

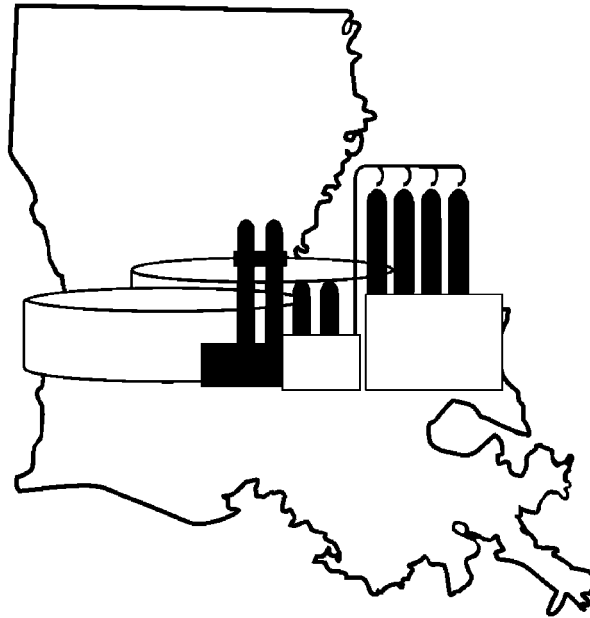
# **LOUISIANA CRUDE OIL REFINERY SURVEY REPORT**

**Fourteenth Edition**

**2005 Survey**

By Bryan Crouch, P.E.

**Refining, Alternative Energy & Power Systems Program**



## **LOUISIANA DEPARTMENT OF NATURAL RESOURCES**

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## Foreword

Since 1989, the Technology Assessment Division of the Louisiana Department of Natural Resources (DNR) has periodically conducted surveys of Louisiana crude oil refineries. The results of the survey are compiled into a report focusing on developments that have occurred since the previous survey. These include an overview of the general direction of the industry and updated information on the current status of refinery ownership, mailing addresses, operating status and key personnel. Tabulated statistical data, charts, and graphs relating to oil production, refinery crude oil sources, refinery margins, capacities, operating rates, and product slate are also presented. Information on both operating and non-operating refineries that are still intact is included. The previous survey was accomplished in December 2003, and published in June 2004.

The information contained in this report was collected in December 2005, and is designed to complement the information presented in the refinery section of the Department of Energy/Energy Information Administration (DOE/EIA) Petroleum Supply Annual. DNR gratefully acknowledges permission to use the latest *Oil and Gas Journal* Worldwide Refining Survey results for Louisiana refineries to provide another independent dataset for comparison.

The operating refining capacities, operating rates, and product slate statistics presented in this report are prepared from data supplied by survey respondents. The information on the non-operating refineries is obtained from their owners, trustees, or management personnel and is current within a few weeks of publication. The data used to construct the charts and graphs on oil production, refinery margins, and crude oil sources is obtained from DNR's database.

The principal terms and phrases used in this report are the same as those used in DOE/EIA publications. The definitions of these terms can be found on page 11 of this report. The slight difference in meaning between *operable* and *operating*, when used to specify capacity or utilization rate, has caused some confusion. "Operable" refers to the maximum amount of crude oil that a refinery can process in its atmospheric stills; "operating" refers to the amount of crude oil actually processed.

The Department of Natural Resources uses the information in this report to enhance the economic development efforts of the State by:

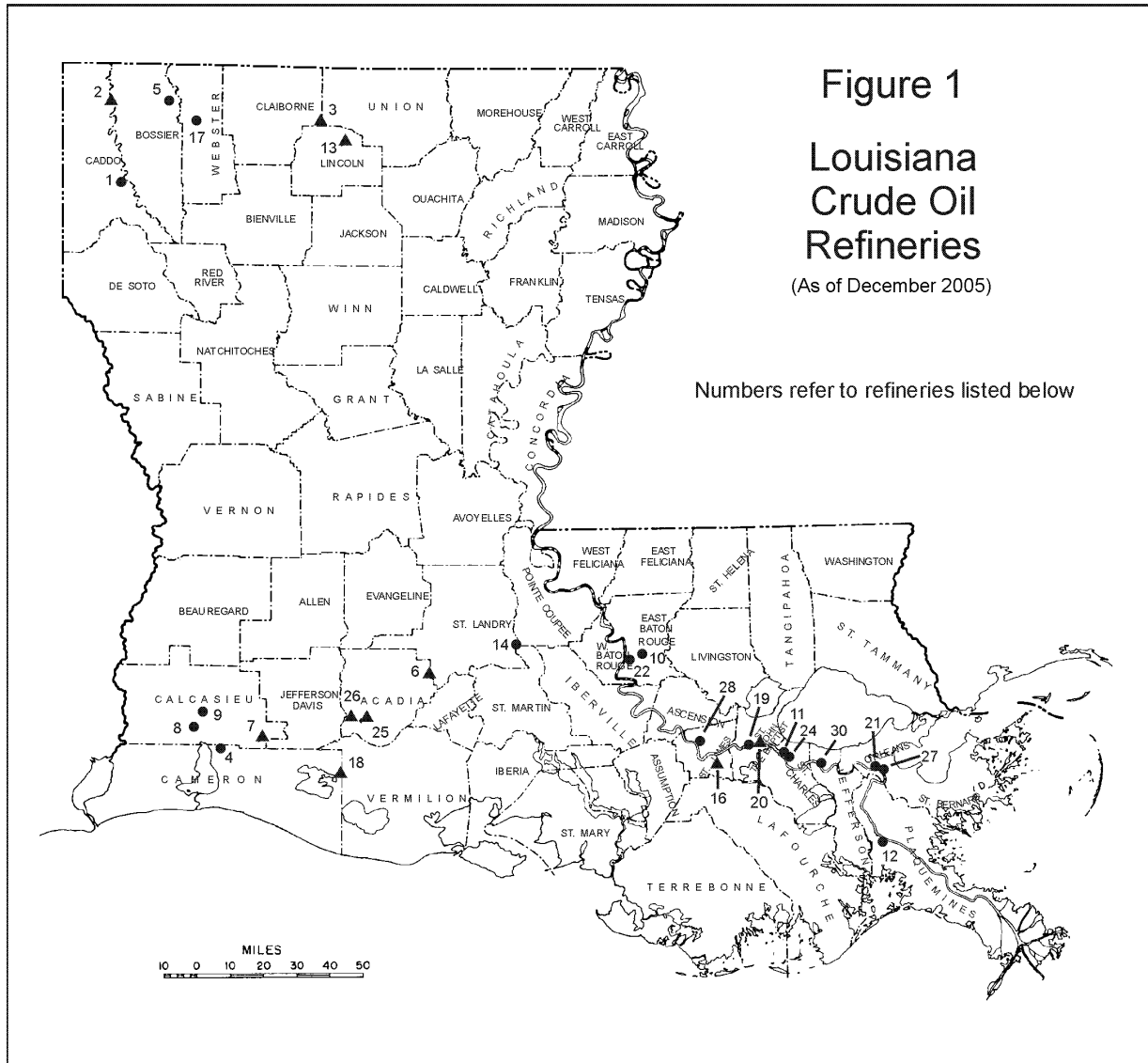
- Developing information on State and Federal energy policies that affect the oil and gas production and refining industries located in the State;
- Helping crude suppliers locate refining sources and refined petroleum product buyers locate sources of supply;
- Assisting new industries desiring to site facilities near refineries; and,
- Providing information to parties evaluating refineries for possible purchase.

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**Figure 1**  
**Louisiana Crude Oil Refineries**

(As of December 2005)

Numbers refer to refineries listed below



Technology Assessment Division

**OPERATING REFINERIES** ●

- 1 Calumet Shreveport - Shreveport
- 4 Calcasieu Refining - Lake Charles
- 5 Calumet Lubricants - Princeton
- 8 CITGO Petroleum - Lake Charles
- 9 ConocoPhillips - Lake Charles
- 10 ExxonMobil - Baton Rouge
- 11 Valero Refining - Norco
- 12 ConocoPhillips - Belle Chasse
- 14 Valero Refining - Krotz Springs
- 17 Calumet Lubricants - Cotton Valley
- 19 Marathon Petroleum - Garyville
- 21 Murphy Oil U.S.A. - Meraux
- 22 Placid Refining - Port Allen
- 24 Motiva Enterprises - Norco
- 27 Chalmette Refining - Chalmette
- 28 Motiva Enterprises - Convent
- 30 Shell Chemical - St. Rose

**NON-OPERATING REFINERIES** ▲

- 6 Canal Refining - Church Point
- 7 American International Refinery - Lake Charles
- 18 Tina Resources - Talen's Landing
- 25 Quantum Fuel & Refining - Egan
- 26 Gold Line Refining - Jennings

Note: Refineries 2, 3, 13, 15, 16, 20, 23, and 29 have been intentionally removed from this listing because they no longer produce finished refinery products (15) or have been dismantled (all others).

## Discussion

### Overview

Louisiana is a primary energy producing state with 427 million barrels in crude reserves (2004), ranking it 7<sup>th</sup> among the states (2<sup>nd</sup> if the Louisiana portion of the federal outer continental shelf (OCS) is included). Louisiana ranks 4<sup>th</sup> among the states in crude oil production (1<sup>st</sup> if Louisiana OCS is included), with an estimated 82.4 million barrels produced in 2004. The Louisiana OCS territory is the most extensively developed and matured OCS territory in the United States. The Louisiana OCS territory has produced approximately 89% of the 15.5 billion barrels of crude oil and condensate consumed in the U.S. from the beginning of time through the end of 2004.

The discovery of these large quantities of crude oil led to the development of the refining and petrochemical industry in Louisiana. Louisiana's refining capacity grew with oil production until about 1970 when Louisiana's oil production peaked and began to decline. Refinery capacity continued to grow by processing more oil from other states as well as overseas. In 2004, 61% of refinery input was foreign crude.

All refineries and refining companies are not created equal. There are small refineries and large ones. Some are quite complex, while others are relatively simple. A number are part of major, integrated oil companies, and some are independent.

In addition to refining, integrated oil companies are engaged in all other aspects of the petroleum industry which range from the exploration of crude oil to the marketing of finished petroleum products.

Independent refiners, on the other hand, purchase most of their crude oil on the open market rather than producing it. Refiners such as Placid Refining Co. and Calcasieu Refining Co. are examples of independent refiners.

Major oil companies dominate the refining industry. The top 10 U.S. refiners, all of them major, integrated oil companies, account for about 73% of the total domestic refinery charge capacity. Most of these have operations in Louisiana, either as wholly owned facilities such as the Baton Rouge ExxonMobil refinery or as part owners or joint ventures such as Motiva Refineries in Norco and Convent.

Many refineries are primarily fuels refineries, some are lube stock refineries, and others are petrochemical refineries. The Shell oil refinery in St. Rose is a good example of a petrochemical refinery. All of its products are raw feed for a chemical plant. Table 2 (pg. 12 & 13) clearly shows the focus and product slate of the refiners in Louisiana.

Besides the level of vertical integration of a refiner and the product mix of a refinery, industry analysts also look at capacity and complexity.

A "complexity factor" is assigned to each process unit of a refinery based on its relative construction cost. The atmospheric crude distillation unit is assigned a value of one. For



example, the cost of a fluidized catalytic cracker is six times greater than an atmospheric crude distillation unit of the same capacity, so its unit complexity factor is six.

Greater complexity does not necessarily go hand-in-hand with larger capacity. Some of the smaller facilities in Louisiana are the most complex. For example, the smaller lube and wax producing refineries of North Louisiana are quite complex when compared to some very large refineries in the state.

EIA statistics show that overall petroleum product demand increased by 3.5% in 2004 to 20.731 million barrels per day. Finished motor gasoline supply rose 1.9% in 2004 to 9.105 million barrels per day, and jet fuel reversed its three year decline and rose 3.3% to 1.63 million barrels per day.

The Louisiana refinery operating rate was 93.3% for this survey period. Figure 3 (pg. 24) compares Louisiana, Texas gulf coast, and total U.S. refinery operating rates since 1989.

