
DEPARTMENT OF ENERGY
UNITED STATES OF AMERICA
Strategic Petroleum Reserve

Presentation Agenda

Tulane ENGINEERING Forum

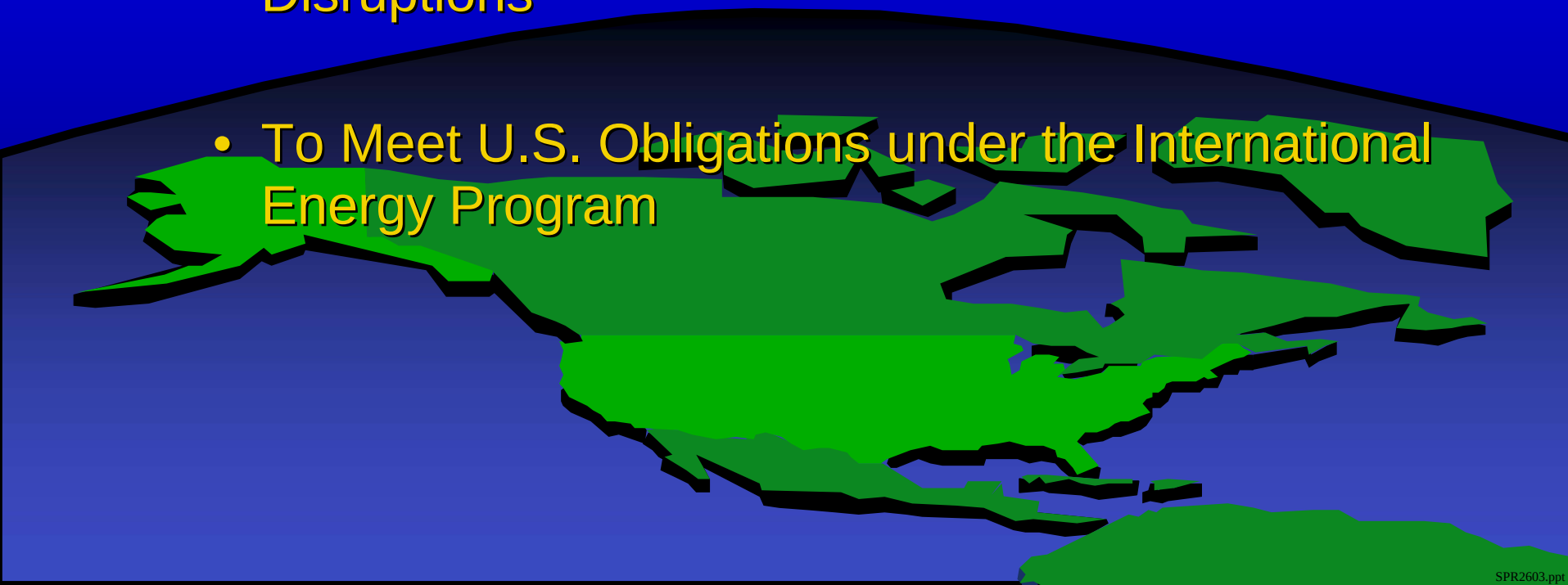
- What has happened recently, especially since the hurricanes
- Background- Overview of the SPR
- Information on Recent Initiatives

Energy Policy & Conservation Act (1975)

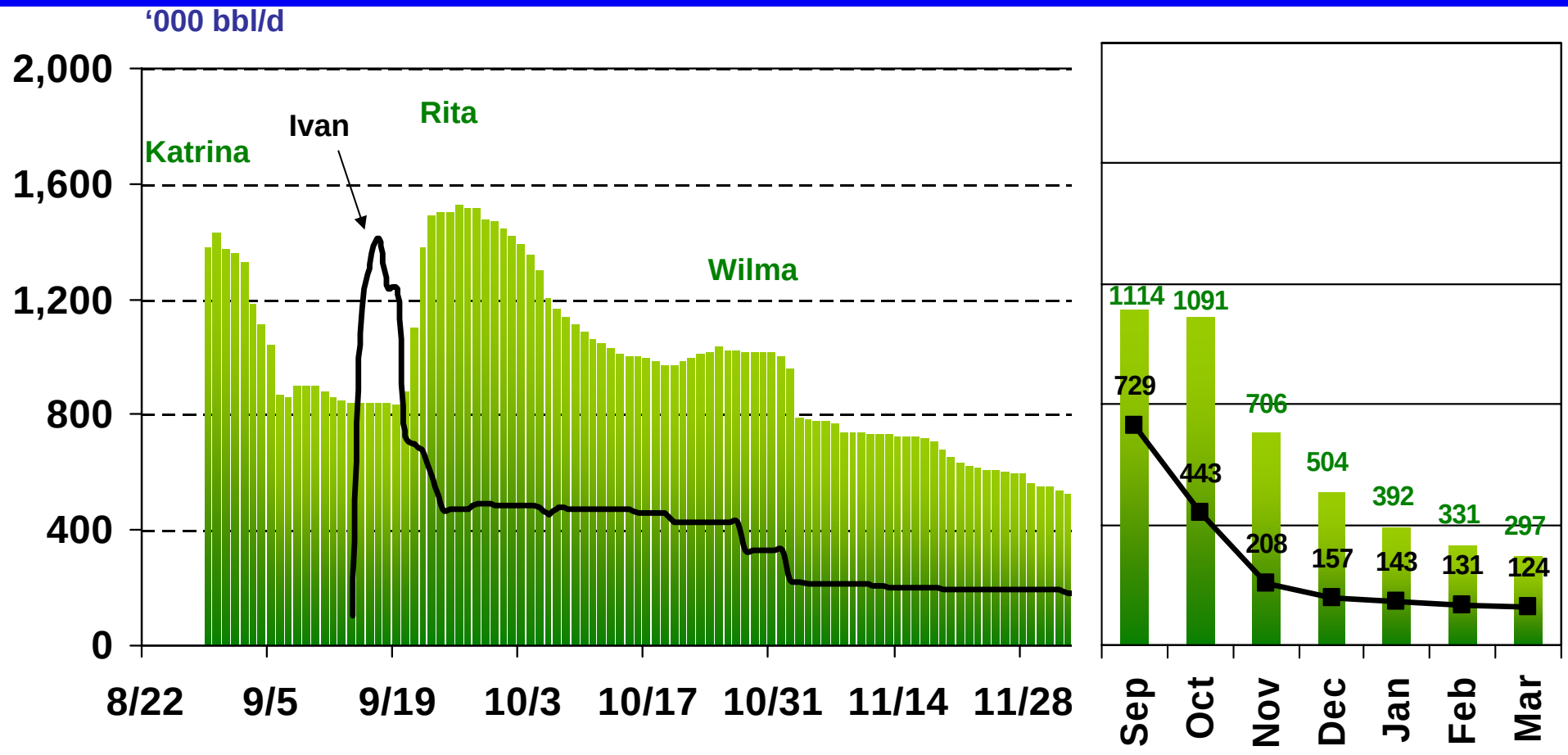
SPR MISSION

- To Diminish the Vulnerability of the United States to the Harmful Effects of Petroleum Supply Disruptions

- To Meet U.S. Obligations under the International Energy Program

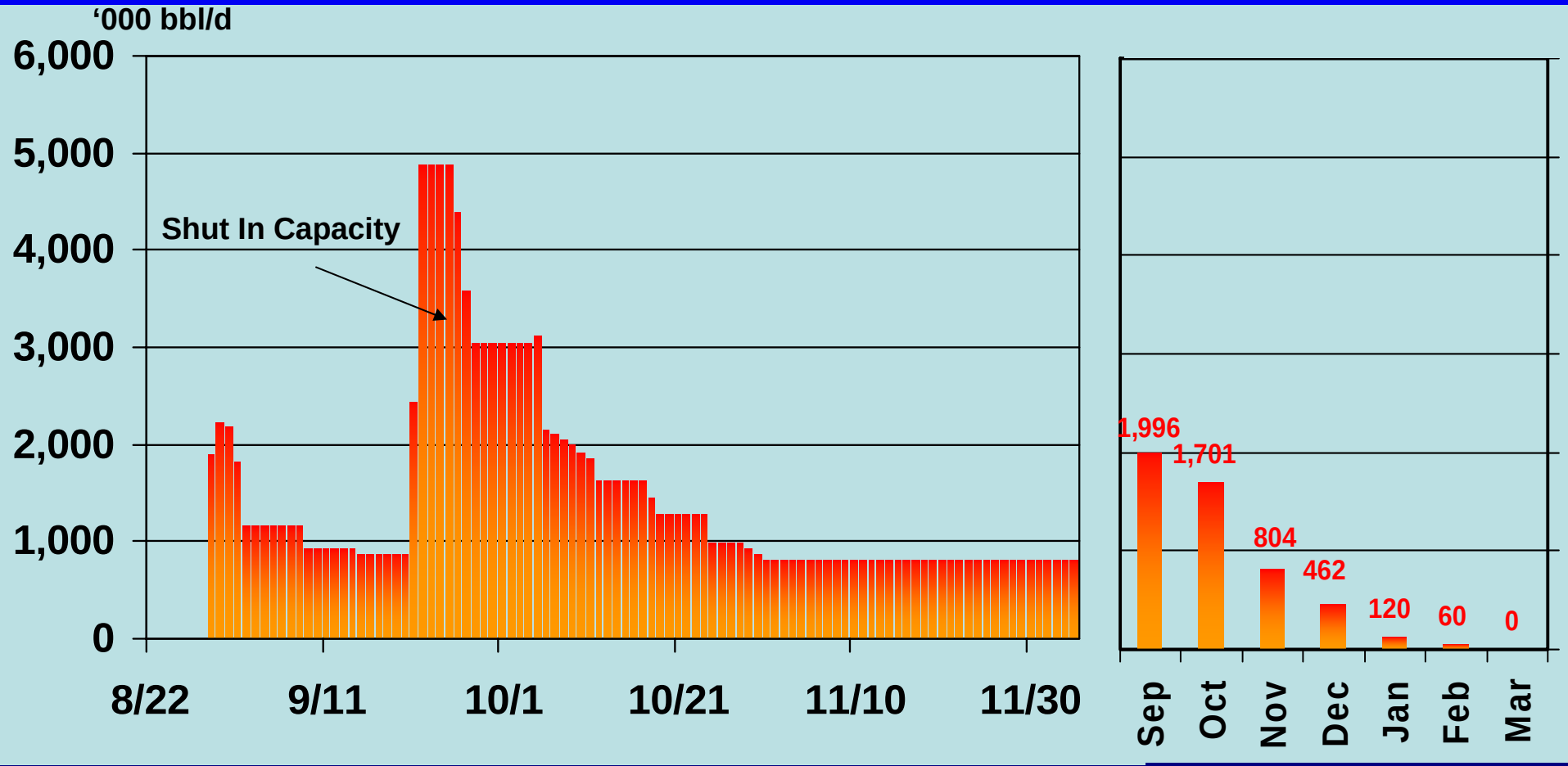


Hurricanes Katrina and Rita Shut In Significant Gulf Crude Oil Production



Source: Short Term Energy Outlook, December 2005.

Hurricanes Katrina and Rita Initially Shut Down Most Gulf Refinery Capacity



Source: Short Term Energy Outlook, December 2005.

SPR Hurricane Response

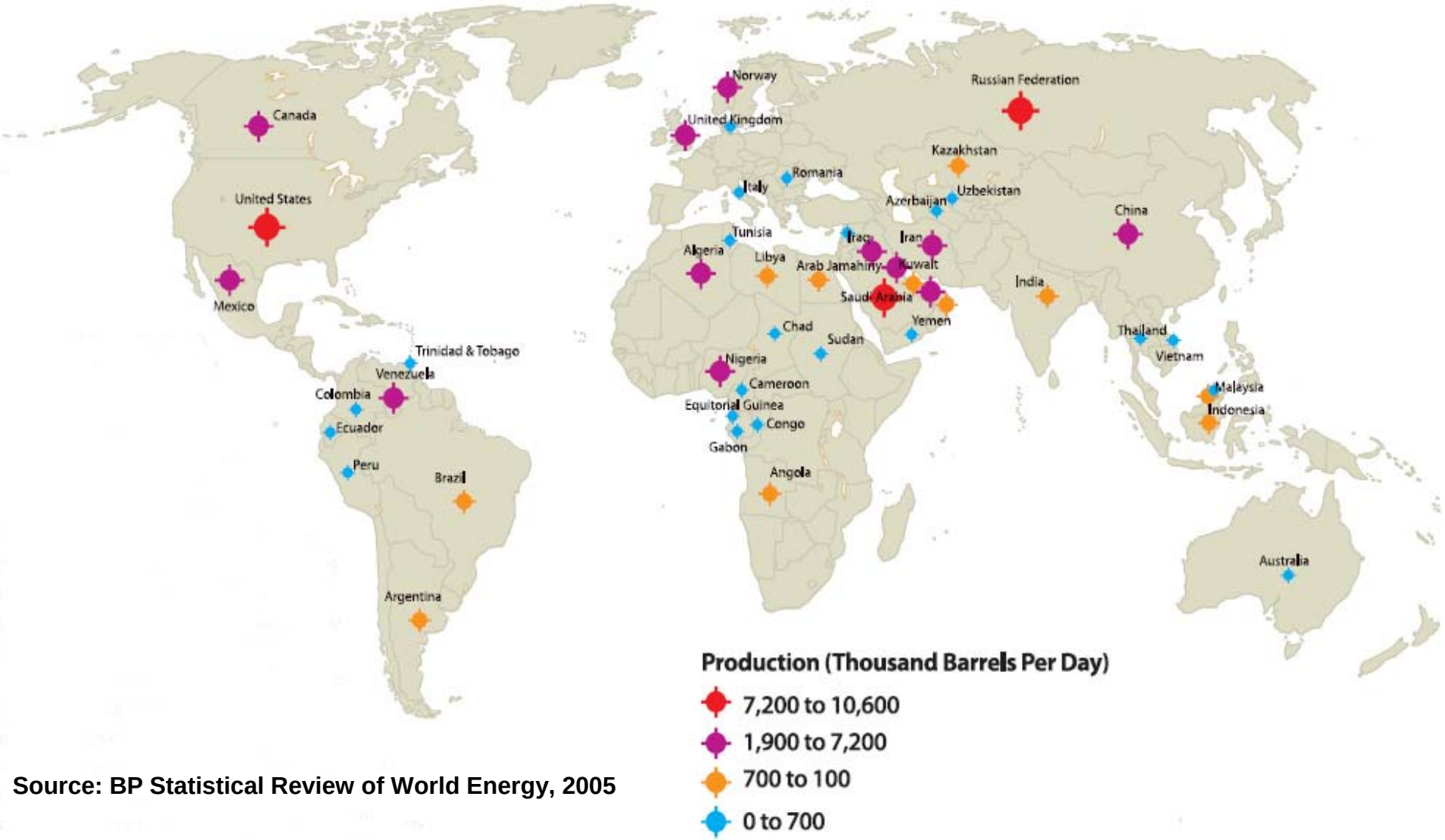
- Response to Supply Disruptions *
  - Executed exchange agreements (loans) for up to 13.2 million barrels of oil to alleviate shortages
  - Presidential Order was issued for the sale of 11 million barrels of crude oil in addition to the loans
  - The SPR fulfilled its mission in an outstanding manner

* SPR received Secretary Of Energy's Gold Award

Key Aspects of Hurricane Response

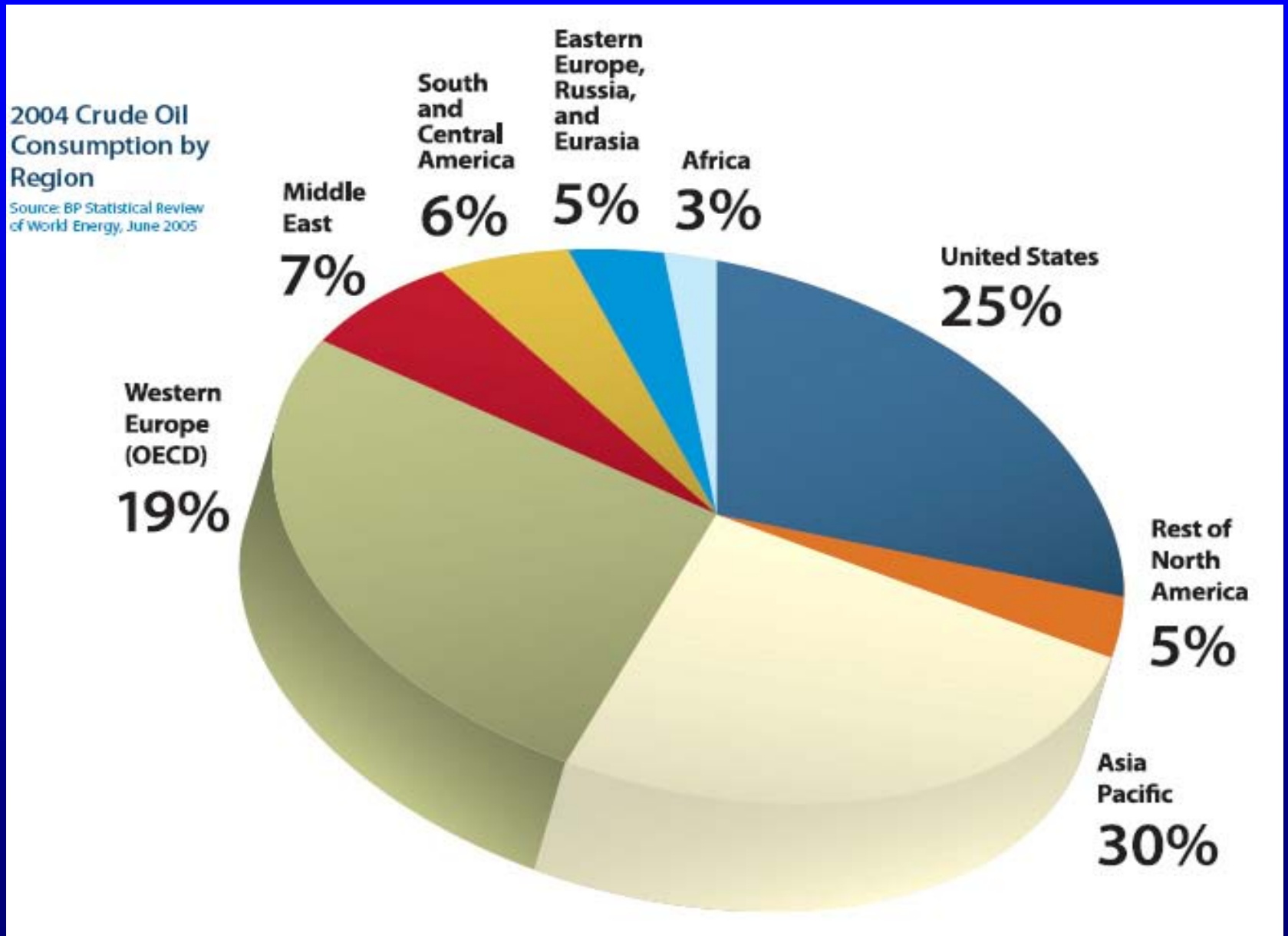
1. Preparation- Emergency Procedures
2. Emergency Operations Center (EOC) and Team
   A. Activation of Key Personnel and Facilities
   B. Coordination with LA and TX State EOCs
3. Emergency Response Mission Execution
4. Employee Communications and Assistance
   A. Estimated 100 out of 900 employees without permanent residence after the storms
5. Facilities Recovery, Re-opening and Repair
   1. New Orleans (DOE) re-opened Oct 3, 2005
6. No deaths or significant injuries among SPR community from either Katrina or Rita

