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Energy and Water Development: FY2008 Appropriations

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Carl E. Behrens, Coordinator,
Anthony Andrews, David M. Bearden,
Nicole T. Carter, Mark Holt, Nic Lane,
Daniel Morgan, and Fred Sissine
Resources, Science, and Industry Division

Jonathan Medalia
Foreign Affairs, Defense, and Trade Division

Carol Glover
Knowledge Services Group

The annual consideration of appropriations bills (regular, continuing, and supplemental) by Congress is part of a complex set of budget processes that also encompasses the consideration of budget resolutions, revenue and debt-limit legislation, other spending measures, and reconciliation bills. In addition, the operation of programs and the spending of appropriated funds are subject to constraints established in authorizing statutes. Congressional action on the budget for a fiscal year usually begins following the submission of the President's budget at the beginning of the session. Congressional practices governing the consideration of appropriations and other budgetary measures are rooted in the Constitution, the standing rules of the House and Senate, and statutes, such as the Congressional Budget and Impoundment Control Act of 1974.

This report is a guide to the regular appropriations bills that Congress considers each year. It is designed to supplement the information provided by the House and Senate Appropriations Subcommittees on Energy and Water Development. It summarizes the status of the bill, its scope, major issues, funding levels, and related congressional activity, and is updated as events warrant. The report lists the key CRS staff relevant to the issues covered and related CRS products.

NOTE: A Web version of this document with active links is available to congressional staff at [http://beta.crs.gov/cli/level_2.aspx?PRDS_CLI_ITEM_ID=73].

Energy and Water Development: FY2008 Appropriations

Summary

The Energy and Water Development appropriations bill includes funding for civil works projects of the Army Corps of Engineers (Corps), the Department of the Interior's Bureau of Reclamation (BOR), the Department of Energy (DOE), and a number of independent agencies.

Key budgetary issues involving these programs include

- the distribution of Army Corps of Engineers appropriations across the agency's authorized construction and maintenance activities (Title I);
- support of major ecosystem restoration initiatives, such as Florida Everglades (Title I) and California "Bay-Delta" (CALFED) (Title II);
- funding for the proposed national nuclear waste repository at Yucca Mountain, Nevada, and proposals to store nuclear spent fuel temporarily (Title III: Nuclear Waste Disposal); and
- the Administration's proposed Global Nuclear Energy Partnership to supply plutonium-based fuel to other nations (Title III: Nuclear Energy).

The House Appropriations Committee reported out its FY2008 Energy and Water Development Appropriations bill, H.R. 2641, on June 6, 2007. The bill as reported did not contain indications of funding for specific projects. On June 14, by unanimous consent, the House gave permission to the Committee on Appropriations to file a supplemental report to H.R. 2641. Appropriations Chairman Obey said the bill would not be forwarded to the Senate until the House had considered and voted on the supplemental report.

Key Policy Staff

Area of Expertise	Name	CRS Division	Telephone
General	Carl Behrens Carol Glover	RSI KSG	7-8303 7-7353
Corps of Engineers	Nicole Carter Steve Hughes	RSI RSI	7-0854 7-7268
Bureau of Reclamation	Nic Lane Betsy Cody	RSI RSI	7-7905 7-7229
Solar and Renewable Energy	Fred Sissine	RSI	7-7039
Nuclear Energy	Mark Holt	RSI	7-1704
Science Programs	Daniel Morgan	RSI	7-5849
Nuclear Weapons Stewardship	Jonathan Medalia	FDT	7-7632
Nonproliferation and Terrorism	Carl Behrens	RSI	7-8303
DOE Environmental Management	David Bearden	RSI	7-2390
Power Marketing Administrations	Nic Lane	RSI	7-7905
Bonneville Power Administration	Nic Lane	RSI	7-7905
Fossil Energy Research	Anthony Andrews	RSI	7-6843
Strategic Petroleum Reserve	Robert Bamberger	RSI	7-7240
Energy Conservation	Fred Sissine	RSI	7-7039
Budget Data and Report Preparation	Carol Glover	KSG	7-7353

Division abbreviations: RSI = Resources, Science, and Industry; FDT = Foreign Affairs, Defense, and Trade; KSG = Knowledge Service Group.

Contents

Most Recent Developments 1

Status 1

Overview 1

Title I: Army Corps of Engineers 3
- Key Policy Issues — Corps of Engineers 4
  - Project Backlog and Agency Priorities 4
  - Everglades 6
  - Hurricane Katrina Repairs and Coastal Louisiana Restoration 6

Title II: Department of the Interior 7
- Central Utah Project and Bureau of Reclamation: Budget In Brief 8
- Key Policy Issues — Bureau of Reclamation 8
  - Background 8
  - CALFED 9
  - Loan Guarantee Program 9
  - Security 9
  - Water 2025 9

Title III: Department of Energy 10
- Key Policy Issues — Department of Energy 12
  - Energy Efficiency and Renewable Energy 12
  - Electricity Delivery and Energy Reliability 14
  - Nuclear Energy 15
  - Fossil Energy Research, Development, and Demonstration 20
  - Strategic Petroleum Reserve 23
  - Science 24
  - Nuclear Waste Disposal 26
  - Loan Guarantees 27
  - Nuclear Weapons Stockpile Stewardship 27
  - Nonproliferation and National Security Programs 37
  - Environmental Management 39
  - Power Marketing Administrations 46

Title IV: Independent Agencies 47
- Key Policy Issues — Independent Agencies 47
  - Nuclear Regulatory Commission 47

For Additional Reading 49
- CRS Products 49

List of Tables

Table 1. Status of Energy and Water Development Appropriations, FY2008 . . . 1
Table 2. Energy and Water Development Appropriations, FY2001 to FY2008 . . 2
Table 3. Energy and Water Development Appropriations Summary 2
Table 4. Energy and Water Development Appropriations Title I:
Army Corps of Engineers 3
Table 5. Energy and Water Development Appropriations Title II:
Central Utah Project Completion Account 7
Table 6. Energy and Water Development Appropriations Title II:
Bureau of Reclamation 7
Table 7. Energy and Water Development Appropriations Title III:
Department of Energy 10
Table 8. Energy Efficiency and Renewable Energy Programs 14
Table 9. Fossil Energy Research and Development Programs 21
Table 10. Energy Policy Act of 2005 Title IV Authorization 22
Table 11. Funding for Weapons Activities 28
Table 12. NNSA Future Years Nuclear Security Program 29
Table 13. DOE Defense Nuclear Nonproliferation Programs 37
Table 14. Environmental Management Program Appropriations 42
Table 15. Office of Legacy Management Appropriations 45
Table 16. Energy and Water Development Appropriations Title IV:
Independent Agencies 47

Energy and Water Development: FY2008 Appropriations

Most Recent Developments

The Bush Administration's FY2008 budget request was released in February 2007.

Energy and Water Development programs were funded for FY2007 in the Revised Continuing Appropriations Resolution, 2007 (H.J.Res. 20, P.L. 110-5). On March 16, 2007, the Department of Energy (DOE) submitted its "operating plan" to Congress, detailing funding for individual programs not specifically identified in P.L. 110-5.

The House Appropriations Committee reported out its FY2008 Energy and Water Development Appropriations bill, H.R. 2641, on June 6, 2007. The bill as reported did not contain indications of funding for specific projects. On June 14, by unanimous consent, the House gave permission to the Committee on Appropriations to file a supplemental report to H.R. 2641. Appropriations Chairman Obey said the bill would not be forwarded to the Senate until the House had considered and voted on the supplemental report.

Status

Table 1. Status of Energy and Water Development Appropriations, FY2008

Subcommittee Markup		House	House	Senate	Senate	Conf.	Conf. Report Approval		Public
House	Senate	Report	Passage	Report	Passage	Report	House	Senate	Law
5/30/07		H.Rept. 110-185							

Overview

The Energy and Water Development bill includes funding for civil works projects of the U.S. Army Corps of Engineers (Corps), the Department of the Interior's Central Utah Project (CUP) and Bureau of Reclamation (BOR), DOE, and a number of independent agencies, including the Nuclear Regulatory Commission (NRC) and the Appalachian Regional Commission (ARC).

Table 2 includes budget totals for energy and water development appropriations enacted for FY2001 to FY2007 and the requested amount for FY2008.

Table 2. Energy and Water Development Appropriations, FY2001 to FY2008

(budget authority in billions of current dollars)

FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08[a]
23.9	25.2	26.1	26.7	30.2[b]	36.7[c]	29.4	30.3

Note: Figures represent current dollars, exclude permanent budget authorities, and reflect rescissions.

a. Request.
b. For FY2005 and later, total includes DOE programs formerly funded in the Interior and Related Agencies appropriations bill and transferred to the Energy and Water Development appropriations bill.
c. Includes $6.6 billion in emergency funding for the Corps of Engineers.

Table 3 lists totals for each of the four titles. It also lists several "scorekeeping" adjustments of accounts within the four titles, reflecting various expenditures or sources of revenue besides appropriated funds. These adjustments affect the total amount appropriated in the bill but are not included in the totals of the individual titles. Amounts listed in this report are derived from the Administration's FY2008 Congressional Budget Requests, and from H.Rept. 110-185, to accompany H.R. 2641.