The table to the right shows the ranking of the 10 largest refiners in the world according to crude capacity. The top 3 positions remained unchanged. Newcomers to the top 10 are Valero Energy Corp. and China National Petroleum. Dropping out of the top 10 were ChevronTexaco and PetroleoBrasileiro SA.

World Rank	Company	Crude Capacity (bcd)
1	ExxonMobil	5,690,000
2	Royal Dutch Shell PLC	5,172,000
3	BP PLC	3,871,000
4	Sinopec	3,611,000
5	Valero Energy Corp.	2,830,000
6	Petroleos de Venezuela SA	2,792,000
7	Total SA	2,738,000
8	ConocoPhillips	2,659,000
9	China National Petroleum	2,440,000
10	Saudi Aramco	2,417,000

Source: *Oil & Gas Journal*, Dec. 19, 2005

As reported in the *Oil & Gas Journal's* 2005 Worldwide Refinery Report, world wide refining capacity grew by over 2.7 million barrels per calendar day (mmbcd) to 85.127 mmbcd. This was the largest increase since the early 1990s. In the United States, refining capacity from its 132 refineries grew by over 350,000 barrels per calendar day (bcd) to 17.126 mmbcd. Louisiana capacity increased by 185,515 bcd to 2.703 mmbcd. Louisiana ranks second among the states with 16.9% of the U.S. refining capacity. Texas ranks first with 27.8% and California ranks third with 11.4%.

According to DNR's current survey, operating capacity for Louisiana refineries is up by almost 180,000 bcd. Table 1 (pg. 11) shows the details of operating capacity and throughput changes. Figure 2 (pg. 23) shows the historical Louisiana and U.S. operating capacity since 1947.

## Refinery Products

Louisiana's 17 operating refineries process over 2.9 million bcd of crude into refined products. Gasoline accounts for the largest percentage of refinery production, at almost 40%. The table to the right shows the top six refinery products from DNR's latest survey. A complete listing of Louisiana refinery products is shown in Table 2 (pg. 12 & 13).

Product	Percent of Refinery Products
Regular gasoline	30.7
Diesel	18.2
Jet fuel/Kerosene	11.0
Fuel oil	6.2
Residual/Coke	5.7
Premium gasoline	4.8

The Clean Air Act Amendments of 1990 mandated the use of oxygenated gasoline in areas of high pollution. Refiners can use oxygenates such as ethanol or MTBE (methyl tertiary-butyl ether) to meet this requirement. There are two programs designed to meet the oxygenated gasoline requirement. The Winter Oxyfuel Program is used during cold months in cities that have high levels of carbon monoxide. Ethanol is primarily used in this program. The other program is a year-round reformulated gasoline (RFG) Program for cities with the worst ground level ozone problem. MTBE was the preferred oxygenate outside the Midwest region because it is easier to blend, has a high octane rating, has lower volatility, and can be shipped through existing pipelines; however, MTBE is now being phased out and replaced with ethanol due to liability concerns over ground water contamination.

The Energy Policy Act of 2005 eliminated the Clean Air Act's oxygenate requirement for reformulated gasoline beginning May 6, 2006. The act also establishes a renewable fuel program that requires gasoline in the U.S. contain a certain volume of renewable fuel. The volume is set at 4 million gallons for 2006, increasing to 7.5 million gallons by 2012.

Currently, RFG is not required to be used anywhere in Louisiana, but the five parish area surrounding Baton Rouge was almost forced to use it. On June 15, 2005, the EPA revoked the 1-hour ozone standard and replaced it with the 8-hour standard. This change effectively changed the Baton Rouge area's ozone non-attainment status from "severe" to "marginal", and negated the RFG requirement. The five parish area surrounding Baton Rouge has until June 15, 2007 to achieve attainment status.

Figure 7 (pg. 29) shows the Wright Killen Gulf Coast Refinery Margins taken from the *Oil & Gas Journal* over time. In 1999, the *Oil & Gas Journal* switched to using the refinery margin data from Muse, Stancil & Co. We have plotted both sources and, although they trend similarly, the absolute values are different because of different assumptions about refinery operations.

Wright Killen refining margins are gross cash margins before depreciation, taxes, and financial charges, based on actual refinery yields and crude oil and wholesale products prices. Wright Killen estimates fixed costs, excluding most corporate expenses for such activities as research and development-and variable costs based on regional refinery configurations. Details about the methodology used by Muse Stancil are explained in the January 15, 2001 edition of the *Oil & Gas Journal*.

## **Refinery Issues in the Energy Bill**

In August 2005, a comprehensive federal energy bill was passed and signed by President Bush. The Energy Policy Act of 2005 contains several items of interest to refiners. The legislation provides a tax incentive that allows the immediate expensing of 50% of the cost of capacity expansions. The expansion must increase capacity by 5% or greater and be put in service by 2012.

Problems associated with the use of local, specialized fuels (sometimes referred to as “boutique fuels”) were addressed by placing a cap on the number of these types of fuels. The cap was set at the number of these fuels that were in existence on September 1, 2004. Also included was a provision that would allow the EPA to temporarily waive the requirement to use these fuels if supply problems exist.

The legislation removed the Clean Air Act’s oxygenate requirement for reformulated gasoline beginning May 6, 2006. This removes a key defense in MTBE product liability suits. MTBE manufacturers were seeking MTBE product liability protection to be included in the bill, but the measure was ultimately defeated. The combination of these two things led Valero Energy Corp. to announce plans to quit manufacturing MTBE. Other refiners are expected to follow.

Ethanol manufacturers benefited from the legislation in the form of a renewable fuel program. The program requires gasoline in the U.S. contain a certain volume of renewable fuel. The volume is set at 4 million gallons for 2006 increasing to 7.5 million gallons by 2012.

## **Hurricanes Katrina and Rita**

Two characteristics of the U.S. refining industry were highlighted when Hurricanes Katrina and Rita struck; the concentration of refineries along the Gulf Coast and the low surplus refining capacity.

Operable refinery utilization rates increased dramatically from the early 1980s to the late 1990s and have remained high since then. High operable utilization rates translate into low spare capacity, which reduces the industry’s ability to maintain adequate fuel supplies should a loss of capacity occur. Basic economics teaches us that when supply decreases relative to demand, prices increase. That was precisely the scenario that played out in the summer of 2005 when Hurricanes Katrina and Rita blew ashore into areas of Louisiana and Texas that are home to 38% of the U.S. refinery capacity.

Prior to Hurricanes Katrina and Rita, the U.S. refinery operable capacity was 17,124,870 million barrels per calendar day (with an operating utilization rate of 93.2%), and idle capacity stood at 118,580 bcd. The combined refinery capacity that was in the paths of Hurricanes Katrina and Rita totaled almost 6.5 million barrels per day, or 38% of the total U.S. refining capacity.

On August 28, in preparation for the storm, approximately 2.1 million bcd (325,000 bcd from one refinery in Mississippi and the rest from ten refineries in Louisiana) went offline. After Katrina blew through, and as power began to be restored, refineries that sustained minor or no damage began to come back online. Then, on September 24, with 879,000 bcd of refinery

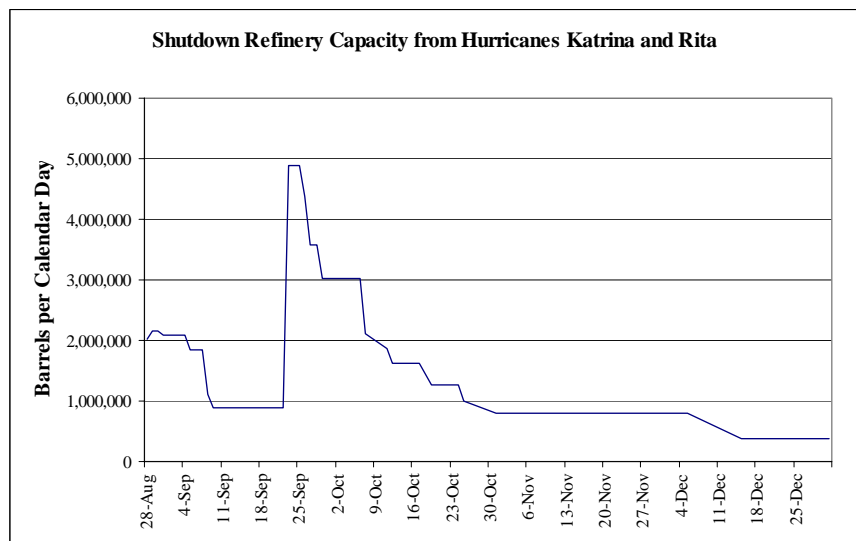
capacity in Louisiana and Mississippi still shut down due to Hurricane Katrina, Hurricane Rita came ashore and reduced refinery capacity by an additional 4 million bcd (594,000 bcd from three Louisiana refineries and 3.4 million bcd from thirteen Texas refineries). The table below lists the refineries affected by Hurricanes Katrina and Rita.

Louisiana Refineries Affected by '05 Hurricanes				
Hurricane	Refinery	Location	Capacity (bcd)	Notes
Katrina	ConocoPhillips	Belle Chase	247,000	major damage
	Chalmette Refining	Chalmette	187,200	major damage
	ExxonMobil	Baton Rouge	493,500	
	Marathon Petroleum	Garyville	245,000	
	Murphy Oil	Meraux	120,000	major damage, still shutdown
	Motiva	Convent	235,000	
	Motiva	Norco	226,500	
	Placid	Port Allen	48,500	
	Valero	Krotz Springs	80,000	
	Valero	Norco	185,000	
Rita	Citgo	Lake Charles	324,300	
	ConocoPhillips	West Lake	239,400	

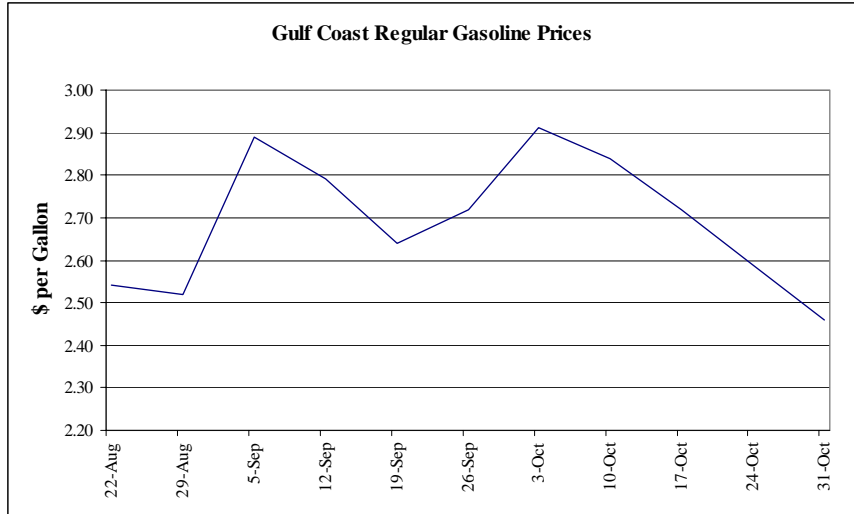
Source: U.S. Dept. of Energy, Office of Electricity Delivery and Energy Reliability

In the wake of the storms, several refineries sustained significant damage. Three refineries in Louisiana (see table above) and Chevron’s Pascagoula refinery sustained major damage. All of the affected refineries are currently back on-line and operating at or near full capacity, except Murphy Oil in Meraux, which expects to return to operation in May 2006.

The figure to the right shows the reduction in refinery capacity versus time from refineries that were in the paths of Hurricanes Katrina and Rita. In addition, several refineries that were not directly in the paths of the hurricanes had to reduce output due to a shortage of crude oil that resulted from wells being shut in, and pipelines being without electricity.



As expected, the sudden reduction in refinery capacity caused an increase in fuel prices nationwide and fuel shortages and price spikes along the Gulf Coast and southeast parts of the country. The figure to the right shows the rise and fall of Gulf Coast gasoline prices resulting from the supply decrease. Diesel prices experienced similar movement.