The Big Picture: Global Oil Production

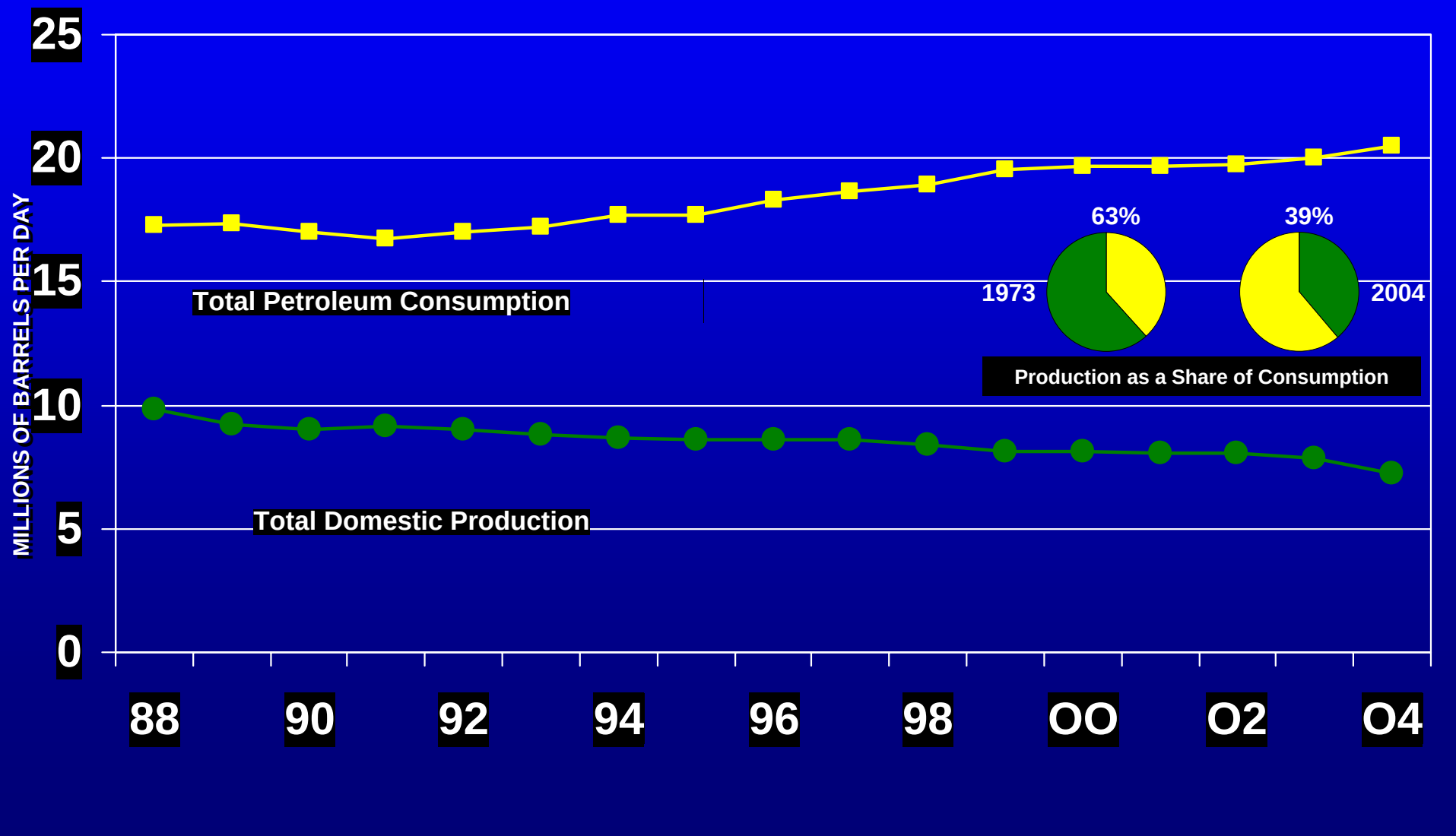


Source: BP Statistical Review of World Energy, 2005

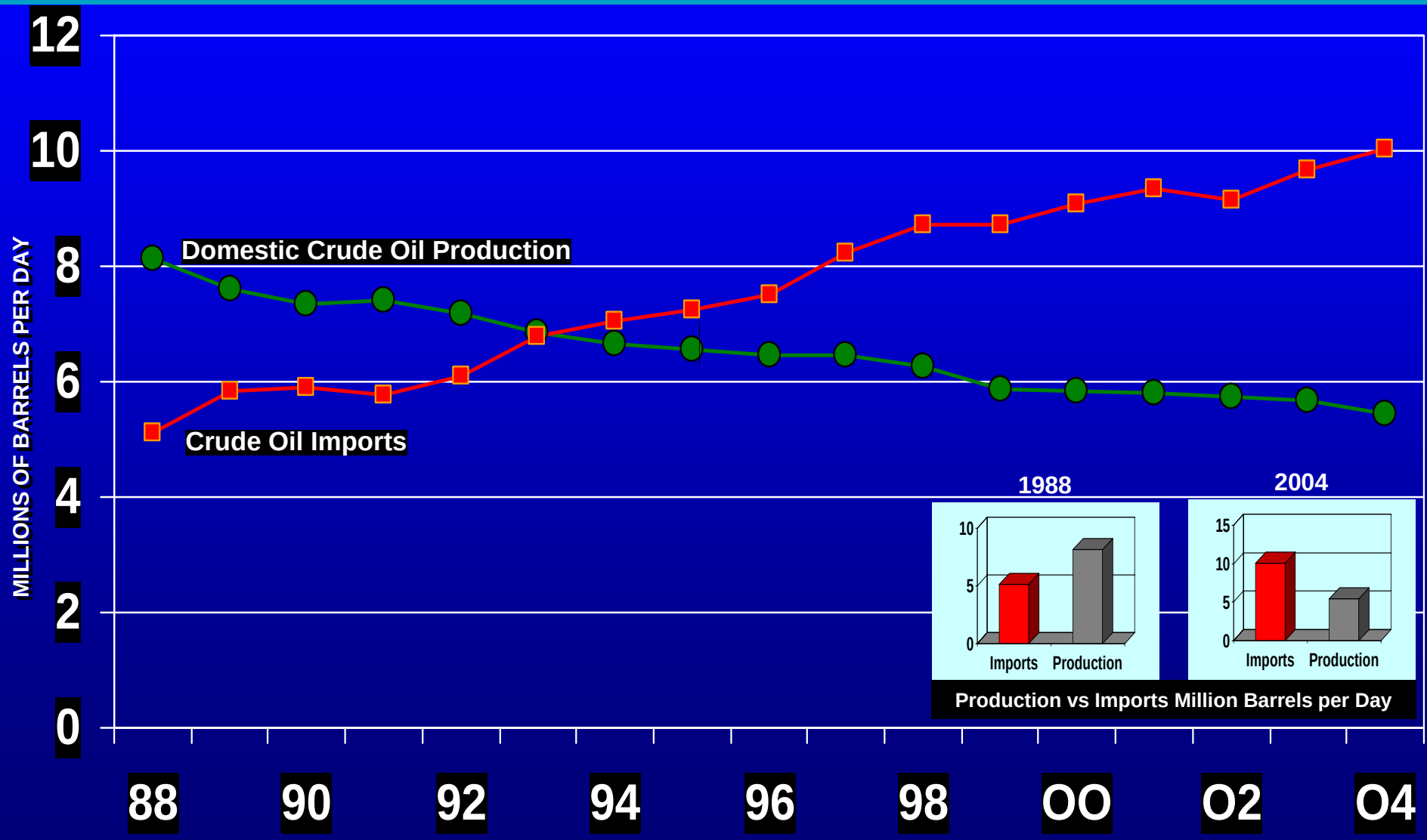
Crude Oil Consumption by Region



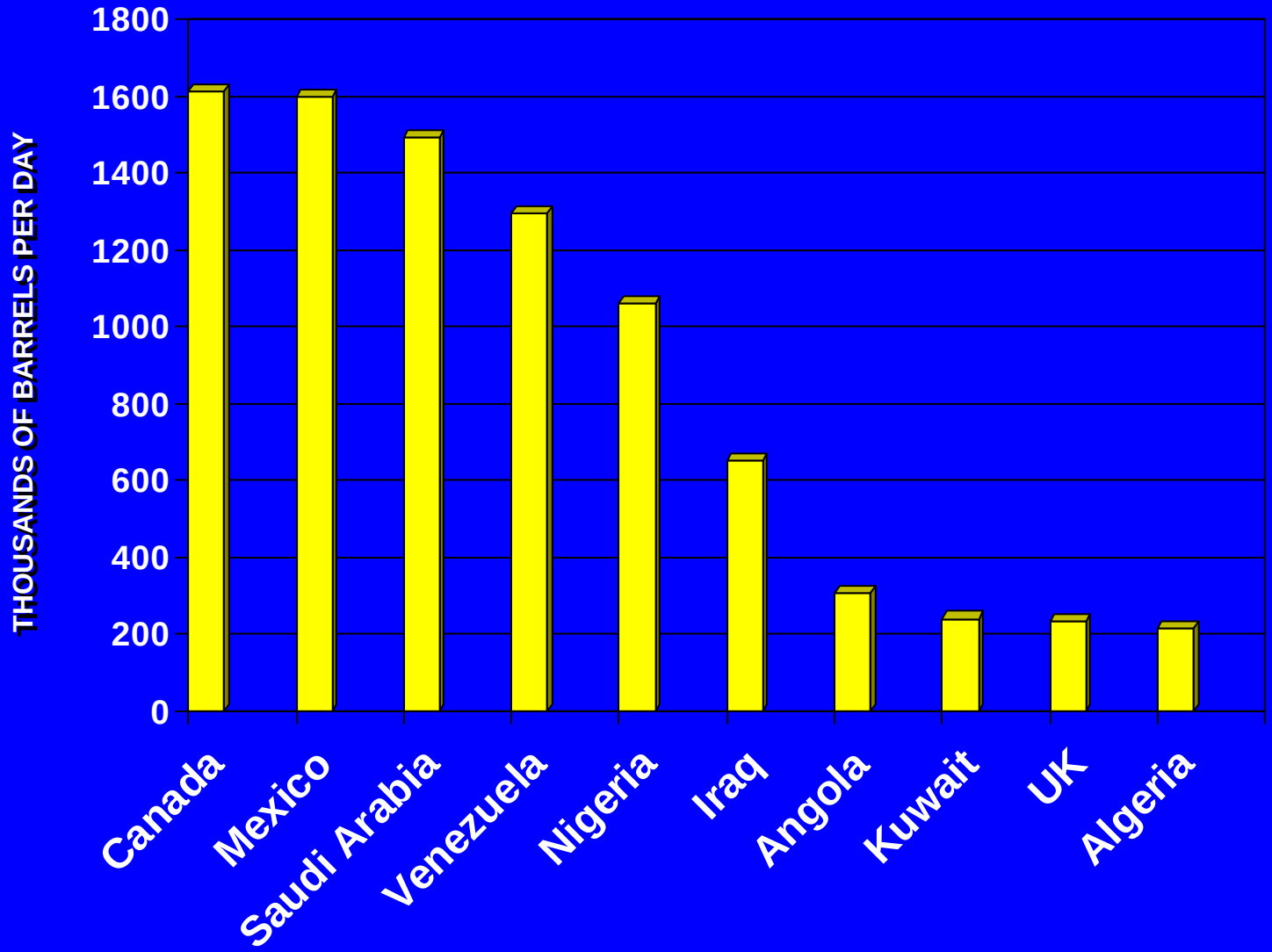
Domestic Production and Consumption



Domestic Crude Oil Production and Crude Oil Imports

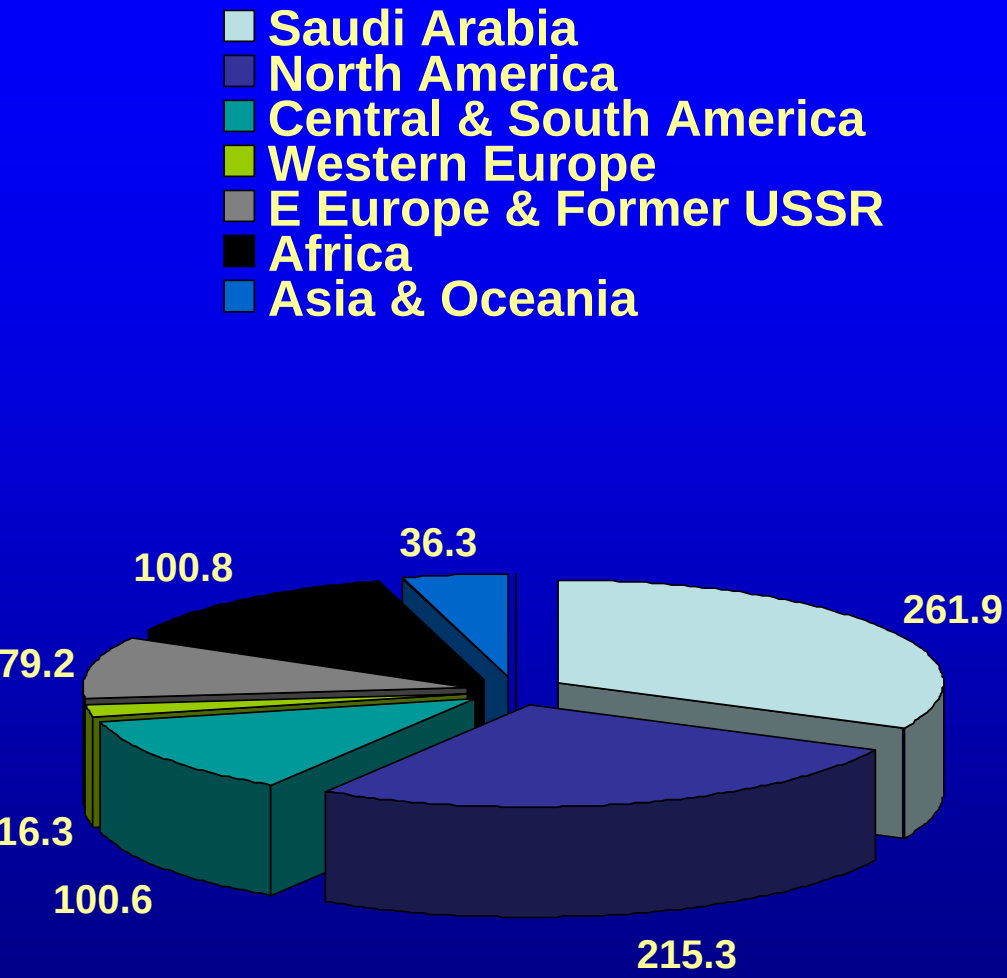


Top 10 Suppliers – U.S. Oil Imports
January-December 2004

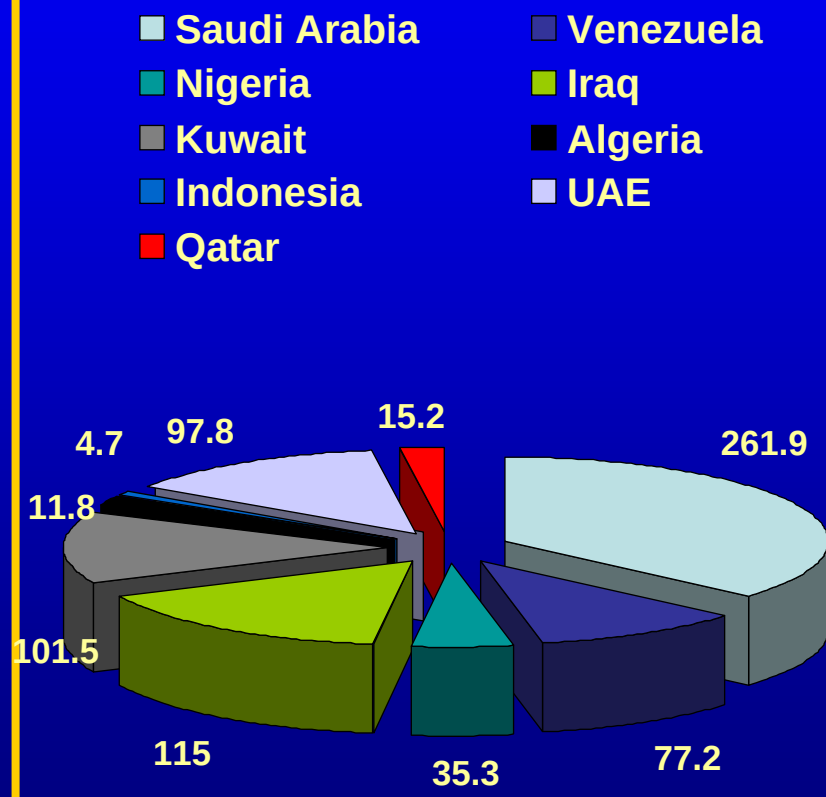


Proven Oil Reserves
Dec 2004

World Reserves
(in billions of barrels)



OPEC Reserves*
(in billions of barrels)



**Iran and Libya not shown*

World Reserves 2003

World's Largest Oil Companies Based on Liquid Reserves in 2003

Note: Figures account for recent Unocal /ChevronTexaco and Burlington/ConocoPhillips mergers