Table 3. Energy and Water Development Appropriations Summary

($ millions)

Title	FY2007	FY2008 Request	House	Senate	Conf.
Title I: Corps of Engineers	$5,340.2	$4,871.0	$5,584.4		
Title II: CUP & BOR	1,054.7	1,001.4	$1,065.4		
Title III: Department of Energy	24,228.2	24,762.7	25,243.1		
Title IV: Independent Agencies	306.0	251.5	237.8		
E&W Subtotal	**30,794.1**	**30,863.6**	**32,130.7**		
Scorekeeping Adjustments					
Undistributed Pay Raise	33.0				
Title II					
Central Valley	(44.0)	(51.3)	(51.3)		
Title III					
Colorado River Basins, WAPA	(23.0)	(23.0)	(23.0)		
Uranium Fund	(446.0)	(463.0)	(463.0)		
Excess Fees FERC	(19.2)	(17.5)	(17.5)		
E&W Total	**30,294.9**	**30,308.8**	**31,575.9**		

Source: Administration FY2008 budget request; H.Rept. 110-185.
Note: Details may not add to totals due to rounding.

Tables 4 through 16 provide budget details for Title I (Corps of Engineers), Title II (Department of the Interior), Title III (Department of Energy), and Title IV (independent agencies) for FY2005-FY2006.

Title I: Army Corps of Engineers

The Administration's Energy and Water Development FY2008 budget request provides for $4.871 billion for the U.S. Army Corps of Engineers, a decrease of $0.47 billion (9%) from the FY2007 enacted appropriations (not including supplemental funds). For FY2008, the House bill recommends $713 above FY2007 appropriations for a total of $5.584 billion for FY2008. Generally around 85% of the appropriations for the agency is directed to specific projects. The House Appropriations Committee FY2008 report, H.Rept. 110-185, breaks with reports for past bills; it includes no specific funding levels for individual Corps projects. Instead the direction by the Committee is limited to the overall funding levels for accounts (see **Table 4**) and programs (e.g., the continuing authorities programs in the Construction account), and operation and maintenance funding levels for 21 geographic regions across the country specified in bill language. According to the report:

> The Committee provide no recommendation at this time for specific projects contained in either the Administration's budget or proposed by Members of Congress. Individual project allocations will be considered comprehensively after the Committee has properly analyzed all relevant information.

On June 14, by unanimous consent, the House gave permission to the Committee on Appropriations to file a supplemental report to H.R. 2641. Appropriations Chairman Obey said the bill would not be forwarded to the Senate until the House had considered and voted on the supplemental report.

Funding for the Corps' civil works program is often a contentious issue between the Administration and Congress, with final appropriations typically providing more funding than requested, regardless of which political party controls the White House and Congress. Although the House bill increases the level of appropriations for the agency, the draft report expresses general support for the approach used by the Administration in developing its FY2008 budget request.

Table 4. Energy and Water Development Appropriations Title I: Army Corps of Engineers

($ millions)

Program	FY2007	FY2008 Request	House[a]	Senate	Conf.
Investigations and Planning	$162.9	$90.0	$120.0		
Construction	2,336.5	1,523.0	2,004.2		
Mississippi River & Tributaries	396.6	260.0	278.0		

Program	FY2007	FY2008 Request	House[a]	Senate	Conf.
Operation and Maintenance (O&M)	1,975.1	2,471.0	2,655.2		
Regulatory	159.3	180.0	180.0		
General Expenses	167.2	177.0	171.0		
FUSRAP[b]	138.7	130.0	130.0		
Flood Control and Coastal Emergencies	—	40.0	40.0		
Office of the Asst. Secretary of the Army	4.0	—	6.0		
Total Title I	**5,340.2**	**4,871.0**	**5,584.4**		

Sources: FY2008 Budget Request; Army Corps of Engineers Civil Works: FY2007 Work Plan (March 19, 2007); H.Rept. 110-185.

a. These figures account for recommendations for rescissions.
b. "Formerly Utilized Sites Remedial Action Program."

The FY2008 budget request proposed altering the account used to fund several activities. Rather than funding (1) Endangered Species Act compliance, (2) shoreline mitigation for federal navigation activities, (3) construction for and using dredged material, and (4) some rehabilitation of navigation and hydropower infrastructure from the Construction account, the budget proposes funding these activities using the O&M account. The House bill would shift the funding for the first three to the O&M account, but would continue to fund major rehabilitation activities from the Construction account.

Key Policy Issues — Corps of Engineers

Project Backlog and Agency Priorities. The policy debate on how to structure the Corps' budget and priorities is ongoing. The Corps civil works program has been criticized by some observers as an agglomeration of projects with no underlying design. These observers see the Corps' backlog of authorized activities as an example of this lack of focus. Estimates of the backlog's size vary from $11 billion to more than $60 billion, depending on which projects are included. Although some observers view the backlog as nothing more than a Corps "to do" list, others are concerned that projects in the backlog face construction delays and related cost overruns as available appropriations are spread across an increasing portfolio of projects.

The Corps' backlog of authorized projects and concerns about the fiscal planning and management of the agency's portfolio contribute to support for performance-based criteria for structuring the agency's budget and for concentrated appropriations on a small set of priority projects. Others also express concerns about the agency's fiscal planning and management, yet reject both the use of performance-based criteria that have been proposed and the focus on 6 to 10 priority projects. These critics argue that the criteria used are too simplistic and that basing the Corps' budget on performance criteria does not produce an integrated multiyear program for

the agency. They also argue that the focus on priority projects has resulted in a disproportionate amount of the agency's budget being concentrated on a few projects, resulting in less investment in other authorized, cost-beneficial projects and in those regions of the country that do not have priority projects.

Performance-Based Budgeting. One way recent Administration requests have tried to address the backlog of Corps projects has been the application of a performance-based budgeting approach for determining which projects to include in its requests for construction and maintenance funds; the performance measures were based on their economic and environmental returns and protection of human safety. The construction projects selected for funding were chosen largely on their having either a high ratio of benefits to costs, or, for environmental projects, a high cost-effectiveness. The FY2008 budget request continued the Administration's movement toward presenting the agency's budget according to "business lines" (e.g., navigation, flood control, recreation, hydropower). For example, of the $4.871 billion budget request, $2.009 billion (41% of the agency's budget) is for commercial navigation, $1.384 billion (28%) is for flood and coastal storm damage reduction, and $274 million (6%) and $110 million (2%) are for the agency's relatively new roles in aquatic ecosystem restoration and environmental stewardship, respectively. The agency's regulatory responsibilities represent $180 million, 4% of the agency's budget. The draft report generally supports the Administration performance-based budgeting approach; it states: "While the Committee agrees in large part with the prioritization of projects, it does not believe the level of funding provided by the Administration is sufficient to meet the needs of the Nation."

Priority Projects and New Starts. To address the backlog of authorized Corps activities, the Administration's request limited the number of new activities started to only two planning activities and one maintenance assessment. The President's request would fund construction projects that could be completed in FY2008 and six projects considered by the Administration to be priorities, similar to the President's FY2007, FY2006, and FY2005 requests. The draft report expresses general support for the Administration's no new start policy as applied to the FY2008 budget for the Corps. The exception noted by the Committee is that it "will consider funding for the major rehabilitation" at specific locks on the Ohio and Mississippi River systems because it "does not view the rehabilitation of existing infrastructure as a new construction start ... but rather a necessity."

Financial Management and O&M Budgeting. Unlike previous budget requests, the FY2007 and FY2008 requests did not specify the amount that individual Corps projects would receive for O&M. Instead, the Administration's recent requests divide the country into 21 regions and specify O&M funding for each region for six different categories of activities — commercial navigation, flood and coastal storm damage reduction, environment, hydropower, recreation, and water supply. The Corps has provided estimates of how much individual projects are expected to receive; however, these estimates are not part of the agency's formal budget request and budget justification package. This budgeting approach appears to allow the agency flexibility to move money across projects within the region as O&M needs arise, without being subject to many of the reprogramming restrictions put into place with the agency's FY2006 appropriations. Some project stakeholders are likely to be uncomfortable as a result of the decreased certainty in the O&M funding available

for particular projects under this regional O&M budgeting approach. Although the draft report is critical of how the Administration developed its request for each of the 21 regions, it adopts the regional approach to O&M funding by specifying an O&M funding level for each region.

Although the House report noted improvement in the Corps' financial management, the House Appropriations Committee continues to express concerns, particularly related to multi-year budgeting, reprogramming of funds, multi-year contracts, budget submission materials, and most recently the accuracy of the agency's cost estimates.

Everglades. The Corps plays a significant coordination role in the restoration of the Central and Southern Florida ecosystem. The agency's FY2008 budget request was for $162.4 million for Everglades restoration activities, down from the $164 million requested and provided for FY2007. The FY2008 request consists of Central and Southern Florida Project ($91 million), Kissimmee River Restoration Project ($33 million), Everglades and South Florida Restoration Projects ($4 million), and Modified Water Deliveries Project ($35 million).[1] FY2006 was the first year that funds for the Mod Waters project were included in the Corps budget request and enacted appropriations; previously, the project was funded solely through Department of the Interior appropriations. (For more information on the Modified Water Deliveries Project, see CRS Report RS21331, *Everglades Restoration: Modified Water Deliveries Project*, by Pervaze A. Sheikh.)

