U.S. DEPARTMENT OF ENERGY
STRATEGIC PETROLEUM RESERVE
PROJECT MANAGEMENT OFFICE
NEW ORLEANS, LOUISIANA

Site Environmental Report
For
Calendar Year 2006

COVER: A resident osprey lingers on the SPR West Hackberry site with electrical cable trays and Black Lake in the background.

STRATEGIC PETROLEUM RESERVE

SITE ENVIRONMENTAL REPORT

FOR

CALENDAR YEAR 2006

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Strategic Petroleum Reserve Project Management Office
under Contract No. DE-AC96-93PO92207

DynMcDermott Petroleum Operations Company
850 South Clearview Parkway
New Orleans, Louisiana 70123

Malcolm Baldrige National Quality Award 2005 Award Recipient

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Department of Energy
Strategic Petroleum Reserve Project Management Office
900 Commerce Road East
New Orleans, Louisiana 70123

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Distribution:

SITE ENVIRONMENTAL REPORT FOR 2006 - STRATEGIC PETROLEUM RESERVE

Enclosed for your information is a copy of the Site Environmental Report for Calendar Year 2006 for the U.S. Department of Energy's Strategic Petroleum Reserve. This report is prepared and published annually for distribution to local, State, and Federal Government agencies, the Congress, the public and the news media. The report was prepared for the Department of Energy by DynMcDermott Petroleum Operations Company.

To the best of my knowledge, this report accurately summarizes and discusses the results of the 2006 environmental monitoring program.

If you have any question or desire additional information, please contact G. R. Shutt of the Project Management Office, Office of Technical Assurance at (504) 734-4339.

Sincerely,

William C. Gibson, Jr.
Project Manager

FE-4441: (R. Crist)

Enclosure:
As stated

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QUESTIONNAIRE/READER COMMENT FORM

Please submit your questions/comments on a photocopy of this page and forward it to the following address:

DynMcDermott Petroleum Operations Company
Environmental Department, EF-20
850 South Clearview Parkway
New Orleans, LA 70123

A copy of your comments will be sent to the originator for response.

Date: _____

Name of Submitter:_____

Street or P.O. Box: _____

City/State/Zip code: _____

Organization (if applicable): _____

Comments:

_____

_____

_____

_____

_____

_____

(Attach other sheets as needed)
(for originator's use)

Subject Matter Expert (SME): _____ Date: _____

SME's Response:_____

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ABBREVIATIONS AND ACRONYMS

ac	acre
A&E	Architect and Engineer
ACI	ASRC Constructors, Inc.
AFFF	aqueous film forming foam
AFV	Alternate Fuel Vehicle
ANAB	ANSI-ASQ National Accreditation Board
ANSI	American National Standards Institute
AP	Affirmative Procurement
APHA	American Public Health Association
ASQ	American Society for Quality
ASRC	Artic Slope Regional Corporation
ASTM	American Society for Testing and Materials
avg	average
BACT	best available control technology
bbl	barrel (1 bbl = 42 gallons)
BC	Bayou Choctaw
BDL	below detectable limit
BH	Big Hill
bls	below land surface

ABBREVIATIONS AND ACRONYMS (continued)

BM	Bryan Mound
BOD_5	five day biochemical oxygen demand
BST	Behavioral Safety Technology
°C	degrees Celsius
CAA	Clean Air Act
CAP	corrective action plan
CBT	computer-based training
CEMP	Code of Environmental Management Principles
CEQ	Council for Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESQG	conditionally exempt small quantity generator
CFS	Cubic feet per second
CFR	Code of Federal Regulations
CI	contour interval
CMD	Coastal Management Division of LDNR
CO	carbon monoxide
COD	chemical oxygen demand
COE	United States Army Corps of Engineers
CPG	Comprehensive Procurement Guidelines
CQI	Continuous Quality Improvement
CV	coefficient of variation
CWA	Clean Water Act
CY	calendar year
DCS	Distributed Control System
DM	DynMcDermott Petroleum Operations Company
DMR	discharge monitoring report
DO	dissolved oxygen
DOE	United States Department of Energy
DOT	United States Department of Transportation
E2	Energy Efficiency
E2P2	Energy Efficiency / Pollution Prevention
E&P	Exploration and Production
EA	environmental assessment
EFH	East Fillhole
EIQ	emissions inventory questionnaire

ABBREVIATIONS AND ACRONYMS (continued)

EIS	emissions inventory summary
EIS	environmental impact statement
EMP	Environmental Monitoring Plan
EMS	Environmental Management System
EO	executive order
EOT	Extension of Time
EP	Energy Policy
EPA	United States Environmental Protection Agency
EPACT	Energy Policy Act
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Emergency Response Procedure
ERT	emergency response team
ESA	Endangered Species Act
ES&H	Environmental Safety & Health
ESH&Q	Environmental, Safety, Health, and Quality Assurance
E-W	East-West
FAR	Federal Acquisition Regulations
FEMP	Federal Energy Management Program
FFCA	Federal Facilities Compliance Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FRP	Facility Response Plan
ft	feet
ft/yr	feet per year
FTX	field training exercise
FWPCA	Federal Water Pollution Control Act
F&WS	United States Fish and Wildlife Service
FY	Fiscal Year
GALCOE	U.S. Army Corps of Engineers, Galveston District
GC	gas chromatographic
GLO	General Land Office
gpd	gallons per day
GSA	General Services Administration
GWPMP	Ground Water Protection and Management Plan
HAP	hazardous air pollutant
HVAC	Heating Ventilation Air Conditioning
HW	hazardous waste

ABBREVIATIONS AND ACRONYMS (continued)

ICW	Intracoastal Waterway
ISM	Integrated Safety Management
ISO	International Organization for Standardization
IR	Infrared
km	kilometers
kV	kilovolts
kWhs	kilowatt hours
LA	Louisiana
lab	laboratory
LAC	Louisiana Administrative Code
lbs	pounds
LCF	Light Commercial Facility
LCMS	Lake Charles Meter Station
LCUP	Louisiana Coastal Use Permit
LDEQ	Louisiana Department of Environmental Quality
LDHH	Louisiana Department of Health and Hospitals
LELAP	Louisiana Environmental Laboratory Accreditation Program
LLEA	local law enforcement agency
LPG	Liquefied Petroleum Gas
LDNR	Louisiana Department of Natural Resources
LPDES	Louisiana Pollutant Discharge Elimination System
LWDPS	Louisiana Water Discharge Permit System
m	meters
m^3	cubic meters
ml	milliliters
m/yr	meters per year
max	maximum
MCL	maximum contaminant levels
MDEQ	Mississippi Department of Environmental Quality
MDR	maximum diversion rate
mgd	million gallons per day
mg/l	milligrams per liter
mmb	million barrels
MPAR	Maintenance Performance Appraisal Report
m/sec	meters per second
M&O	management & operating

MS	Mississippi
msl	mean sea level
MSDS	Material Safety Data Sheets
MSGP	multi-sector general permit
mt	metric tons
MW	monitoring well
N	north
NAAQS	National Ambient Air Quality Standards
NAEP	National Association of Environmental Professionals
NAICS	North American Industry Classification System
NE	northeast
NEPA	National Environmental Policy Act
NEPT	National Environmental Performance Track
NFRAP	No Further Remedial Action Planned
NHPA	National Historic Preservation Act
NIMS	National Incident Management System
NMID	number of measures identified
NMIN	number of measures installed
NO	New Orleans
NODCOE	U.S. Army Corps of Engineers, New Orleans District
NOEC	No Observed Effect Concentration
NOEP	New Orleans Emergency Preparedness
NOI	Notice of Intent
NORM	naturally occurring radioactive material
NOV	notice of violation
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List (CERCLA)
NRC	National Response Center
N-S	North-South
NSR	new source review
NV	not a valid or statistically meaningful number
NW	northwest
NWP	nationwide permit
O&G	oil and grease
OPA	Oil Pollution Act of 1990
OSPRA	Oil Spill Prevention and Response Act

ABBREVIATIONS AND ACRONYMS (continued)

OVA	organic vapor analyzer
P&A	plug and abandon
P2	Pollution Prevention
P2E2	Pollution Prevention Energy Efficiency (see E2P2)
PCB	polychlorinated biphenyl
PdM	predictive maintenance
PE	performance evaluation
pH	negative logarithm of the hydrogen ion concentration
PID	Performance Improvement Department
PM_{10}	particulate matter (less than 10 microns)
PMO	Project Management Office
PPA	Pollution Prevention Act of 1990
PPOA	Pollution Prevention Opportunity Assessment
PPP	Pollution Prevention Plan
ppt	parts per thousand
PREP	Preparedness for Response Exercise Program
PSD	prevention of significant deterioration
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
PW	periphery well
PZ	piezometer
QC	quality control
QPL	Qualified Products List
RAB	Registrar Accreditation Board
RCRA	Resource Conservation and Recovery Act
RCT	Railroad Commission of Texas
RECAP	Risk Evaluation Corrective Action Program
ROD	Record of Determination
RQ	reportable quantity
RWIS	sSouth
SAL	salinity
SAP	Systems, Applications and Products (SAP GmbH)
SARA	Superfund Amendments and Reauthorization Act
SCIB	small craft intrusion barrier
SDWA	Safe Drinking Water Act
SE	southeast

ABBREVIATIONS AND ACRONYMS (continued)

SEMIS	SPR ES&H Management Information System
SER	Site Environmental Report
SHPO	State Historic Preservation Office
SIC	Standard Industrial Classification
SIP	state implementation plan
SO_2	sulfur dioxide
SOC	security operations center
SO_X	Sulfur oxides
SPCC	Spill Prevention Control and Countermeasures
SPR	Strategic Petroleum Reserve
SPRPMO	Strategic Petroleum Reserve Project Management Office
SSni	Screening Standards Non Industrial
SQG	small quantity generator
STP	sewage treatment plant
s.u.	standard units
SW	southwest
SWPPP	Storm Water Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
TCLP	Toxicity Characteristic Leaching Procedure
TDH&PT	Texas Department of Highways and Public Transportation
TDS	total dissolved solids
TNRCC	Texas Natural Resource Conservation Commission
TOC	total organic carbon
TPDES	Texas Pollution Discharge Elimination System
TPH	Total Petroleum Hydrocarbons
TPQ	threshold planning quantity
tpy	tons per year
TRI	Toxic Release Inventory
TSCA	Toxic Substance Control Act
TSD	Treatment Storage Disposal
TSS	total suspended solids
TVP	True Vapor Pressure
TX	Texas
UIC	underground injection control
URS	United Research Services
USCG	United States Coast Guard

ABBREVIATIONS AND ACRONYMS (continued)

UST	underground storage tank
VOC	volatile organic compound
VWS	Verification Well Study
WAD	Work Authorization Directive
VWS	verification well study
W	west
WH	West Hackberry
WILT	Weeks Island Long Term

EXECUTIVE SUMMARY

The purpose of this Site Environmental Report (SER) is to characterize site environmental management performance, confirm compliance with environmental standards and requirements, and highlight significant programs and efforts for the U. S. Department of Energy (DOE) Strategic Petroleum Reserve (SPR). The SER, prepared annually, serves the public by summarizing monitoring data collected to assess how the SPR impacts the environment. The SER provides a balanced synopsis of non-radiological monitoring and regulatory compliance data, affirms that the SPR has been operating within acceptable regulatory limits and promotes pollution prevention, and illustrates the success of SPR efforts toward continual improvement.

Included in this report is a description of each site's environment, an overview of the SPR environmental program, and a recapitulation of special environmental activities and events associated with each SPR site during CY 2006.

There was one reportable oil spill (two to three barrels) that occurred at the West Hackberry site and zero reportable brine spills during 2006. The long-term trend for oil and brine spills has declined substantially from 27 in 1990 down to one in 2006. The spill was reported to the appropriate agencies and immediately cleaned up with no quantifiable environmental impact.

Concern for the environment is integrated into daily activities through environmental management. In addition, adherence to the requirements of Executive Order 13148 also ensures that a high level environmental stewardship is maintained. The SPR's continuing efforts to improve the quality, cost effectiveness, and seamless integration of environmental awareness and control into all operations are consistent with the SPR Environmental Management System and the ISO 14001 standard, as part of a greater Integrated Safety Management System.

The SPR management and operating contractor's environmental management system (EMS) has been certified by a third party registrar against the international ISO 14001 standard since May 2000. The DOE Environmental Management System was self-certified in 2006. The SPR is a charter member of the EPA National Environmental Performance Track (NEPT) program and in 2006 completed its second three-year membership in the program. Less than half of the 226 charter members have been able to maintain such continuous membership like the SPR has since the inception of this elite program. The Big Hill and Bryan Mound sites were also selected by the Texas Commission on Environmental Quality as the first Platinum Level members of their Clean Texas program. Both programs recognize and reward facilities that have environmental management systems and manage beyond regulatory requirements.

The SPR sites were inspected or visited on twelve occasions by outside regulatory agencies or third party auditors during 2006. There were no findings associated with these inspections. One minor noncompliance that occurred at West Hackberry was self-reported under state and federal discharge permits for all SPR sites during 2006, and no Clean Air Act, Clean Water Act or RCRA Notice of Violations (NOV) were received.

During 2006 the SPR facilities in Louisiana and Mississippi continued to operate as Conditionally Exempt Small Quantity Generators (CESQG). The two Texas sites briefly operated as Small Quantity Generators (SQG) for one month and immediately returned to CESQG status. The SPR is not a hazardous waste treatment, storage, or disposal (TSD) facility. Superfund Amendments and Reauthorization Act (SARA) Title III, Tier Two, reports for each facility were prepared and submitted to a number of agencies detailing the kinds and amounts of hazardous substances on SPR facilities. The submittal of a (TRI) Form R was required in 2006 because the SPR introduced crude oil into commerce (drawdown) due to the Hurricanes Katrina and Rita in 2005.

The SPR facilities operate under the National Pollutant Discharge Elimination System (NPDES). The Louisiana Department of Environmental Quality (LDEQ) has primacy for the Louisiana NPDES program (LPDES) while the Railroad Commission of Texas (RCT), which has SPR jurisdiction in Texas, does not. Consequently, at this time, there is a dual federal and state discharge program only at the Texas sites. Also, each SPR site operates in accordance with a Pollution Prevention Plan prepared in accordance with a separately issued general permit for storm water associated with industrial activity.

The air quality programs at the SPR facilities are regulated by LDEQ and TCEQ for the Louisiana and Texas sites respectively. The effluent monitoring of hazardous and non-hazardous air pollutants at the SPR indicated that all the sites operated in accordance with air quality regulatory requirements during CY 2006.

The SPR met its drill and exercise requirements for 2006 under the Oil Pollution Act of 1990 (OPA) through the National Preparedness for Response Exercise Program (PREP).

Environmental compliance and management audits were conducted in-house and by outside entities. DOE Strategic Petroleum Reserve Project Management Office (SPRPMO) appraisal teams conducted formal annual appraisals at the New Orleans Headquarters and the Bayou Choctaw, Big Hill, and West Hackberry sites, meeting with Management and Operations (M&O) and construction contractor management staff, reviewing environmental practices and performance indicators, environmental management systems, and reviewing findings with contractor staff. During FY 2006 there were 12 low risk environmental findings associated with the DOE SPRPMO audits. Nine of these findings were corrected by the end of 2006. Internal M&O contractor environmental assessments at the five SPR sites during FY 2006 identified no high or medium risk environmental findings and 29 low risk environmental findings. Table 2-7 in Section 2 of this report provides a tabulation of the M&O environmental assessments. Twice during FY 2006, Advanced Waste Management Systems, Inc., a third party registrar, audited the DynMcDermott Petroleum Operations Company (DM) EMS against the ISO 14001 standard. Three minor non-conformances were found. Surveillance Audits are conducted by the registrar every six months. Of the total 44 findings, none of the findings identified environmental degradation.

The SER also characterizes environmental management performance and programs pertinent to the SPR. The active permits and the results of the environmental monitoring program (i.e., air, surface water, ground water, and water discharges) are discussed within each section by site. The quality assurance program utilized at the SPR is presented and includes results from laboratory and field audits and studies performed internally and by regulatory agencies. Internal DOE on-site management appraisals were performed in compliance with the SPRPMO Order 220.1, and criterion 10 of DOE Order 414.1C. DM's internal assessments were conducted in accordance with instruction, Organizational Assessment (NOI1000.72). This characterization, discussion, and presentation illustrate the SPR's environmental performance measures program.

The Questionnaire/Reader Comment Form located inside the front cover of this document may be utilized to submit questions or comments to the originator for response.

End of section

1. INTRODUCTION

As required by DOE Order 231.1A, the purpose of this Site Environmental Report (SER) is to present a summary of environmental data gathered at or near Strategic Petroleum Reserve (SPR) sites to characterize site environmental management performance, confirm compliance with environmental standards and requirements, assure protection of the public, and highlight significant programs and efforts.

The creation of the SPR was mandated by Congress in Title I, Part B, of the Energy Policy and Conservation Act (P.L. 94-163), of December 22, 1975. The SPR provides the United States with sufficient petroleum reserves to mitigate the effects of a significant oil supply interruption.

Emergency crude oil supplies are stored by the SPR in salt caverns. The caverns were created deep within the massive Louann salt deposits that underlie most of the Texas and Louisiana coastline. The caverns currently in use were created through the process of solution mining.

The utilization of the caverns to store crude oil provides assurance against normal hazards associated with the above ground storage, offers the best security, and is the most affordable means of storage. The cost of using caverns to store crude oil is up to 10 times less than aboveground tanks and 20 times less than hard rock mines.

Storage locations along the Gulf Coast were selected because of the combination of a preponderance of salt domes and proximity to a key portion of the Nation's commercial oil transport network. SPR oil can be distributed through interstate pipelines to nearly half of the Nation's oil refineries or loaded into ships or barges for transport to other refineries. The SPR presently consists of four Gulf Coast underground salt dome oil storage facilities (two in Louisiana and two in Texas), two warehouse facilities (one in Louisiana and one in Mississippi), and a project management facility (in Louisiana). Two other sites are no longer

active SPR storage facilities, Weeks Island in Iberia Parish, LA, and St. James Terminal in St. James Parish, LA. Weeks Island was decommissioned in November 1999 and St. James Terminal was leased to Shell Pipeline in January 1997. Although these two sites are no longer active SPR storage facilities, they continue as SPR property and therefore, the sites are addressed in this report.

Three of the currently operating salt domes, Bayou Choctaw, Bryan Mound, and West Hackberry, were selected as storage sites early in the SPR program due to their existing brine caverns, which could be readily converted to oil storage and their proximity to commercial marine and pipeline crude oil distribution facilities. The storage capacity at the fourth operating site, Big Hill, was fully developed by the SPR.

The SPR crude oil storage sites are located near marsh or other wetland areas so protection of the environment through oil spill prevention and control is a primary commitment. Each SPR site has structures in place to contain or divert any harmful release that could impact surrounding waterways or land areas. Onsite spill control equipment, detailed emergency plans, and extensive training are used to ensure that the environment is safeguarded.

At year's end, the SPR employed approximately 860 government and contractor personnel, excluding subcontract maintenance and construction personnel.

1.1 BAYOU CHOCTAW

The Strategic Petroleum Reserve (SPR) Bayou Choctaw storage facility is located in Iberville Parish, Louisiana. The storage facility occupies 356 acres. Development of the site was initiated in 1977 and completed in 1991. Small canals and bayous flow through the site area and join larger bodies of water off-site.

The area surrounding the site is a freshwater swamp, which includes substantial stands of bottomland hardwoods with interconnecting waterways. The site proper is normally dry and protected from spring flooding by the site's flood control levees and pumps. The surrounding forest and swamp provide habitat for a diverse wildlife population, including many kinds of birds and mammals such as raccoon and deer, and reptiles including the American alligator.

1.2 BIG HILL

The Strategic Petroleum Reserve (SPR) Big Hill storage facility is located in Jefferson County, Texas. The storage site covers approximately 270 acres over the Big Hill salt

dome. The Big Hill storage facility is the SPR's most recently constructed storage facility and is located close to commercial marine and pipeline crude oil distribution facilities. Development of the site was initiated in 1982 and completed in 1991.

Most of the site is upland habitat, consisting of tall grass. A few 150-year-old live oak trees are present on the site. The nearby ponds and marsh provide excellent habitat for the American alligator and over-wintering waterfowl. Identified bird concentrations and rookeries are located in the area of the site. No rare, threatened, or endangered species habitat has been identified in the vicinity of the Big Hill site. Wildlife in the area includes coyote, rabbits, raccoon, and many bird species.

1.3 BRYAN MOUND

The Strategic Petroleum Reserve (SPR) Bryan Mound storage facility is located in Brazoria County, Texas. The storage facility occupies 500 acres, which almost encompasses the entire Bryan Mound salt dome. Development of the site was initiated in 1977 and completed in 1987.

The marsh and prairie areas surrounding Bryan Mound are typical of those found throughout this region of the Texas Gulf Coast. Brackish marshland dominates the low-lying portions of the site. The coastal prairie is covered with tall grass forming cover and feeding grounds for wildlife. Water bodies surrounding the site provide a diverse ecosystem. Marshes and tidal pools are ideal habitats for a variety of birds, aquatic life, and mammals. Migratory waterfowl as well as nutria, raccoon, skunks, rattlesnakes, turtles, and frogs can be found on and in the area surrounding Bryan Mound.

1.4 ST. JAMES TERMINAL

The St. James Terminal located along the Mississippi River in St. James Parish, Louisiana was leased to Shell Pipeline in 1997. The property consists of 173 acres in three parcels. The main facility is just west of the Mississippi River, and two satellite docks are located on the west Mississippi River batture. A small onsite area was identified as contaminated with crude oil and remediation efforts toward clean closure through bioremediation are ongoing.

1.5 WEEKS ISLAND

The Weeks Island facility located in Iberia Parish, Louisiana, was decommissioned in 1999 and long-term groundwater monitoring suspended at the end of 2004, when five full years of monitoring was completed. The property consists of a number of surface

parcels of land totaling seven acres, and an additional underground portion of the salt dome. In October 2005, concurrence by LDNR that post closure monitoring had been successfully completed was received. The property and above ground assets await final disposition to a new owner through real estate transfer facilitated by the General Services Administration (GSA).

1.6 WEST HACKBERRY

The Strategic Petroleum Reserve (SPR) West Hackberry storage facility is located in Cameron Parish, Louisiana. The storage site covers approximately 565 acres on top of the West Hackberry salt dome. Development of the site was initiated in 1977 and completed in 1988.

Numerous canals and natural waterways bisect the area. The surrounding area consists of marshland with natural ridges. These ridges, called cheniers, typically support grass and trees and affect water flow through the marshes. In many areas, lakes, bayous, and canals are concentrated so that the marsh may not seem to be a landmass, but rather a large region of small islands.

The marshlands surrounding the West Hackberry site provide excellent habitat for a variety of wetland species. Many bird species frequent the area, including southern bald eagle, Arctic peregrine falcon, brown pelicans, and waterfowl. Other inhabitants include red fox, raccoon, nutria, opossum, wolf, bobcat, rabbits, and white-tailed deer. The American alligator is extremely common, breeding and nesting in this area. The marsh also supports a variety of other reptiles, fish, shellfish, and mammals.

1.7 SPR HEADQUARTERS

The project management office for SPR operations is housed in two adjacent office buildings and a nearby warehouse in Harahan, Louisiana, part of the New Orleans metropolitan area. This facility is the main office through which DynMcDermott manages, operates, maintains and supports the crude oil reserve sites. Activities conducted at the New Orleans office complex are predominantly administrative with nearby warehouse capacity. Office and warehouse space is leased, not owned, by the Department of Energy.

1.8 STENNIS WAREHOUSE

The Stennis Warehouse facility is located in Hancock County, Mississippi. The warehouse, and adjacent concrete aprons and parking lot occupy approximately 3.4

acres within the John C. Stennis Space Center. The Space Center is located approximately 8 miles southeast of Picayune, Mississippi. The warehouse has been leased from the U.S. Army since 2004. It is used to maintain and store heavy pieces of equipment and piping in support of the four storage sites. It also has office space permanently used by its tenants and, if needed, temporarily used by headquarters personnel.

End of Section

2. COMPLIANCE SUMMARY

General

The SPR operates in conformance with standards established by federal, state, and local statutes and regulations, Executive Orders, and Department of Energy (DOE) orders and directives. A list of environmental federal, state, and many of the DOE standards that, in varying degrees, affect the SPR is provided in Appendix A.

The DOE Office of Deputy Assistant Secretary for the Petroleum Reserves has overall programmatic responsibility for establishing the objectives of the SPR. The SPRPMO Project Manager is responsible for implementing these goals and objectives including articulating an Environmental Policy statement that is responsive to Departmental requirements. The DOE policy (SPRPMO P 451.1B) is applied to SPR operations through the current M&O contractor's Environmental Policy (both in Appendix B).

The SPR has had an Environmental Protection Program since its inception and initial operation in 1978. The SPRPMO has assigned contractual responsibilities for implementation of the program to the current Management & Operating (M&O) contractor, DynMcDermott Petroleum Operations Company (DM). The M&O contractor operates on behalf of DOE with regard to waste classification, representations, shipments, and disposal for all SPR activities. Additional responsibilities, as applicable, are assigned to the Architect-Engineering (A&E) contractor, URS Group, Inc., the Construction Management services contractor, Arctic Slope Regional Corporation Constructors, Inc. (ACI), and SPR subcontractors. DM has been under contract to DOE since April 1, 1993.

The SPRPMO Environmental, Safety, Health, and Quality Assurance (ESH&Q) division is responsible for development and oversight of ES&H programs and provides direction, technical guidance, and independent oversight to its prime contractors in the implementation of environmental programs and assessment of contractor performance. It is the SPR's policy and practice to conduct operations in compliance with all applicable environmental requirements with the highest regard for protection and preservation of the environment. Compliance status in this year's report reflects compliance activities conducted by DOE and DM personnel. The SPRPMO has self-certified that it operates an EMS conforming to the ISO 14001 standard.

To illustrate its commitment to excellence with regard to environmental management, DM also operates with an EMS that is certified against the ISO 14001 standard by a third party registrar. This EMS reinforces conformance with DOE Order 450.1, the environmental management

requirements of Executive Order 13148, and strengthens the environmental leg of the SPR Integrated Safety Management (ISM) system.

A summary of the programs and procedures that presently make up the SPR environmental protection program includes:

a. a NEPA program that provides a comprehensive environmental review of all projects including purchase requisitions, engineering scopes of work, engineering change proposals, design reviews, and design changes for all SPR activities;

b. a wetlands and floodplains management program that addresses projects that have an impact on Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and state coastal zone management programs;

c. inspections, appraisals, assessments, and surveillance which provide regular monitoring to ensure compliance with regulatory and policy requirements;

d. a non-routine reporting program directed toward notification of oil, brine, or hazardous substance spills, or noncompliant effluent emissions, to identify the impact of such spills or emissions on property and the environment, and to comply with regulatory requirements;

e. a routine reporting program directed toward fulfilling self-reporting obligations under water, air, and waste permits and regulations;

f. a permit monitoring program to ensure compliance with all permit requirements and limitations, onsite operations and maintenance activities;

g. an environmental monitoring program to detect any possible influence routine SPR operations might have on surface waters and ground waters on or near SPR sites and to provide a baseline in the event of an environmental upset;

h. discharge procedures used by each site when releasing liquid from any authorized containment or control system;

i. an environmental training program to ensure that applicable personnel are aware of the SPR environmental management system and environmental laws and regulations and are proficient in oil and hazardous material spill prevention, and safe handling of hazardous waste;

j. a pollution prevention program which focuses on source reduction, recycling, reuse, affirmative and biobased procurement, and proper disposal of all wastes produced on the SPR sites;

k. an underground injection control program mandated by the Safe Drinking Water Act (SDWA) to ensure sound operation of Class II underground wells/caverns for brine disposal or hydrocarbon storage to protect aquifers;

l. a regulatory review program for identification of new environmental requirements; and,

m. an employee environmental awards program to recognize activities, initiatives, and innovative approaches for improved environmental management and pollution prevention.

Regulatory

The principal agencies responsible for enforcing environmental regulations at SPR facilities are the Environmental Protection Agency (EPA) Region VI, the New Orleans and Galveston Districts of the U.S. Army Corps of Engineers (COE), the U.S. Fish and Wildlife Service (F&WS), the Louisiana Department of Environmental Quality (LDEQ), the Louisiana Department of Natural Resources (LDNR), the Louisiana Department of Wildlife and Fisheries (LDWF), the Railroad Commission of Texas (RCT), the Texas Commission on Environmental Quality (TCEQ), the Texas General Land Office (GLO), Texas Parks and Wildlife Department (TPWD), and the Mississippi Department of Environmental Quality (MDEQ). These agencies issue permits, review compliance reports, inspect site operations, and oversee compliance with regulations.

Executive Orders (E.O.)

The SPR follows and operates in conformance with numerous Executive Orders applicable to its operation. Five of the previously existing major orders are Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (E.O. 13101), Greening the Government Through Efficient Energy Management (E.O. 13123), Developing and Promoting Bio-based Products and Bio-energy (E.O. 13134), Greening the Government Through Leadership in Environmental Management (E.O. 13148), and Greening the Government Through Federal Fleet and Transportation Efficiency (E.O. 13149).

The SPR has responded to these associated DOE guidance and implementation memoranda through several initiatives. One of these is the organization of the DM Environmental Department to increase efficiency and place added emphasis on key program areas. Job tasks are arranged into the functions of Chemical Management, NEPA and Air Quality, Waste Management, Surface and Ground Water, Environmental Management Systems, Pollution Prevention, and Environmental Compliance.

DOE environmental staff includes a NEPA Compliance Officer, who also has responsibility for Pollution Prevention / Waste Management, and an Environmental Program Manager, whose responsibilities include Air Quality, Surface and Ground Water, and Environmental Management Systems.

The SPR follows and operates in conformance with numerous DOE Orders applicable to its operation. Two of the major orders include General Environmental Protection Program (DOE O 450.1) and National Environmental Policy Act (NEPA) Compliance Program (DOE O 451.1B). The orders establish some of the policies of the SPRPMO that help to ensure environmental stewardship is maintained.

2.1 COMPLIANCE STATUS (JAN. 1, 2006 THROUGH DEC. 31, 2006)

A major component of the SPR's compliance program is associated with meeting regulations under the Clean Water Act. At the beginning of the year, the SPR sites had a total of 95 wastewater and stormwater discharge monitoring stations that remained unchanged during this period, and 35 active (core-structure) individual wetland permits authorizing various structures at each of the sites.

The SPR is also required to meet many requirements under the Clean Air Act and the Safe Drinking Water Act and conduct waste management activities in accordance with the Resource Conservation and Recovery Act (RCRA) and state guidelines.

The following sections highlight primary compliance activities at the SPR sites by environmental statute.

Clean Water Act (CWA)

The SPR sites comply with the CWA through permitting under the National Pollution Discharge Elimination System (NPDES) program, following the spill prevention control and countermeasures (SPCC) regulations, complying with the requirements of the Oil Pollution Act of 1990 (OPA), and complying with the wetlands usage program.

During 2006 the SPR self reported one minor noncompliance with state and federal water discharge permits to regulatory agencies under the permit self-reporting provisions. This noncompliance is discussed further in Sections 2.3 and 5.4.

In 2004, the SPR, on its own initiative, requested minor modifications to both of the Texas site general NPDES permits to increase the minimum nozzle exit velocity from the assigned 20 fps to 30 fps in order to increase dispersion of the offshore brine discharge further reducing potential impacts to organisms in the receiving waters. These modification requests were granted effective February, 2005 and remained in full force during 2006. Louisiana has primary enforcement responsibility for the NPDES discharge program, issuing permits under the Clean Water Act. LDEQ issued the Bayou Choctaw

facility a renewed permit early in the calendar year 2006. Details of this change are found in a subsequent section.

The SPR maintains a Louisiana statewide permit from LDEQ for discharge of hydrostatic test water that minimizes permit-filing fees and increases flexibility in support of site construction and maintenance activities.

Each SPR storage site and the Stennis warehouse comply with the federal Spill, Prevention, Control, and Countermeasures (SPCC) regulations and in Louisiana with the state SPCC regulations by following a plan that addresses prevention and containment of petroleum and hazardous substance spills. All of the SPR SPCC plans are current in accordance with Title 40 CFR 112 and corresponding state regulations.

The SPR sites obtain permits from the U.S. Army Corps of Engineers and Coastal Zone Management representatives of the responsible state agencies whenever fill, discharge, or dredging occurs in a wetland.

During 2006, eight SPR projects occurred in jurisdictional wetlands in Louisiana and Texas requiring Corps of Engineers permit actions from the New Orleans and Galveston districts in addition to Coastal Zone Management approval (Department of Natural Resources – Coastal Zone Management in Louisiana and the General Land Office in Texas). Project authorizations resulted from work involving maintenance dredging and spoil placement at the raw water intake structures (RWIS), maintenance dredging and renovations to an existing boat slip, pipeline or brine disposal line maintenance, construction of a full 100-meter-wide perimeter clear zone, installation of a replacement 48-inch diameter raw water pipeline, placement of floating small craft intrusion barriers, placement of canal erosion control devices, and traveling screen removals for repair and associated replacements.

Oil Pollution Act (OPA) of 1990

SPR emergency programs, planning, and management are guided by OPA 90 regulatory standards for onshore storage facilities, pipelines, and marine terminal facilities. Facility Response Plans (FRP) on the SPR have been combined with the site emergency response procedures in accordance with the EPA “One Plan” scheme and meet or exceed the requirement of OPA 90 and related state acts such as the Oil Spill Prevention and Response Act (OSPRA) in Texas. The plans are approved by the appropriate

federal and state regulatory agencies. The Texas sites maintain their individual OSPRA certifications in accordance with state requirements.

The SPR conducts emergency drills or hands-on training of its sites each quarter in accordance with the National Preparedness for Response Program (PREP), along with full equipment deployment exercises (announced and unannounced) at each site annually. A professional staff of emergency management personnel from DM New Orleans conducts these drills and exercises and includes the participation of public and regulatory/governmental agencies as available.

The SPR utilizes the National Incident Management System (NIMS), the response management system required by the National Oil and Hazardous Substances Pollution Contingency Plan. SPR site and New Orleans response management personnel have been trained in the unified Incident Command System, and a team of selected New Orleans personnel is available to support extended site emergency operations when needed.

Safe Drinking Water Act (SDWA)

The SPR oil storage caverns and brine disposal wells are regulated by the SDWA. The EPA granted primacy under the SDWA to both Louisiana and Texas Underground Injection Control (UIC) programs, which regulate underground hydrocarbon storage, related brine disposal, and oil field wastes. The SPR operates 21 saltwater disposal wells for the Louisiana sites. In Texas, brine is disposed via brine pipelines that extend into the Gulf of Mexico. Some ancillary commercial disposal wells are used occasionally. The 2006 Annual Report Form OR-1 for underground injection was completed and submitted on schedule to the LDNR.

Historic ground water evaluations have indicated the presence of some shallow ground water impacts from salt water at the Bryan Mound and West Hackberry sites. At Bryan Mound, data suggests that use of unlined brine storage pits by the previous industrial tenants may have been a major contributor to the salt impacted ground water located east of the site's closed large brine storage pond. In a parallel project, the post-closure monitoring near the Bryan Mound brine storage pond is provided through this report to the RCT as requested.

The West Hackberry site completed closure of its brine ponds under a corrective action plan (CAP) negotiated with LDNR. All remedial recovery pumping was successfully

completed in 2001. Post closure monitoring of certain wells for 30 years is currently met by monitoring quarterly and reporting annually in this SER, which is shared with LDNR.

A program to establish baseline ground water conditions at Weeks Island prior to making post-decommissioning comparisons was conducted from 1996 through 1999 when it was converted to a 5 year post-decommissioning "detection" monitoring program, completed at the end of 2004. LDNR concurred that the post closure actions had been satisfactorily completed in October, 2005. As a result no direct physical monitoring activities occurred in 2006.

Potable water systems at Bryan Mound, Big Hill, and Bayou Choctaw are classified as "non-transient, non-community" public water systems. Big Hill and Bryan Mound distribute purchased surface water received from local purveyors. Water received at Bryan Mound is disinfected with chloramine by the purveyor. In June the purveyor serving Big Hill changed disinfectant from chlorine to chloramine. Bayou Choctaw produces, treats (with chlorine), and distributes groundwater from a well on-site. Local public water systems supply drinking water to the West Hackberry site, New Orleans headquarters, and the New Orleans and Stennis warehouses.

In 2006, drinking water samples were taken monthly at Big Hill and Bryan Mound and quarterly at Bayou Choctaw for total coliform testing by state-approved outside laboratories. On a weekly and daily basis, residual chlorine/chloramine and chlorine were monitored at Big Hill and Bayou Choctaw, respectively. Residual chloramine was monitored weekly at Bryan Mound.

Potable water at Bryan Mound, Big Hill, and Bayou Choctaw has been tested under state programs for lead and copper, most recently in 2002 and 2004 at Bryan Mound and Bayou Choctaw, and in 2005 and 2006 at Big Hill. Test results dictate that Bayou Choctaw maintain a corrosion control program to protect piping and help ensure the drinking water lead and copper concentration action thresholds are not exceeded. The program has been successful.

Annual testing for disinfection by-products continued at Bryan Mound and Bayou Choctaw, and was begun at Big Hill. Testing is conducted through the Texas Commission on Environmental Quality and the Louisiana Department of Health and Hospitals. Concentrations of the two groups of disinfection by-products – trihalomethanes and haloacetic acids – were below the maximum contaminant levels

(MCL) at all sites in 2006. Previous to 2005, the MCL for both contaminants were exceeded at Bayou Choctaw and required quarterly testing. However, the results in 2006, as in 2005, were below the MCL for both by-products, allowing future testing to be reduced to every three years.

Big Hill, Bryan Mound, and Bayou Choctaw calculate maximum residual disinfectant levels (free chlorine at Bayou Choctaw, and chloramine at Big Hill and Bryan Mound), based on a running annual arithmetic average. Calculated results at both sites have not exceeded the regulatory MCL Disinfectants.

Clean Air Act (CAA)

The SPR sites comply with the applicable provisions of the CAA and State Implementation Plans (SIP) through permitting and following applicable regulations. The state agencies have primacy (LDEQ and TCEQ). All of the SPR sites are located in attainment areas for all National Ambient Air Quality Standards (NAAQS) pollutants with the exception of ozone. West Hackberry is located in an attainment area for ozone; therefore, the Prevention of Significant Deterioration (PSD) permitting program regulates it. Big Hill, Bryan Mound, and Bayou Choctaw are located in non-attainment areas for ozone; therefore, the New Source Review (NSR) permitting program applies. None of the SPR sites are considered to be major sources during normal operations under PSD, NSR, Title III hazardous air pollutant, or Title V operating permit regulations. All of the facilities operate in accordance with the provisions of the applicable state air permits.

Pollution Prevention Act of 1990 (PPA)

Each SPR site operates in accordance with a Storm Water Pollution Prevention Plan prepared in accordance with EPA multi-sector general storm water discharge authority for storm water associated with industrial activity and similar Louisiana and Mississippi requirements. This multimedia document consolidates these regulatory agency requirements with the more general DOE Order 450.1 and E.O. 13148, which require a Pollution Prevention Program, and the related Waste Minimization and Solid Waste Management Plans.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

The SPR has not needed to conduct response activities pursuant to this act. DOE Order 5480.14 required all DOE-owned sites to evaluate compliance with CERCLA, even if not required to do so by CERCLA. The SPR completed DOE Phase I and II reports (similar to CERCLA's Preliminary Assessment and Site Investigation process) in 1986 and 1987,

respectively. The reports recommended no further action under CERCLA criteria. The DOE Phase I and II reports were submitted to EPA Region VI, and as a result all SPR sites are considered as No Further Remedial Action Planned (NFRAP) to reflect the findings in the reports.

Resource Conservation and Recovery Act (RCRA)

Hazardous wastes generated on the SPR are managed in strict compliance with state and EPA hazardous waste programs. The EPA has delegated the hazardous waste program to LDEQ in Louisiana and MDEQ in Mississippi. SPR Texas sites fall under the jurisdiction of the RCT, which has not yet received delegation; therefore, the SPR complies with both EPA and RCT regulations in Texas.

Large quantities of hazardous waste are not routinely generated at the SPR and the sites have in the past been typically classified as either Conditionally Exempt Small Quantity Generators (CESQG), or Small Quantity Generators (SQG). Hazardous wastes are not treated, stored, or disposed at the SPR sites and therefore, the sites are not RCRA-permitted treatment, storage, and disposal (TSD) facilities. Each site has an EPA generator number that is used to track the manifesting of hazardous waste for off-site treatment or disposal. None of the SPR sites are identified on the National Priority Listing (NPL) under CERCLA.

SPR non-hazardous wastes which are associated with underground hydrocarbon storage activities are regulated under the corresponding state programs for managing drilling fluids, produced waters, and other wastes associated with the exploration, development, production or storage of crude oil or natural gas. These wastes are referred to as Exploration and Production (E&P) wastes. Hazardous E&P wastes are exempted from RCRA, but Congress did not include the underground storage of hydrocarbons in the scope of the E&P criteria. However, under LA and TX regulations, underground storage of hydrocarbons is included in the E&P scope. For this reason, in order to remain in compliance with federal law, the SPR does not dispose of hazardous waste under the "E&P" exemption rules. The SPR characterizes all E&P waste streams to determine if they exhibit hazardous characteristics, and any that do are managed and disposed as hazardous waste. The SPR disposes of non-hazardous wastes generated by the E&P process at state approved E&P disposal facilities. During 2006, 99.9 percent of non-hazardous E&P wastes (1,164 tons) generated on the SPR were recycled.

Other non-hazardous wastes, such as office wastes, are managed in accordance with state solid waste programs. The appropriate waste management strategy is based on the results of waste stream characterization.

During CY 2006, the only hazardous wastes that were shipped from the SPR were fluorescent bulbs from the TX SPR sites. There were no shipments of hazardous waste from the LA or MS SPR sites. The hazardous waste that was generated consisted primarily of laboratory wastes (generated SPR site-wide), and fluorescent bulbs (generated at SPR Texas sites). During CY 2006, all SPR sites averaged hazardous waste generation rates well within the CESQG limits.

The DOE and M&O contractor's corporate policies stress the SPR's commitment to waste management and environmental protection (Appendix B).

Toxic Substances Control Act (TSCA)

Friable asbestos is not present at SPR sites. Small amounts of nonfriable asbestos usually in the form of seals or gaskets are disposed of locally as they are taken out of service, in accordance with applicable solid waste regulations. Non-asbestos replacement components are used. No liquid-filled electrical equipment or hydraulic equipment currently used on the SPR has been identified as PCB equipment or PCB contaminated under TSCA. Procedures are in place to preclude or prohibit purchase of equipment containing either friable asbestos or PCBs.

National Environmental Policy Act (NEPA)

Approximately 820 documents that included design reviews, engineering change proposals, deviations and waivers, and purchase requisitions were evaluated for NEPA review in 2006. Out of these documents, seventy-one required NEPA categorical exclusion documentation. None of the projects associated with these documents had the potential to adversely affect any environmentally or culturally sensitive resources, such as structures of historic, archeological, or architectural significance or any threatened or endangered species or their habitat. Also, no wetlands were adversely impacted as a result of these actions. All of these NEPA reviews resulted in categorical exclusions that did not require further action.

DOE Headquarters completed an Environmental Impact Statement (EIS) in CY 2006 as required by the Energy Policy Act (EPACT) of 2005 in support of site selection to expand the SPR capacity to 1 billion barrels of crude oil. EPACT requires the Site Selection to be

completed within one year of the Act's effective date requiring Final EIS DOE/EIS-0385, and Record of Decision (ROD) to be published in CY 2007. The Final EIS considered the development of one or two new SPR sites from five proposed locations (2 in Mississippi, 2 in Louisiana, and 1 in Texas) and the expansion of 2 or 3 of the existing SPR sites (Bayou Choctaw, Big Hill, and West Hackberry). The Final EIS DOE/EIS-0385 was published in December 2006. The direct link follows: http://www.fossil.energy.gov/programs/reserves/publications/Pubs-SPR/2006_SPR_EIS.html

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

Much of the SPR property is developed with buildings, piping, cable trays, and other structures where the use of pesticide products is necessary to control unwanted vegetation and other pests. During CY 2006 the SPR continued to use pesticide products to control vegetation, maintain the security zone areas, and mitigate the reduction of the number of personnel dedicated to mowing. Although the use of pesticides and herbicides is a necessary and integral part of property maintenance on the SPR, there is a concerted effort made, through screening of chemicals prior to purchase, to restrict the use of those products to the least harmful to the environment and the employees.

Endangered Species Act (ESA)

In a continuing effort to minimize disruption and provide suitable habitat to the existing migratory birds at SPR sites, bird-nesting areas are closed or otherwise protected during critical periods to prevent disturbance as a result of site operations. The F&WS is consulted in regard to appropriate actions taken that may affect migratory birds or threatened and endangered species. For example, the F&WS is consulted prior to the removal and relocation of nuisance wildlife.

As part of the original conditional coverage obtained through the re-issued Multi Sector General Permit (MSGP), a required signatory on each Notice of Intent (NOI) precipitated a formal review of site-specific potential endangered species impacts. This was accomplished prior to finalizing the NOIs and involved an update/comparison step with original Environmental Impact Statements (EISs), with the current ESA lists, and a generalized evaluation or assessment of any potential impacts relating to or resulting from SPR storm water "sheet flow" run-off. No potential impacts were discerned.

National Historic Preservation Act (NHPA)

No site projects required certified reviews by the Louisiana State Historical Preservation

Office in CY 2006. A historic project-wide review step for the NHPA to accompany the MSGP Notices of Intent as detailed in the previous ESA section was accomplished. No places on or eligible to the National Register of Historic Places are located on or adjacent to SPR sites. The Bryan Mound SPR site is located on a Texas State Historical Place for its significance to the sulfur mining industry and long-term development of the nearby town of Freeport. A monument commemorates the historical significance of this location. As part of the interagency and public noticing activity for the issuance of permits for the West Hackberry replacement raw water pipeline project, an internal review of the state owned bottomlands affected was conducted and concurrence received from the Louisiana SHPO prior to release of the required LDNR consistency certification.

Federal Facilities Compliance Act (FFCA)

During CY 2006 none of the SPR sites generated any waste considered to be hazardous and radioactive (mixed waste). Therefore, this act did not apply to the SPR.

Atomic Energy Act of 1954

X-ray and other sealed radioactive sources are used at the SPR to perform analytical, monitoring and scanning activities. Conformance with this act is demonstrated by following state implementing agency radiation control regulations.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds and the Migratory Bird Treaty Act

The active storage facilities comprising the Strategic Petroleum Reserve are located in a variety of environs and migratory pathways along the Gulf Coast of Texas and Louisiana. As such, a variety of waterfowl and other nesting birds frequent our sites during a typical year. Environmental awareness of migratory bird issues commences at the site level. Each site ES&H Manager implements site-wide surveillance, through others as appropriate, in the conduct of normal operations. Selected fields are not mowed from early fall through early spring at Bryan Mound to provide food and shelter for migrating birds. Similarly at the Bayou Choctaw site a feed plot is provided for wintering wildlife. When discovered, nesting areas at all sites are flagged in the field for the nesting season (e.g. least terns); and equipment has

been designated for limited/restricted use on occasion when they harbor bird nests (e.g. by mockingbird, mourning dove, and shrikes). At the West Hackberry site selected areas are not mowed and/or are posted to avoid from early spring through mid summer to allow bird nesting and brooding. These activities illustrate the coordination maintained with local Fish & Wildlife representatives at the SPR sites in fulfillment of environmental stewardship.

Executive Order (E.O.) 11988, "Floodplain Management"

Since the inception of the SPR, compliance with E.O. 11988 has been maintained by complying with NEPA requirements, identifying potential environmental impacts, and obtaining permits through the COE and state coastal management agencies prior to any construction, maintenance, rehabilitation, or installation of structures and facilities.

Executive Order (E.O.) 11990, "Protection of Wetlands"

The measures that illustrate the SPR compliance with E.O. 11988 are also used to comply with E.O. 11990 and ensure that any practicable steps to minimize harm to wetlands are identified and taken.

Executive Order (E.O.) 13101, "Greening the Government Through Waste Prevention, Recycling and Federal Acquisition"

One of the key programs in E.O. 13101 is Affirmative Procurement (AP), the purchasing of EPA-designated items (61 items listed under 8 categories), that contains recovered material. The DOE Affirmative Procurement Program ensures that items composed of recovered materials will be purchased to the maximum extent practicable, consistent with Federal Law and Procurement Regulations (RCRA 6002 and Federal Acquisition Regulations (FAR)).

On March 16, 2006, the USDA published a final rule designating the first six biobased items for preferential procurement consideration. The final rule is to go into effect one year from the date of publication. The six products include mobile equipment hydraulic fluid, penetrating lubricants, diesel fuel additives, roof coatings, water tank coatings, and bedding, bed linens, and towels. However, two items (water tank coatings and bedding, bed linens, and towels) on the list have been given an extended time to effective date due to only having a single source for each product. A follow up notice was published on November 20, 2006, giving these products their effective date of November 20, 2007. The SPR began reviewing products from this first set of designated products to include them on the SPR Qualified Products List in advance of their effective date in 2007.

The SPR is committed to meeting the Secretary of Energy's goal of achieving 100 percent success in purchasing of AP products, restricting its procurement and tracking processes for purchase of affirmative procurement materials, including incorporation into construction contracts. Affirmative Procurement success was 100 percent for CY 2006.

Executive Order (E.O.) 13148, "Greening the Government through Leadership in Environmental Management"

In accordance with all applicable pollution control standards, the SPR complies with E.O. 13148. These requirements were satisfied through implementation of the SPR Pollution Prevention (P2) Plan and the SPRPMO and the O&M contractor's environmental management systems (EMS). The P2 plan references the SPR Pollution Prevention and Energy Efficiency Leadership Goals required by several executive orders and DOE memoranda, which include hazardous and non-hazardous waste reduction. Both EMSs are based on the ISO 14001 Standard. The SPRPMO EMS was self-certified in November 2005, and the O&M contractor's EMS has been certified by a third-party registrar since May 2000.

Since the 1993 baseline of 2.4 mt (2.7 tons), the SPR had reduced hazardous waste generation by 95 percent, down to 0.10 mt (0.13 tons) to just 268 lbs for all SPR sites combined. Waste streams at the SPR continue to be reduced due to increased awareness, surveillance, management participation, and waste minimization efforts on the part of all SPR employees. Figures 2-1 and 2-2 illustrate FY 2006 monthly waste generation versus the pro-rated fiscal year's target of 539 lbs and the trend of hazardous waste reduction since 1993, respectively.

The SPR takes an environmental leadership role by striving to eliminate or reduce all SPR waste streams at the source whenever possible. In CY 2006, excluding E&P waste, the majority of SPR recycled solid waste consisted of 74,915 lbs of paper/cardboard and 715,400 lbs of scrap metal which is indicative of recycling awareness among SPR employees. The overall recycle rate for 2006 was 71%.