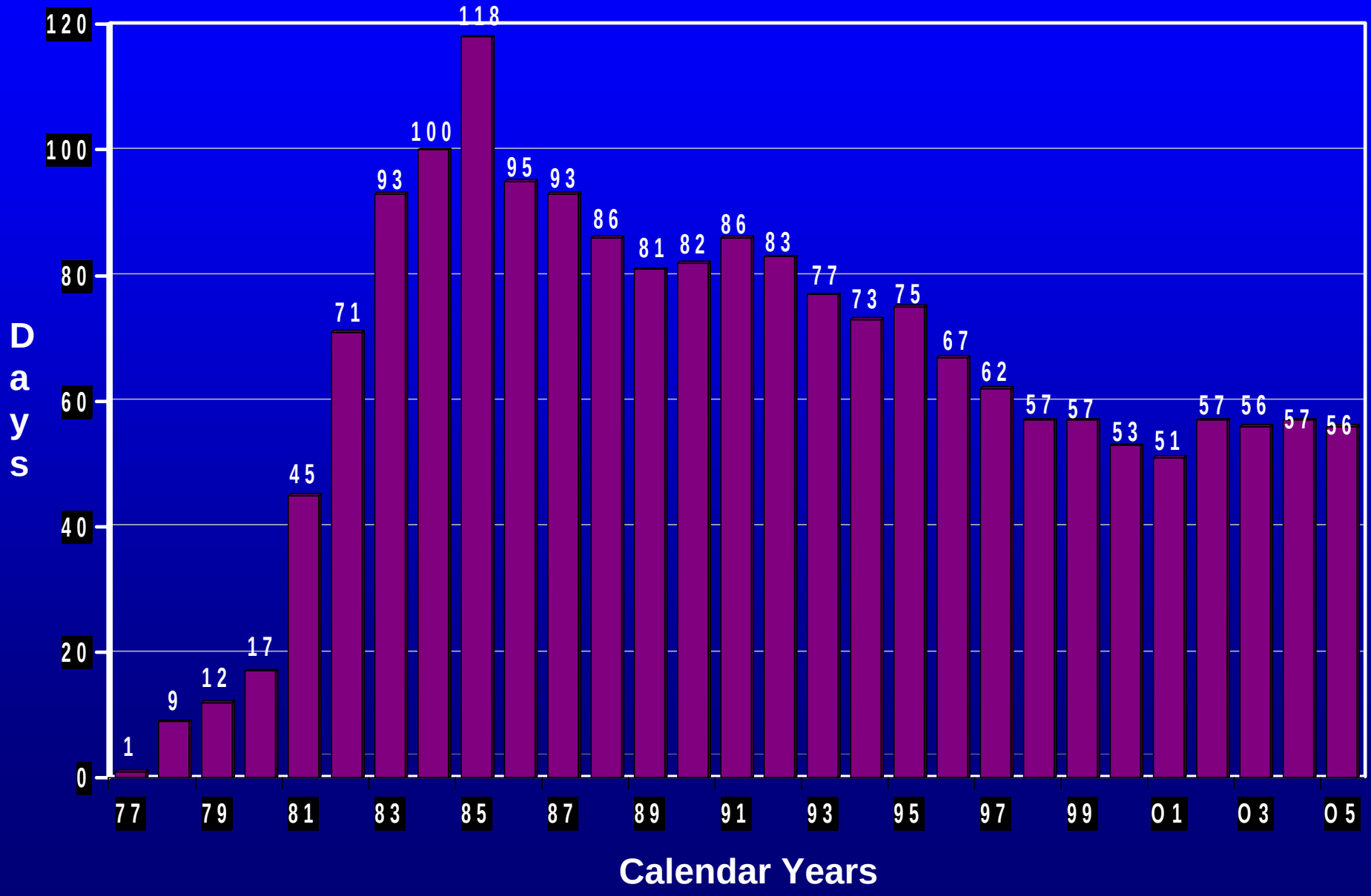
Source: Energy Intelligence Group, Inc. and BP Statistical Review of World Energy, June 2005

Rank	Company	Country	Liquids Reserves (Millions of Barrels)	Percent of World Reserves
1	Saudi Aramco	Saudi Arabia	259,400	21.83%
2	NIOC	Iran	125,800	10.59%
3	INOC	Iraq	115,000	9.68%
4	KPC	Kuwait	99,000	8.33%
5	PDV	Venezuela	77,800	6.55%
6	Adnoc	UAE	55,210	4.65%
7	Libya NOC	Libya	22,680	1.91%
8	NNPC	Nigeria	21,153	1.78%
9	Pemex	Mexico	16,041	1.35%
10	Lukoil	Russia	15,977	1.34%
11	Gazprom	Russia	13,561	1.14%
12	Exxon Mobil	United States	12,856	1.08%
13	Yukos	Russia	11,833	1.00%
14	PetroChina	China	10,997	0.93%
15	Qatar Petroleum	Qatar	10,950	0.92%
16	Sonatrach	Algeria	10,533	0.89%
17	BP	United Kingdom	10,081	0.85%
18	Petrobras	Brazil	9,772	0.82%
19	ChevronTexaco/Unocal	U.S.	9,274	0.78%
20	Total	France	7,323	0.62%
21	Royal Dutch/Shell	UK & Netherlands	7,257	0.61%
22	Petronas	Malaysia	7,136	0.60%
23	Surgutneftgas	Russia	6,771	0.57%
24	ConocoPhillips/Burlington	United States	5,784	0.49%
25	Pertamina	Indonesia	4,722	0.40%
26	Sibneft	Russia	4,623	0.39%
27	Eni	Italy	4,138	0.35%
28	ONGC	India	3,711	0.31%
29	Sinopec	China	3,257	0.27%
30	PDO	Oman	3,193	0.27%
31	Socar	Azerbaijan	3,105	0.26%
32	Rosneft	Russia	2,400	0.20%
33	TNK-BP	Russia/UK	2,150	0.18%
34	Occidental	United States	2,038	0.17%
35	Syrian Petroleum	Syria	1,886	0.16%
36	Repsol YPF	Spain	1,882	0.16%
37	EGPC	Egypt	1,800	0.15%
38	Statoil	Norway	1,789	0.15%
39	Ecopetrol	Colombia	1,542	0.13%
40	Amerada Hess	United States	1,226	0.10%
41	Norsk Hydro	Norway	993	0.08%
42	EnCana	Canada	957	0.08%
43	Devon Energy	United States	870	0.07%
44	Apache	United States	844	0.07%
45	Petro-Canada	Canada	768	0.06%
46	Anadarko	United States	646	0.05%
47	BG	United Kingdom	645	0.05%
48	Marathon	United States	578	0.05%
		World	1,188,300	100.00%

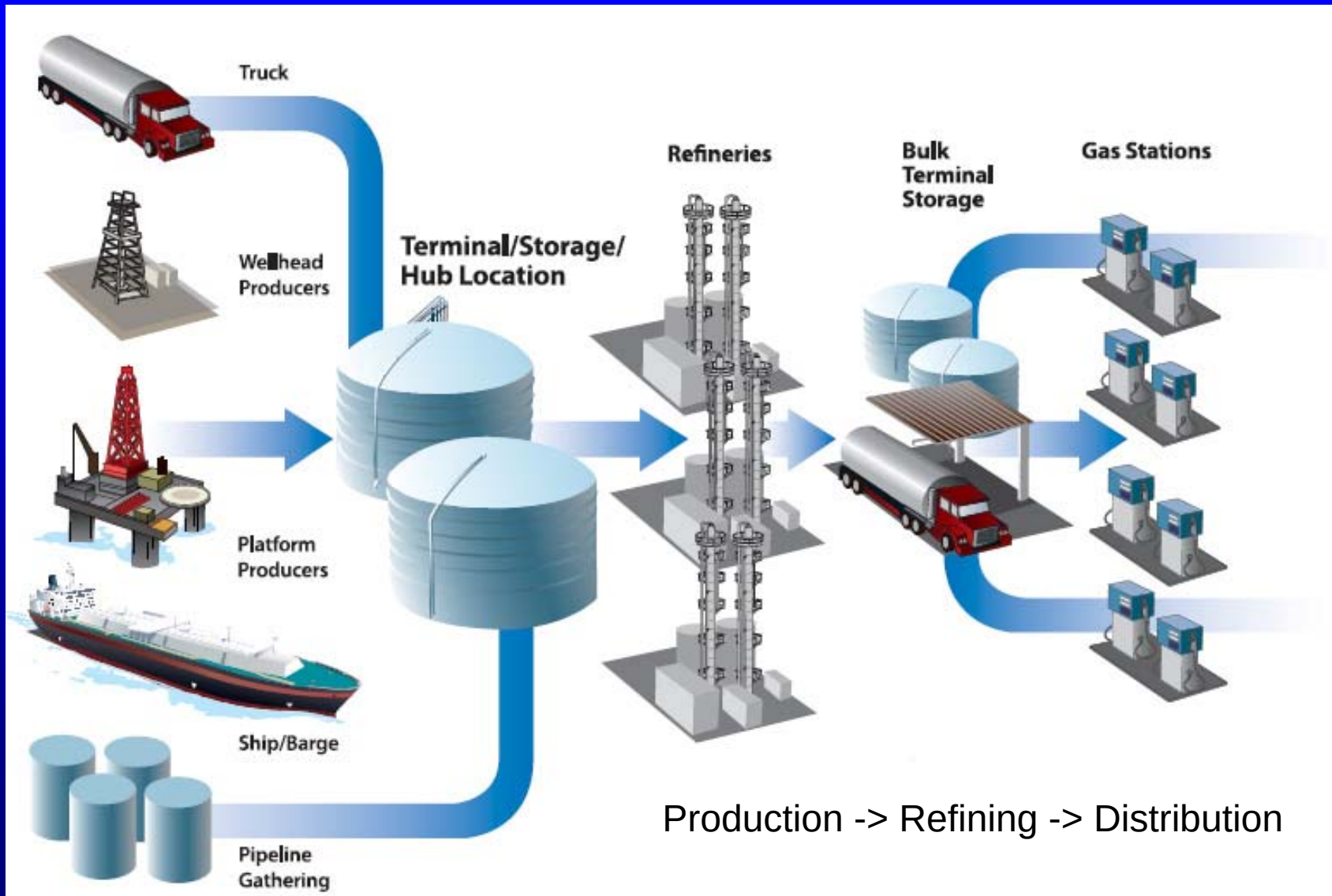
Major Flows of Crude Oil

Reference: Understanding Today's Crude Oil and Market Products

Days Of Net Import Protection



Oil Supply Chain



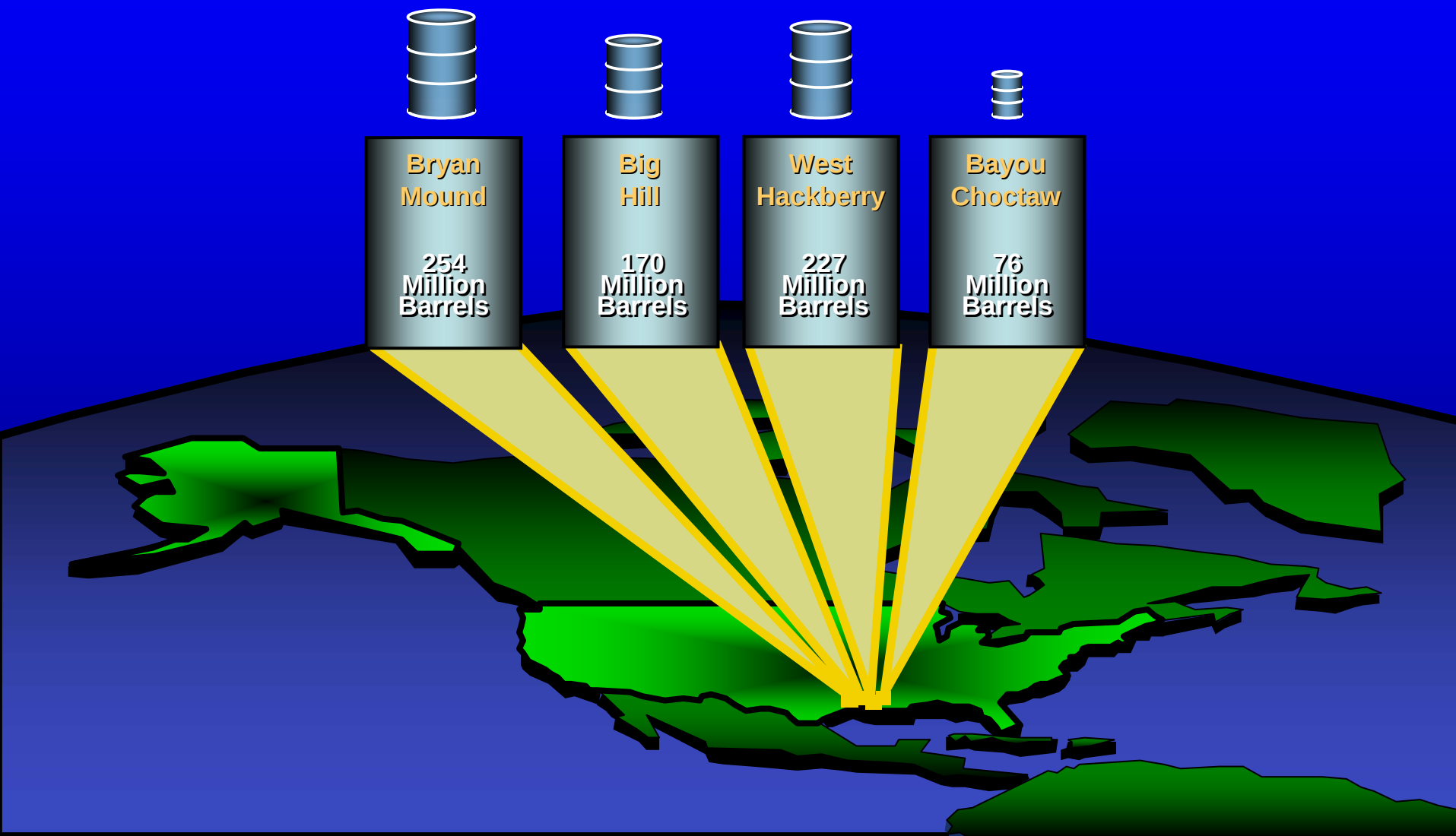
Production -> Refining -> Distribution

Gulf Coast Storage

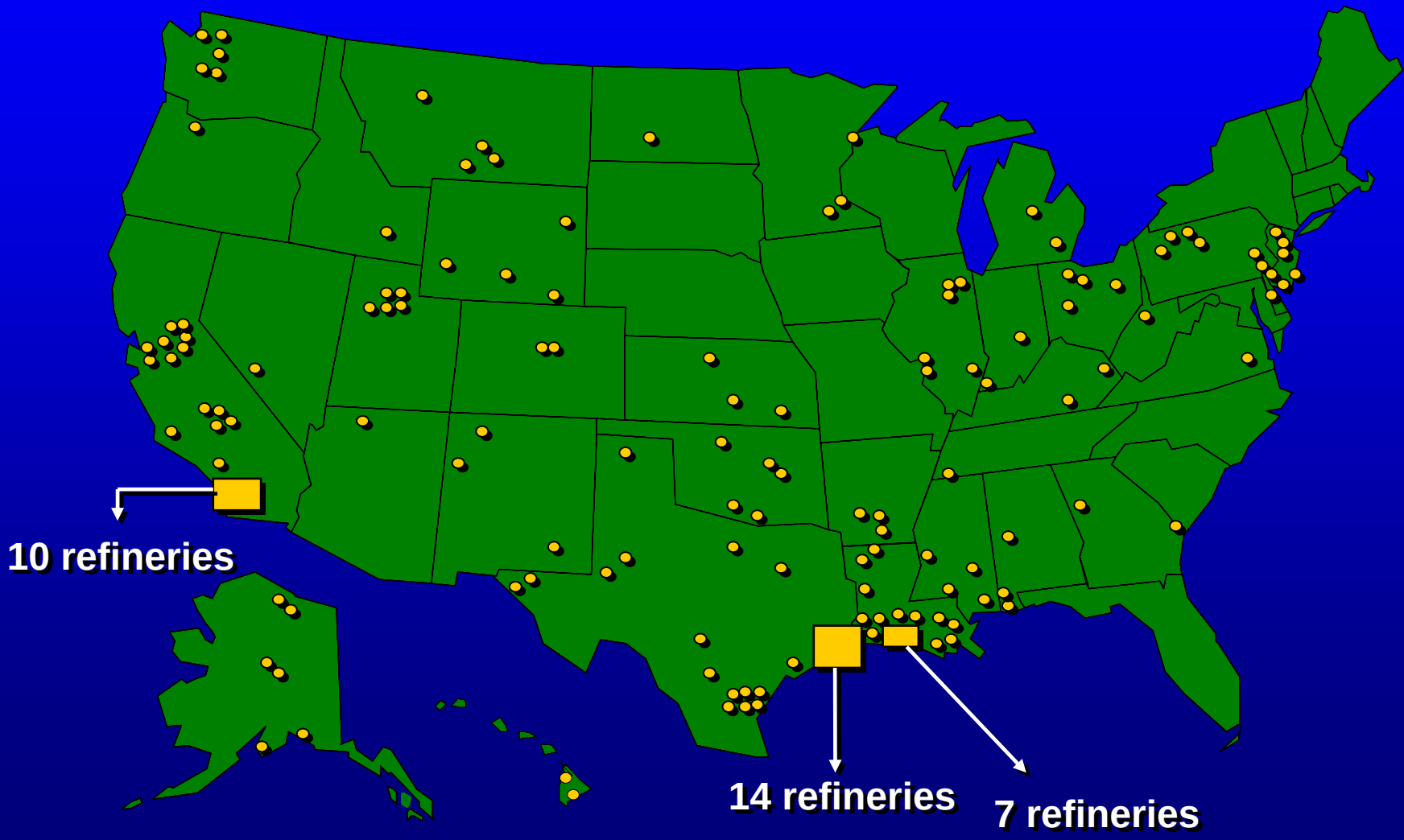
- Concentration Of Salt Domes
  - Secure
  - Economical
  - Low Environmental Risk
- Major U.S. Refinery Area
- Major Crude Oil Distribution Center
  - Tanker Terminals
  - Pipelines
- Provides Maximum Flexibility To Respond To A Wide Range Of Interruptions


TEXAS
LOUISIANA
MISSISSIPPI
Capline Pipeline
TEXOMA COMPLEX
SUNOCO & UNOCAL TERMINALS
LAKE CHARLES
CAPLINE SYSTEM
SEAWAY SYSTEM
BATON ROUGE
BAYOU CHOCTAW
SPR (Stennis)
HOUSTON
BEAUMONT PORT ARTHUR
TEXAS CITY
BIG HILL
WEST HACKBERRY
NEW ORLEANS
BRYAN MOUND
SEAWAY TERMINAL
SUGARLAND ST. JAMES TERMINAL
LOOP
SEAWAY TERMINAL FREEPORT
Gulf of Mexico
SPR STORAGE FACILITY
PIPELINE TERMINAL
REFINING CENTERS
CRUDE OIL PIPELINES
SPR (Stennis)