Of the $162.4 million request, $98 million would be for activities related to the Everglades but not part of the Comprehensive Everglades Restoration Plan (CERP), and $64 million would be used toward CERP activities. (For more information on CERP and Everglades funding, see CRS Report RS20702, *South Florida Ecosystem Restoration and the Comprehensive Everglades Restoration Plan*, by Pervaze A. Sheikh and Nicole T. Carter.) In addition to funding for Corps activities through Energy and Water Development appropriations, federal activities in the Everglades are funded through Department of the Interior appropriations bills.

As part of the general absence of project specific funding levels, the House bill and report do not specify funding levels for Everglades activities.

Hurricane Katrina Repairs and Coastal Louisiana Restoration. The Corps is responsible for much of the repair and fortification of the hurricane protection system of coastal Louisiana, particularly in the greater New Orleans area; to date, most of the Corps' work on the region's hurricane protection system has been funded through emergency supplemental appropriations, not through the annual appropriations process. The Corps has received $6,985.5 million in emergency supplemental funds for flood protection and water resources repair and recovery work. The vast majority of the enacted and requested supplemental appropriations for the region are for structural hurricane defenses; coastal wetlands restoration activities by the Corps have received less than $200 million of the enacted Katrina

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[1] For more information on the Modified Water Deliveries Project, see CRS Report RS21331, *Everglades Restoration: Modified Water Deliveries Project*, by Pervaze A. Sheikh.

appropriations. The 110th Congress enacted emergency supplemental legislation with an additional $1.64 billion for the Corps, largely to continue repairs and accelerate completion of flood and storm damage reduction projects in the New Orleans and south Louisiana area. Previously appropriated funds were insufficient to complete these activities because of increased costs, improved data on costs, and other factors.

Title II: Department of the Interior

The Department of the Interior requested that Congress provide an increase in funding for the Central Utah Project (CUP) Completion Account and a reduction for the Bureau of Reclamation (BOR) for FY2008.

Table 5. Energy and Water Development Appropriations Title II: Central Utah Project Completion Account

($ millions)

Program	FY2007	FY2008 Request	House	Senate	Conf.
Central Utah Project Construction	$31.4	$40.4	$40.4		
Mitigation and Conservation Activities	0.9	1.0	1.0		
Oversight & Administration	1.7	1.6	1.6		
Total, Central Utah Project	**34.0**	**43.0**	**43.0**		

Source: Central Utah Project Completion Act, FY2008 Budget Justification. H.Rept. 110-185.
Note: Details may not add to totals due to rounding.

Table 6. Energy and Water Development Appropriations Title II: Bureau of Reclamation

($ millions)

Program	FY2007	FY2008 Request	House	Senate	Conf.
Water and Related Resources	$874.7	$816.2	$871.2		
Policy & Administration	57.3	58.8	58.8		
CVP Restoration Fund (CVPRF)[a]	52.1	59.1	59.1		
Legislative Proposal — SJRRF[b]	—	(7.5)	(7.5)		
Calif. Bay-Delta (CALFED)	36.6	31.8	40.8		
Gross Current Authority	**1,020.7**	**958.4**	**1,022.4**		
CVP Collections[a]	(43.9)	(51.6)	(51.6)		
Net Current Authority	**976.8**	**906.8**	**978.3**		
Total, Title II	**1,054.7**	**1,001.4**	**1,065.4**		

Source: Bureau of Reclamation FY2008 Budget Justification. H.Rept. 110-185.

a. In its request, BOR lists CVP Collections as an "offset." Congress does not follow this procedure.
b. FY2008 reflects a legislative proposal to redirect $7.5 million collected from Friant Division water users to the new San Joaquin River Restoration Fund.

Central Utah Project and Bureau of Reclamation: Budget In Brief

The Administration requested $43.0 million for the CUP Completion Account for FY2008. The FY2007 request for BOR totaled $958.4 million in gross current budget authority. This amount is $62.3 million less than enacted for FY2007. The FY2008 request included "offsets" of $51.6 million for the Central Valley Project (CVP) Restoration Fund, yielding a "net" current authority of $906.8 million for BOR. The total for Title II funding is $1.0014 billion.

BOR's single largest account, Water and Related Resources, encompasses the agency's traditional programs and projects, including construction, operations and maintenance, the Dam Safety Program, Water and Energy Management Development, and Fish and Wildlife Management and Development, among others. The Administration requested $816.2 million for the Water and Related Resources Account for FY2008. This amount is $58.5 million (6.7%) less than enacted for FY2007.

The House Appropriations Committee recommended funding at the amount reflected in the President's Budget for all programs except Water and Related Resources and CALFED. The Committee recommends an increase in both programs, with increases of $55 million for Water and Related Resources and $9 million for CALFED. The Committee has made no recommendations for specific water projects within Water and Related Resources, and indicates that it will consider individual project allocations after further analysis.

Key Policy Issues — Bureau of Reclamation

Background. Most of the large dams and water diversion structures in the West were built by, or with the assistance of, the Bureau of Reclamation. Whereas the Army Corps of Engineers built hundreds of flood control and navigation projects, BOR's mission was to develop water supplies, primarily for irrigation to reclaim arid lands in the West. Today, BOR manages hundreds of dams and diversion projects, including more than 300 storage reservoirs in 17 western states. These projects provide water to approximately 10 million acres of farmland and 31 million people. BOR is the largest wholesale supplier of water in the 17 western states and the second-largest hydroelectric power producer in the nation. BOR facilities also provide substantial flood control, recreation, and fish and wildlife benefits. At the same time, operations of BOR facilities are often controversial, particularly for their effect on sensitive fish and wildlife species and conflicts among competing water users.

CALFED. The Administration requested $31.8 million for the California Bay-Delta Restoration Account (Bay-Delta, or CALFED) for FY2008. The bulk of the requested funds were targeted at three main program areas, including the environmental water account, the storage program, and conveyance. The remainder of the request was allocated for science, water quality, planning and management, and ecosystem restoration. The House Appropriations Committee recommends that all programs within CALFED be funded at the level in the FY2008 budget request, except for a $1 million dollar reduction in Planning and Management. The Committee also recommends $5 million each for Water Use Efficiency and Delta Levees which were not in the President's Budget. The Committee indicated that funding for Delta Levees is to be transferred to the Corps of Engineers. (For more information on CALFED, see CRS Report RL31975, *CALFED Bay-Delta Program: Overview of Institutional and Water Use Issues*, by Betsy A. Cody and Pervaze Sheikh.)

Loan Guarantee Program. BOR has requested $1 million in FY2008 to establish a loan guarantee program. Reclamation is establishing this program to guarantee private loans to water districts that have responsibility for funding operation and maintenance or rehabilitation costs on Reclamation facilities. Because the federal government retains title to these projects, it may be difficult for water users to secure loans from private lenders. The House Appropriations Committee recommended funding this program at the level requested.

Security. The Administration requested $35.5 million for site security for FY2008, a decrease of $4.1 million compared with that enacted for FY2007. The bulk of the request is for facility operations/security. Funding covers activities such as administration of the security program (e.g., surveillance and law enforcement), antiterrorism activities, and physical emergency security upgrades. (For more information, see CRS Report RL32189, *Terrorism and Security Issues Facing the Water Infrastructure Sector*, by Claudia Copeland and Betsy A. Cody.)

The FY2008 request assumes that annual costs for guard and patrol activities will be treated as project O&M costs, and hence will be reimbursable based on project cost allocations. These costs are estimated to be $18.9 million in FY2008, of which $11.6 million will be in up-front funding from power customers and $7.3 million will be appropriated funds which are reimbursed by irrigation, municipal, and industrial users and other customers. BOR will continue to treat facility fortification and antiterrorism management-related expenses as nonreimbursable.

Water 2025. This program is intended to reduce water use conflicts by increasing certainty, diversity, and flexibility of water supplies. In 2008, BOR plans to focus program resources on areas where water conflicts exist currently or are likely to develop in the future. The 2008 budget request for this program is $11.0 million, a decrease of $3.5 million from FY2007. The House Appropriations Committee did not include funding for Water 2025, citing a lack of authorization for the program.

Title III: Department of Energy

The Energy and Water Development bill since FY2005 has funded all DOE's programs. Major DOE activities historically funded by the Energy and Water bill include research and development on renewable energy and nuclear power, general science, environmental cleanup, and nuclear weapons programs, and now includes programs for fossil fuels, energy efficiency, the Strategic Petroleum Reserve, and energy statistics, which formerly had been included in the Interior and Related Agencies appropriations bill.