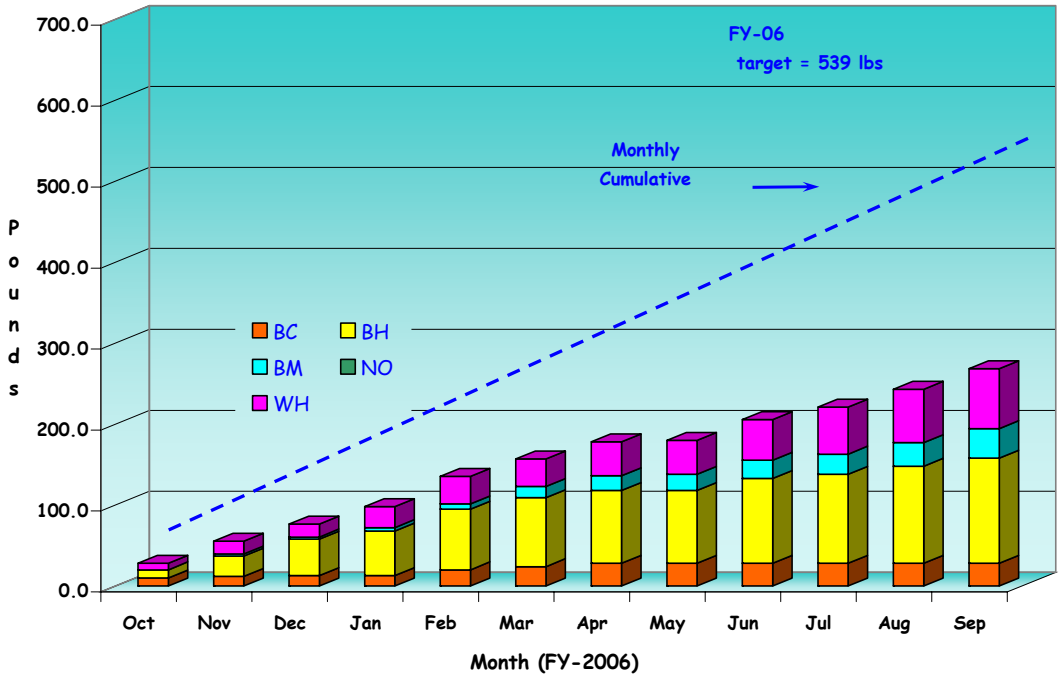


Figure 2-1. FY 2006 Monthly Hazardous Waste Generation

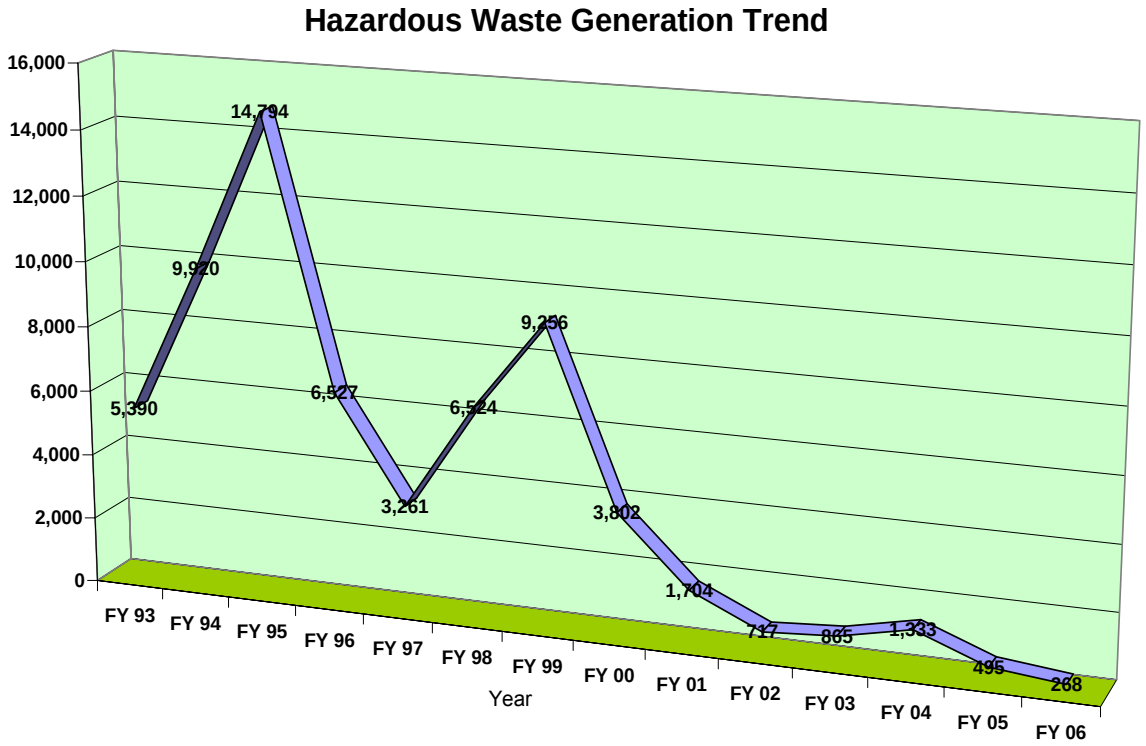


Figure 2-2. SPR Hazardous Waste Generation FY 1993 to FY 2006

E&P wastes can be generated as a result of routine site operations such as pond or tank cleanouts and brine disposal well maintenance operations. In 2006, 1056 mt (1164 tons) of non-hazardous E&P wastes were recycled by use of a production process known as land farming and 0.8 mt of (0.9 tons) of E&P waste were disposed. As a result of the SPR's recycling efforts during (FY) 2006 a recycle rate of 99.9 percent was achieved for E&P wastes.

Pollution prevention is integrated into the SPR mission through policies, procedures, instructions, performance measures, and standards. This was accomplished by updating the environmental goals and training, computerizing the regulatory tracking, self-assessments, and continual improvement priority planning. Pollution prevention is integrated into the Behavioral Safety process at all sites by including pollution prevention behaviors in the critical behavior inventory list. To heighten employee pollution prevention awareness and behavioral safety, trained employees "observe" the work force

and note defined pollution prevention behaviors providing positive reinforcement for those beneficial behaviors.

Awards from outside entities validate the benefits of a working EMS. In 2006 New Orleans, Bayou Choctaw, and West Hackberry received - for the fourth time – the Environmental Management Award at the highest "Excellence" level from the Louisiana Quality Foundation. The award recognizes leadership in environmental management. The SPR also received an honorable mention by the White House Closing the Circle for EMS implementation at the SPR. By controlling significant environmental aspects such as spills, other related and costly environmental aspects such as waste are avoided.

During 2006, the process of screening purchase requests against the SPR Qualified Products List and the Affirmative Procurement guidelines continued to assure that products purchased met environmental criteria established to reduce waste, toxicity and ensure purchasing of EPA-designated and environmentally friendly products. During CY 2006, approximately 1,800 chemical products were evaluated in accordance with AP criteria. The SPR Pollution Prevention Energy Efficiency (P2E2) initiatives continue to address the Greening the Government Executive Orders: E.O 13101 (Waste Prevention, Recycling and Federal Acquisition), E.O. 13148 (Leadership in Environmental Management), E.O. 13123 (Efficient Energy Management) and E.O. 13149 (Federal Fleet and Transportation Efficiency).

An E2P2 committee was established with the purpose of developing and coordinating energy efficiency and pollution prevention projects for the SPR. The committee meets on a quarterly basis to incorporate activities designated by the DOE Energy Policy Act of 1992, which calls for programs designed to incorporate energy heating/cooling initiatives and accelerate the introduction of alternative fuel vehicles to reduce the nation's dependence on imported oil. SPR E2 and P2 Leadership Goals are discussed in detail in the SPR Pollution Prevention Plan.

Membership in EPA's Performance Track and Texas' Clean Texas Programs

In November 2000 EPA accepted its charter round of member into the National Environmental Performance Track Program in response to E.O. 13148. The program promotes and recognizes outstanding environmental management performance in agencies and facilities. All five SPR facilities were accepted as a single multi-site member to join 228 charter members named nationwide. The first three-year

membership commitment was completed in 2003, and the SPR was accepted in 2004 for a second three year membership which was completed in 2006. The SPR has since applied for and been accepted into the third round of charter memberships. While there are currently about 400 members, less than 50 % of the original charter members have succeeded in maintaining their continuous charter membership as has the SPR. Member facilities are top environmental performers who systematically manage environmental responsibilities, reduce and prevent pollution, and are good corporate neighbors. They have working environmental management systems, are committed to continuous improvement, public outreach, and performance reporting, and have achieved a record of sustained compliance with environmental regulations.

As a result of their environmental achievements, Performance Track members are rewarded with recognition, access to state of the art information, and regulatory and administrative flexibility.

Big Hill and Bryan Mound sites maintained “Platinum Level” membership of Clean Texas Environmental Leadership Program. The platinum level of this state program is analogous to the Performance Track program, except that individual sites are recognized for membership.

Performance Track and Clean Texas members must make measurable commitments for environmental improvement. Information pertaining to achieving the Clean Texas commitments is included in the Performance Track reports. The reports for 2001 through 2006 are available to the public at the EPA website www.epa.gov/performancetrack. The SPR chose to achieve the following five performance commitments by the end of 2006. Success in meeting the three-year commitments is discussed as follows:

1. *Reduce hazardous solid waste from fluorescent bulbs to no more than 259 lbs/yr SPR-wide (P-Track), 139 lbs/yr for Big Hill (Clean Texas), and 120 lbs/yr for Bryan Mound (Clean Texas)* - The SPR recycles all spent fluorescent bulbs. Since the TX SPR sites are regulated by the RCT for waste generation, spent old-style high mercury content fluorescent bulbs must be counted as hazardous waste in Texas. The generation of hazardous waste has been reduced through replacement of these bulbs with new lower mercury content "green" bulbs. In 2006, only 20.4 lbs of spent old-style bulbs were removed from the SPR, which is 13 times better than the goal. This is a decrease from 604 lbs and 27.5 pounds collected in 2004 and 2005, respectively. Overall, this commitment was met for both programs.

2. *Reduce volatile organic compound (VOC) emissions from workover operations by 15%, based on an average of workover VOCs emitted at Bryan Mound and Big Hill over the previous six years (P-Track and Clean Texas)* – To minimize VOC emissions, the entire workover oil transfer process was examined to reduce, eliminate, or consume VOC emissions. A source of substantial VOC losses are frac tanks used as a crude oil surge vessel during cavern workovers. Workover VOC emissions in 2006 totaled 30.24 tons – well below the 49.4 tons per year target for 2006. More importantly, VOC emissions were reduced by 21% SPR-wide and 34% at Big Hill primarily due to the use of a permitted floating roof surge tank at Big Hill for directly receiving oil from depressurization activities instead of a frac tank. This commitment was achieved for both programs.

3. *Avoid potential VOC emissions, utilizing the degasification plant, of at least 500 tons off-site at terminals and refineries that would receive crude oil from Big Hill during a drawdown (Performance Track and Clean Texas- Big Hill only)* – Crude oil degasification of selected “gassy” caverns continued in 2006 at the Big Hill site to remove unwanted methane and ethane gases from the crude oil supply. As they evaporate, these gases strip valuable oil fractions from the crude oil. The VOC avoidance target for a hypothetical 2006 drawdown is 500 tons. By the end of 2006,

Caverns 101, 103, 104, 112, and 115 were degassed and 594 tons of VOC emissions were avoided. The target (500 tons avoided) was surpassed by 19% and the commitment was completed.

4. *Reduce the amount of lead purchased annually in lead/acid batteries used in the electric vehicle fleet by 5%, based on purchasing in 2003. This is no more than 3051 lbs/yr purchased SPR-wide (P-Track), no more than 794 lbs/yr purchased at Big Hill (Clean Texas), and no more than 264 lbs/yr purchased at Bryan Mound (Clean Texas)* - Conventional lead/acid batteries that were original equipment in the electric vehicles were replaced (as the batteries failed) with newer batteries that use absorbed glass electrolyte technology. These batteries did not perform as expected and actually contained more lead than conventional batteries. Consequently, the sites resumed using the original equipment batteries, promoting battery longevity through greater emphasis on battery maintenance and proper charging. In 2006, 3,409 lbs of lead were purchased, just above the SPR wide target of 3,051 lbs/yr. Big Hill achieved its Clean Texas target; 197 lbs were purchased (target: 794 lbs/yr). Bryan Mound did not; 792 lbs were purchased (target: 264 lbs/yr).

5. *Set aside at least 40 acres of grassy environment on-site for migrating birds for feeding and protection during the spring and fall migrations (Performance Track and Clean Texas – Bryan Mound only)* – Acreage at the Bryan Mound, West Hackberry, and Bayou Choctaw sites have been set aside to provide cover and food for nesting and migratory birds and other wildlife. About 40 acres at Bryan Mound are not mowed from late summer to early spring, thus supporting migratory bird movement. About 32 acres at West Hackberry are not mowed from early spring through September (early fall) allowing bird nesting and brooding to be completed. By the end of 2006, Bayou Choctaw set aside 7 acres (two more than last year) as food plots. These areas are seeded with winter wheat, rape, oats, rye, clover, and various vegetables, and feed wildlife during the winter and early spring. Other wildlife enhancements are also implemented throughout the SPR.

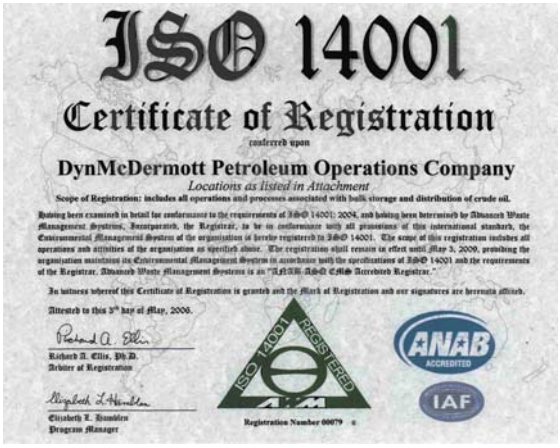
<u>Superfund Amendments and Reauthorization Act (SARA)</u>

SARA Title III Tier Two reports, also known as Emergency Planning and Community Right-to-Know Act (EPCRA) Section 312 reports, were prepared and distributed as required by March 1st to state and local emergency planning committees and local fire departments. Tables 2-2 through 2-7 contain a summary of the inventory information that was submitted for 2006. The SPR continued to use an electronic format as required by

the state implementing agencies for the preparation and submission of Tier Two Reports for the SPR facilities in Louisiana, Texas, and Mississippi.

SPR sites are required to report under EPCRA Section 313, by submitting Toxic Release Inventory (TRI) Form R when reporting thresholds, defined by emissions from crude oil placed in commerce, are exceeded. Specifically when crude oil is placed in commerce, it is considered to be repackaging of hazardous substances and must be reported. This form must be submitted by July 1 for the reporting thresholds exceeded during the preceding calendar year. The submittal of a (TRI) Form R was required in 2006 because the SPR introduced crude oil into commerce (drawdown) from the West Hackberry site due to Hurricanes Katrina and Rita in 2005.

International Organization for Standardization (ISO 14001) Certification


ISO 14001
Certificate of Registration
conferred upon
DynMcDermott Petroleum Operations Company
Locations as listed in Attachment
Scope of Registration: includes all operations and processes associated with bulk storage and distribution of crude oil.
Having been examined in detail for conformance to the requirements of ISO 14001: 2004, and having been determined by Advanced Waste Management Systems, Incorporated, the Registrar, to be in conformance with all provisions of this international standard, the Environmental Management System of the organization is hereby registered to ISO 14001. The scope of this registration includes all operations and activities of the organization as specified above. The registration shall remain in effect until May 3, 2009, providing the organization maintains its Environmental Management System in accordance with the specifications of ISO 14001 and the requirements of the Registrar. Advanced Waste Management Systems is an "[illegible] Accredited Registrar."
In witness whereof this Certificate of Registration is granted and the Mark of Registration and our signatures are hereunto affixed.
Attested to this 3rd day of May, 2006.
Richard A. Ellis, Ph.D.
Arbiter of Registration
Elizabeth L. Hamblen
Program Manager
ISO 14001 REGISTERED
Registration Number 00079
ANAB ACCREDITED
IAF

On May 19, 2000, the DM environmental management system (EMS) was first evaluated by an independent registrar (accredited by the ANSI-ASQ National Accreditation Board (ANAB)) and certified in conformance with the International Organization for Standardization 14001 standard. The DM EMS was recertified in 2003 and again in 2006 by the same ANAB accredited Registrar. Between certifications the registrar has conducted surveillance audits to evaluate the DM EMS every six months.

DOE Order 435.1, “Radioactive Waste Management”

There are no processes that generate radioactive wastes at any of the SPR sites and therefore this order does not apply.

DOE Order 5400.5, "Radiation Protection of the Public and the Environment"

In addition to the X-ray sources used in equipment the SPR does subcontract work where sealed radioactive sources are used in monitoring activities. This topic is addressed in Section 4 of this report.

Table 2-1. 2006 Louisiana SARA Title III Tier Two Summary at Bayou Choctaw

Chemical Name (Category)	* Max Daily Amt (lbs.)	Location
CRUDE OIL PETROLEUM	> 1 Billion	FLAMMABLE STORAGE BUILDING, SITE TANKS, PIPING, UNDERGROUND CAVERNS
DIESEL FUEL #2	10,000 - 99,999	EMERGENCY GENERATOR FUEL TANK, PROPERTY TANK 2
FC-203CE LIGHT WATER BRAND AFFF	10,000 - 99,999	FOAM STORAGE BLDG
FC-203CF LIGHTWATER BRAND AFFF	1,000 - 9,999	FOAM DELUGE BLDG
FLOGARD POT805	100 - 999	POTABLE WATER BUILDING
GASOLINE, INCLUDING CASING HEAD	10,000 - 99,999	PROPERTY TANK 1
GERMICIDAL BLEACH	1,000 - 9,999	BLDG 402, POTABLE WATER BUILDING
MOTOR OIL	1,000 - 9,999	FLAMMABLE STORAGE BUILDING, MAINTENANCE BAY, PROPERTY FLAMMABLE CABINET, BENCHSTOCK, FLAMMABLE STORAGE CABINET - HPP
SODIUM CHLORIDE SALT CULLIGAN	1,000 - 9,999	POTABLE WATER BUILDING

* Reporting range specified by LA SARA Title III Tier Two Reporting Requirement

Table 2-2. 2006 Texas SARA Title III Tier Two Summary at Big Hill

Chemical Name (Category)	* Max Daily Amt (lbs.)	Location
CRUDE OIL	> 1 Billion	BHT-2, BHT-6, BHT-7, BHT-10, SITE TANKS, PIPING, UNDERGROUND CAVERNS
DIESEL FUEL	10,000 – 99,999	BHT-4, BHT-11, BHT-50, BHT-51, WORKOVER RIG
DIGLYCOLAMINE	10,000 – 99,999	DEGAS WATER TANK, IN SYSTEM
FC-600 LIGHT WATER BRAND ATC/AFFF	10,000 – 99,999	BOAT SHED, ERT PAD, FIRE TRUCK, FOAM BLDG-BHT 16
NITROGEN	10,000 – 99,999	DEGAS ELECTRICAL & I&C SHOPS, TVP-2000, WORK TRUCK
OIL	10,000 – 99,999	2ND STAGE COMPRESSOR, BENCHSTOCK, BOAT SHED, DEGAS FLAMMABLE CABINET, DEGAS FLAMMABLE STORAGE BLDG., ELECTRICAL & I&C SHOPS, ENVIRONMENTAL LAB, FLAMMABLE STORAGE BLDG 817, LAYDOWN YARD, NITROGEN HEADER, PROPANE TANKS, PROPERTY FLAMMABLE CABINET, RWIS, WORKOVER RIG
PROPANE	10,000 – 99,999	DEGAS, DEGAS CONTROL ROOM-MCC, PROPANE SKID, PROPERTY FLAMMABLE CABINET

* Reporting range specified by Texas SARA Title III Tier Two Reporting Requirement

Table 2-3. 2006 Texas SARA Title III Tier Two Summary at Bryan Mound

Chemical Name (Category)	*Max Daily Amt (lbs.)	Location
CRUDE OIL	> 1 Billion	SITE TANKS, PIPING UNDERGROUND CAVERNS
DIESEL FUEL	10,000 – 99,999	BLDG 210, C. OIL LAB, DIKED AREA, FLAMABLE CABINET
FC-203CF LIGHT WATER BRAND AFFF	100,000 – 999,999	AF3 FIXED SYSTEMS, STORAGE & MOBILE UNITS
GASOLINE, [CASING-HEAD AND NATURAL]	10,000 – 99,999	DIKED AREA, FUEL TANK AREA

* Reporting range specified by Texas SARA Title III Tier Two Reporting Requirement

Table 2-4. 2006 Louisiana SARA Title III Tier Two Summary at Stennis Warehouse

Chemical Name (Category)	*Max Daily Amt (lbs.)	Location
DIESEL FUEL	10,000 – 99,999	WEST SIDE OF WAREHOUSE

* Reporting range specified by LA SARA Title III Tier Two Reporting Requirement

Table 2-5. 2006 Louisiana SARA Title III Tier Two Summary in Offsite Pipelines

Chemical Name (Category)	*Max Daily Amt (lbs.)	Location
CRUDE OIL, PETROLEUM	50,000,000 - 99,999,999	OFF-SITE PIPELINES IN CALCASIEU PARISH, LA (WEST HACKBERRY)
CRUDE OIL, PETROLEUM	10,000,000 - 49,999,999	OFF-SITE PIPELINES IN CAMERON PARISH, LA (WEST HACKBERRY)

* Reporting range specified by LA SARA Title III Tier Two Reporting Requirement

Table 2-6. 2006 Louisiana SARA Title III Tier Two Summary at West Hackberry

Chemical Name (Category)	*Max Daily Amt (lbs.)	Location
CHEMGUARD PURPLE K DRY CHEMICAL	1,000 – 9,999	BLDG 305
CRUDE OIL PETROLEUM	> 1 Billion	LCMS PIPING, SITE TANKS, PIPING, UNDERGROUND CAVERNS, WAREHOUSE E
DIESEL FUEL # 2	10,000 – 99,999	FUEL PUMP TANK, MAINTENANCE LAYDOWN YARD, MEACHAM BRINE TANK AREA, WORKOVER RIG
FC-203 CF LIGHT WATER BRAND AFFF	10,000 – 99,999	FIRE TRUCK WHFT3, FOAM STORAGE BLDG
GASOLINE, INCLUDING CASING HEAD	10,000 – 99,999	FUEL PUMP TANK, LSW LAYDOWN YARD, MAINTENANCE LAYDOWN YARD, MEACHAM BRINE TANK AREA
GLYPHOSATE BASED HERBICIDE	100 – 999	FLAMMABLE STORAGE BUILDING
MOTOR OIL	10,000 – 99,999	ENVIRONMENTAL LAB, FLAMMABLE STORAGE BUILDING, HPPP FLAMMABLE CABINET, LCMS BLDG 320, LSW LAYDOWN YARD, MAIN GATE, OCB 5KV SUBSTATION, WAREHOUSE A, WAREHOUSE D, WORKOVER RIG
NO-DUST-O SWEEPING COMPOUND	100 – 999	WAREHOUSE A, WAREHOUSE D
OIL BASE EZ FLOOR SWEEP	100 – 999	WAREHOUSE A, WAREHOUSE D
PAINTS, FLAMMABLE OR COMBUSTIBLE	1,000 – 9,999	FLAMMABLE STORAGE BUILDING, MEACHAM BRINE TANK AREA, WORKOVER RIG
PROPANE	1,000 – 9,999	LCMS PROPANE TANK
SILICA, CRYSTALLINE QUARTZ	1,000 – 9,999	PAINT LAYDOWN YARD

* Reporting range specified by LA SARA Title III Tier Two Reporting Requirement

2.2 MAJOR ENVIRONMENTAL ISSUES AND ACTIONS

Gassy Oil

When SPR crude oil is brought to surface facilities, methane and ethane gas (non-regulated) that has migrated from the salt in the salt dome is released, stripping regulated pollutants (VOC) into the atmosphere. Also, geothermal processes raise the crude oil temperature, elevating the true vapor pressure (TVP) potentially above the atmospheric pressure of 14.7 pounds per square inch (PSI). This elevated vapor pressure may exceed regulatory limits for storage in floating roof tanks, potentially affecting some of the SPR sites and receiving commercial terminals (customers). Beginning in 1995 the SPR conducted operations to separate and remove gas from stored oil, in addition to heat exchangers used to cool oil prior to transport offsite. Recent operation of the degas plant at Big Hill began in early 2004 and completed operations in October 2006. The degas plant is being disassembled and moved to Bryan Mound for the next round of inventory degasification.

West Hackberry North and South Anhydrite Pits

A re-engineered compacted soil cap for the closed North Anhydrite Pit was completed in early 2005. Re-sodding and re-seeding efforts were commenced late in the year. Just after construction of the re-graded cap, some minor areas were re-worked and due to the slow start and winter rains small sections of the cap were eroded and needed redressing and re-seeding in 2006.

The winter rains also commenced a similar erosional impact at the similar closed South Anhydrite Pit. Follow-on actions were beginning to be investigated at the close of 2005 and response activities were in progress for the limited areas of dike seepage and erosion noted. A project design action was commenced in CY2005 for remedial cap restoration and the final design construction was essentially completed by the close of 2006.

Billion Barrel Expansion

During 2006 SPR Environmental Staff provided extensive environmental input for the EIS to expand the SPR storage capacity to one billion barrels. The support included the review and comment of early drafts of the EIS, scheduling requirements for permitting, suggested staffing and budgetary requirements, consulting with Federal and state regulators in two regions and three states, attending public meetings, and incorporating the SPR Environmental Advisory Committee into the process.

DOE On-Site Appraisal

SPRPMO On-Site Management Appraisal teams conduct formal visits to SPR sites annually. The teams meet with site contractor management staff and audit environmental compliance and environmental management system practices, survey performance indicators, and review the audit findings with the contractor staff during exit briefings. Issues reviewed in FY 2006 included air, water, and waste management, recycling, and NEPA compliance. EMS issues examined included handling of external communications, legal and other requirements, environmental aspects, and success in correcting nonconformities. Findings were tracked to completion in the DOE Consolidated Corrective Action Plan and in the DM Assessment Tracking System (ATS). During FY 2006 there were 12 low risk environmental findings associated with the audits, and nine were corrected by the end of CY 2006.

M&O Contractor Organizational Assessment

The New Orleans environmental group conducted annual EMS and compliance assessments of all five sites in FY 2006. Assessors were independent of the sites and were not accountable to those directly responsible for the issues audited.

EMS related issues were examined based on the 17 elements of the ISO 14001:2004 Standard. All elements were reviewed at least once (and preferably twice) during the audit year. Environmental compliance was examined through the framework of the EMS and included compliance with regulations, DOE contract requirements, and other internal requirements. Compliance issues examined were related to air, water, waste, toxic chemicals, and pollution prevention programs. Findings were tracked to completion in ATS.

Specific audit topics were also chosen based on current management concerns and the results of previous audits. Potable water management and the use of the SPR Qualified Products List remained environmental concerns for 2006. Improvements made since 2003 in performing and tracking the management of potable water systems at Bayou Choctaw, Big Hill, and Bryan Mound indicate greater awareness of regulatory requirements by certified water operators. The use of the Purchasing of Environmentally Friendly Products from the QPL has decreased slightly from 94.2% in FY 2005 to 92.5% in FY 2006. Improved compliance will require continuing communication with product requestors and purchasers in using the QPL.

DM identified 18 compliance findings and 11 EMS non-conformances during FY 2006. All compliance findings were classified as low risk hazards, minor deviations from internal requirements and regulations. All EMS non-conformances were also minor. Corrective action plans for all of the findings and non-conformances were provided, and ten compliance findings and four EMS non-conformances were closed in CY 2006. Table 2-7 is a tabulation of 2006 findings/non-conformances by site.

Table 2-7. FY 2006 M&O Contractor Organizational Assessment Environmental Findings and Non-Conformances

Site	High Risk Hazard (compliance)	Medium Risk Hazard (compliance)	Low Risk Hazard (compliance)	Low Risk Hazard EMS
Bayou Choctaw	0	0	3	2
Big Hill	0	0	0	2
Bryan Mound	0	0	5	1
New Orleans	0	0	8	6
West Hackberry	0	0	2	0

Third Party EMS Audits

One recertification audit and one surveillance audit were conducted in CY 2006 by the DM ISO 14001 registrar, Advanced Waste Management Systems, Inc. Each crude oil storage site and the Stennis Warehouse were audited once, and the New Orleans site (headquarters) twice. The performance of DM's EMS was evaluated through the review of all 17 elements of the ISO 14001 standard. In CY 2006 there were ten minor nonconformities with the ISO standard. Corrective action plans were developed for all nonconformities although none were closed by the end of 2006. A recommendation was given for DM to maintain the ISO 14001 certification at the conclusion of both audits.

Regulatory Inspections/Visits

There were five inspections or visits by or on behalf of regulatory agencies to SPR facilities in 2006 summarized in Table 2-8. These visits are routine and are usually conducted by the regulatory agencies to ensure compliance or to address concerns regarding activities at the SPR facilities. There were no findings associated with these inspections.

Table 2-8. Summary of Regulatory and Third-Party Inspections/Visits During 2006

Site	Organization	Remarks
BC	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.
	LDEQ	Radiation inspection of entrance portal x-ray machine and laboratory Sulfur Analyzer. Requested follow-up information provided. No findings.
BH	TGLO	Texas General Land Office routine annual site visit, wished all facilities were as clean. No findings.
	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.
BM	TGLO	Announced audit of site's spill prevention and response program was conducted. No findings.
	TCEQ	Inspection of the BM Potable Water Distribution System. No Findings
	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.
NO	ISO 14001 Registrar	Two surveillance audits. Three minor nonconformances, two related to the Communication element and one to the element of Internal Audit. Recommendation to maintain certification.
SW	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.
WH	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.
	USCG	Coast Guard visit, not an inspection, getting familiar with the site. No problems or findings.

Non-Routine Releases

The majority of the non-routine releases of pollutants occur with the spills of crude oil and brine into the environment from the SPR operations. In 2006, there was one reportable crude oil spill and zero reportable brine spills at the SPR.

State and federal agencies require notification if an oil spill meets or exceeds the reportable criteria. This reportable criteria is established by each agency and may vary greatly in the amount to be considered a reportable spill. This is illustrated by the following examples: one barrel for the LDNR, five barrels for the RCT, or a sheen on a navigable waterway for the NRC.

During 2006, the SPR moved (received and transferred internally) 15.2 million m^3 (95.6 mmb) of oil and disposed of 1.56 million m^3 (9.08 mmb) of brine. Additional spill information is listed in Tables 2-9 through 2-11. The long-term trend for spills and releases has declined substantially from 26 in 1990 to one in 2006 as depicted in Figure 2-3.

Figure 2-3. Number of Reportable Spills 1990-2006

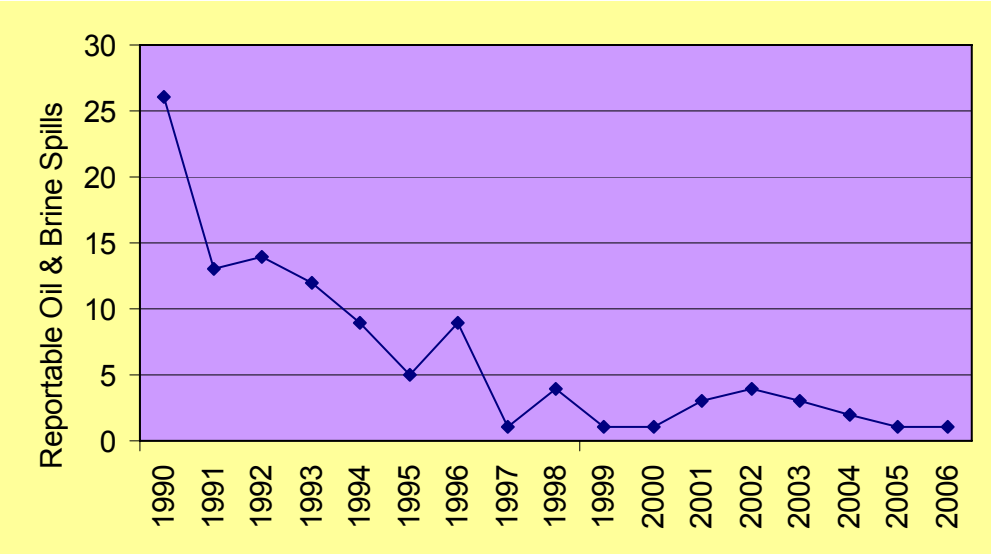


Table 2-9. Number of Reportable Oil Spills

Year	Total Spills	Volume Spilled m^3 (barrels)	Percent Spilled of Total Throughput
1982	24	847.0 (5,328)	0.00704
1983	21	380.9 (2,396)	0.00281
1984	13	134.8 (848)	0.00119
1985	7	85.4 (537)	0.00122
1986	5	1232.5 (7,753)	0.01041
1987	5	2.5 (16)	0.00002
1988	6	8.8 (55)	0.00001
1989	11	136.4 (858)	0.00004
1990	14	74.8 (467)	0.00003
1991	6	37.9 (237)	0.0004
1992	5	1.9 (12)	0.00006
1993	6	36.9 (232)	0.0007
1994	7	6.2 (39)	0.0003
1995	2	56.3 (354)	0.0006
1996	4	4.7 (30)	0.00002
1997	1	0.32 (2)	4.0×10^{-9}
1998	1	Sheen	N/A
1999	1	31.8 (200)	0.00056
2000	1	11.1 (70)	0.00011
2001	2	1.6 (10)	0.0000163
2002	0	0	0
2003	3	1.1 (7)	0.0000104
2004	1	1	0*
2005	0	0	0
2006	1	0.5 (3)	3.3×10^{-6}

* Note: During CY 2004 there were no reportable crude oil spills at the SPR. The spill that occurred during 2004 resulted from a sheen due to a diesel fuel spill on a navigable waterway.

Table 2-10. 2006 Reportable Oil Spill

Date	Location	Amount	Description
06/21/2006	West Hackberry	2 – 3 barrels	The WH pipeline crew reported crude oil residue in the grass and a sheen on standing water in the marshy area west of pipeline valve WH-5. WH-5 is near Black Bayou on the WH - Sunoco pipeline. Approximately 2-3 barrels may have been released. This release was offsite at the WH SPR Valve station which is about 15.5 miles from the site and 250 yards from the Intracoastal. A ring levee was constructed around the affected area and contaminated soil/rock was excavated and disposed offsite. Leak from the bottom valve body bleed was the cause, the line was repaired and the location restored.

Table 2-11. Number of Reportable Brine Spills

Year	Total Spills	Volume Spilled m^3 (barrels)	Percent Spilled of Total Throughput
1982	43	443.8 (2,792)	0.0005
1983	44	259.4 (1,632)	0.0002
1984	17	314.0 (1,975)	0.0003
1985	16	96,494.8 (607,000)	0.1308
1986	7	275.6 (1,734)	0.0017
1987	22	96.5 (608)	0.0003
1988	12	93.8 (586)	0.0001
1989	17	31,231.6 (825,512)	0.1395
1990	12	11,944.3 (74,650)	0.0170
1991	7	1,156.8 (7,230)	0.004
1992	9	48.0 (302)	0.003
1993	6	59.2 (370)	0.001
1994	2	14.4 (90)	0.0006
1995	3	131.1 (825)	0.0028
1996	5	179.7 (1,130)	0.0014
1997	0	0	0.0
1998	3	6.2 (39)	0.00028
1999	0	0	0.0
2000	0	0	0.0
2001	1	0.019 (0.12)	5.60×10^{-7}
2002	2	2.1 (13)	3.9×10^{-6}
2003	0	0	0
2004	1	1.6 (10)	2.2×10^{-7}
2005	1	27 .0 (170)	5.5×10^{-6}
2006	0	0	0.0

2.3 SUMMARY OF PERMITS (JAN. 1, 2006 THROUGH DEC. 31, 2006)

General

Permits in effect during 2006 include 10 state and federal CWA wastewater discharge permits, six CAA permits, 35 active original structure COE wetlands (Section 404 of CWA) permits (not counting associated modifications and amendments), and over 100 oil field pit, underground injection well, and mining permits. In addition, a number of other minor permits were in effect during the year. Many of these major permits are presented in tabular form in Section 3, Tables 3-2 through 3-6.

Permit alterations of the Big Hill and Bryan Mound air permits were granted by TCEQ in May 2006 to allow a reduction in monitoring frequency for valves, pumps and compressor seals from quarterly to biennial. This incentive is contingent upon the SPR maintaining "National Leader" status in the TCEQ's Clean Texas Environmental Leadership Program. As a result of TCEQ granting of these permit alterations, DOE withdrew the flexible air permit applications for Big Hill and Bryan Mound.

Degas operations were completed at Big Hill in October 2006. DOE notified TCEQ that the Big Hill degas air permit was no longer needed.

Permit Compliance

Compliance with environmental permits is assured by meeting the conditions detailed within the permit. These conditions can be monitoring of components or processes, monitoring of pollutant effluents to ensure they meet permit limits, maintaining structures in their original condition, and inspecting facilities.

Air quality operating permits require piping components such as valves, flanges, pressure relief valves, and pump seals be inspected for leaks of VOC on a regular basis (biennially in Texas and annually in Louisiana) using organic vapor analyzers (OVA). In addition, the Texas permits require that the flanges be inspected visually, audibly, and or by olfactory methods to identify any possible leaks on a weekly basis. All SPR air permits contain permit limitations based on pollutant emission rate in pounds per hour and tons per year.

The SPR ensures compliance with these permit limits by monitoring the processes that emit the pollutants. This includes monitoring use of generators, volumes of crude oil, diesel, and gasoline movements through tanks, volume of painting, and others. The results of this effluent monitoring are reported to the agencies annually at Bryan Mound and Big Hill through an Emissions Inventory Questionnaire (EIQ). Bayou Choctaw and West Hackberry do not require reporting because they are below the required emission limit to report in Louisiana. All air reports were submitted to the appropriate agencies on time.

Water discharge permits require that analytical permit limits are met and reported. Other permit conditions require visual monitoring of the effluents to ensure that they have no visible sheen or foaming. All SPR sites periodically (daily, monthly and/or quarterly) monitor permit limit compliance with quarterly reporting through the NPDES, LPDES, and

RCT Statewide Rule 8 Discharge Monitoring Reports (DMRs). All such reports were submitted to the appropriate agencies on time in 2006.

Noncompliances

One discharge permit noncompliance occurred at the SPR out of a total of 1,120 permit-related analyses performed in 2006. This was the result of a TSS sample being outside of the permit parameter limits at West Hackberry. The noncompliance was of short duration and immediately resolved, causing no observable adverse environmental impact.

This single noncompliance produced an overall project-wide 99.9 percent compliance rate for 2006. Summary information of NPDES exceedances and noncompliances is contained in Section 5.4, Table 5-10.

Environmental Reportable Project Events

Project events equal all reportable spills, both oil and brine and all discharge permit non-compliances. These events are used to provide a summary of SPR performance as illustrated in Figure 2-4. During 2006 there were two environmental reportable project events at the SPR.

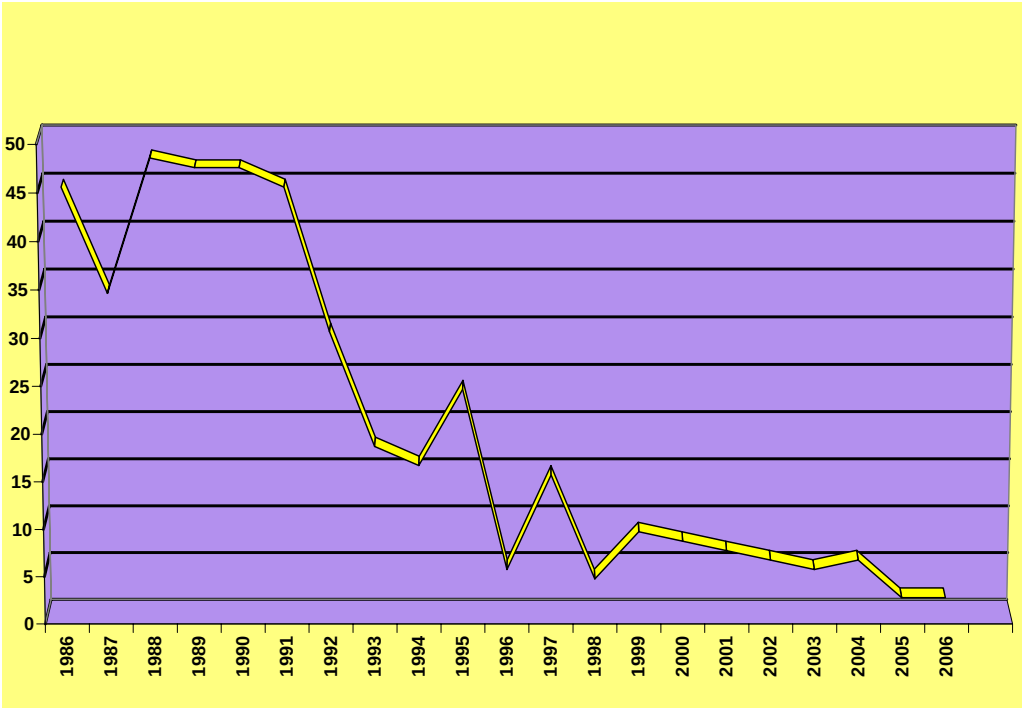


Figure 2-4 SPR Environmental Project Events 1986 - 2006

Notice of Violation (NOV)

During 2006, the SPR continued to maintain a status of low risk to the environment. NOVs have declined significantly from 9 (all administrative) in 1990 to zero since 1995 as depicted in Figure 2-5.

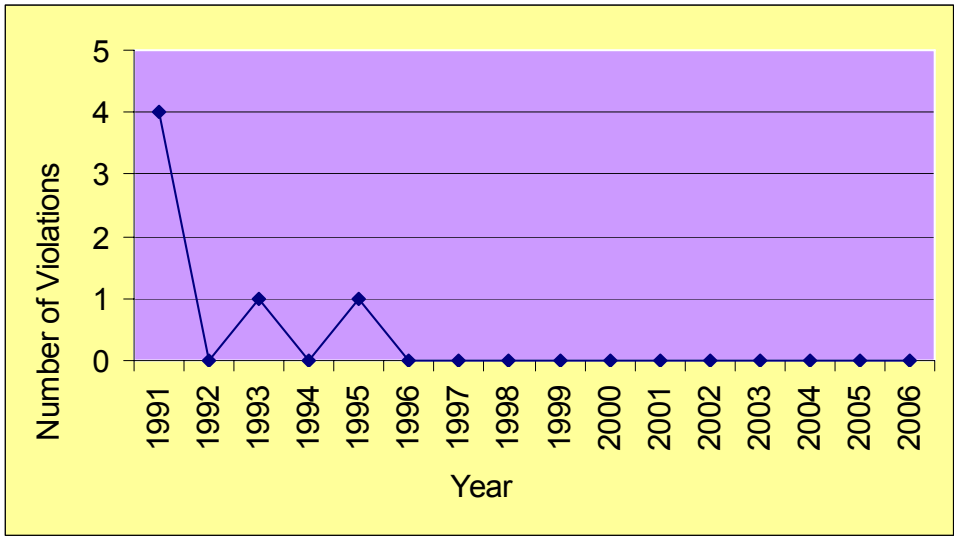


Figure 2-5. Number of Violations 1990-2006

2.4 SUCCESS IN MEETING PERFORMANCE MEASURES

General

Twenty-eight performance measures were tracked by the DM EMS in FY 2006. A performance measure that is part of the EMS is identified as an environmental objective. A target (a metric that can be measured) is established for each objective. Many objectives have two targets, a minimum level (all DOE contractors should meet as a minimum) and a more challenging target level.

Twenty-one of these EMS targets are identified in contract Work Authorization Directives (WADs) as contract objectives. WAD objectives and targets are jointly developed for each fiscal year by DOE and DM and tracked for success. WAD targets originate from several departments. In FY 2006 nine of the targets tracked were from the Environmental Department WAD, and twelve other targets originated from WADs from other departments. The other seven performance measures were based on an energy management performance agreement referenced by a WAD, environmental commitments made for EPA's Performance Track and TCEQ's Clean Texas programs,

and management interests. All performance measures were related to significant environmental aspects or interests to top management.

Success in Meeting Environmental Objectives

The environmental objectives and targets, success in meeting them in FY 2006, and their performance trends since FY 2000 are delineated in Table 2-12.

Of 27 environmental objectives tracked in FY 2006, 24 met or surpassed the more challenging target level, one surpassed the minimum level, but not the target, one did not meet either minimum or target level targets, and one was not applicable due to the lack of relevant activity. Most of the environmental objectives have been tracked for several years. The following highlights provide an overview of the 3 to 6 year measurements of success in meeting the targets:

- Consistent improvement in reducing sanitary waste
- Substantial improvement in increasing recycling and the use of the Qualified Products List
- Improvement in reducing permit exceedances, reportable releases, hazardous waste, VOC emissions from degasing crude oil, and providing acreage for wildlife habitat.
- Performance remains steady on 14 other objectives that have been tracked for several years
- Performance is fluctuating on reducing lead acquisition and repairing fire systems, and fluctuating slightly on affirmative procurement
- No trends are available yet on two objectives dealing with PREP drills and reducing VOC emissions from workover operations.

Table 2-12. FY 06 OBJECTIVES AND TARGETS WITH PERFORMANCE

ID #	WAD ID	Aspect	Objective	Target		Level of Achievement in FY 2006	Performance Trend (Since FY00)	Trend
				Minimum	Target			
1	2006-ENV	Discharges	Reduce permit exceedances reported on the Discharge Monitoring Reports	No more than 4/quarter	No more than 2/quarter	Surpassed target. 1 permit exceedance	9 in 2000 4 in 2001 2 in 2002 6 in 2003 3 in 2004 1 in 2005	Steady
2	2006 1.J.1 (ENV)	Spill Discharges Air Emissions Monitoring Wetlands disturbance Drainage Navigation Public exposure	Avoid cited Clean Water Act, Clean Air Act, and RCRA (waste) violations	Not Applicable	0 per year	Met target. 0 violations	0 violations from FY00 through 2006 and past 10 years.	Steady
3	2006 - ENV	Spill	Reduce reportable occurrences of releases from operational facilities	No more than 8 annually	Less than or equal to 2 per six months	Surpassed target. 1 reportable release for entire FY.	1 in 2000 4 in 2001 1 in 2002 4 in 2003 2 in 2004 1 in 2005	Steady
4	2006 TSM – ENG	Spill Monitoring and Surveillance Results	In managing the Piping and Pipeline Assurance program, submit semiannual Pipeline and Piping Integrity report by 1/31/06 and 7/31/06	Not Applicable	On schedule	Met target. Done and on schedule	On schedule since 2000.	Steady
5	2006 1.T.1.b (TSM – FP/EM)	Spill	Ensure key emergency equipment is available	90%	100%	Met target. 100%	100% since 2000.	Steady
6	2006 TSM FP-EM	Spill Fire	Ensure basic order agreements are in place for spill response and clean up at each site.	At least 1/site	At least 2/site	Surpassed target. 11 BOAs in place	Greater than 100% since 2001	Steady

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target**		**Level of Achievement in FY 2006**	**Performance Trend (Since FY00)**	**Trend**
				Minimum	**Target**			
7	2006 1.T.1.a (TSM – FP/EM)	Spill Fire	Ensure emergency preparedness and response capabilities through training Emergency Response Team (ERT) members.	95% ERT trained/site. 18 @ BC 20@ BM, BH, & WH	100% ERT trained/site	Met target. 100% trained. 21 @ WH 20 @ BM 25 @ BH 21 @ BC	97.3% in 2000 96.3% in 2001 100% from 2002 through 2005	Steady
8	2006 TSM FP-EM	Spill Fire	Ensure Incident Commander/Qualified Individual at each site is trained in ICS.	Not Applicable	100%	Met target. 100% trained (12 total)	100% from 2002 through 2005	Steady
9.	2006 1.T.1.c (TSM-FP-EM)	Spill	Successfully complete Preparedness for response Exercise Program (PREP) drills/exercises	Not Applicable	100% of PREP objectives tested/site/yr (prorated)	Met target. 100% completion at all sites.	Tracked since 2005. Remains at 100%	Steady
10	2006 1.J.2.a (ENV) P-Track and Clean TX programs	Waste	Reduce total amount of hazardous waste generated. Fluorescent bulb waste is a CY metric for P-Track and Clean Texas programs.	Not Applicable	No more than 539 lbs/FY total Fluorescent bulbs: BM: 120 lbs/yr BH: 139 lbs/yr	Surpassed FY target for SPR, 268 lbs generated. Surpassed bulb target: BM: 5.4 lbs BH: 15.0 lbs	3802 lbs in 2000 1712 lbs in 2001 717 lbs in 2002 865 lbs in 2003 1333 lbs in 2004 495 lbs in 2005	Improving substantially
11	2006 1.M.3 (MAINT)	Resource Use	Conduct a predictive maintenance program (PdM) that will identify potential equipment failures.	Achieve 90% weighted average PdM Index each month	Achieve 95% weighted average PdM Index each month	Surpassed target. 100%	Completed scheduled PdM activities: 99.5% in 2003 99.98% in 2004 99.93% in 2005	Steady
12	2006 ENV	Monitoring and Surveillance Results	Submit environmental documents on time to DOE & regulators (timeliness & quality)	Not Applicable	100%	Met target. 100%	98% in 2000 100% from 2001 through 2005	Steady

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target**		**Level of Achievement in FY 2006**	**Performance Trend (Since FY00)**	**Trend**
				Minimum	**Target**			
13	2006 1.M.1.a(2) (MAINT)	Spill Air Emissions Waste	Meet weighted average (MPAR) of quality of maintenance, preventive maintenance completion, maintenance support, scheduling effectiveness, productivity, corrective maintenance backlog, and readiness of critical must-operate equipment.	95% MPAR for each site each month	98% MPAR for each site each month	Surpassed target. 98.2%	97.3% in 2000 97.6% in 2001 98.5% in 2002 98.4% in 2003 and 2004 98.3% in 2005	Steady
14	2006 ENV	Waste Spill Air Emissions Resource Use	Review all purchase requests, designs, summaries of work, and other documents sent to Environmental Department for review.	Not Applicable	100%	100% of information expected to contain environmental issues had been reviewed.	100% from 2001 through 2005	Steady
15	2006 TSM FP-EM	Fire	Ensure fire protection capabilities at each site through prompt Priority One and Two fire protection system repairs.	Average time to complete fire protection repairs equal to completion time of Must-Operate equipment repairs	Average time to complete fire protection repairs less than completion time of Must-Operate equipment repairs	Only BC met target for priority 1 and 2 repairs. Only BH met priority 1 target. BM and WH did not meet either target.	2002: Surpassed target (except at BM – Priority 2 only) at all sites 2003 & 2004: Surpassed targets at all sites but not 2005: BH & WH met priority 1, BH & BC met priority 2	Declining
16	2006 1.H.4.a (SEC)	Spill	Maintain availability of all physical security protection systems	At least 90% detection probability	100% detection probability	Met target (100%)	98% in 2002 99.6% in second half of 2003 99.7% in 2004 99.8% in 2005	Steady

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target Minimum**	**Target Target**	**Level of Achievement in FY 2006**	**Performance Trend (Since FY00)**	**Trend**
17	2006 1.J.2.b (ENV)	Waste	Reduce total amount of sanitary waste generated	Not Applicable	No more than 1.6 million lbs/yr	Surpassed target. 449,754 lbs (0.45 million lbs) generated	636,502 lbs in 2000 607,120 lbs in 2001 484,059 lbs in 2002 449,637 lbs in 2003 437,997 lbs in 2004 402,616 lbs in 2005	Consistently Improved through 2005, but beginning to increase again.
18	2006 ENV	Waste	Increase recycling of sanitary waste through waste diversion	Not Applicable	46%	Surpassed target. 69% recycled	52% in 2000 69% in 2001 40% in 2002 38% in 2003 41% in 2004 88% in 2005	Steady
19	2006 1.J.2.c	Resource Use	Increase purchasing of EPA designated recycled content products (affirmative procurement)	Not Applicable	100%	Met target. 100%	83% in FY00 87% in FY01 100% from 2002 through 2004 98.4% in 2005	Steady
20	NONE Energy Mgmt. Perf. Agreement	Resource Use	Demonstrate progress toward installing cost effective energy conservation measures identified by the Site Building Comprehensive Facility Audits and the E2P2 committee.	NMIN ≥ 0.25 NMID NMIN= Number of measures installed. NMID = Number of measures identified.	NMIN ≥ 0.35 NMID	Surpassed target. 0.43 (43%) with 3 of 7 measures implemented.	0.444 (44.4%) in 2004 0.40 (40%) in 2005	Steady
21	NONE Energy Mgmt. Perf. Agreement	Resource Use	Purchase low standby power devices from 5 of the 10 device types identified at http://oahu.lbl.gov/	At least 5 devices	At least 7 devices	Met target. 7 devices purchased.	7 types purchased in 2004 and 2005	Steady

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target**		**Level of Achievement in FY 2006**	**Performance Trend (Since FY00)**	**Trend**
				Minimum	**Target**			
22	2006 TSM PROJ MGMT	Public Involvement	Plan and administer an effective community outreach program. Complete community outreach activities using the Annual Community Outreach Program plan as a baseline.	Complete all activities in accordance with the plan.	Complete activities in addition to those planned.	Surpassed target. 105%	156% in 2002 105.6% in 2003 105+% in 2004 103+% in 2005	Steady
23	None. P-Track and Clean Texas Programs	Resource Use	Reduce lead acquisition via lead acid batteries in electric vehicles by 5%, based on a 2003 procurement baseline (+161 lb reduction). This is a 3 year objective to be achieved by the end of CY 06 for P-Track and Clean Texas programs.	Not Applicable	Total: Reduce purchase to no more than 3051.4 lbs/yr BH: no more than 794 lbs/yr BM: no more than 264 lbs/yr BC + WH: no more than 2006 lbs/yr	Busted "Total" target by purchasing 3409 lbs BH: 197 lbs – meets CT target BM: 792 lbs – busted CT target WH: 792 lbs BC: 1628 lbs	In 2003: Total: 3212 lbs purchased BH: 836 lbs BM: 264 lbs In 2004: Total: 1389 lbs purchased BH: 277.8 lbs BM: 0 lbs In 2005: Total: 5018.6 lbs purchased BH: 1740.24 lbs BM: 1375.2 lbs	Decreasing lead acquisition since 2005, but greater than the 2003 baseline
24	None. P-Track and Clean Texas Programs	Air Emissions	Reduce VOC emissions by at least 15% from the cavern workover process. This is a 3 year objective to be achieved by the end of CY 06 for P-Track and Clean Texas programs.	Not Applicable	Do not exceed 49.44 tons/yr	Surpassed target (30.24 tons generated). A 21% reduction in emissions occurred SPR-wide due to the use of BHT-7. Process improvement observed only at BH (15.6 tons generated), with a 34% reduction in emissions. WH generated 14.64 tons	In 2004: 18.06 tons/yr total BH: 17.39 tons/yr BM: 0.67 tons/yr In 2005: 26.34 tons at BH (only)	Total emissions generated in 2006 was greater than 2004 and 2005, but 15% reduction in emissions overall was successful due to changes in workover process at BH where BHT-7 was used instead of a frac tank.

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target**		**Level of Achievement in FY 2006**	**Performance Trend (Since FY00)**	**Trend**
				Minimum	**Target**			
25	None. P-Track and Clean Texas Programs	Wildlife Exposure	Provide habitat on site to protect wildlife. This is a 3 year objective to be achieved by the end of CY 06 for P-Track and Clean Texas programs.	Not Applicable	At least 40 acres	Surpassed target (79 acres). 40 acres set aside at BM, 32 at WH and 7 at BC (2 more acres added at BC)	72 acres in 2004 77 acres in 2005	Improved for P-Track and Steady for Clean Texas
26	None. Mod to P-Track and Clean Texas Programs	Air Emissions	Degas crude oil to avoid VOC emissions off-site when oil is moved into Commerce.	34 million bbls	39 million bbls	Surpassed target. 43.3 million bbls treated	New target this year	None
27	None Env. Instr. Manual	Waste	Increase use of the Qualified Products List (QPL)	Not Applicable	At least 90% products sampled found as “approved” on QPL	Surpassed target. 92.5% approved	81.6% found approved in 2004 94.2% found approved in 2005	Slight decrease from 2005.
28	2006 1.T.1.d ATSM-FP-EM	Spill Fire	Train Protective Force to assist in Support Response.	Train 50% of Protective Force Officers	Train 75% of Protective Force Officers	Surpassed target. Consistently exceeded 75% each month.	100% since 2004.	Steady

End of Section

3. ENVIRONMENTAL PROGRAM INFORMATION

The environmental program is implemented by the prime M&O contractor for the SPR on behalf of DOE (permittee) and is designed to support the SPR through tasks aimed at avoiding or minimizing adverse environmental effects from the SPR on surrounding lands, air, and water bodies.