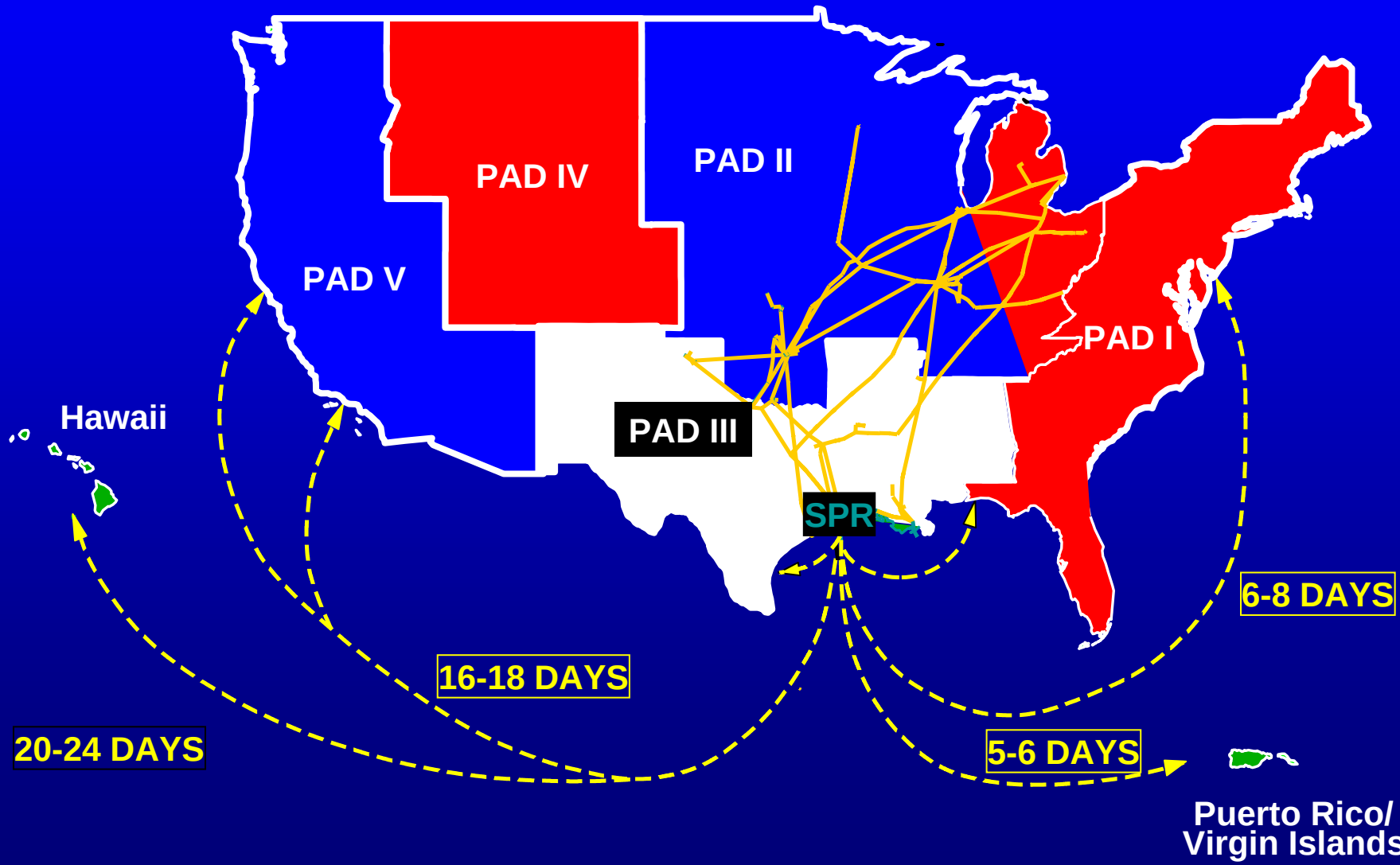
Designed Storage Capacity: 727 MMB



Location of U.S. Refineries



Reserve Distribution Capability



Four Methods of Storage

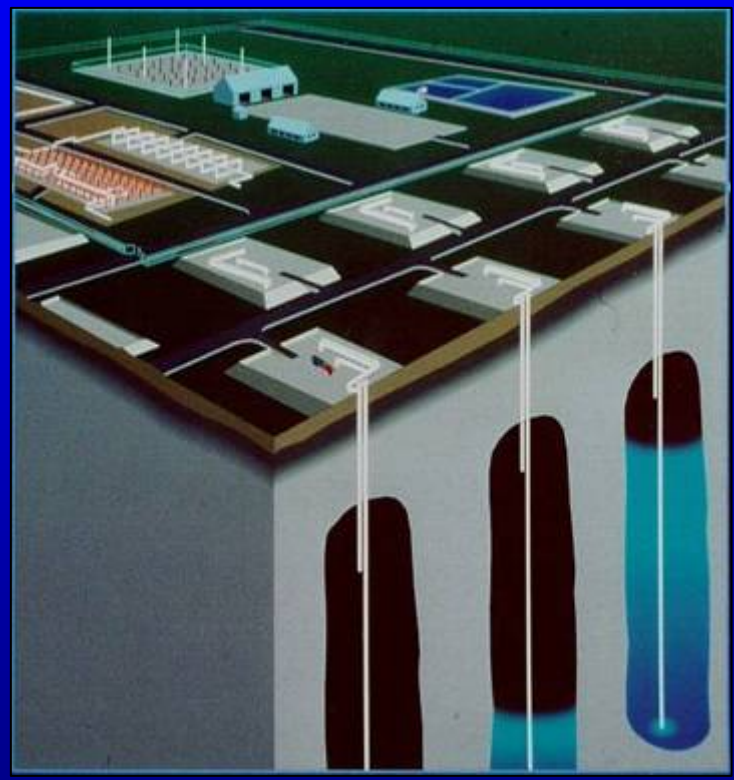
- Salt Cavern Storage Technology
- Hard Rock Mine Storage Technology
- In-Ground Steel Tank Technology
- In-Ground Cut & Cover Technology

Underground Storage Technologies Comparisons

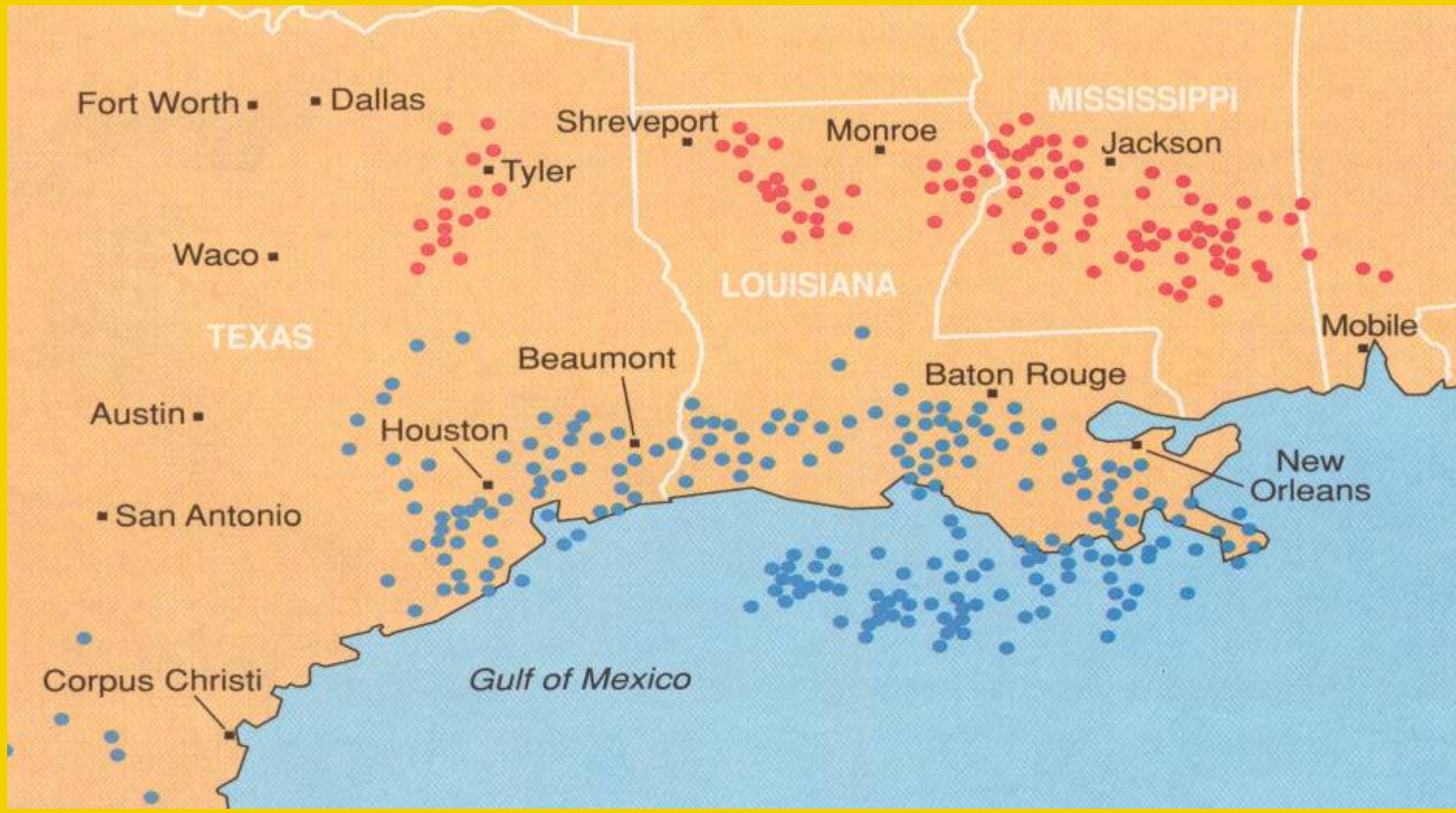
Storage Technology	Siting Requirements	Economic Site Capacities	Development Cost Range
Salt Caverns	Salt Formation (domal or bedded)	50 – 200 Million Barrels	$6-$8 per Barrel
Hard Rock Mine	Hard Rock Formation	1 – 15 Million Barrels	$20-$25 per Barrel
In-Ground Steel Tanks	No Restrictions	No Restrictions	$25-$50 per Barrel
In-Ground Cut & Cover Concrete Tanks	Dry Land Area (low water table)	5 – 100 Million Barrels	$18-$22 per Barrel

Salt Cavern Storage Technology

- Salt Dome Storage for Hydrocarbon Storage Patented in 1919
- Used Commercially for
  - Crude
  - Refined Products
  - Natural Gas
  - LPG
- Used for Oil Reserves by
  - U.S.A.
  - Germany
  - France
  - Netherlands

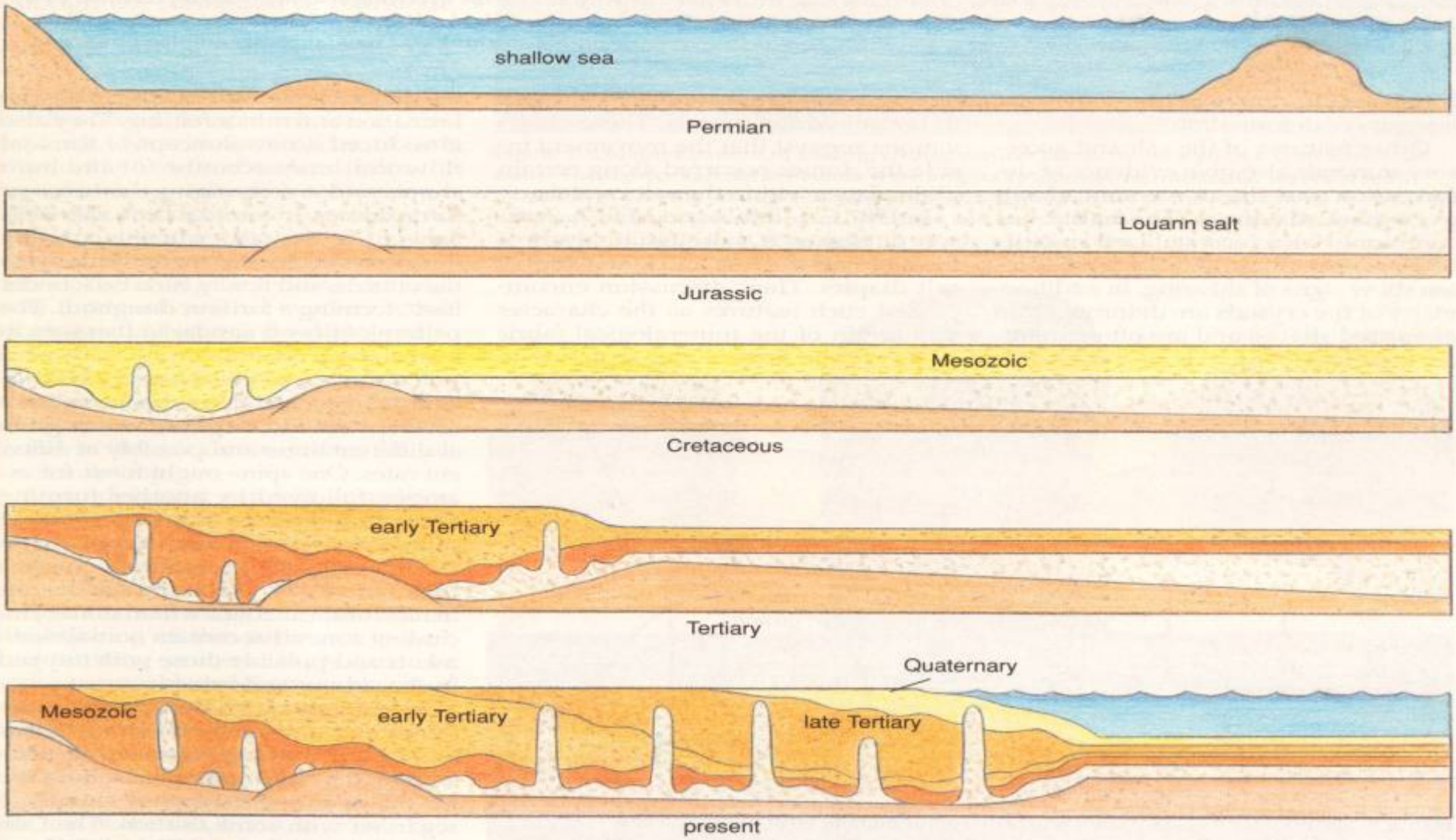


Salt domes of the U.S. Gulf Coast

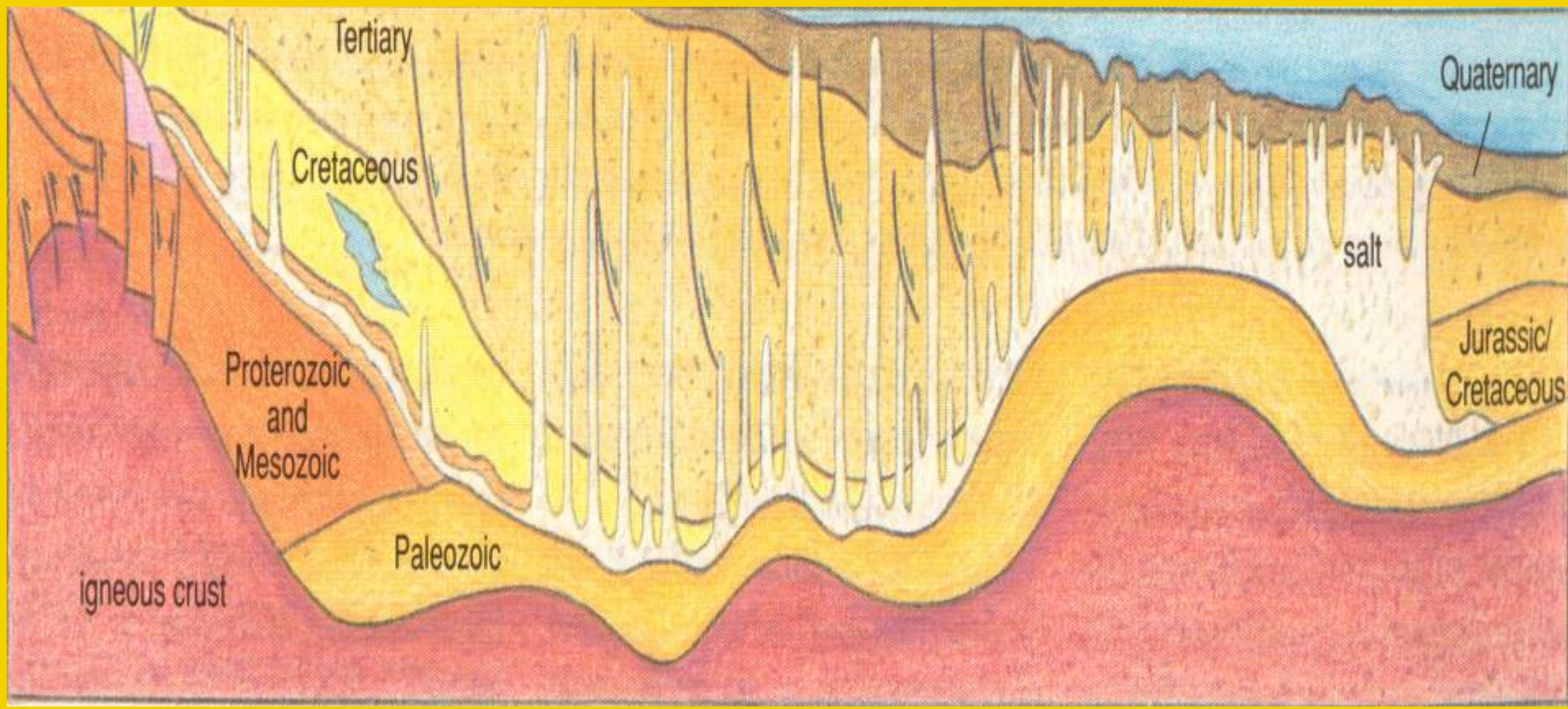


Overall more than 500 domes have been discovered in the Gulf region onshore and near the shore. Many more domes exist in the deeper Gulf.