### Operating Refinery Recent Changes

The Citgo refinery in Lake Charles added a new vacuum distillation tower resulting in a net capacity increase of 86,000 bcd. Marathon Oil Corp. bought out the Ashland, Inc. share of Marathon Ashland Petroleum LLC. Marathon announced plans to increase the capacity of the Garyville refinery by 180,000 bcd. Construction is estimated to start in 2007 and be completed in late 2009.

The identity and location of each of the operating refineries is shown on the map in Figure 1 (pg. 1). Mailing addresses and contacts are listed in Table 7 (pg. 30). Physical locations are listed in Table 8 (pg. 31), and name histories are listed in Table 9 (pg. 32).

### Non-Operating Refinery Recent Changes

The Canal Refining Co. facility at Church Point is in the middle of an extensive maintenance and upgrade project. No estimate for a restart date was available.

The identity and location of each of the non-operating refineries is shown on the map in Figure 1 (pg. 1). Mailing addresses and contacts are listed in Table 10 (pg. 33). Physical locations, last known crude capacity, date last operated, and present status are described in Table 11 (pg. 34), and name histories are listed in Table 12 (pg. 35).

## Definitions

**Barrels per calendar day** - The amount of input that a distillation facility can process under usual operating conditions. The amount is expressed in terms of capacity during a 24-hour period and reduces the maximum processing capability of all units at the facility under continuous operation (see Barrels per Stream Day) to account for the following limitations that may delay, interrupt, or slow down production:

- The capability of downstream facilities to absorb the output of crude oil processing facilities of a given refinery. No reduction is made when a planned distribution of intermediate streams, through other than downstream facilities, is part of a refinery's normal operation;
- The types and grades of inputs to be processed;
- The types and grades of products expected to be manufactured;
- The environmental constraints associated with refinery operations;
- The reduction of capacity for scheduled downtime due to such conditions as routine inspection, maintenance, repairs, and turnaround; and
- The reduction of capacity for unscheduled downtime due to such conditions as mechanical problems, repairs, and slowdowns.

**Barrels per stream day** - The maximum number of barrels of input that a distillation facility can process within a 24-hour period when running at full capacity under optimal crude oil and product slate conditions with no allowance for downtime.

**Charge capacity** - The input (feed) capacity of the refinery processing facilities.

**Idle capacity** - The component of *operable* capacity that is not in operation and not under active repair, but capable of being placed in operation within 30 days; and capacity not in operation, but under active repair that can be completed within 90 days.

**Operable capacity** - The amount of capacity that, at the beginning of the period, is in operation; not in operation and not under active repair, but capable of being placed in operation within 30 days; or not in operation, but under active repair that can be completed within 90 days. Operable capacity is the sum of the operating and idle capacity and is measured in barrels per calendar day or barrels per stream day. *Note: This survey uses the capacity at the **end** of the period.*

**Operating capacity** - The component of operable capacity that is in operation at the beginning of the period. *Note: This survey uses the capacity at the **end** of the period.*

**Operable utilization rate** - Represents the utilization of the atmospheric crude oil distillation units. The rate is calculated by dividing the gross input to these units by the operable refining capacity of the units.

**Operating utilization rate** - Represents the utilization of the atmospheric crude oil distillation units. The rate is calculated by dividing the gross input to these units by the operating refining capacity of the units.

**Throughput** – Is the actual barrels of crude oil processed by the atmospheric stills for the survey time period.

**Operating rate %** - Throughput divided by 365 divided by operating capacity expressed as a percentage.

**Operable rate %** - Throughput divided by 365 divided by operable capacity expressed as a percentage.

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**Table 1**  
**Louisiana Operating Refineries**  
**Capacity and Throughput Changes**

Refinery Name	December 2003 Survey Operating Capacity <sup>1</sup> (bcd)	Capacity Change (bcd)	December 2003 Survey Throughput <sup>1</sup> (Barrels)	Throughput Change (Barrels)	Capacity Change (%)	Throughput Change (%)
Calcasieu Refining Co Lake Charles	31,000	0	11,112,238	-152,984	0.00	-1.38
Calumet Lubricants Co LP Cotton Valley	13,616	-1,458	3,423,108	-482,521	-10.71	-14.10
Calumet Lubricants Co LP Princeton	8,204	301	63,675	2,998,125	3.67	4,708.48
Calumet Shreveport LLC Shreveport	8,134	31,866	2,969,018	0	391.76	0.00
Chalmette Refining LLC Chalmette	190,200	4,800	59,907,883	5,280,543	2.52	8.81
Citgo Petroleum Corp Lake Charles	352,000	86,000	113,942,537	25,488,944	24.43	22.37
ConocoPhillips Belle Chasse	260,000	-13,000	92,602,489	-5,955,093	-5.00	-6.43
ConocoPhillips West Lake	250,000	-11,000	82,823,342	-552,937	-4.40	-0.67
ExxonMobil Refining & Supply Co Baton Rouge	493,000	500	180,310,000	-912,500	0.10	-0.51
Marathon Petroleum Co LLC Garyville	255,000	0	86,651,423	8,589,651	0.00	9.91
Motiva Enterprises LLC Convent	225,000	0	82,125,000	0	0.00	0.00
Motiva Enterprises LLC Norco	240,000	0	74,897,397	1,560,757	0.00	2.08
Murphy Oil USA Inc <sup>2</sup> Meraux	105,000	15,000	21,411,634		14.29	
Placid Refining Co Port Allen	49,500	0	16,707,302	1,306,075	0.00	7.82
Shell Chemical Co St. Rose	54,000	0	16,696,000	-887,667	0.00	-5.32
Valero Refining Co Krotz Spings	78,000	2,000	24,994,316	3,913,017	2.56	15.66
Valero Refining Co Norco	121,416	63,584	14,934,100	46,544,587	52.37	311.67
Totals <sup>2</sup>	2,734,070	178,593	885,571,462	40,193,410	6.53	4.65

1. December 2003 survey published in June, 2004.

2. Murphy was not able to respond to current survey due to outage resulting from Hurricane Katrina. Current operating capacity figure from EIA. Throughput change totals do not include Murphy.

**Table 2**  
**Louisiana Operating Refineries**  
**Crude Capacity and Percent Product Slate**  
**2005 DNR Survey**

Data in this table may differ from data reported elsewhere for a different time period.

Refinery Name	DNR Fac. Code	Operating capacity as of 6/30/2005 (bcd)	Operating rate (%)	Idle capacity (bcd)	Operable rate (%)	Throughput 7/1/2004 - 6/30/2005 (Barrels)
Calcasieu Refining Co Lake Charles	CLC	31,000	96.9	0	96.9	10,959,254
Calumet Lubricants Co LP Cotton Valley	CTT	12,158	66.3	0	66.3	2,940,587
Calumet Lubricants Co LP Princeton	CLM	8,505	98.6	995	88.3	3,061,800
Calumet Shreveport LLC Shreveport	ATL	40,000	20.3	1,000	19.8	2,969,018
Chalmette Refining LLC Chalmette	TNN	195,000	91.6	0	91.6	65,188,426
Citgo Petroleum Corp Lake Charles	CTS	438,000	87.2	0	87.2	139,431,481
ConocoPhillips Belle Chasse	STN	247,000	96.1	0	96.1	86,647,396
ConocoPhillips West Lake	CNB	239,000	94.3	0	94.3	82,270,405
ExxonMobil Refining & Supply Co Baton Rouge	EXX	493,500	99.6	0	99.6	179,397,500
Marathon Petroleum Co LLC Garyville	MRT	255,000	102.3	0	102.3	95,241,074
Motiva Enterprises LLC Convent	TXC	225,000	100.0	0	100.0	82,125,000
Motiva Enterprises LLC Norco	SHL	240,000	87.3	0	87.3	76,458,154
Murphy Oil USA Inc <sup>1</sup> Meraux	MRP	120,000				
Placid Refining Co Port Allen	PLC	49,500	99.7	0	99.7	18,013,377
Shell Chemical Co St. Rose	INT	54,000	80.2	0	80.2	15,808,333
Valero Refining Co Krotz Spings	HLL	80,000	99.0	0	99.0	28,907,333
Valero Refining Co Norco	GDH	185,000	91.0	0	91.0	61,478,687
Weighted State Average <sup>1</sup>			93.3		93.2	
Total La. Operating Capacity <sup>1</sup>		2,912,663		1,995		950,897,825

**Table 2 (Continued)**  
**Louisiana Operating Refineries**  
**Crude Capacity and Percent Product Slate**  
**2005 DNR Survey**

Data in this table may differ from data reported elsewhere for a different time period.

DNR Fac. Code	% of Total Product Slate												
	Gasoline			Other Fuels			Miscellaneous			Other Products			
	Reg.	Prem.	RFG	Diesel	Jet/ Kero.	Fuel oil	LPGs	Napth.	Resid./ Coke	Product 1	Product 2	Product 3	All Other
CLC				21.0	19.0	23.0	9.0	27.0					
CTT				4.6				59.8		22.1 gas oil	13.3 light straight run	0.2 butane/ pentane	
CLM				8.0				2.0		72.0 lube oil	18.0 asphalt		
ATL	29.9			21.2	19.5				3.8	19.3 lubes	3.7 waxes	2.6 asphalt	0.1 slop oil/cat feed
TNN	30.4	8.4		25.8	5.4	4.8	4.6	1.1	5.3	6.6 fuel gas/FCC carbon	3.8 aromatics	2.4 gas oil	1.4 gasoline comp., sulfur
CTS	36.3	8.5	1.9	14.8	18.4	2.1	1.2		7.2	4.2 petrochem.	3.4 propane/ propylene	2.8 lubes, waxes	0.8 normal butane
STN	28.1	5.5		30.8	12.6	2.9	4.4	0.1	3.5	5.3 gasoline blendstocks	4.5 chemicals	2.0 vacuum gas oil	0.3 diesel blend stocks, sulfur
CNB	30.1			32.3	13.6		1.1		6.9	14.6 lube oil feed stock	1.4 ref. grade propylene		
EXX	15.5	4.6	15.3	14.0	12.2	2.6	2.4	1.5	4.2	19.7 petrochem. feedstock	4.1 fuel gas, sulfur	2.3 lubes, waxes	1.6 gas oil, misc.
MRT	44.6	4.1	0.2		1.7	23.5	6.0	0.7	8.2	7.0 asphalt	3.4 dry gas	0.6 sulfur	
TXC	40.8	0.8		23.1	13.3	7.9	1.2		1.6	5.6 fuel gas	4.1 propylene	1.0 sulfur	0.6 butane
SHL	31.6	14.5	4.3	15.2	10.4	2.2	10.4	0.8	5.5	1.8 gasoline blendstock	1.7 fuel gas	0.9 normal butane	0.9 misc.
MRP													
PLC	45.9	0.8		26.8	11.1		0.3		7.1	3.9 propylene	3.2 fuel gas	0.9 gas oil	
INT					8.0				12.0	80.0 olefins plant feed			
HLL	26.3	0.5		13.8	11.9	25.8	1.8	10.0	2.8	5.1 light-cycle oil	1.8 light straight run	0.1 fuel gas	
GDH	46.0			25.0	3.0	9.0	6.0		11.0				
Wtd. % <sup>1</sup>	30.7	4.8	3.5	18.2	11.0	6.2	3.5	1.3	5.7				

1. Murphy was not able to respond to survey due to outage resulting from Hurricane Katrina. Operating capacity figure from EIA. Total operating capacity figure includes Murphy. All other totals and averages do not include Murphy.