The monitoring and inspection program, originally developed under guidance of the SPR Programmatic Environmental Action Report and Site Environmental Action Reports, now conforms to the monitoring program by DOE Order 450.1. This program includes monitoring permitted NPDES outfalls and air emissions, conducting other required federal and state inspections, and surveillance sampling and analysis of site-associated surface and ground water quality. This makes possible the assessment of environmental impacts relative to the baseline and early detection of water quality degradation that may occur from SPR operations.

The results of the individual program areas such as air emissions monitoring and reporting, NPDES compliance, water quality monitoring, and ground water monitoring for 2006 are discussed in sections 5 and 6.

3.1 ASSOCIATED PLANS AND PROCEDURES

Associated plans that support the SPR environmental program include the Emergency Management Plan and Implementing Procedures, the site specific Emergency Response Procedures with spill reporting procedures; the site-specific Spill Prevention, Control, and Countermeasures Plans (SPCC); the Environmental Monitoring Plan (EMP) which incorporates the Ground Water Protection Management Program (GWPMP) plan; and the Pollution Prevention Plan (PPP). The EMP, GWPMP, and the PPP are reviewed and updated annually; the SPCC plans are reviewed and revised as needed or every five years per regulation.

Associated procedures that support the SPR environmental program are located in the DM Environmental Instructions Manual. These procedures identify requirements, responsible personnel, deadlines, and governing standards. Each site has developed instructions where needed that implement the environmental program specific to their facility.

The ISO 14001 Environmental Management System Manual was developed to describe and provide direction to DM policies, plans, and procedures that make up the

environmental management system and to illustrate how the EMS conforms to the ISO 14001 standard. This document is reviewed and revised at least annually.

3.2 REPORTING

Proper operation of the SPR with respect to the environment involves several types of reports and reporting procedures. The basic reports are summarized briefly in this section.

3.2.1 Spill Reporting

Site Emergency Response Procedures address spill reporting requirements of the SPR contractor, DOE, and appropriate regulatory agencies. Specific reporting procedures are dependent upon several key factors including the quantity and type of material spilled, immediate and potential impacts of the spill, and spill location (e.g., wetland or water body). All spills of hazardous substances are first verbally reported to site management and then through the SPR contractor management reporting system to New Orleans contractor and DOE management. The tool to document these spills is the Operations Control Center (OCC) Non-Routine and Occurrence Report form that is completed at the site level and then forwarded to the New Orleans. Verbal notification and associated written reports to the appropriate regulatory agencies occur as required, if the spill meets the reportable criteria. Final written reports from the sites are submitted after cleanup, unless otherwise directed by the DOE or appropriate regulatory agency.

3.2.2 Discharge Monitoring Reports

Wastewater and storm water discharges from SPR sites are authorized by EPA through the NPDES program and through the LDEQ by the Louisiana Pollutant Discharge Elimination System (LPDES). The EPA has not yet delegated the NPDES program to the Railroad Commission of Texas (RCT) so parallel EPA NPDES and RCT Rule 8 water discharge programs are in place for Big Hill and Bryan Mound. The routine monitoring reports are prepared and submitted in accordance with site-specific permit requirements. All discharge permits issued to the SPR require quarterly reporting to the appropriate agency(s) (LDEQ, or RCT and EPA). Should a noncompliance or bypass occur during the reporting period, an explanation of the cause and actions taken to correct the event is included in the corresponding quarterly report.

3.2.3 Other Reports

The SPR contractor provides several other reports to, or on behalf of DOE. Table 3-1 contains a comprehensive list of environmental regulations and reporting requirements applicable to the SPR.

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
Clean Air Act	Control of hydrocarbon emissions from tanks, valves, and piping	TCEQ	Air Emissions Permit	Annual Emissions Inventory Questionnaires
		TCEQ	Air Emissions Permit Special Requirement	Monthly Tank Emissions
Clean Water Act as amended (FWPCA)	Wastewater discharges	U.S. EPA, Region VI	NPDES Permit	Quarterly monitoring reports
		LA Dept. of Env. Quality (LDEQ)	Water Discharge Permit	Quarterly monitoring reports
		Railroad Commission of Texas (RCT)	Water Discharge Permit	Quarterly monitoring reports
	Spill Prevention, Control and Countermeasures (SPCC)	U.S. EPA, LDEQ	SPCC Plan	Submit existing plan when spills on navigable waters exceed 1000 gals or occur ≥2x in 1 year
	Discharge notification	LDEQ, TCEQ, RCT, U.S. DOT, EPA	Verbal and written notification	Non-permitted discharges over RQ
	Dredging maintenance, and any construction in wetlands for structures (Sections 404 & 10)	U.S. Army Corps of Engineers (COE)	Construct & Maintain Permit, Maintenance Notifications	Two-week advance of work start, notice suspension, and end.
	Wildlife refuges	U.S. Fish and Wildlife Service (US F&WS)	Right-of-way for Construction and Maintenance	None
Clean Texas Program, Platinum Level membership	Environmental Management Systems	TCEQ	Applicable environmental requirements, audit results, performance in meeting commitments, and outreach information	Annual progress report. Information on individual Texas facilities is included in the National Environmental Performance track Report
Coastal Zone Management Act	Wetlands construction within state coastal management zones	Louisiana Dept. of Natural Resources (LDNR), Texas General Land Office (GLO)	Federal project consistency determinations	None

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements (continued)

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
DOE Order 450.1*	Environmental Planning and Monitoring	DOE	Ground Water Protection Management Program Plan	Annual review (now contained in EMP)
			Environmental Monitoring Plan	Annual revision
			Site Environmental Report	Annual report
			Performance Indicators	Monthly electronic updates in PB Views data management system and quarterly report
	Waste Management	DOE	Annual Report on Waste Generation and Pollution Prevention Progress	Annual summary of all wastes
DOE Order 451.1B	NEPA Compliance	DOE	NEPA Planning Summary	Annual Report
			EIS Supplement Analysis	As needed
EO 13101	Affirmative Procurement	DOE	Affirmative Procurement Report	Annual report
EO 13352	Conflict Resolution	U.S. Council on Environmental Quality (CEQ)	Report on actions to implement EO regarding facilitation of cooperative conservation	Annual report
Federal Migratory Bird Act	Disturbance of bird nests	US F&WS	Special Purpose Permit	As requested by USFWS
Miscellaneous State Environmental Regulations	Use of salt domes	LDNR	Permit for Use of Salt Domes for Hydrocarbon Storage	None
	Water withdrawal from coastal areas	TCEQ	Water Appropriation Permit	Annual Usage Report
	Pipeline usage	RCT	Pipeline and Gathering System Certification (T-4C)	Annual Certification
	Operation of brine ponds	LDNR, RCT	Operate and Maintain Permit	None
	Operation of relined brine ponds 7&37 BH	RCT	Operate and Maintain Permit, Weekly Leak Detection	Retain on site
	Surveillance of closed brine and anhydrite ponds	LDNR, RCT	Closure agreements, annual ground water monitoring results	Report in SER
	Wastewater	TCEQ	DM operator's license	None
	Potable water	TCEQ	DM company operations license	None
National Environmental Performance Track Program	Environmental Management Systems	EPA	Applicable environmental requirements, audit results, performance in meeting commitments, and outreach information	Annual progress report; Triennial renewal
Clean Texas Program, Platinum Level	Environmental Management Systems	TCEQ	Applicable environmental requirements, audit results, performance in meeting commitments, and outreach information	Annual progress report. Progress is reported in the National Environmental Performance Track Report; Triennial renewal
National Environmental Policy Act	Review of proposed projects for environmental considerations	CEQ	Environmental Impact statements, Environmental Assessments	Only when not tiered under other EIS or EA.
			Categorical Exclusions	For projects that require consent.

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements (continued)

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
National Environmental Policy Act (continued)	Inclusion of cooperating agencies in NEPA process	CEQ	Agency participation in NEPA activities to ensure adequate information in the decision-making process	Memorandum, as needed
Oil Pollution Act of 1990 (amendment of FWPCA)	Oil spill response	EPA, LDEQ, USCG, TCEQ	Emergency Response Procedures, Oil Spill Response Cert.	None
		U.S. Dept. of Transportation (DOT)	Pipeline Response Plan	None
Oil Spill Prevention & Response Act of 1991	Oil spill response in Texas coastal zone	GLO	Discharge Prevention and Response Plan	Report spills of oil as required
			Discharge Prevention and Response Facility Cert.	Annual review by agency.
Pollution Prevention Act of 1990	Strategy to incorporate pollution prevention into ES&H goals	EPA, DOE	Pollution Prevention Plan, Waste Min Plan, Waste Mgmt Plan, Storm water Pollution Prevention Plan	None
Resource Conservation and Recovery Act	Hazardous waste generation and disposal	LDEQ	Annual Generators Report	Annual report to agency
			LA Notification of HW Activity	New waste stream, change in generator status
			LA Uniform HW Manifest	Complete and submit form with disposal
		RCT	TX Uniform HW Manifest	Complete and submit form with disposal
			Oil and Gas Waste Report	Annotate Report to Agency
			Texas Notification of hazardous waste activity	New waste stream or change in generator status
	Used oil burned for recovery	LDEQ, RCT	Uniform HW Manifest (Recycling)	Complete and submit form with disposal
	Non-hazardous oilfield waste disposal (exploration and production)	LDNR	Non-Hazardous Oilfield Waste Shipping Control Ticket (UIC-28)	Complete and submit form with disposal
	Non-hazardous special	LDEQ, TCEQ	Shipping Paper	Complete and submit form with disposal
	Waste Management	LDEQ, TCEQ	Monthly waste inventory form	Complete for documentation
			Weekly waste inspection form	Complete for documentation
	Affirmative Procurement	EPA	Affirmative Procurement Report	Annual Report
Safe Drinking Water Act	Cavern formation, well workovers, and salt-water disposal wells	LDNR, Office of Conservation, Under-ground Injection and Mining Division	Well Work over Permit (WH-1)	Well Work over Report
			Cavern Inspection (29-M)	Semi-annual Cavern Inspection Report
			Saltwater Disposal (UIC-10)	Annual Saltwater Disposal Well Report
			Cavern Integrity Test Report	Annual Cavern Integrity
			Oil Wells Integrity (W-10)	Annual Oil Well Status Report

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements (continued)

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
Safe Drinking Water Act (continued)		RCT	Brine Injection Permit (H-10)	Annual Disposal/ Injection Wells Reports
	Potable water	LA Dept. of Health & Hospitals (LDHH)	Daily Chlorine Residual Concentration (BC) Quarterly total coliform test (BC) Annual disinfectant and disinfectant by-products test (BC)	Retain on site Retain results on site Submit to LDHH
		TCEQ	Weekly disinfectant residual concentration (BM and BH) Monthly total coliform test (BM and BH) Annual disinfectant and disinfectant by-products test (BM)	Quarterly to agency Retain results on site Submit to TCEQ
	Storage of oil in underground salt domes	LDNR, RCT	Storage permit	None
Superfund Amendment Reauthorization Act	Reporting of inventories of hazardous substances and materials stored on site	Louisiana Dept. of Public Safety and Corrections, Texas Dept. of Health	Title III, Tier Two	Annual Inventory Report
	Reporting of discharges of all listed hazardous materials	EPA	Toxic Release Inventory, Form R	Complete and submit form when threshold exceeded

3.3 ENVIRONMENTAL PERMITS

The active environmental permits required by regulatory agencies to construct, operate, and maintain the SPR are discussed by site.

The SPR holds a general permit to discharge hydrostatic test water in the state of Louisiana that applies to all of the Louisiana SPR sites, and their offsite pipelines. This permit requires quarterly discharge monitoring reporting.

LDEQ has primacy for the NPDES program in Louisiana that includes responsibility for all compliance and enforcement actions relating to the discharge of water in Louisiana. The LDEQ-issued general storm water permit coverage remained in-force throughout 2006 for West Hackberry and the renewal general permit issued early in 2006 for Bayou

Choctaw authorizing all of their discharges replaced both the state administered individual permit and MSGP coverage there.

Since the RCT does not have primacy for the NPDES program, Big Hill and Bryan Mound operate under parallel EPA and RCT discharge permits. In addition to maintaining federal coverage, the two Texas SPR sites operate under authority granted with Statewide Rule 8 water discharge permits issued by the RCT. Modifications for nozzle exit velocity and NOI's for the administratively extended federal MSGP coverage for sheet flow (non point source) storm water associated with industrial activity remained in-force during 2006.

The Certification of No Exposure processed to the MDEQ for the Mississippi Stennis Warehousing operations in lieu of MSGP stormwater coverage at that location remained in-force during 2006.

The air permits for the SPR facilities are administered by the LDEQ in Louisiana and the TCEQ in Texas. The Bayou Choctaw and West Hackberry air permits did not require modification or renewal in 2006.

Permit alterations of the Big Hill and Bryan Mound air permits were granted by TCEQ in May 2006 to allow a reduction in monitoring frequency for valves, pumps and compressor seals from quarterly to biennial. This incentive is contingent upon the SPR maintaining "National Leader" status in the TCEQ's Clean Texas Environmental Leadership Program. As a result of TCEQ granting of these permit alterations, DOE withdrew the flexible air permit applications for Big Hill and Bryan Mound.

Degas operations were completed at Big Hill in October 2006. DOE notified TCEQ that the Big Hill degas air permit was no longer needed.

3.3.1 Bayou Choctaw

Table 3-2 lists the permits at Bayou Choctaw. Individual work permits are received from the Louisiana Underground Injection Control Division of LDNR for each well work over performed. State inspectors periodically visit the site to observe SPR operations. Bayou Choctaw operates under the water and air programs delegated to Louisiana by EPA.

Blanket fees and basic renewal information were supplied in 2006 to the Department of Health and Hospitals for the continued certified operations of the Bayou Choctaw potable water system.

The 2004 LPDES renewal application for Bayou Choctaw resulted in the issuance of renewed authority to discharge effective January 6, 2006. This general permit for Light Commercial Facilities (LCF) permit LAG480540 effectively replaced the site's individual permit LA0053040 and the MSGP permit LAR05M577. However, the state's LCF permit expired on July 31, 2006, and coverage has been administratively extended to all permittees pending internal renewal actions and state level adjudication.

A project to expand the site's security perimeter "clear sight zone" to a full 100 meters was authorized and implemented in the spring and implemented by the summer CY2006. This project required a total of 46.2 acres of permit assigned compensatory wetlands mitigation and a state water quality certification before issuance of the final NODCOE permit authority. A project complete notification was issued as required to NODCOE. Verification of NWP 13 for erosion control work in the site's N-S Canal was requested of and granted by NODCOE. This work was not fully completed by the close of 2006.

Table 3-2. Permits at Bayou Choctaw

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
LAG480540	LDEQ	LPDES	01/06/06	07/31/06 (extended)	(1),(2)
1280-00015- 02	LDEQ	Air	12/2/99	Open	(3)
None	LDNR	Injection	01/11/83	Open	(4)
SDS-1	LDNR	Injection	09/09/77	Open	(5)
LMNOD-SP (Bull Bay) 3	COE	Constr. & Maintain	01/30/79	- *	(6)
LMNOD-SP (Iberville Parish Wetlands) 7	COE	Constr. & Maintain	09/26/77	-	(7)
LMNOD-SP (Iberville Parish Wetlands) 10	COE	Constr. &Maintain	06/12/78	-	(8)
LMNOD-SP (Iberville Parish Wetlands) 17	COE	Constr. & Maintain	11/06/78	-	(9)
LMNOD-SP (Iberville Parish Wetlands) 31	COE	Constr. & Maintain	05/27/80	-	(10)
LMNOD-SP (Iberville Parish Wetlands) 102	COE	Constr. & Maintain	09/26/77	-	(11)
WN-20-020-0168	COE	Constr. & Maintain	04/02/02	-	(12)
WT-20-020-2654	COE	Constr. & Maintain	08/20/02	-	(13)
WT-20-020-3621	COE	Constr. & Maintain	09/17/02	-	(14)
LMNOD-SP (Bayou Plaquemine)	COE	Constr. & Maintain	09/26/77	-	(15)

Table 3-2. Permits at Bayou Choctaw (continue

PERMIT NUMBER	ISSUING* AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
CT-20-030-1379-0	COE	Constr. & Maintain	03/12/03	-	(16)
CT-20-030-1501-0	COE	Constr. & Maintain	03/28/03	-	(17)
CT-20-030-3087-0	COE	Constr. & Maintain	07/25/03	-	(18)
MVN-2004-4453-CT	COE	Constr. & Maintain	10/14/04	-	(19)
MVN-2003-2234-CT	COE	Constr. & Maintain	02/2/06	-	(20)

* COE permits remain active for the life of the structure.

(1) LDEQ cancelled the LPDES converted permit LA0053040 and LA MSGP permit LAR05M577 replacing both with a single Light Commercial Facility (LCF) general permit LAG480540.
(2) The state's LPDES LCF general permit (LAG48000) expired on 7/31/2006 and discharge authority has been extended indefinitely (stayed) for all permittees pending LPDES internal permitting actions and state level adjudication per LPDES enforcement.
(3) Site air operating permit modified 12/99
(4) Letter of financial responsibility to plug and abandon injection wells.
(5) Permit approved use of salt dome cavities for storage of liquid hydrocarbons.
(6) Maintain Bull Bay 24" brine disposal pipeline recorded with applicable Registrar of Deeds.
(7) Construct and maintain well pads (brine disposal wells).
(8) Enlarge existing well pads and construct access roads (brine disposal wells 1, 2, & 3.)
(9) Construct and maintain access road to brine disposal well area. NOTE: brine disposal pipeline was constructed under NWP authority and maintenance is allowed in conjunction with the access road permit. Major maintenance performed in 1996.
(10) Construct and maintain well pad, levees, access road & appurtenances to Cavern 102 and additional bank stabilization, warehouse pad and culvert per additions of 1983.
(11) Construct and maintain ring levee, drill site and appurtenances, Well 101.
(12) Install and maintain fill with culverts for parking. Permit authorized a construction period until 4/30/2007.
(13) Install and maintain culverts and fill to construct minor roadway crossings. Activity authorized under NWP-14 and provides a construction period until 8/20/2004.
(14) Replace, repair and maintain security fence with concrete footing and curbing. Activity authorized under NWP-3 and provides a construction period until 9/17/2004.
(15) Install and maintain 36-inch petroleum products pipeline under and across Bayou Plaquemine
(16) Install and maintain a replacement N-S bridge for an existing, permitted N-S bridge on the Main Site. Activity authorized under NWP-3; provides a construction period until 3/12/2005.
(17) Install and maintain a replacement brine disposal access road bridge for an existing permitted structure on the brine disposal access road. Activity authorized under NWP-3, provides a construction period until 3/28/2005.
(18) Install and maintain a bulkhead and fill for bank stabilization in the North-South Canal on the Main Site. Activity authorized under NWP-13 providing a construction period until 7/25/2005.
(19) Install and maintain refurbished Bailey Bridge crossing over Wilbert's Canal via NWP14, providing construction period for 2 years.
(20) Implement and maintain an expanded clear sight security perimeter zone. Requires compensatory mitigation and long-term oversight of the mitigation bank sites.

3.3.2 Big Hill

Table 3-3 lists the permits at Big Hill. In 2006, the site appropriated 157,623 m^3 (128 acre-feet) of water from the Intracoastal Waterway exclusive of water for fire protection. This represents less than one-half percent of the recently revised total allowable withdrawal for a year. The certified affidavit and annual report of water usage was forwarded to the TCEQ as required in 2006.

The forms T-4C were forwarded to the appropriate branch of the Railroad Commission of Texas (RCT) in late October 2006, for the Big Hill crude oil pipeline distribution system.

The NPDES permit required brine line integrity test demonstrated integrity and the results were provided to EPA Region 6 during 2006.

Both agencies holding discharge permits for the Texas sites concurred with the addition of corrosion inhibiting chemicals in low concentrations in the raw water ahead of the heat exchanger units, for the condition of Presidential drawdown, under EPA's renewed authority in 2003, and under state authority effective in 2005. These chemicals have never been required and are no longer needed for drawdown due to incorporation of a special metallurgy in replacement bundles for these units (completed in 2006) precluding the need.

The M&O contractor is registered with TCEQ as a Public Water System Operations Company (registration # WC0000073) since Big Hill (and Bryan Mound) provides sanitary control of their purchased water distribution system on-site. A status report, including current licensed water operators, was submitted to TCEQ in 2006.

No permit modification requests were made to either EPA or RCT during 2006. All original permit (2003) conditions and subsequent approved minor permit modifications (2005) remained in full force during 2006.

The RCT permit to construct, operate, and maintain the site's interconnected brine ponds no's 7 & 37, permit P000226B, was conditionally modified to allow for the construction of a new continuous bottom liner material. The renovation project is scheduled for completion in 2007. The operations of the re-lined ponds is contingent upon an construction-complete inspection from the issuing authority.

The U.S. Army Corps of Engineers, Galveston District (GALCOE) reviewed a project description for a replacement oil water separator to be added to the site's RWIS construct and maintain permit and determined no permit was necessary for the activity as described. Field repairs and renovations to the Big Hill brine disposal pipeline, and relocation of a 34.5 kV power transmission line underground all authorized in a single 2005 permitting action,

were completed in 2006. A floating small craft intrusion barrier (SCIB) to be placed in front of the RWIS approach was authorized by the GALCOE using an NWP and found acceptable by the Coast Guard.

Permit alterations of the Big Hill and Bryan Mound air permits were granted by TCEQ in May 2006 to allow a reduction in monitoring frequency for valves, pumps and compressor seals from quarterly to biennial. This incentive is contingent upon the SPR maintaining "Platinum Level" status in the TCEQ's Clean Texas Environmental Leadership Program. As a result of TCEQ granting of these permit alterations, DOE withdrew the flexible air permit applications for Big Hill and Bryan Mound.

Degas operations were completed at Big Hill in October 2006. DOE notified TCEQ that the Big Hill degas air permit was no longer needed.

Table 3-3. Permits at Big Hill

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
TX0092827	EPA	NPDES	11/01/03	10/31/08	(1)
NOI	EPA	NPDES	01/24/01	09/2005	(2)
SWGCO-RP 16536 (01,02,03,04, 05)	COE	Constr. & Maintain	01/11/84	Dredging clause to 12/2008	(3) (4)
P-7	F&WS	Constr. & Operate	07/31/86	06/30/2036	(5)
9256	TCEQ	Air	04/22/98	04/22/2008	Site Air Permit
51839	TCEQ	Air	08/15/02	10/17/2006	Degas Permit (11)
02939	RCT	Operate	11/28/83	Open	(6)
P000226A & P000226B	RCT	Operate/ Maintain	09/19/84	Open	(7)
0048295, 0048320, 004816, 004817	RCT	Operate	05/09/83 06/23/83	Open Open	(8)
UHS-006	RCT	Water Disch.	01/01/05	12/31/2009	(9)
4045A	TNRCC	Water Use	11/14/83	Open	(10)

(1) Renewal submitted 11/24/93 - accepted as administratively complete 12/22/93. Acted upon through 2002 and 2003 with final permit issued in September 2003, effective 11/1/03.
(2) NPDES Multi-Sector General Permit (MSGP) coverage for Storm Water Associated with Industrial Activity expired in October 2005 and was automatically extended by EPA until a renewed permit is made effective.
(3) Permits and modifications to construct and maintain RWIS, raw water 48" pipeline, brine disposal 48" pipeline, crude oil 36" pipeline. Maintenance dredging clause renewed until 12/31/08. Modified in 1996 for new integrity test method.
(4) Completion of raw water, brine disposal, and crude oil pipeline extended. Amended to install offshore pipeline by trenching.
(5) Completion of pipeline construction extended. (48" Brine Pipeline)
(6) Pipeline distribution system registration to operate crude oil lines. Renewed annually.
(7) Permits to operate and maintain anhydrite and brine/oil pits. Modifications are on file.
(8) Permits to create, operate, and maintain an underground hydrocarbon storage facility consisting of 14 caverns.
(9) Corresponds to TX0092827 (EPA-NPDES). Permit renewed 12/30/2004 with an effective date of 1/1/05.
(10) Permit amended in 1990 to allow for annual diversion of no more than 117,291 acre feet of water and to authorize diversion until termination of the project as a SPR operation. Modified in 1996 to reduce water set aside down to 30,000 ac/ft per year. Maximum Diversion Rate 175 cfs.
(11) TCEQ notified on 10/17/06 that degas operations were completed at Big Hill and that the degas air permit was no longer needed.

3.3.3 Bryan Mound

Table 3-4 lists the permits for the Bryan Mound site. The Bryan Mound site has a permit from TCEQ for the appropriation of state waters for the leaching program, site utility, and fire protection systems. The permit requires a yearly report of the quantity of water used. In 2006, the site used a total of 165,523 m^3 (134 acre-feet) of water from the Brazos River Diversion Channel, representing slightly over one-quarter percent of the annual water usage authorized. The certified affidavit and annual report of water usage was forwarded as required in 2006.

During 2006 a single notification for maintenance dredging in the approach channel to the RWIS was made for COE permit 12347 (as amended in 1995). Activity occurring in the on site designated wetlands associated with below grade crude oil header piping installation for the relocation of the degas unit was authorized in 2006 with an appropriate non-reporting NWP. An SCIB to be placed in front of the RWIS approach was authorized by the GALCOE using an NWP and was found acceptable by the Coast Guard.

No permit modification requests were made to either EPA or RCT during the 2006. All original permit (2003) conditions and subsequent approved minor permit modifications (2005) remained in full force during 2006.

Required reporting for 2006 involved the successful annual brine line integrity test to Region 6 EPA, wastewater operators' reports to TCEQ; and crude oil pipeline system operations renewal to the RCT.

Both agencies holding water discharge permits for the Texas sites concurred with the addition of corrosion inhibiting chemicals in low concentrations in the raw water ahead of the heat exchanger units, for the condition of Presidential drawdown, under EPA's renewed authority in 2003, and under state authority effective in 2005. These chemicals have never been required and are no longer needed for drawdown due to incorporation of a special metallurgy in replacement bundles for these units (completed in 2006) precluding the need.

The M&O contractor registered with TCEQ as a Public Water System Operations Company (registration # WC0000073) since Bryan Mound (and Big Hill) provide sanitary control of their purchased water distribution system on-site. A status report, including current licensed water operators, was submitted to TCEQ in 2006.

Permit alterations of the Big Hill and Bryan Mound air permits were granted by TCEQ in May 2006 to allow a reduction in monitoring frequency for valves, pumps and compressor seals from quarterly to biennial. This incentive is contingent upon the SPR maintaining "Platinum Level" status in the TCEQ's Clean Texas Environmental Leadership Program. As a result of TCEQ granting of these permit alterations, DOE withdrew the flexible air permit applications for Big Hill and Bryan Mound.

Table 3-4. Permits at Bryan Mound.

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
TX0074012	EPA	NPDES	11/01/03	10/31/08	(1)
NOI	EPA	NPDES	01/24/01	09/2005	(2)
SWGCO-RP-12347 (03)	COE	Constr & Maintain	02/22/78	-Dredging clause open to 12/2006	(3)
3-67-782 (Docket#)	RCT	Injection	08/21/78	Open	(4)
3-70-377 (Docket#)	RCT	Injection	12/18/78	Open	(4)
P001447	RCT	Operate	10/30/84	Open	(5)
3681A	TNRCC	Water Use	07/20/81	Open	(6)
UHS-004	RCT	Water Disch	04/01/04	03/31/09	(7)
82-8475	TDH&PT	Constr.	01/01/83	Open	(8)
SWGCO-RP-11666	COE	Constr. & Maintain	10/15/77	- *	(9)
SWGCO-RP-12112	COE	Constr. & Maintain	07/25/77	-	(10)
SWGCO-RP-12062 (03)	COE	Constr. & Maintain	10/10/78	-	(11)
SWGCO-RP-14114 (01)	COE	Constr. & Maintain	05/18/85	-	(12)
SWGCO-RP-16177	COE	Constr. & Maintain	09/07/82	-	(13)
SWGCO-RP-13435 (01)	COE	Constr. & Maintain	05/21/79	-	(14)
04994	RCT	Operate	08/01/00	Open	(15)
6176B	TCEQ	Air	06/12/02	06/12/12	Site Air Permit
52962	TCEQ	Air	11/07/02	11/07/12	Degas Permit

* COE permits remain active for the life of the structure.

(1) Renewal submitted 03/03/00. Accepted as administratively complete 05/22/00. Acted upon through 2002 and 2003 with final permit issued in September 2003, effective 11/1/03.
(2) NPDES Multi-Sector General Permit (MSGP) coverage for Storm Water Associated with Industrial Activity expired in October, 2005, and was administratively extended by EPA until a renewed permit is made effective.
(3) Maintenance dredging of raw water intake extended to 12/31/06. (SWGCO-RP 12347 authorized construction of RWIS). Extension/renewal authorizes spoil area addition. A renewal application for an Extension of Time (EOT) provided to GALCOE in November was not acted upon in 2006.
(4) Approval of oil storage and salt disposal program.
(5) Authority to operate brine pond.
(6) Permit expires at project end, covers 52000 ac/ft/yr and MDR of 130 CFS per 2001 amendment.
(7) Corresponds with TX0074012 (EPA-NPDES). (Renewal submitted 12/9/03, RCT acted on permit in March, '04, effective 4/1/04.)
(8) Corresponds with SWGCO-RP-16177.
(9) For 30-inch crude oil pipeline to 3 miles SW from Freeport
(10) For 30-inch crude oil pipeline to 2 miles S from Freeport
(11) For 36-inch brine disposal pipeline & diffuser. Revision/amendment (01) deleted special condition (a) requiring maximized deep well injection; (02) approved construction of 24-inch replacement pipeline and diffuser in January 12, 1993. (03) Added the offshore additions the new integrity test method.
(12) General permit for pipeline crossings by directional drilling in navigable waters
(13) Place an 8-inch water line (PVC, potable)
(14) For construction of cavern pads 101, 102, 103, 111, and 113 in wetlands. Mod.01 added access road and fill placement for DCS-2.
(15) Pipeline distribution system registration to operate crude oil lines. Renewed annually with T-4C.

3.3.4 St. James

The SPRPMO negotiated a twenty year long-term leasing arrangement for use of the St. James site by the private corporation Shell Pipeline in 1997. Shell Pipeline retains all responsibility for maintaining necessary permits at St. James concurrent with their lease.

3.3.5 Stennis Warehouse

There are no permits for the Stennis Warehouse facility. A Certificate of No Exposure, declaring that all activities are conducted in a manner that will not expose potential pollutants to stormwater, was submitted to and confirmed by the Mississippi Department of Environmental Quality (MDEQ) in lieu of operating under a multi-sector general permit. Air emissions from Stennis Warehouse operations are *de minimus*, requiring no permitting or reporting activity.

3.3.6 Weeks Island

The permits for Weeks Island are listed in Table 3-5. Long-term ground water monitoring implemented for the SDS-8 supplement was completed in 2004 on the 5-year post decommissioning monitoring anniversary. In 2005 the overall monitoring program was determined to be complete by LDNR per a concurrence letter dated October 31, 2005. As a result no physical monitoring or sampling activities occurred in 2006.

Table 3-5. Permits at Weeks Island

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
SDS-8	LDNR	Injection	02/16/79 revised for post closure 9/99	Terminated	(1)
SDS-8 Supplement	LDNR	Decommission Supplement	9/1/99	Open	(2)

(1) Approval for use of salt dome cavities for storage of liquid hydrocarbons.
(2) Supplement for the decommissioning activities as modified to reflect completion of decommissioning monitoring.

3.3.7 West Hackberry

Since renewal of the discharge authority effective November 1, 2004, the site continued to operate with the permit prescribed streamlined effluent monitoring involving a combination of three outfalls numerically limited with an individual permit. The remainder of the storm water retained in secondary containments and storm water associated with industrial activity are addressed under the written Storm Water Pollution Prevention Plan (SWPPP) required by the state's Multi-Sector General Permit.

The replacement raw water line project, which included limited renovations to the site's RWIS was authorized mid-year, requiring NODCOE authority; a consistency determination; a water quality certification; and, a Cameron Parish police jury LCUP. The project, although begun in August, will not be completed until 2007. Later in the year, a project to perform maintenance dredging and to make and install certain renovations and erosion control measures at the existing boat launch for the main site was authorized by NODCOE and the CMD. This work was completed in 2006. An SCIB to be placed in front of the RWIS approach was authorized by the GALCOE using an NWP and was found acceptable by the Coast Guard. A single COE permit maintenance notification was also processed during this calendar year for traveling screen work on the site's RWIS. Permits for West Hackberry are listed in Table 3-6.

Table 3-6. Permits at West Hackberry

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
LA0053031	LDEQ	LPDES	11/1/04	10/31/09	(1)
LAR05M559	LDEQ	LPDES	05/27/06	04/30/11	(2)
LMNOD-SP (LTCS) 26	COE	Constr.& Maintain	02/08/79	-	(3)
LMNOD-SP (Black Lk) 31	COE	Constr.& Maintain	10/26/82	-	(4)
LMNOD-SP (Black Lk) 43	COE	Constr.& Maintain	07/26/84	-	(5)
LMNOD-SP (Gulf of Mexico) 2574	COE	Constr.& Maintain	08/11/80	-	(6)
LMNOD-SE (LTCS) 40	COE	Constr.& Maintain	05/25/88	-	(7)
LMNOD-SP (Cameron Parish Wetlands) 162	COE	Constr. & Maintain	03/09/78	-	(8)
SDS-9	LDNR	Injection	08/07/79	Open	(9)
None (Letter)	LDNR	Injection	01/11/83	Open	(10)
971198-9	LDNR	Injection	09/27/83	Open	(11)
0560-00019-02	LDEQ	Air	11/24/97	Open	-
SWGCO-RP-12342	COE	Constr. & Maintain	03/28/78	-	(12)
LMNOD-SP (Cameron Parish Wetlands) 152	COE	Constr. & Maintain	03/16/78	-	(13)
LMNOD-SP (Cameron Parish Wetlands) 276	COE	Constr. & Maintain	02/11/80	-	(14)
WN20-000-3972-0	COE	Constr. & Maintain	8/31/00	-	(15)
WO-20-020-1136	COE	Constr. & Maintain	01/25/02 02/19/02	-	(16)
WO-20-020-3607	COE	Constr. & Maintain	10/23/02	-	(17)
WW-20-030-3748	COE	Constr. & Maintain	10/22/03	-	(18)

(1) LDEQ obtained primacy and issued and LPDES permit with former NPDES number. Renewed in 2004.
(2) LPDES Multi-Sector General Permit (MSGP) coverage for Storm Water Associated with Industrial Activity obtained as a renewal with a NOI dated 1/22/01; coverage was automatic 48 hours after postmark State issued LPDES permit in May 2001. State renewed authority for the MSGP became effective 5/1/2006; a re-instatement letter effective 5/27/2006 replaced the expired coverage with the new MSGP authority (and conditions) maintaining existing permit number.
(3) Maintenance dredging for raw water intake.
(4) Maintenance dredging for firewater canal and extended boat slip access amendment of 1993.

(5) Construction of erosion control dike completed in 1986. Maintenance dredging open until 7/26/94; addition of riprap amendment of 1993 open until 1995.
(6) Amended to install parallel pipeline (05/29/86).
(7) Permit to construct and maintain 36" crude oil pipeline from site to Texoma/LC Meter Station.
(8) Permit to maintain 42" crude oil pipeline.
(9) Approval to create 16 additional salt dome cavities
(10) Letter of financial responsibility to close all injection wells on this site. Still active
(11) Approval to construct and operate wells 117A and B.
(12) For 42" crude oil pipeline crossings of waters & waterways in Texas
(13) For brine disposal wells, well pads, and brine disposal pipelines, (12", 20", & 24")
(14) For well pads, levees, and access roads (Wells 110, 111, 112, 113, 114, & 115)
(15) Category I programmatic general permit. Repair exposed 42-inch crude oil pipeline.
(16) Restore riprap along the north perimeter dike adjacent to Cavern 6 and Black Lake. Permit authorized a construction period until 1/25/2007.
(17) Deposit fill in the fire ditch. Permit authorized a construction period until 10/23/2007.
(18) Modifications to the existing Boat Ramp; and, re-establishment of the erosion control breakwater in Black Lake along the north side of the site. Authorizes construction period until October 31, 2008 and includes an associated Water Quality Certification and Federal Consistency Determination for the activity.

3.4 WASTE MINIMIZATION PROGRAM

The waste minimization program reduces the generation of all wastes including hazardous, non-hazardous sanitary, and Exploration & Production (E&P) wastes.

The SPR successfully met the hazardous and non-hazardous sanitary waste generation targets generating less than 539 and 1,600,000 lbs respectively during FY 2006. Although E&P wastes are not included in these targets, during FY 2006 the SPR recycled 1,142 mt (1259 tons) of wastes generated by the E&P process.

DM environmental staff members were able to assist in this success by a thorough review of the potential waste streams, evaluation of all possible recycling alternatives, communication with SPR site personnel, and consultation with federal and state regulatory agencies as required.

Materials and respective amounts recycled during CY 2006 are delineated in Table 3-7.

Table 3-7. CY 2006 Materials Recycled from all SPR Sites

Recycled Material	Recycled (lbs)	Recycled (metric tons)
Aluminum Cans (including co-mingled w/plastics)	710	0.32
Antifreeze	460	0.21
Ballasts, Non-PCB	219	0.10
Batteries, Non-Pb/Acid (including alkaline, Lithium, NiCd)	708	0.32
Batteries, Pb/Acid	13,846	6.28
Bioremediated Soil	72,500	32.89
Bulbs (all style bulbs including fluorescent, incandescent, etc.)	529	0.24
Concrete	3,605,663	1,635.50
Construction Debris	7,505	3.40
E&P	2,328,691	1,056.28
Fuel & Oil Filters	161	0.07
Gasoline	16	0.01
Iron, Scrap	820,235	372.05
Miscellaneous, N.O.S.	44	0.02

Table 3-7. CY 2006 Materials Recycled from all SPR Sites (continued)

Recycled Material	Recycled (lbs)	Recycled (metric tons)
Paper/Cardboard	96,768	43.89
Toner Cartridges	2,416	1.10
Used Oil Burned for Energy Recovery	9,277	4.21
TOTAL	6,959,748	3,156.89

The SPR Chemical Management Program is successful in restricting use of chemical products to those that are more environmentally friendly. One of the key tools to select chemical products is the SPR Qualified Products List.

In February 2005, the Performance Improvement Team: Acquisition and Management of Chemicals on the SPR was chartered. In response to auditing findings of non-compliant chemical purchases, the team evaluated controls that restrict acquisition. The team proposed eight improvements to the process which were successfully implemented.

Tools that were implemented in 2006 to minimize noncompliant chemical purchases and maximize the choice of environmentally friendly products included:

- Establishment of a joint consolidated environmental and safety review of Material Safety Data Sheets
- Providing a pick-list of chemicals approved for purchase
- Improvement of the nomenclature between the QPL and product MSDS
- Development of product categories for the QPL
- Correcting procedure deficiencies across SPR (financial procedures and develop QPL work instructions)
- Improving purchase forms (petty cash and request for check)
- Rewarding positive behaviors for acquisition and management of chemicals.

3.5 POLLUTION PREVENTION (P2)

The purpose of the SPR P2 program is to integrate P2 activities into all SPR operations, support technology development programs aimed at minimizing multimedia waste generation, and coordinate P2 efforts with SPR sites. All SPR employees have P2 responsibilities under the program.

The P2 Advocates Team, composed of staff from across the SPR, disseminate awareness throughout the SPR. P2 announcements and suggestions are communicated via scheduled quarterly conference calls; the SPR electronic banner; and the SPR's quarterly newsletter, the "ESPRIT." P2 conference minutes, news articles, and program updates are published on the DM Environmental webpage, which is available to all SPR

employees. In 2006, the SPR continued its aggressive integration of the P2 and EMS programs into its business operations, providing both cost savings and pollution reduction.

An SPR Green Building Performance Improvement Team, chartered in 2006, evaluated commercially available and cost effective green building technology for incorporation into SPR facilities. The team prioritized SPR engineering specifications to include green design requirements to enhance energy efficiency, water conservation, waste minimization, indoor environmental quality, and sustainable design. The "greening" process considers life cycle cost/benefit for the SPR and equates to "doing business better."

In recognition of Earth Day, P2 information was distributed by email to all SPR employees throughout the week leading up to Earth Day. A slide presentation underscoring the importance of environmental stewardship was also distributed to all the SPR employees on behalf of the children of SPR employees. SPR employees participated in Earth Day Events including "Cleanest Exhaust" competitions emphasizing the importance of vehicle engine maintenance and "Tire Pressure Checks" to not only reduce gasoline consumption but also aid in safe driving. Results from these efforts will improve safety and efficiency for the participants.

For the seventh year SPR employees continued support of annual Beach Sweep activities. Volunteers also included employee relatives, friends, and an employee-sponsored girl scout troop. All SPR sites, including New Orleans, are located in coastal regions throughout Louisiana and Texas. Participation in this important event during 2006 took on a new meaning since the devastating 2005 hurricane season. Effects of Hurricanes Katrina and Rita are still evident and the Beach Sweep participants were able to make a difference by removing storm debris from shorelines and neighborhood storm drains. Bryan Mound employees

participated in the bi-annual Adopt-a-Beach program on Surfside Beach while Big Hill employees cleaned up a section of McFaddin Beach near High Island.

The SPR established the Federal Transportation Subsidy Program in 2006 to provide incentives to encourage employees to use mass transit or vanpooling as their preferred commuting choice. Partnering with another Federal agency (Minerals Management Services) increases realized benefits such as reduced air emissions and fuel consumption, and increased safety and cost savings for the participants.

All SPR employees generate waste and are responsible for properly managing it. SPR requirements, corresponding training, and compliance with procedural and contractual requirements minimize its generation. To further achieve waste minimization/reduction, the SPR promotes the use of non-hazardous substitutes, prevention of spills, and proper management of those wastes generated. These and other P2 activities are incorporated in the design, construction, operation, and maintenance of all projects and activities.

SPR employees are trained on buying items with recycled content in accordance with the Comprehensive Procurement Guidelines (CPG), which is EPA's continuing effort to promote the use of materials recovered from solid waste. DM employees empowered to make purchases are required annually to take a computer based training (CBT) course on Affirmative Procurement. This helps ensure that the materials collected in recycling programs will be reused again in the manufacture of new products.

In 2006, the SPR again achieved 100 percent success for purchasing Affirmative Procurement products, helping to fulfill the SPR target Pollution Prevention Goal to increase purchases of EPA-designated items with recycle content, as referenced in Section 2.

3.6 INTEGRATED SAFETY MANAGEMENT (ISM)

The Environmental Management System (EMS) is the environmental leg of ISM that is integrated throughout all SPR activities. The SPR ISM utilizes the EMS to infuse ISM principles throughout the environmental program. In the same regard EMS elements are directed up through the overarching ISM system.

3.7 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

An SPR EMS complies with provisions of executive order 13148 and DOE Order 450.1. Environmental considerations are interwoven into management and work programs and

practices at all levels so as to achieve DOE's mission while achieving prevention of pollution, continuous improvement, and compliance with requirements. By integrating the NEPA process into the EMS, the SPR enhances protection of the environment. Protection of the public and the environment is achieved throughout all phases of a project beginning with a formal NEPA review at the conceptual stage of a project and ending with the project's completion under controlled conditions that minimize environmental impact. A NEPA review includes the recognition of the environmental aspects of the project that, if not managed, could result in detrimental environmental impact when the project is completed. The end point of the project, such as the construction, installation, and use of a piece of equipment, is also examined for environmental aspects so that impact is controlled from implementation forward. Section 5.1 discusses the SPR EMSs in greater detail.

3.8 TRAINING

Site personnel with environmental responsibilities and Emergency Response Team (ERT) personnel have received training in environmental plans and procedures. Site management personnel are knowledgeable of environmental procedures; spill reporting procedures, site-specific Spill Prevention Control and Countermeasures (SPCC) Plans, Emergency Response Procedures, and compliance awareness. ERT personnel from all sites participate in annual spill response refresher and hazardous materials technician training currently provided at Mississippi State Fire Academy. Onsite drills and exercises are also conducted to hone spill management strategies, practice spill cleanup methodologies, and sharpen control skills. Site response personnel are trained to rapidly and effectively contain and cleanup oil, brine, and hazardous substance spills under circumstances typical at each SPR site. New Orleans personnel, who are expected to provide site support during an incident response, have also been trained to the hazardous materials technician level. All site personnel and unescorted subcontractors and site visitors receive compliance awareness training via "The Active Force of Protection" video which provides an overview of the environmental program including individual responsibilities under the program. Spill Prevention and Waste Management/Hazardous Waste Handling training is mandatory and conducted annually for those personnel who could discover, prevent, or respond to spills, and handle or supervise the handling of wastes.

All site personnel also receive computer-based ISO 14001 EMS training annually. The training provides an overview of those elements of the ISO 14001 standard that involve all personnel. It also identifies environmental aspects and impacts of SPR activities and

environmental objectives to be achieved that year. A select group of personnel receive biennial CBT-based AP training

As a goal, all M&O contractor environmental staff members are trained to the National Registry of Environmental Professionals, Registered Environmental Manager (REM), level and are independently certified as such through examination.

Several M&O environmental staff members have completed ISO 14001 Lead Auditor certification training in order to better assist the SPR sites with regard to performing SPR site assessments, and Treatment Storage Disposal (TSD) facility due-diligence inspections.

DOE environmental staff provides oversight of M&O and construction contractor activities and have completed ISO 14001 Lead Auditor Certification, and NEPA and environmental compliance training. DOE staff certifications include REM designation and certified EH&S manager.

3.9 ES&H WEBSITE

In order to provide an efficient and effective means of obtaining information about key environmental topics at the SPR, an ES&H website was developed. This website is only available on the SPR internal intranet and contains a summary of all the major environmental regulatory and program information, including active permits, procedures and this report. The website is typically updated monthly, or more frequently when appropriate.

In addition, a brief description of the DM ES&H program is available to the public at www.DynMcDermott.com. This report and other DOE ES&H information is available to the public at www.spr.doe.gov/esh/.

End of Section

4. ENVIRONMENTAL RADIOLOGICAL PROGRAM INFORMATION

Radioactive sources at the SPR consist of X-ray that is used in laboratory and scanning equipment or other sealed sources brought on site for the purpose of performing radiography and cavern wire-line type logging operations. Procedures are in place to protect personnel from exposure during these operations. In addition the SPR is subject to inspections by the state implementing agencies (Louisiana Department of Environmental Quality and Texas Department of Health) and required notices to employees are posted on each X-ray scanning device.

4.1 SEALED SOURCES

At the SPR sealed sources of radiation are used for monitoring activities related to the physical properties of crude oil, brine, and cavern dimensions. During 2006 sealed sources were used at the SPR to perform cavern integrity monitoring activities without the occurrence of any incidents.

4.2 NATURALLY OCCURRING RADIOACTIVE MATERIALS (NORM)

A contracted survey, conducted at all SPR sites and the commercial pipe yard where SPR piping is stored, was completed in 1991. The results, no readings of elevated levels at any location, were submitted to the states as required by Louisiana and Texas regulations. No additional monitoring is required due to the negative results of this 1991 NORM survey.

End of Section

5. ENVIRONMENTAL NON-RADIOLOGICAL PROGRAM INFORMATION

A primary goal of DOE and the SPR contractor is to ensure that all SPR activities are conducted in accordance with sound environmental practices and that the environmental integrity of the SPR sites and their respective surroundings is maintained.

Effluent and surveillance monitoring are conducted at the SPR storage sites to assess the impact of SPR activity on air, surface water, and ground water. Effluent monitoring consists of measuring the pollutants of concern in airborne and liquid effluents while surveillance monitoring consists of sampling the environmental media at or around the sites.

5.1 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

Two EMSs are employed at the SPR for environmental management, one at the DOE Project management office (PMO) level and one at the M&O contractor level. DOE self-certified their EMS to the ISO 14001:2004 Standard in 2005. The M&O contractor's (DM) EMS was initially certified to the ISO 14001:1996 standard by an RAB (now ANAB) accredited registrar in 2000 and re-certified in 2003. Recertification to the updated ISO 14001:2004 standard occurred in 2006. Both EMSs include the organizational structure, activity planning, designation of responsibilities, practices, procedures, processes, and resources to support and validate the DM and DOE Environmental Policies, ASP5400.2 and SPRPMO P 451.1B, respectively (Appendix B).

Conformance of the EMS to the ISO 14001 standard is illustrated through the DOE order "SPRPMO Environmental Management System," (SPRPMO O 450.1) and the DM procedure "ISO 14001 Environmental Management System Manual," (ASI5400.55). These documents provide descriptions and references to SPR policies, plans, procedures, environmental aspects and impacts, and objectives and targets that are the foundation of the EMSs. The 17 ISO elements are identified in these documents with discussions on how DM and DOE implement them. Some DOE EMS requirements flow down to the M&O contractor and include portions of the M&O contractor's EMS. Environmental management programs conducted in 2006 to achieve environmental objectives are described in Table 5-1, EMS Program Achievement.

Table 5-1. EMS Program Achievement

Environmental Objective	Implementation
Reduce hazardous waste generation.	An E2/P2 Leadership goal. Refer to Item 1, Table 2-1.
Reduce sanitary waste generation.	An E2/P2 Leadership goal. Refer to Item 3, Table 2-1.
Increase recycling of sanitary waste through waste diversion.	An E2/P2 Leadership goal. Refer to Item 4, Table 2-1.
Submit environmental documents on time to DOE and regulators (timeliness and quality).	Milestone dates for document completion are agreed upon with environmental personnel prior to discussion with DOE and their subsequent establishment. Document milestones are tracked by environmental personnel weekly via DM's Summary of Significant Environmental Impacts and Activities report and quarterly for DM's performance evaluation by DOE.
Review purchase requests, designs, summaries of work, and other documents sent to Environmental Department for review.	Each department has a focal point for receiving documents for review. The documents are distributed by the focal point to subject matter experts for review and comment.
Reduce environmental permit exceedances reported on Discharge Monitoring Reports.	Personnel involved with activities that involve environmental permits are made aware of permit limitations that can be affected by their activities. Communication is key to awareness. Improvement can be made in understanding and communicating up front to those involved the permit requirements associated with an activity before the activity is performed. When an exceedance occurs, it is addressed formally, in real time, in an Occurrence Report. The report form prompts a description of the occurrence, cause, and corrective action. To provide awareness and promote corrective action, the information is also provided monthly in a report to the DM project manager and to upper management at the monthly project review meeting for discussion.
Eliminate cited Clean Water Act, Clean Air Act, and RCRA (waste) violations.	Awareness is provided to site personnel through annual spill prevention and waste management training. To promote improvement, spills and excursions that have occurred on the SPR since the last training session are discussed. Reportable releases are documented and managed like permit exceedances. Waste accumulation areas are inspected weekly and waste inventories are conducted monthly to assure compliance with accumulation requirements. Waste reports are reviewed monthly for compliance issues by ES&H managers and the New Orleans waste management specialist.
Reduce reportable occurrences of releases from operational facilities.	The number of reportable spills has been reduced through a combination of spill awareness by personnel, systematic preparation for activities that can cause a spill, and the upgrade of equipment that can fail and cause a release. Emphasis continues to be placed on personnel behavior, procedures, and equipment to minimize mishaps. Releases are documented and reviewed in the same manner as permit exceedances and violations to the Clean Air and Clean Water Acts.
Maintain EMS certification to the ISO 14001 Standard.	Audit dates are scheduled with the ANAB accredited registrar and participating sites months in advance to assure that a minimum of two audits are completed by the end of June and December.
Increase purchasing of EPA designated recycled content products (affirmative procurement).	An E2/P2 Leadership goal. Refer to Item 6, Table 2-1.