Evolution of Gulf Coast Salt Deposits



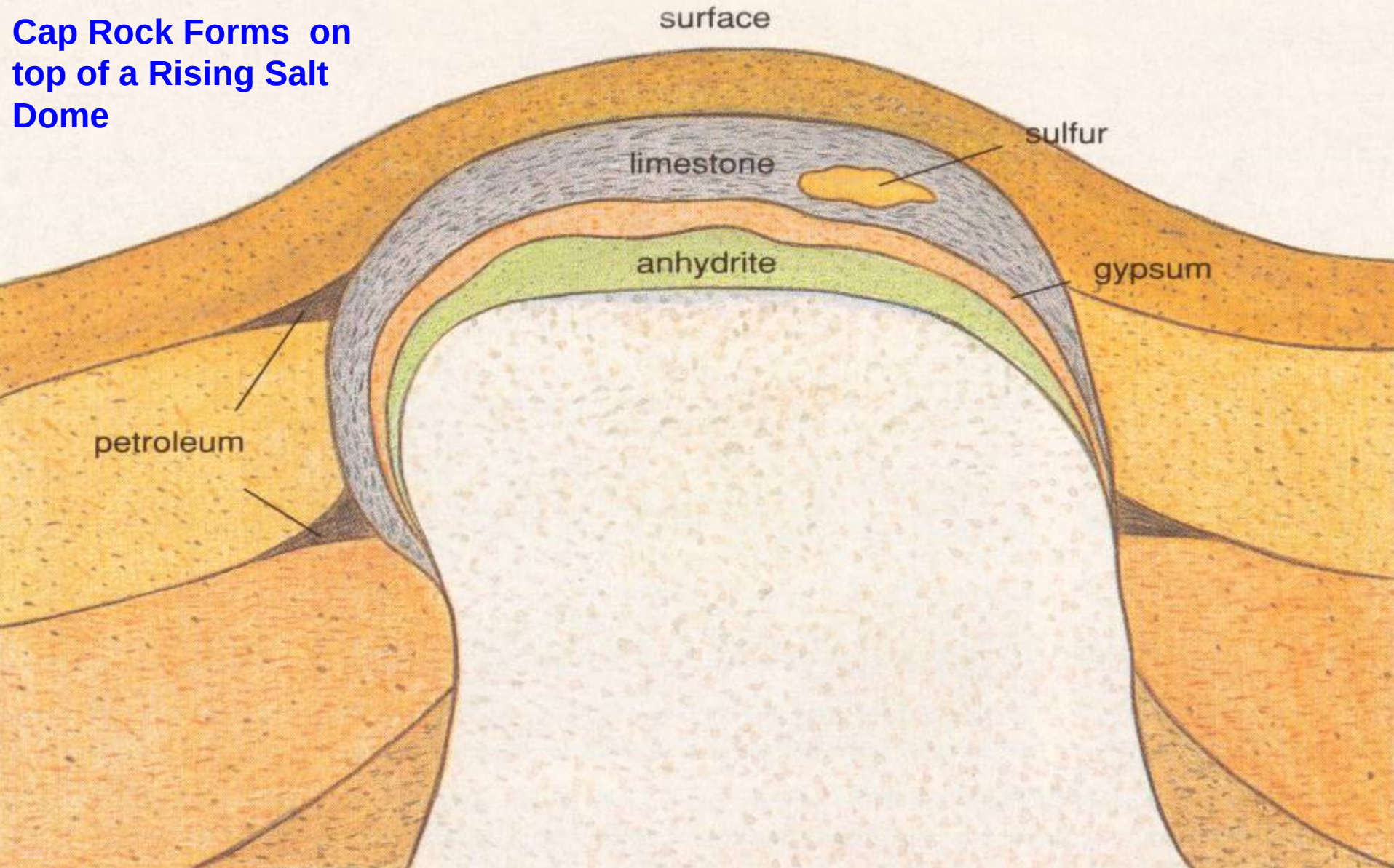
Evolution of Gulf Coast Salt Deposits



Columns of salt rising from a thick salt bed left behind by an ancient sea have penetrated the overburden of sediments laid down along the U.S. Gulf Coast.

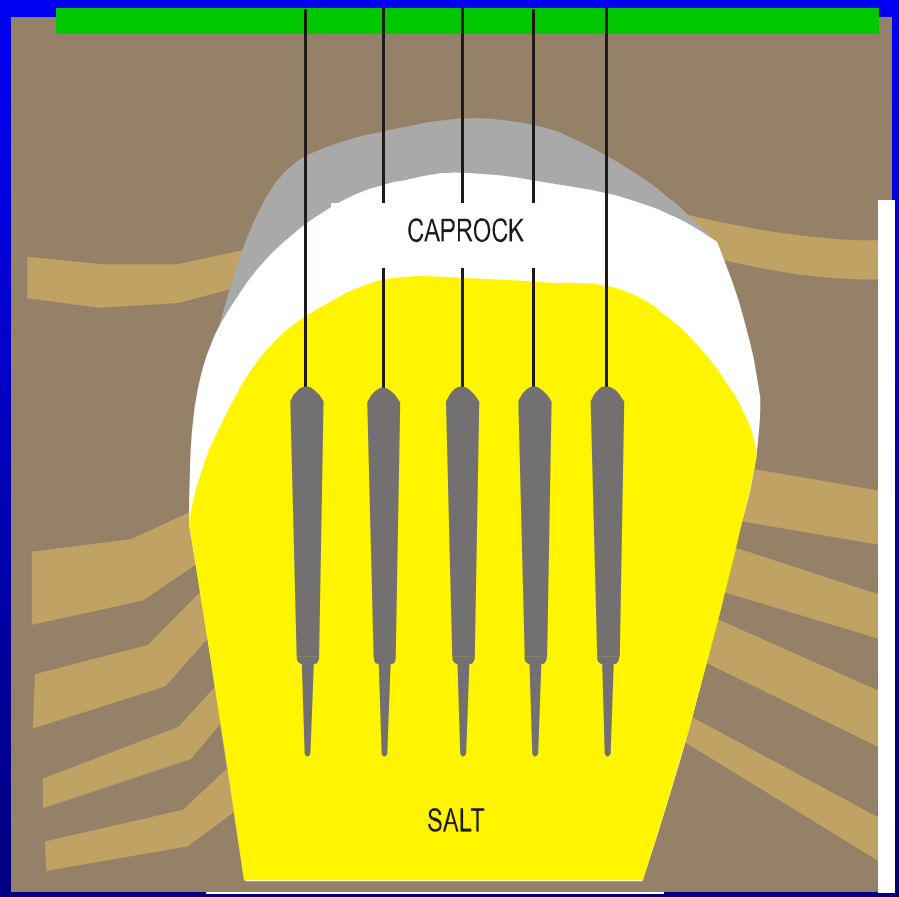
Evolution of Gulf Coast Salt Deposits

Cap Rock Forms on top of a Rising Salt Dome

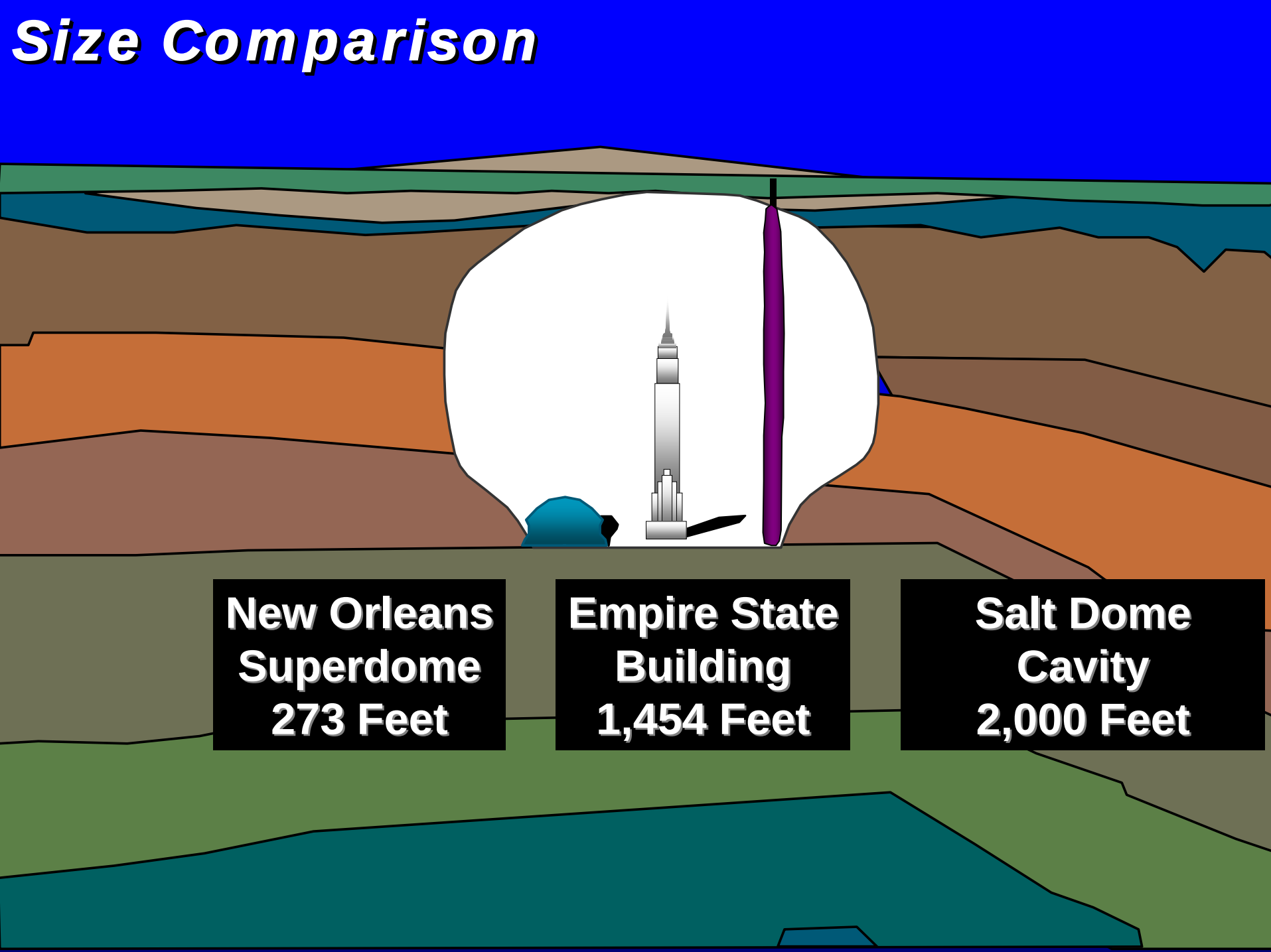


Salt Cavern Storage Technology

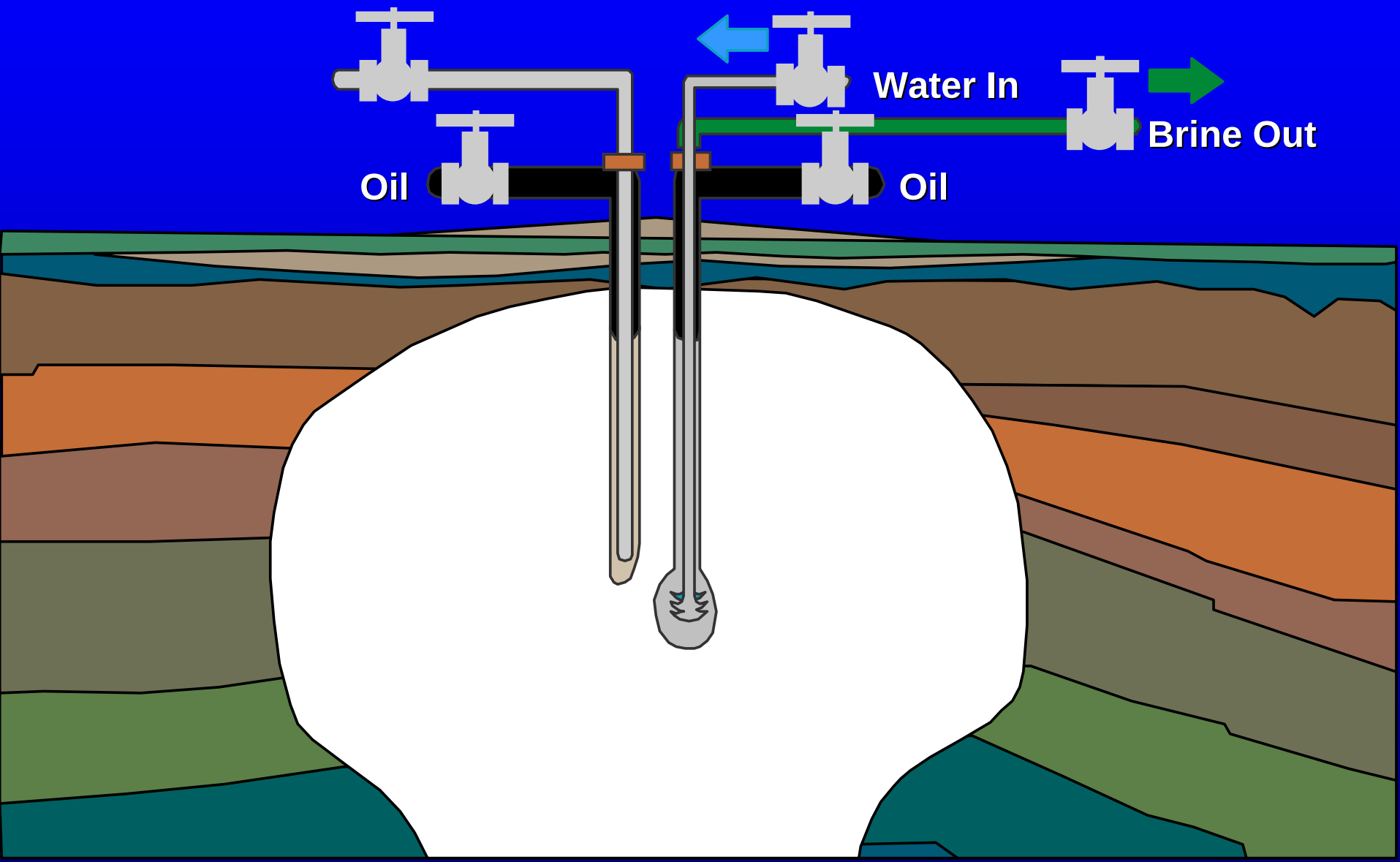
- Storage is located in Underground Salt Dome Formations
- Storage Caverns (cavities) are created through Solution Mining
- A salt dome can contain a number of storage caverns
- Storage Caverns range in size from 1,000 to 50,000,000 barrels.