**Table 3**  
**U.S. Department of Energy**  
**Capacity of Louisiana Operable Petroleum Refineries as of January 1, 2005**

(Barrels per Stream Day, Except Where Noted)

Refinery Name	DNR Fac. Code	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
		Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking			
		Operating	Idle	Operating	Idle		Delayed Coking	Fluid Coking	Vis- Breaking	Other Gas/Oil
Calcasieu Refining Co Lake Charles	CLC	30,000	0	32,000	0	0	0	0	0	0
Calumet Lubricants Co LP Cotton Valley	CTT	13,020	0	14,000	0	0	0	0	0	0
Calumet Lubricants Co LP Princeton	CLM	8,300	0	8,655	0	7,000	0	0	0	0
Calumet Shreveport LLC Shreveport	ATL	35,000	0	50,000	0	24,300	0	0	0	0
Chalmette Refining LLC Chalmette	TNN	187,200	0	195,000	0	111,800	35,000	0	0	0
Citgo Petroleum Corp Lake Charles	CTS	324,300	0	338,000	0	88,000	107,000	0	0	0
ConocoPhillips Belle Chasse	STN	247,000	0	260,000	0	92,000	27,000	0	0	0
ConocoPhillips West Lake	CNB	239,400	0	252,000	0	132,000	52,000	0	0	10,600
ExxonMobil Refining & Supply Co Baton Rouge	EXX	493,500	0	514,000	0	232,500	118,500	0	0	0
Marathon Petroleum Co LLC Garyville	MRT	245,000	0	274,000	0	125,000	37,400	0	0	0
Motiva Enterprises LLC Convent	TXC	235,000	0	255,000	0	119,400	0	0	0	0
Motiva Enterprises LLC Norco	SHL	226,500	0	242,000	0	86,000	25,000	0	0	0
Murphy Oil USA Inc Meraux	MRP	120,000	0	125,000	0	50,000	0	0	0	0
Placid Refining Co Port Allen	PLC	48,500	0	49,950	0	20,000	0	0	0	0
Shell Chemical Co St. Rose	INT	55,000	0	56,000	0	28,000	0	0	0	0
Valero Refining Co Krotz Spings	HLL	80,000	0	83,000	0	36,200	0	0	0	0
Valero Refining Co Norco	GDH	185,003	0	186,000	0	130,000	70,400	0	0	0
<b>Totals</b>		<b>2,772,723</b>	<b>0</b>	<b>2,934,605</b>	<b>0</b>	<b>1,282,200</b>	<b>472,300</b>	<b>0</b>	<b>0</b>	<b>10,600</b>

Source: Energy Information Administration, "Petroleum Supply Annual 2004 Vol. 1", Table 38

**Table 3 (Continued)**  
**U.S. Department of Energy**  
**Capacity of Louisiana Operable Petroleum Refineries as of January 1, 2005**  
(Barrels per Stream Day, Except Where Noted)

DNR Fac. Code	Downstream Charge Capacity (Continued)							
	Catalytic Cracking		Catalytic Hydrocracking			Catalytic Reforming		Fuels Solvent Deasphalting
	Fresh	Recycled	Distillate	Gas Oil	Residual	Low Pressure	High Pressure	
CLC	0	0	0	0	0	0	0	0
CTT	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0
ATL	3,500	7,000	0	0	0	8,000	0	0
TNN	71,600	0	20,100	0	0	19,000	29,400	0
CTS	147,000	0	0	42,000	0	58,000	52,800	0
STN	102,000	2,000	0	0	0	0	44,600	0
CNB	48,000	0	0	34,000	0	44,000	0	0
EXX	241,000	0	26,000	0	0	78,000	0	0
MRT	125,000	0	0	0	0	48,500	0	35,000
TXC	92,000	0	0	0	52,000	0	40,000	0
SHL	115,000	0	0	36,000	0	40,000	22,000	0
MRP	37,000	0	0	32,000	0	32,000	0	18,000
PLC	20,000	2,000	0	0	0	10,000	0	5,000
INT	0	0	0	0	0	0	0	0
HLL	34,000	0	0	0	0	0	13,000	0
GDH	97,380	8,000	0	0	0	25,000	0	0
Totals	1,133,480	19,000	46,100	144,000	52,000	362,500	201,800	58,000

Source: Energy Information Administration, "Petroleum Supply Annual 2004 Vol. 1", Table 38

**Table 3 (Continued)**  
**U.S. Department of Energy**  
**Capacity of Louisiana Operable Petroleum Refineries as of January 1, 2005**

(Barrels per Stream Day, Except Where Noted)

Refinery Name	DNR Fac. Code	Downstream Charge Capacity (Continued)							
		Desulfurization (incl. Catalytic Hydrotreating)							
		Naptha/Reformer Feed	Gasoline	Kerosene/Jet Fuel	Diesel Fuel	Other Distillate	Residual	Heavy Gas Oil	Other
Calcasieu Refining Co Lake Charles	CLC	0	0	0	0	0	0	0	0
Calumet Lubricants Co LP Cotton Valley	CTT	4,750	0	0	0	0	0	0	0
Calumet Lubricants Co LP Princeton	CLM	0	0	0	0	8,500	0	0	0
Calumet Shreveport LLC Shreveport	ATL	8,000	0	0	0	8,000	0	8,000	1,200
Chalmette Refining LLC Chalmette	TNN	40,000	0	0	0	27,500	0	64,000	0
Citgo Petroleum Corp Lake Charles	CTS	123,000	77,000	29,000	37,500	0	0	74,500	0
ConocoPhillips Belle Chasse	STN	48,300	0	0	70,100	0	0	0	0
ConocoPhillips West Lake	CNB	50,000	0	24,000	55,000	0	12,500	49,000	0
ExxonMobil Refining & Supply Co Baton Rouge	EXX	78,000	129,000	0	100,000	0	0	0	145,600
Marathon Petroleum Co LLC Garyville	MRT	50,000	0	0	81,000	0	0	106,000	0
Motiva Enterprises LLC Convent	TXC	98,000	0	39,800	61,000	0	0	36,000	0
Motiva Enterprises LLC Norco	SHL	38,500	55,000	0	47,000	0	0	0	0
Murphy Oil USA Inc Meraux	MRP	35,000	0	18,000	34,000	0	0	12,000	0
Placid Refining Co Port Allen	PLC	10,000	0	0	13,500	0	0	0	0
Shell Chemical Co St. Rose	INT	0	0	0	0	0	0	0	0
Valero Refining Co Krotz Spings	HLL	14,000	0	0	0	0	0	0	0
Valero Refining Co Norco	GDH	45,000	60,000	0	0	48,000	0	31,000	0
<b>Totals</b>		<b>642,550</b>	<b>321,000</b>	<b>110,800</b>	<b>499,100</b>	<b>92,000</b>	<b>12,500</b>	<b>380,500</b>	<b>146,800</b>

Source: Energy Information Administration, "Petroleum Supply Annual 2004 Vol. 1", Table 38

**Table 4**  
**U.S. Department of Energy**  
**Production Capacity of Louisiana Operable Petroleum Refineries as of January 1, 2005**  
(Barrels per Stream Day)

Refinery Name	DNR FAC. CODE	Production Capacity								
		Alkylate	Aromatics	Asphalt and Road Oil	Isomers		Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd)	Sulfur (short tons per day)
					Isobutane	Isopentane and Isohexane				
Calcasieu Refining Co Lake Charles	CLC	0	0	0	3,400	0	0	0	0	0
Calumet Lubricants Co LP Cotton Valley	CTT	0	0	0	0	500	0	0	2	0
Calumet Lubricants Co LP Princeton	CLM	0	0	2,000	0	0	7,000	0	5	3
Calumet Shreveport LLC Shreveport	ATL	4,500	0	5,800	4,000	0	9,000	0	6	10
Chalmette Refining LLC Chalmette	TNN	13,100	10,200	0	10,000	10,000	0	11,000	0	920
Citgo Petroleum Corp Lake Charles	CTS	22,000	17,200	0	0	28,000	11,000	26,500	0	640
ConocoPhillips Belle Chasse	STN	38,000	12,300	0	0	0	0	5,289	4	125
ConocoPhillips West Lake	CNB	6,000	0	0	0	0	24,000	22,500	0	440
ExxonMobil Refining & Supply Co Baton Rouge	EXX	37,000	0	0	0	0	16,000	28,870	24	744
Marathon Petroleum Co LLC Garyville	MRT	28,200	0	27,000	24,000	21,000	0	12,900	0	790
Motiva Enterprises LLC Convent	TXC	16,500	0	0	0	12,500	0	0	63	728
Motiva Enterprises LLC Norco	SHL	16,400	0	0	0	0	0	6,000	60	169
Murphy Oil USA Inc Meraux	MRP	8,500	0	18,000	0	0	0	0	0	31
Placid Refining Co Port Allen	PLC	4,000	0	0	0	0	0	0	0	28
Shell Chemical Co St. Rose	INT	0	0	0	0	0	0	0	0	0
Valero Refining Co Krotz Spings	HLL	0	0	0	2,970	6,220	0	0	0	22
Valero Refining Co Norco	GDH	19,800	0	0	0	0	0	23,785	34	393
Totals		214,000	39,700	52,800	44,370	78,220	67,000	136,844	198	5,043

MMcfd = Million cubic feet per day

Source: Energy Information Administration, "Petroleum Supply Annual 2004 Vol. 1", Table 39

**Table 5: Oil & Gas Journal 2005 Worldwide Refining Survey  
Capacities of Louisiana Refineries as of January 1, 2006**

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Refinery Name	DNR Fac. Code	Charge Capacity, Barrels per Calendar Day							
		Crude	Vacuum Distillation	Coking	Thermal Operations	Catalytic Cracking	Catalytic Reforming	Cat Hydro- cracking	Cat Hydro- treating
Calcasieu Refining Co. Lake Charles	CLC	15,680							
Calumet Lubricants Co. Cotton Valley	CTT	9,500							<sup>13</sup> 5,000
Calumet Lubricants Co. Princeton	CLM	9,500	8,500					<sup>4</sup> 8,000	
Calumet Lubricants Co. Shreveport	ATL	35,000	15,000				<sup>1</sup> 10,000	<sup>C4</sup> 8,500	<sup>1</sup> 12,000 <sup>5</sup> 7,000 <sup>13</sup> 5,000
Chalmette Refining LLC Chalmette	TNN	188,000	112,000	<sup>2</sup> 33,000		<sup>1</sup> 68,000	<sup>1</sup> 28,000 <sup>3</sup> 19,000	<sup>C1</sup> 18,500	<sup>1</sup> 39,500 <sup>7</sup> 27,000 <sup>8</sup> 62,000 <sup>12</sup> 44,000
Cit-Con Oil Corp - Lake Charles			36,100						
Citgo Petroleum Corp. Lake Charles	CTS	440,000	79,800	<sup>2</sup> 88,200		<sup>1</sup> 126,000	<sup>1</sup> 42,300 <sup>3</sup> 52,200	<sup>C1</sup> 37,800	<sup>1</sup> 103,500 <sup>2</sup> 6,300 <sup>4</sup> 26,100 <sup>5</sup> 32,400 <sup>8</sup> 64,800
ConocoPhillips Belle Chasse	STN	247,000	92,000	<sup>2</sup> 25,200		<sup>1</sup> 104,000	<sup>1</sup> 42,000		<sup>1</sup> 47,000 <sup>7</sup> 65,000 <sup>13</sup> 32,400
ConocoPhillips Westlake	CNB	239,000	106,200	<sup>2</sup> 57,800		<sup>1</sup> 44,800	<sup>3</sup> 33,000	<sup>C3</sup> 29,000	<sup>1</sup> 35,600 <sup>4</sup> 21,800 <sup>5</sup> 49,100 <sup>6</sup> 4,000 <sup>12</sup> 34,500 <sup>7</sup> 35,900
ExxonMobil Refining Supply Co. Baton Rouge	EXX	501,000	227,000	<sup>2</sup> 112,500		<sup>1</sup> 229,000	<sup>2</sup> 75,500	<sup>C1</sup> 24,000	<sup>1</sup> 75,500 <sup>2</sup> 104,000 <sup>7</sup> 95,000 <sup>11</sup> 22,000 <sup>12</sup> 95,000 <sup>13</sup> 46,000
Marathon Ashland Petroleum LLC Garyville	MRT	245,000	127,300	<sup>2</sup> 37,100		<sup>1</sup> 123,500	<sup>3</sup> 46,100		<sup>1</sup> 47,500 <sup>5</sup> 77,000 <sup>8</sup> 100,700 <sup>12</sup> 82,700
Motiva Enterprises LLC Convent	TXC	235,000	100,000			<sup>1</sup> 85,000	<sup>1</sup> 36,000	<sup>C2</sup> 45,000	<sup>1</sup> 40,000 <sup>4</sup> 25,000 <sup>5</sup> 63,000 <sup>8</sup> 34,000 <sup>12</sup> 48,000
Motiva Enterprises LLC Norco	SHL	220,000	78,000	<sup>2</sup> 21,300		<sup>1</sup> 105,000	<sup>1</sup> 19,100 <sup>2</sup> 38,200	<sup>C1</sup> 31,500	<sup>1</sup> 38,000 <sup>5</sup> 35,300 <sup>14</sup> 49,500