Table 5-1. EMS Program Achievement (continued)

Environmental Objective	Implementation
Maintain a high Maintenance Performance Appraisal Report (MPAR) score for the maintenance program.	A well-maintained facility should equate to fewer environmental impacts. MPAR is a weighted average that is, on a monthly basis, calculated, published in a detailed report, and reported to DOE. It is used to measure performance related to quality of maintenance, preventive maintenance completion, maintenance support, scheduling effectiveness, productivity, corrective maintenance backlog, and readiness of critical must-operate equipment.
Conduct a predictive maintenance program (PdM) that will identify potential equipment failures.	Data is systematically collected and analyzed on equipment essential for drawdown and fill operations to prevent failure and possible resultant environmental impact. Equipment performance is monitored during actual use and during exercises. Vibration monitoring is a critical part of PdM. Other types of predictive maintenance testing include monitoring of pump flow and head performance, utilizing thermography to inspect electrical distribution systems, testing oil in rotating equipment to determine machine and lubricant condition, analyzing motor data, and utilizing airborne ultrasonic technology to detect electrical abnormalities.
Plan and administer an effective community outreach program. Complete community outreach activities using the Annual Community Outreach Program Plan as a baseline.	A Public Outreach Plan is developed by DOE and implemented each year by the DM director, Property and Facilities. The plan addresses four areas of focus – community outreach, primary customer outreach, environmental safety and health outreach, and new initiatives. The plan lists the year's activities and provides a description for each. Employee awareness and participation in community outreach is promoted.
Maintain availability of all physical security protection systems.	A physically secure site should be less vulnerable to environmental impact by subversive elements. Security systems are constantly monitored for performance by the site's protective force. Discrepancies are reported daily to the site security specialist for review and initiation of a work order for repair. Work orders for the PPS systems are given very high priority – the same as drawdown critical equipment. Also, the site security specialists champion the work orders during the work scheduling meetings.
Complete and submit semi-annual piping and pipeline assurance reports by January 31st and July 31st.	Piping and pipeline assurance reports document pipe integrity assessments. These assessments support spill prevention. They report significant pipeline and piping activities, problems, deficiencies, and concerns. They also report on repairs or inspections of deficiencies and proposed inspections, studies, and repairs to determine piping and pipeline conditions.
Ensure key emergency equipment is available.	Each site has key emergency equipment that is tailored to site conditions. The equipment is inventoried quarterly by the site's fire protection/emergency management specialist. Any operational discrepancies are noted and corrective action is taken.

Table 5-1. EMS Program Achievement (continued)

Environmental Objective	How Achieved
Ensure basic order agreements are in place for spill response and clean up at each site.	DM has a sufficient number of agreements with spill response contractors to ensure at least one and preferably two or more are available at any time for call-out. When choosing contractors, factors such as company location, availability/type of equipment, and availability of manpower are considered. Effort continues to be made to partner with contractors with the resources that ideally suit the SPR sites. The contractors are also called out to participate in annual drills where their performance is evaluated.
Ensure emergency preparedness and response capabilities through training Emergency Response Team (ERT) members.	Each site has a group of well-trained ERT personnel who can respond to emergencies such as spills and fires. Training is budgeted annually by the New Orleans Emergency Preparedness (NOEP) group. New ERT members receive 40 hours of fire training and 40 hours of HazMat level training at an independent off-site training facility. Refresher training is provided annually with pertinent topics covered within a three-year cycle and specific topics receiving more emphasis than others. Unannounced and scheduled site drills are also conducted at each site to test skills, tactics, and strategies.
Ensure that the Incident Commander/Qualified Individual at each site is trained in Incident Command.	Due to the potential size and complexity of SPR emergencies, and the probability that emergency response will include outside agencies and other entities, many key management at all sites (including New Orleans) who could serve as the incident commander or qualified individual have received training in Incident Command. The NOEP group develops the training program and conducts quarterly response notification exercises. Incident management is tested during every site drill.
Successfully complete Preparedness for Response Exercise Program (PREP) drills and exercises.	Formally implemented emergency fire, spill, and security exercises test communications, organizational abilities, strategies, and physical competence of personnel and equipment. Response by DM personnel and emergency response contractors is observed and evaluated by a team composed of DM and DOE personnel and outside interested parties such as state and federal regulators and environmental advisory team members. Exercises allow responders to apply their abilities and knowledge, test their equipment, and learn ways to improve their response.
Ensure fire protection capabilities at each site through prompt Priority One and Two fire protection system repairs.	Work orders to repair fire protection equipment are tracked weekly to assure that they receive sufficient attention for prompt resolution. The site fire protection specialist champions work orders for fire system repair. The level of response to repair fire equipment is gauged against the level of response provided to must-operate equipment. Fire system repairs are to be completed as promptly or sooner than the time for must-operate equipment repairs.
Minimize utility costs by controlling overall electric loads and reduce energy consumption through efficiency improvements.	An E2/P2 Leadership goal. Refer to Item 7, Table 2-1.
Demonstrate progress toward installing cost effective energy conservation measures identified by the Site Building Comprehensive Facility Audits and the E2/P2 committee.	An E2/P2 Leadership goal. Refer to Item 7, Table 2-1.

Table 5-1. EMS Program Achievement (continued)

Environmental Objective	How Achieved
Purchase low standby power devices from five of the ten devices identified at the website http://oahu.lbl.gov/	Effort has been made to purchase low standby power devices identified by the Federal Energy Management Program. Computer monitors with a one watt standby power consuming feature are purchased to support Thin Client PC technology employed at all sites. All devices purchased also meet "Energy Star" requirements, and Energy Star devices have been flagged in the electronic material database.
Reduce lead acquisition via lead/acid batteries in the electric vehicle fleet.	In 2004, battery packs composed of conventional wet lead/acid batteries in electric vehicles were replaced with newer technology absorbed glass mat batteries that are designed to last longer. Battery use and further product investigation showed that the new technology batteries did not last any longer and actually contained more lead than the original wet cells. Therefore, as they failed, the new technology batteries were replaced with original equipment type wet cell batteries, focusing on promoting battery life through careful maintenance and charging.
Reduce VOC emissions from cavern workover operations.	Effort was made to find ways to prevent or reduce workover related VOC emissions through operational and equipment changes. In 2006 at Big Hill began using BACT surge tanks for transfer of crude oil instead of a frac tank, reducing VOC emissions substantially.
Reduce VOCs in crude oil distributed in commerce.	This objective was completed in 2005 at Big Hill by processing crude oil through a degasification plant on site. The oil vapor pressure was lowered, thereby lowering its emissions at its destination (i.e., terminal or refinery). Crude degasifying continued in 2006.
Provide habitat on site to protect wildlife.	On-site areas are designated and protected when and where possible as refuge for wildlife. Grassy acreage at Bryan Mound is left undisturbed from late summer through early spring for use by resident and migratory birds for food and shelter. At all sites, active bird nesting locations are noted and marked as needed to warn personnel not to disturb them. In the fall, a grassy area at Bayou Choctaw is seeded to provide winter food for deer and other wildlife.
Purchase only those chemical products that are approved on the Qualified Products List (QPL).	Chemical products screened for environmental issues prior to purchase reduce the risk of hazardous waste generation later when used, promote efficient product use, and decrease unnecessary user exposure. Product requestors select chemical products previously approved on the QPL or obtain the approval of an unlisted product from the Environmental Department in New Orleans before purchasing. Awareness of the need of the program and how to use the QPL has been increased to bolster success of this program.
Train Protective Force to assist in support response.	The site protective force is an excellent 24-hour resource for initial emergency response and for assisting the Emergency Response Team (ERT). They are trained to look for incidents. and support response in the safe, "cold" response zone of the emergency where special personal protective gear is not needed. The protective force is trained annually on site by DM emergency response personnel.

5.2 PROTECTION OF BIOTA

As addressed in previous sections of this report, the SPR does not maintain radioactive processes and thus there is not a requirement to monitor radioactive doses in the surrounding biota. The SPR does, however, take steps in accordance with the DM Environmental Policy (Appendix B) and standards established by DOE, to ensure that the surrounding wildlife population is not impacted.

In addition, select SPR site personnel have received training on wildlife rescue and rehabilitation techniques including oiled wildlife response. This training allows personnel to work under the supervision of a licensed rehabilitator or manage contract rehabilitators. An oil spill at the SPR sites could affect large numbers of protected migratory birds and wildlife requiring many trained and certified responders. Trained personnel have special knowledge and skills in the wildlife rescue and rehabilitation techniques necessary in support of the emergency incident command structure organization.

5.3 AIR QUALITY EFFLUENT MONITORING

Air pollutants of concern emitted by the SPR sites are either hazardous or have an impact on the ambient air quality. The hazardous air pollutants (HAP) are benzene, toluene, ethyl benzene, and xylene. However these are emitted in relatively small quantities that do not trigger HAP reporting. The non-hazardous pollutants that have an impact on air quality are non-methane/non-ethane volatile organic compounds (VOC), nitrogen oxides (NOx), sulfur dioxides (SO_2), carbon monoxide (CO), and particulate matter (PM_{10}). The quantity of these pollutants emitted is minor relative to other facilities in the respective air quality regions.

Effluent monitoring for air pollutants consists of monitoring processes and calculating the effluent volume through the use of acceptable industry practices. These results are compared to the permitted limits to ensure that they are in compliance.

Effluent monitoring at the SPR consists of measuring the following in order to quantify emissions:

- run-time of diesel powered emergency electrical generators;
- volume and type of crude oil flowed through frac tanks, floating roof tanks, diesel tanks, gasoline tanks, and oil-water separators;
- volume of paint and solvent used on-site;
- volume of brine which may release VOCs placed into the brine pond;

- number of piping components that emit over the acceptable regulatory limits (leakers) by monitoring all components with an organic vapor analyzer (OVA).

Effluent monitoring for air pollutants is conducted at both Texas (Big Hill and Bryan Mound) and two Louisiana sites (Bayou Choctaw and West Hackberry). The results are reported to state agencies through EIQs, except for Bayou Choctaw and West Hackberry. These sites are exempt from reporting because their emissions are below the regulatory threshold for reporting in their respective air quality regions. Even though the results of monitoring for Bayou Choctaw and West Hackberry are not reported, they are used to determine ongoing compliance with the permit and assure adequate performance of emission control equipment.

Another type of monitoring conducted at the SPR sites is air pollution control equipment monitoring. The air regulations require that the seals on internal and external floating roof tanks be inspected at frequent intervals for visible tears, holes, or cumulative gaps exceeding regulatory limits and to ensure they are operating accordingly. Big Hill has an external floating roof tank that requires inspection of the primary (every five years) and secondary (semi-annual) seals. The three internal floating roof tanks at Bryan Mound have a mechanical shoe seal that requires seal inspections every year.

5.3.1 Bayou Choctaw

Located in a marginal non-attainment area for ozone, Bayou Choctaw is permitted to emit 7.4 metric tpy (8.14 tpy) of VOC. Since this site emits less than nine metric tpy (10 tpy), it is not required to submit an emissions inventory summary (EIS) to report its annual emissions.

Although Bayou Choctaw is exempt from reporting emissions, effluent monitoring was conducted in 2006 on all permitted sources. These sources include the volume of crude oil in slop tanks and frac tanks, volume of brine flowing through the brine pond, fugitive emissions from monitoring piping components for acceptability, and monitoring the run-time of the emergency generators.

Bayou Choctaw operated in accordance with all air quality regulatory requirements in 2006. Table 5-2 is a summary of the permitted limits for Bayou Choctaw. Reporting of air regulatory requirements in Louisiana is not required and therefore they are not listed in Table 5-2.

Table 5-2. Parameters for the Bayou Choctaw Emission Points

Emission Point Description	Parameter	Permit Limits Metric tpy (tpy)
Crude & Slop Oil Tanks	VOC	2.43(2.67)
Gasoline Fuel Tank	VOC	0.52 (0.57)
Frac Tanks	VOC	1.42 (1.56)
Brine Pond	VOC	1.14 (1.26)
Fugitive Emissions	VOC	1.66 (1.83)
Air Eliminator	VOC	0.04 (0.04)
Emergency Generators/Pumps	VOC PM_{10} SO_2 NO_x CO	0.19 (0.21) 0.18 (0.20) 0.72 (0.79) 5.54 (6.09) 1.26 (1.39)

5.3.2 Big Hill

Located in a marginal non-attainment area for ozone, Big Hill is permitted to emit 16.6 metric tpy (18.35 tpy) of VOC. Since it emits more than nine metric tpy (10 tpy), it is required to use an emissions inventory questionnaire (EIQ) to report its annual emissions. Effluent monitoring was conducted in 2006 on all permitted sources such as the volume of crude oil in slop tanks, frac tanks, and surge tank; volume of brine into the brine pond; monitoring piping components to determine fugitive emission acceptability monitoring the run-time of the emergency generators. Big Hill operated in accordance with all air quality regulatory requirements in 2006. Table 5-3 is a summary of the permitted limits and actual emissions for Big Hill.

Table 5-3. Parameters for the Big Hill Emission Points

Emission Point Description	Parameter	Permit Limits, Metric tpy (tpy)	Actual Emissions Metric tpy (tpy)
Crude & Slop Oil Tanks	VOC	0.59 (0.65)	0.83 (0.91)
Gasoline & Diesel Fuel Tanks	VOC	0.25 (0.28)	0.24 (0.26)
Brine Pond	VOC	2.86 (3.15)	0.76 (0.84)
Fugitive Emissions	VOC	8.47 (9.34)	0.07 (0.08)
Air Eliminator	VOC	1.36 (1.50)	0 (0)
Solvent Recycler	VOC Acetone	0.05 (0.06) 0.01 (0.01)	0 (0) 0 (0)
Emergency Generators/Pumps	VOC PM_{10} SO_2 NO_x CO	0.11 (0.12) 0.07 (0.08) 0.64 (0.71) 2.38 (2.62) 0.52 (0.57)	0.02 (0.02) 0.02 (0.02) 0.10 (0.11) 0.45 (0.49) 0.11 (0.12)
Degas Plant	VOC NO_x CO SO_2 PM_{10}	2.95 (3.25) 14.14 (15.59) 18.11 (19.96) 0.44 (0.48) 1.24 (1.37)	0.18 (0.20) 2.23 (2.45) 2.89 (3.18) 0.02 (0.02) 0.19 (0.21)

5.3.3 Bryan Mound

Located in a moderate non-attainment area for ozone, Bryan Mound is permitted to emit 19.7 metric tpy (21.8 tpy) of VOC. Since the site emits more than nine metric tpy (10 tpy), it is required to use an EIQ to report its annual emissions. Effluent monitoring was

conducted in 2006 on all permitted sources. These sources include the volume of crude oil in slop tanks, frac tanks, and three internal floating roof tanks; volume of brine into the brine tank; monitoring piping components to determine fugitive emission acceptability; and monitoring the run-time of the emergency generators. Bryan Mound operated in accordance with all air quality regulatory requirements in 2006. Table 5-4 is a summary of the permitted limits and actual emissions for Bryan Mound.

Table 5-4. Parameters for the Bryan Mound Emission Points

Emission Point Description	Parameter	Permit Limits, Metric tpy (tpy)	Actual Emissions Metric tpy (tpy)
Crude Oil Tanks	VOC	9.35 (10.31)	2.79 (3.07)
Gasoline & Diesel Fuel Tanks	VOC	0.38 (0.42)	0.33 (0.36)
Brine Tank	VOC	4.92 (5.42)	0.51 (0.56)
Fugitive Emissions	VOC	0.89 (0.98)	0.14 (0.15)
Paints & Solvents	VOC	0.62 (0.68)	0.27 (0.30)
Emergency Generators/Pumps	VOC PM_{10} SO_2 NO_x CO	0.06 (0.07) 0.06 (0.07) 0.50 (0.55) 1.62 (1.79) 0.37 (0.41)	0.03 (0.03) 0.03 (0.03) 0.03 (0.03) 0.28 (0.31) 0.06 (0.07)
Degas Plant	VOC NO_x CO SO_2 PM_{10}	3.48 (3.84) 13.67 (15.07) 17.23 (18.99) 0.34 (0.37) 1.24 (1.37)	N/A N/A N/A N/A N/A

5.3.4 West Hackberry

Located in an ozone attainment area, West Hackberry is permitted to emit 37 metric tpy (40.8 tpy) of VOC. Since the site emits less than 45.4 metric tpy (50 tpy), it is not required to submit an EIS to report its annual emissions.

Although West Hackberry is exempt from reporting emissions, effluent monitoring was conducted in 2006 on all permitted sources. These sources include the volume of crude oil in slop tanks and frac tanks, volume of brine into the brine tank, monitoring piping components to determine fugitive emission acceptability, and monitoring the run-time of the emergency generators. West Hackberry operated in accordance with all air quality regulatory requirements in 2006. Table 5-5 is a summary of the permitted limits for West Hackberry. Reporting air regulatory requirements in Louisiana is not required therefore they are not listed in Table 5-5.

Table 5-5. Parameters for the West Hackberry Emission Points

Emission Point Description	Parameter	Permit Limits, Metric tpy (tpy)
Slop Oil Tanks	VOC	1.81 (1.99)
Gasoline Fuel Tank	VOC	0.25 (0.28)
Frac Tanks	VOC	23.86 (26.30)
Brine Tank	VOC	0.95 (1.05)
Fugitive Emissions	VOC	9.71 (10.70)
Air Eliminator	VOC	0.06 (0.07)
Emergency Generators/Pumps	VOC PM_{10} SO_2 NO_x CO	0.41 (0.45) 0.20 (0.22) 0.02 (0.02) 12.59 (13.88) 2.75 (3.03)

5.4 WATER DISCHARGE EFFLUENT MONITORING

The water discharge permit-monitoring program fulfills the requirements of the EPA NPDES, and corresponding states RCT Rule 8 and LPDES programs. All SPR point source discharges are conducted in compliance with these federal and state programs.

SPR personnel regularly conducted point source discharges from all sites during 2006. These discharges are grouped as:

a. brine discharge to the Gulf of Mexico;
b. storm water runoff from tank, well, and pump pads;
c. rinse water from vehicles at specific locations draining to permitted outfalls;
d. effluent from package sewage treatment plants; and
e. hydrostatic test water from piping or tanks (LA only).

The SPR disposed of 1.56 million m^3 (9.807 mmb) of brine (mostly saturated sodium chloride solution with some infrequent discharges of lower salinities than normally attributed to brine) during 2006. Approximately 34.18 percent of the brine was disposed in the Gulf of Mexico via the Big Hill (20.47 percent of the total) and the Bryan Mound (13.71 percent of the total) brine disposal pipelines. The remainder was disposed in saline aquifers via injection wells at the Bayou Choctaw (33.17 percent of the total) and West Hackberry (32.65 percent of the total) sites. These figures represent an overall project-wide reduction in brine disposal of 68.4 percent versus the 2005 calendar year.

During 2006, 1,120 measurements and analyses were performed to monitor wastewater discharge quality from the SPR in accordance with NPDES and corresponding state permits. The SPR was in compliance with permit requirements for approximately 99.91 percent of the analyses performed in 2006. Only one permit non-compliance was

reported in 2006. The single non-compliance was of short duration and immediately resolved, causing no observable adverse environmental impact. Detailed information for this non-compliance is provided in section 5.4.4 of this report.

Parameters monitored varied by site and discharge. Separate tables provide specific parameters and the most frequent sampling interval (based on permit limitations). More frequent measurements are often made of certain parameters that assist with unit operations; these additional data are reported as required by the permits. The data measurement variations observed during CY 2006 are discussed in separate sections by site.

5.4.1 Bayou Choctaw

Bayou Choctaw personnel performed a total of 48 measurements on permitted outfalls and reporting stations to monitor LPDES permit compliance during 2006. Table 5-6 provides the permit required monitoring parameters and limits for the Bayou Choctaw outfalls, reflecting the changes associated with the permit renewal effective early in January. There were no permit non-compliances at Bayou Choctaw in 2006 resulting in a 100 percent site compliance performance record for the year.

Most monitoring is related to water discharges regulated under the Louisiana Department of Environmental Quality (LDEQ) Office of Water Resources LPDES permit. Discharges are from two package sewage treatment plants (STP), a permit limited vehicle rinsing station with the site's stormwater runoff from well pads, pump pads (containment areas), addressed a cross-reference to the LA MSGP and in the permit required SWPPP.

Table 5-6. Parameters for the Bayou Choctaw Outfalls

Location/Discharge	Parameter	Frequency*	Compliance Range
Sewage Treatment Plants	Flow BOD_5 TSS pH Fecal Coliform	1/6 months 1/6 months 1/6 months 1/6 months 1/6 months	(Report only, GPD) <45 mg/l Avg. <45 mg/l max 6.0 – 9.0 s.u. <400 col./100 ml
Storm Water (from former named/numbered outfalls)	Systematic Visual Observation	1/quarter (if discharging)	maintain written observations
Vehicle Rinsing (without soaps and/or detergents)	Flow TOC Oil and grease pH	1/quarter 1/quarter 1/quarter 1/quarter	Estimate in GPD <50 mg/l <15 mg/l 6.0-9.0 s.u.

*Permit requires an increase in the sampling frequency when an exceedance occurs.

5.4.2 Big Hill

During 2006, 628 measurements were performed to monitor NPDES and state discharge permit compliance. Table 5-7 provides the permit required monitoring parameters and limits for the Big Hill outfalls. There were no non-compliances during 2006 resulting in a 100 percent site compliance performance level.

Water discharges at Big Hill are regulated and enforced through the EPA NPDES permit program and the similar RCT discharge permit program (Rule 8). The discharges at the site involve brine to the Gulf of Mexico, hydroclone blow down into the Intracoastal Waterway, effluent from the sewage treatment plant, and storm water from well pads and pump pads. There were no discharges during 2006 from the hydroclone blow down system.

Table 5-7. Parameters for the Big Hill Outfalls

Location/Discharge	Parameter	Frequency*	Compliance Range
Brine to Gulf	Flow	Continuously	0.27 million m3/day
	Velocity	Per flow	>9.1 m/sec (30 ft/sec)
	Oil & Grease	1/mo	<15 mg/l max, <10 mg/l avg.
	TDS	1/mo	(report only)
	TSS	1/mo	(report only)
	pH	1/mo	6.0 - 9.0 s.u.
	DO	Daily	detectable (when using O_2 scavenger)
	Biomonitoring	1/qtr	Lethal NOEC 2.5%
	Integrity Tests	1/yr	Offshore within 4% of onshore
Storm Water Outfalls	Oil and Grease	1/mo	<15 mg/l
	TOC	1/mo	< 75 mg/l
	pH	1/mo	6.0 - 9.0 s.u.
	Salinity	1/mo	<8 ppt
Recirculated Raw Water	Flow	1/mo	Report only
Sewage Treatment Plant	Flow	5 days/wk	(report only)
	BOD_5	1/mo	<45 mg/l max <20 mg/l avg.
	TSS	1/mo	<45 mg/l max <20 mg/l avg.
	pH	1/mo	6.0 - 9.0 s.u.
Hydroclone Blow down (not used)	Flow	1/wk	report
	TSS	1/wk	report
	pH	1/wk	6.0 - 9.0 s.u.

*Permit requires an increase in the sampling frequency when an exceedance occurs.

5.4.3 Bryan Mound

Bryan Mound personnel made 369 measurements on permitted outfalls for the purpose of monitoring NPDES and state discharge permit compliance during 2006. Table 5-8 provides the permit-required parameters and limits for the Bryan Mound outfalls. There were no non-compliances during 2006 resulting in a 100 percent site compliance performance level.

Water discharges at Bryan Mound are regulated and enforced through the EPA NPDES permit program and the similar RCT discharge permit program for state waters (Rule 8).

Table 5-8. Parameters for the Bryan Mound Outfalls

Location/Discharge	Parameter	Frequency*	Compliance Range
Brine to Gulf	Flow	Continuously	report only
	Velocity	Per flow	>9.1 m/sec (30 ft/sec)
	Oil & Grease	1/wk(RCT)	<15 mg/l max <10 mg/l avg.
	TDS	1/mo	(report only)
	TSS	1/mo	(report only)
	pH	1/mo	6.0 - 9.0 s.u.
	Biomonitoring	1/qtr	Lethal NOEC 2.5%
	Integrity test	1/yr	Offshore within 4% of onshore
Storm Water	Oil and Grease	1/qtr	<15 mg/l
	TOC	1/qtr	<75 mg/l
	pH	1/qtr	6.0 - 9.0 s.u.
	Salinity	1/qtr	< 8 ppt
Recirculated Raw Water	Flow	1/mo	Report only
Sewage Treatment Plant	Flow	1/mo	Report only
	BOD_5	2/mo	<20 mg/l avg. <45 mg/l max
	TSS	2/mo	<20 mg/l avg. <45 mg/l max
	pH	2/mo	6.0 - 9.0 s.u.

*Permit requires an increase in the sampling frequency when an exceedance occurs.

5.4.4 West Hackberry

West Hackberry personnel performed 75 measurements on permitted outfalls to monitor LPDES permit compliance during 2006. Table 5-9 provides the permit-required parameters and limits for the West Hackberry outfalls. There was one permit non-compliances during 2006 resulting in a 98.7 percent site compliance level. Details of the single noncompliance may be found in Table 5-10.

The water discharges at the West Hackberry site were regulated under the EPA (NPDES) permit administered by the state of Louisiana under the LPDES permit program. Since removed from service in 1999 the site has had no permit controlled testing or reporting requirements for the former offshore brine line. The current permit covers treated sanitary sewage, car rinsing, and an intermittent mixed discharge of raw water, storm water and once-through non-contact bearing cooling water with separate effluent limitations and incorporates coverage for all of the former named stormwater outfalls under the state's MSGP. Certain named non-storm water discharges are addressed via the required site SWPPP. That permit coverage remained in full-force during 2006 as detailed in Table 5-9.

Table 5-9. Parameters for the West Hackberry Outfalls

Location/Discharge	Parameter	Frequency*	Compliance Range
Raw Water Test Discharges (incl. Non-contact Once-through Cooling Water and Diversion Water)	TOC Oil & Grease pH Visible sheen	None None None None	≤50 mg/l ≤15 mg/l 6.0 to 9.0 s.u. no presence
Storm Water (Wellpads & Containments at Slop Oil Tank battery, slop oil tank booster pump pad, vehicle rinse station, brine storage tank area, High Pressure Pump Pad, Fuel Storage Area, Emergency Generator, Lake Charles Meter Station, and RWIS Transformer Area)	Visual Observations made in accordance with Sector P (SIC Code 5171) of the current MSGP	1/quarter	perform and record standardized observations and maintain onsite in accordance with the SWPPP and/or site instruction
External Vehicle Rinsing/Washing	Flow (Daily Max) COD TSS O&G + visual pH	1/quarter 1/quarter 1/quarter 1/quarter 1/quarter	Report est. (gpd) ≤300 mg/l ≤45 mg/l ≤15 mg/ (vis. Y/N) 6.0 to 9.0 s.u.
Treated Sanitary Wastewater	Flow BOD_5 TSS pH fecal coliform	1/quarter 1/quarter 1/quarter 1/quarter 1/quarter	Report meas. (gpd) ≤ 45 mg/l ≤ 45 mg/l 6.0 to 9.0 s.u. ≤ 400 col./100 ml

* Permit requires an increase in the sampling frequency when an exceedance occurs

The non-stormwater discharges addressed by the West Hackberry SWPPP are routine discharges of: fire water (including fire pump packing gland seepage), air conditioner condensate, inspection pit discharges, ground water discharges, potable water system line discharges for maintenance, exterior building and piping wash down with no additives prior to painting/maintenance, and hydrostatic test waters under separate general permit control.

Table 5-10. 2006 Permit Noncompliance at West Hackberry

Date	Outfall Location	Permit Parameter	Value (Limit)	Cause
5/22/06	003 – Vehicle Rinsing Station	TSS	78 mg/l* (45 mg/l) * re-test of same sample 71 mg/l	Routine quarterly grab sampling of the flowing effluent of the subject outfall revealed a verifiable excursion for the parameter TSS. All other parameters were found acceptable. Once the excursion was determined and verified the station was made non-discharging until an engineered fix (improved settlement) could be designed, constructed, and implemented.

5.5 SURFACE WATER QUALITY SURVEILLANCE MONITORING

During 2006, surface waters of the Bayou Choctaw, Big Hill, Bryan Mound, and West Hackberry SPR sites were sampled and monitored for general water quality according to the SPR Environmental Monitoring Plan. Monitoring is conducted to provide early detection of surface water quality degradation resulting from SPR operations. It is separate from, and in addition to, the water discharge permit monitoring program.

Data and statistics are presented in tabular form, by site, in Tables 5-11 through 5-14. Observed values that were below detectable limit (BDL) were assigned a value of one-half the detection limit for statistical calculation purposes. In addition to commonly used summary statistical methods, the coefficient of variation (CV) treatment was incorporated to identify data sets with a high incidence of variation. Values approaching or exceeding 100 percent indicate that one standard deviation from the stated mean encompasses zero. This method draws attention to highly variable or skewed data sets for further evaluation. Extremely low values of CV (approaching or equal 0 percent) indicate the standard deviation is small, relative to the mean, such as would be the case with very stable data, or if a preponderance of the measurements fell below the method limit of detectability.

5.5.1 Bayou Choctaw

Samples were collected and analyzed monthly, where possible, for seven surface water-monitoring stations. Monitoring stations A through G are identified in Figure 5-1. Parameters monitored (Table 5-11) include pH, salinity (SAL), temperature, dissolved oxygen (DO), oil and grease (O&G), and total organic carbon (TOC). A discussion of each parameter follows.

5.5.1.1 Hydrogen Ion Activity

The annual median values of pH for all the monitored stations ranged from 7.2 to 7.4 s.u. which is consistent with the ambient conditions of surrounding waters. The complete range for all measurements at all stations for 2006 is 6.8 to 8.2 s.u. Fluctuations observed are attributed to environmental and seasonal factors such as variations in rainfall, temperature, and aquatic system flushing.

5.5.1.2 Temperature

Observed temperature ranged from 14.6 °C to 28.9 °C. Temperature fluctuations were consistent among all stations and are attributed solely to meteorological conditions since the Bayou Choctaw site produces no thermal discharges.

5.5.1.3 Salinity

In 2006, average annual salinities ranged from 0.5 ppt (indicating below detectable limits) to 1.8 ppt (Station C). Wetland stations A, E, F and G revealed below detectable limits throughout much of the year in their respective databases for 2006. It is believed that most of these values are a response to the return of normal rainfall. The largest measurement (6.6 ppt) occurred at Station C this year. This anomaly is attributed to a

low surface water extreme near this station in the E-W canal which temporarily reversed the hydraulic head direction allowing salt affected ground water to seep into a limited area of the canal. The CV at this station of 122.2 percent confirms the wide variability of the few measurements found above the method's detectable limit during the year. Further details of the historic ground water source are found in Section 6.

5.5.1.4 Oil and Grease

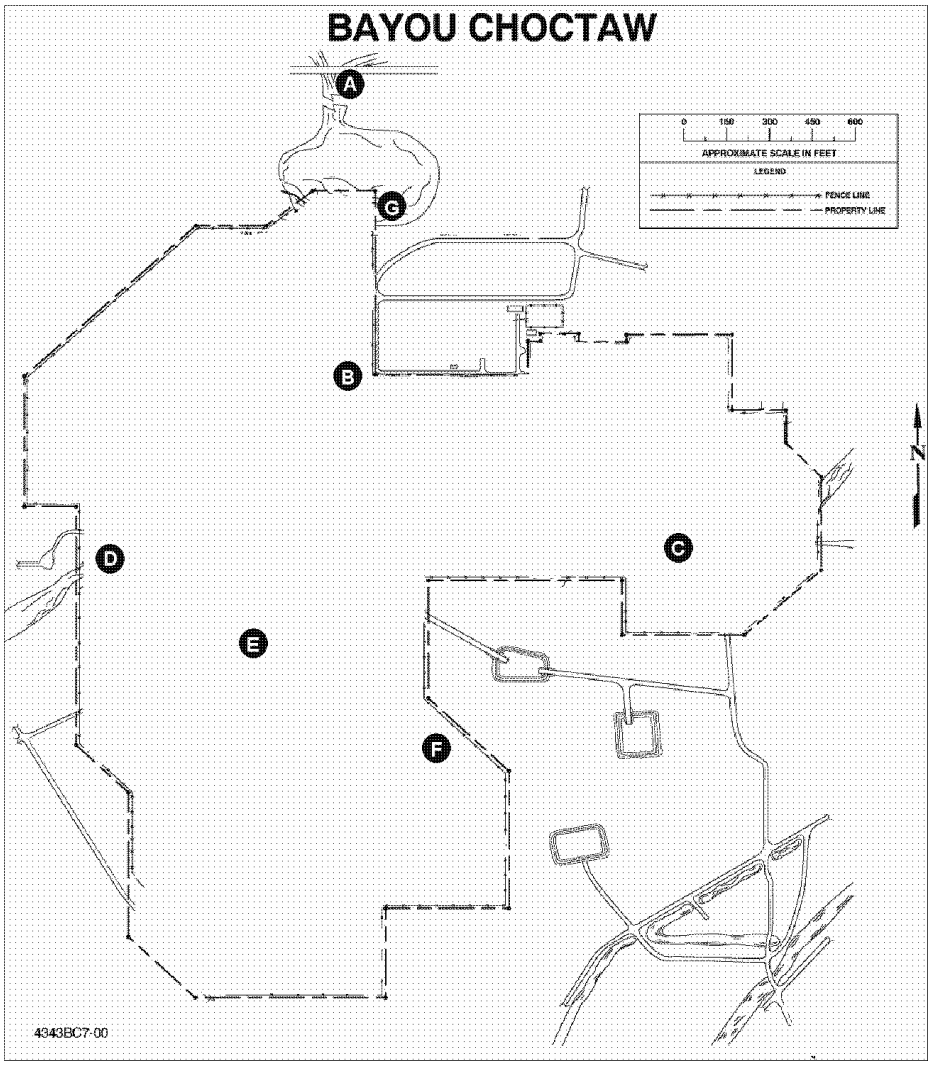
All samples at the seven stations were below the detectable limit (5.0 mg/l) calculated at 2.5 mg/l for statistical calculations. These data favorably reflect continued good site housekeeping and effective site spill prevention, control, and response efforts.

5.5.1.5 Dissolved Oxygen

Overall, DO average and median levels are low (below the minimum threshold <5 mg/l) with a single exception (5.1 mg/l). These low numbers are attributed to high temperature and high natural organic loading combined with low flow and minimal flushing typically observed at times in the two wetland area stations. Peak levels approaching 8.3 mg/l at stations C and E are attributed to high primary productivity.

5.5.1.6 Total Organic Carbon

Average annual TOC concentrations ranged from 6.2 to 15.8 mg/l. High TOC readings typically correlate with high organic loading that is usually found in stagnant or sluggish water bodies of limited volume, such as an evaporating pool of water. The highest value measured was 33.9 mg/l occurring at Station D suggesting low flows to stagnant water at the station for that month. The relatively low values observed around the site sampling locations as well as the peaks produced no discernible physical impacts and are not out of line with the natural setting or system receiving episodic rainfall.



Water Quality Monitoring Stations

A Canal north of Cavern Lake at perimeter road bridge
B Ditch running under the road to warehouse on West side of the road in area of heat exchangers.
C East-West Canal at Intersection of road to brine disposal wells
D East-West Canal
E Wetland Area
F Wetland Area
G Near Raw Water Intake

Figure 5-1. Bayou Choctaw Environmental Monitoring Stations

Table 5-11. 2006 Data Summary for Bayou Choctaw Monitoring Stations

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
A	Sample Size	12	12	12	4	12	12
	Number of BDL	0	NV	12	4	0	0
	Maximum	8.0	28.7	0.5	2.5	5.8	19.1
	Minimum	6.8	15.4	0.5	2.5	3.0	4.4
	Mean	NV	21.4	0.5	2.5	4.2	10.8
	Median	7.2	19.4	0.5	2.5	4.0	9.9
	Standard Deviation	NV	5.5	0.0	0.0	0.8	4.5
	Coefficient of Variation	NV	25.7	0.0	0.0	19.0	41.5
B	Sample Size	12	12	12	4	12	12
	Number of	0	NV	9	4	0	1
	Maximum	7.5	28.3	3.0	2.5	4.7	12.0
	Minimum	6.9	15.0	0.5	2.5	1.1	0.5
	Mean	NV	20.9	1.0	2.5	3.4	6.2
	Median	7.3	19.9	0.5	2.5	3.9	6.4
	Standard Deviation	NV	4.7	0.9	0.0	1.2	3.6
	Coefficient of Variation	NV	22.4	90.3	0.0	35.0	58.1
C	Sample Size	12	12	12	4	12	12
	Number of	0	NV	7	4	0	0
	Maximum	7.8	28.6	6.6	2.5	8.3	27.6
	Minimum	6.8	14.7	0.5	2.5	1.8	5.6
	Mean	NV	21.1	1.8	2.5	4.2	11.4
	Median	7.3	19.6	0.5	2.5	4.8	9.7
	Standard Deviation	NV	4.9	2.2	0.0	1.7	6.0
	Coefficient of Variation	NV	23.4	122.2	0.0	39.4	52.4
D	Sample Size	12	12	12	4	12	12
	Number of	0	NV	9	4	0	0
	Maximum	7.8	28.5	2.0	2.5	6.2	33.9
	Minimum	6.8	15.6	0.5	2.5	2.8	3.3
	Mean	NV	21.2	0.8	2.5	4.6	12.4
	Median	7.3	19.2	0.5	2.5	4.3	11.0
	Standard Deviation	NV	5.1	0.5	0.0	1.0	7.9
	Coefficient of Variation	NV	23.9	66.8	0.0	20.8	64.3
E	Sample Size	12	12	12	4	12	12
	Number of	0	NV	10	4	0	1
	Maximum	8.1	28.9	3.0	2.5	8.3	32.4
	Minimum	6.9	15.3	0.5	2.5	1.7	0.5
	Mean	NV	20.7	0.8	2.5	3.7	15.8
	Median	7.3	19.3	0.5	2.5	3.6	14.7
	Standard Deviation	NV	5.3	0.7	0.0	1.8	9.6
	Coefficient of Variation	NV	25.7	95.2	0.0	47.2	61.0

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

Table 5-11. 2006 Data Summary for Bayou Choctaw Monitoring Stations (continued)

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
F	Sample Size	12	12	12	4	12	12
	Number of BDL	0	NV	8	4	0	1
	Maximum	7.9	28.8	2	2.5	6.8	32.0
	Minimum	7.0	15.2	0.5	2.5	2.0	2.8
	Mean	NV	20.9	0.8	2.5	3.7	15.3
	Median	7.3	19.6	0.5	2.5	3.8	14.2
	Standard Deviation	NV	5.1	0.6	0	1.3	7.2
	Coefficient of Variation	NV	24.3	66.3	0	36.1	47.5
G	Sample Size	12	12	12	4	12	12
	Number of BDL	0	NV	12	4	1	0
	Maximum	8.2	28.2	0.5	2.5	6.1	18.7
	Minimum	6.9	14.6	0.5	2.5	2.5	5.7
	Mean	NV	20.9	0.5	2.5	4.9	11.7
	Median	7.4	18.9	0.5	2.5	5.1	11.5
	Standard Deviation	NV	5.5	0	0	1.0	3.9
	Coefficient of Variation	NV	26.4	0	0	20.5	33.4

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

5.5.1.7 General Observations

Based on the above discussion, the following general observations are made regarding the quality of Bayou Choctaw surface waters.

a. The surrounding surface waters continue to have a relatively neutral pH.
b. Observed salinity measurements remained generally low and within the historical range. One station reported a single spike suggesting an anomaly related to ground water influencing surface water at that location.
c. Temperature variations were caused by seasonal changes. There are no thermal processes used at any SPR site.
d. Low DO levels are attributed to high temperatures and organic loading resulting from low flow and minimal flushing typically observed in backwater swamp areas.
e. No stations measured any oil and grease levels above the method detection limit confirming that site oil inventories are effectively managed, minimizing any impact on the Bayou Choctaw environs.

5.5.2 Big Hill

Monitoring stations were established at five locations (Figure 5-2) to assess site-associated surface water quality and to provide early detection of any surface water quality degradation that may result from SPR operations. It should be noted that Station A has only one complete sampling array. Because this sample point is located at an overflow point to a former stock pond located onsite receiving the site's treated effluent, it has become rare that a monthly flowing surface water sample can be taken due to low rainfall and the infrequent batching from the sewage treatment plant. Parameters including pH, temperature, salinity, oil and grease, dissolved oxygen, and total organic carbon were monitored (Table 5-12).

5.5.2.1 Hydrogen Ion Activity

The 2006 data show the pH of site and surrounding surface waters remained between 6.2 and 8.3 s.u. The annual median values of pH for each of the monitored stations ranged from 6.4 to 7.7 s.u.

5.5.2.2 Temperature

Temperatures observed in 2006 ranged from 15 °C to 34 °C exhibiting the characteristics expected from seasonal meteorological changes. With the exception of Station A, temperature fluctuations were very similar among stations. Collection dates for Station A were August, September, and October.

5.5.2.3 Salinity

Annual average salinities were generally quite low throughout most of the year ranging from fresh on the site all year long to a maximum of 22 ppt at the RWIS location on the ICW (Station C) nearer to the Gulf. Because of its location, Station C also had a higher mean (11.9 ppt) and a higher median (11.3 ppt) compared to the other stations. Station E south of the site toward the Gulf had one outlier (20.5 ppt). However, there was no indication of any adverse impact as a result of this spike and is believed to be normal climatologic variation due to cyclic patterns. No brine releases or chronic impacts are indicated.

5.5.2.4 Oil and Grease

No oil & grease value was found above the historic detectable limit of 5 mg/l this year. No indication of oil impacts from SPR activities was found or observed during the sampling episodes. The range of all values was from 1.1 mg/l to 1.2 mg/l. The range of means for 12 total measurements from the 4 stations was from 1.1 mg/l to 1.6 mg/l. Station A had only a single O&G sample this year.

5.5.2.5 Dissolved Oxygen

Dissolved oxygen generally is greatest in the winter and spring and lowest from summer through fall. DO peaks were observed in the months of January and February and the lowest values were determined in June and July with a single low value in November at Station E. The lowest variability was found at the RWIS (Station C) and at Station B with the CV respectively being 26.9 and 31.4 where more regular flows and depths provide a more constant dissolved oxygen level. The station with the most DO variability during the year was Sampling station E with a CV of 51.8. The overall range in DO was found to be 1.4 mg/l to 9.2 mg/l with a mean range of 4.8 mg/l to 5.2 mg/l from all sites tested during the year. All stations (B-E) produced samples with DO levels above 1 mg/l. Levels below 1.0 mg/l cannot support much aerobic life.

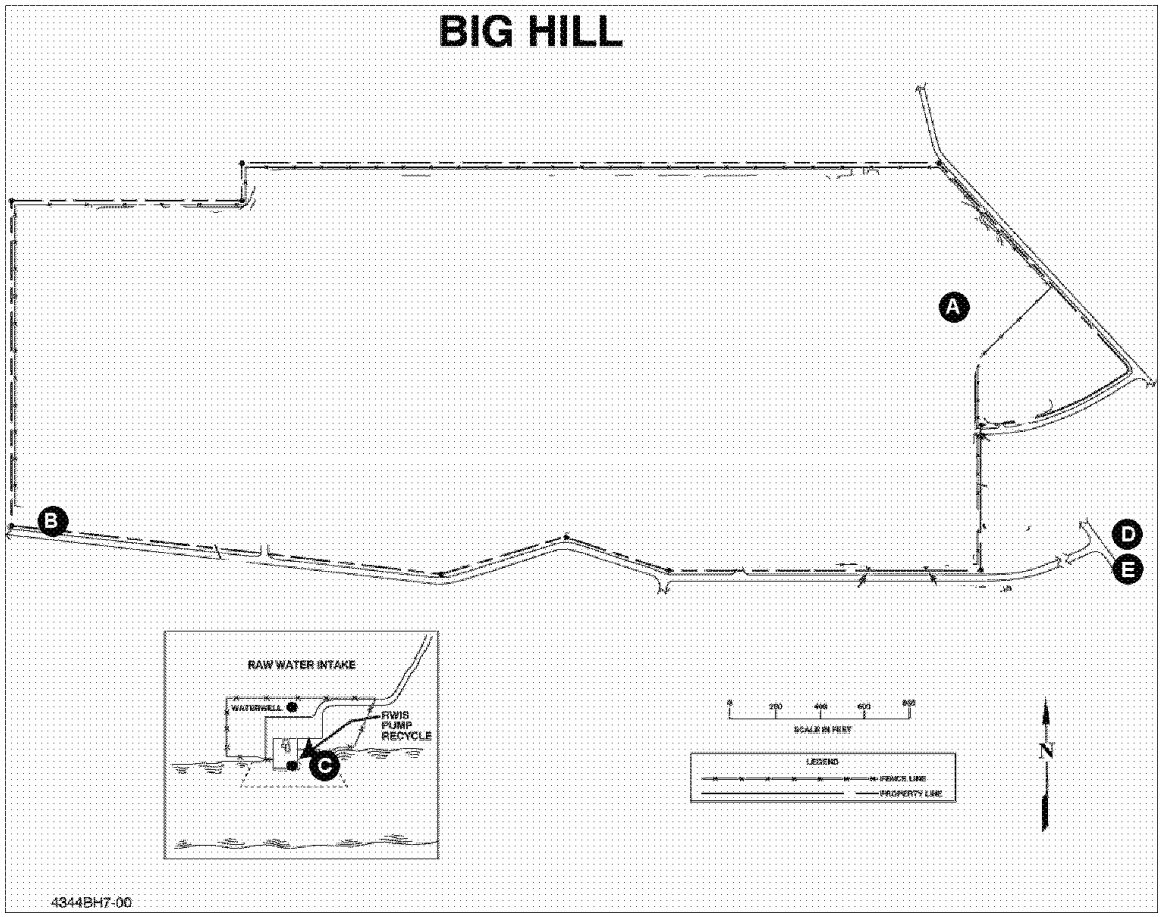
5.5.2.6 Total Organic Carbon

Average annual TOC concentrations varied from 7.9 to 27.1 mg/l over the year at the five monitoring stations. Total TOC samples ranged from 5.9 to 43.3 mg/l. Station D, located at Pipkin Reservoir had significantly higher levels of TOC than any other station. The consistently higher TOC levels observed are believed to be a result of reduced flushing and higher organic loading throughout the year

5.5.2.7 General Observations

Based on the above discussion, the following general observations are made regarding the quality of Big Hill surface waters.

a. The fresh surface waters had a nearly neutral pH, but were slightly lower than in 2005.
b. The observed salinity measurements were low on the site and increased in natural fashion from fresh water at the site to an intermediate brackish and highly variable water regime at the ICW.
c. Surrounding surface waters were neither contaminated nor affected by SPR crude oil.
d. Temperature variations followed seasonal meteorological changes.
e. In general, low dissolved oxygen and high total organic carbon fluctuations were within typical ranges indicative of seasonal meteorological and biological influences for such a setting and range of environments. Although DO levels sporadically reached lows that are unfavorable to sustain life, TOC levels did not exceed permit standards.



Water Quality Monitoring Stations

A Pond receiving effluent from site sewage treatment plant (STP)
B Wilbur Road ditch – southwest of site
C RWIS at Intracoastal Waterway
D Pipkin Reservoir – (1.8 Miles from map location)
E Gator Hole – (3.1 Miles from map location)

Figure 5-2. Big Hill Environmental Monitoring Stations

Table 5-12. 2006 Data Summary for Big Hill Monitoring Stations

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
A	Sample Size	3	3	3	1	1	3
	Number of BDL	0	NV	3	1	1	0
	Maximum	7.2	27.0	0.5	1.1	0.1	10.2
	Minimum	6.4	22.0	0.5	1.1	0.1	5.9
	Mean	NV	24.7	0.5	1.1	0.1	7.9
	Median	6.4	25.0	0.5	1.1	0.1	7.5
	Standard Deviation	NV	2.5	0.0	NV	NV	2.2
	Coefficient of Variation	NV	10.2	0.0	NV	NV	27.8
B	Sample Size	11	11	11	4	9	11
	Number of BDL	0	NV	6	4	0	0
	Maximum	8.3	33.0	3.6	1.2	8.2	22.8
	Minimum	6.9	20.0	0.5	1.1	3.0	9.9
	Mean	NV	26.0	1.1	1.1	5.3	13.7
	Median	7.7	26.0	0.5	1.1	5.1	12.3
	Standard Deviation	NV	4.3	1.0	0.0	1.4	4.1
	Coefficient of Variation	NV	16.7	86.0	2.2	26.9	29.8
C	Sample Size	11	11	11	4	9	11
	Number of BDL	0	NV	0	4	0	0
	Maximum	7.9	31.0	22.0	1.2	7.4	13.0
	Minimum	7.1	15.0	1.2	1.1	3.4	5.3
	Mean	NV	23.6	11.9	1.1	5.2	8.7
	Median	7.5	25.0	11.3	1.1	5.6	8.6
	Standard Deviation	NV	5.4	6.9	0.0	1.6	2.6
	Coefficient of Variation	NV	22.8	57.7	3.7	31.4	30.1
D	Sample Size	11	11	11	4	9	11
	Number of BDL	0	NV	5	4	0	0
	Maximum	8.3	34.0	6.6	1.2	9.2	43.3
	Minimum	7.2	19.0	0.5	1.1	2.0	9.6
	Mean	NV	25.4	2.7	1.1	5.9	27.1
	Median	7.6	23.0	1.7	1.1	6.5	30.9
	Standard Deviation	NV	5.0	2.5	0.0	2.2	11.4
	Coefficient of Variation	NV	19.7	92.7	2.2	37.0	42.2
E	Sample Size	11	11	11	4	9	11
	Number of BDL	0	NV	0	4	0	0
	Maximum	8.0	33.0	20.5	1.2	8.2	27.3
	Minimum	6.2	20.0	1.4	1.1	1.4	7.5
	Mean	NV	25.5	5.9	1.1	4.8	16.4
	Median	7.1	24.0	3.0	1.1	4.5	15.5
	Standard Deviation	NV	4.7	5.9	0.0	2.5	5.6
	Coefficient of Variation	NV	18.5	98.6	2.2	51.8	34.3

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

5.5.3 Bryan Mound

Surface waters surrounding the Bryan Mound site were monitored during 2006. Blue Lake has seven sampling stations and Mud Lake has three established stations.

Surface water monitoring stations are identified in Figure 5-3. Stations A through C and E through G are located along the Blue Lake shoreline to monitor effects of site runoff. Stations H and I are located along the Mud Lake shoreline to monitor effects of site runoff. Stations D and J, located further from the site, serve as controls. The results from these controls will not be included in the analysis, but will serve as references.

Parameters monitored in the Bryan Mound surface waters include pH, temperature, salinity, oil and grease, dissolved oxygen, and total organic carbon (Table 5-13).

Drought, along with low tides kept Mud Lake levels low throughout the year inhibiting monthly sampling during working hours. Therefore, only three sampling sets were taken during 2006, limiting meaningful comparisons.

5.5.3.1 Hydrogen Ion Activity

In 2006 the pH range for Blue Lake and Mud Lake stations was from 6.6 to 8.8 s.u. for the datasets. The control point for Blue Lake produced a similar range of 7.2 s.u to 8.6 s.u. The range for the Mud Lake control was 6.8 to 7.0 s.u. The results reveal a slightly basic condition for Blue Lake, and slightly acidic for Mud Lake, while also proving an analogous condition for the controls. These data are indicative of natural waters devoid of carbon dioxide and generally hard in regard to mineral content. Marine and brackish waters, such as those in Blue Lake and Mud Lake, typically have somewhat elevated pH levels and high mineral content. The pH fluctuations measured this year are comparable to the normal range of variability historically seen at the Bryan Mound site.

5.5.3.2 Temperature

Temperatures observed in 2006 ranged from 13.0 °C to 31.5 °C and reflect nearly a complete set of monthly ambient surface water testing. The deduction can be made, however, that the range of fluctuations are attributed to meteorological events.

5.5.3.3 Salinity

Observed salinity fluctuations ranged from 1.3 ppt to only 2.1 ppt in Blue Lake and from 2.3 ppt to 23.9 ppt in Mud Lake. Salinity fluctuations are attributed to meteorological and tidal conditions rather than site operations, since salinity observed at control sample stations D and J varied consistently with those found along site shorelines. The higher

salinity values in Mud Lake are primarily caused by the strong tidal and wind influence on the lake, and its more direct link with the nearby Gulf of Mexico through the Intracoastal Waterway. This year's dataset reflects the return to more normal rainfall patterns very similar to last year.

5.5.3.4 Oil and Grease

All of the O&G measurements made during 2006 were found below the method detectable limit of 5 mg/l. These data are reflective of effective spill prevention and good housekeeping practices being maintained.

5.5.3.5 Dissolved Oxygen

During 2006, DO was measured eight to eleven times from all stations in Blue Lake during the year, but only twice in Mud Lake where there was insufficient water to regularly access the monitoring stations. This year both lakes revealed differences in oxygen content that reflect positively with variation in salinities. Mud Lake has direct tidal influence with estuarine/Gulf waters showing lower DO concentrations. Blue Lake reflects a fresher regime, thus a higher carrying capacity. Fluctuations in DO levels are consistent with both control points. All measurements indicate “no apparent impact” from SPR operations. While some samples for Blue Lake were low in DO (2.5 mg/l), means and medians that range from 8.2 mg/l to 10.4 mg/l and 7.9 mg/l to 11.1 mg/l verify that these low DO levels are infrequent, and would not have an impact on aquatic life. Mud Lake also had samples with low DO, however, means (4.8 to 5.1 mg/l) and higher medians (4.8 to 5.1 mg/l) support the likelihood that low DO levels are infrequent and that Mud Lake was stable during the limited sampling times.

5.5.3.6 Total Organic Carbon

In 2006, the measurements of Blue Lake ranged from 11.0 to 37.0 mg/l. The TOC observations (three) in Mud Lake were lower ranging from the 2.8 mg/l to 38.8 mg/l. Both control points have results that are similar to the two lakes. Higher TOC measured in Blue Lake is attributed to primary productivity and low volumetric flushing. The TOC levels observed in both lakes, however, are indicative of healthy, unaffected ambient conditions.