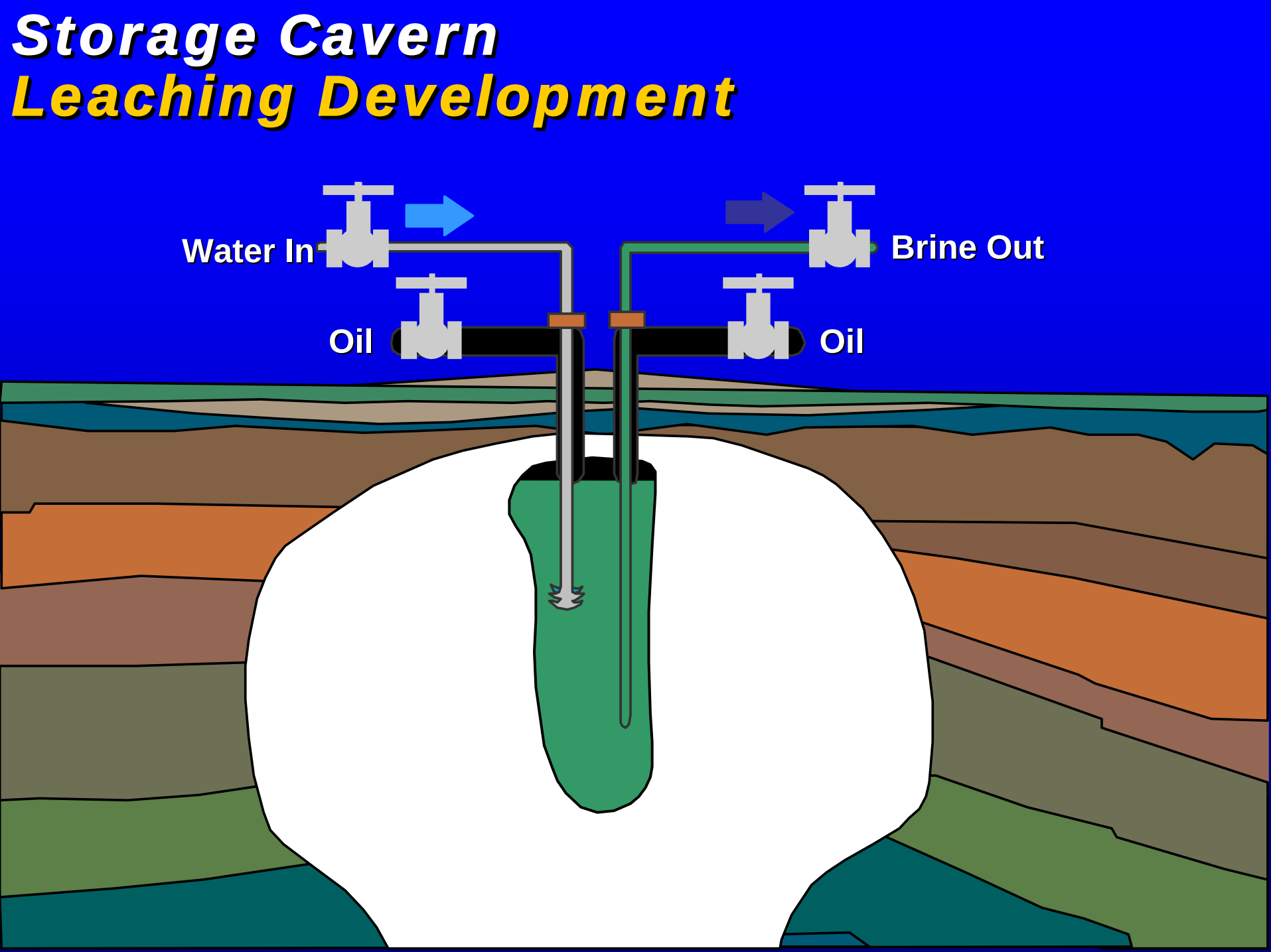
Size Comparison



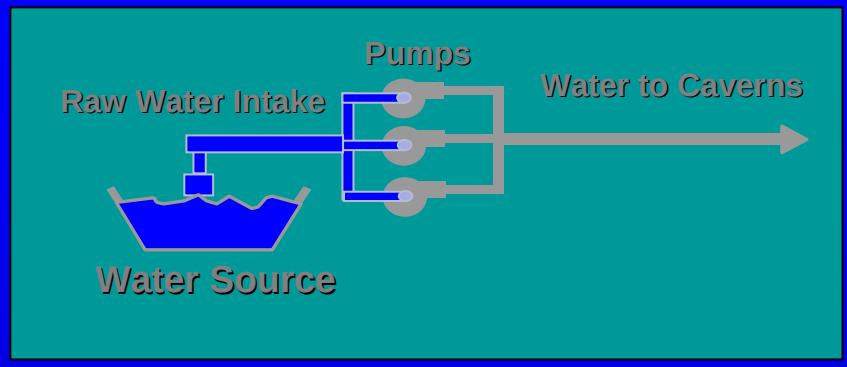
Storage Cavern Development



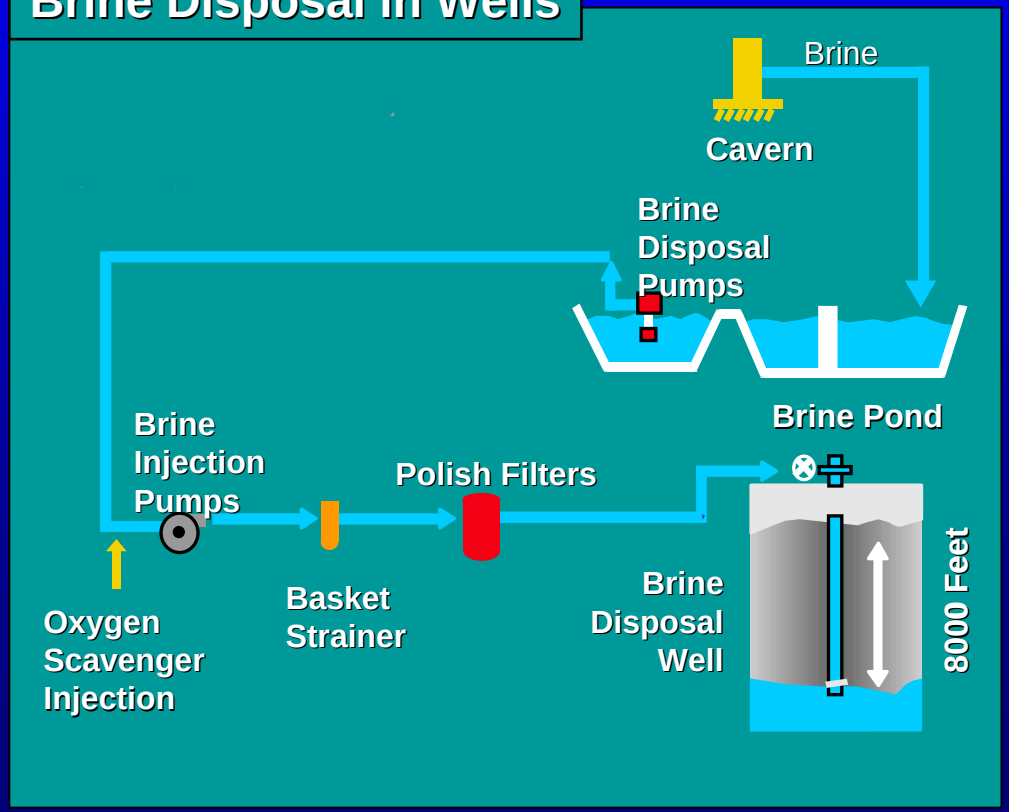
Storage Cavern
Leaching Development



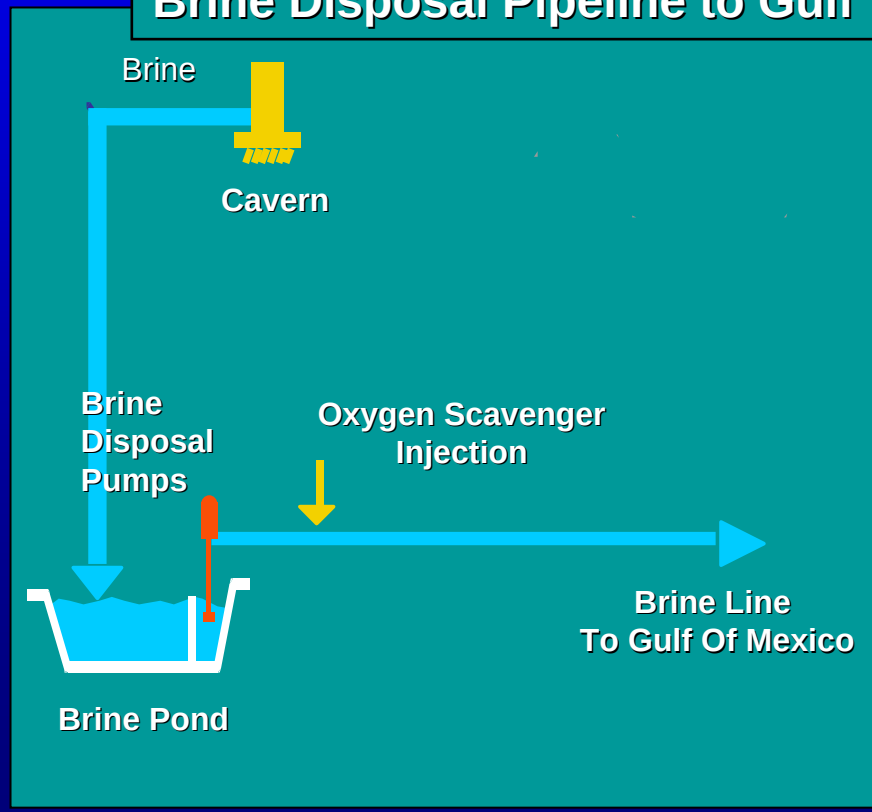
Brine Disposal Systems



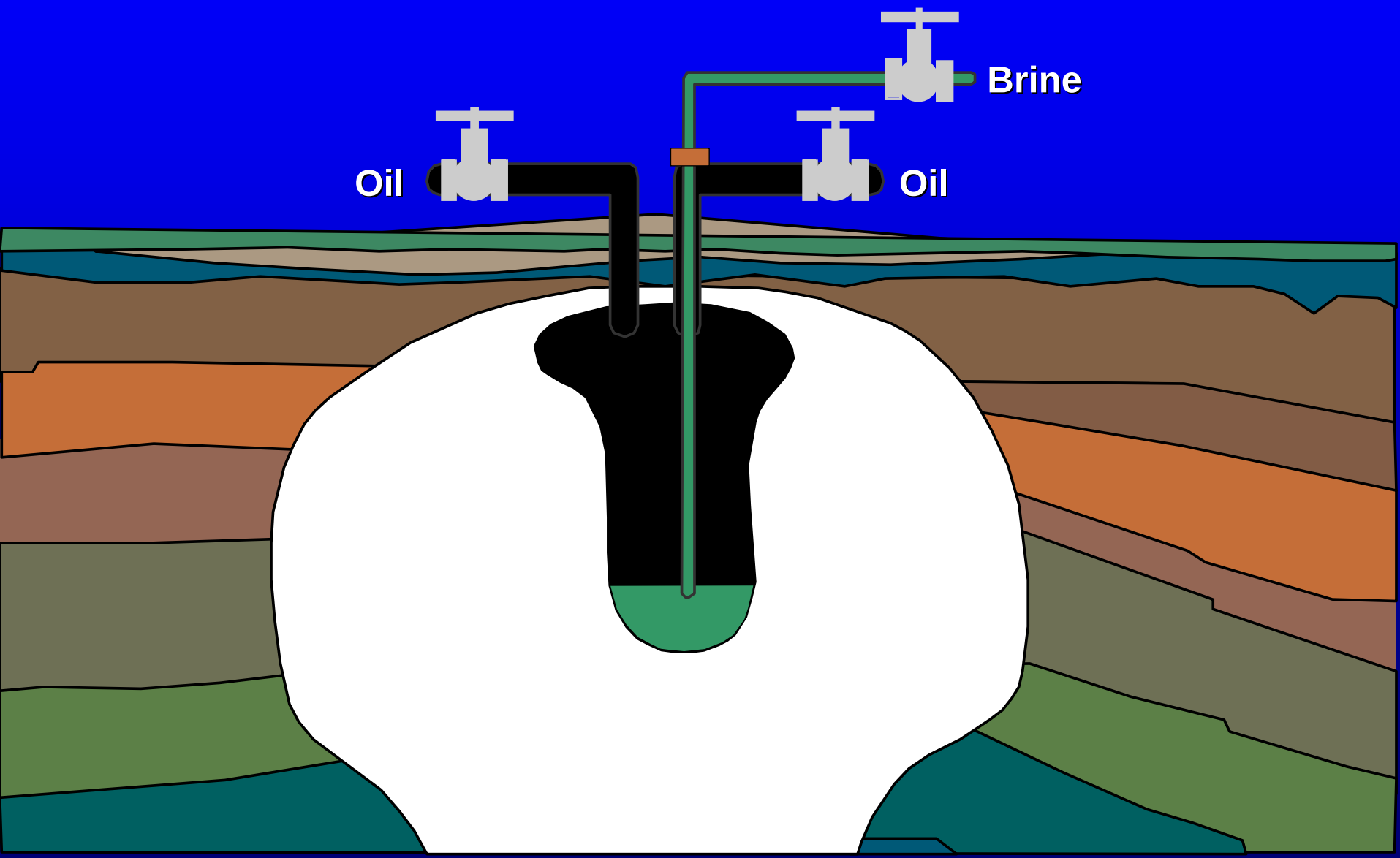
Brine Disposal in Wells



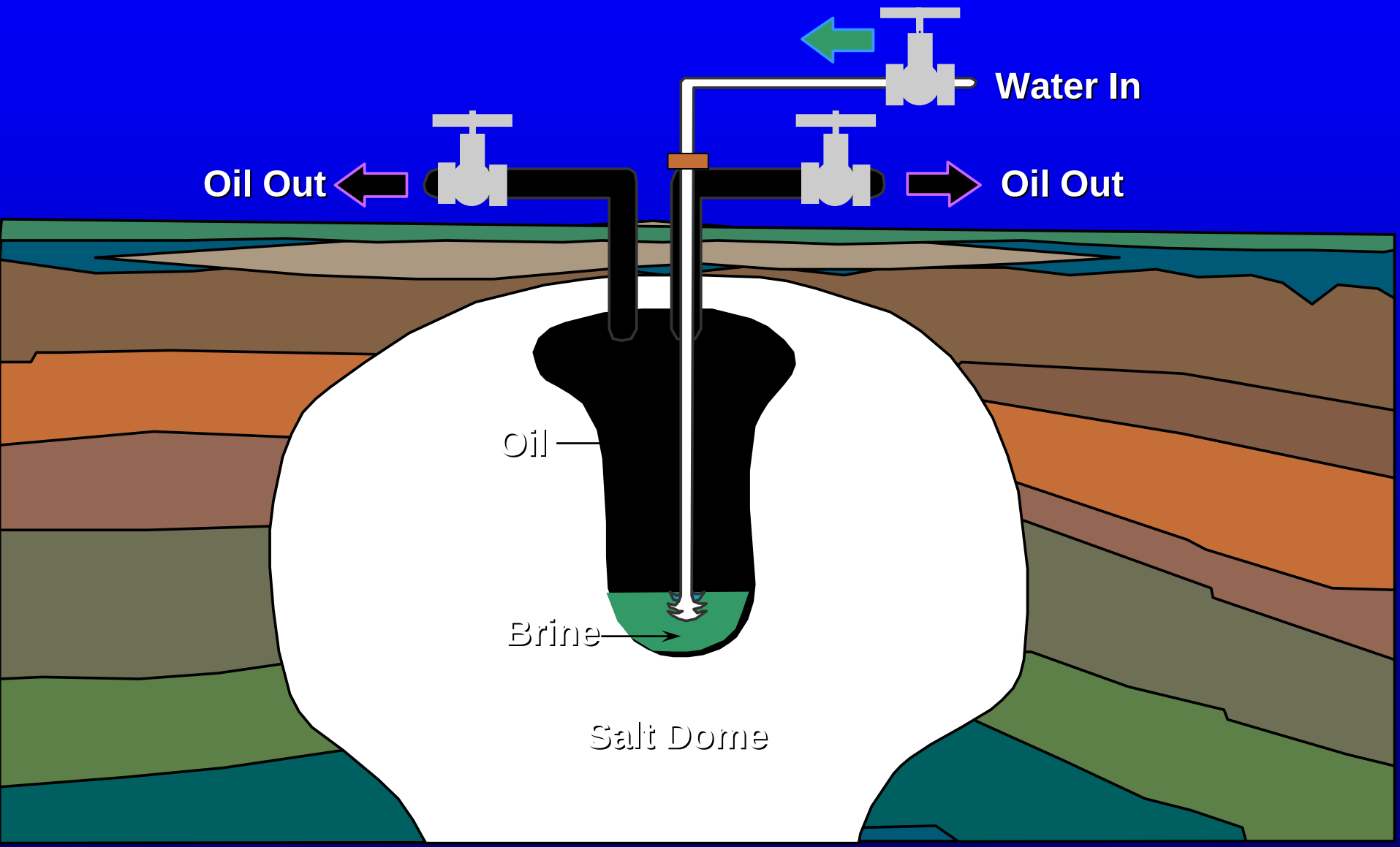
Brine Disposal Pipeline to Gulf



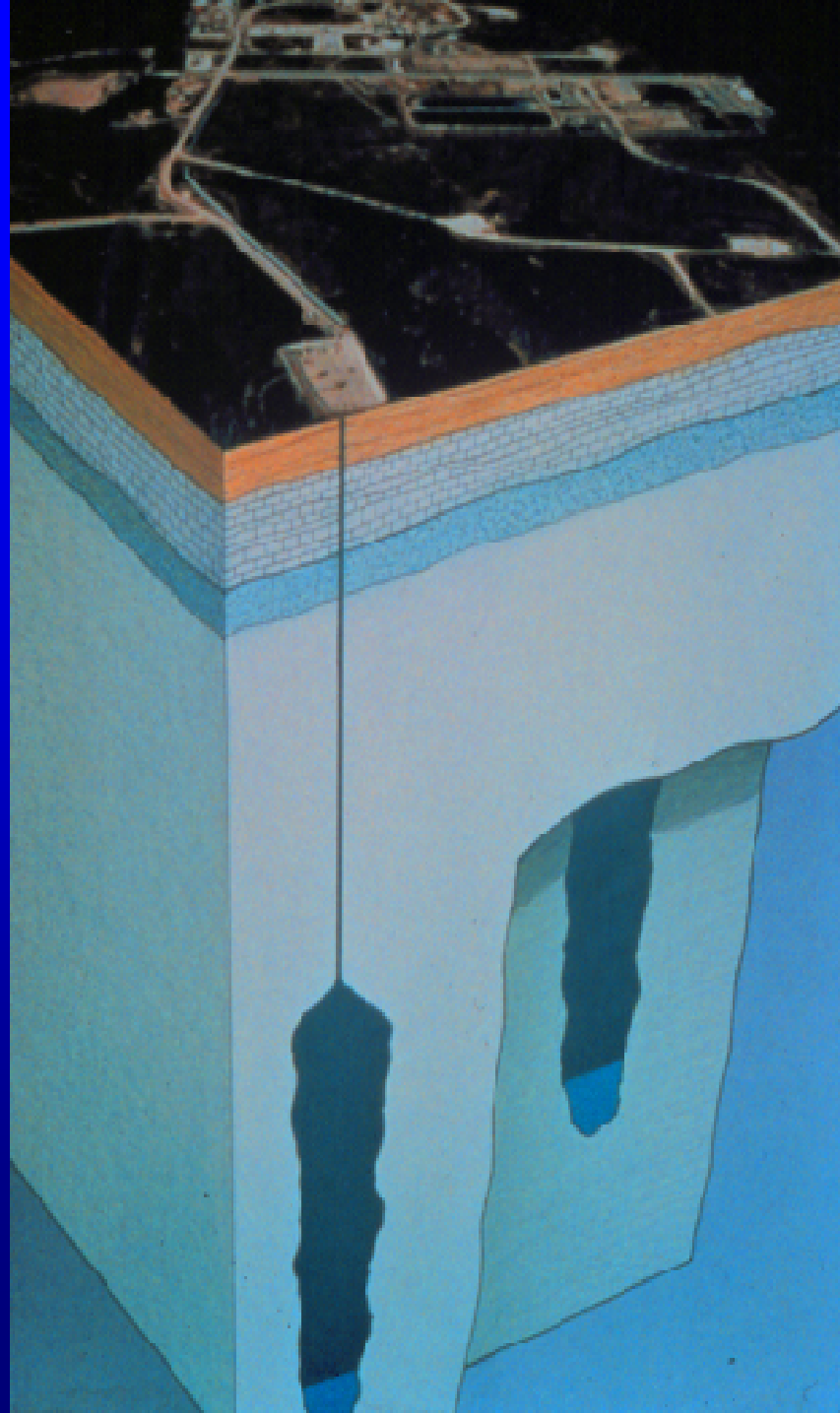
Storage Cavern
Development Complete



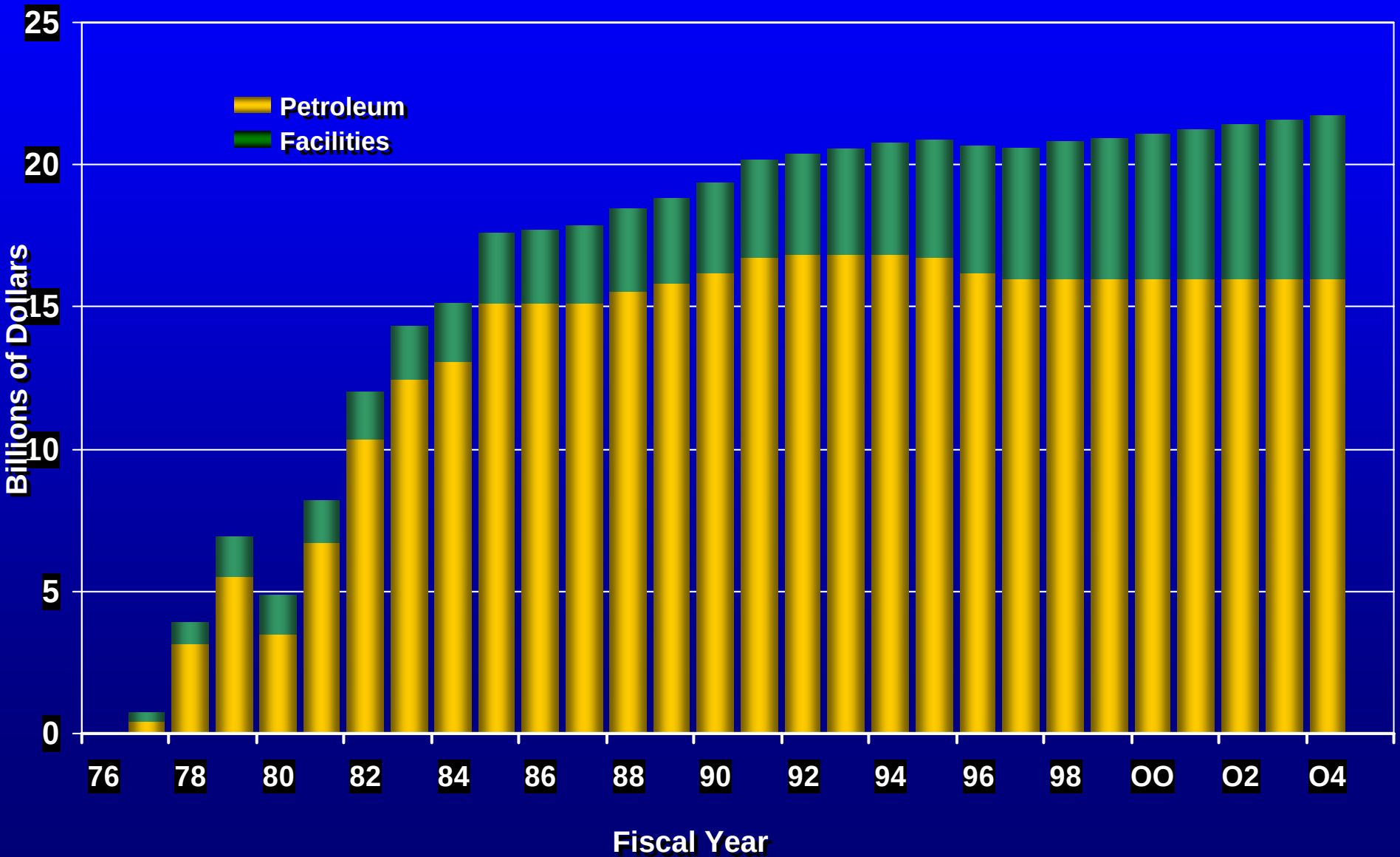
Storage Cavern Drawdown



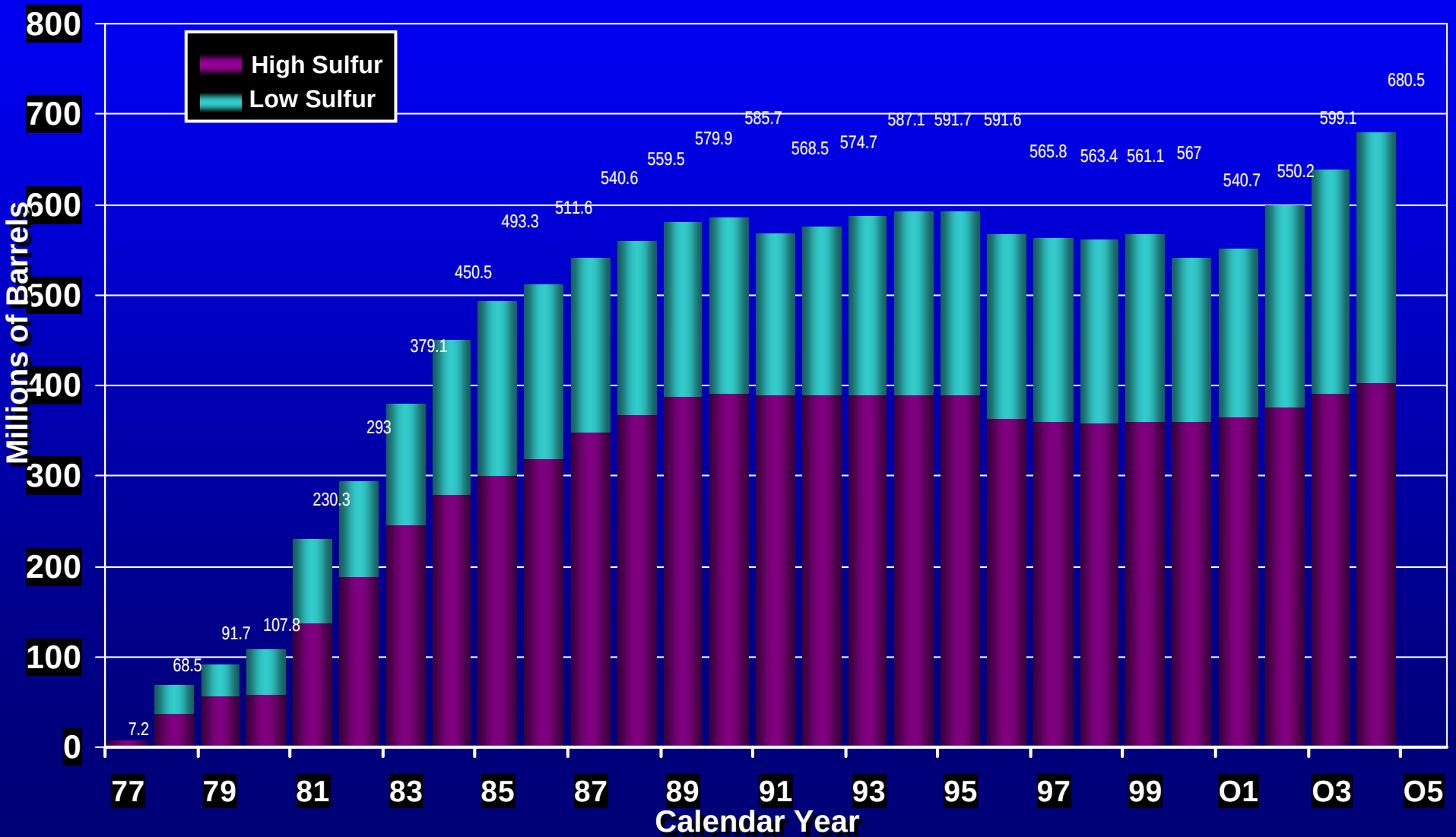
Storage Cavern Cutaway View



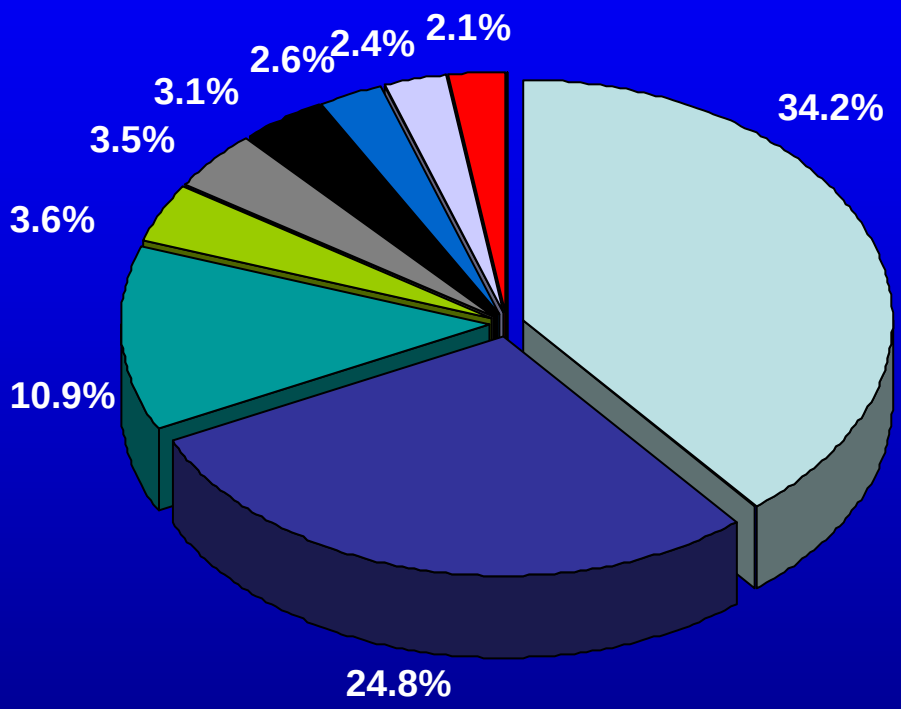
Strategic Petroleum Reserve
Cumulative Funding



Cumulative Strategic Petroleum Reserve Oil Fill



SPR Crude Oil Receipts (Cumulative) Through 2004 (Top Providers)



- Mexico (34.2%)
- United Kingdom (24.8%)
- United States (10.9%)
- Saudi Arabia (3.6%)
- Libya (3.5%)
- Venezuela (3.1%)
- Iran (2.6%)
- UAE (2.4%)
- Nigeria (2.1%)

Authority & Conditions for Use

- US Presidential Authority