See page 22 for notes and legend



**Table 5 (Cont.): Oil & Gas Journal 2005 Worldwide Refining Survey  
Capacities of Louisiana Refineries as of January 1, 2006**

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DNR Fac. Code	Production Capacity, Barrels per Calendar Day									
	Alkylation	Pol./Dim.	Aromatics	Isomerization	Lubes	Oxygenates	Hydrogen (MMcfd)	Coke (t/d)	Sulfur (t/d)	Asphalt
CLC										
CTT							<sup>a1</sup> 2.5 <sup>4</sup> 2.5			
CLM					7,500		<sup>a1</sup> 4.5 <sup>4</sup> 4.5	3		
ATL					8,000		<sup>a1</sup> 6.1 <sup>4</sup> 6.1		15	
TNN	<sup>2</sup> 12,500		<sup>1</sup> 10,000	<sup>3</sup> 10,000				2,050	920	
CTS	<sup>1</sup> 20,700		<sup>1</sup> 13,500	<sup>3</sup> 28,800	8,550 9,900	<sup>1</sup> 3,150	<sup>a1</sup> 47.7 <sup>6</sup> 10.8	3,870	567	
STN	<sup>2</sup> 38,000		<sup>1</sup> 24,600 <sup>2</sup> 7,200				<sup>7</sup> 10.4	800	70	
CNB	<sup>1</sup> 7,500	<sup>1</sup> 1000					<sup>4</sup> 90.5	3,600	350	
EXX	<sup>1</sup> 36,000	<sup>1</sup> 9,500			16,000	<sup>1</sup> 7,000	<sup>4</sup> 12.0 <sup>6</sup> 12.0	5,250	690	
MRT	<sup>2</sup> 26,800			<sup>1</sup> 22,800 <sup>3</sup> 20,000				3263	1,039	25,700
TXC	<sup>1</sup> 13,050	<sup>2</sup> 3,600		<sup>3</sup> 11,250		<sup>1</sup> 2,250 <sup>3</sup> 2,500	<sup>a1</sup> 58.0		700	
SHL	<sup>1</sup> 14,800					<sup>1</sup> 7,500	<sup>1</sup> 49.4	900	140	

See page 22 for notes and legend

**Table 5 (Cont.): Oil & Gas Journal 2005 Worldwide Refining Survey  
Capacities of Louisiana Refineries as of January 1, 2006**

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Refinery Name	DNR Fac. Code	Charge Capacity, Barrels per Calendar Day							
		Crude	Vacuum Distillation	Coking	Thermal Operations	Catalytic Cracking	Catalytic Reforming	Cat Hydro- cracking	Cat Hydro- treating
Murphy Oil USA Inc. Meraux	MRP	125,000	50,000			<sup>1</sup> 37,000			<sup>2</sup> 35,000 <sup>7</sup> 52,000 <sup>9</sup> 12,000 <sup>13</sup> 24,750
Placid Refining Co. LLC Port Allen	PLC	55,000	22,000			<sup>1</sup> 20,000	<sup>1</sup> 1,000		<sup>2</sup> 14,000 <sup>7</sup> 17,000
Shell Chemical Co. - St. Rose	INT	55,000	28,000						
Valero Energy Corp. Krotz Springs	HLL	83,100	36,200			<sup>1</sup> 34,100	<sup>1</sup> 12,000		<sup>1</sup> 14,600 <sup>2</sup> 4,100
Valero Energy Corp. Norco	GDH	186,000	200,000	<sup>2</sup> 70,400		<sup>1</sup> 100,000	<sup>1</sup> 25,000		<sup>2</sup> 36,000 <sup>5</sup> 48,000 <sup>8</sup> 35,100 <sup>12</sup> 12,000
Totals		2,888,780	1,318,100	445,400	0	1,076,400	488,400	202,300	2,142,650

See page 22 for notes and legend

**Table 5 (Cont.): Oil & Gas Journal 2005 Worldwide Refining Survey  
Capacities of Louisiana Refineries as of January 1, 2006**

Reprinted with permission. Oil and Gas Journal, Vol 103.47, December 19, 2005

DNR Fac. Code	Production Capacity, Barrels per Calendar Day									
	Alkylation	Pol./Dim.	Aromatics	Isomerization	Lubes	Oxygenates	Hydrogen (MMcfd)	Coke (t/d)	Sulfur (t/d)	Asphalt
MRP	<sup>2</sup> 8,500								1,800	
PLC	<sup>2</sup> 3,800								28	
INT										
HLL		<sup>1</sup> 2,100		<sup>3</sup> 4,100		<sup>1</sup> 1,800			20	
GDH	<sup>1</sup> 19,000							4,500	450	
Totals	200,650	16,200	55,300	96,950	49,950	24,200	317	24,233	6,792	25,700

See page 22 for notes and legend

## Legend & Notes for Table 5

### LEGEND

#### **Coking**

1. Fluid coking
2. Delayed coking
3. Other

#### **Thermal Processes**

1. Thermal cracking
2. Visbreaking

#### **Catalytic Cracking**

1. Fluid
2. Other

#### **Catalytic Reforming**

1. Semiregenerative
2. Cyclic
3. Continuous regen.
4. Other

#### **Catalytic Hydrocracking**

1. Distillate upgrading
  2. Residual upgrading
  3. Lube oil manufacturing
  4. Other
- c. Conventional (high-pressure) hydrocracking:  
( $>100$  barg or 1,450 psig)
- m. Mild to moderate hydrocracking:  
( $<100$  barg or 1,450 psig)

#### **Catalytic Hydrotreating**

1. Pretreating cat reformer feeds
2. Naphtha desulfurization
3. Naphtha aromatics saturation
4. Kerosine/jet fuel desulfurization
5. Diesel desulfurization
6. Distillate aromatics saturation
7. Other distillates
8. Pretreatment of cat cracker feeds
9. Other heavy gas oil hydrotreating
10. Resid hydrotreating
11. Lube oil polishing
12. Post hydrotreating of FCC naphtha
13. Other

#### **Alkylation**

1. Sulfuric acid
2. Hydrofluoric acid

#### **Polymerization/Dimerization**

1. Polymerization
2. Dimerization

#### **Aromatics**

1. BTX
2. Hydrodealkylation
3. Cyclohexane
4. Cumene

#### **Isomerization**

1. C<sub>4</sub> feed
2. C<sub>5</sub> feed
3. C<sub>5</sub> and C<sub>6</sub> feed

#### **Oxygenates**

1. MTBE
2. ETBE
3. TAME
4. Other

#### **Hydrogen**

##### Production:

1. Steam methane reforming
2. Steam naphtha reforming
3. Partial oxidation
  - a. Third-party plant

##### Recovery:

4. Pressure swing adsorption
5. Cryogenic
6. Membrane
7. Other

### NOTES

#### **Capacity definitions:**

Capacity expressed in barrels per calendar day (b/cd) is the maximum number of barrels of input that can be processed during a 24-hr period, after making allowances for the following:

- (a) Types and grades of inputs to be processed.
- (b) Types and grades of products to be manufactured.
- (c) Environmental constraints associated with refinery operations.
- (d) Scheduled downtime such as mechanical problems, repairs, and slowdowns.

Capacity expressed in barrels per stream day (b/sd) is the amount a unit can process when running at full capacity under optimal feedstock and product slate conditions. An asterisk (\*) beside a refinery location indicates that the number has been converted from b/sd to b/cd using the conversion factor 0.95 for crude and vacuum distillation units and 0.9 for all downstream cracking and conversion units.

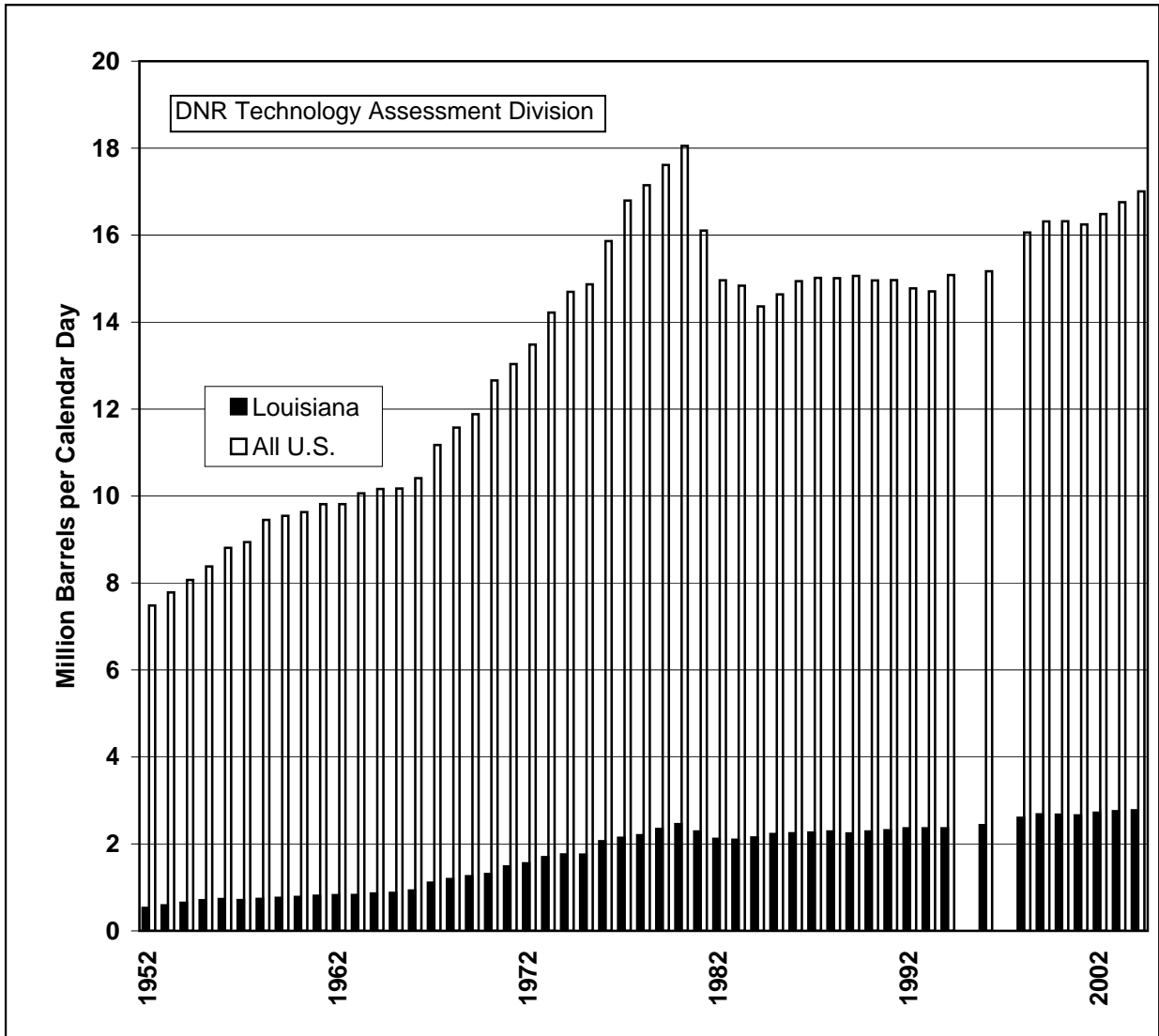
#### **Hydrogen:**

Hydrogen volumes presented here represent either generation or upgrading to 90+% purity.