Table 7. Energy and Water Development Appropriations Title III: Department of Energy

($ millions)

Program	FY2007	FY2008 Request	House	Senate	Conf.
Energy Supply & Conservation					
Energy Efficiency & Renewables	$1,474.3	$1,236.2	$1,873.8		
Electricity Delivery & Energy Reliability	137.0	114.9	134.2		
Nuclear Energy	482.2	801.7	759.2		
Environment, Safety, Health [a]	27.8	—	—		
Legacy Management	33.2	35.1	—		
Total, Energy Supply & Conservation	2,154.5	2,187.9	2,767.2		
Fossil Energy R&D	592.6	566.8	708.8		
Clean Coal Technology (Deferral)	—	(58.0)	(58.0)		
Naval Petrol. & Oil Shale Reserves	21.3	17.3	17.3		
Strategic Petroleum Reserve	164.4	331.6	163.5		
Northeast Home Heating Oil Rsrv.	5.0	5.3	5.3		
Energy Information Administration	90.7	105.1	105.1		
Non-Defense Environmental Cleanup	349.7	180.9	286.0		

Program	FY2007	FY2008 Request	House	Senate	Conf.
Uranium Decontamination and Decommissioning Fund	556.6	573.5	618.8		
Science					
High Energy Physics	751.8	782.2	782.2		
Nuclear Physics	422.8	471.3	471.3		
Basic Energy Sciences	1,250.3	1,498.5	1,498.5		
Bio. & Env. R&D	483.5	531.9	581.9		
Fusion	319.0	427.9	427.9		
Advanced Scientific Computing	283.4	340.2	340.2		
Other	292.2	351.5	417.7		
Adjustments	(5.6)	(5.6)	(5.6)		
Total, Science	3,797.3	4,397.9	4,514.1		
Nuclear Waste Disposal	99.2	202.5	202.5		
Environment, Safety, Health [a]	—	—	31.8		
Departmental Admin. (net)	153.8	148.6	143.0		
Office of Inspector General	41.8	48.4	47.7		
Innovative Technology Loan Guarantee	—	8.4	—		
National Nuclear Security Administration (NNSA)					
Weapons	6,275.6	6,511.3	5,879.1		
Nuclear Nonproliferation	1,818.3	1,672.6	1,683.7		
Naval Reactors	781.8	808.2	808.2		
Office of Administrator	340.3	394.7	415.9		
Total, NNSA	9,216.0	9,386.8	8,786.9		

Program	FY2007	FY2008 Request	House	Senate	Conf.
Defense Environmental Cleanup	5,731.8	5,363.9	5,766.6		
Other Defense Activities	636.3	764.0	604.3		
Defense Nuclear Waste Disposal	346.5	292.0	292.0		
Total, Defense Activities	15,930.6	15,806.8	15,449.8		
Power Marketing Administrations (PMA)					
Southeastern	5.6	6.5	6.5		
Southwestern	30.0	30.4	30.4		
Western	232.3	201.0	201.0		
Falcon & Armistad O&M	2.7	2.5	2.5		
Total, PMAs	270.6	240.4	240.4		
FERC (revenues)	221.9 (221.9)	255.4 (255.4)	255.4 (255.4)		
Total, Title III	**24,228.2**	**24,762.7**	**25,243.1**		

Sources: DOE FY2008 Congressional Budget Request, February 2007; H.Rept. 110-185.

a. Environment, Safety and Health moved from Energy Supply and Conservation for FY2008.

The Administration's FY2008 request for DOE programs was $24.7397 billion, compared with $24.0932 billion appropriated for FY2007.

Key Policy Issues — Department of Energy

DOE administers a wide variety of programs with different functions and missions. In the following pages, the programs are described and major issues are identified, in approximately the order in which they appear in the budget tables in **Table 7**.

Energy Efficiency and Renewable Energy. A key component of the Administration's American Competitiveness Initiative is the Advanced Energy Initiative (AEI). DOE says AEI "aims to reduce America's dependence on imported energy sources." The AEI included hydrogen, biofuels, and solar energy initiatives that would be supported by programs in DOE's Office of Energy Efficiency and Renewable Energy (EERE). The goal of the Hydrogen Initiative is to "bring hydrogen and fuel cell technology from the laboratory to the showroom." Specifically, the program aims to "facilitate a decision by industry to commercialize

a hydrogen infrastructure and fuel cell vehicles by 2015."[2] The goal of the Biofuels Initiative is to develop transportation fuels, such as cellulosic ethanol, from agricultural waste products and energy crops such as wood chips, switchgrass, and plant stalks. The goals of the Solar America Initiative are to reduce the cost of photovoltaics (PV) technology, increase its commercial deployment, and help reduce natural gas demand for electric power generation.

DOE's FY2007 request for EERE programs proposed major funding increases to support the newly proposed Hydrogen, Biofuels, and Solar America initiatives. Also, the versions of the FY2007 appropriation bill passed by the House and reported by the Senate Appropriations Committee had approved virtually all of the request for these initiatives. However, the 109th Congress did not complete action on the bill. Subsequently, the 110th Congress enacted P.L. 110-5 (H.J.Res. 20), which set FY2007 EERE funding at $1.474 billion, about $308 million above the FY2006 appropriation. The specific breakdown of the $308 million increase was left to DOE. That breakdown was reported in DOE's FY2007 Operating Plan, and it is shown in **Table 8**. The very large increase for the Facilities Program included one-time increases of $63 million to build a new facility at the National Renewable Energy Laboratory (NREL), $20 million for NREL's biorefinery researching ethanol, and $16 million for advanced photovoltaic manufacturing equipment. DOE provided sizable increases for most other programs, but also had notable decreases for Geothermal Technology (-$17.8 million), Hydropower (-$.05 million, termination), and Weatherization grants (-$38.0 million).

In the 2007 State of the Union address, the President reasserted the importance of "investing in new methods of producing ethanol" and set forth a goal to "reduce gasoline usage in the United States by 20% in the next ten years." To reach this "20-in-10" goal, he called for an "alternative" fuels production target of 35 billion gallons by 2017."[3] The goal aims to "help make cellulosic ethanol cost competitive by 2012 using a wide array of regionally available biomass resources." In support of the 35 billion gallon goal, the FY2008 EERE budget request for the Biomass/Biorefinery Program proposed funding for the Biofuels Initiative. Also, the request proposed funding for the Hydrogen Initiative and for the Solar America Initiative under the Solar Energy Program. The Solar increase would "help accelerate the market competitiveness of solar electricity." It also would aim to "lower the cost of energy from photovoltaic systems through manufacturing and efficiency improvements."[4]

As **Table 8** shows, DOE's FY2008 request seeks $1,236.2 million for the Energy Efficiency and Renewable Energy programs, which is $238.1 million, or

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[2] U.S. Executive Office of the President, *Budget of the United States Government, Fiscal Year 2007*, Appendix, p. 390. Also see DOE, *FY2007 Congressional Budget Request: Budget Highlights*, p. 41.

[3] This target, he noted, is nearly five times the 7.5 billion gallon target in the Renewable Fuels Standard (RFS) set by EPACT. The White House, *State of the Union 2007*, p. 3, at [http://www.whitehouse.gov/news/releases/2007/01/20070123-2.html].

[4] The White House, Office of Management and Budget, *Budget of the United States Government, Fiscal Year 2008 — Appendix* (Department of Energy), p. 362, at [http://www.whitehouse.gov/omb/budget/fy2008/pdf/appendix/doe.pdf].

21%, less than the FY2007 appropriation.[5] Key decreases for renewable energy include Biomass (-$20.4 million), Solar Energy (-$11.1 million), and Wind Energy (-$9.3 million). Also, the request would terminate International Renewables (-$9.5 million) and Geothermal Technology (-$5.0 million). The House Appropriations Committee recommended $1,873.8 million for EERE.

The FY2008 request seeks $189.5 million for energy conservation grants, which is $64.5 million, or 25%, less than the FY2007 appropriation. This includes cuts for Weatherization (-$60.6 million) and States (-$4.0 million). The request would also provide $521.6 million for energy efficiency R&D, which is $20.9 million, or 4%, less than the FY2007 appropriation. The only proposed increase is for Hydrogen ($19.4 million). Cuts for R&D technology programs include Buildings (-$17.9 million), Vehicles (-$11.9 million), and Industry (-$10.6 million).

At House and Senate hearings on the FY2008 DOE budget request, Energy Secretary Bodman testified that the funding request for the AEI initiatives would continue to "support clean energy technology breakthroughs that will help improve our energy security through diversification and could help to reduce our dependence on foreign oil." More specifically, the Secretary stated that biomass is a promising option for near-term liquid transportation fuels and that the Solar Initiative aims to make photovoltaic solar electricity cost competitive by 2015. At the hearings, concerns were raised about DOE's proposed termination of the Geothermal and Small Hydropower programs.[6]

Electricity Delivery and Energy Reliability. The FY2008 request includes $114.9 million for the Office of Electricity Delivery and Energy Reliability (OE). This would be $22.1 million less than the FY2007 appropriation. The largest cut would be for High Temperature Superconductivity (-$18.8 million), to reduce work on motors and generators.