- Presidential Finding:
  - A “Severe Energy Supply Disruption”
  - IEP Obligations
- Two Levels Defined:
  - Section 161(d) Full Drawdown
  - Section 161(h) Limited Drawdown - 30 MMB

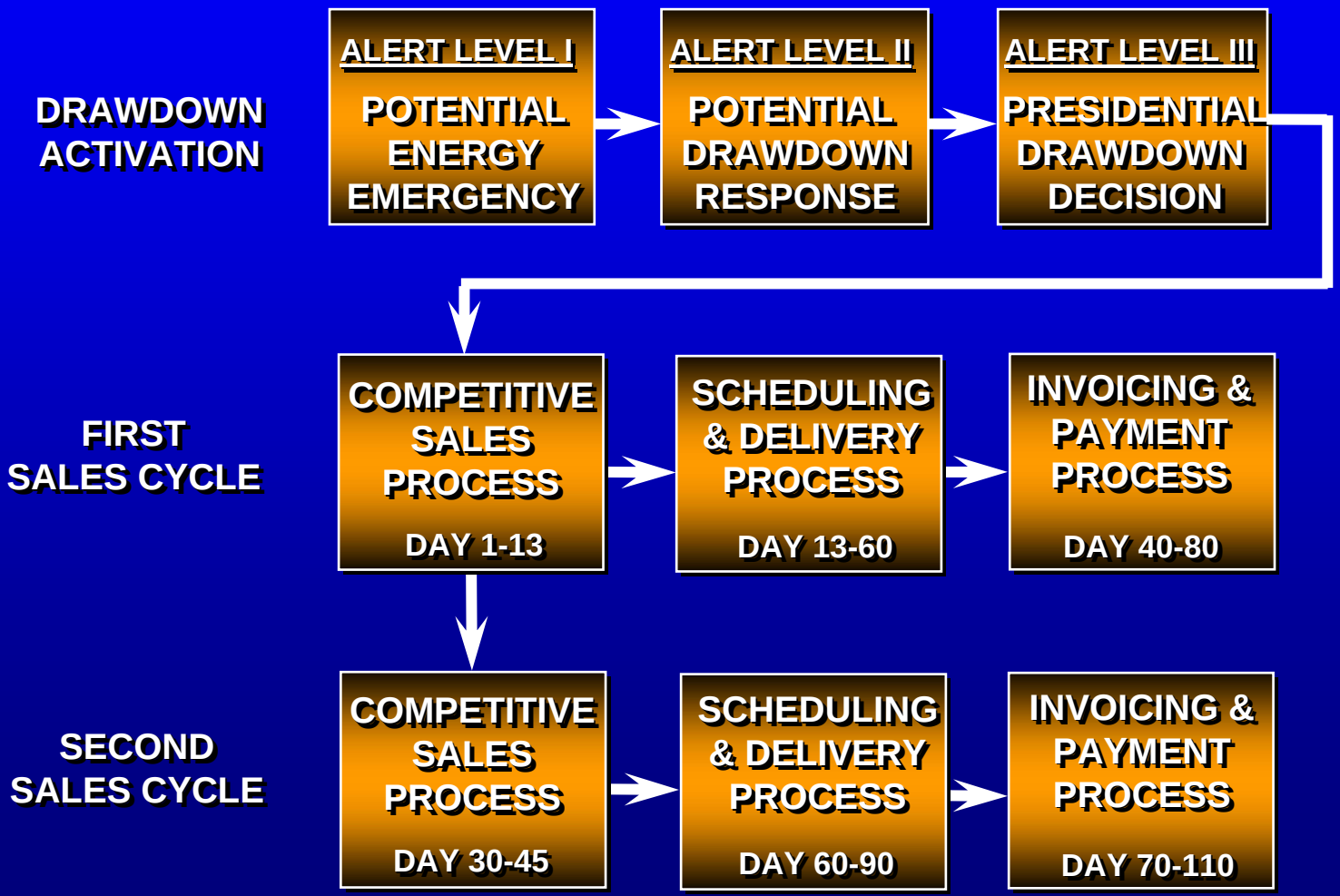
Authority & Conditions for Use

- Secretary of Energy Authority

- Oil Exchange Authority:
  - To Acquire Oil for Reserve
  - To Alter Crude Mix

- Test Sale Authority:
  - To Test Reserve Capabilities
  - Limited to 5 MMB

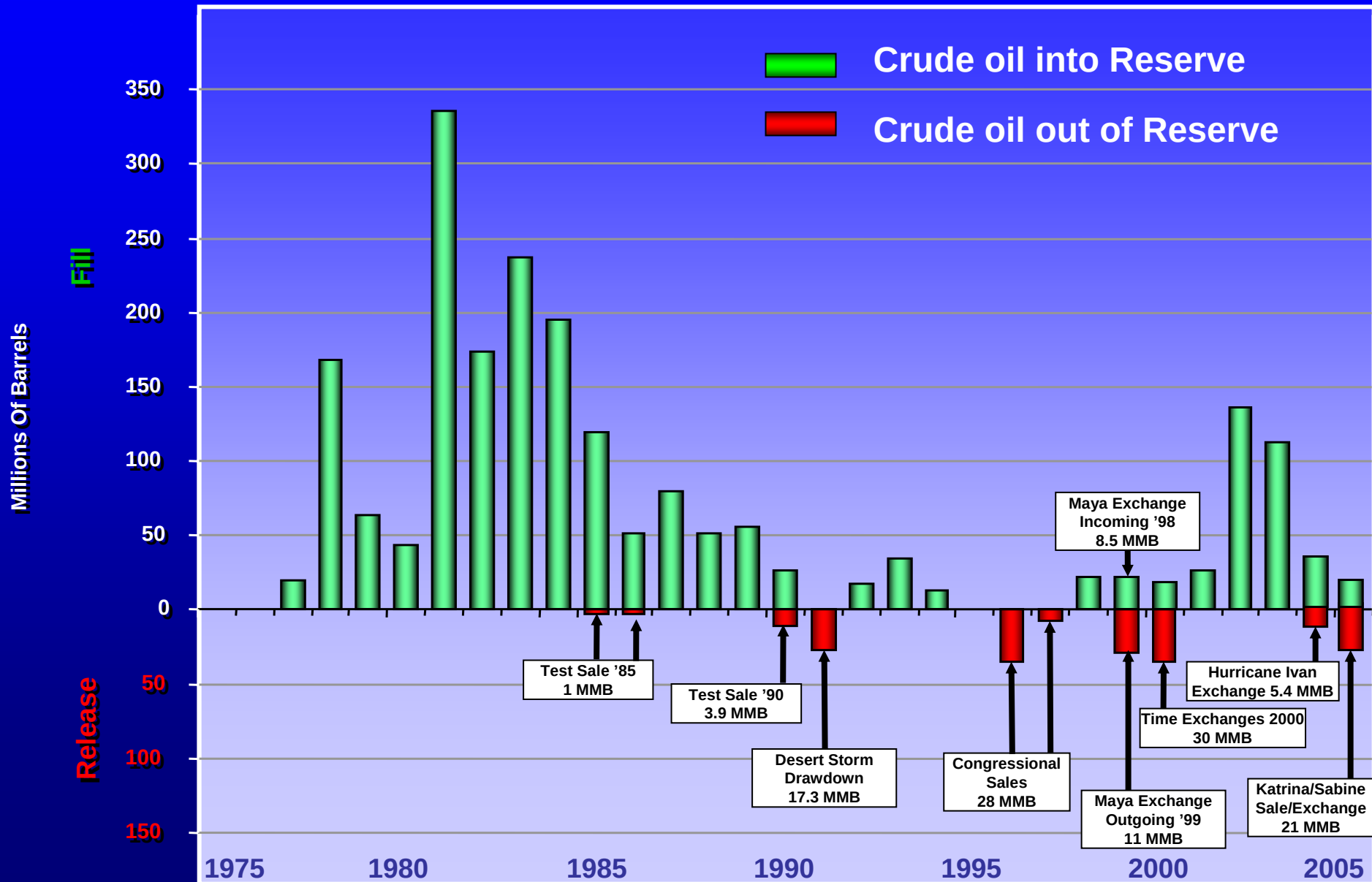
SPR Drawdown Process



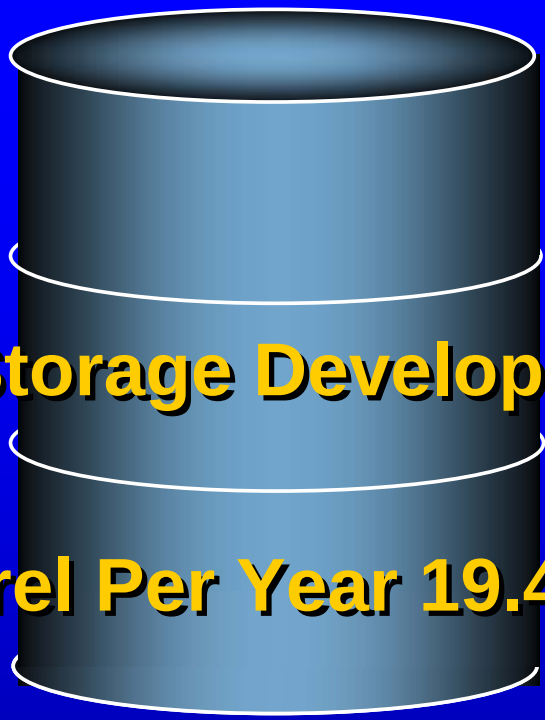
Sales Process

SALES EVENT	DAY
Issue Notice of Sale	Day 1
Receive Offers & Bid Guarantees	Day 5
Notify Successful Offerors / Public	Day 7
Receive Performance Guarantees	Day 8 - 13
Award Contracts	Day 11 - 15
Commence Early Deliveries	Day 13

How the US Reserve Has Been Used

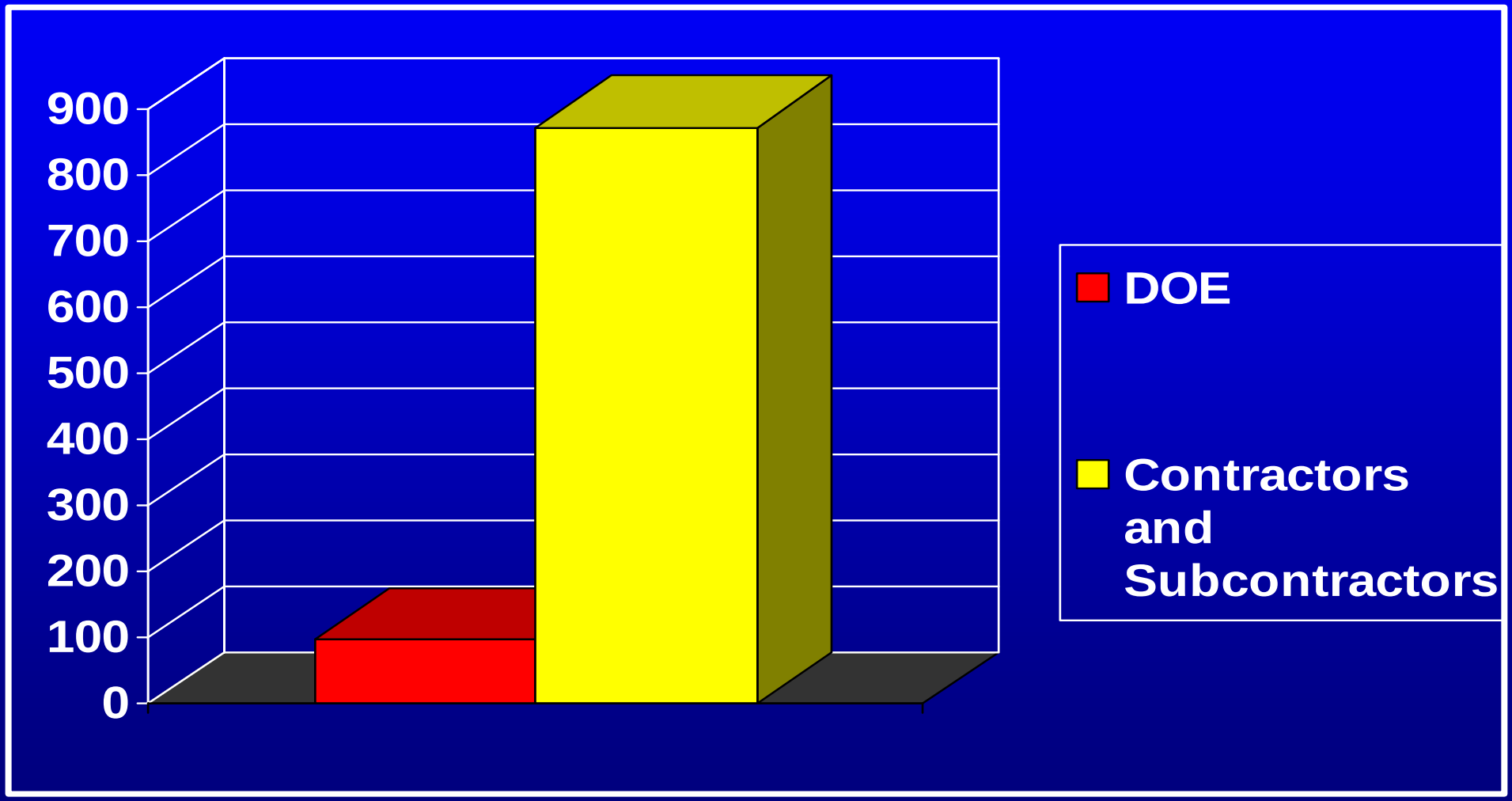


Cost Per Barrel



- **$4.50-$5.00 Per Barrel Storage Development**
- **Operating Cost Per Barrel Per Year 19.4 Cents**
- **Cost Per Barrel Drawdown Reserve 10.28 Cents** (With 90 Day Drawdown Of 395 mmb)