#### **Catalytic reforming:**

1. Semiregenerative reforming is characterized by shutdown of the reforming unit at specified intervals, or at the operator's convenience, for in situ catalyst regeneration.
2. Cyclic regeneration reforming is characterized by continuous or continual regeneration of catalyst in situ in any one of several reactors that can be isolated from and returned to the reforming operation. This is accomplished without changing feed rate or octane.
3. Continuous regeneration reforming is characterized by the continuous regeneration of part of the catalyst in a special regenerator, followed by continuous addition of this regenerated catalyst to the reactor.
4. Other includes nonregenerative reforming (catalyst is replaced by fresh catalyst) and moving-bed catalyst systems.

**Figure 2**  
**Operating Capacity of LA and U.S. Refineries**



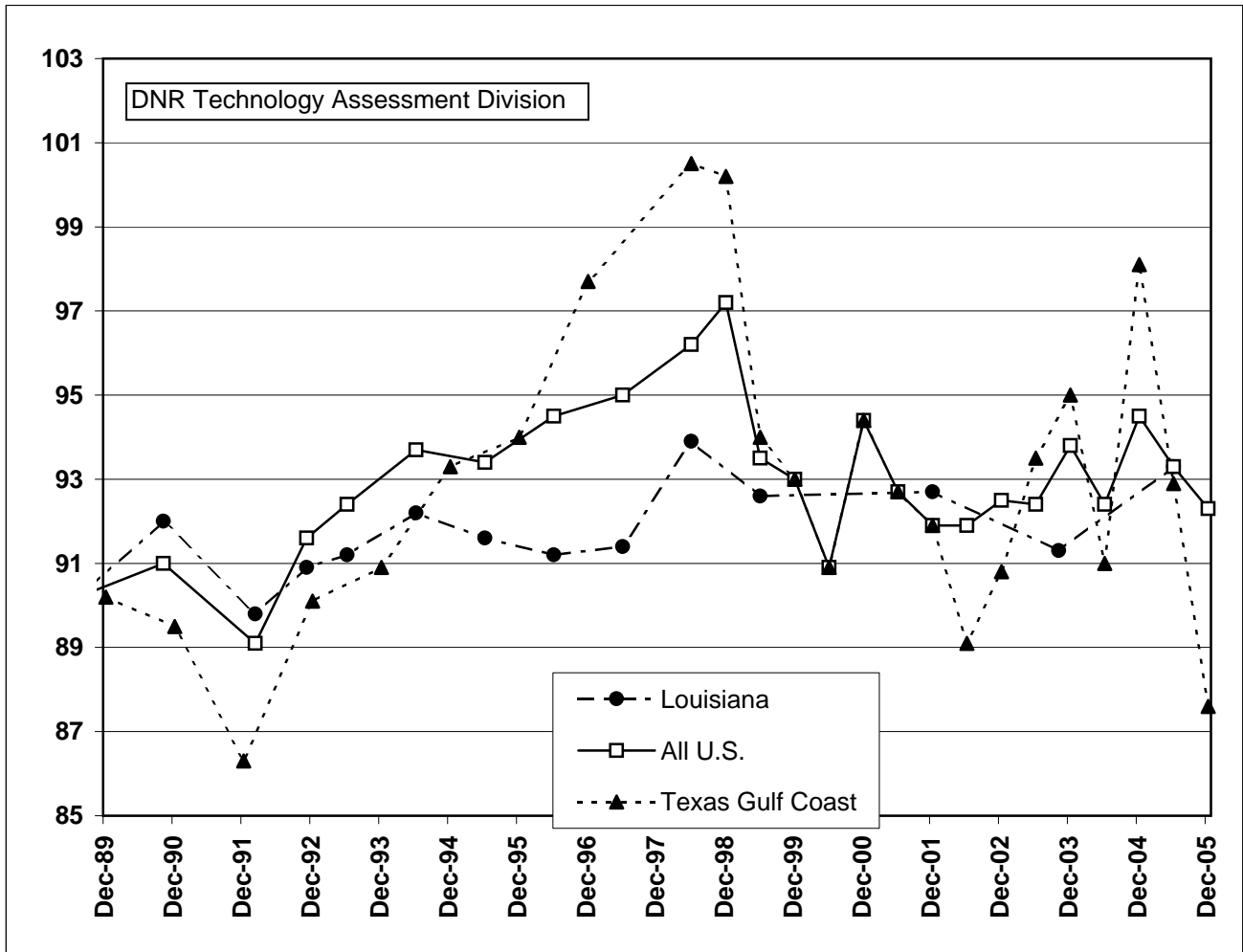
Data not available for 1995 & 1997

Source: 1947 - 1975: U.S. Bureau of Mines, "Petroleum Refineries in the United States and Puerto Rico" Annual

1976 - 1981: EIA, "Petroleum Refineries in the United States and U.S. Territories" Annual

1982 - 2004: EIA, "Petroleum Supply Annual, Vol. 1"

**Figure 3**  
**Operating Rates (%)**  
**Louisiana, Texas Gulf Coast, and U.S. Refineries**

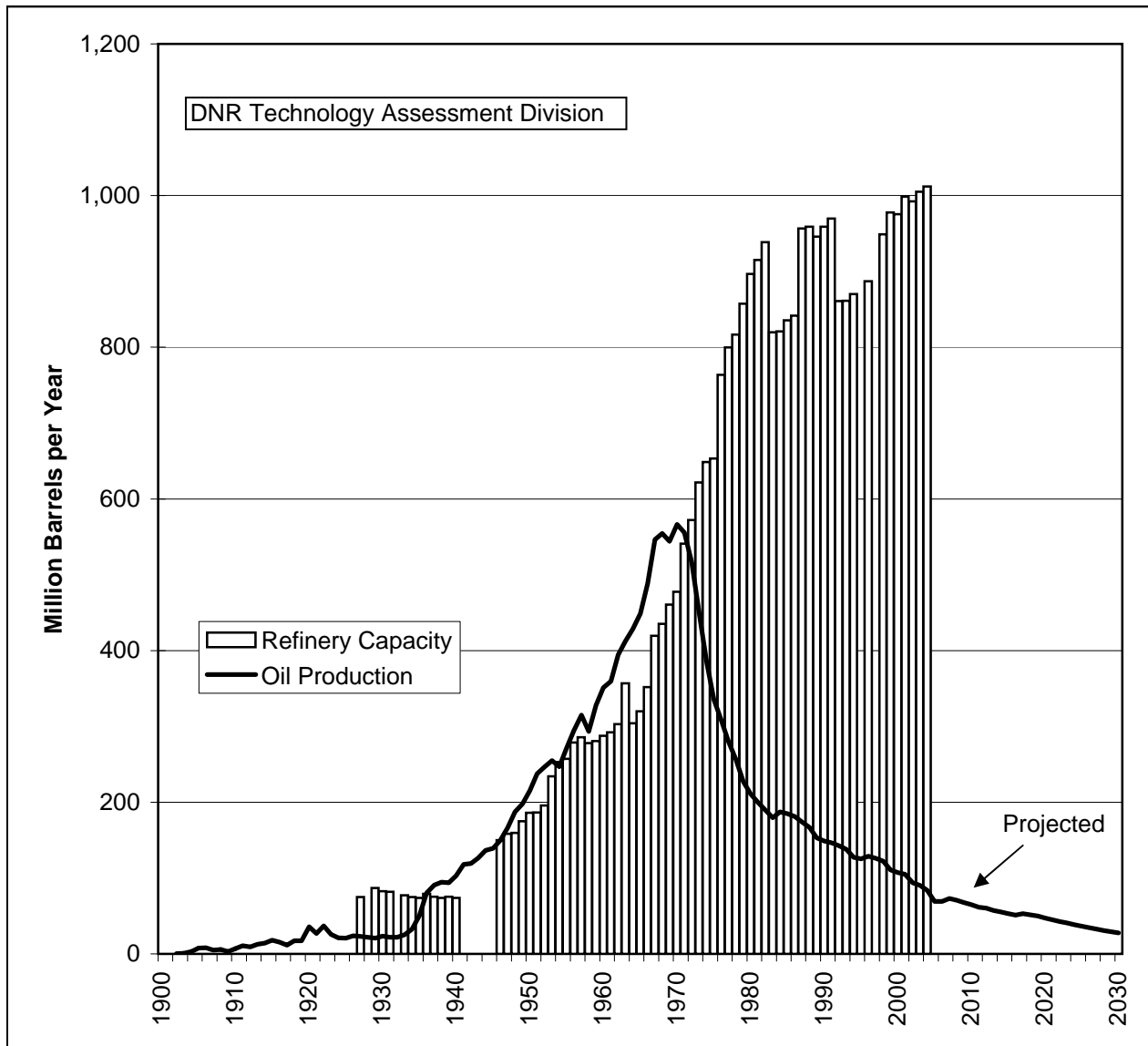


Note: Data points generally represent 6-month or 12-month averages

Source: LA Refineries: DNR Survey

TX & U.S. Refineries: EIA, "Petroleum Supply Annual, Vol. 1 & 2"

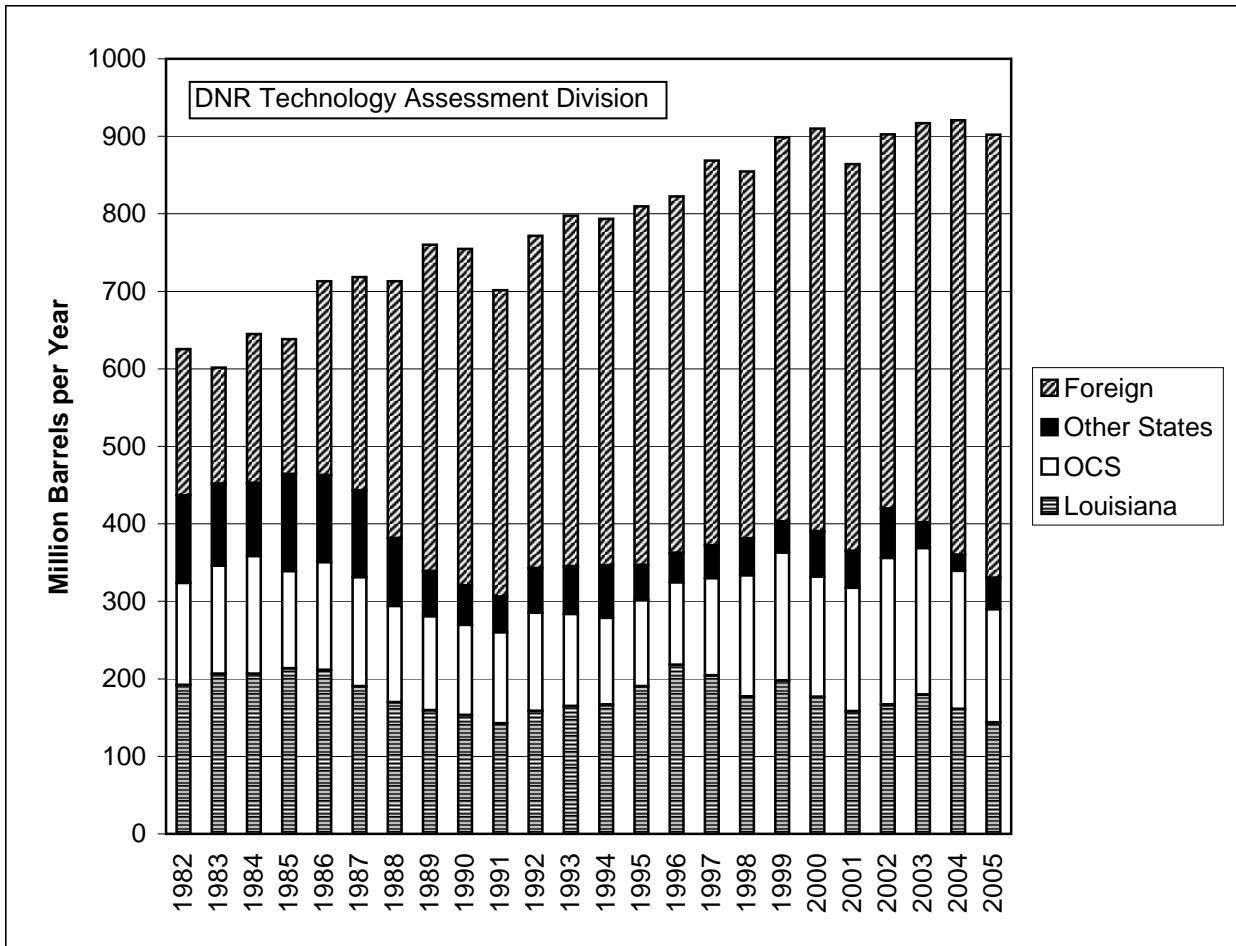
**Figure 4**  
**Louisiana Oil Production (Excluding OCS) and Refinery Operable Capacity**