5.5.3.7 General Observations

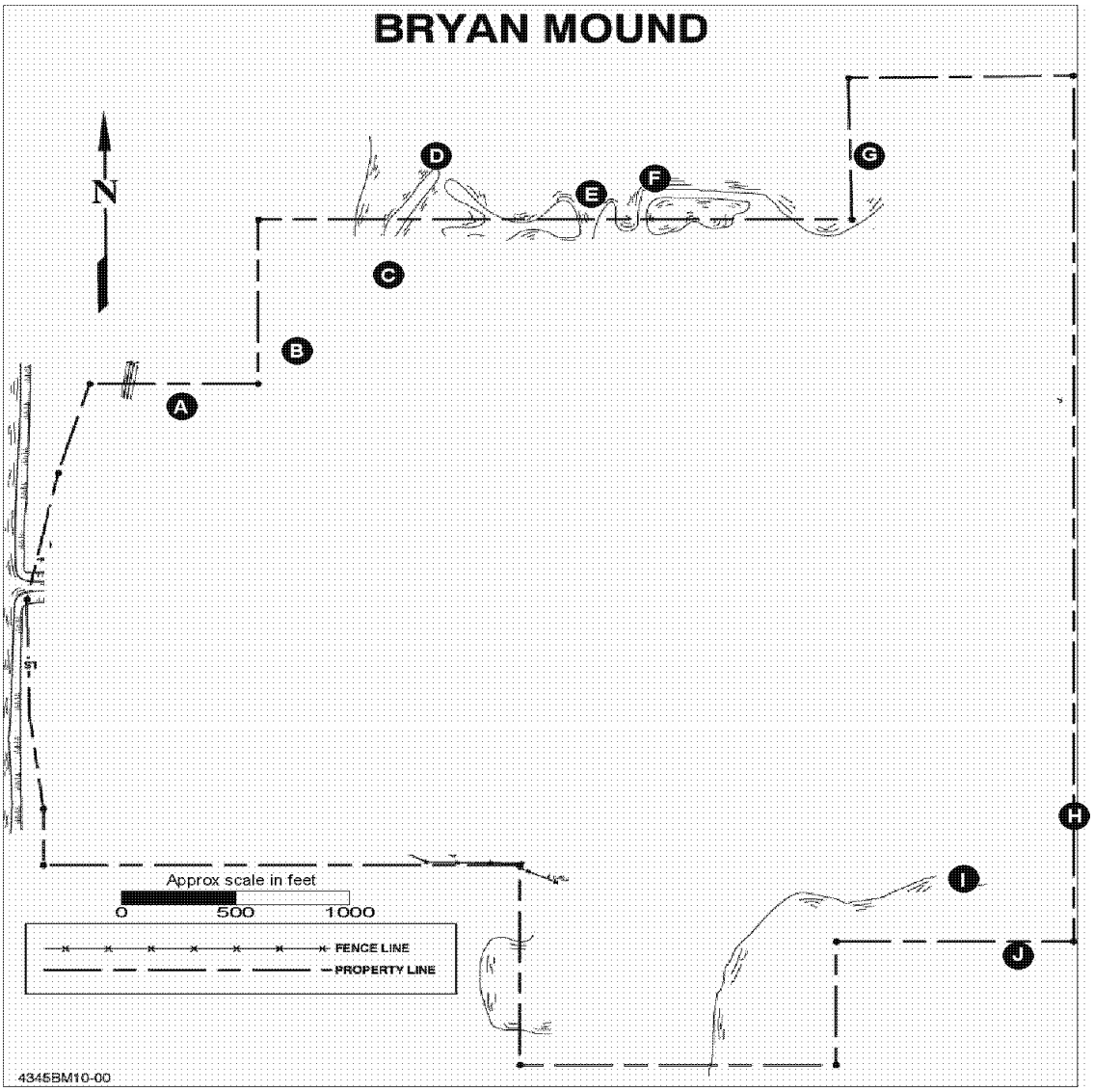
Based on the above discussions, the following general observations are made regarding the quality of Bryan Mound surface waters.

a. The observed pH was stable for the period tested and slightly basic in both Blue Lake and Mud Lake, but typical of brackish waters. Of the two receiving waters, Blue Lake was slightly more basic again this year.

b. Temperature and salinity fluctuations observed during the period tested are attributed to meteorological and tidal conditions rather than site operations.

c. Higher TOC levels observed in Blue Lake are attributed to higher primary productivity and low flushing of this surface water body.

d. The dissolved oxygen level measured in both Blue Lake and Mud Lake was within typical ranges indicative of seasonal, meteorological, and biological influences for such a setting and environment.



Water Quality Monitoring Stations

A Blue Lake
B Blue Lake
C Blue Lake
D Blue Lake – Control Point 1
E Blue Lake
F Blue Lake
G Blue Lake
H Mud Lake
I Mud Lake
J Mud Lake – Control Point 2

Figure 5-3. Bryan Mound Environmental Monitoring Stations

Table 5-13. 2006 Data Summary for Bryan Mound Monitoring Stations

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
A	Sample Size	11	11	11	4	9	10
	Number of BDL	0	NV	0	4	0	0
	Maximum	8.5	31.5	2.1	2.5	15.6	37.0
	Minimum	6.8	13.7	1.4	2.5	3.4	11.0
	Mean	NV	22.1	1.6	2.5	8.6	19.9
	Median	7.5	22.0	1.6	2.5	7.9	18.5
	Standard Deviation	NV	6.0	0.2	0.0	3.5	8.1
	Coefficient of Variation	NV	27.0	14.3	0.0	40.6	40.5
B	Sample Size	11	10	10	4	8	10
	Number of	0	NV	0	4	0	0
	Maximum	8.6	31.0	1.9	2.5	12.8	36.4
	Minimum	7.0	14.9	1.3	2.5	6.7	11.7
	Mean	NV	22.9	1.6	2.5	10.2	20.6
	Median	7.6	22.7	1.6	2.5	10.5	18.5
	Standard Deviation	NV	5.5	0.2	0.0	2.3	8.8
	Coefficient of Variation	NV	24.0	12.7	0.0	23.0	42.8
C	Sample Size	11	11	11	4	11	10
	Number of	0	NV	0	4	0	0
	Maximum	8.6	30.6	2.1	2.5	13.2	34.4
	Minimum	7.1	13.3	1.3	2.5	2.5	12.2
	Mean	NV	22.1	1.6	2.5	8.2	20.4
	Median	7.6	22.8	1.6	2.5	8.7	19.4
	Standard Deviation	NV	5.9	0.2	0.0	4.1	8.1
	Coefficient of Variation	NV	26.8	14.0	0.0	50.1	39.9
D	Sample Size	10	10	10	4	8	9
	Number of	0	NV	0	4	0	0
	Maximum	8.6	30.7	2.0	2.5	13.5	33.8
	Minimum	7.2	13.0	1.4	2.5	4.0	12.4
	Mean	NV	22.9	1.6	2.5	9.7	19.9
	Median	7.8	22.9	1.6	2.5	9.2	19.6
	Standard Deviation	NV	6.0	0.2	0.0	3.4	7.1
	Coefficient of Variation	NV	26.2	12.3	3.0	34.7	35.9
E	Sample Size	11	11	11	4	9	10
	Number of	0	NV	0	4	0	0
	Maximum	8.8	30.8	2.1	2.5	13.4	30.2
	Minimum	7.1	13.0	1.3	2.5	4.0	12.1
	Mean	NV	22.2	1.6	2.5	9.6	18.3
	Median	7.8	22.2	1.6	2.5	10.9	15.5
	Standard Deviation	NV	6.3	0.3	0.0	3.3	6.7
	Coefficient of Variation	NV	28.2	15.8	0.0	34.1	36.5

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

Table 5-13. 2006 Data Summary for Bryan Mound Monitoring Stations (continued)

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
F	Sample Size	11	11	11	4	9	10
	Number of	0	NV	0	4	0	0
	Maximum	8.6	30.7	2.1	2.5	13.3	32.7
	Minimum	7.3	13	1.3	2.5	2.8	12.8
	Mean	NV	22.2	1.6	2.5	9.3	18.8
	Median	7.8	22.3	1.5	2.5	10.3	16.0
	Standard Deviation	NV	6.2	0.3	0	3.3	7.3
	Coefficient of Variation	NV	28.1	16.0	0	35.6	38.6
G	Sample Size	10	10	10	4	8	10
	Number of	0	NV	0	4	0	0
	Maximum	8.6	30.5	2.1	2.5	13.7	30.8
	Minimum	7.5	13	1.3	2.5	6.7	12.4
	Mean	NV	22.1	1.6	2.5	10.4	18.9
	Median	7.7	22	1.6	2.5	11.1	17.3
	Standard Deviation	NV	6.6	0.3	0.0	2.4	6.7
	Coefficient of Variation	NV	29.8	16.6	0.0	23.4	35.4
H	Sample Size	3	3	3	2	2	3
	Number of	0	NV	0	2	0	0
	Maximum	7.1	30.4	22.4	2.5	6.3	8.1
	Minimum	6.6	20.6	2.3	2.5	3.2	3.1
	Mean	NV	24.2	13.8	2.5	4.8	5.1
	Median	6.7	21.6	16.7	2.5	4.8	4.2
	Standard Deviation	NV	5.4	10.4	0.0	2.2	2.6
	Coefficient of Variation	NV	22.3	75.1	0.0	46.1	2.0
I	Sample Size	3	3	3	2	2	3
	Number of	0	NV	0	2	0	0
	Maximum	7.0	30.5	22.3	2.5	6.6	8.8
	Minimum	6.8	19.8	2.4	2.5	3.4	2.8
	Mean	NV	24.0	13.8	2.5	5.0	5.1
	Median	6.8	21.6	16.7	2.5	5.0	3.8
	Standard Deviation	NV	5.7	10.3	0.0	2.3	3.2
	Coefficient of Variation	NV	23.9	2.0	0.0	45.3	62.6
J	Sample Size	3	3	3	2	2	3
	Number of	0	NV	0	2	0	0
	Maximum	6.9	28.7	23.9	2.5	6.5	9
	Minimum	6.8	19.6	2.4	2.5	3.6	3.6
	Mean	NV	23.5	14.3	2.5	5.1	6.1
	Median	6.8	22.1	16.6	2.5	5.1	5.7
	Standard Deviation	NV	4.7	10.9	0.0	2.1	2.7
	Coefficient of Variation	NV	20.0	76.5	0.0	40.6	44.6

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

5.5.4 West Hackberry

In 2006, six surface water quality stations (Figure 5-4) were monitored monthly at West Hackberry. Parameters monitored (Table 5-14) include pH, temperature, salinity, dissolved oxygen, oil and grease, and total organic carbon.

5.5.4.1 Hydrogen Ion Activity

The pH of surface waters ranged between 6.5 and 8.7 s.u., and annual median values ranged from 7.3 to 7.9 s.u. from all stations. The ambient waters measured were very similar to last year's data. Two stations (D & E) located in stormwater ditches eventually exiting the main site did not produce the higher median values as with last year but instead were 7.5 and 7.3 s.u. respectively. Although the travel paths and long but intermittent travel times over crushed limestone placed for erosion control and trafficability would tend to raise pH levels, the rainfall events of 2006 reduced that tendency. Fluctuations observed are relatively minor and attributed to environmental and seasonal factors such as variation in rainfall, temperature, algae and biotic growth, aquatic system flushing and the buffering effects of crushed limestone gravel on slightly acidic rainfall.

5.5.4.2 Temperature

Observed temperatures in 2006 were consistent with observations at other sites and were indicative of regional climatic effects. No off-normal measurements were observed. Recorded temperatures ranged from 13.0 °C to 33.0 °C and were found very consistent among stations.

5.5.4.3 Salinity

Meteorological factors such as wind, tide, and rainfall contributed to the salinity variation observed in brackish Black Lake (Stations A, B, and C) and the Intracoastal Waterway (Station F). Salinity ranges observed in these water bodies (8.7 to 15.5 ppt in Black Lake) and (1.2 to 13.8 ppt in the ICW) are more conducive to supporting euryhaline organisms with variable salinity tolerance and those with sufficient mobility to avoid salinity stresses that occur with seasonal changes. Station F on the ICW reflected a wider range due to the influences of the tides and proximity to diluted but saltier Gulf waters. However, mean annual salinity observed at the ICW (6.4 ppt) was lower than that of Black Lake (12.6 to 13.3 ppt) due largely to the fresher water influences received from more northerly drainage ways and brackish water with limited movement to or from Black Lake. Stations D and E had the lowest salinities, with 21 out of 24 samples being BDL. Salinities observed at these two upland site stations were affected by rainfall induced surface runoff and not by Black Lake. The salinity mean in the drainage ditch at

the southeast corner of the site (Station D) was 0.5 ppt, while the mean at the high pressure pump pad (Station E) was 0.8 ppt.

5.5.4.4 Oil and Grease

Observed O&G levels were below the detectable level (5 mg/l) for all six monitoring stations during 2006. These data are reflective of effective spill prevention and good housekeeping practices being maintained by site personnel.

5.5.4.5 Dissolved Oxygen

Minimum DO levels were at levels that support aquatic life, ranging from 2.6 to 3.8 mg/l. Dissolved oxygen was most variable at onsite Station D as opposed to the open and flowing receiving water stations. Since all other parameters have similar patterns with the other stations, Station D's variability and lower DO values can be attributed to natural factors, such as decreased aeration and increased biological oxygen demand. Greater surface area and water movement through currents and wave action provided continuous aeration of the lake and ICW water. Mean DO values ranged from 4.7 to 6.9 mg/l across the six sampling sites.

5.5.4.6 Total Organic Carbon

TOC concentrations for 2006 ranged from 3.6 to 26.6 mg/l with Station F experiencing the highest single value during the year. This value is not out of line with the nature of the water bodies and is very consistent with the measurements obtained during the year at all Black Lake stations. The average annual TOC concentrations by station ranged from 7.6 to 12.9 mg/l with the ICW station (F) experiencing the second most variability throughout the year experiencing both the highest value, and the second lowest value overall. Because the variation is so consistent among the remaining stations, and especial y so for the Black Lake stations, it is indicated that these measurements reflect a return of consistent rainfall to Black Lake and also the surrounding environs.

5.5.4.7 General Observations

The following observations are made, based on the above discussion, concerning operational impacts on the West Hackberry aquatic environs.

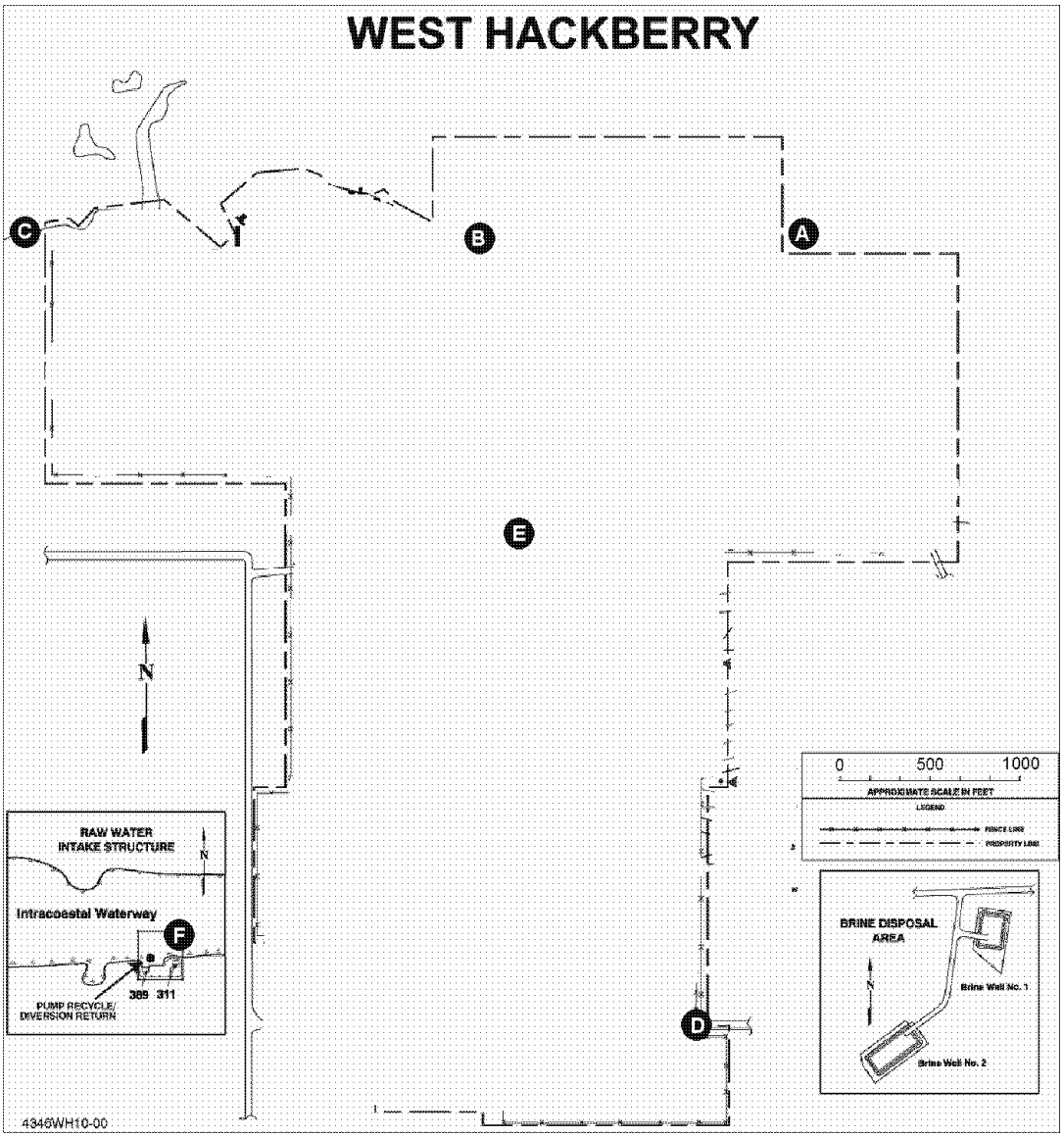
a. pH and temperature remained fairly stable, generally slightly basic and were only affected by seasonal factors.
b. Detectable salinity levels were found mainly in Black Lake and the ICW. The salinity measurements made throughout 2006 were consistent with the ambient

and slightly brackish receiving water environment, reflective of the return of rainfall to the area.

c. Oil and grease levels were below the detectable limit at all six stations throughout 2006, which is indicative of good housekeeping.

d. With the exception of the southeast drainage ditch (station D), dissolved oxygen levels at site and Black Lake stations were consistently high and did not appear adversely affected by site operations.

e. Total organic carbon concentrations were quite similar at all stations with the exception of station F throughout the year suggesting no substantial transient bio-contamination or ecological events. The increased variability at the ICW station (F) and the site drainage station (E) results from the wider range of measurements made at the locations during the year but nothing indicative of any impact or impairment.



Water Quality Monitoring Stations

A Black Lake
B Black Lake
C Black Lake
D Southeast drainage ditch
E High-pressure pump pad
F Raw water intake structure (Intracoastal Waterway)

Figure 5-4. West Hackberry Environmental Monitoring Stations

Table 5-14. 2006 Data Summary for West Hackberry Monitoring Stations

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
A	Sample Size	12	12	12	4	12	12
	Number of BDL	0	NV	0	4	0	0
	Maximum	8.2	33.0	15.5	2.5	11.5	11.8
	Minimum	6.6	13.0	9.3	2.5	3.9	7.2
	Mean	NV	22.5	13.3	2.5	6.5	9.6
	Median	7.9	22.0	13.4	2.5	6.2	9.7
	Standard Deviation	NV	6.2	1.9	0.0	2.3	1.5
	Coefficient of Variation	NV	27.6	14.5	0.0	34.9	15.2
B	Sample Size	12	12	12	4	12	12
	Number of	0	NV	0	4	0	0
	Maximum	8.3	33.0	15.3	2.5	10.6	12.2
	Minimum	6.9	13.0	9.3	2.5	4.2	7.8
	Mean	NV	22.4	13.3	2.5	6.7	9.7
	Median	7.7	21.5	13.7	2.5	6.4	9.8
	Standard Deviation	NV	6.4	1.8	0.0	2.1	1.6
	Coefficient of Variation	NV	28.7	13.3	0.0	30.9	16.3
C	Sample Size	12	12	12	4	12	12
	Number of	0	NV	0	4	0	0
	Maximum	8.1	33.0	15.1	2.5	10.1	12.0
	Minimum	6.5	13.0	8.7	2.5	4.3	8.2
	Mean	NV	22.6	12.6	2.5	6.5	10.0
	Median	7.6	21.5	12.8	2.5	6.5	9.9
	Standard Deviation	NV	6.3	1.9	0.0	1.7	1.5
	Coefficient of Variation	NV	27.9	15.3	0.0	26.7	15.0
D	Sample Size	12	12	12	4	12	5
	Number of	0	NV	12	4	0	0
	Maximum	8.7	29.0	0.5	2.5	10.0	19.2
	Minimum	7.0	17.0	0.5	2.5	2.6	7.4
	Mean	NV	24.1	0.5	2.5	6.9	12.9
	Median	7.8	25.0	0.5	2.5	7.2	12.4
	Standard Deviation	NV	3.9	0.0	0.0	2.3	4.3
	Coefficient of Variation	NV	16.1	0.0	0.0	33.9	33.1

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

Table 5-14. 2006 Data Summary for West Hackberry Monitoring Stations (continued)

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
E	Sample Size	12	12	12	4	12	12
	Number of	0	NV	9	4	0	0
	Maximum	8.4	29.0	2.4	2.5	6.4	15.6
	Minimum	6.9	19.0	0.5	2.5	3.1	3.6
	Mean	NV	24.2	0.8	2.5	4.7	7.6
	Median	7.5	25.0	0.5	2.5	4.7	6.5
	Standard Deviation	NV	3.6	0.6	0.0	1.2	3.7
	Coefficient of Variation	NV	15.0	74.9	0.0	26.2	48.3
F	Sample Size	12	12	12	3	12	12
	Number of	0	NV	0	3	0	0
	Maximum	8.5	32	13.8	2.5	7.1	26.6
	Minimum	6.8	13	1.2	2.5	3.7	6
	Mean	NV	23.3	6.4	2.5	5.7	10.8
	Median	7.3	23.5	5.8	2.5	5.8	9.8
	Standard Deviation	NV	5.7	4.3	0	1.0	5.2
	Coefficient of Variation	NV	24.7	67.3	0	17.7	48.2

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

End of Section

6. SITE HYDROLOGY, GROUND WATER MONITORING AND PUBLIC DRINKING WATER PROTECTION

Ground water monitoring is performed at the Bayou Choctaw, Big Hill, Bryan Mound, and West Hackberry sites to comply with DOE Order 450.1, and also in the case of West Hackberry, a state agency agreement. Salinity is measured and the potential presence of hydrocarbons is screened at all sites. The monitoring scheme performed at West Hackberry is governed by an agreement between DOE and the LDNR to report annual ground water monitoring data through this document. At the Weeks Island site, long-term ground water monitoring has been accepted as complete as part of the state approved decommissioning plan. Bryan Mound ground water quality is conveyed annually to the RCT via copy of this report. Wells surrounding the operating brine storage and disposal pond system at Big Hill monitor groundwater as part of permit required leak detection. The St. James terminal has undergone a remediation to satisfy state criteria for some limited crude oil leakage. Because follow-on studies indicated the presence of only trace quantities, there is no permanent site-wide ground water monitoring at St. James facility, although attenuation of the crude oil continued throughout 2006.

Available ground water salinity data collected for the past five years are presented graphically, for the historic site well nets and for the more recently installed Periphery Well (PW) series. These data are then discussed within each site-specific section and any gaps in data for the graphs are noted. The graphs' Y-axes have been standardized with few noted exceptions at either the 0–10 ppt or 0–100 ppt as the baseline dependent upon the historical range, providing easier comparisons among the monitoring stations.

Each of the storage sites has a long history of industrialized development primarily involving the mining of salt and associated minerals that were used for various purposes and feedstock. A 10 ppt cut-off for salinity is used in this book in making comparisons for assessing affected and unaffected waters. This is not a regulatory limit but rather a value, given the setting, which represents usable versus unusable water. At Bryan Mound, however, because of its particular site specific and historic mining conditions, a 20 ppt cut-off is employed for evaluating the generalized ambient shallow ground water conditions there.

6.1 BAYOU CHOCTAW

The Plaquemine Aquifer, the main source of fresh water for the site and several surrounding municipalities, is located approximately 18 m (60 ft) below the surface and extends to a depth of 150 to 182 m (500-600 ft). The upper 18 m (60 ft) of sediment in the aquifer consists predominantly of Atchafalaya clay. The interface of freshwater and saline water occurs at a depth of 122 to 150 m (400-500 ft) below the surface. Ground

water in the Plaquemine Aquifer communicates locally with the Mississippi River, flowing away from it during the high river stage and towards the river when in the low stage. Other local influences to the general flow patterns are manifested by structural features; such as the piercing salt domes and proximity to off-take.

Historically, there have been four monitoring wells (BC MW1, BC MW2, BC MW3, and BC MW4) circumscribing the brine storage pond at Bayou Choctaw (Figure 6-1). These wells were drilled roughly 9 m (30 ft) below land surface (bls) generally at the corners of the structure to monitor potential impact from the brine storage pond and any other potential nearby shallow contamination sources. Seven additional similarly screened wells were installed at various locations around the main site, and one off site near a selected brine disposal well pad. BC PW3 was plugged and abandoned in the original VWS study.

These periphery wells (PWs) have now been added to the site's monitoring scheme to enhance evaluation of ground water flow direction and outlying salinity movements and variation. Those wells with a full five-year monitoring history are also presented in this report. The CY 1996 Site Environmental Report contains a detailed overview of the Phase II (periphery well) studies of this site. An adjunct of these studies is the determination of an estimated linear velocity for the shallow ground water movement of the monitored zone. For Bayou Choctaw the water in the shallow zone moves an estimated 1.2 to 2.4 m (4 feet to 8 feet) per year in a generally radial direction off the main site and underlying dome, loosely mimicking the ground contours.

Groundwater salinity observed at all of the four pond wells (BC MW1 through BC MW4, Figure 6-2) has historically been above an ambient cut-off concentration of 10 ppt, somewhat high for a fresh water environment. This condition of elevated salinity is attributed to a previous owner’s salt water brine operational activities and possibly some more recent brine handling activities. Three of these wells (BC MW1, BC MW2, and BC MW3) exhibit 5 year traces this year that are either below or near the 10 ppt cut-off and the fourth well BC MW4 revealed a sub-10 ppt level for the last half of 2006. All four wells exhibit seasonal salinity fluctuations that are affected by rainfall. Higher salinity values usually occur in late winter and early spring, and lower salinity measurements have been observed in late spring and summer. The former steep decline observed at well BC MW3, indicative of the passage of a small plume, is now flattened and appears to be slowly responding to the muted effects of a former release

event. BC MW1, although showing a slight increasing five-year trace, has all of its measured values well below 10 ppt.

Past surface brine spills and other activities from previous occupants of the area may have also affected the ground water salinity observed in these shallow wells. The long-term salinity range observed at well BC MW3, that had been much greater than that of the other three historical wells, appears to be returning to the ambient conditions more reflective of background, as observed with wells BC MW1 and BC MW2. Well BC MW4 located down gradient of the site and south of the E-W canal has revealed a somewhat elevated overall salinity concentration, but the long-term time-series trend remains downward. Much of the variability exhibited with the earlier data may have resulted from over purging and inconsistently applied sampling techniques. However, the advent of dedicated low-flow sampling apparatus and techniques has aided the ground water testing by assuring more representative sampling. Ground water surface piezometric data of all the wells indicate that ground water movement is radial in all directions from the high point on the dome around Cavern 15 and to the north. A 1991 brine spill on the nearby low pressure pump pad north of the well BC MW3 appears to have passed with the salinity trend flattening to around the 10 ppt cutoff. The southerly movement with the ground water flow now appears to be reaching the further down gradient well BC MW4.

The present five-year salinity trend of well BC MW4 defines a freshening salinity with time. The overall downward trend and the previous observed wide fluctuations appear to have moderated. This well is situated away from and down gradient of the brine pond.

Long-term salinity trends have been established which, when examined within the context of the radial ground water movement, assist in identifying possible areas or sources of contamination. On the main site, the only exception to having all of the historical and periphery wells trace a five-year decreasing trend is BC MW2. While last year's five year trace for this well indicted a decrease, the 2006 data exhibited a small increase changing the trace. A similar "trend reversal" occurred at well BC MW1, but with this year's five-year trace being a decreasing trend versus last year's increasing five-year trace. With ground water moving so slowly being applied to a series of salinity values all below 10 ppt, slight fluctuations can cause the five-year trends to change direction (flip-flop) with a single year's data addition.

As mentioned the well BC MW1, up gradient of the brine pond, has developed a slightly decreasing salinity trend below 10 ppt even with a 6 ppt “uptick” occurring in the 2006 timeframe. Last year this same well exhibited a slightly increasing trend and in general it is noted that the salinity values fluctuate around 4 ppt throughout the well’s five year window. Well BC MW2, the intercept well immediately down gradient of the brine pond reveals a five year trace this year of slightly increasing salinity but with no values exceeding 2 ppt. These changes in trending at such low concentration are inevitable and especially exacerbated with numerous below detectable limit samples contained in the dataset.

With full implementation of the low-flow sampling methodology and the early more variable data no longer in the trend set more realistic groundwater conditions and trending of the data are evident. Well BC MW1 situated hydraulically on the up gradient side of the brine pond and well BC MW2 located immediately down gradient hydraulically of this potential source (see Figure 6-1) reveal opposing trends for their positions, possibly due to this effect. Another potential source of subsurface contamination may be residuals from historical activity that occurred along the northwest corner of the pond. Periphery well BC PW2 has encountered this area of existing affected ground water and the five-year trace indicates a stable to slightly decreasing trend from 60 ppt to 55 ppt in this area that would be up gradient of and therefore not associated with the current brine pond operations.

Although it has in the past captured the most saline ground water on the site, BC MW3 is now exhibiting an essentially stable trend. The slightly decreasing five-year trend varying around the 10 ppt cut-off which was nudging below that level to ambient in 2005, is now beginning a mild upswing through 2006. This reversal which was indicative of the passage of an ephemeral impact of a former piping leak found and repaired near the low pressure pump pad in 1991, is now more suggestive of a second response that may involve some trailing effects of that historical event and changes in rainfall conditions from drought to more abundant and frequent rainfall.

Changes in sampling methodology implemented in 1995 and 1996 may have affected the long-term historical trending at all positions. The overall general five-year decreasing trend found at most wells is definitely evident with the current 5-year data window.

All of the PW well series wells indicate decreasing five-year salinity trends with the

exception of well BC PW7 located remotely from the main site down near the brine disposal well pads area. The current five-year trace is influenced by the omission of the historical higher values commencing with the earlier annual samplings and also by the quarterly sampling regime now in-place. The salinity levels currently fluctuate at or below the 10 ppt cut-off and we shall closely watch this well for changes. All of these monitored locations appear to fluctuate regularly over the entire period of record, but generally with decreasing trend lines and especially with decreasing variability for each well. Future ground water data, including that from the periphery wells added from the Phase II verification studies and ongoing inspections of the brine pond and site piping, will assist in identifying any contamination originating from SPR activities. The shallow ground water monitoring well net for this site is adequately placed and sampled to serve as a complete site-wide detection monitoring system.

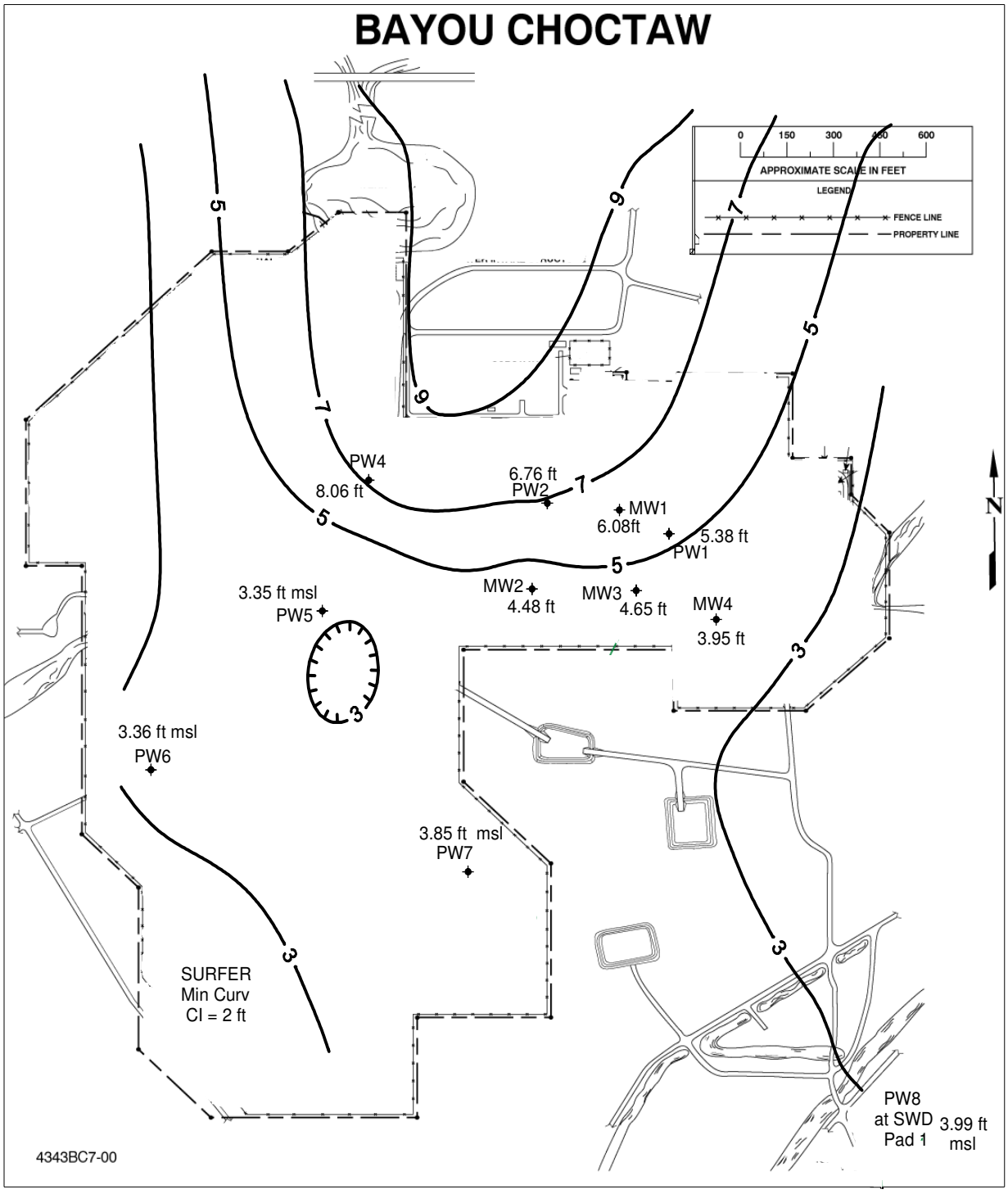


Figure 6-1. Bayou Choctaw Ground Water Monitoring Stations and Shallow Ground Water Contoured Elevations Winter 2006

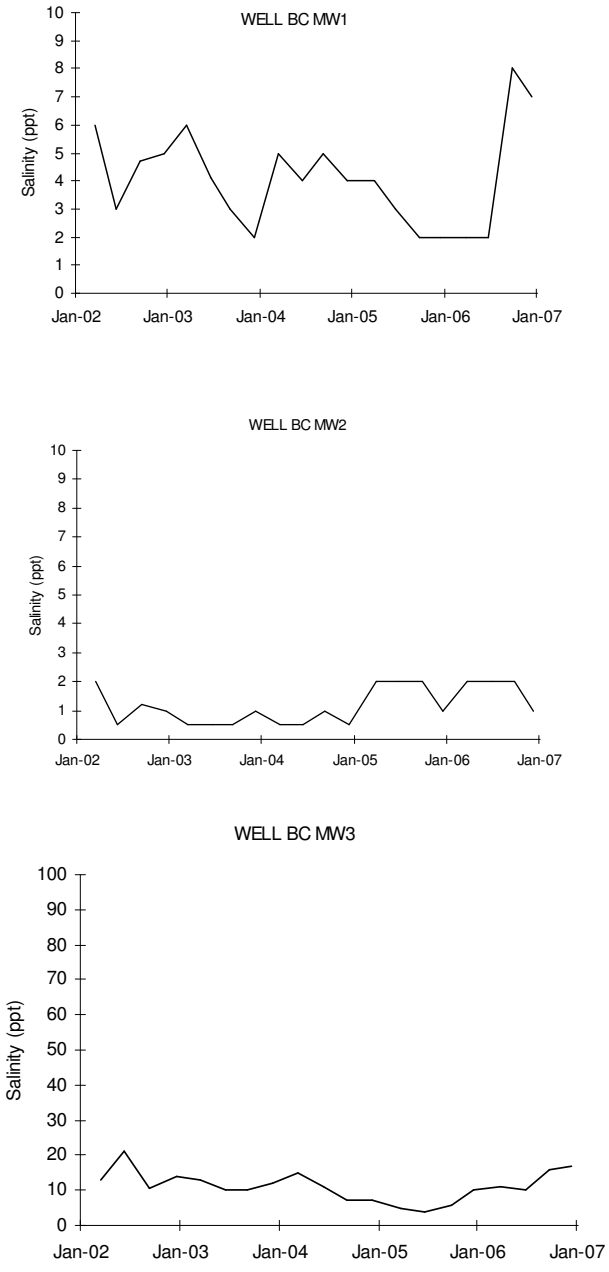


Figure 6-2. Bayou Choctaw Ground Water Monitoring Well Salinities

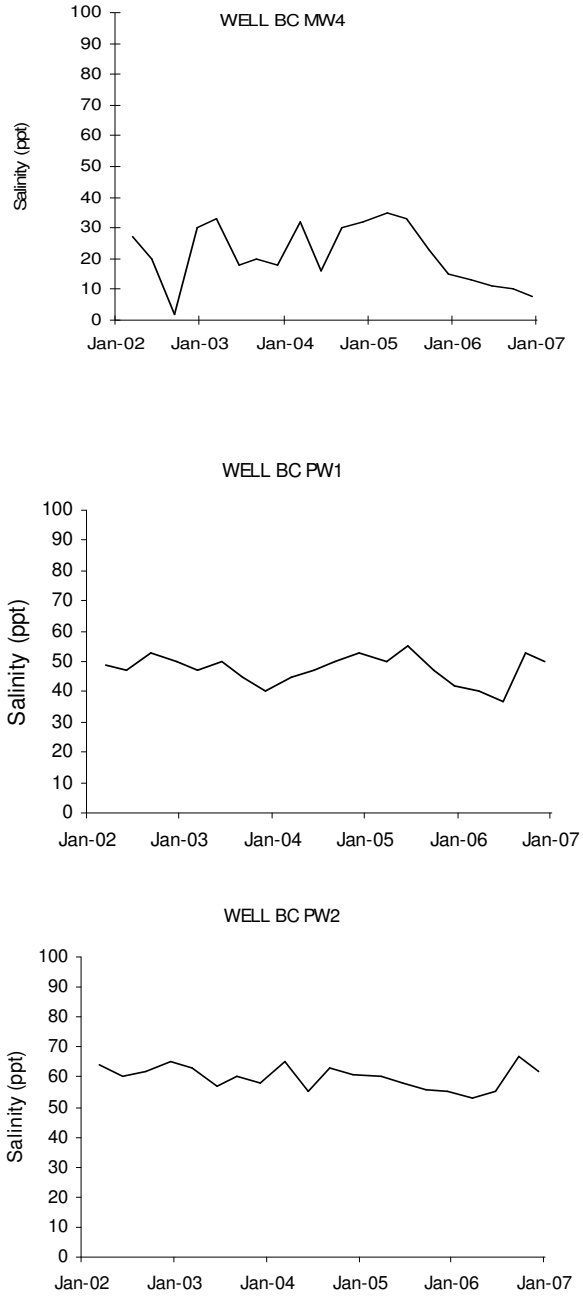


Figure 6-2. Bayou Choctaw Ground Water Monitoring Well Salinities (continued)

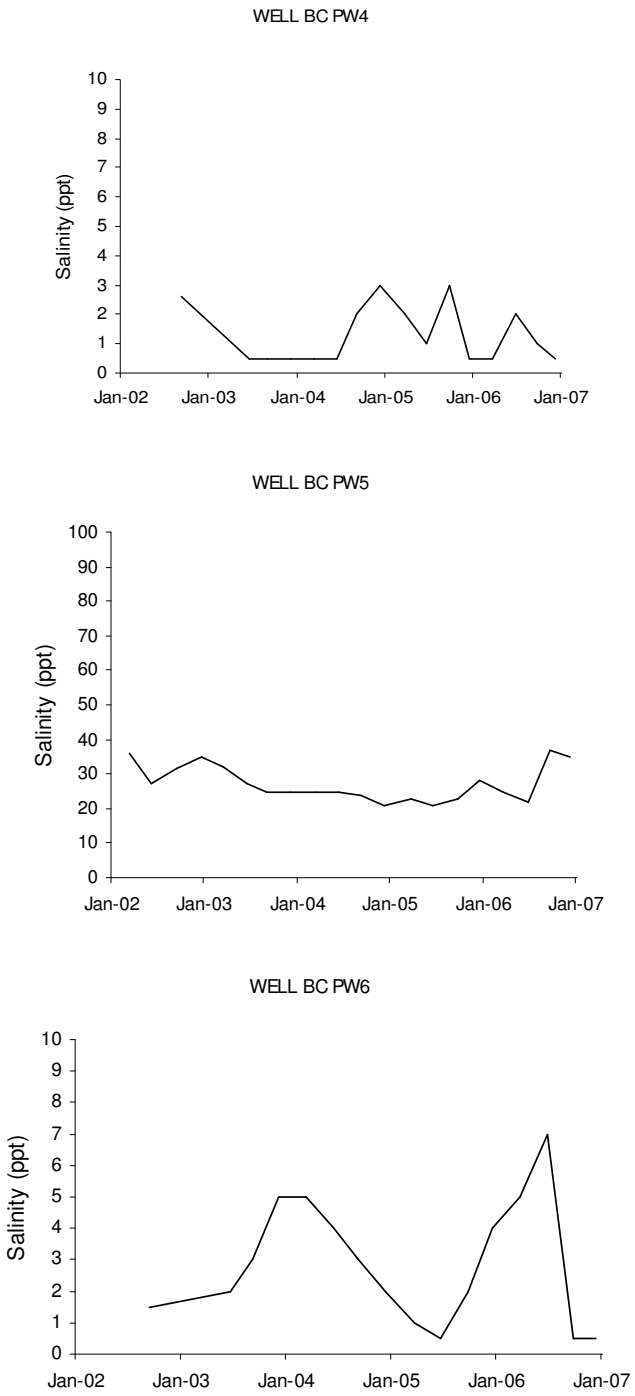


Figure 6-2. Bayou Choctaw Ground Water Monitoring Well Salinities (continued)

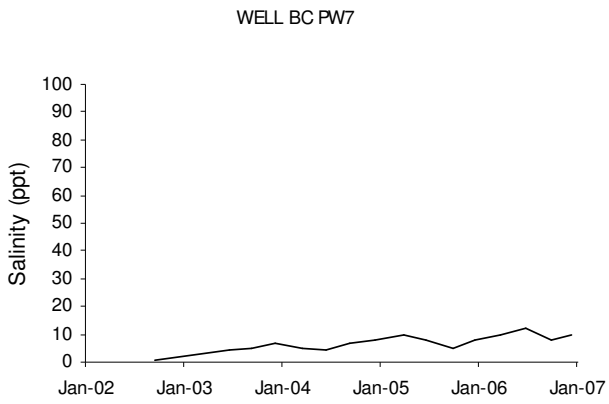


Figure 6-2. Bayou Choctaw Ground Water Monitoring Well Salinities (continued)

6.2 BIG HILL

The three major subsurface hydrogeological formations in the Big Hill site vicinity are the Chicot and Evangeline Aquifers and the Burkeville Aquitard. The major source of fresh water is the Chicot Aquifer, which is compressed from uplift and piercement over the Big Hill salt dome. Fresh water in the upper Chicot Aquifer over the dome is limited from near the surface to a depth of -30 m (-98 ft) mean sea level. The town of Winnie, situated off the dome and to the west, uses fresh water from the upper Chicot Aquifer. Beaumont and nearby Port Arthur both draw fresh water from the lower Chicot Aquifer.

Sampling of six monitoring wells (wells BH MW1 to BH MW6) around the brine disposal pond system (Figure 6-3) began in 1987. Big Hill personnel began sampling these wells by the low-flow method in May 1995.

The interconnected brine pond system is composed of three contiguous PVC-lined ponds, of which two have a protective concrete topcoat. All three have an under drain system contained within a surrounding slurry wall system keyed to an underlying clay bed. Commencing in August 2006, a renovation project to replace the liner material in the second and third ponds in the series, was implemented. The project was not completed in the 2006 calendar year.

Salinity data collected from the six permit required wells surrounding the ponds have for the past five years indicated complete consistency and absence of effects below detection limits until 2001 for well BH MW2, which is on the up-gradient side of the ponds (Figure 6-4). All observed values that are below the established detection limit

are evaluated as one-half the detection limit for statistical calculations. No ground water effects associated with the pond operation are evident since monitoring was begun in 1987. The salinity increase in BH MW2, up-gradient (northwest of) the ponds, is attributed to a previous release from buried piping. During 2006, the basic trace of the monthly salinity measurements indicates a continued freshening at this location. This freshening trend is especially pronounced with this year's five-year trace although a slight uptick was observed in January 2007. The salinity peak reached near the end of calendar year 2002 to early 2003, combined with the overall sharp downturn in salinity for the remainder of this window, is suggestive of the slow passage of a pulse or slug of affected groundwater ostensibly associated with the historic release further upgradient near cavern pad 113. Groundwater flow in this monitored zone has been estimated at almost 4 m (12 ft) per year based on observed gradients and the soil permeability information. Translation of the arrival time of the salt front at BH MW2, from the previous release location better estimates the water velocity of 15 m (50 ft) per year. However, saltwater diffusion effects may overestimate actual water flow in this case.

Figure 6-3 presents the contours of data obtained on a date in the summer quarter for all the site wells, as representative of 2006. The gradients and flow direction remain very similar to the spring contours from 2000, two summer quarters, a winter quarter, and last year's spring quarter. In the vicinity of the brine storage pond (wells MW1 through MW6) the flow is southeasterly. The overall basic shallow flow regime mimics the ground surface and appears to be moving radially off the underlying salt dome structure. This contouring appearance cannot be corroborated due to lack of control points off the site in a northwesterly direction. As with our other sites, it is suspected that regional flow regimes are locally modified by the underlying piercements.

Well BH PW1 located further up-gradient from the pond system is the only other well with a trace of measurable salinity on the site. The trace fluctuates around the method detection limit of 1 ppt and follows a fairly regular pattern indicative of a pulse which may be associated with changes in rainfall, lag times, and a nearby historical brine soils impact. The levels are very low over this year's five-year trace and were non-detectable since January 2005.

The well BH PW2 was plugged and abandoned as part of the original VWS Study in the 1995/1996 timeframe and therefore is not depicted as an active well on the site well locator map.

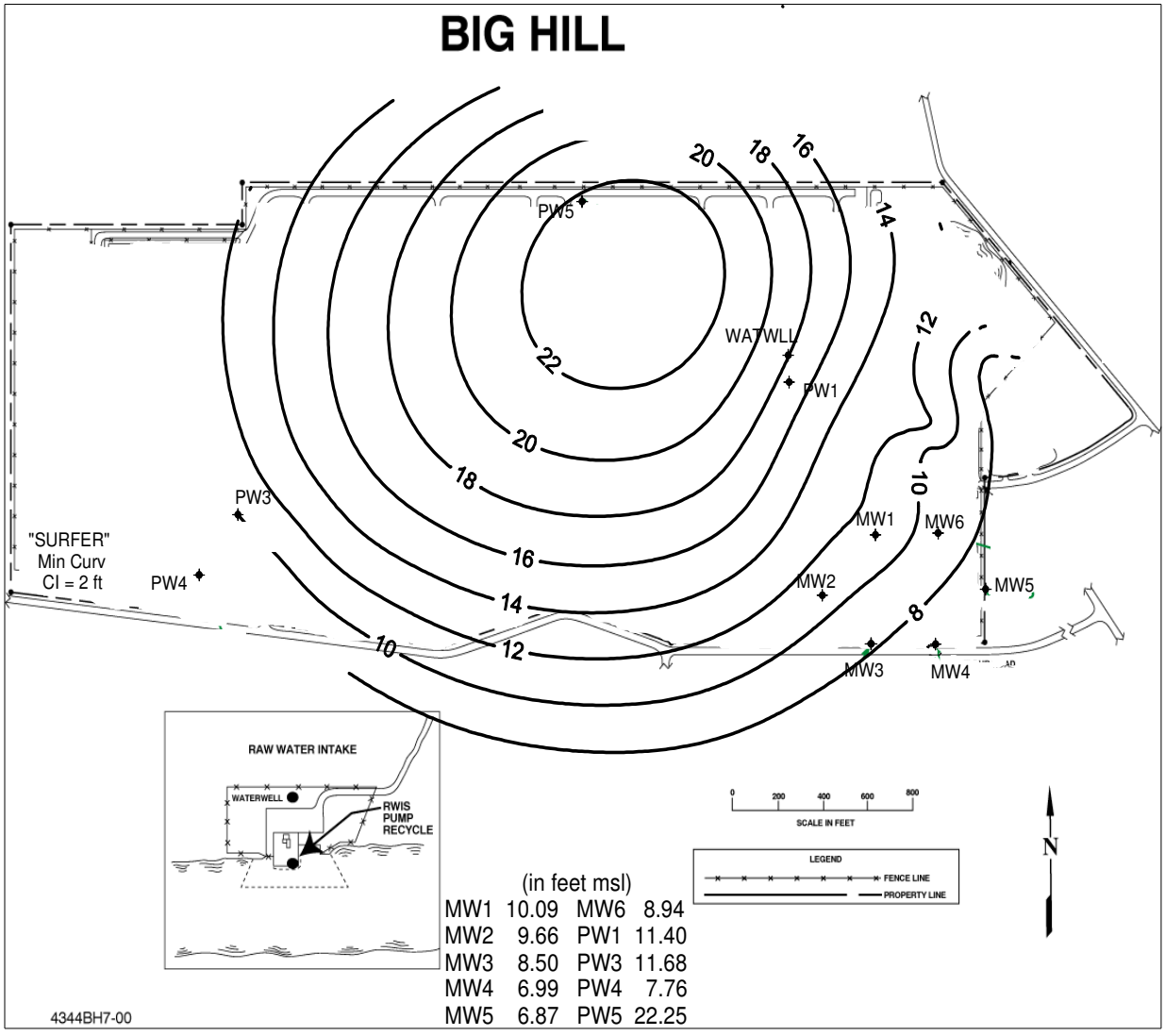


Figure 6-3. Big Hill Ground Water Monitoring Wells and Shallow Ground Water Contoured Elevations Winter 2006

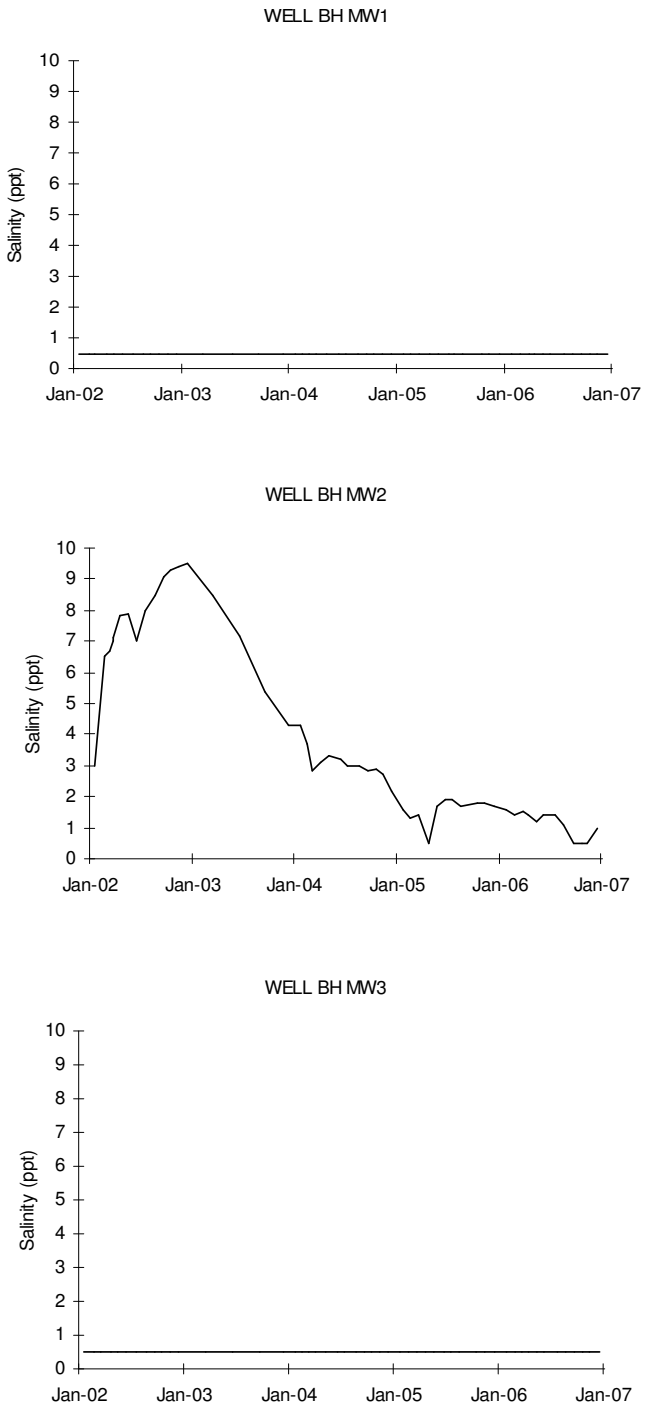


Figure 6-4. Big Hill Ground Water Monitoring Well Salinities

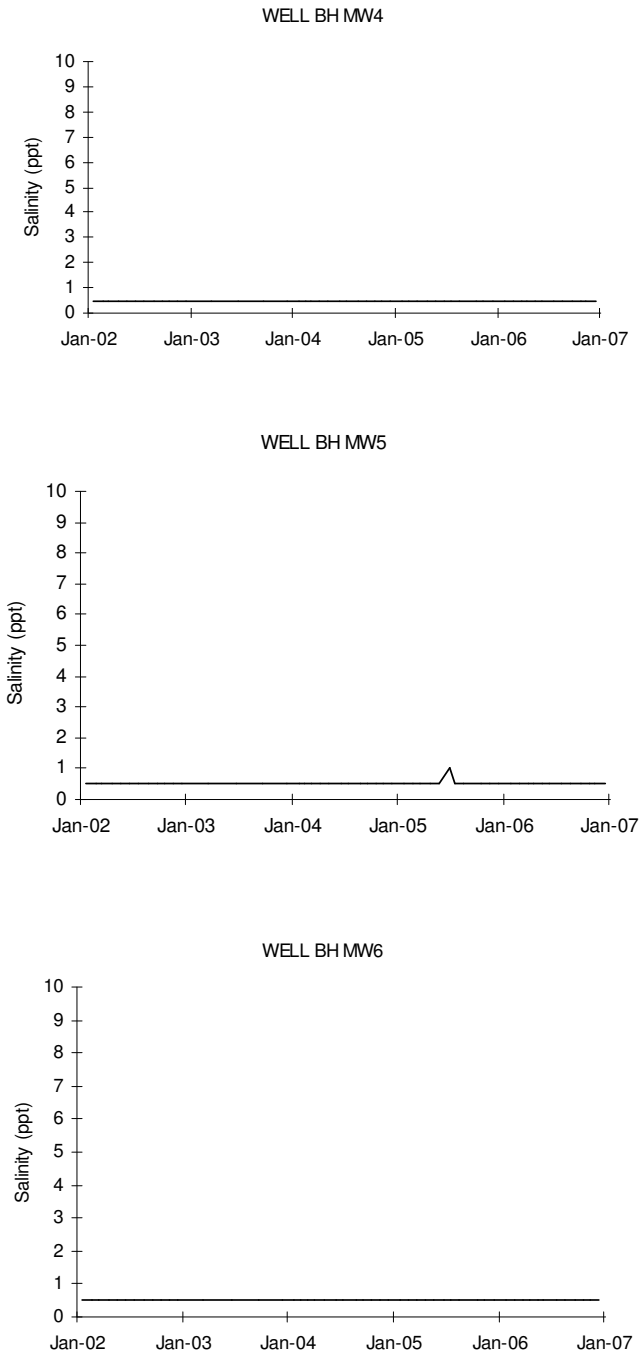


Figure 6-4. Big Hill Ground Water Monitoring Well Salinities (continued)

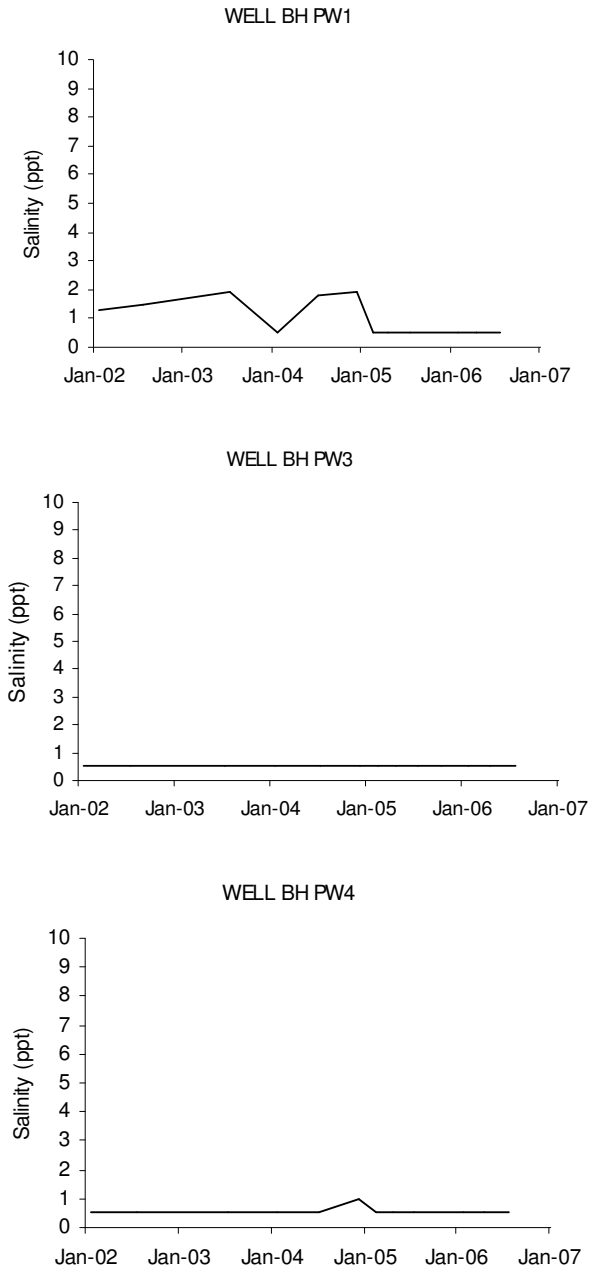


Figure 6-4. Big Hill Ground Water Monitoring Well Salinities (continued)

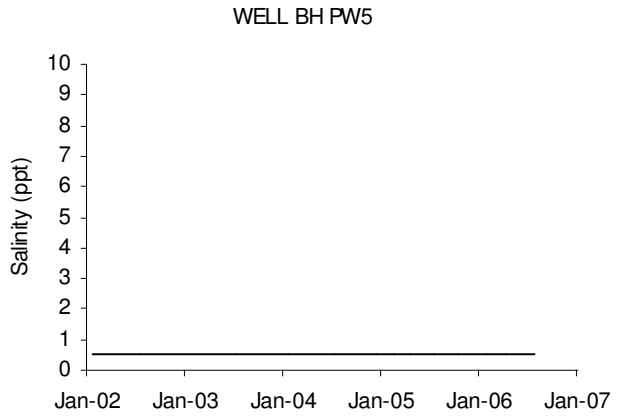


Figure 6-4. Big Hill Ground Water Monitoring Well Salinities (continued)

6.3 BRYAN MOUND

Site monitoring wells screened in two water bearing zones, 6 and 15 m (20 and 50 ft) bls, indicate that no shallow fresh water exists in the uppermost inter-connected aquifer over the Bryan Mound salt dome structure. This generalization was confirmed by the additional salinity data from the verification well study (VWS) in 1995-96. However, the Chicot and Evangeline Aquifers are fresh to slightly saline in the Bryan Mound area, and fresh water for Brazoria County is obtained from the upper portions of the Chicot up gradient of the Bryan Mound salt dome.