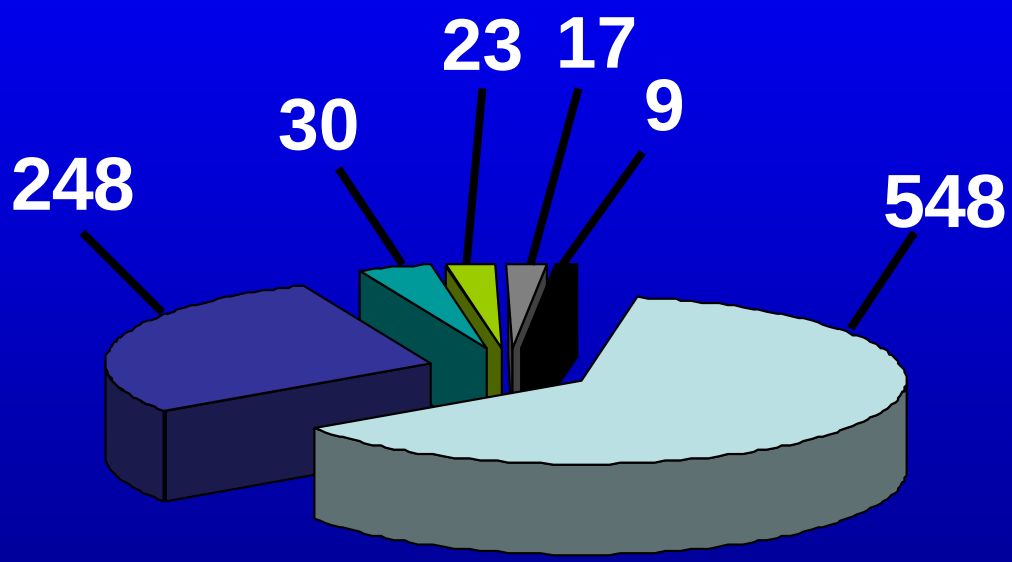
FY 2005 AUTHORIZED STAFFING



DOE- 95 authorized full time equivalents

Contractors and subcontractors – 874 authorized full time equivalents

FY 2005 AUTHORIZED STAFFING



- DynMcDermott
- DynMcDermott Subs
- URS
- Deltha Critique
- ACI
- Sandia

DOE has 95 authorized
Full Time Equivalents positions

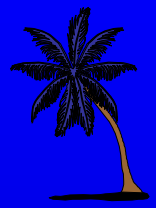
Special Initiatives

- Drawdown Readiness
- Commercialization
- Oil Acquisition And Exchanges
- Environment, Safety, And Health
- Emergency Management and Security

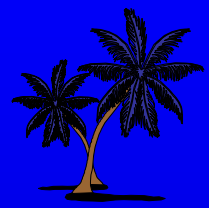
Special Initiatives
Drawdown Readiness

- **Recovery Drills Test Ability To Recover From Natural Or Man-made Disasters**
- **Periodic Assessments - Functions, Facilities And Systems**
- **Continuous Improvement of Drawdown Readiness Processes**

Special Initiatives
Drawdown



State of Hawaii



November 13, 1998, The President Signed An Act Allowing The State Of Hawaii To Submit An Offer To Buy Oil During A Drawdown

Tankers Destined For Hawaii Would Receive Priority Scheduling

Only State Concerned That The SPR Oil Would Not Reach Hawaii Quickly Enough During A Crisis

Special Initiatives
Commercialization

In 1995 Began Program To Lease Or Sell Underutilized Facilities And Pipelines

- **Bayou Choctaw Pipeline Leased To Shell Pipeline Company For 10 Years, 2004 Revenues Equaled $174,338.**

- **St. James Terminal Leased To Equilon Enterprises LLC. dba Shell Oil In 2003, Lease Revenues of $1,700,000.**

- **Two Bryan Mound Pipelines Leased To EXXON Pipeline Company January 1999. In 2004, Lease Revenues Amounted To $1,546,121.**

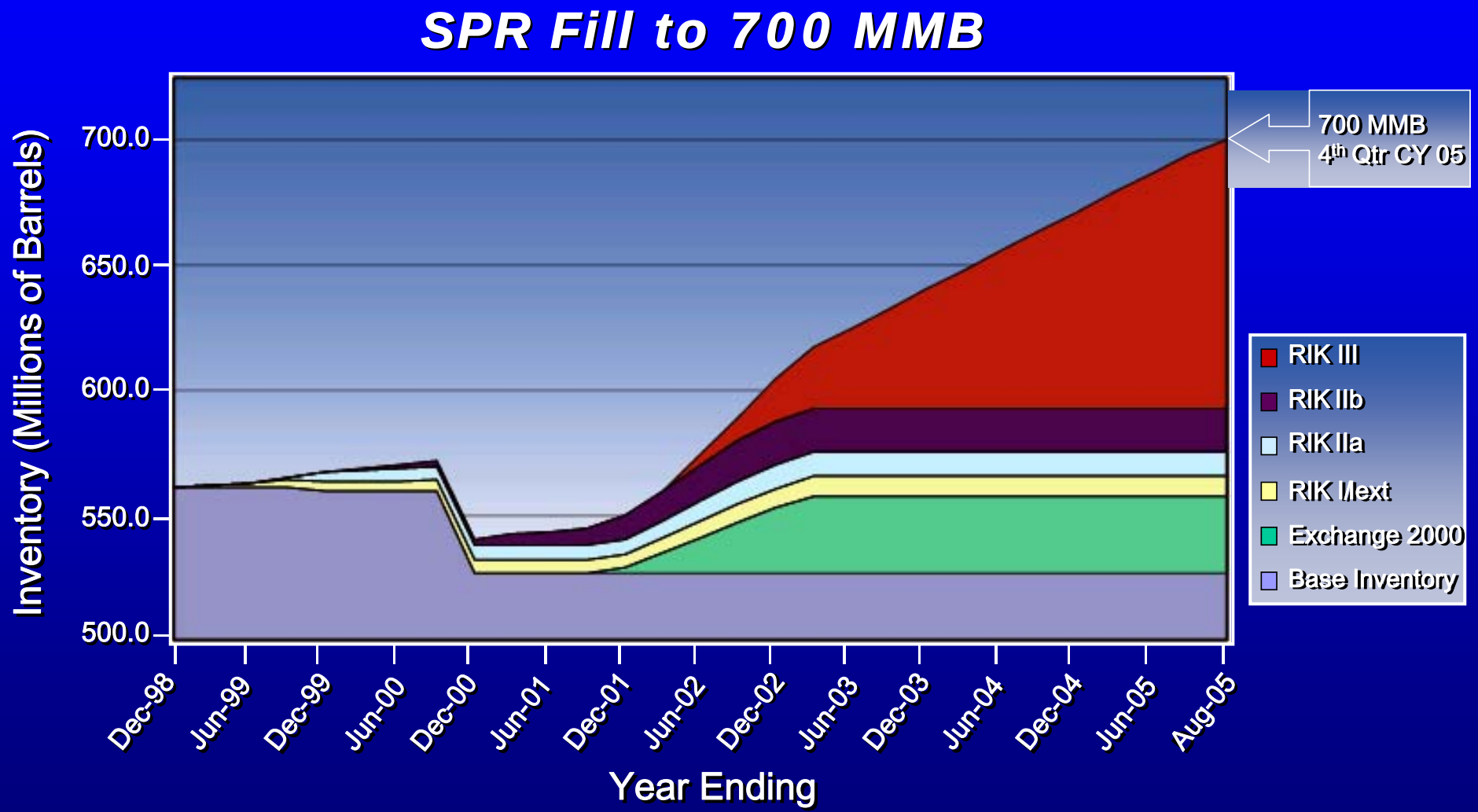
Special Initiatives
Royalty-In-Kind

In 1999 Interagency Agreement W/ Dept of Interior to Divert Federal Royalty Oil Payments From Leases in the Gulf Of Mexico to the SPR

In Nov 2001 The President directed the SPR be filled To 700 mmb Primarily Through RIK Program

As of end of 2004 SPR had received 88.1 mmb under RIK Program which continues to be the SPR primary method of bringing Crude Oil into the Reserve

Special Initiatives
Royalty-In-Kind



Special Initiatives
Heating Oil Reserve

Energy Act 2000 authorizes Secretary of Energy to establish Northeast Home Heating Oil Reserve* of 2mmb distillate located on the east coast to alleviate concerns over low distillate inventories

The SPR issued a solicitation to exchange crude oil for distillate stocks and storage space

The Heating Oil Reserve was filled in October 2000. A new storage terminal was added at Providence, RI in August 2001.

**Operates separately from the SPR*

Special Initiatives
Environmental, Safety & Health

Charter Member
National Environmental Achievement Track
Open Only To Organizations With
Strong Compliance Record

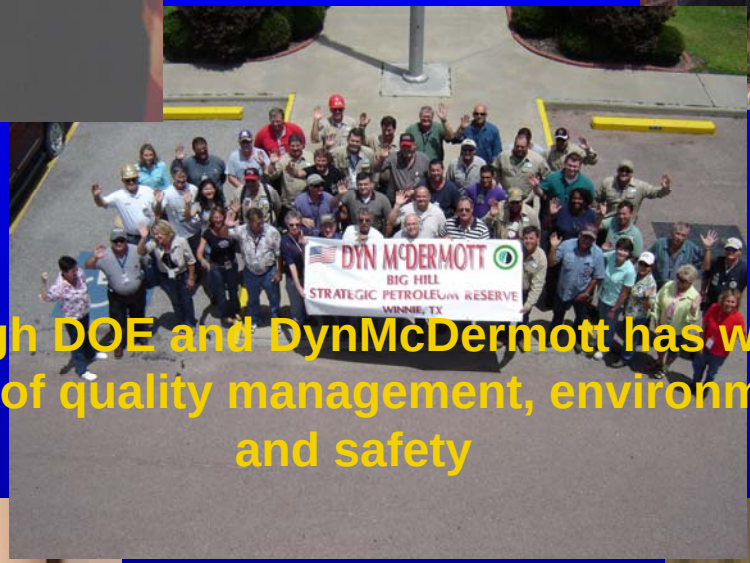
ISO 14001 Environmental Management System
1st US Bulk Petroleum Storage Entity Certified

Voluntary Protection Programs (VPP)
Achieved STAR Status Rating From
Occupational Safety And Health Administration (OSHA)

Award Winning Program

The SPR through DOE and DynMcDermott has won numerous awards in the area of quality management, environmental protection, and safety. Recent awards include:

- Malcolm Baldrige National Quality Award- DynMcDermott M&O contractor
- Louisiana Dept. of Economic Development Lantern Award
- Texas Quality Award – Big Hill
- LA Quality Foundation Award for Environmental Management – NO, WH, BC
- White House Closing the Circle Award
- Clean Texas-Cleaner World National Leader – BH and BM first recipients in state
- DOE Pollution Prevention Award for receiving Positive EMS Return
- Texas GLO OSPRA Award – Big Hill
- APEX and Communicator Award – ESPRIT Newsletter
- Achievement Awards for best Safety Project and Greatest Environmental Impact
- Three Semi-Finalist in ASQ International Team Competition
- Louisiana Chamber Quality Council Award – West Hackberry
- DOE and OSHA VPP Star Award – Big Hill, West Hackberry and Bryan Mound



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Emergency Management and Fire Protection

Coordinates With Federal, State And Local Response Agencies And Private Response Entitles

Emergency Response Teams At Each Site Attend Annual Firefighting Training And Receive Hazardous Materials Clean-Up Training

Security

- Higher Security Posture Since 9-11-01
- Ongoing Improvements And Upgrades At All Sites In All Facets Of Security
- Integrated Safeguards and Security Management Systems In Place
- Enhanced Ability To Prevent Or Respond To Threats To The SPR

Customer Service

Primary Customer Team

Establish Dialogue With Petroleum Industry Primary Customers – Refiners and Traders

Open Communication With SPR Stakeholders, International visitors and Industry

Community Involvement

- Louisiana Regional Science Bowl
- Commemorative Events, African American History, Hispanic Heritage, Women's History
- Historically Black College & Universities Internship And Hispanic Student Internships
- United Way's Annual Campaign
- Holiday Outreach
- Take Our Children To Work

Future Notes

- The Energy Policy Act of 2005 directs the Secretary of Energy to fill the SPR to its authorized one billion barrel capacity.
- This requires the Department of Energy to complete proceedings to select the necessary sites by August 2006
- The DOE is planning to increase capacity at existing SPR storage sites and develop one new storage site

Environmental Impact Statement

- DOE is preparing an EIS to evaluate the environmental impacts of the proposed expansion from its current 727 million barrels by utilizing expansion potential at three of its existing oil storage sites and through the development of a new oil storage site.
- Reference Fossil.Energy.Gov- Techlines

Potential Environmental Issues

The preliminary list of potential environmental issues that may be analyzed in the EIS includes the following:

(1) Air Quality
(2) Water Resources
(3) Ecological Resources
(4) Land Use
(5) Geological Resources
(6) Public Health and Safety
(7) Socioeconomics

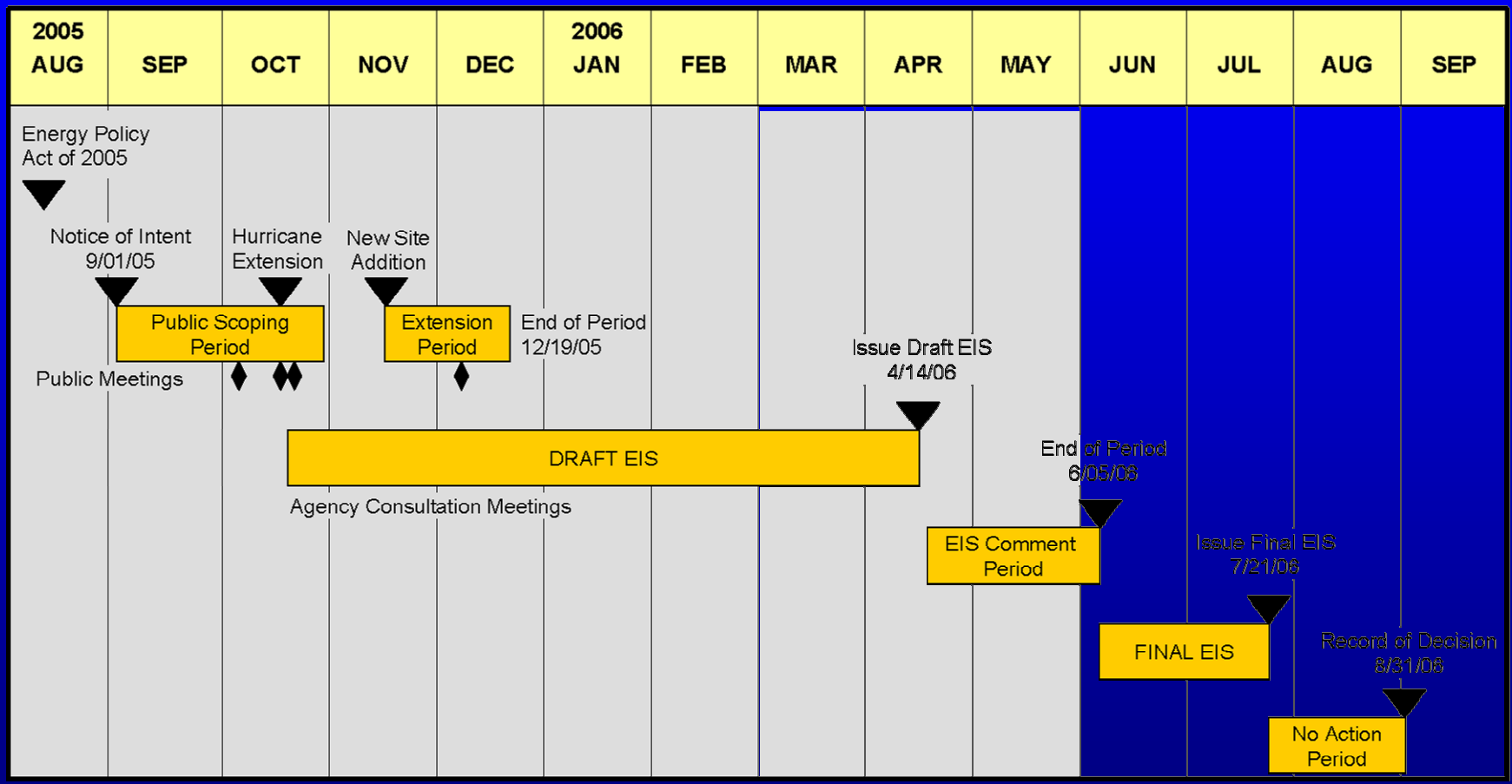
Sites Being Evaluated

- A new site must be selected from the group of sites previously assessed in the Draft Environmental Impact Statement, DOE/EIS-0165-D, or other sites as proposed by a State where a site has been previously studied by the DOE.

Candidate Salt Domes *

* Sites previously assessed in the Draft Environmental Impact Statement, DOE/EIS-0165-D

NEPA Site Selection Schedule



National Energy Policy

- Acknowledges SPR as Major Tool For Responding To Supply Disruptions
- Work With International Energy Agency (IEA) To Ensure Fulfillment Of Stockholding
- Work Closely With Congress To Ensure SPR Protection Is Maintained

Summary and Conclusion

SPR Supports DOE Fossil Energy and Departmental Goals

- Energy Security
- Economic Benefits
- Energy Technology and Environmental Issues
- National Security
- Environment, Safety And Health

U.S. DEPARTMENT OF ENERGY

STRATEGIC PETROLEUM RESERVE