Source: Oil production data from DNR database

Refinery capacity data from DNR database and EIA, "Petroleum Supply Annual, Vol. 1"

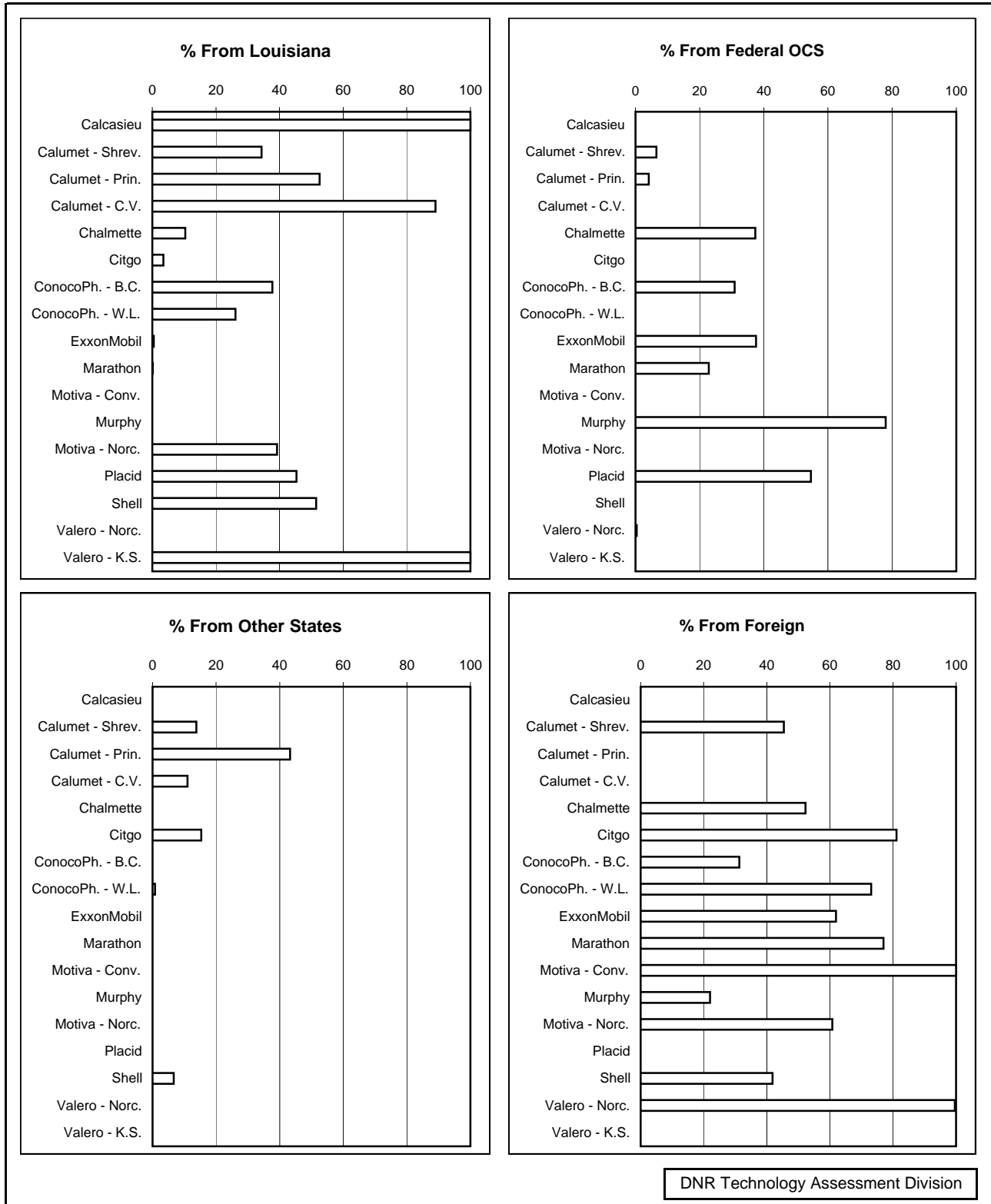
**Figure 5**  
**Crude Oil Sources for Louisiana Refineries**



Source: DNR Database, from Refiner's Monthly Report, Form R-3



**Figure 6**  
**Crude Oil Input Percentages by Source and Refinery**  
**2005 DNR Survey**



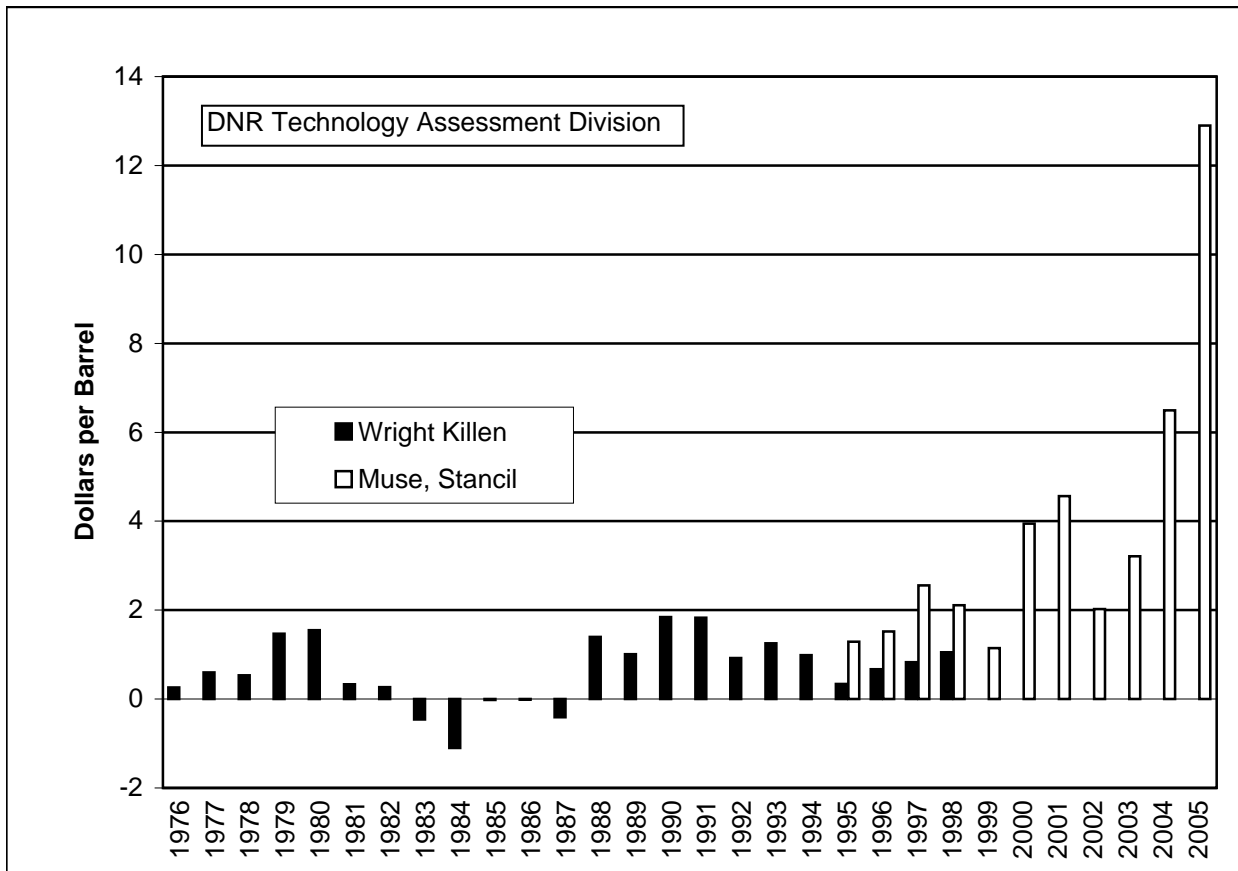
Source: DNR Database, from Refiner's Monthly Report, Form R-3

**Table 6**  
**Crude Oil Input Volumes by Source and Refinery**  
**2005 DNR Survey**

Refinery	Louisiana	Federal OCS	Other States	Foreign	Total
Calcasieu Refining Co Lake Charles	10,790,504	0	0	0	10,790,504
Calumet Shreveport LLC Shreveport	2,009,277	380,507	808,577	2,658,087	5,856,448
Calumet Lubricants Co Princeton	1,567,083	123,914	1,290,572	0	2,981,569
Calumet Lubricants Co Cotton Valley	2,579,666	0	317,661	0	2,897,327
Chalmette Refining LLC Chalmette	6,726,158	24,181,613	0	33,818,918	64,726,689
Citgo Petroleum Corp Lake Charles	4,249,646	0	18,577,835	98,157,086	120,984,567
ConocoPhillips Belle Chase	32,655,200	26,717,894	0	27,076,442	86,449,536
ConocoPhillips West Lake	21,524,767	0	652,233	60,115,253	82,292,253
ExxonMobil Refining & Supply Co Baton Rouge	816,339	62,113,113	7,540	102,442,410	165,379,402
Marathon Petroleum Co LLC Garyville	136,820	21,960,693	0	73,857,020	95,954,533
Motiva Enterprises LLC Convent	0	0	0	75,969,965	75,969,965
Murphy Oil USA Inc Meraux	0	31,216,094	0	8,809,214	40,025,308
Motiva Enterprises LLC Norco	29,476,556	0	0	45,721,043	75,197,599
Placid Refining Co LLC Port Allen	8,106,827	9,781,253	0	0	17,888,080
Shell Chemical Co St. Rose	8,846,465	0	1,148,990	7,173,488	17,168,943
Valero Refining Co Norco	0	198,935	0	51,550,489	51,749,424
Valero Refining Co Krotz Springs	28,495,891	0	0	0	28,495,891
Total	157,981,199	176,674,016	22,803,408	587,349,415	944,808,038