Fifteen monitoring wells have been drilled at Bryan Mound in four phases between 1981 and 1990 (Figure 6-5). Sampling began shortly after installation. Wells BM BP1S, BM BP2S, and BM PZ2S have been removed from monitoring service due to casing damage. Five additional shallow well locations and one additional deep well were installed in 1996 as part of the VWS, and all of these have been incorporated into the site's monitor well net.

The wide salinity fluctuations observed in the graphs occurring prior to the year 1997 have been moderating due to the implementation of the site-wide low-flow sampling methodology. All five-year traces this year reflect only the low-flow sampling method, producing less data variability attributed to more consistent and representative sampling of the shallow aquifers across the SPR. The resulting time trending graphs now more accurately reflect the site’s ground water conditions. Eight of the 12 total shallow zone wells around the site reveal decreasing trends or freshening conditions for the current 5 –

year window. Three of the six total deep wells reveal this same general freshening trend, with the exceptions being: BM BP1D, BM MW1D, and BM PW 2D (which maintains only a slight upward trend despite the single anomalous spike in 2005). BM BP1D also maintains a slight upward trend generally at or below 10 ppt, and has a single data point in 2006 of 3.6 ppt. Well BM MW1D is downgradient of a pre-DOE source and despite its current five-year trend being upward, the 2006 data points were freshening somewhat.

Salinity trends are evident in both salt-affected and unaffected areas. Elevated ground water salinity measurements in both the deep and shallow zones near the former brine pond and pump pad area have, however, remained relatively constant over time.

After an overall step change in salinity evident back in 1995, occurring at the paired wells BM MW1S and BM MW1D, a decidedly consistent and similar freshening trend was noted in both zones at this location. However, commencing with the 2005 five-year trace, the deep zone well BM MW1D is trending upwards while the shallow zone well screened above it, BM MW1S, maintains is consistently freshening. This may be the result of a slug of salty water slowly passing the position in the deeper monitored zone that is not currently affecting the shallow zone. Both the water level measurements, and now the test results, support the idea that the two zones are hydraulically separate or at best very poorly connected.

High salinity measurements (>20 ppt) observed in the shallow zone near the SOC (BM MW5) is flat to slightly increasing in the current 5-year trace and are not indicative of any significant or noteworthy recent releases or events. Salinity swings are found this year in both the shallow and deep well pair BM MW2S and BM MW2D. The spike occurring in the shallow well early in the year (2006) has altered the five-year trace to that of a mild upward trend despite returning to near ambient conditions later in the year. The deep well complement continues a downward (freshening) trace. Salinity observed in the unaffected (<20 ppt) deep and shallow well pair at the northwest corner of the site (BM MW4S and BM MW4D) continue to trace decreasing five year trends below 10 ppt; with the shallow well showing a decided uptick in 2006 and the underlying deep well going fresher overall indicative of differing waters even though the water level measurements in this single pair do not have the hydraulic separation (water level difference) noted with all the other deep and shallow well pairs on the site.

BM MW3, also remaining under 10 ppt, shows a freshening salinity trend over this five-year period even with a single measured spike in the dataset occurring at the beginning of 2005.

Site ground water movement in the shallow, 6 m bls (20 ft), zone is in the northerly direction toward Blue Lake while that of the deep, 15 m bls (50 ft), zone is in the southeasterly direction toward Mud Lake. Local ground water movement is primarily affected by the domal upthrusting. The newer, more peripheral wells indicate that the shallower zone is influenced more by the topography and appears to be flowing radially (in all directions) off the dome (see Figure 6-5). The flow direction in the deeper zone results from a NW-SE trending recharge zone causing flow to move in a northeasterly manner over half the site and in a southwesterly manner for the remaining half (see Figure 6-6). The water level data for 2006 were contoured using the new re-leveled measuring points from 2005 and again this year the data do not produce any dramatic changes in flow direction interpretation but reveal gradients that appear to have steepened on portions of the site near the edges of the dome. Most notably the area of generalized mounding in the shallow zone near well BM PZ1S is now completely smoothed and regular revealing no discernable anomalies or tendencies versus the previous years. These shallow zone conditions will be watched for subtle changes, as a return to more normal rainfall amounts and patterns, could also produce the same effect through localized recharge.

The water level contouring of the deeper zone wells is now tending to show a response consistent with lack of local recharge with time as the gradients are flattening, especially in the center of the site, as the contour lines expand outward towards the edge of the dome.

Both of these aquifers exhibit a very low average linear velocity ranging from an estimated 1.5 m/yr (5 ft/yr) in the shallow zone to 3 m/yr (10 ft/yr) in the deeper zone. This slow movement is due to the combined effects of the clay content of the water bearing strata and very low hydraulic gradients which range from 0.0006 m/m to 0.001 m/m (0.002 ft/ft to 0.004 ft/ft). This low average velocity characteristic reduces the risk of contaminating any fresh and potable water bearing zones known to exist off the flanks of the subsurface dome.

When contoured, two major areas emerge where ground water salinity exceeds ambient conditions (>20 ppt) for the Bryan Mound site. The first area stretches from the former

brine pond eastward to the brine pump pads and to the vicinity of an older brine pond demolished by DOE in 1989, and then southward towards the center of the site and below the maintenance building already discussed. Operations pre-dating DOE ownership included brine retention in two separate unlined elongated abandoned ponds reclaimed (filled) by DOE in this same area. The second and considerably smaller area lies southeast of the security operations center (SOC) adjacent to a closed anhydrite and drilling muds confinement area.

The trending lines for the wells at each of these locations reveal a downward slope of freshening conditions (see graphs for BM MW1S; BM MW2S; BM MW2D; and BM MW4S). The notable exceptions to this group is well BM MW1D, which continues to show an increasing trend with time in this year's 5-year charting because of a downward spike in 2003 and in spite of a freshening trend in 2006; the shallow well BM MW3S, and to some degree BM MW5S which is revealing a slight upward 5-year trending due to a swing observed with this year's data. Deep well BM MW1D which is at a position down gradient of previously mentioned unlined ponds is screened in very low permeability materials and the resulting slow ground water movement in this zone basically has us sampling the same water over and over. The shallow well BM MW3S is showing an increasing trend for the first time in its history due to a spurious single measurement of 38 ppt in 2006. This was the only measurement made in the year due to the location being blocked by an extensive construction project and the first measurement obtained in 2007 shows the well back down into the routine historic levels below 10 ppt (7.6 ppt). Elevated salinity observed at shallow monitor wells since their installation, BM PZ1S, BM MW1S, and former BM BP1S, has been speculated to be associated with SPR brine storage pond activity. The large brine pond with a Hypalon® (chlorosulfonated polyethylene) membrane was originally constructed in 1978. The pond was subsequently renovated and enlarged (raised levee for capacity) with installation of a new Hypalon® liner and a concrete weight coat in 1982. The Bryan Mound brine pond was removed from brine storage service in September 1998. Removal of solids and closure construction activities concluded in the early spring of 1999. Because of the very slow ground water movement rates and the estimated long lag-time needed for vertical migration, the salinity measurements observed in the pond area and especially those to the northeast and east could be the result of seepage from before 1982 renovations of the pond, or from operations occurring before the SPR. Salinity of deep complements to wells BM PZ1S and former BM BP1S (BM PZ1D and BM BP1D) are much lower and considered ambient (<20 ppt) for the site. They indicate no contamination of the deep zone around the immediate vicinity of the former pond and no apparent direct communication with the

shallow zone in this area. The shallow zone wells BM MW1S and BM PZ1S reveal downward or freshening trends now with the consistent sampling regimen and the well directly down gradient of the former SPR brine pond, shallow zone well BM PZ1S reveals a steadily freshening trend even with a 2006 uptick for the current 5-year window. Well BM BP1D, located south of the former SPR brine pond continues to trend slowly upward, but overall remaining below 20 ppt.

Data from the VWS completed in the summer of 1996 indicate that the primary location of shallow zone salinity impact is in the area of well BM MW1S, which is mirrored by elevated salinity in the underlying deep zone around BM MW1D. This is the location of former below grade unlined brine retention ponds from pre-SPR operations. The high salinity of the deep well may also indicate limited hydraulic communication of the two ground water zones in or just up gradient of that location. It is also possible that complete saturation and permeation of the clayey separation layer between the two zones by a dense salt solution has occurred in a very limited area, as the water levels indicate continued hydraulic separation with over 5 feet of head difference noted.

The former SPR brine pond was closed in 1999. The final annual structural inspection of the brine pond, made in November 1998, concluded that no obvious structural compromises of the pond's integrity had occurred. From the time when the pond had all its contained liquids and solids removed late in 1998 until the close of 2006, the shallow ground water has not moved more than about 40 feet laterally. Given the anticipated long lag-time for vertical migration and then the lateral distance required to be covered to the nearest wells, it may be some time for any potential post-closure salinity changes to become evident in the monitoring.

Southeast of the SOC and adjacent to an anhydrite disposal area used during early construction is a second area where elevated salinity ground water is found. The limited area of contamination is intercepted in the shallow zone by well BM MW5S and perhaps BM PZ3S and has been relatively consistent over the history of long term monitoring. The VWS study indicated these wells may be affected more by diffusion than by flow gradient, especially at well BM PZ3S which is somewhat on the up-flow side of the closed anhydrite disposal pit. The five-year trending charts for both of these wells has indicated a general freshening with time continuing into 2006 for well BM PZ3S, although well BM MW5 reveals a slight upward trend in response to an uptick in 2006. In the short-term (2006) there is a big swing evident with the data from BM MW5 versus the downswing

observed in CY2005, this can only be speculated to be a response to the general ground water movements or a response to localized historical rainfall conditions (post drought).

A suspect brine contamination source south of the site's maintenance building may be producing another area of elevated salinity. A definite source has not been identified or associated with any known historical SPR operations or incidents, and is therefore most likely predates SPR activity. Salinity measurements exceeding ambient levels (> 20 ppt) have been observed historically in both zones at wells BM MW2S and BM MW2D, with the shallow well BM MW2S remaining below 20 ppt from 2000 through 2006 with continuing improving quality. This area is masked when contoured, falling under the general "blanket" of the effects associated with the pre-SPR brining operations located in the north central portion of the site already described. This area may therefore be considered part and parcel of that historic saltwater release; being affected more by diffusion and dispersion rather than direct flow.

Salt water effects are not evident at the northwest corner of the site. Shallow zone monitor wells BM MW3S and BM MW4S near the southwest corner and west of the former brine pond, respectively, have historically remained relatively stable in the unaffected 5 to 10 ppt range, with the exception of the single outlier occurring this year at BM MW3S. The ground water salinity at the northwest corner of the site is consistent or better than the salinity observed in Blue Lake, the adjoining surface water feature. These two wells are also down gradient of the anhydrite disposal area and do not reveal any impacts at this time. During 2005 two anomalous spikes in salinity were observed at the paired deep and shallow wells BM PW2S and BM PW2D. These wells are located near the center of the site and are both therefore situated atop apparent site recharge areas based on the water level contouring. Not being down gradient of any known or potential salinity source and because these spikes were similarly noted and also found to be ephemeral (as normal levels were measured in subsequent samplings) and were maintained throughout 2006. This observation reinforces the interpretation that current activities are not a contributing factor to the salinity levels observed at this site. Returning rainfall may also be recharging the wells locally and any surface soil sources would percolate downward. And most wells at this site are showing marked improvements with increasing regular rainfall.

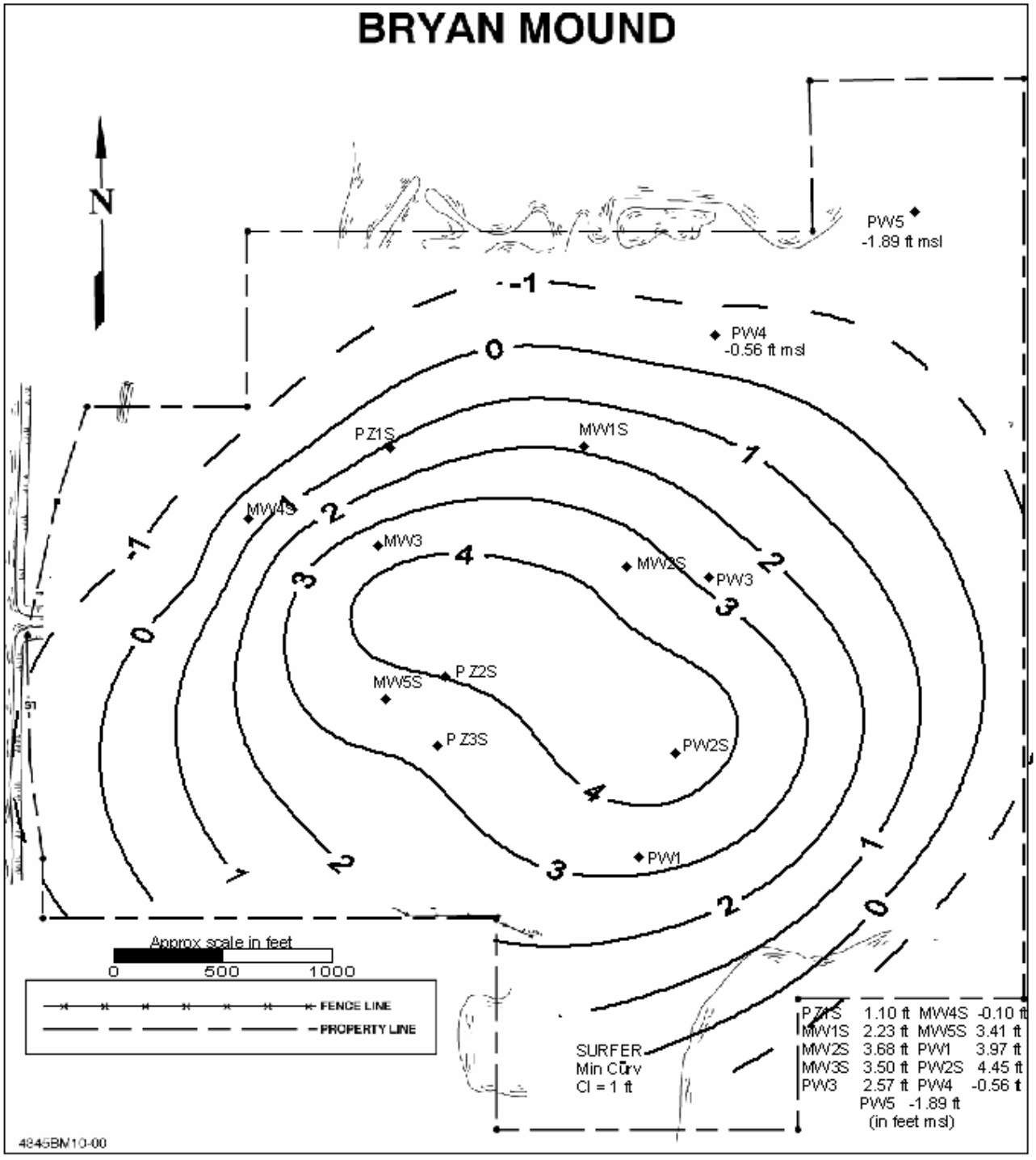


Figure 6-5. Bryan Mound Ground Water Monitoring Wells and Shallow Ground Water Zone Contoured Elevations Winter 2006

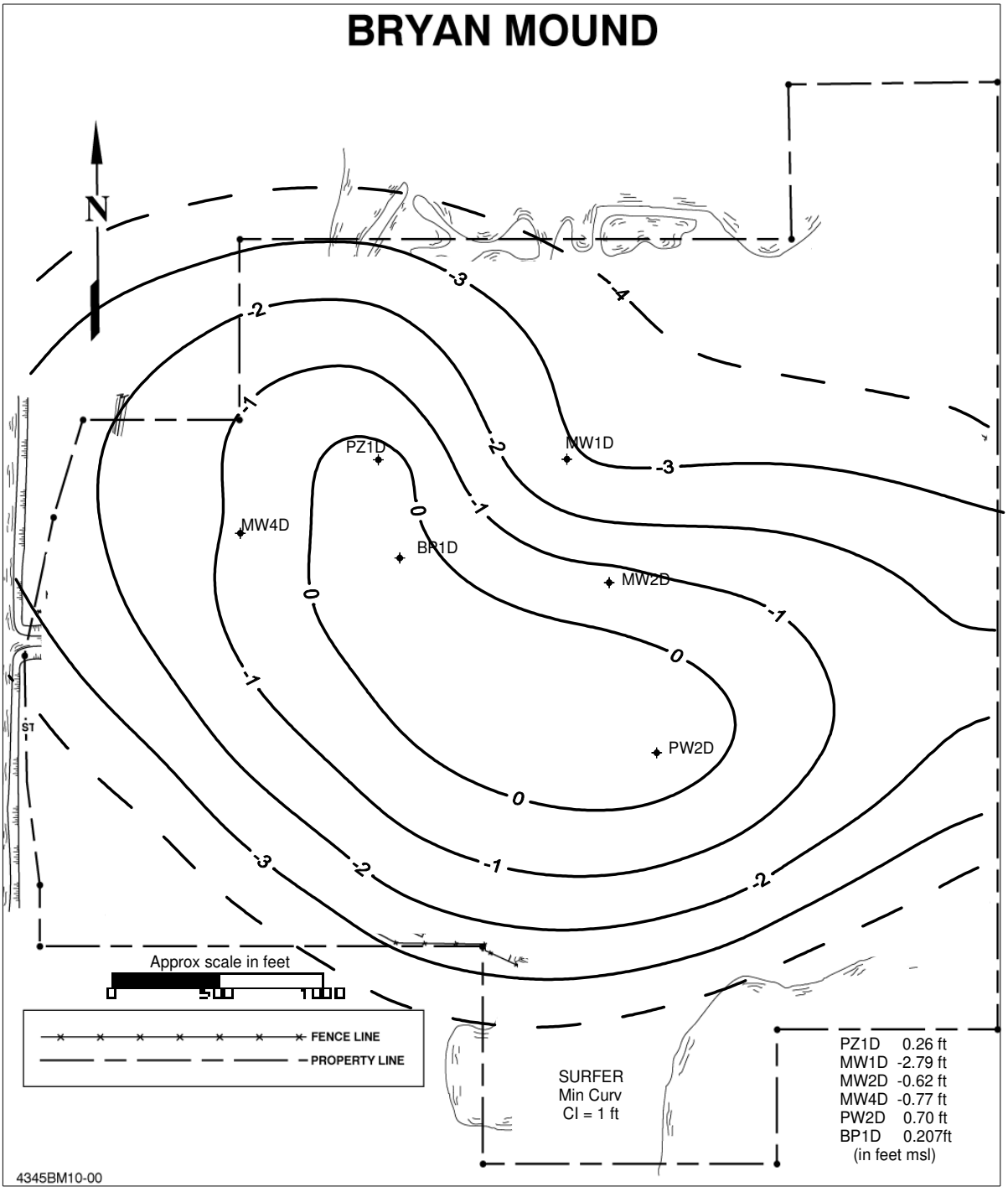


Figure 6-6. Bryan Mound Deep Ground Water Zone Contoured Elevations Winter 2006

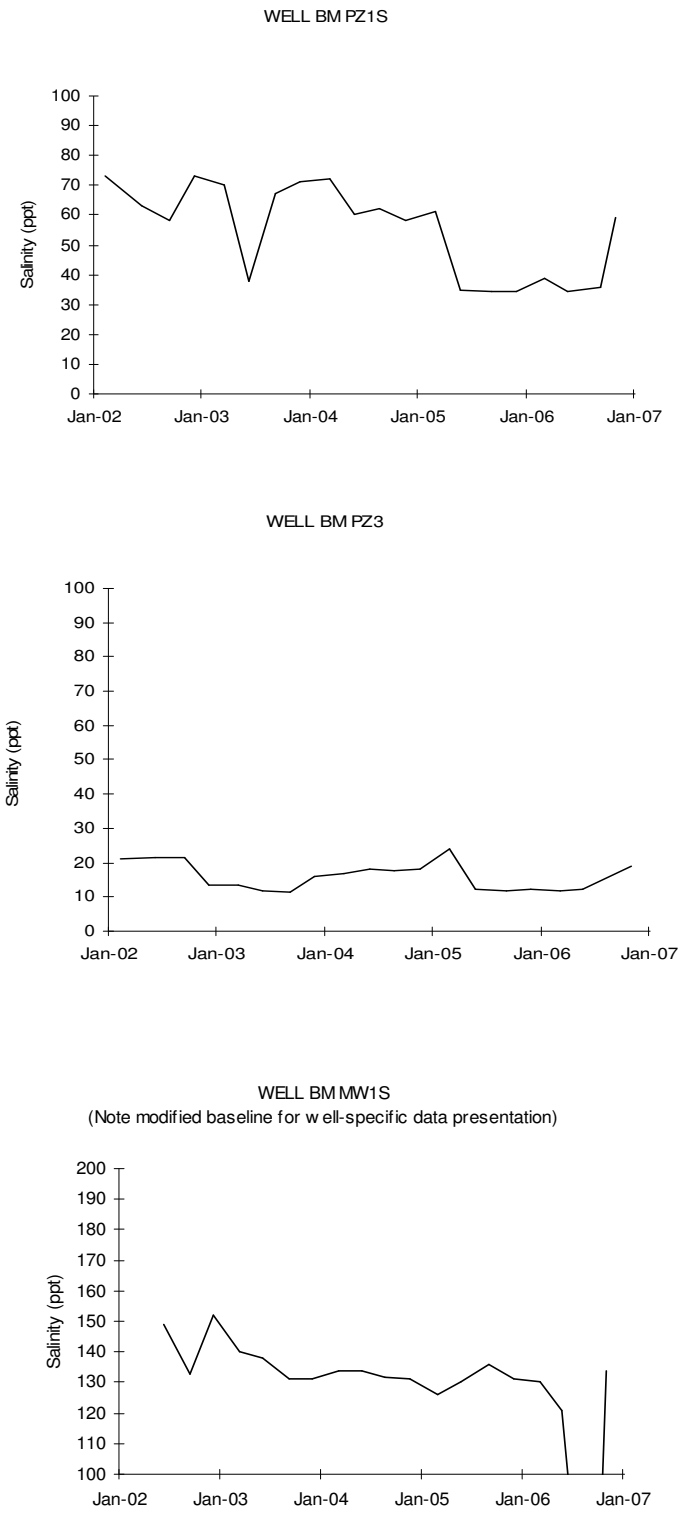


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities

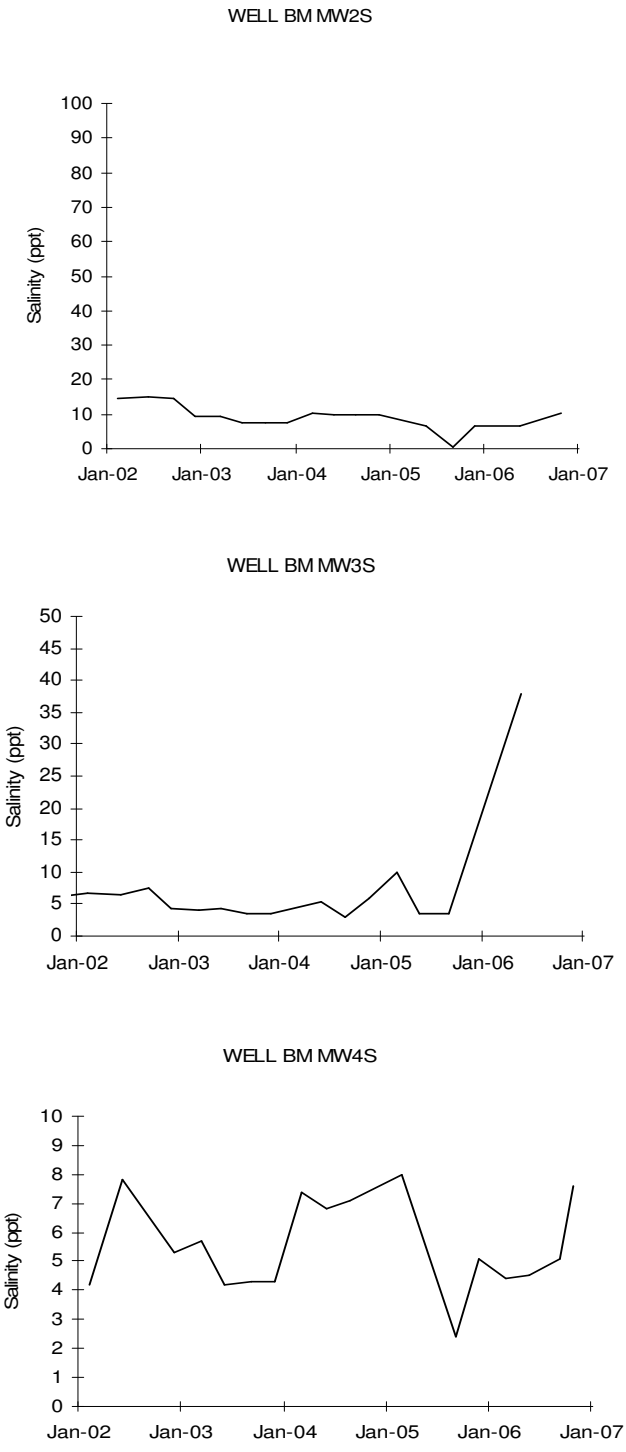
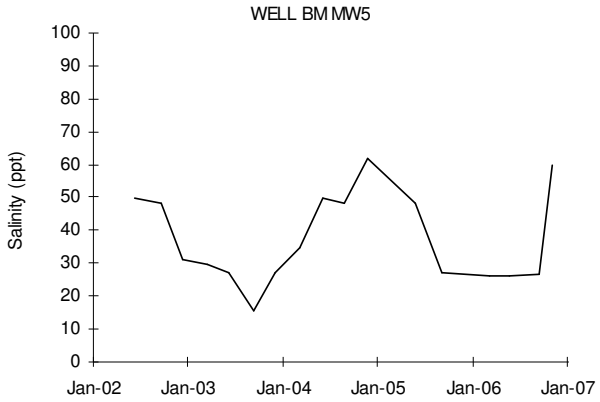
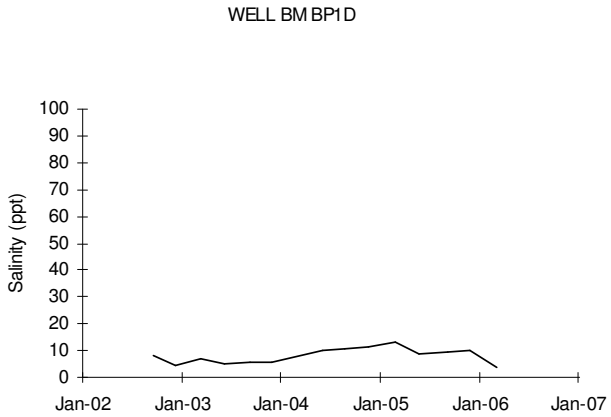


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)





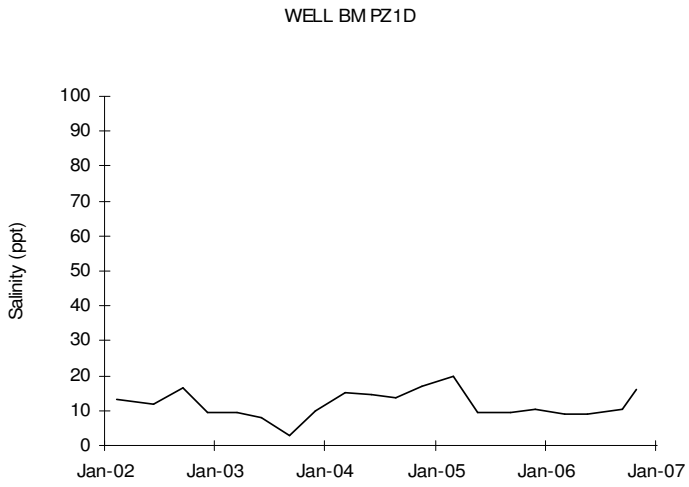


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)

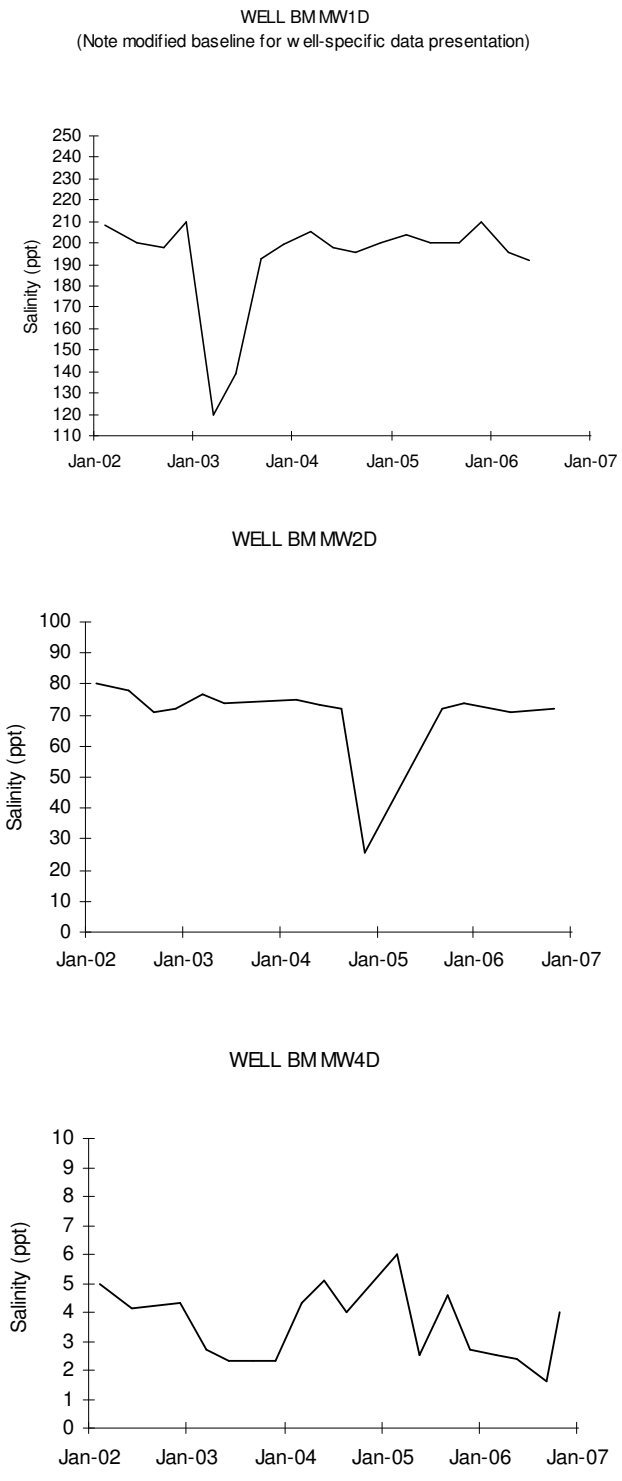


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)

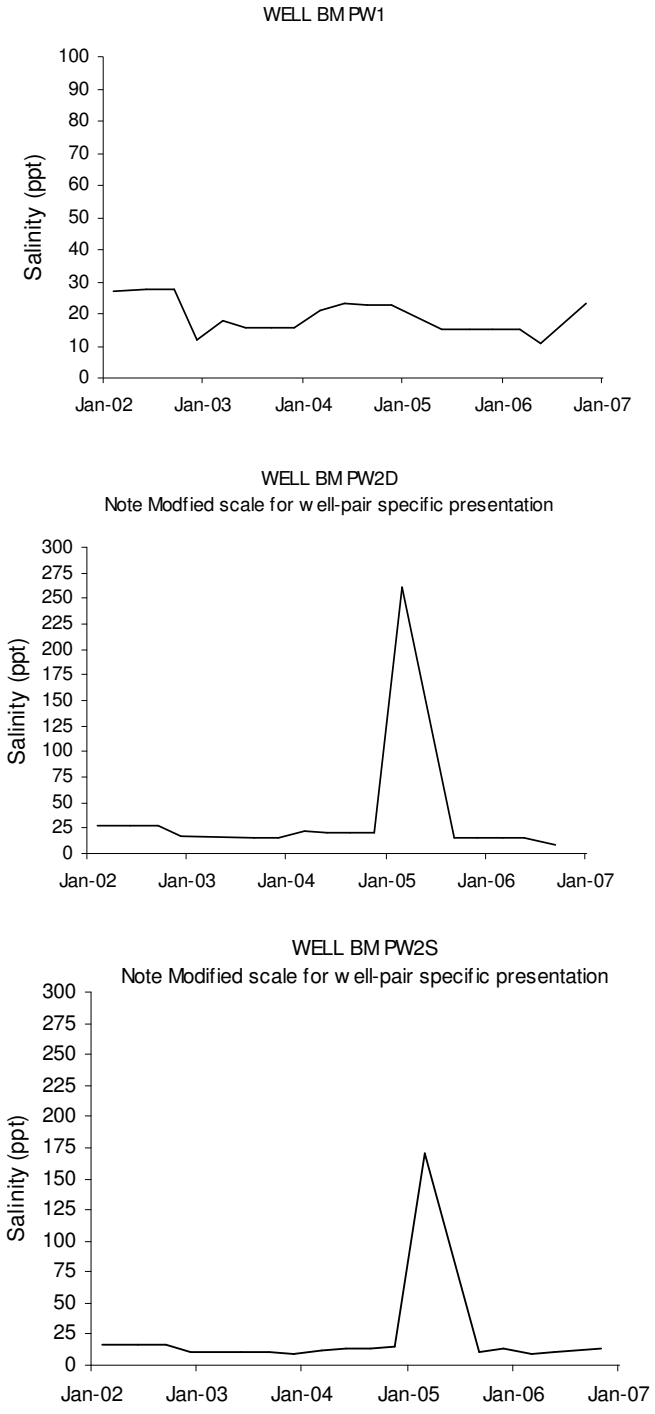


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)

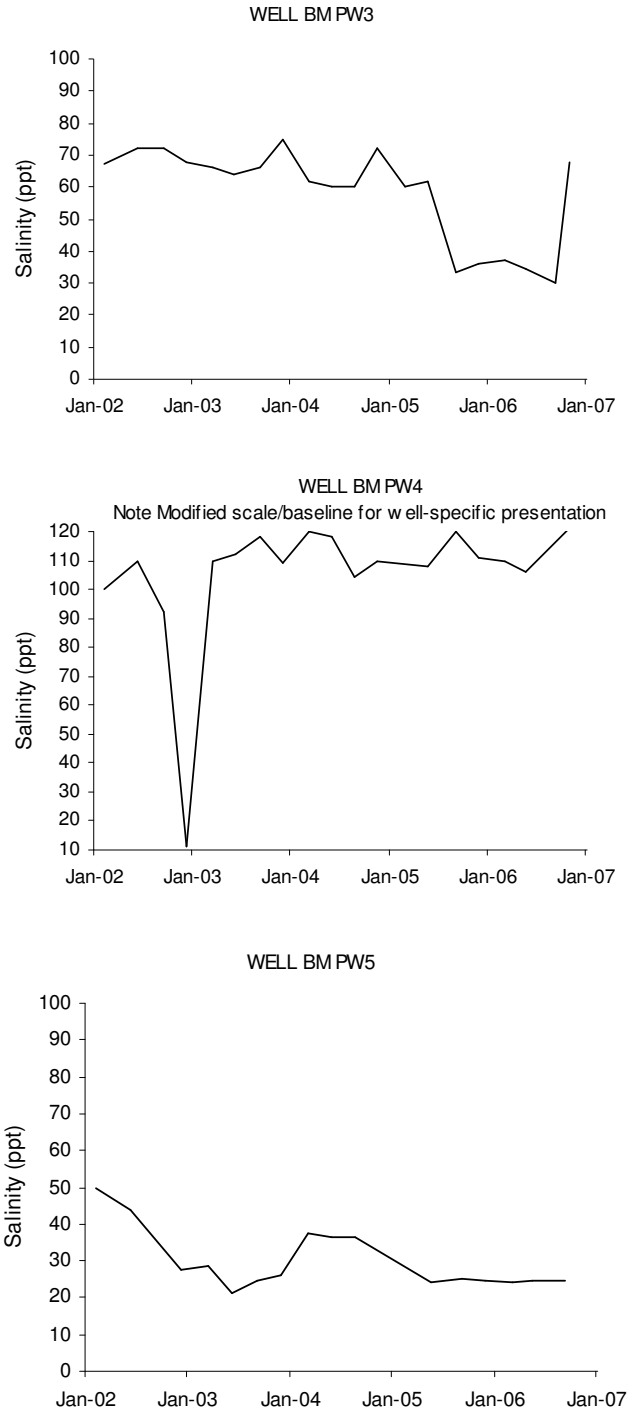


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)

6.4 SAINT JAMES

The Chicot Aquifer is the principal regional aquifer at St. James. The upper strata of the Chicot Aquifer are in direct hydrologic contact with the Mississippi River. Much of the ground water contained in this aquifer is slightly brackish. In the St. James area only the uppermost units contain fresh water.

As a result of due diligence studies undertaken prior to the lease of property to Shell Pipeline, crude oil contamination was identified on the shallowest perched water table at two limited areas at St. James. In 1998 the SPR entered an agreement with the LDEQ to perform monitoring and remediation of petroleum hydrocarbon contaminated soil and groundwater. In accordance with the Risk Evaluation/Corrective Action Program (RECAP) periodic monitoring, product recovery, and bioremediation activities were completed, with status reported to LDEQ on a quarterly basis.

The data from three consecutive sampling events that spanned from 2003 to 2006 were assessed under the MO-1 non-industrial standard criteria. Results indicated that clean closure without conveyance notification requirements was attainable. In July 2006, SPR personnel presented LDEQ with the results of this assessment and requested approval to begin steps towards closure of the contaminated area. Based on the data, LDEQ gave a verbal confirmation that the SPR could begin steps towards closure.

Due to the complexity of the closure report, DM focused the remainder of 2006 to evaluate previous historical data against RECAP 2003 closure criteria and procured the services of a qualified vendor to prepare the closure report along with a soil re-use plan for the excavated soil. This report will be submitted to LDEQ in 2007.

6.5 WEEKS ISLAND

The Chicot formation is the principal aquifer in the Weeks Island area. The aquifer's potentiometric surface is generally at or just below sea level upon the domal structure of Weeks Island and is found to slope slightly west southwesterly producing a very mild but noticeable gradient towards Vermilion and Weeks Bays in the southwest quadrant where the majority of the island is occupied. The fresh water bearing sand layers that occur above the salt provide usable water for the local area. No monitoring activity occurred in 2006.

6.6 WEST HACKBERRY

The Chicot Aquifer, which occurs closest to the surface in the Hackberry area, contains predominantly fresh water with salinity increasing with depth and with proximity to the Gulf of Mexico. The majority of the ground water pumping from the Chicot Aquifer takes place in the Lake Charles area. Pumping is so great that a cone of depression has been created which has reversed the flow direction to the north. The fresh/saline water interface is approximately 213 m (700 ft) bls off the sides of the dome and more shallow directly over the dome where our site is situated. Areally limited zones found affected and monitored at the West Hackberry site are much nearer the ground surface, with a shallow zone at roughly 6 m (20 ft) bls and a deeper zone at roughly 15 m (50 ft) bls. Details provided by the VWS in 1996 indicate that the two zones contrast sharply in permeability, and as a result, their estimated linear velocity measurements are quite different. The range of flow rates estimated for the shallow zone is from 50 to 200 feet of movement per year, which results from both variable permeability values and varying gradients across the site. The deep zone exhibits a generalized flow rate estimate of only 7.5 feet per year, which is largely due to the more clayey nature of the sands conveying these waters and the lower gradients evident within the site's limited well net.

Situated directly atop the salt dome and given the long industrialized history of the site and the immediate area, a 10 ppt cut-off for salinity is used in comparisons for determining affected and unaffected waters as historical ambient conditions have been found highly variable across the site.

The 1991 Contamination Assessment Report and Remedial Alternatives Analysis identified the former brine pond as a source of ground water contamination. The decommissioned brine pond was one of five adjoining ponds comprising a pond system and solids management system that handled brine and anhydrite solids pumped from the storage caverns. The state approved brine pond-decommissioning plan was concluded in November 1999.

Eleven monitoring wells and 15 former recovery wells (Figure 6-8) have been installed on the West Hackberry site in five phases. All were historically used to either monitor or control brine contamination movement beneath the brine pond system. Salinity data gathered over the past five years at all wells is depicted in Figure 6-10. Four of the seven wells originally installed for VWS were retained for additional water level

measurement around the periphery of the main site brought the site total up to 30 and in the late fall 2006 three wells which were not part of any outside monitoring agreement (WH MW1S, WH MW1D, and WH MW2D, were plugged and abandoned due to cap maintenance construction activity for a close anhydrite pond, which brings the final site total wells down to 27. Salinity data are depicted in the five-year trending graphs for all of these wells, however, certain wells are tested for salinity only once per year per our 2002 monitoring proposal for resumption of site-wide monitoring approved by LDNR in early 2004.

West Hackberry personnel began using the low flow technique for sampling all non-pumping wells in December 1995. Water level measurements from both zones for the winter quarter timeframe of 2006 have been reduced to elevations, contoured, and are presented as Figures 6-8 and 6-9, Shallow Zone and Deep Zone, respectively. The effects of the long-term pumping have dissipated in both zones over time and the current data appear to reflect unaffected flow regimes. The contour map of the water levels in the underlying deep zone reveals a rather flat pressure derived gradient within the semi-confined water bearing zone. The low permeability of the deeper zone routinely produced very pronounced draw down levels at the former pumping wells, which in turn produced an unusually deep and pronounced cone of depression as an artifact of the contouring. The slow recharge to this lower permeability zone has been monitored closely for a number of years. The pressure gradient evident is very flat (low) and continues to maintain very slow travel times and indecisive (ephemeral) travel paths with no hard and fast direction beneath the site on this portion of the dome. The general appearance is that of a recovered confined water bearing zone, receiving some recharge potential in the vicinity of wells WH P1D, WH P4D, and WH P2D.