Table 8. Energy Efficiency and Renewable Energy Programs

($ millions)

Program	FY2006	FY2007	FY2008 Request	FY2008 House	FY2008 Senate	FY2008 Conf.
Hydrogen Technologies	$153.5	$193.6	$213.0	$194.6		
— Fuel Cell Technologies	66.6	—	92.7	—		
Biomass & Biorefinery Systems	89.8	199.7	179.3	250.0		
— Biochemical Platform (Cellulose)	10.4	—	—	—		
Solar Energy	81.8	159.4	148.3	200.0		
— Photovoltaics	58.8	—	137.3	149.0		

[5] The DOE FY2008 budget document is available at [http://www.mbe.doe.gov/budget/08budget/Content/Volumes/Vol_3_ES_New.pdf].

[6] Bodman's Senate testimony is available at [http://energy.senate.gov/public/_files/BodmanTestimony.pdf].

Program	FY2006	FY2007	FY2008 Request	FY2008 House	FY2008 Senate	FY2008 Conf.
Wind Energy	38.3	49.3	40.1	57.5		
Geothermal Technology	22.8	5.0	0.0	44.3		
Small Hydropower	0.5	0.0	0.0	22.0		
Vehicle Technologies	178.4	188.0	176.1	235.4		
Building Technologies	68.2	104.3	86.5	146.5		
Industrial Technologies	52.1	56.6	46.0	57.0		
Federal Energy Management	19.0	19.5	16.8	27.0		
Facilities & Infrastructure	26.1	107.0	7.0	195.7		
Weatherization Grants	242.6	204.6	144.0	245.6		
State Energy Grants	35.6	49.5	45.5	49.5		
Program Management	115.2	110.2	118.3	128.9		
R&D Subtotal	887.9	1,220.3	1,046.7	1,558.9		
Grants Subtotal	278.2	254.0	189.5	314.9		
Use of Prior Year Balances	—	—	—	—		
Total Appropriation, EE & RE	1,166.1	1,474.3	1,236.2	1,873.8		
Office of Electricity Delivery & Energy Reliability (OE)[a]	158.2	137.0	114.9	134.2		

Sources: DOE FY2008 Congressional Budget Request, vol. 3, February 2007; DOE FY2007 Operating Plan; H.Rept. 110-185.

a. The Distributed Energy Program was moved from EERE to OE in FY2006.

Nuclear Energy. For nuclear energy research and development — including advanced reactors, fuel cycle technology, nuclear hydrogen production, and infrastructure support — DOE is requesting $801.7 million for FY2008, nearly 30% above the FY2007 funding level. The request would boost funding for the Advanced Fuel Cycle Initiative (AFCI) from $167.5 million in FY2007 to $395.0 million in FY2008. The higher AFCI funding would allow DOE to continue developing a demonstration plant for separating plutonium and uranium in spent nuclear fuel, as part of the Administration's Global Nuclear Energy Partnership (GNEP). The nuclear energy program is run by DOE's Office of Nuclear Energy, Science, and Technology.

The House Appropriations Committee recommended cutting AFCI to $120 million and shifting the mixed-oxide (MOX) fuel program to the nuclear energy program from the nuclear nonproliferation program (see nuclear nonproliferation section below). The Committee also recommended shifting funding from GNEP's proposed plutonium-burning fast reactors to the high temperature gas-cooled Next Generation Nuclear Plant program. Overall, the Committee recommended a funding level of $835.2 million for nuclear energy, including $74.9 million from the Other Defense Activities account.

According to DOE's FY2008 budget justification, the nuclear energy R&D program is intended "to secure nuclear energy as a viable, long-term commercial energy option, providing diversity in the energy supply." However, opponents have criticized DOE's nuclear research program as providing wasteful subsidies to an industry that they believe should be phased out as unacceptably hazardous and economically uncompetitive.

Under the Administration's GNEP initiative, plutonium partially separated from the highly radioactive spent fuel from nuclear reactors would be recycled into new fuel to expand the future supply of nuclear fuel and potentially reduce the amount of radioactive waste to be disposed of in a permanent repository. The United States and other advanced nuclear nations would lease new fuel to other nations that agreed to forgo uranium enrichment, spent fuel recycling (also called reprocessing), and other fuel cycle facilities that could be used to produce nuclear weapons materials. The leased fuel would then be returned to supplier nations for reprocessing. Solidified high-level reprocessing waste would be sent back to the nation that had used the leased fuel, along with supplies of fresh nuclear fuel, according to the GNEP concept; see [http://www.gnep.energy.gov].

Although GNEP is largely conceptual at this point, DOE issued a Spent Nuclear Fuel Recycling Program Plan in May 2006 that provides a general schedule for a GNEP Technology Demonstration Program (TDP),[7] which would develop the necessary technologies to achieve GNEP's goals. According to the Program Plan, the first phase of the TDP, running through FY2006, consisted of "program definition and development" and acceleration of AFCI. Phase 2, running through FY2008, is to focus on the design of technology demonstration facilities, which then are to begin operating during Phase 3, from FY2008 to FY2020.

Nuclear critics oppose GNEP's emphasis on spent fuel reprocessing, which they see as a weapons proliferation risk, even if weapons-useable plutonium is not completely separated from other spent fuel elements, as envisioned by the Administration. "As the research of DOE scientists makes clear, the reprocessing technologies under consideration would still produce a material that is not radioactive enough to deter theft, and that could be used to make nuclear weapons," according to the Union of Concerned Scientists.[8]

The House Appropriations Committee sharply criticized GNEP, calling the Administration's proposal "rushed, poorly-defined, expansive, and expensive." The Committee recommended focusing on further research before committing the much higher funding required for commercial-scale facilities.

Nuclear Power 2010. President Bush's specific mention of "clean, safe nuclear power" in his 2007 State of the Union address reiterated the Administration's interest in encouraging construction of new commercial reactors — for which there

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[7] DOE, *Spent Nuclear Fuel Recycling Plan*, Report to Congress, May 2006.

[8] Union of Concerned Scientists, *U.S. Nuclear Fuel Reprocessing Initiative*, [http://www.ucsusa.org/global_security/nuclear_terrorism/US_Nuclear_Fuel_Reprocessing_Initiative.html].

have been no U.S. orders since 1978. DOE's efforts to restart the nuclear construction pipeline have been focused on the Nuclear Power 2010 Program, which will pay up to half of the nuclear industry's costs of seeking regulatory approval for new reactor sites, applying for new reactor licenses, and preparing detailed plant designs. The Nuclear Power 2010 Program, which includes the Standby Support Program authorized by EPACT05 to pay for regulatory delays, is intended to encourage near-term orders for advanced versions of existing commercial nuclear plants.

The Nuclear Power 2010 Program is helping three utilities seek NRC Early Site Permits (ESPs) for potential new reactors in Illinois, Mississippi, and Virginia. NRC issued the first of these on March 15, 2007, to Exelon Generating Company for a potential new reactor at the company's Clinton, Illinois, nuclear plant. The ESP means that Exelon would not have to revisit site-related issues if it sought a license for a new reactor at the Clinton site during the next 20 years. DOE paid half the $15 million cost of the ESP under its Nuclear Power 2010 program.

In addition, two industry consortia are receiving DOE assistance over the next several years to design and license new nuclear power plants. DOE awarded the first funding to the consortia in 2004. DOE is requesting $114.0 million for Nuclear Power 2010 for FY2008, more than 40% above the FY2007 funding level of $80.3 million. The House Appropriations Committee recommended flat funding for the program, contending that funds should not be provided for reactor design work.

The nuclear license applications under the Nuclear Power 2010 program are intended to test the "one-step" licensing process established by the Energy Policy Act of 1992 (P.L. 102-486). Under the process, NRC may grant a combined construction permit and operating license (COL) that allows a completed plant to begin operation if all construction criteria have been met. Even if the licenses are granted by NRC, the industry consortia funded by DOE have not committed to building new reactors. The following two consortia receive COL assistance under the Nuclear Power 2010 program:

- A consortium led by Dominion Resources that is preparing a COL for an advanced General Electric reactor. The proposed reactor would be located at Dominion's existing North Anna plant in Virginia, where the company is also seeking an NRC early-site permit with DOE assistance.

- A consortium called NuStart Energy Development, including Exelon and several other major nuclear utilities, which announced on September 22, 2005, that it would seek a COL for a Westinghouse design at the site of TVA's uncompleted Bellefonte nuclear plant in Alabama and for a General Electric design at the Grand Gulf plant in Mississippi. The Nuclear Power 2010 Program is providing funding for review and approval of a COL application for the Bellefonte site.

The advanced Westinghouse reactor selected by NuStart, the AP-1000, may first be built in China. Under a contract signed December 16, 2006, four of the

Westinghouse reactors are to be constructed at two sites, with the first two units to begin operating by 2013.[9] The contract could help pay for detailed engineering and demonstrate the commercial viability of the new design, which received final design certification from NRC effective February 27, 2006.[10] A preliminary commitment to provide almost $5 billion in financial support for the China reactor sale was approved on February 18, 2005, by the Export-Import Bank of the United States. Critics contend that the Ex-Im financing could provide unwarranted subsidies to the nuclear power industry and unwisely transfer U.S. nuclear technology to China.

