its attachments were prepared by me or under my supervision and direction, and that the data and facts stated therein are true, correct, and complete, to the best of my knowledge.

_____ Typed or printed name of operators's representative _____ Title

_____ Telephone: Area Code - Number _____ Date _____ Signature

__Does the applicant request to receive all Commission correspondence concerning the administrative review of this application VIA EMAIL ONLY: If yes, indicate email address _____@_____

RRC USE ONLY

Administrative action: Approved _____ Denied _____

Permit Number _____ Effective Date _____ Expiration Date _____

ALL PRODUCTION SHOULD BE ACCURATELY MEASURED WITH DISPOSITION OF GAS REPORTED TO CODE 4 ON MONTHLY PR

Return to: *RAILROAD COMMISSION OF TEXAS*
TERRY EDWARDS

Regulatory Changes 2013

EPA Amendments to Oil and Gas Air Regulations- Quad O

- To ensure enough combustion devices and other emission reduction technologies are available, the final rule provides a one-year phase-in for this requirement.
- After one year, owners/operators of new storage tanks at sites with wells in production must comply.
- Owners/operators at sites with new wells in production will have 30 days to determine the emissions from a tank; and another 30 days to install controls.

Regulatory Changes 2013

EPA Amendments to Oil and Gas Air Regulations- Quad O

On March 28, 2013, EPA proposed updates to its 2012 VOC performance standards for storage tanks used in crude oil and natural gas production to facilitate compliance with the standards and clarify requirements. The proposed changes reflect recent information showing that more higher-volume storage tanks will be coming on line than the agency originally estimated.

Based on EPA's analysis it believes that there are on the order of 970 storage vessels per month being installed at this time and expected in the future, and over 20,000 affected storage vessels constructed, modified or reconstructed between the August 23, 2011, proposal date of the NSPS


HI
MANUAL
WH
26/08 5.07.53PM
LOW

WHAT GETS SEEN, GETS MEASURED

WHAT GETS MEASURED, GETS CONTROLLED

WHAT GETS CONTROLLED, CAN MAKE YOU MONEY

KEY POINTS

- The final rule will become effective 60 days after publication in the Federal Register on August 16, 2012 / October 15, 2012 (**compliance by APRIL 15, 2014**).

- Storage tanks with VOC emissions of **6 tons a year or more must reduce VOC emissions by at least 95 percent**.

- Storage vessels constructed, modified or reconstructed after August 23, 2011.

KEY POINTS

- Process vessels such as surge control vessels, bottoms receivers or knockout vessels are exempt

- If *Technically* and *Economically Feasible*, *then* **VRU'S ARE THE BEST SOLUTION**


CO2

State Emission Regulation

Site wide emissions

Failure to Control Emissions

GAS COMING OUT OF SOLUTION


USA
3"


08/28/2007 14:14

Federal Regulation of the oil and gas industry includes:

- MMS: Minerals Management Service (outer continental shelf)
- OSHA: Occupational Safety and Health Administration
- CWA: Clean Water Act
- SDWA: Safe Drinking Water Act
- CAA: Clean Air Act
- NEPA: National Environmental Policy Act
- ESA: Endangered Species Act
- CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
- SARA: Superfund Amendments and Reauthorization Act

States and state agencies may adopt their own standards; however, these must be at least as protective as the federal standards they replace, and may even be more protective in order to address local conditions.

Keys to Success

"TOTAL SOLUTIONS APPROACH"

Using Standardized VRU Designs Engineered to cost effectively capture the gas analysis from your field or basin with maximum run times with the RIGHT PARTNER

Our Recommendation:

A Pilot Program – Evaluate 10 Sites in one Basin

Allows for management decisions based on fact


Help Me Help You

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HY-BON Engineering Company

2404 Commerce Drive
Midland, TX 79703

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Fax: (432) 697-2310

www.hy-bon.com

EDI

Electronic Design for Industry

100 Ayers Blvd.
Belpre, OH 45714

Phone: (740) 401-4000
Fax: (740) 401-4005

www.ediplungerlift.com

Feeling Stranded?
We Can Help!