Source: DNR Database, from Refiner's Monthly Report, Form R-3

**Figure 7**  
**Gulf Coast Refinery Cash Operating Margins**



Source: *Oil & Gas Journal*

**Table 7**  
**Louisiana Operating Refineries Mailing and Contact Information**

Company Name	Mailing Address	Contacts *	Telephone
Calcasieu Refining Co	4359 W. Tank Farm Rd. Lake Charles, LA 70605	Carolyn Taflinger Jack Trykoski Tony Elliot	(337) 478 2130
Calumet Lubricants Co LP	PO Box 97 Cotton Valley, LA 71018	Rodney Butts Charles Cost Rodney Butts	(318) 832 4236
Calumet Lubricants Co LP	10234 La Hwy. 157 Princeton, LA 71067-9172	Jerry Arnold Jerry Arnold Jerry Tollefsen	(318) 949 2421
Calumet Shreveport LLC	PO Box 3099 Shreveport, LA 71133	Rick Williams Jeff Lang Dan McKibben	(318) 632 4102
Chalmette Refining LLC	PO Box 1007 Chalmette, LA 70044	Sally Chow Albert Stroink	(504) 281 1656
Citgo Petroleum Corp	PO Box 1562 Lake Charles, LA 70602	Phil Woods Al Prebula Steve Hays	(337) 708 6357
ConocoPhillips	PO Box 176 Bell Chasse, LA 70037-0176	Bill Crawford Peter Batey	(504) 656 3641
ConocoPhillips	PO Box 37 Westlake, LA 70669	Dawn Cox John Gott	(918) 661 4821
ExxonMobil Refining and Supply Co	PO Box 551 Baton Rouge, LA 70821	Barbara Beckman Bruce March A.K. Drew Turner	(225) 977 8888
Marathon Petroleum Co LLC	PO Box AC Garyville, LA 70051-0842	Junius McCants Rich Bedell Bill Kepner	(985) 535 2241
Motiva Enterprises LLC	PO Box 37 Convent, LA 70723	Gary Miller Doug Quinn Todd Monette	(225) 562 6820
Motiva Enterprises LLC	PO Box 10 Norco, LA 70079	Gene Bourgeois Keith Casey Dan Yoder	(504) 465 6986
Murphy Oil USA Inc	PO Box 100 Meraux, LA 70075-0100	Dennis Bennett Greg Neve David Mendrek	(504) 278 5299
Placid Refining Co	1940 La Hwy 1 North Port Allen, LA 70767	Gary Fuller Gary Fuller	(225) 346 7464
Shell Chemical Co	PO Box 10 Norco, LA 70079	Tom Ford Tom Ford Liam O'Sullivan	(504) 465 6393
Valero Refining Co	PO Box 453 Krotz Springs, LA 70750 0453	Kevin Roy John Hill Gregg Byers	(337) 566 0114
Valero Refining Co	PO Box 537 Norco, LA 70079	William Buhler Gary Simmons Tommy Luong	(985) 764 4717

\* Contacts are listed in order as: Contact person, Plant Manager, Plant Engineer

**Table 8  
Louisiana Operating Refinery Locations**

Company Name	Physical Location
Calcasieu Refining Co	4359 W. Tank Farm Rd. Lake Charles 70605
Calumet Lubricants Co LP	1756 Old Hwy. 7 Cotton Valley 71018
Calumet Lubricants Co LP	10234 Hwy. 157 Princeton 71067
Calumet Shreveport LLC	3333 Midway St. Shreveport 71109
Chalmette Refining LLC	500 W. St. Bernard Hwy. Chalmette 70044
Citgo Petroleum Corp	4401 Hwy. 108 Sulphur 70665
ConocoPhillips	15551 Hwy. 23 South Belle Chase 70037
ConocoPhillips	2200 Old Spanish Trail Rd. Westlake 70669
ExxonMobil Refining and Supply Co	4045 Scenic Hwy. Baton Rouge 70805
Marathon Petroleum Co LLC	U.S. 61 @ Marathon Ave. Garyville 70051
Motiva Enterprises LLC	La. 44 Convent 70723
Motiva Enterprises LLC	15536 River Rd. Norco 70079
Murphy Oil USA Inc	2500 St. Bernard Hwy. Meraux 70075
Placid Refining Co	1940 La. 1 North. Port Allen 70767
Shell Chemical Co	11842 River Rd. St. Rose 70087
Valero Energy Corp	La. 105 Krotz Springs 70750
Valero Energy Corp	14902 River Rd. Norco 70079

**Table 9  
Louisiana Operating Refineries Name History (1980-2005)**

Refinery Name	Date	DNR Code & Location	Refinery Name	Date	DNR Code & Location
ExxonMobil Refinery and Supply Co Exxon Co USA	1999- 1980-99	EXX - Baton Rouge	Calcasieu Refining Co CPI Oil & Refining Inc Calcasieu Refining Ltd	1985- 1982-84 1980-81	CLC - Lake Charles
ConocoPhillips Philips Petroleum Co B.P. Amoco PLC B.P. Oil Corp Standard Oil Co Gulf Refining & Marketing Co Gulf Oil Corp Gulf Oil Co US	2003- 2000-02 1999-00 1989-98 1986-88 1985-85 1981-84 1979-80	STN - Belle Chasse	Citgo Petroleum Corp Cities Service Co  ConocoPhillips Conoco Inc Conoco Continental Oil Co	1984- 1980-83  2003- 1982-02 1980-81 1979	CTS - Lake Charles   CNB - Lake Charles
Chalmette Refining LLC Mobil Oil Corp Tenneco Oil Co	1998 - 1989-98 1980-88	TNN - Chalmette	Murphy Oil USA Inc Murphy Oil Corp  Motiva Enterprises LLC Shell Oil Co	1984- 1980-83  1998- 1980-98	MRP - Meraux   SHL - Norco
Motiva Enterprises LLC Star Enterprises Texaco Refining & Marketing Texaco Inc	1998- 1989-98 1985-88 1980-84	TXC - Convent	Calumet Lubricants Co LP Calumet Refining Co  Placid Refining Co	1991- 1980-90  1980-	CLM - Princeton   PLC - Port Allen
Calumet Lubricants Co LP Kerr-McGee Refining Corp Kerr-McGee Corp Cotton Valley Solvents Co	1996- 1985-95 1983-84 1980-82	CTT - Cotton Valley	Calumet Shreveport LLC Calumet Lubricants Co LP Pennzoil-Quaker State Corp Pennzoil Producing Co Pennzoil Products Co Pennzoil Co Atlas Processing Co	2005- 2000-04 1999-00 1992-98 1986-91 1985-85 1980-84	ATL - Shreveport
Marathon Petroleum Co LLC Marathon Ashland Petroleum LLC Marathon Oil Co Marathon Petroleum Co Marathon Oil Co	2005- 1998-04 1992-98 1985-91 1980-84	MRT - Garyville	Shell Chemical Co St. Rose Refinery Inc Phibro Energy USA Inc Phibro Refining Inc Hill Petroleum Co International Processors	1996- 1994-95 1993-93 1992-92 1987-91 1981-86	INT - St. Rose
Valero Refining Co Orion Refining Corp TransAmerican Refining Co TransAmerica Refining Co GHR Energy Corp Good Hope Refineries Inc Good Hope Industries Inc	2004- 1999-03 1992-98 1988-91 1982-87 1981-81 1980-80	GDH - Good Hope			
Valero Refining Co Basis Petroleum Inc Phibro Energy USA Inc Phibro Refining Inc Hill Petroleum Co	1997- 1996-96 1993-95 1992-92 1980-91	HLL - Krotz Springs			

**Table 10**  
**Louisiana Non-Operating Refineries Mailing and Contact Information**

Company Name	Mailing Address	Contacts	Telephone
American International Refinery Inc	PO Drawer 16866 Lake Charles, LA 70616	Mr. Allen Lyons	(337) 439 4066
Bayou State Oil Corp	PO Box 7886 Shreveport, LA 71137	Mr. Ellis E. Brown, Sr.	(318) 222 0737
Canal Refining Co	PO Box 8 Church Point, LA 70525	Mr. Bob McKee	(337) 824 2500
Gold Line Refining Ltd	11 Greenway Plaza Ste 2602 Houston TX 77046	Mr. Earl Thomas	(713) 271 3550
Quantum Fuel & Refining	Po Box 136 Newton, TX 75966	Mr. James Hughes	(409) 397 9093
Tina Resources Inc	207 Firestone Dr. Marble Falls, TX 78654	Mr. Leslie Vance	(512) 463 2123
<b>Non-Operable Refineries</b>			
El Paso Field Services	400 Travis Street Ste 1100 Shreveport, LA 71101	Mr. Martin Anthony	(318) 677 5551
Ergon St. James Co	PO Box 318 St. James, LA 70086	Mr. Ronald Ardoine	(225) 265 8020
Lisbon Refinery JV LLC	8613 East Wilderness Way Shreveport, LA 71106	Mr. James Ballengee	(318) 469 3084
Petroleum Fuel and Terminal	PO Box T Garyville, LA 70051	Mr. Claude Phelps	(985) 535 6256

**Table 11  
Louisiana Non-Operating Refineries**

Name	Physical Location	Last Known Operating Capacity	Date Last Operated	Status
American International Refinery Inc	La. 3059 Lake Charles	35,000	2003	Shutdown. Unable to contact.
Bayou State Oil Corp	U.S. 71 N. @ La. 2 West Hosston	3,000	Feb. 1987	No plans to reopen. Some equipment sold, but process equipment remains operable.
Canal Refining Co	1901 E. Ebey Church Point	30,000	2003	Planning to start up in 2006.
El Paso Field Services	U.S. 167 Dubach	10,000	Jun. 1993	Dismantled
Gold Line Refining Co Ltd	U.S. 90 E. Jennings	14,800	Feb. 1998	Not able to contact.
Lisbon Refinery J.V. LLC	La. 2 Lisbon	12,500	Jan. 1996	150,000 barrels storage useable. Refinery to be dismantled.
Petroleum Fuel & Terminal Co	La. 44 Mt. Airy	23,000	Dec. 1986	Process equipment dismantled and disposed of.
Ergon St. James Co LLC	La.18 St. James	20,000	Aug. 1983	Mostly dismantled and taken possession of by land owners.
Tina Resources Inc.	La. 14 Lake Arthur	7,400	Feb. 1986	Not able to contact. Last status received was that the refinery was for sale.
Quantum Fuel & Refining	101 Old Ferry Rd. Egan	10,000	Sep. 1987	500,000 barrel storage capacity. Currently seeking to restart.



**Table 12  
Louisiana Non-Operating Refinery Name History (1980-2005)**

Refinery Name	Dates	DNR Code & Location	Refinery Name	Dates	DNR Code & Location
American International Refinery Inc	1997-	LKC - Lake Charles	Gold Line Refining Co Ltd	1994-98	SLP - Mermanteau
Gold Line Refining Ltd	1992-97		CAS Refining	1991-93	
American Int'l Refining Inc	1989-91		Celeron Oil and Gas Co	1983-90	
Lake Charles Refining Co	1980-88		Slapco	1980-82	
Aweco	1979-79		South Louisiana Production Co	1979	
Sooner Refining Co	1980-82	SNR - Darrow	Petroleum Fuel & Terminal Co	1992-	MTR- Mt. Airy
Conoco Inc	1982-89	CNA - Egan	Clark Oil and Refining Corp	1983-91	
Conoco	1980-81		Mt. Airy Refining	1980-82	
Continental Oil Co	1979		St. James Co LLC	1998-	TXS - St. James
Quantum Fuel & Refining	1998-	LOR - Egan	Texas NAPCO Inc	1983-98	
U.S. Refining Inc	1994-98		La Jet Inc	1980-82	
Britt Processing & Refining Co	1992-93		McTan Refining Corp	1983-96	BRN - St. James
Crystal Refining Inc	1989-91		McTan Corp	1982-82	
OGC Corp	1988-88		Bruin Refining Co	1980-81	
Louisiana Oil Refining Co of Egan	1987-87		Sabine Resources Group	1990-92	PRT - Stonewall
El Paso Field Services	1997-	KRR - Dubach	Port Petroleum Inc	1980-89	
Arcadia Refining	1995-96		Schulze Processing Inc	1980-82	SCH - Tallulah
Endevco Inc	1989-94		Gulf Oil Co USA	1981-81	GLF - Venice
Kerr-McGee Refining Corp	1985-88		Gulf Oil Corp	1980-80	
Kerr-McGee Corp	1980-84		Lisbon Refinery J.V LLC	1998-	CLB - Lisbon
Tina Resources Inc	1993-96	MLL - Gueydon	Padre Refining Co	1997-98	
Cameron Oil Refining Co Inc	1992-92		Arcadia Refining & Mktg. Co	1995-96	
Cameron Resources	1990-91		Dubach Gas Co	1992-94	
Mallard Resources Inc	1980-89		Claiborne Gasoline Co	1980-91	
Bayou State Oil Corp	1980-	BYS - Hosston	Canal Refining Co	1980-	CNL - Church Pt.
Evangeline Refining Co	1980-92	EVN - Jennings			
Shepard Oil Co	1980-82	SHP - Jennings			
Laidlaw Environmental Systems	1992-92	TSR - Jennings			
GSX Recovery Systems	1983-91				
T & S Refining Co	1980-82				