Generation IV. Advanced commercial reactor technologies that are not yet close to deployment are the focus of DOE's Generation IV Nuclear Energy Systems Initiative, for which $36.1 million is being requested for FY2008 — about the same as the FY2007 funding level. The House Appropriations Committee recommended nearly tripling the request to $115.1 million, with $70 million devoted to the Next Generation Nuclear Plant (NGNP).

NGNP also would receive most of the Administration's FY2008 request, $30 million. The Energy Policy Act of 2005 authorizes $1.25 billion through FY2015 for NGNP development and construction (Title VI, Subtitle C). The authorization requires that NGNP be based on research conducted by the Generation IV program and be capable of producing electricity, hydrogen, or both. Under DOE's current plans, NGNP will use Very High Temperature Reactor (VHTR) technology, which features helium as a coolant and coated-particle fuel that can withstand temperatures up to 1,600 degrees celsius. Phase I research on the NGNP is to continue until 2011, when a decision will be made on moving to the Phase II design and construction stage, according to the FY2008 DOE budget justification.

In conjunction with the GNEP Technology Demonstration Program, the Generation IV Program will also focus on developing a sodium-cooled fast reactor (SFR). Existing U.S. commercial nuclear reactors use water to slow down, or "moderate," the neutrons released by the fission process (splitting of nuclei). The relatively slow (thermal) neutrons are highly efficient in causing fission in certain isotopes of heavy elements, such as uranium 235 and plutonium 239.[11] Therefore, fewer of those isotopes are needed in nuclear fuel to sustain a nuclear chain reaction (in which neutrons released by fissioned nuclei then induce fission in other nuclei, and so forth). The downside is that thermal neutrons cannot efficiently induce fission in more than a few specific isotopes.

In contrast, "fast" neutrons, which have not been moderated, are less effective in inducing fission than thermal neutrons but can induce fission in a much wider range of isotopes, including all major plutonium isotopes. Therefore, nuclear fuel for a fast reactor must have a higher proportion of fissionable isotopes than a thermal

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[9] "Westinghouse Wins China Contract; Chinese Look at Next Expansion," *Nucleonics Week*, December 21, 2006, p. 1.

[10] 71 *Federal Register* 4464, January 27, 2006.

[11] Isotopes are atoms of the same chemical element but with different numbers of neutrons in their nuclei.

reactor to sustain a chain reaction, but a larger number of different isotopes can constitute that fissionable proportion.

A fast reactor's ability to fission most heavy radioactive isotopes, called "transuranics" (TRU), makes it theoretically possible to repeatedly separate those materials from spent fuel and feed them back into the reactor until they are entirely fissioned. In a thermal reactor, the buildup of non-fissile isotopes sharply limits the number of such separation cycles before the recycled fuel can no longer sustain a nuclear chain reaction.

"Given the benefits of continuous recycling, at this time GNEP-TDP is focused on the development of fast reactor technologies, recognizing that fast reactor operating experience is much more limited than thermal reactor operating experience, and that fast burn reactor fuels, or transmutation fuels, are not fully developed," according to the DOE Program Plan.[12]

The House Appropriations Committee directed DOE to make the gas-cooled NGNP a higher priority than fast reactors for GNEP and begin a competitive solicitation for a commercial demonstration plant at the Idaho National Laboratory.

The Generation IV program is also monitoring international research on lead-cooled fast reactors, gas-cooled fast reactors, and supercritical water-cooled reactors, according to the FY2008 budget justification.

Advanced Fuel Cycle Initiative. The Advanced Fuel Cycle Initiative (AFCI) is the primary component of the GNEP program. AFCI's $395 million budget request for FY2008 is more than double the FY2007 funding level of $167.5 million, which in turn is more than double the FY2006 appropriation. The House Appropriations Committee voted to cut AFCI to $120 million. "The Department should focus its limited AFCI resources in FY2008 on research activities at the Idaho National Laboratory, the Oak Ridge National Laboratory, and the Argonne National Laboratory, with support from university and private sector researchers as appropriate," the Committee report said.

According to the DOE budget justification, AFCI will develop and demonstrate nuclear fuel cycles that could reduce the long-term hazard of spent nuclear fuel and recover additional energy. Such technologies would involve separation of plutonium, uranium, and other long-lived radioactive materials from spent fuel for reuse in a nuclear reactor or for transmutation in a particle accelerator. Much of the program's research will focus on a separations technology called UREX+, in which uranium and other elements are chemically removed from dissolved spent fuel, leaving a mixture of plutonium and other highly radioactive elements. Proponents believe the process is proliferation-resistant, because further purification would be required to make the plutonium useable for weapons and because its high radioactivity would make it difficult to divert or work with.

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[12] *Spent Nuclear Fuel Recycling Program Plan*, p. 8.

FY2008 funding will also be used for conceptual design work on an Advanced Fuel Cycle Facility (AFCF) to provide engineering-scale demonstration of AFCI technologies, according to the budget justification. At the same time, industry design teams are to complete conceptual designs for nuclear fuel recycling demonstration facilities to be used for GNEP.

Removing uranium from spent fuel would eliminate most of the volume of spent nuclear fuel that would otherwise require disposal in a deep geologic repository, which DOE is developing at Yucca Mountain, Nevada. The UREX+ process also would reduce the heat generated by nuclear waste — the major limit on the repository's capacity — by removing cesium and strontium for separate storage and decay over several hundred years. Plutonium and other long-lived elements would be fissioned in accelerators or fast reactors (such as the type under development by the Generation IV program) to reduce the long-term hazard of nuclear waste. Even if technically feasible, however, the economic viability of such waste processing has yet to be determined, and it still faces significant opposition on nuclear nonproliferation grounds.

Nuclear Hydrogen Initiative. In support of President Bush's program to develop hydrogen-fueled vehicles, DOE is requesting $22.6 million in FY2008 for the Nuclear Hydrogen Initiative, about 10% above the FY2007 funding level but below the FY2006 appropriation. The House Committee recommended flat funding for the program. According to DOE's FY2008 budget justification, the program will continue laboratory-scale experiments to allow selection by 2011 of a hydrogen-production technology for pilot-scale demonstration by 2013.

Fossil Energy Research, Development, and Demonstration. The Bush Administration has requested $566.8 million in the FY2008 budget for Fossil Energy Research and Development (see **Table 9**). This is about 20.7% more than the $469.7 million requested in FY2007. (The FY2007 Operating Plan, however, showed a higher planned spending of $592.6 million). Major funding categories and amounts in the FY2008 request include President's Coal Research Initiative (Clean Coal Power Initiative, $73 million; FutureGen, $108 million, and Fuels and Power Systems, $245.60 million), Program Direction ($129.97 million), Fossil Energy Environmental Restoration ($9.57 million), and Special Recruitment Programs ($0.66 million). Coal and coal-related activities accounted for more than 75% of the FY2008 Fossil Energy R&D budget request.

The House Committee on Appropriations recommends transferring $58 million to the carbon sequestration program as opposed to the President's request to transfer the amount to the Clean Coal Power Initiative. The Committee also recommends a $130 million increase in the Fuels and Power system request (bringing the total to $375.6 million), and funding the Natural Gas and Oil Technologies Programs at their FY2007 level of spending as opposed to the President's request to cancel the programs.

Table 9. Fossil Energy Research and Development Programs

($ millions)

Clean Coal Technology		FY2007 Operating Plan	FY2008 Request	FY2008 H.Comte.
Deferral of unobligated balance, FY2007		257.0		
Deferral of unobligated balance, FY2008		-257.0	257.0	257.0
Rescission, uncommitted balances		—	-149.0	-149.0
Transfer to FutureGen		—	-108.0	-108.0
Transfer to Clean Coal Power Initiative		—	-58.0	—
Transfer to Carbon Sequestration				-58.0
Total		—	-58.0	-58.0
Fossil Energy R & D	**FY2006**	**FY2007 Operating Plan**	**FY2008 Request**	**FY2008 H. Comm.**
Clean Coal Power Initiative	48.135	60.433	73.000	73.000
FutureGen	17.326	54.000	108.000	108.000
Fuels & Power Systems	301.301	311.314	245.602	375.602
Natural Gas Technologies	31.801	12.000	—	12.000
Petroleum-Oil Technologies	30.805	2.700	—	2.700
Fossil Energy Environmental Restoration	9.504	9.715	9.570	9.570
Program Direction	105.872	129.803	129.973	127.273
Other	35.925	12.656	0.656	0.656
Total	580.669	592.621	566.801	708.800

Sources: DOE FY2007 Operating Plan; DOE FY2008 Budget Request; H.Rept. 110-185.

The Clean Coal Power Initiative will demonstrate advanced clean coal-based power generation technologies on a commercial scale capable of achieving 45% thermal efficiency. The FutureGen project will partner with industry to build the advanced coal-based Integrated Gasification Combined Cycle (IGCC) plant that can produce electricity at 45%-50% efficiency at a capital cost of $1000/kW (in constant 2003 dollars) and can integrate CO_2 separation, capture, and sequestration. The Fuels program is a key component of the Hydrogen Fuel Initiative and will provide the hydrogen production supporting R&D for the FutureGen project. The Fossil Energy Environmental Restoration program remediates the National Energy Technology Laboratory at the Morgantown, WV; Pittsburgh, PA; Tulsa, OK; Fairbanks, AK; and Albany, OR, sites.