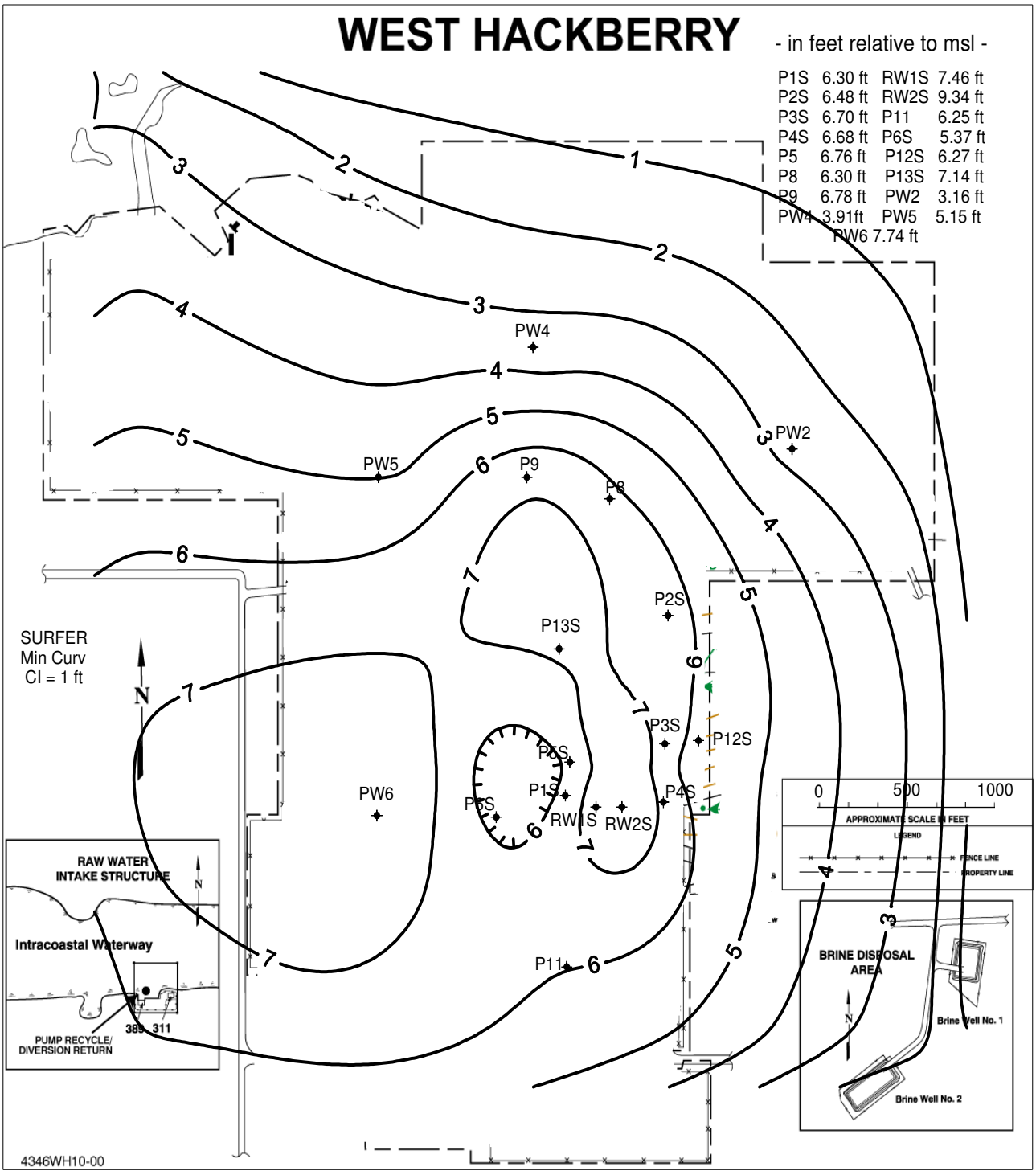


Figure 6-8. West Hackberry Ground Water Monitoring Wells and Shallow Ground Water Zone Contoured Elevations Winter 2006

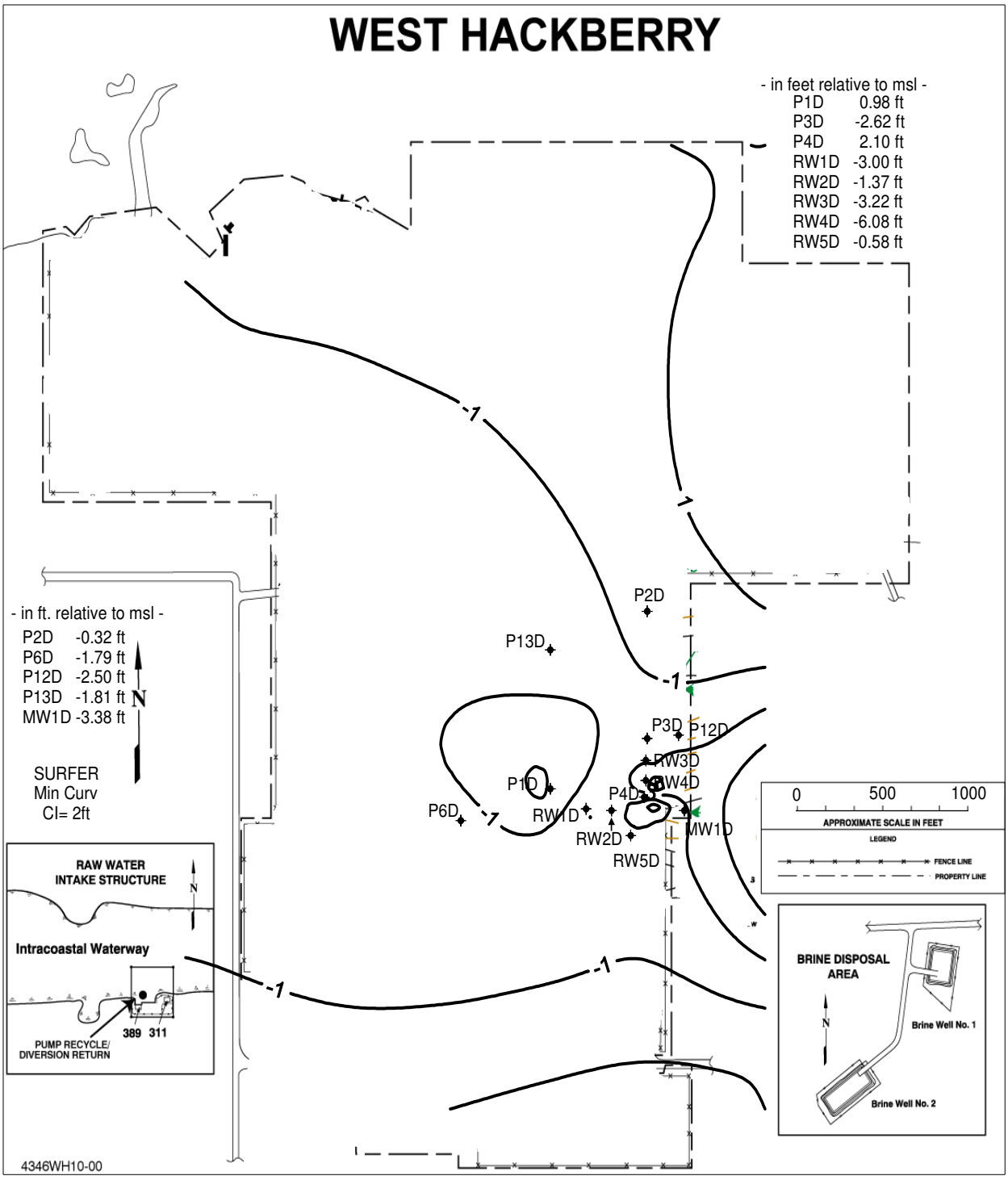


Figure 6-9. West Hackberry Ground Water Monitoring Wells and Deep Ground Water Zone Contoured Elevations Winter 2006

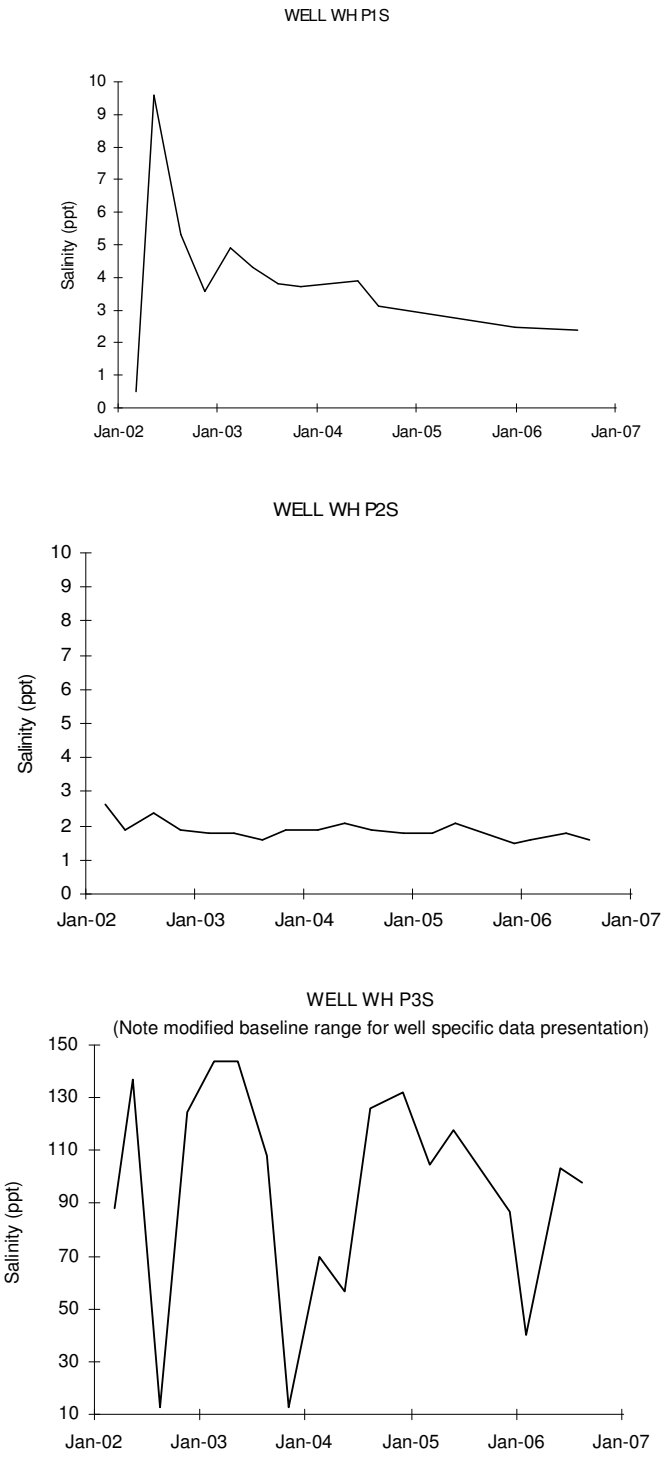


Figure 6-10. West Hackberry Ground Water Monitoring Well Salinities

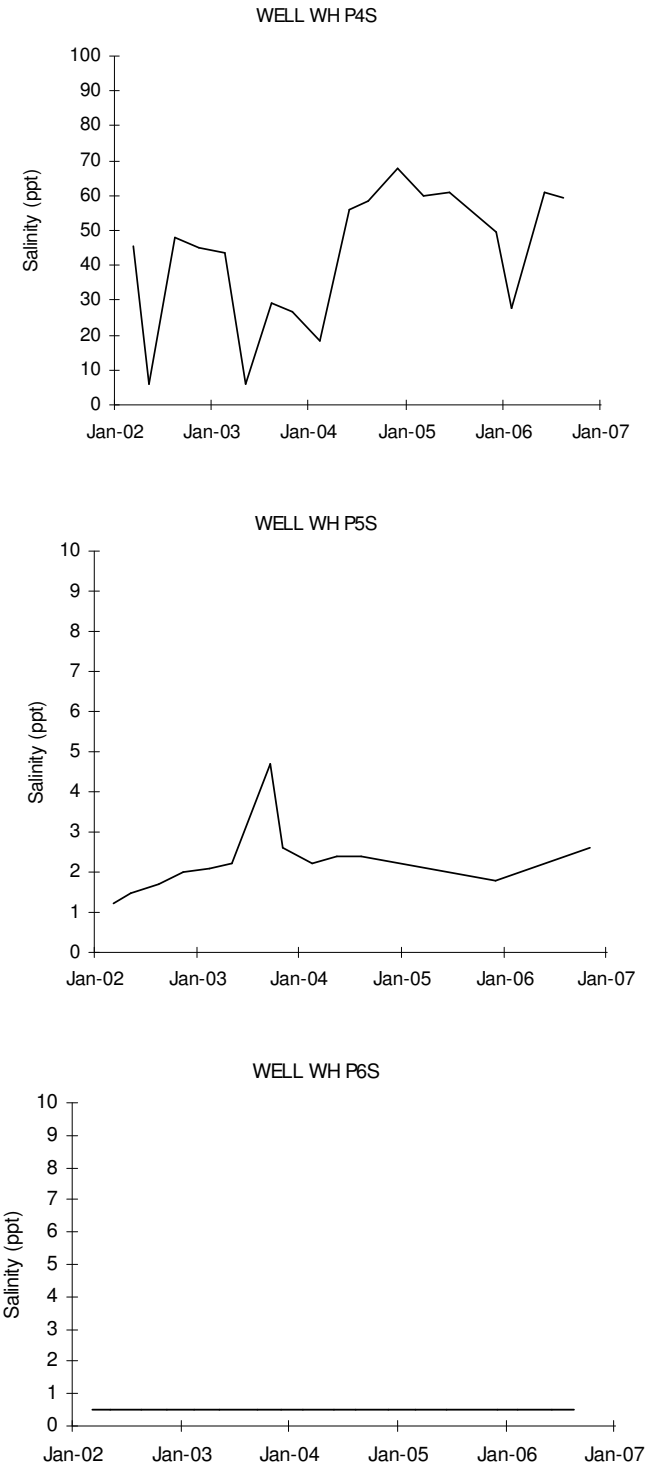


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)

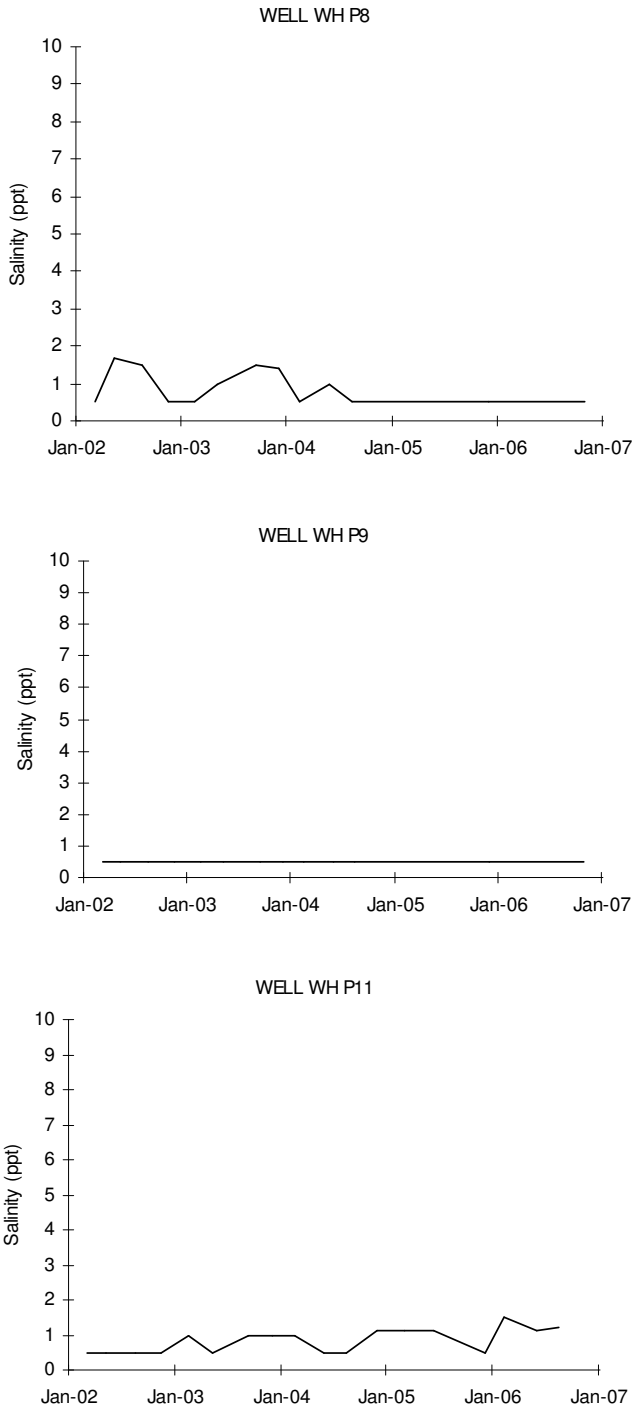


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)

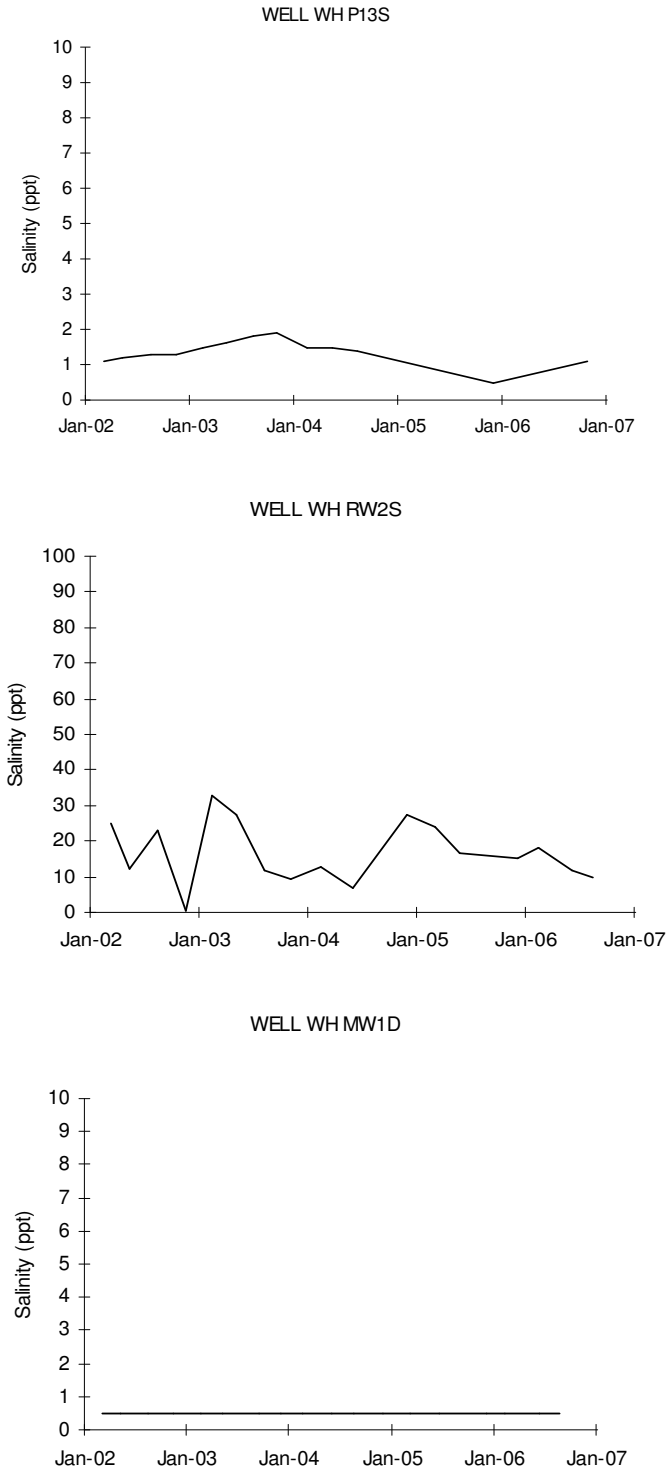
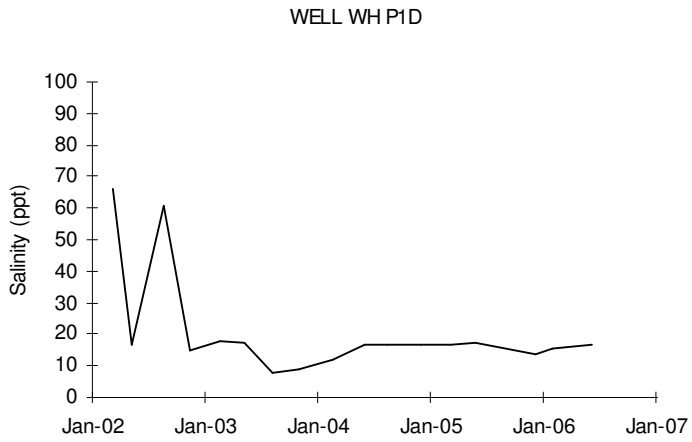
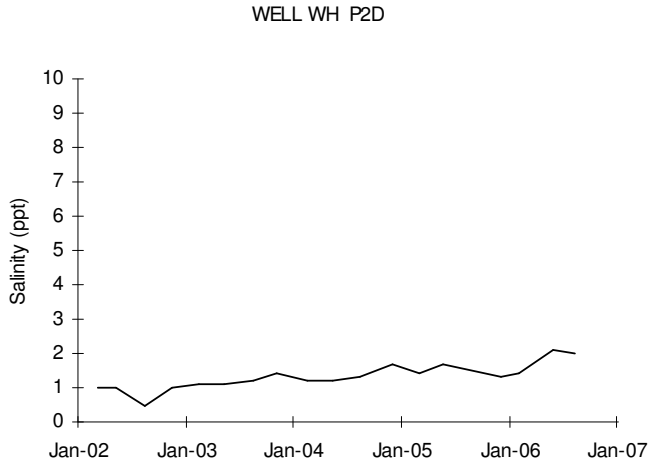


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





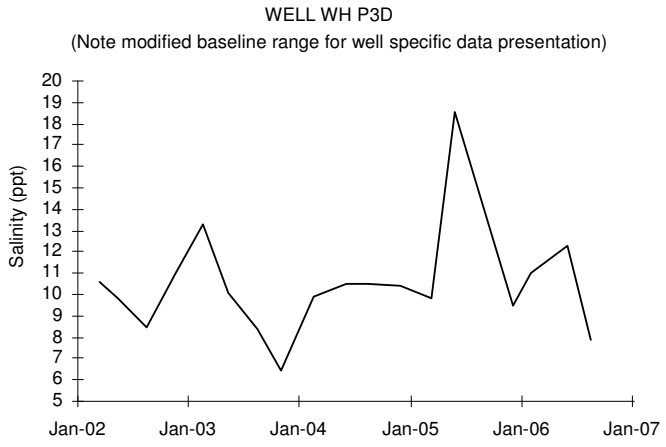
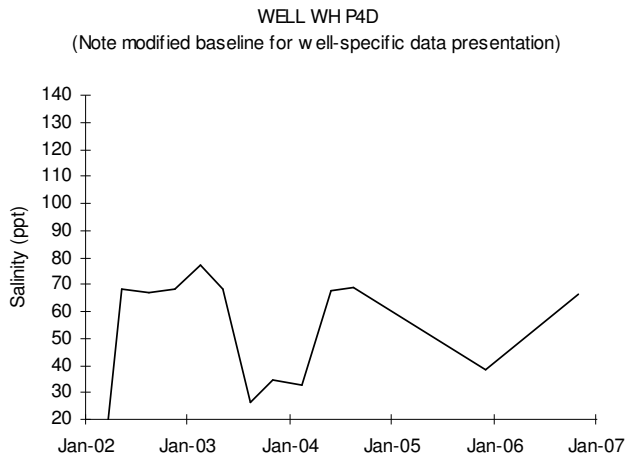
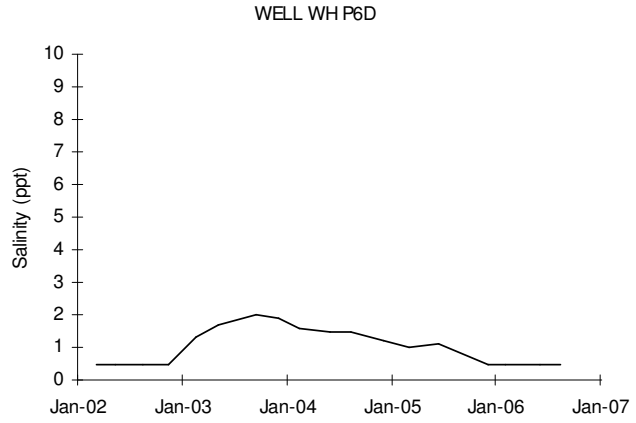


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





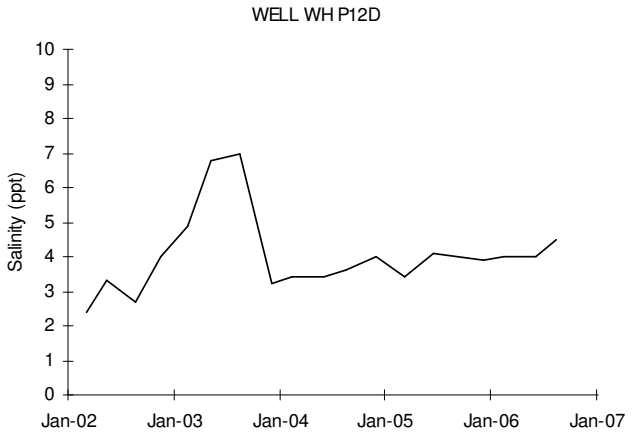
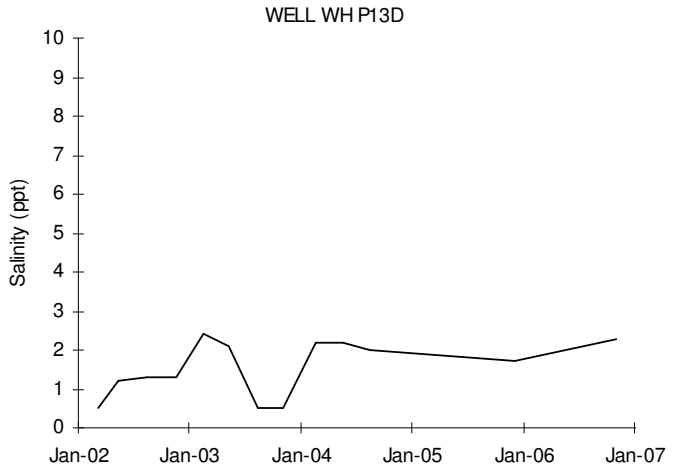
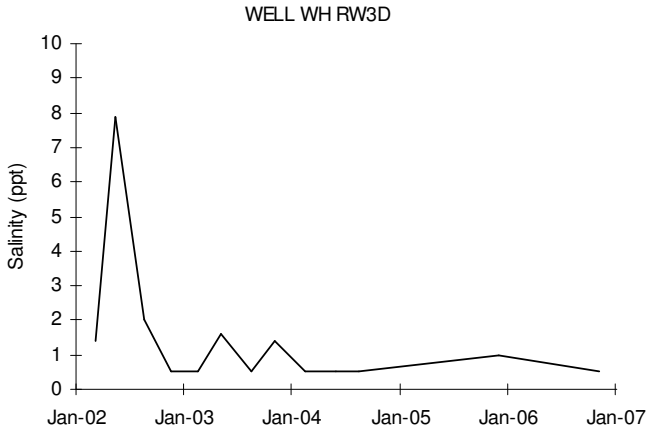


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





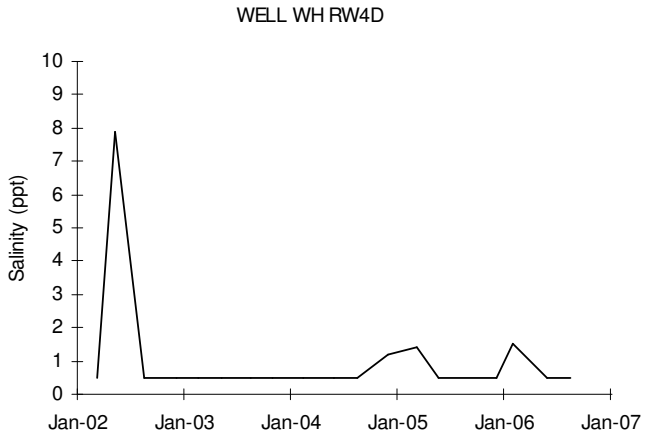


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)

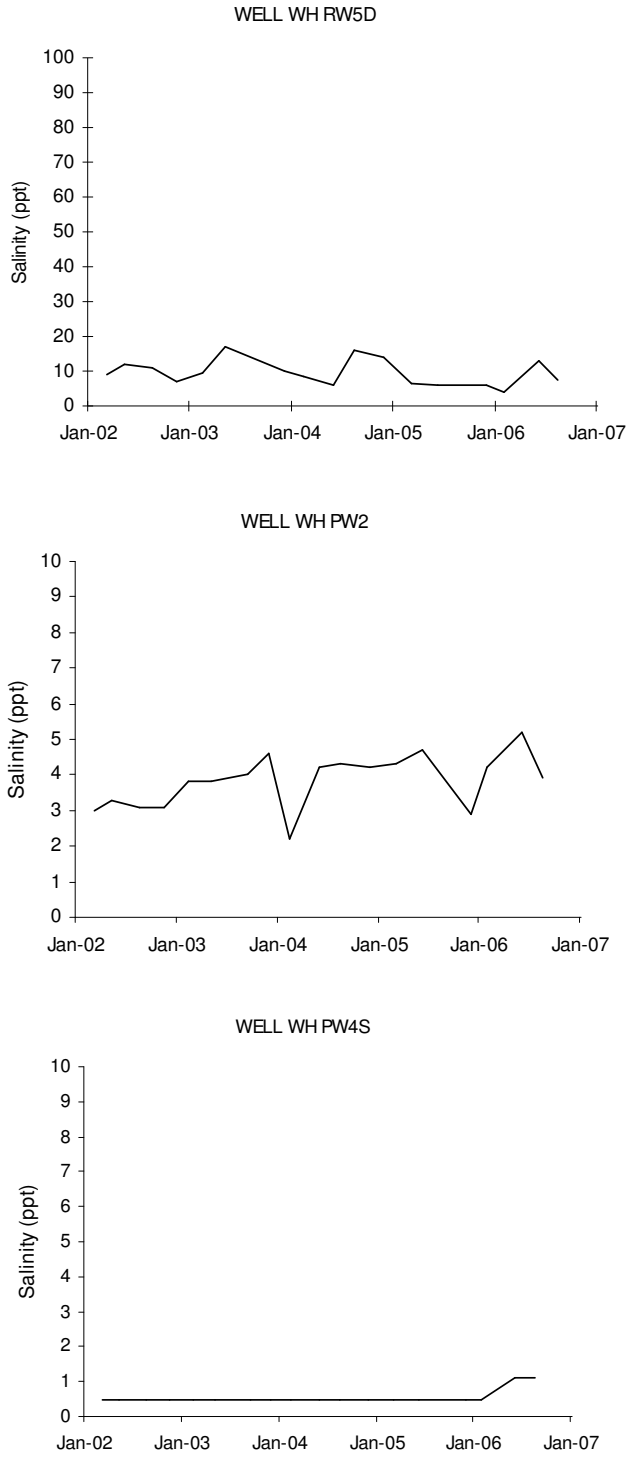


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)

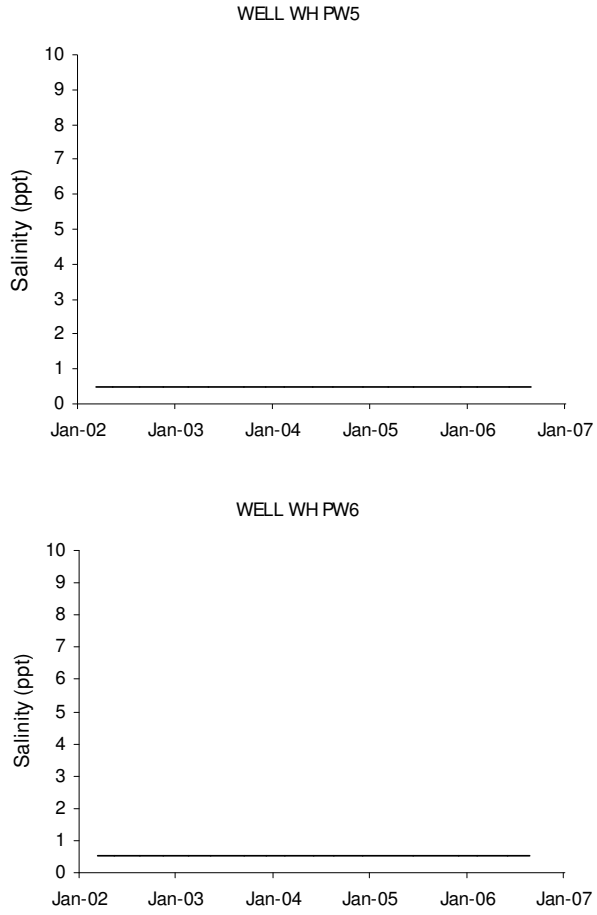


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)

Once the pumping wells were shut-in at the end of 2001, a five quarter evaluation interval was conducted that would cover 4 complete reporting periods under full shut-in. During this evaluation, the routine physicochemical data were collected and reported with very little interpretation leading to a detailed Summary Report at the conclusion. This Summary Report, mailed to LDNR in September 2002, presented all of the resulting data in both tabular and graphical forms and made direct comparisons to historical averages compiled during recovery as well as to the last pumping data points on a well by well basis.

The primary focus was on any discernible changes in salinity at the wells around the site; however, water elevation changes within both monitored zones were showcased with time series hydrographs and with quarter by quarter contour mapping. The year of no pumping produced no dramatic salinity ramifications as some wells around the immediate

former pond area noticeably improved (freshened) while others became more saline. The cones of depression previously developed in both zones collapsed (filled in) more rapidly and noticeably in the shallow zone; however, this phenomenon was quite lengthy in duration which supported the long held suspicion that the zone is at best a leaky or semi-confined water bearing unit receiving some recharge locally or on the site. The underlying (less permeable) deep zone required a longer period to reveal a reversion to more ambient conditions. Again, this observation supports the concept of this water bearing unit being recharged primarily offsite, although leak-by at the limited deeper well locations cannot be discounted. A Second-Year, Year-Long Evaluation Report was prepared in 2003 representing a comprehensive review of the continued changes resulting from the cessation of recovery pumping for a second year and which also proposed the same reinstatement of long-term site-wide ground water detection monitoring, which was not officially acted upon by the agency until early in 2004. After several exchanges of information via email a final letter was issued from LDNR's Office of Conservation that authorized the West Hackberry ground water recovery to revert to site-wide ground water monitoring per the proposal of September 2002, and which also concurred with the closure complete petition made for the interconnected brine pond system. This letter authority effectively allowed the site to re-commence site wide detection monitoring activities and also terminated the permits issued for the brine storage and management pits and the raw water holding pit.

Former recovery well salinity measurements depict a complex picture of ground water impacts beneath the former pond system. Salinity remains more elevated and spatially variable in the shallow zone than the deep zone with the exception of the two deep zone wells WH P1D and WH P4D on opposing west and east sides of the brine pond respectively, where salinity, even though highly variable, has in the past inexplicably exceeded that of any other well. Both of these wells have shown marked improvement since recovery cessation and WH P1D has approached 10 ppt cut-off.

An essentially stable brine plume exists in an east-northeastward shaped ellipse beneath the brine pond in the shallow zone from the southwest corner over to well WH P3-S. The saline ground water is defined primarily by five wells now. Recovery wells WH P1S and WH P5S formerly tugging on the plume from the west side of the pond show notable freshening once the pumping ceased with both having all their values in the five-year trending below 10 ppt. Salinity in well WH RW2S on the south side of the former pond system now trends downward. And wells WH P3S, in the center of the historic plume and WH P4S, along the eastside now trace an apparent trend of increasing salinity over

this year's five-year window presumably due to the rather large fluctuations in their historic datasets. Wide salinity fluctuations seen on the data traces of these affected wells are attributed to salinity/density stratification occurring within each well and to the former oscillating cones of depression affecting both zones over time since recovery shut-in especially for those wells where fresher water mixes occurred when pumping was in effect. Wide salinity swings were also noted historically with both of the wells WH P2S and WH P3S as these were the only two where the high volume submersible pumps were used near the end of the recovery program.

Until sporadic spikes of elevated salinity were experienced with pond closure construction early in 1999, a slight decreasing salinity trend had been observed at wells WH P1S, WH P5S, and WH RW1S along the west side of the former brine pond. Each of the wells exhibited a response to closure construction that eventually began to subside sometime in 2000 and even more so since recovery cessation. In fact, wells WH P1S and WH P5S both began exhibiting salinity below the 10 ppt cut-off within 2002 with nearby well WH RW1S joining them in that range for 2004 and remaining so through 2005 until it was plugged and abandoned in November 2006.

Many shallow wells exhibited an obvious salinity drop upon cessation of active recovery, this would be indicative of fresher recharge and to wells no longer pulling salty water through the formation to their screens. Relatively few (most notably hard pumped well WH P3S) responded with an abrupt salinity spike at shut-in. These wells were formerly pulling a fresher water mix across their screened length when actively pumping. With the pre-recovery ground water movement to the east now returning, it is expected that wells on the west side of the pond will eventually capture fresher, uncontaminated ground water from the western recharge area as the source of brine contamination was removed with pond closure in late 1999. The two shallow pumping wells WH P1S and WH P5S have already responded this way. This improving salinity response will undoubtedly be delayed to the wells on the east and situated directly in the core of the plume as the overlying salt impregnated soils slowly respond to the now diminished available percolation and to the slow post-closure recharge.

Ground water salinity conditions over most of the site have improved and have also settled into a gradual freshening trend. As the five-year window for each well progresses beyond the former recovery operations, the graphs should reveal a very "quiet" shallow ground water monitoring regime similar to the response which began to occur shortly after the pond system was closed in early 1999 and also when the recovery pumping was

ceased in the spring of 2001. Shallow monitoring wells WH P8, WH P9, and WH P11 at caverns 8, 9, and 11, respectively, are located away from the brine pond and intercept unaffected waters that are near ambient levels, compared to up-gradient well WH P6S. Two of these wells (WH P8 and WH P11) have detected minor localized but historic impacts from former firewater line leakage and have since returned to ambient unaffected levels over the present five-year history. These two wells are tested annually now for salt content per the approved monitoring plan.

Shallow zone monitoring wells WH P6S, WH P12S, and WH P13S, and deep zone monitoring wells WH P2D, WH P6D, WH P12D, WH P13D, and WH MW1D are nearer the brine pond than wells at the caverns and along the site's perimeter and with the exception of well WH P12S, also intercept ambient ground water. Well WH P12S is the only down gradient monitoring well that is affected by the shallow zone brine plume, extending eastward from the former brine pond. Its salinity remains elevated (31 ppt average based on 3 measurements in 2006) which has been generally consistent since sampling began in 1992 (range 13 to 39 ppt, Std. D = 6 ppt, avg. = 28 ppt, n = 57); however, the well has shown a reversal of an historic freshening trend that commenced the last half of 1998. An overall gradual rise in salinity commencing in 2000 and continuing into 2006 may have been a delayed (travel time) response to the closure construction spikes seen nearer the former pond early in 1999 and perhaps the gradual down gradient plume movement towards this well. The overall trend since 1992 to present is slightly downward; however, the annual data for 2005 which revealed a "down tick" at the close of the year was reversed in 2006, and the general trace of the five-year window (2002 to 2006), although quite variable, indicates a gradual rise in salinity for the period. This monitoring position is about 300 feet east and down gradient of the closed brine pond system. As defined in the final approved closure plan, the liner beneath the pond's weight was required to be pierced to preclude any future concerns with long-term hydraulics. As a result, the soils beneath this liner, presumably, continue to respond to rainfall conditions and events.

Three wells were plugged and abandoned (P&A) during 2006, these wells were not part of any named or authorized monitoring regime and were P&A'd as a result of routine maintenance construction completed for the cap of closed in-place above grade south anhydrite pond. The wells successfully P&A'd are: WH RW1S, WH RW1D, and WH RW2D. The shallow well WH RW2S, named in the approved closure plan for the south anhydrite pond remained active and was re-configured from a well with aboveground "stick-up" to one completed at grade for the purpose of mowing on the newly extended

slope for the cap renovations. All affected wells were properly identified to the LDOTD registration database. The P&A'd wells closed their historic traces well below the 10 ppt cut-off when last sampled in 2005 and their graphs have been removed from this reporting.

End of Section

7. QUALITY ASSURANCE

The SPR sites undergo periodic evaluation throughout the year in the form of annual internal audits as well as inspections by outside federal and state agencies. The structured laboratory quality assurance program has continued through the systematic application of acceptable accuracy and precision criteria at SPR laboratories. Compliance with this and other environmental program requirements was reviewed and evaluated at each site by means of DM's Organizational Assessments and program inspections at selected sites by state and federal environmental agencies. Results from the environmental program assessments are addressed in Section 2 of this report.

7.1 FIELD QUALITY CONTROL

All field environmental monitoring and surveillance activities are performed in accordance with standard procedures, which are maintained in DM's Laboratory Programs and Procedures Manual, the Environmental Monitoring Plan and in individual sampling and analytical work instructions. These procedures include maintenance of chain-of-custody, collection of quality control (QC) samples, and field documentation.

7.2 DATA MANAGEMENT

SPR and contractor laboratories generate SPR data. All data generated by SPR laboratories are recorded and maintained in bound, numbered, and signed laboratory notebooks. Contractor laboratory data and accompanying QC data are received by the site laboratory or environmental department and retained on site as part of the original data file.

Water quality data are added to the SPR ES&H Data Management System for retention, manipulation, and interpretation. The data are compiled and appear in various reports such as this Site Environmental Report, in support of assessments of the SPR, evaluations of explained events, and development of appropriate responses.

7.3 LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY LABORATORY ACCREDITATION PROGRAM (LELAP)

The Louisiana Department of Environmental Quality (LDEQ) has mandated that any commercial laboratory submitting environmental results from samples to the state must be accredited by the state. DOE requested that all SPR laboratories, including those in Texas, participate in the accreditation program on a voluntary basis as the SPR laboratories are not by definition "commercial." As part of this program the laboratories are required to analyze Performance Evaluation samples twice per calendar year.

Through this program, LDEQ ensures verifiable and consistent data generation by requiring the environmental analytical laboratories of permitted dischargers to perform analysis on blind samples for each of the permit parameters. The Bayou Choctaw, Big Hill, Bryan Mound and West Hackberry laboratories have completed and renewed their accreditations annually since the inception of the program (2001). The Texas sites are accredited through this program because they may serve as a backup to the Louisiana site laboratories. The laboratories have successfully completed their 2006 round of blind samples. Resultant data was provided to LDEQ, via the Performance Evaluation (PE) sample contractor/provider, on a standard report form. The results of this study indicate that all SPR laboratories performed acceptably and are approved for continued DMR/LPDES analyses.

7.4 SPR LABORATORY ACCURACY AND PRECISION PROGRAM

The SPR laboratory quality assurance program is based on the U.S. EPA Handbook for Analytical Quality Control in Water and Wastewater Laboratories. This program focuses on the use of solvent or standard and method blanks, check standards, and for instrumental methods, final calibration blanks and final calibration verification standards with each analytical batch to verify quality control. Additionally, replicate and spiked samples are analyzed at a 10 percent frequency to determine precision and accuracy, respectively.

Analytical methodology is based on the procedures listed in Table 7-1. Over fifteen hundred of these quality assurance analyses were performed in 2006 to verify the continuing high quality of SPR laboratory data.

The EPA quality control document advocates use of quality control charts to maintain and evaluate accuracy and precision data. The SPR uses a computer program to allow rapid and exact determinations of accuracy and precision without the necessity of manual quality control chart preparation.

7.5 CONTROL OF SUBCONTRACTOR LABORATORY QUALITY ASSURANCE

The M&O Contractor subcontracts some of the required analytical work. The Laboratories Programs and Procedures Manual contains mandatory guidelines by which such contracts must be prepared. In addition, the respective laboratory staff and M&O

Contractor Quality Assurance, Operations and Maintenance, and Environmental staff review laboratory procurement documents.

Subcontractor laboratory service vendors are selected from an approved vendor's list maintained by the M&O Contractor Quality Assurance organization. The successful bidder must be on the approved vendor's list prior to the start of the laboratory contract. Vendors on the approved list are periodically reassessed by the M&O Contractor Quality Assurance and Operations and Maintenance organizations for adequacy of their analytical and quality assurance program.

Table 7-1. SPR Wastewater Analytical Methodology

Parameter	**Method**	**Source***	**Description**
Biochemical Oxygen Demand	5210(B) 405.1	APHA EPA-1	5 Day, 20 ^{o}C 5 Day, 20 ^{o}C
Chemical Oxygen Demand	D1252-88(B) 410.4 5220(D)	ASTM EPA-1 APHA	Micro Spectrophotometric Proc. Colorimetric, Manual Closed Reflux, Colorimetric
Fecal Coliform	Part III-C-2 9222(D)	EPA-2 APHA	Direct Membrane Filter Method Membrane Filter Procedure
Residual Chlorine	4500-C1(G) 330.5 8021	APHA EPA-1 Hach	DPD Colorimetric Spectrophotometric, DPD DPD Method
Oil & Grease (Total, Recoverable)	413.1	EPA-1	Gravimetric, Separatory Funnel Extraction
Oil & Grease (Partition, Gravimetric)	5520-(B)	APHA	Gravimetric, Separatory Funnel Extraction
Total Organic Carbon	415.1 D4839-88 5310(C) D2579(A) 5310(B)	EPA-1 ASTM APHA ASTM APHA	Combustion or Oxidation Persulfate – UV Oxidation, IR Persulfate – UV Oxidation, IR Combustion – IR Combustion - IR
Dissolved Oxygen	D888-87(D) 360.1 360.2 4500-O(C) 4500-O(G)	ASTM EPA-1 EPA-1 APHA APHA	Membrane Electrode Membrane Electrode Winkler Method with Azide Mod. Winkler Method with Azide Mod. Membrane Electrode
Hydrogen Ion conc. (pH)	D1293-84(A&B) 150.1 4500-H^{+}(B)	ASTM EPA-1 APHA	Electrometric Electrometric Electrometric
Total Dissolved Solids (Residual, Filterable)	160.1 2540(C)	EPA-1 APHA	Gravimetric, Dried at 180^{o}C Gravimetric, Dried at 180^{o}C
Total Suspended Solids (Residual, Non-Filterable)	160.2 2540(D)	EPA-1 APHA	Gravimetric, Dried at 103-105^{o}C Gravimetric, Dried at 103-105^{o}C
Salinity	D4542-85 (Sect. 7) 2520(B) & 2510 210B	ASTM APHA APHA (16th Ed.)	Refractometric Electrical Conductivity Hydrometric
Biomonitoring	1006.0 1007.0	EPA-3 EPA-3	*Menidia beryllina* 7 day survival *Mysidopsis bahia* 7 day survival
Copper	200.7	EPA-1	Inductively coupled plasma atomic emission spectrometric method for trace element analysis of water and waste.

EPA-1 = U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Wastes, Document No. EPA - 600/4-79-020, March 1983.

APHA = American Public Health Association, et al., Standard Methods for the Examination of Water and Wastewater, 17th Ed., 1989.

EPA-2 = U.S. EPA, Microbiological Methods for Monitoring the Environment: Water and Wastes, Document No. EPA-600/8-78-017, December 1978.

ASTM = American Society for Testing and Materials, Annual Book of Standards, Section 11 - Water, Volumes 11.01 and 11.02, 1990.

Hach = Hach Company, Hach Water Analysis Handbook, 2nd Ed., 1992

EPA-3 = U.S. EPA, Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Document No. EPA/600/4-87/028.

End of Section

APPENDIX A1

SPR – DM ES&H Standards

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STANDARD	AREA	DESCRIPTION
055-001-01049-4	CW	Quality Criteria for Water
10 CFR 1021	MR	Compliance with the National Environmental Policy Act
10 CFR 1022	MR	Compliance with Flood Plain/Wetlands Environmental Review
10 CFR 835	RP	Occupational Radiation Protection - Applicable and Enforceable Portions
10 USC 2692	HW	Storage, treatment, and disposal of nondefense toxic and hazardous materials
120 IAC	IS	Boiler And Pressure Vessels - Degas Project Only
14 CFR 121	IS	(Aviation) Operating Requirements: Domestic, Flag, and Supplemental Operations
14 CFR 125	IS	(Aviation) Certifications and Operations
14 CFR 127	IS	(Aviation) Certification and Operations of Scheduled Air Carriers with Helicopters
14 CFR 133	IS	(Aviation) Rotorcraft External Load Operations
14 CFR 135	IS	(Aviation) Operating Requirements: Commuter and On-Demand Operations
14 CFR 137	IS	(Aviation) Agricultural Aircraft Operations
14 CFR 139	IS	(Aviation) Certification and Operation: Land Airport Serving Certain Air Carriers
14 CFR 145	IS	(Aviation) Repair Stations
14 CFR 77	IS	(Aviation) Objects Affecting Navigable Airspace
14 CFR 830	IS	(Aviation) Notification And Reporting - Accidents and Incidents
14 CFR 91	IS	(Aviation) General Operating and Flight Rules
16 U.S.C. §§ 661-666c	USC	Fish and Wildlife Coordination Act
16 U.S.C. §§ 668-668d	USC	Bald and Golden Eagle Protection Acts
16 U.S.C. §§ 703-711	USC	Migratory Bird Treaty Act
16:TAC I.3	CW TS	Oil and Gas Division
16:TAC I.4	PP	Environmental Recycling
25:TAC I.289	IH IS RP	Radiation Control
27 CFR 55	IS, CS, FP	Commerce In Explosives (ATF)
29 CFR 1903.13	IS	Imminent Danger
29 CFR 1903.2	IS	Posting of Notice: Availability of the Act, Regulations, and Applicable Standards
29 CFR 1904	MO	Recordkeeping and Reporting Occupational Injuries and Illnesses
29 CFR 1910 SUBPART A	IS,FP	General (1 through 8)
29 CFR 1910 SUBPART B	IS	Adoption and Extension of Established Federal Standards (11 through 19)
29 CFR 1910 SUBPART D	IS	Walking-Working Surfaces (21 through 30)
29 CFR 1910 SUBPART E	IS	Means of Egress (35 through 38)
29 CFR 1910 SUBPART F	IS	Powered Platforms, Manlifts, and Vehicle Mounted Work Platforms (66 through 68)
29 CFR 1910 SUBPART G	IH	Occupational Health and Environmental Control (94 through 98)
29 CFR 1910 SUBPART H	IS,CS,FP	Hazardous Materials (101 through 126)

STANDARD	AREA	DESCRIPTION
29 CFR 1910 SUBPART I	IS	Personal Protective Equipment (132 through 139)
29 CFR 1910 SUBPART J	IS,FP	General Environmental Controls (141 through 147)
29 CFR 1910 SUBPART K	MS	Medical and First Aid (151)
29 CFR 1910 SUBPART L	IS,FP	Fire Protection (155 through 165)
29 CFR 1910 SUBPART M	IS	Compressed Gas and Compressed Air Equipment (169)
29 CFR 1910 SUBPART N	IS	Materials Handling and Storage (176-179, 181, 183-184)
29 CFR 1910 SUBPART O	IS	Machinery and Machine Guarding (211 through 213, 215, 219)
29 CFR 1910 SUBPART P	IS	Hand/Portable Powered Tools and Other Hand-Held Equipment (241 through 244)
29 CFR 1910 SUBPART Q	IS	Welding, Cutting, and Brazing (251 through 255)
29 CFR 1910 SUBPART R	IS	Special Industries (269) Power generation, Transmission
29 CFR 1910 SUBPART R	IS	Special Industries (268) Telecommunications
29 CFR 1910 SUBPART S	IS	Electrical (301 through 306, 331–335, 399)
29 CFR 1910 SUBPART T	IS	Commercial Diving Operations (401 through 402, 410, 420-427, 430, 440-441)
29 CFR 1910 SUBPART Z	IH	Toxic and Hazardous Substances (1000 through 1450 except 1029, 1043, 1045, 1047, 1050-1051)
29 CFR 1926 APPENDIX A	IS	Designations for General Industry Standards Incorporated Into Body of Construction Standards
29 CFR 1926 SUBPART A	MO	General (1 through 5)
29 CFR 1926 SUBPART B	IS	General Interpretations (10 through 16)
29 CFR 1926 SUBPART C	IS,FP	General Safety and Health Provisions (20 through 35)
29 CFR 1926 SUBPART D	IS	Occupational Health and Environmental Controls (50 through 66)
29 CFR 1926 SUBPART E	IS,FP	Personal Protection and Life Saving Equipment (95 through 107)
29 CFR 1926 SUBPART F	IS,FP	Fire Protection and Prevention (150 through 155)
29 CFR 1926 SUBPART G	IS	Signs, Signals, and Barricades (200 through 203)
29 CFR 1926 SUBPART H	IS	Materials Handling, Storage, Use, and Disposal (250 through 252)
29 CFR 1926 SUBPART I	IS	Tools - Hand and Power (300 through 307)
29 CFR 1926 SUBPART J	IS	Welding and Cutting (350 through 354)
29 CFR 1926 SUBPART K	IS	Electrical (400 through 408, 416-417, 431-432, 441, 449)
29 CFR 1926 SUBPART L	IS	Scaffolds (450 through 454)
29 CFR 1926 SUBPART M	IS	Fall Protection (500 through 503)
29 CFR 1926 SUBPART N	IS	Cranes, Derricks, Hoists, Elevators, and Conveyors (550 through 555)
29 CFR 1926 SUBPART O	IS	Motor Vehicles, Mechanized Equipment, and Marine Operations (600 through 606)
29 CFR 1926 SUBPART P	IS	Excavations (650 through 652)
29 CFR 1926 SUBPART Q	IS	Concrete and Masonry Construction (700 through 706)
29 CFR 1926 SUBPART R	IS	Steel Erection (750 through 752)
29 CFR 1926 SUBPART S	IS	Underground Construction, Caissons, Cofferdams, and Compressed Air (800 through 804)

STANDARD	AREA	DESCRIPTION
29 CFR 1926 SUBPART T	IS	Demolition (850 through 860)
29 CFR 1926 SUBPART U	IS	Blasting and the Use of Explosives (900 through 914)
29 CFR 1926 SUBPART V	IS	Power Transmission and Distribution (950 through 960)
29 CFR 1926 SUBPART W	IS	Rollover Protective Structures; Overhead Protection (1000 through 1003)
29 CFR 1926 SUBPART X	IS	Stairways and Ladders (1050 through 1060)
29 CFR 1926 SUBPART Y	IS	Diving (1071 through 1092)
29 CFR 1926 SUBPART Z	IH	Toxic and Hazardous Substances (1100 through 1152 except 1129, 1145, 1147)
30:TAC 1.30	CW	Occupational Licenses and Registrations
30:TAC 1.339	CW	Groundwater Protection Recommendation Letters and Fees
30:TAC I.101	CA	General Air Quality Rules
30:TAC I.106	CA	Exemption from Permitting
30:TAC I.111	CA	Control of Air Pollution from Visible Emissions and Particulate Matter
30:TAC I.112	CA	Control of Air Pollution from Sulfur Compounds
30:TAC I.113	CA	Control of Air Pollution from Toxic Materials
30:TAC I.114	CA	Control of Air Pollution from Motor Vehicles
30:TAC I.115	CA	Control of Air Pollution from Volatile Organic Compounds
30:TAC I.116	CA	Control of Air Pollution by Permits for New Construction or Modification
30:TAC I.117	CA	Control of Air Pollution from Nitrogen Compounds
30:TAC I.118	CA	Control of Air Pollution by Episode
30:TAC I.119	CA	Control of Air Pollution from Carbon Monoxide
30:TAC I.122	CA	Federal Operating Permits
30:TAC I.25	CW MR	Environmental Testing Laboratory Accreditation and Certification
30:TAC I.279	CW	Water Quality Certification
30:TAC I.281	CW	Applications Processing
30:TAC I.285	CW	On-site Sewage Facilities
30:TAC I.290	CW	Public Drinking Water
30:TAC I.294	CW	Underground Water Management Areas
30:TAC I.295	CW	Water Rights, Procedural
30:TAC I.297	CW	Water Rights, Substantive
30:TAC I.307	CW	Surface Water Quality Standards
30:TAC I.312	HW	Sludge Use, Disposal, and Transportation
30:TAC I.324	CW	Used Oil
30:TAC I.327	CW	Spill Prevention and Control
30:TAC I.328	PP	Waste Minimization and Recycle

STANDARD	AREA	DESCRIPTION
30:TAC I.330	PP	Municipal Solid Waste
30:TAC I.334	HW	Underground and Aboveground Storage Tanks
30:TAC I.335	HW	Industrial Solid Waste and Municipal Hazardous Waste
30:TAC I.336	RP	Radioactive Substance Rules
30:TAC I.90	MR	Regulatory Flexibility
31:TAC I.15	CW	Planning Division
31:TAC I.19	CW	Oil Spill Prevention and Response
31:TAC I.20	CW	Natural Resource Damage Assessment
31:TAC I.21	CW	Oil Spill Prevention and Response Hearings Procedures
31:TAC II.57	MR	Fisheries
31:TAC II.65	MR	Wildlife
31:TAC II.69	MR	Resource Protection
31:TAC XVI.501	CW	Coastal Management Program
31:TAC XVI.503	CW	Coastal Management Program Boundary
31:TAC XVI.504	CW	Coastal Management Program
31:TAC XVI.505	CW	Council Procedures for State Consistency With Coastal Management Program Goals and Policies
31:TAC XVI.506	CW	Council Procedures for Federal Consistency With Coastal Management Program Goals and Priorities
33 CFR 126	CW	Handling Class I (Explosive) Materials or Other Dangerous Cargo
33 CFR 153	CW	Control of Pollution by Oil and Hazardous Substances, Discharged Removed
33 CFR 154	CW	Facilities Transferring Oil or Hazardous Material in Bulk
33 CFR 156	CW	Oil and Hazardous Material Transfer Operations
33 CFR 158	HW	Reception Facilities for Oil, Noxious Liquid Substances, and Garbage (MARPOL)
33 CFR 322	CW	Permits for Structures or Work in or Affecting Navigable Waters of the U.S.
33 CFR 323	CW	Permits for Discharges of Dredged or Fill Material into Waters of the U.S.
33 CFR 325	CW	Process of Department of Army Permits
33 CFR 326	CW	Enforcement
33 CFR 328	CW	Definition of Waters of the United States
33 CFR 329	CW	Definition of Navigable Waters of the United States
33 CFR 330	CW	Nationwide Permits
33 CFR 64	CW	Markings of Structures, Sunken Vessels and Other Obstructions
33 CFR 67	CW	Aids to Navigation on Artificial Islands and Fixed Structures
33 CFR 68	CW	Private Aid to Navigation
33:LAC I.13	MR	Risk Evaluation/Corrective Action Program
33:LAC I.14	MR	Groundwater Fees