The Energy Policy Act of 2005 (P.L. 109-58) authorizes the annual appropriation of $200 million in FY2006 through FY2014 to remain available until expended for the Title IV — Clean Coal Power Initiative (see **Table 10**). Of the funds made available, 70% (i.e., $140 million annually) are only to be used in funding coal-based gasification technologies: combined cycle, fuel cell, coproduction, hybrid, and advanced technologies capable of producing concentrated

carbon monoxide — technologies aimed at FutureGen. Subtitle F (Fossil Energy) authorizes Section 962 — Coal and Related Technologies Program and the appropriation of $611 million in FY2007, $626 million in FY2008, and $641 million in FY2009, in addition to Title IV programs for research, development, demonstration, and commercial application of coal-based power generation through gasification, advanced combustion, and turbines for synthesis gas derived from coal.

Table 10. Energy Policy Act of 2005 Title IV Authorization
($ millions)

EPAct Authorization	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Clean Coal Power	200	200	200	200	200	200	200	200	200
FutureGen related	140	140	140	140	140	140	140	140	140
Fossil Energy		611	626	641					

Source: DOE FY2008 Budget Request.

The Energy and Water Development Appropriations Act for FY2006 (P.L. 109-103) made $598 million available for Fossil Energy Research and Development and deferred $257 million available in previous Clean Coal Technology appropriations until FY2006, regardless of separate requests, provided that $20 million of the uncommitted balance is rescinded. The conference agreement (Conference Report 109-275) deferred $257 million in clean coal technology funding until FY2007; rescinded $20 million in prior year uncommitted balances and applied them to Clean Coal Technology (they were misapplied to Fossil Energy Research and Development in both House and Senate Reports); provided $598 million to fossil energy research; provided $50 million for the Clean Coal Power Initiative (the conferees noted this was short of the administration's $200 million commitment and directed the administration to fulfill the commitment by transferring funds remaining from the termination of the low emission boiler project); and agreed to provide the $18 million requested for FutureGen. The conference agreement also included $9.6 million for fossil energy environmental restoration.

The Continuing Appropriations Resolution of September 30, 2006, (P.L. 109-289, division B) carried the same level of funding appropriated for Clean Coal and Fossil Energy projects in FY2006 forward to FY2007,[13] as did the Revised Continuing Appropriations Resolution of February 15, 2007 (P.L. 110-5).

DOE proposes to terminate programs in Natural Gas Technology and Petroleum-Oil Technology in FY2008. Based on the Program Assessment Rating Tool developed by OMB, a review rated both programs as ineffective. Congressional support of Natural Gas and Oil Technology programs has been significantly higher than the Bush Administration's request in previous years. Congress funded both

[13] H.R. 5631, making appropriations for the Department of Defense for the fiscal year ending September 30, 2007, and for other purposes.

programs in FY2006. The House committee agreed not to fund Natural Gas Technologies and scaled back funding for Petroleum Technologies to $2.7 million because, according to the committee, the Energy Policy Act of 2005 authorizes $50 million of "mandatory receipts" for oil and gas technologies R&D. The Senate Appropriations Committee recommended $17 million for the development of natural gas from methane hydrates and $10 million for R&D efforts in oil shale and tar sands technology. No funding has been requested for the program in Plant and Capital Equipment. DOE believes that the research centers sponsored under the Cooperative Research and Development program can compete for Fossil Energy funding through the competitive solicitation process, thus funding was not requested in FY2007 or FY2008. Funding for Advanced Metallurgical Research and Import/Export was consolidated under the Fossil Energy R&D Program in FY2007 and FY2008.

Strategic Petroleum Reserve. The Strategic Petroleum Reserve (SPR), authorized by the Energy Policy and Conservation Act (P.L. 94-163) in 1975, consists of caverns formed out of naturally occurring salt domes in Louisiana and Texas in which roughly 690 million barrels of crude oil are stored. Current capacity is 727 million barrels; the SPR currently holds 690 million barrels. The purpose of the SPR is to provide an emergency source of crude oil that may be tapped in the event of a presidential finding that an interruption in oil supply, or an interruption threatening adverse economic effects, warrants a drawdown from the reserve. A Northeast Heating Oil Reserve (NHOR) was established during the Clinton Administration. NHOR houses 2 million barrels of home heating oil in above-ground facilities in Connecticut, New Jersey, and Rhode Island.

Program costs for the SPR in recent years have been dedicated principally to maintaining SPR facilities and keeping the SPR in readiness should it be needed. Any fill activity was accomplished by accepting deliveries of royalty-in-kind (RIK) oil to the SPR in lieu of cash royalties on offshore production being paid to the federal government. The Administration request for FY2007 for the SPR was $155.4 million. DOE's 2007 operating plan set FY2007 spending at $169.4 million, including $5.0 million for the NHOR. The FY2008 request for the same activities is $168.8 million. However, the request includes an additional $168.1 million to launch the Administration's plan to expand the SPR to 1.5 billion barrels, for a total of $331.6 million. Expansion of the Reserve to 1 billion barrels was authorized in the Energy Policy Act of 2005 (P.L. 109-58). The FY2008 request would achieve capacity of 1 billion barrels by adding 115 million barrels of capacity at three existing sites and establishing a new site, in Richton, Mississippi, where 160 million barrels of capacity would be created. The FY2008 budget request indicates that the Administration intends to seek authority at a later date to expand the SPR to 1.5 billion barrels, and that budgeted activities during FY2008 are a start toward that goal.

The proposal to raise spending significantly to expand the SPR was anticipated to be controversial. In its report on the bill (H.Rept. 110-185), the House Committee on Appropriations indicated that it did not support expansion of the SPR at this time, noting an estimate that it would cost $10 billion for creating additional capacity, $55 billion to fill, and expansion would not be completed until 2027. The Committee expressed that the plans for the expansion lacked "analytical clarity," citing recommendations in a 2006 report from the Government Accountability Office

(GAO) that a new assessment be made of the optimal mix for the SPR of sweet and sour crudes, as well as the appropriate size of the SPR. The Committee recommended $163.5 million for the SPR program in FY2008, and approved the Administration request of $5.3 million for the NHOR.

The Administration sold 11 million barrels of oil from the SPR after Hurricane Katrina, and has indicated it intended to replace that oil as well as to fill the SPR to its current capacity. The Administration made awards during May 2007 for deliveries of nearly 18 million barrels of royalty-in-kind (RIK) oil, with delivery to begin in July 2007. The fill rate from these contracts will reach roughly 100,000 barrels per day later in the summer. There is some opposition to RIK fill. Critics argue that it is inadvisable to add oil to the SPR when markets are tight and prices already elevated, and that the additional oil adds little to U.S. energy security. Supporters of RIK fill argue that the fill rate is too little to have a discernible impact on markets, and that currently high product prices are sustained owing to factors other than crude supply, which is more than ample at this time.

Science. The DOE Office of Science conducts basic research in six program areas: basic energy sciences, high-energy physics, biological and environmental research, nuclear physics, fusion energy sciences, and advanced scientific computing research. Through these programs, DOE is the third-largest federal funder of basic research and the largest federal funder of research in the physical sciences.[14] For FY2008, DOE has requested $4.398 billion for Science, an increase of 16% from the FY2007 operating plan amount of $3.797 billion. This unusually large increase reflects the American Competitiveness Initiative (ACI), which the President announced in his State of the Union address on January 31, 2006. Over 10 years, the ACI would double the combined R&D funding of the DOE Office of Science and two other agencies. The House committee recommended $4.514 billion for Science, or $116 million more than the request.

The requested funding for the largest Office of Science program, basic energy sciences, is $1.498 billion, a 20% increase from the FY2007 operating plan amount of $1.250 billion. Much of the requested increase would support expanded facility operating time. The House and Senate appropriations reports for FY2006 both called for increased funding for this purpose. An increase of $200 million was included in the FY2007 request and the FY2007 House and Senate appropriations reports, but was not fully provided in the final FY2007 appropriation. For FY2008, the House committee recommended the requested amount.

For high-energy physics, the request is $782 million, up 4% from the FY2007 operating plan. The budget justification states that the program's "highest priority R&D effort is the development of the proposed International Linear Collider (ILC)." The FY2007 Senate committee report expressed concern about the long-term effects that funding for the ILC may have on other activities supported by the high-energy physics program. For FY2008, the House committee recommended the requested

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[14] Based on preliminary FY2005 data from Tables 29 and 22 of National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2003, 2004, and 2005*, NSF 06-313 (May 2006).

amount, including the requested increase for the ILC. In report language, the House committee emphasized its support for the NASA/DOE Joint Dark Energy Mission (JDEM), for which it said "DOE has done its part" but "NASA has failed to budget and program for launch services."

The request for biological and environmental research is $532 million, an increase of 10%. In recent years, the request for this program has usually been a decrease, resulting from the proposed termination of projects funded at congressional direction in the previous year's appropriations conference report. The final FY2007 appropriation for biological and environmental research included no congressionally directed projects. For FY2008, the House committee recommended dividing this program into two accounts: biological research, for which it recommended an increase of $30 million above the request, and climate change research, for which it recommended an increase of $20 million. The House committee report for FY2008 included no congressionally directed projects.