STANDARD	AREA	DESCRIPTION
33:LAC I.15	MR	Permit Review
33:LAC I.3	MR	Departmental Administrative Procedures
33:LAC I.39	MR	Notification Regulations and Procedures for Unauthorized Discharges
33:LAC I.45	MR	Policy and Intent
33:LAC I.47	MR	Program Requirements
33:LAC I.49	MR	Organization and Personnel Requirements
33:LAC I.51	MR	On-site Inspection/Evaluation
33:LAC I.53	MR	Quality System Requirements
33:LAC I.55	MR	Sample Protocol/Sample Integrity
33:LAC I.57	MR	Maintenance of Accreditation
33:LAC I.69	MR	Emergency Response Regulations
33:LAC III.1	CA	General Provisions
33:LAC III.11	CA	Control of Emissions of Smoke
33:LAC III.13	CA	Emission Standards for Particulate Matter (including standards for some specific facilities)
33:LAC III.14	CA	Conformity
33:LAC III.15	CA	Emission Standards for Sulphur Dioxide
33:LAC III.17	CA	Control of Emission of Carbon Monoxide (new sources)
33:LAC III.2	CA	Rules and Regulations for the Fee System of the Air Quality Control Programs
33:LAC III.21	CA	Control of Emission of Organic Compounds
33:LAC III.25	CA	Miscellaneous Incineration Rules
33:LAC III.29	CA	Odor Regulations
33:LAC III.30	CA	Standards of Performance for New Stationary Sources
33:LAC III.5	CA	Permit Procedures
33:LAC III.51	CA	Comprehensive Toxic Air Pollutant Emission Control Program
33:LAC III.53	CA	Minor Sources of Toxic Air Pollutants
33:LAC III.56	CA	Prevention of Air Pollution Emergency Episodes
33:LAC III.59	CA	Chemical Accident Prevention and Minimization of Consequences
33:LAC III.7	CA	Ambient Air Quality
33:LAC III.9	CA	General Regulations on Control of Emissions and Emission Standards
33:LAC IX.1	CW	General Provisions
33:LAC IX.11	CW	Surface Water Quality Standards
33:LAC IX.13	CW	Louisiana Water Pollution Control Fee System Regulation
33:LAC IX.15	CW	Water Quality Certification Procedures

STANDARD	AREA	DESCRIPTION
33:LAC IX.17	CW	Rules Governing Disposal of Waste Oil, Oil Field Brine, and All Other Materials Resulting From the Drilling for, Production of, or Transportation of Oil, Gas or Sulphur (as amended January 27, 1953)
33:LAC IX.19	CW	State of Louisiana Control Commission
33:LAC IX.23	CW	The LPDES Program Definitions and General Program Requirements
33:LAC IX.25	CW	Permit Application and Special LPDES Program Requirements
33:LAC IX.27	CW	LPDES Permit Conditions
33:LAC IX.29	CW	Transfer, Modification, Revocation and Reissuance, and Termination of LPDES Permits
33:LAC IX.3	CW	Permits
33:LAC IX.31	CW	General LPDES Program Requirements
33:LAC IX.33	CW	Specific Decisionmaking Procedures Applicable to LPDES Permits
33:LAC IX.5	CW	Enforcement
33:LAC IX.7	CW	Effluent Standards
33:LAC IX.9	CW	Spill Prevention and Control
33:LAC V.1	HW	General Provisions and Definitions
33:LAC V.109	HW	Definitions
33:LAC V.11	HW	Generators
33:LAC V.13	HW	Transporters
33:LAC V.15	HW	Treatment, Storage and Disposal Facilities
33:LAC V.18	HW	Containment Buildings
33:LAC V.19	HW	Tanks
33:LAC V.21	HW	Containers
33:LAC V.22	HW	Prohibitions on Land Disposal
33:LAC V.26	HW	Corrective Action Management Units and Temporary Units
33:LAC V.30	TS	Transportation of Hazardous Liquids by Pipeline
33:LAC V.37	HW	Financial Requirements
33:LAC V.38	HW	Universal Wastes
33:LAC V.39	HW	Small Quantity Generators
33:LAC V.40	PP	Used Oil
33:LAC V.41	PP	Recyclable Materials
33:LAC V.49	HW	Lists of Hazardous Wastes
33:LAC V.51	HW	Fee Schedules
33:LAC V.9	HW	Manifest System for TSD Facilities
33:LAC VII.1	HW	General Provisions and Definitions (solid waste regulations)
33:LAC VII.103	PP	Recycling and Waste Reduction Rules

STANDARD	AREA	DESCRIPTION
33:LAC VII.105	PP	Waste Tires
33:LAC VII.3	HW	Scope and Mandatory Provisions of the Program
33:LAC VII.5	HW	Solid Waste Management System
33:LAC VII.7	HW	Solid Waste Standards
33:LAC VII.9	HW	Enforcement
33:LAC XI.1	HW	Program Applicability and Definitions
33:LAC XI.15	HW	Enforcement
33:LAC XI.3	HW	Registration Requirements, Standards and Fee Schedule
33:LAC XI.5	HW	Spill and Overfill Control
33:LAC XI.7	HW	Methods Release Detection and Release Reporting, Investigation, Confirmation and Response
33:LAC XI.9	HW	Out of Service UST Systems and Closure
33:LAC XV.1	RP	General Provisions
33:LAC XV.10	RP	Notices, Instructions, and Reports to Workers; Inspections
33:LAC XV.14	RP	Regulation and Licensing of Naturally Occurring Radioactive Material (NORM)
33:LAC XV.15	RP	Transportation of Radioactive Material
33:LAC XV.17	RP	Licensing and Radiation Safety Requirements for Irradiators
33:LAC XV.2	RP	Registration of Radiation Machines and Facilities
33:LAC XV.20	RP	Radiation Safety Requirements for Wireline Service Operations and Subsurface Tracer Studies
33:LAC XV.25	RP	Fee Schedule
33:LAC XV.3	RP	Licensing of Radioactive Material
33:LAC XV.4	RP	Standards for Protection Against Radiation
33:LAC XV.5	RP	Radiation Safety Requirements for Industrial Radiographic Operations
33:LAC XV.8	RP	Radiation Safety Requirements for Analytical X-Ray Equipment
36 CFR 800	MR	Advisory Council on Historical Preservation
37:TAC XIII.501	FP	Texas Commission on Fire Protection, Flammable Liquids
4:TAC I.7	CS	Pesticides
40 CFR 763	IH,CS	Asbestos
40 CFR 109	CW	Criteria for State, Local, and Regional Oil Removal Contingency Plans
40 CFR 110	CW	Discharge of Oil
40 CFR 112	CW	Oil Pollution Prevention
40 CFR 116	CW	Designation of Hazardous Substances
40 CFR 117	CW	Determination of Reportable Quantities for Hazardous Substances
40 CFR 121	CW	State Certification of Activities Requiring a Federal License or Permit
40 CFR 122	CW	EPA Administrated Permit Programs: The National Pollutant Discharge Elimination System

STANDARD	AREA	DESCRIPTION
40 CFR 124	CW	Procedures for Decision Making
40 CFR 125	CW	Criteria and Standards for NPDES
40 CFR 129	CW	Toxic Pollutant Effluent Standards
40 CFR 131	CW	Water Quality Planning and Management, Water Quality Standards
40 CFR 133	CW	Secondary Treatment Regulation
40 CFR 136	CW	Guidelines Establishing Test Procedures for the Analysis of Pollutants
40 CFR 141	CW	National Primary Drinking Water Regulations
40 CFR 142	CW	National Primary Drinking Water Regulations Implementation
40 CFR 143	CW	National Secondary Drinking Water Regulations
40 CFR 144	CW	Underground Injection Control Program
40 CFR 146	CW	Underground Injection Control Program: Criteria and Standards
40 CFR 147	CW	State Underground Injection Control Programs
40 CFR 149	CW	Sole Source Aquifers
40 CFR 1500	MR	NEPA Purpose, Policy and Mandate
40 CFR 1501	MR	NEPA and Agency Planning
40 CFR 1502	MR	NEPA Environmental Impact Statement
40 CFR 1503	MR	NEPA Commenting
40 CFR 1504	MR	NEPA Predecision Referrals to the Council of Proposed Federal Actions Determined to be Environmentally Unsatisfactory
40 CFR 1505	MR	NEPA and Agency Decision Making
40 CFR 1506	MR	Other Requirements of NEPA
40 CFR 1507	MR	NEPA Agency Compliance
40 CFR 1508	MR	NEPA Terminology and Index
40 CFR 1515	MR	Freedom of Information Act Procedures
40 CFR 1516	MR	Privacy Act Implementation
40 CFR 152	CS	Pesticide Registration and Classification Procedures
40 CFR 156	CS	Labeling Requirements for Pesticides and Devices
40 CFR 170	CS	Worker Protection Standards (Pesticides)
40 CFR 171	CS	Certification of Pesticide Applicators
40 CFR 220	CW	General
40 CFR 228	CW	Ocean Dumping
40 CFR 243	HW	Guidelines for Storage and Collection of Residential, Commercial, and Institutional Solid Wastes
40 CFR 247	HW	Comprehensive Procurement Guideline for Products Containing Recovered Materials
40 CFR 260	HW	Hazardous Waste Management System: General
40 CFR 261	HW	Identification and Listing of Hazardous Waste

STANDARD	AREA	DESCRIPTION
40 CFR 262	HW	Standards Applicable to Generators of Hazardous Wastes
40 CFR 263	HW	Standards applicable to transporters of hazardous wastes
40 CFR 264	HW	Standards for Owners and Operators of Hazardous Waste, Treatment, Storage, and Disposal Facilities
40 CFR 266	HW	Standards for Management of Specific Hazardous Wastes
40 CFR 268	HW	Land Disposal Restrictions
40 CFR 271	HW	Requirements for Authorization of State Hazardous Waste Programs
40 CFR 272	HW	Approved State Hazardous Waste Management Programs
40 CFR 273	HW	Standard for Universal Waste Management
40 CFR 279	HW	Standards for Management of Used Oil
40 CFR 280	HW	Technical Standards and Corrective Action Requirements for Owners and Operators of UST
40 CFR 282	HW	Approved Underground Storage Tank Programs
40 CFR 300	CS	National Oil and Hazardous Substances Pollution Contingency Plans
40 CFR 302	CS	Designation of Reportable Quantities and Notification
40 CFR 355	CS	Emergency Planning and Notification
40 CFR 370	CS	Hazardous Chemical Reporting: Community Right-to-Know
40 CFR 372	CS	Toxic Chemical Release Reporting: Community Right-to-Know
40 CFR 373	CS	Reporting Hazardous Substance Activity When Selling or Transferring Federal Real Property
40 CFR 401	CW	General Provisions
40 CFR 403	CW	General Pretreatment Regulations for Existing and New Sources of Pollution
40 CFR 52	CA	Approval & Promulgation of Implementation Plans
40 CFR 53	CA	Ambient Air Monitoring
40 CFR 60	CA	Standards of Performance for New Stationary Sources
40 CFR 60, Appendix A	CA	Determination of Emissions from Volatile Compounds Leaks
40 CFR 61	CA	National Emission Standards for Hazardous Air Pollutants
40 CFR 63	CA	National Emission Standards for Hazardous Air Pollutant for Source Categories
40 CFR 66	CA	Assessment and Collection of Noncompliance Penalties
40 CFR 70	CA	State Operating Permit Programs
40 CFR 700	CS	General
40 CFR 761	CS	PCB Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
40 CFR 80	CA	Regulations of Fuels and Fuel Additives
40 CFR 81	CA	EPA Regulations Designating Areas for Air Quality Planning
40 CFR 82	CA	Protection of Stratospheric Ozone
42 USC 6962	USC, CFR, ABP	RCRA and Affirmative Procurement
42 USC Chapter 55	MR	National Environmental Policy

STANDARD	AREA	DESCRIPTION
42 USC Chapter 85	CA	Air Pollution Prevention and Control
42 USC Chapter 91	USC, CFR, ABP	National Energy Policy Act of 1992
43:LAC I.7	CW	Coastal Management
43:LAC VI	CW	Water Resources Management
43:LAC XI.3	TS	Underwater Obstructions
43:LAC XI.5	TS	Pipeline Safety
43:LAC XIX.1	CW	General Provisions (Statewide Order 29-B)
43:LAC XIX.2	CW	Fees
43:LAC XVII.1	CW	Class I, III, IV, and V Injection Wells (Statewide Order 29-N-1)
43:LAC XVII.3	CW	Hydrocarbon Storage Wells in Salt Dome Cavities (Statewide Order 29-M)
48:LAC V.73	CW	Certification (Water and Wastewater Operator Certification)
48:LAC V.75	CW	Sewerage Program
48:LAC V.77	CW	Drinking Water Program
49 CFR 130	CS	Oil Spill Prevention and Response Plans
49 CFR 171	TS	General Information, Regulations, and Definitions
49 CFR 172	TS	Hazardous Material Tables, Hazardous Materials Communications Requirements and Emergency Response Information Requirements
49 CFR 173	TS	Shippers - General Requirements for Shipments and Packaging
49 CFR 177	TS	Carriage by Public Highway
49 CFR 194	TS	DOT Response Plans for Onshore Pipelines
49 CFR 195	TS	Transportation of Hazardous Liquids by Pipeline
49 CFR 199	TS	Drug and Alcohol Testing
49 CFR 383	TS	Commercial Driver's License Standards; Requirements and Penalties
50 CFR 17	MR	Endangered and Threatened Wildlife and Plants
50 CFR 450	MR	General Provisions
50 CFR Ch 1 Subch B	CFR	Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants
56 LA R.S. 112	LRS	Disposal of Birds or Quadrupeds Becoming a Nuisance
7 CFR Part 2902	CFR, PP, ABP	US Department of Agriculture Federal Biobased Products Preferred Procurement Program
7 USC 136	CS	Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
7 USC 8102	USC, CFR, ABP	Farm Security and Rural Investment Act (FSRIA) of 2002, Section 9002
7:LAC XXIII	CS	Pesticide
76 LAC V.125	LAC	Control of Nuisance Wild Quadrupeds
76 LAC V.127	LAC	Nuisance Wildlife Control Operator Program
AAA4010.10	CW	Stennis Warehouse Spill Prevention, Control, and Countermeasures Plan

STANDARD	AREA	DESCRIPTION
ACGIH TLV	IH	Threshold Limit Values For Chemical Substances - Current Year & Applicable Substances
ACP USCG	CW	Area Contingency Plan for Galveston
ACP USCG	CW	Area Contingency Plan for Lake Charles
ACP USCG	CW	Area Contingency Plan for New Orleans
ACP USCG	CW	Area Contingency Plan for Port Arthur
ACP-EPA	CW	Area Contingency Plan for EPA Region 6
AIHMM	PP	Hazardous Materials Management Education Program Observations and Recommendations: Environmental Mgmt, Hazardous Waste Minimization, and Pollution Prevention for the SPR Operations
AL 5500.11	MO,MR	Drill and Exercise Program Plan
American Public Health Assoc.	CW	Standard Methods for the Examination of Water and Wastewater
ANSI Standards	IS	OSHA Referenced Standards
ANSI/ISO 14001:2004	MR	Environmental Management Systems Specification With Guidance For Use
AP-42	CA	Compilation of Air Pollutant Emission Factors, Mobile Sources
APC-S-2	CA	Permit Regulations for the Construction and/or Operation of Air Emissions Equipment (Mississippi)
API	MR	Amer. Petroleum Institute - Recommended Practices and Guides
API - Standard	CA	API Standard 653 for Tank Inspection, Repair, Alteration, and Reconstruction
AR 200-2	MR	Environmental Effects of Army Actions
ASE 5400.48	MR	Annual Site Environmental Report
ASI 3400.1	MO, MR	Conduct of Training for the SPR M&O Contractor
ASI 4000.10	FP	Integrated Logistics Support Procedures
ASI 4330.16	FP,IS	Work Order System Procedures
ASI 4400.4	PP	Supply Services Manual
ASI 5400.15	MR	Environmental Instructions Manual
ASI 5480.19	MO,MR	Conduct of Operations at the SPR
ASI 5480.22	IS	Accident Prevention Manual
ASI 5600.1	FP	Security Operations Manual
ASI 5700.15	MR	Quality Assurance Instructions
ASI 6410.2	FP	Construction Management Procedures
ASI 6430.15	MO,MR	Design Review Procedure
ASL 4700.1	MO,MR	Configuration Management Plan and Procedures
ASL 5400.57	CW, CA	SPR Environmental Monitoring Plan
ASL 5480.18	FP	Fire Protection Manual
ASL 5500.10	MO,MR	Emergency Readiness Assurance Plan
ASL 5500.25	MO,MR	Emergency Response Team Organization and Training Plan

STANDARD	AREA	DESCRIPTION
ASL 5500.58	EM, FP	Emergency Management Plan and Implementing Procedures
ASL 6400.18	MO,MR	Drawdown Management Plan
ASL 6400.30	CW	Cavern Inventory & Integrity Control Plan
ASL 7000.397	MO,MR	Drawdown Readiness Program Plan
ASME Standards	IS	OSHA Referenced Standards
ASP 4000.11	FP	Integrated Logistics Support Master Plan
ASP 5400.2	MR	Environmental Policy
ASR 4330.5	FP	Interim Repair/Mitigation Authorization
ASR 5480.49	MO,MR	Environmental, Safety and Health (ES&H) Orientation Video Program
ASR 7000.2	MO,MR	SPR Crosstalk Information Exchange Program
ASR 7000.7	MO,MR	Readiness Review Board
BC BRAMA	EM	Membership in BRAMA
BC Greater BR Industry Allianc	EM	Membership in Greater Baton Rouge Industry Alliance
BC Iberville CAER	EM	Membership in Iberville CAER
BC Iberville LEPC	EM	Membership in the Iberville LEPC
BC West Baton Rouge LEPC	EM	Membership in West Baton Rouge LEPC
BCI 5500.3	EM, FP	Bayou Choctaw Emergency Response Procedures
BCL 5400.16	CW	Bayou Choctaw Spill Prevention, Control, and Countermeasures Plan
BH & NEWPARK	EM	Safety Agreement with NEWPARK
BH LEPC	EM	Membership in the LEPC
BH LLEA	EM	Membership in the Local Law Enforcement Agency for BH
BH Sabine-Neches Chiefs Mutu	EM	Membership in Sabine-Neches Chiefs Mutual Aid
BHI 5500.4	EM, FP	Big Hill Emergency Response Procedures
BHL 5400.21	CW	Big Hill Spill Prevention, Control, and Countermeasures Plan
BM BEPC	EM	Membership in the BEPC
BM BMAT	EM	Membership in the BMAT for BM
BM CAER	EM	Membership in the Brazosport CAER
BM LLEA	EM	Membership in the Local Law Enforcement Agency at BM
BM VDD	EM	Agreement between BM and VDD on restrictions to working on Hurricane Levees near BM
BMI 5500.5	EM, FP	Bryan Mound Emergency Response Procedures
BML 5400.17	CW	Bryan Mound Spill Prevention, Control, and Countermeasures Plan
CERI-89-224	CW	Seminar on Site Characterization for Subsurface Remediations
Chapter 13 Jefferson Parish C	FP	Fire Prevention and Protection; Emergency Services and Communication (Explosives)
Chapter 235 TX Statutes, Local	IS	County Regulation of Matters Relating to Explosives and Weapons Subchapter A. Explosives

STANDARD	AREA	DESCRIPTION
Chapter 417TX Statutes, Gover	FP	State Fire Marshall (Explosives)
Chapter 545 TX Statutes, Trans	TS	Operation and Movement of Vehicles (Explosives)
Chapter 547 TX Statutes, Trans	TS	Vehicle Equipment (Explosives)
DEAR 923.4 and 970.2304	O, ABP	DOE Procurement Clauses
DOE HDBK, 1090-9	IS	Hoisting And Rigging Handbook
DOE G 414.1-1A	MR	Management Assessment And Independent Assessment Guide, May 2001
DOE G 450.4-1B	MR	Integrated Safety Management System Guide, March 2001
DOE Guideline	PP	DOE Waste Minimization reporting Requirements, Nov. 1994
DOE Handbook	PP	Pollution Prevention Handbook
DOE Handbook	PP	Guidance for the Preparation of the Waste Minimization and Pollution Prevention Awareness Plan, Dec 1993
DOE Handbook	PP	Waste Minimization Reporting System (Wmin) User's Guide
DOE Memorandum	PP	EPA's Interim Final Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program
DOE Orders	MO,MR	For all applicable DOE Orders See Contract No. DE-AC96-03PO92207 Applicable Standards List
DOE S-0118	PP	Pollution Prevention Program Plan
DOE Standard Spec. 17900	PP	Paint Repair of Exterior Metal Surfaces
DOE/EH-0350	CA	Management of Polychlorinated Biphenyls (PCBs)
DOE/EH-0358	MR	Performance Objectives and Criteria for Conducting DOE Environmental Audits
DOE/EM-0276	PP	Annual report on Waste Generation and Waste Minimization Progress
DOE/EP-0108	FP	Standard for Fire Protection of DOE Electronic Computer/Data Processing Systems
DOE/FM-0145	PP	Waste Minimization/Pollution Prevention Crosscut Plan 1994
DOE-STD-1088-95	FP	Fire Protection for Relocatable Structures
Environmental Permits	CW, MR, AR	All SPR Environmental Permits as listed in the Annual Site Environmental Report (ASER)
EO 11514	MR	Protection and Enhancement of Environmental Quality
EO 11988	CW	Floodplain Management
EO 11990	CW	Protection of Wetlands
EO 12088	MR	Federal Compliance with Pollution Control Requirements
EO 12898	MR	Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations
EO 13158	CW	Marine Protected Area
EO 13186	MR	Responsibilities of Federal Agencies to Protect Migratory Birds
EO 13221	PP	Energy Efficient Standby Power Devices
EO 13423	EO, ABP, PP	Strengthening Federal Environmental, Energy, and Transportation Management
EPA 453/R-93-026	CA	Protocol for Equipment Leak Emission Estimates, Jun 1993
EPA 530/R-93-001	CW	RCRA Groundwater Monitoring; Draft Technical Guidance
EPA 600/2-85/105	CW	Practical Guide for Groundwater Sampling

STANDARD	AREA	DESCRIPTION
EPA 600/4-78-012	CW	Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms
EPA 600/4-79-019	CW	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	CW	Methods for Chemical Analysis of Water and Wastes
EPA 600/4-82-029	CW	Handbook for Sampling and Sample Preservation of Water and Wastewater
EPA 833-R-92-002	PP	Storm Water Management for Industrial Activities
EPA Region IV	MR	Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, 4/1/86
EPA, ISBN:0-86587-279-1	CW	EPA Groundwater Handbook
EPA, ISBN:0-86587-752-1	PP	EPA Waste Minimization Opportunity Assessment Manual
EPA/600/4-83-039	CW	Addendum to Handbook for Sampling and Sample Preservation, EPA 600/4-82-029
EPA/600/8-78-017	CW	Microbiological Methods for Monitoring the Environment, Water and Wastes
EPA/600/R-92/088	PP	Facility Pollution Prevention Guide
FAA AC 150/5345-27	IS	Specification for 8’ and 12’ Unlighted and Externally Lighted Wind Cone Assembly
FAA AC 150/5390-2	IS	Heliport Design, January 4, 1988
FAA AC 70/7460-1G	IS	Obstruction Marking and Lighting, October 1985
FAR 23.4	CFR, ABP	Federal Acquisition Regulations
FM	FP	Factory Mutual - Approval Guide and Loss Prevention Data Sheets
HW-1	HW	Hazardous Waste Management Regulations (Mississippi)
ICIMF	IS	Oil Cos. International. Marine Forum - International Oil Tanker and Terminal Safety Guide
IEEE Standards	IS	OSHA Referenced Standards
LP 92-03	PP	Pollution Prevention Assessment Manual for Texas Businesses
LW-2	CW	Surface Water and Ground Water Use and Protection (Mississippi)
MIL-HDBK-1008	FP	Fire Protection for Facilities - Engineering, Design and Construction
MOU- USFWS	MR	Regarding Implementation of the Executive Order 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds"
MOU with ATFE in LA	EM	MOU with ATFE for Louisiana Sites during Emergencies
MOU with ATFE TX	EM	MOU with ATFE for the Texas Sites during Emergencies
MOU with BCSO	EM	MOU with the BCSO for BM during Emergencies
MOU with CamPSO	EM	MOU with Cameron Parish Sheriff's Office for WH during Emergencies
MOU with CPSO	EM	MOU with Calcasieu Parish Sheriff's Office for WH during Emergencies
MOU with FBI in LA	EM	MOU with the FBI for Louisiana Sites during Emergencies
MOU with FBI TX	EM	MOU with the FBI for the Texas Sites during Emergencies
MOU with Ft. Polk	EM	MOU with Ft. Polk for Louisiana Sites during Emergencies
MOU with JCSO	EM	MOU with JCSO for BH during Emergencies
MOU with LA Homeland Securi	EM	MOU with LA Homeland Security for Louisiana Sites during Emergencies
MOU with LA State Police	EM	MOU with LA State Police for Louisiana Sites during Emergencies

STANDARD	AREA	DESCRIPTION
MOU with US Army 797 EOC	EM	MOU with US Army 797th Explosive Ordinance Co. for the Texas Sites during Emergencies
MP 94W0000131	CA	SPR Gas and Geothermal Heat Effects on Crude Oil Vapor Pressure, Dec. 1994
MSC Section 49-1-39	MDWFP	Power to capture or destroy animals injurious to property
MSC Section 49-7-1	MDWFP	Nuisance Wildlife
MSL 7000.133	CW, HW	Laboratory Programs & Procedures
NACE	FP, IS	National Association of Corrosion Engineers
NEC	FP, IS	National Electric Safety Code
NFPA	FP	Fire Protection Handbook
NFPA 1	FP	Uniform Fire Code
NFPA 10	FP	Standard for Portable Fire Extinguishers
NFPA 1000	FP	Standard for Fire Service Professional Qualifications Accreditation and Certification Systems
NFPA 101	FP, IS	Life Safety Code®
NFPA 101A	FP	Guide on Alternative Approaches to Life Safety
NFPA 101B	FP	Code for Means of Egress for Buildings and Structures
NFPA 1021	FP	Standard for Fire Officer Professional Qualifications
NFPA 1031	FP	Standard for Professional Qualifications for Fire Inspector and Plan Examiner
NFPA 1033	FP	Standard for Professional Qualifications for Fire Investigator
NFPA 1041	FP	Standard for Fire Service Instructor Professional Qualifications
NFPA 105	FP	Standard for the Installation of Smoke Door Assemblies
NFPA 1081	FP	Standard for Industrial Fire Brigade Member Professional Qualifications
NFPA 11	FP	Standard for Low-, Medium-, and High-Expansion Foam Systems
NFPA 110	FP	Standard for Emergency and Standby Power Systems
NFPA 111	FP	Standard on Stored Electrical Energy Emergency and Standby Power Systems
NFPA 13	FP	Standard for the Installation of Sprinkler Systems
NFPA 13E	FP	Recommended Practice for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems
NFPA 14	FP	Standard for the Installation of Standpipe and Hose Systems
NFPA 1401	FP	Recommended Practice for Fire Service Training Reports and Records
NFPA 1404	FP	Standard for Fire Service Respiratory Protection Training
NFPA 1410	FP	Standard on Training for Initial Emergency Scene Operations
NFPA 15	FP	Standard for Water Spray Fixed Systems for Fire Protection
NFPA 1500	FP	Standard on Fire Department Occupational Safety and Health Program
NFPA 1561	FP	Standard on Emergency Services Incident Management System
NFPA 1582	FP	Standard on Comprehensive Occupational Medical Program for Fire Departments
NFPA 16	FP	Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems

STANDARD	AREA	DESCRIPTION
NFPA 1600	FP	Standard on Disaster/Emergency Management and Business Continuity Programs 2007 Edition
NFPA 17	FP	Standard for Dry Chemical Extinguishing Systems
NFPA 170	FP	Standard for Fire Safety Symbols
NFPA 1901	FP	Standard for Automotive Fire Apparatus
NFPA 1911	FP	Standard for Service Tests of Fire Pump Systems on Fire Apparatus
NFPA 1961	FP	Standard on Fire Hose
NFPA 1962	FP	Standard for the Inspection, Care and Use of Fire Hose, Couplings and Nozzles; and the Service Testing of Fire Hose
NFPA 1963	FP	Standard for Fire Hose Connections
NFPA 1964	FP	Standard for Spray Nozzles
NFPA 1965	FP	Standard for Fire Hose Appliances
NFPA 1971	FP	Standard on Protective Ensemble For Structural Fire Fighting
NFPA 1976	FP	Standard on Protective Ensemble for Proximity Fire Fighting
NFPA 1981	FP	Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services
NFPA 1983	FP	Standard on Fire Service Life Safety Rope and System Components
NFPA 1991	FP	Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies
NFPA 1992	FP	Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies
NFPA 1999	FP	Standard on Protective Clothing for Emergency Medical Operations
NFPA 20	FP	Standard for the Installation of Stationary Pumps for Fire Protection
NFPA 20	FP	Standard for the Installation of Stationary Pumps for Fire Protection
NFPA 204	FP	Standard for Smoke and Heat Venting
NFPA 22	FP	Standard for Water Tanks for Private Fire Protection
NFPA 220	FP	Standard on Types of Building Construction
NFPA 221	FP	Standard for Fire Walls and Fire Barrier Walls
NFPA 232	FP	Standard for the Protection of Records
NFPA 24	FP	Standard for the Installation of Private Fire Service Mains and Their Appurtenances
NFPA 241	FP	Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 25	FP	Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
NFPA 251	FP	Standard Methods of Tests of Fire Resistance of Building Construction and Materials
NFPA 252	FP	Standard Methods of Fire Tests of Door Assemblies
NFPA 253	FP	Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
NFPA 255	FP	Standard Method of Test of Surface Burning Characteristics of Building Materials
NFPA 256	FP	Standard Methods of Fire Tests of Roof Coverings
NFPA 291	FP	Recommended Practice for Fire Flow Testing and Marking of Hydrants
NFPA 30	FP	Flammable and Combustible Liquids Code

STANDARD	AREA	DESCRIPTION
NFPA 302	FP	Fire Protection Standard for Pleasure and Commercial Motor Craft
NFPA 306	FP	Standard for the Control of Gas Hazards on Vessels
NFPA 307	FP	Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves
NFPA 326	FP	Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair
NFPA 329	FP	Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases
NFPA 37	FP	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
NFPA 385	FP	Standard for Tank Vehicles for Flammable and Combustible Liquids
NFPA 418	FP	Standard for Heliports
NFPA 430	FP	Code for the Storage of Liquid and Solid Oxidizers
NFPA 45	FP	Standard on Fire Protection for Laboratories Using Chemicals
NFPA 471	FP	Recommended Practice for Responding to Hazardous Materials Incidents
NFPA 472	FP	Standard for Professional Competence of Responders to Hazardous Materials Incidents
NFPA 495	FP	Explosive Materials Code
NFPA 497	FP	Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
NFPA 5000	FP	Building Construction and Safety Code
NFPA 505	FP	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operation
NFPA 51B	FP	Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 54	FP	National Fuel Gas Code
NFPA 55	FP	Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks
NFPA 550	FP	Guide to the Fire Safety Concepts Tree
NFPA 58	FP	Liquefied Petroleum Gas Code
NFPA 600	FP	Standard on Industrial Fire Brigades
NFPA 601	FP	Standard for Security Services in Fire Loss Prevention
NFPA 70	FP, IS	National Electrical Code
NFPA 703	FP	Standard for Fire Retardant Impregnated Wood and Fire Retardant Coatings and Building Materials
NFPA 704	FP	Standard System for the Identification of the Hazards of Materials for Emergency Response
NFPA 70B	FP	Recommended Practice for Electrical Equipment Maintenance
NFPA 70E	FP	Standard for Electrical Safety in the Workplace
NFPA 72	FP	National Fire Alarm Code
NFPA 75	FP	Standard for the Protection of Information Technology Equipment
NFPA 750	FP	Standard on Water Mist Fire Protection Systems
NFPA 77	FP	Recommended Practice on Static Electricity

STANDARD	AREA	DESCRIPTION
NFPA 780	FP	Standard for the Installation of Lightning Protection Systems
NFPA 79	FP	Electrical Standard for Industrial Machinery
NFPA 80	FP	Standard for Fire Doors and Fire Windows
NFPA 80A	FP	Recommended Practice for Protection of Buildings from Exterior Fire Exposures
NFPA 820	FP	Standard for Fire Protection in Wastewater Treatment and Collection Facilities
NFPA 901	FP	Standard Classifications for Incident Reporting and Fire Protection Data
NFPA 90A	FP	Standard for the Installation of Air-Conditioning and Ventilating Systems
NFPA 90B	FP	Standard for the Installation of Warm Air Heating and Air-Conditioning Systems
NFPA 921	FP	Guide for Fire and Explosion Investigations
NFPA 92A	FP	Recommended Practice for Smoke-Control Systems
NFPA-2001	FP	Standard on Clean Agent Fire Extinguishing Systems, 2004 Edition
NFPA-2012	FP	Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire 2001 Edition
NFPA-2113	FP	Standard on Selection, Care, Use, and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire 2001 Edition
No number	CW	Louisiana's Suggested Chemical Weed Control Guide for 1994 (LA Cooperative Extension Services)
No number	MO, MR	SPRPMO Level III Design Criteria
No number	CA	Technical Guidance Package for Chemical Sources, Storage Tanks, TCEQ, Feb 2001
No Number	USC, CFR, MR	Energy Conservation Reauthorization 1998
No number	MR	Membership in Clean Texas Program http://www.cleantexas.org/index.cfm
No number	MR	Membership in EPA National Environmental Performance Track Program http://www.epa.gov/performancetrack/program/index.htm
No number	MR	Membership in Louisiana Environmental Leadership Program (LaELP) http://www.deq.state.la.us/assistance/elp
No number	CA	Technical Guidance Package for Chemical Sources, Equipment Leak Fugitives, TCEQ, Oct 2001
No number	CW	Water Measurement Manual
No number	PP,HW	SPR Qualified Products List
No number	CW,PP,CA,HW,CS	Environmental Exhibit 6.6
No number	CW	Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook (LDOTD and LDEQ)
No Number	USC, CFR, MR	Energy Policy and Conservation Act 1975 and 1994
No number	CW	Earth Manual, 2nd Ed.
No number	CA	Nonattainment New Source Review Guidance Manual, Oct 1993
No number	CW	The Sterling Brine Handbook (Int'l Salt Co.)
No number	CW	Engineering Geology Field Manual
No number	MO,MR	Environmental, Safety, and Health Management Plan (FY 1998 - FY 2002)
No number	CA	Louisiana Air Permit Procedures Manual, Jun 1995
NOI 1000.72	MR	Organizational and Management Assessments

STANDARD	AREA	DESCRIPTION
OSWER-9950.1 (1986)	CW	RCRA Groundwater Technical Enforcement Guidance Document (TEGD)
Pipkin Ranch Road	EM	Pipkin Ranch Road use restrictions in emergencies
Public Law 109-58	USC, CFR, ABP	Energy Policy Act of 2005
Public Notice LE-3799 and LEI	MDWFP	Mississippi DWFP Nuisance Animals
RECAP (2003)	CW	Louisiana Department of Environmental Quality Risk Evaluation/Corrective Action Program
RG-133	PP	Pollution Prevention Assessment Manual
RS 30:2361-2379 SARA Title II	CS	Hazardous Materials Information Development, Preparedness and Response Act
RS 32:173	TS	Certain vehicles must stop at all railroad grade crossings (Explosives)
RS 32:251 Subpart J. Vehicles	TS	Permission for operation; crossing railroad grade crossings; markings
RS 32:252	TS	Equipment and inspection (Explosives)
RS 40:1472.11	IS	Confiscation and disposal of explosives
RS 40:1472.12	IS	Unlawful storage of explosives
RS 40:1472.13	IS	Abandonment of explosives
RS 40:1472.18	IS	Careless use of explosives
RS 40:1472.19	IS	Reckless use of explosives
RS 40:1472.3	IS	License; manufacturer-distributor, dealer, user, or blaster of explosives
RS 40:1472.4	IS	Possession without license prohibited; exceptions (Explosives)
RS 40:1472.7	IS	Reports of losses or thefts; illegal use or illegal possession (Explosives)
SEN-15-90	MR	National Environmental Policy Act
SEN-22-90	HW	DOE Policy on Signatures of RCRA Permit Applications
SEN-37-92	PP	Waste Minimization Crosscut Plan Implementation
SPRMO 220.2	MO	Observations report
SPRPMO M450.1-1	MO, MR	SPRPMO Environmental, Safety and Health Manual
SPRPMO O 3790.1	MR	Employee Occupational Medical and Counseling Programs
SW-2	HW	Nonhazardous Solid Waste Management Regulations and Criteria (Mississippi)
TCRA, 505-507 SARA Title III	CS	Texas Tier Two Reporting Forms and Instructions
TPWC Chapter 43	TPWD	Special Licenses and Permits
TPWC Chapter 64	TPWD	Birds; Protection of Nongame Birds; Destroying Nests or Eggs
TPWC Chapter 65	TPWD	Alligators
TPWC Section 43.024	TPWD	Disposition of Protected Wildlife
TPWD	TPWD	Alligators in Texas: Rules, regulations, and general information, 2006-2007
TRCR part 11	RP	Texas Regulations for Control of Radiation - General provisions
TRCR part 12	RP	Texas Regulations for Control of Radiation - Fees
TRCR part 13	RP	Texas Regulations for Control of Radiation - Hearing and Enforcement Procedures

STANDARD	AREA	DESCRIPTION
TRCR part 21	RP	Standards for Protection Against Radiation - Permissible Doses, Precautionary Procedures, Waste Disposal
TRCR part 22	RP	Notices, Instructions and Reports to Workers; Inspections
TRCR part 31	RP	Radiation Safety Requirements and Licensing and Registration Procedures for Industrial Radiography
TRCR part 41	RP	Licensing of Radioactive Material -Exemptions, Licenses, General Licenses, Specific Licenses, Reciprocity, Transport
UFC/UBC	FP	International Conference of Building Officials - Uniform Building Code and Uniform Fire Code
UL	FP	Underwriter's Laboratory - Building Materials, Fire Resistance, Fire Prot. Equip., & Haz. Location Equip. Directories
Water Supply Paper 1473	CW	Study and Interpretation of the Chemical Characteristics of Natural Water (HEM)
WHI 5500.9	EM,FP	West Hackberry Emergency Response Procedures
WHL 5400.20	CW	West Hackberry Spill Prevention, Control, and Countermeasures Plan
Y-87-1	CW	Corps. of Engineers Wetlands Delineation Manual

Appendix A2
SPRPMO ES&H Directives

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SPRPMO ES&H Directives

Directive	Description
DOE O 151.1C	Comprehensive Emergency Management System
DOE O 225.1A	Accident Investigations
DOE O 231.1A Change 1	Environment, Safety and Health Reporting
DOE O 420.1B	Facility Safety
DOE O 430.1B	Real Property Asset Management
DOE O 430.2A	Departmental Energy and Utilities Management
DOE O 440.1B	Worker Protection Management for DOE Federal and Contractor Employees
DOE O 440.2B Change 1A	Aviation Management Safety
DOE O 450.1 Change 1	General Environmental Program
DOE O 451.1B Change 1	National Environmental Policy Act Compliance Program
DOE O 460.1B	Packaging and Transportation Safety
DOE O 460.2A	Departmental Materials Transportation and Packaging Management
DOE P 443.1	Protection of Human Subjects
DOE O 5400.5 Change 2	Radiation Protection of the Public and the Environment
DOE O 5480.19 Change 2	Conduct of Operations Requirements for DOE Facilities
DOE M 231.1-1A Change 2	Environmental, Safety and Health Reporting Manual
DOE M 231.1-2A	Occurrence Reporting and Processing of Operations Information
DOE M 440.1-1A	DOE Explosives Safety Manual

SPRPMO ES&H Directives

Directive	Description
DOE P 411.1	Safety Management Functions, Responsibilities, and Authorities Policy
DOE P 441.1	DOE Radiological Health and Safety Policy
DOE P 450.2 A	Identifying, Implementing, and Complying with Environmental, Safety and Health Requirements
DOE P 450.3	Authorizing Use of the Necessary and Sufficient Process For Standards-Based Environmental, Safety and Health Management
DOE P 450.4	Safety Management System Policy
DOE P 450.7	Environmental, Safety and Health (ES&H) Goals
SPRPMO O 231.1A	Occurrence Reporting and Processing System
SPRPMO O 450.1	Environmental Management System
SPRPMO O 451.1C	National Environmental PolicyAct Implementation Plan
SPRPMO O 6430.1	Strategic Petroleum Reserve General Design Criteria
SPRPMO P 451.1A	Environmental Policy Statement

Appendix B

DOE Policy
SPRPMO Policy 451.1A, “Environmental Policy Statement”

DM Policy
ASP5400.2, “Environmental Policy”

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U. S. Department of Energy
STRATEGIC PETROLEUM RESERVE PROJECT MANAGEMENT OFFICE
New Orleans, La.

POLICY

SPRPMO P 451.1A

APPROVED: 07-15-05
REVIEW DATE: 07-15-06

SUBJECT: ENVIRONMENTAL POLICY STATEMENT

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1. **PURPOSE AND SCOPE.** The purpose of this Environmental Policy Statement is to confirm the commitment of the Department of Energy (DOE) Strategic Petroleum Reserve Project Management Office (SPRPMO) to the goal of environmental protection for all PMO activities, including management and oversight of contractors, and decision-making for concept, design, development, construction, operations, and decommissioning.

2. **POLICY.** It is the policy and practice of the SPRPMO, as an operating unit of DOE, to conduct its operations in an environmentally sound manner. Protection of the environment and protection of the public are responsibilities that are of paramount importance to our facilities and their environmental programs.

   The SPRPMO top management establishes the Environmental Management System (EMS) to implement this policy, including the following:

   a. **Regulatory Compliance** with applicable Federal, state, and local environmental legal, regulatory, and other requirements that relate to the environmental aspects of the SPRPMO.

   b. **Pollution Prevention** to undertake appropriate measures to prevent the generation of wastes, and other residual materials requiring disposal or release to the environment through recycling, reuse, and source reduction. Where the generation of such wastes cannot be avoided, the SPRPMO will take actions to reduce their volume and toxicity and ensure proper disposal.

   c. **Continual Improvement** of the EMS and environmental performance, as appropriate, by establishing and maintaining documented environmental objectives and targets.

   Our EMS strengthens environmental accountability in the decision-making process and is designed to comply with DOE Order 450.1, Environmental Protection Program; and the principles of the International Organization for Standardization, ISO 14001, *Environmental Management Systems – Specification with Guidance for Use* (2004). The SPRPMO's EMS provides a formal, organized process to plan, perform, assess, and improve environmental performance.

DISTRIBUTION: All SPRPMO Employees **INITIATED BY:** APM, Technical Assurance

We will communicate this policy to all DOE employees and all other persons working for or on behalf of the DOE at the SPR, make it available to the public, and maintain procedures to receive and respond to inquiries from external interested parties. This policy will be reviewed periodically and revised to reflect changing conditions and information. The policy provides the framework for setting and reviewing environmental objectives and targets.

We will also be an **environmentally responsible neighbor** in the communities where we operate and act quickly and responsibly to correct incidents or conditions that endanger health, safety, or the environment, report them to authorities promptly, and inform everyone who may be affected by them. We will minimize harm to endangered species and their habitats, ecologically sensitive areas, and cultural resources, and will strive to conserve energy and natural resources.

DOE Management and Operating, Construction Management, Architect-Engineering (A&E) and other contractors also share our responsibilities for good environmental management. We expect our contractors to conduct facility operations in an environmentally sound manner that limits the risk to the environment and protects the public health.

We will work cooperatively and openly with the appropriate Federal, state, and local agencies, public stakeholders, and site employees to prevent pollution, ensure environmental compliance, and enhance environmental quality.

It is our goal to design, develop, construct, operate, and maintain facilities and operations in a manner that shall be resource-efficient and will protect the quality of the environment consistent with our mission.

William C. Gibson, Jr.
Project Manager
Strategic Petroleum Reserve

1 Attachment:
Attachment 1, Contractor Requirements Document

SPRPMO P 451.1A
07-15-05

Attachment 1

CONTRACTOR REQUIREMENTS DOCUMENT

The Strategic Petroleum Reserve (SPR) contractors shall comply with the requirements of SPRPMO P 451.1A, including:

1. Conduct operations in an environmentally sound manner.

2. Implement the SPRPMO's environmental policy, including the following:

   a. **Regulatory Compliance** with applicable Federal, state, and local environmental legal, regulatory, and other requirements that relate to the environmental aspects of the SPRPMO.

   b. **Pollution Prevention** to undertake appropriate measures to prevent the generation of wastes, and other residual materials requiring disposal or release to the environment through recycling, reuse, and source reduction. Where the generation of such wastes cannot be avoided, take actions to reduce their volume and toxicity and ensure proper disposal.

   c. **Continual Improvement** of environmental performance, as appropriate, by establishing and maintaining documented environmental objectives and targets.

3. Communicate this policy to all contractor and sub-contractor employees.

4. Be an **environmentally responsible neighbor** in the communities where the SPR operates and act quickly and responsibly to correct incidents or conditions that endanger health, safety, or the environment, report them to authorities promptly, and inform everyone who may be affected by them.

5. Minimize harm to endangered species and their habitats, ecologically sensitive areas, and cultural resources, and strive to conserve energy and natural resources.

6. Work cooperatively and openly with the appropriate Federal, state, and local agencies, public stakeholders, and site employees to prevent pollution, ensure environmental compliance, and enhance environmental quality.

POLICY

DynMcDermott Petroleum Operations Company

RESPONSIBLE FUNCTION: ENVIRONMENTAL **AUTHOR:** MICHAEL HUFF EMS Specialist **OWNER:** KIRKLAND JONES ES&H Director	**SUPERSEDES:** ASP5400.2 K1, "ENVIRONMENTAL POLICY" **APPROVED BY:** See E-Mail Approval R. MCGOUGH, PROJECT MANAGER	**POLICY NO: ASP5400.2** **VERSION: 1.0** **PAGE 1**

TITLE: ENVIRONMENTAL POLICY

Effective Date: November 21, 2006

Policy Statement: **DynMcDermott operates only in an environmentally responsible manner.**

Functional Oversight: The Environmental Department is responsible for the annual review and update of this policy.

DynMcDermott Petroleum Operations Company (DM) is committed to continued excellence, leadership, and stewardship in protecting the environment through its environmental management system (EMS). DM will manage, operate, and maintain the Strategic Petroleum Reserve (SPR) sites with the highest regard for the protection of human health and the environment within the confines of the SPR sites and the community. Top management considers this commitment, as well as the commitment to compliance and continual improvement, essential to DM's operation of the SPR.

A. **Scope.** DM manages the transport and storage of crude oil in an environmentally safe and sound manner for the U.S. Department of Energy's Strategic Petroleum Reserve. This environmental policy and DM's environmental management system applies to four Gulf Coast underground salt dome oil storage facilities (two in Louisiana and two in Texas) that hold over 700 million barrels of crude oil, off-site crude oil, brine, and raw water pipelines, a leased warehouse that provides space for heavy equipment storage and as-needed office activities at the Stennis Space Center (near Picayune, Mississippi), and a project management facility, or headquarters (in New Orleans, Louisiana) with a nearby small warehouse. While DM does not own these capital assets, it is responsible for their management and operation under its contract with DOE. DM also oversees its subcontracted activities, maintains specified DOE facilities, and provides technical assistance to DOE in the oversight of their subcontracted construction activities.

Negative environmental impacts recognized with SPR activities include the potential for contamination of water (surface and groundwater), soil, and air; waste generation; misuse of resources, and damage to biota. Positive environmental impacts result from environmental awareness, environmental protection, environmental enhancement, and emergency response.

B. Line Responsibility. Environmental protection is a line responsibility and the responsibility of every DM employee and person who works on behalf of DM. This policy is communicated to all DM employees, and environmental protection is an important measure of employee performance. DM Subcontractors and others who work on behalf of DM are furnished pertinent policy information as it relates to specific activities, products, and services they provide.

C. Policy Commitments. In keeping with this policy and the nature and scale of SPR activities and their impact on the environment, DM pledges, through excellence in environmental management, to:

- comply with applicable legal and other requirements to which we subscribe which relate to our environmental aspects
- prevent pollution through processes, practices, techniques, materials, products and services so that detrimental environmental impact is reduced
- continually improve our overall environmental performance through enhancing our environmental management system.

DM incorporates these commitments, from top management down, in all phases of its activities, including concept, design, development, construction, operations, and decommissioning. DM fully complies with federal, state, and local environmental laws, regulations, statutes, and permits, and with other requirements including the Department of Energy (DOE), industry, and internal environmental standards, as applicable.

Prevention of pollution is a core consideration in process design and operations and is viewed by management as a fundamental activity, as are safety and loss prevention. It is accomplished as practicable through 1) source reduction or elimination, 2) changes in processes, products, and services, 3) efficient use of resources, 4) material and energy substitution, and 5) reuse, recovery, recycling, reclamation, or treatment. DM strives to continually improve processes and systems through decision-making, implementation, and training.

DM also commits to local community environmental outreach through establishing, supporting, or sponsoring local environmental partnerships, programs, or projects that meet local needs.

D. Environmental Impacts, Aspects, Objectives, and Targets. Significant environmental impacts of SPR activities are controlled through recognizing the environmental aspects related to these impacts and setting and achieving environmental objectives and targets to protect the environment. Objectives and targets are consistent with this policy. They are based on specific Work Authorization Directives (a part of the DOE/DM contract), legal and other environmental requirements that DM subscribes to, significant environmental aspects; technological options; financial, operational, and business considerations; and the views of interested parties. Objectives and targets are set annually and evaluated at least annually to measure environmental performance and facilitate continual improvement.

E. Policy and EMS Information Availability. This policy is available to the public on request, on the DM internet website (www.dynmcdermott.com), and from the SPR Site Environmental Report, which is published and distributed annually (see -

http://www.spr.doe.gov/esh/Default.htm). Information about DM's environmental performance and the operation of the EMS is shared with the community and other external interested parties on request and through local public meetings, site newsletters, the Site Environmental Report, the DM Environmental Advisory Committee, and pollution prevention advocacy groups in Louisiana and Texas.

F. Review and Approval. This policy is reviewed annually by the Management Review Team and approved by the project manager. It is revised, as necessary, in response to changing conditions, EMS audit results, and the commitment to continual improvement.

Version History – Significant Changes		
Version	Description	Effective Date
1.0	Versioning was changed to 1.0 in concert with requirements of the new Documentum document management system. In Section A., misuse of resources was added as a negative environmental impact, and environmental enhancement was added as a means of creating positive environmental impact.	11/21/06
K1	Minor revisions include deletion of "Draft" from header on pages 2 through 4 of the document and addition of effective date for K0 on this version history table. No significant content changes were made. Revision bars from the K0 version were left in this version.	12/20/05
K0	Policy was revised to support requirements of the ISO 14001:2004 Standard.	12/02/05
J0	Policy was re-formatted in accordance with the DM Document Control and Management Program. Functional oversight for the policy was added. The policy is now more accessible to the Public through the DM website (added web address in paragraph D).	12/15/04
I0	Added wording that more explicitly states that DM will be involved in community environmental outreach in section B. Revision bars in the right margin mark the changed paragraphs.	12/05/03
H0	Added wording that more clearly states: top management's commitment to compliance and continual improvement (see B below), the framework for establishing and reviewing objectives and targets (C), and requirements for revision of the policy (E). Revision bars in the right margin mark the changed paragraphs.	11/11/02
G0	Deleted specific responsibilities from this document and revised to contain only policy information. The deleted information is covered in other documents.	11/29/01

Version History – Significant Changes		
Version	Description	Effective Date
F0	Changed “ES&H’ to “ES&Q”. Deleted section 4.J, Quality Assurance, and moved 4.J.[1] under 4.B, ES&Q Director. Changed the term “independent assessment” under 4.J.[1] to “management appraisal”. Deleted section 4.M., Information Systems. Other minor changes were made to sentence structure. Changed paragraphs are marked with a revision bar in the right margin.	5/01/01
E0	Combined subsections 3.3.B and 3.3.C into a single paragraph entitled Prevention of Pollution and added the words “prevent pollution” to 3.2. Expanded wording in 3.3.D., Compliance, regarding other requirements. In section 4, responsibilities, added environmental management system representative and general responsibilities. Changed paragraphs are marked with a revision bar in the right margin.	4/28/00
D0	Added the following policy statement “DynMcDermott operates only in an environmentally responsible manner.” (3.1) Added 4.C.[1]h. which states that the environmental manager will “assign a person to fill the role of environmental management system coordinator.” Changed paragraphs are marked with a revision bar in the right margin.	2/10/00
C0	Completely revised in a new format. Revised the reference list. Incorporated material to conform to the ISO 14001 standard. Incorporated policy on waste management in section 3. Added project manager responsibilities. Added environmental manager responsibility. Added Human Resources and Development and Information Systems responsibilities. Added responsibilities of managers and employees. Changed paragraphs are marked with a revision bar in the right margin.	7/27/98
B0	Annual review with no changes. Version not documented.	1997 Date unknown.
A0	New document. Version not documented.	5/3/96

c

END OF DOCUMENT

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End of Site Environmental Report