For nuclear physics, the request is $471 million, up 11%. As in the FY2007 request, no funds are included for construction of the Rare Isotope Accelerator (RIA), despite direction in Section 981 of the Energy Policy Act of 2005 (P.L. 109-58) that construction of this project must begin no later than the end of FY2008. A National Academies report on the RIA was released in December 2006 and is available on the nuclear physics program's website.[15] The House committee recommended the requested amount and endorsed DOE's decision to fund additional R&D rather than build the RIA.

The request for fusion energy sciences is $428 million, a 34% increase. Almost the entire increase is for the U.S. share of the International Thermonuclear Experimental Reactor (ITER), a fusion facility now under construction whose other participants include China, the European Union, India, Japan, Russia, and South Korea. The request for this purpose is $160 million. The estimated total U.S. share of the cost of ITER is $1.122 billion through FY2014. The House and conference appropriations reports for FY2006 directed DOE to fund ITER out of additional resources, not through reductions in the domestic portion of the fusion program. Although the multiyear increase proposed for Science as part of the ACI may relieve some budget pressure, the impact of ITER on the domestic program is likely to remain an issue. For FY2008, the House committee provided the requested amount for fusion energy sciences, but rejected the proposed creation of a new activity in high energy-density physics, instead redistributing its requested $12 million among existing non-ITER activities. The House report noted that the request for the domestic fusion program "is only slightly above the rate of inflation and far smaller than the percentage increases for most other research areas" and directed that if schedule delays reduce ITER expenditures in FY2008, the balance should be redirected to the domestic program rather than carried over to be spent on ITER in FY2009.

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[15] National Research Council, *Scientific Opportunities with a Rare-Isotope Facility in the United States*, online at [http://www.sc.doe.gov/np/program/docs/RareIsotopeScience Assessment.pdf].

The request for the smallest of the Office of Science research programs, advanced scientific computing research, is $340 million, up 20% from the FY2007 operating plan amount. The House committee recommended the requested amount.

The House committee also recommended $73 million more than the request for science laboratories infrastructure. The bulk of this increase would be used to accelerate facility cleanup, replacement, renovation, and upgrades at Pacific Northwest National Laboratory.

Nuclear Waste Disposal. DOE's Office of Civilian Radioactive Waste Management (OCRWM) is responsible for developing a nuclear waste repository at Yucca Mountain, Nevada, for disposal of nuclear reactor spent fuel and defense-related high-level radioactive waste.

DOE is seeking $494.5 million in FY2008 for the nuclear waste program, nearly the same as the FY2006 level and $50 million above FY2007 funding. According to DOE, the FY2008 funding request would allow OCRWM to submit the Yucca Mountain license application in FY2008 as currently planned, conduct security and safety planning, develop a preliminary transportation plan, and improve site infrastructure and operations.[16] The House Appropriations Committee recommended approval of the full request.

Funding for the program is provided under two appropriations accounts. The Administration is requesting $202.5 million from the Nuclear Waste Fund, which holds fees paid by nuclear utilities. An additional $292.0 million is being requested in the Defense Nuclear Waste Disposal account, which pays for disposal of high-level waste from the nuclear weapons program in the planned Yucca Mountain repository.

DOE announced on October 25, 2005, that it would require most spent fuel to be sealed in standardized canisters before shipment to Yucca Mountain, a change that would largely eliminate the handling of individual fuel assemblies at the site. DOE subsequently informed the Nuclear Regulatory Commission that making those changes to the repository's operational plans would further delay submission of a Yucca Mountain license application to NRC. DOE announced on July 19, 2006, that an application would be submitted by June 30, 2008, with a goal of opening the repository in 2017.

The Nuclear Waste Policy Act of 1982 (NWPA, P.L. 97-425), as amended, names Yucca Mountain as the sole candidate site for a national geologic repository. Congress passed an approval resolution in July 2002 (H.J.Res. 87, P.L. 107-200) that authorized the Yucca Mountain project to proceed to the licensing phase.

NWPA required DOE to begin taking waste from nuclear plant sites by January 31, 1998. Nuclear utilities, upset over DOE's failure to meet that deadline, have won two federal court decisions upholding the department's obligation to meet the deadline and to compensate utilities for any resulting damages. Utilities have also

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[16] DOE, *FY 2008 Congressional Budget*, DOE/CF-017, vol. 4, p. 490.

won several cases in the U.S. Court of Federal Claims. The nation's largest nuclear utility, Exelon Corporation, reached a breach-of-contract settlement with the federal government in August 2004 that may total $600 million if DOE does not begin taking spent fuel before its current goal of 2017.

Further delays in the Yucca Mountain program could result from a July 2004 court decision that overturned a key aspect of the Environmental Protection Agency's (EPA's) regulations for the repository. A three-judge panel of the U.S. Court of Appeals for the District of Columbia Circuit ruled that EPA's 10,000-year compliance period was too short, but it rejected several other challenges to the standards. EPA proposed revised Yucca Mountain standards on August 9, 2005. (For more information, see CRS Report RL33461, *Civilian Nuclear Waste Disposal*, by Mark Holt.)

Loan Guarantees. Congress established the DOE Innovative Technology Loan Guarantee Program in the Energy Policy Act of 2005. The act authorized loan guarantees for energy projects using "new or significantly improved technologies" to reduce greenhouse gas emissions.

The Administration requested $2 billion for loan guarantees in FY2007, but Congress had not taken final action on that request before the FY2008 request was submitted on February 5, 2007. In the FY2008 request, the Administration sought $9 billion in loan guarantee authority, to be reduced to $7 billion if the $2 billion request for FY2007 were subsequently approved. Enacted shortly thereafter, the FY2007 continuing resolution provided initial administrative funding for the program and authorized up to $4 billion in loan guarantees (twice the requested amount), but it also prohibited DOE from awarding loan guarantees until final rules were in place. DOE issued proposed rules for the program May 16, 2007.

The House Appropriations Committee recommended $7 billion in loan guarantees for FY2008, which, including the $4 billion ultimately provided for FY2007, gives DOE a cumulative authorization of $11 billion — $2 billion above the Administration's requested cumulative level of $9 billion. The FY2008 DOE budget justification said that the precise allocation of the loan guarantees among nuclear, coal, renewable energy, and other eligible technologies "would depend on the merits and benefits of particular project proposals and their compliance with statutory and regulatory requirements." However, the House panel allocated $2 billion for coal, $4 billion for biofuels, and $1 billion for electric transmission and renewable power systems, specifically omitting the Administration's mention of nuclear power. But because the $4 billion authorized in FY2007 is not allocated among the various technologies, the effect of the proposed FY2008 allocation is uncertain.

Nuclear Weapons Stockpile Stewardship. Congress established the Stockpile Stewardship Program in the FY1994 National Defense Authorization Act (P.L. 103-160) "to ensure the preservation of the core intellectual and technical competencies of the United States in nuclear weapons." The program is operated by the National Nuclear Security Administration (NNSA), a semiautonomous agency within DOE that Congress established in the FY2000 National Defense

Authorization Act (P.L. 106-65, Title XXXII). It seeks to maintain the safety and reliability of the U.S. nuclear stockpile.

Stockpile stewardship consists of all activities in NNSA's Weapons Activities account. The three main elements of stockpile stewardship, described below, are Directed Stockpile Work (DSW), Campaigns, and Readiness in Technical Base and Facilities (RTBF). **Table 11** presents funding for these elements. NNSA manages two programs outside of Weapons Activities: Defense Nuclear Nonproliferation, discussed later in this report, and Naval Reactors.

Most stewardship activities take place at the nuclear weapons complex, which consists of three laboratories (Los Alamos National Laboratory, NM; Lawrence Livermore National Laboratory, CA; and Sandia National Laboratories, NM, and CA); four production sites (Kansas City Plant, MO; Pantex Plant, TX; Savannah River Site, SC; and Y-12 Plant, TN); and the Nevada Test Site. NNSA manages and sets policy for the complex; contractors to NNSA operate the eight sites.

Table 11. Funding for Weapons Activities

($ millions)

Program	FY2007 Operating Plan	FY2008 Request	House Approp. Comm.	Senate Approp. Comm.	Conference
DSW	$1,425.7	$1,447.2	$1,336.6		
Campaigns	1,979.0	1,866.2	1,725.2		
RTBF	1,613.2	1,662.1	1,479.6		
Other[a]	1,257.7	1,535.7	1,337.7		
Total	**6,275.6**	**6,511.3**	**5,879.1**		

Sources: DOE FY2008 Congressional Budget Request, vol. 1 (NNSA), p. 59; U.S. Department of Energy, *FY 2007 Operating Plan by Appropriation,* March 16, 2007, pp. 15-21; and U.S. Congress. House. Committee on Appropriations. *Energy and Water Development Appropriations Bill, 2008,* 110th Congress, 1st Session, H.Rept. 110-185, pp. 136-140.

Notes: Details may not add to totals due to rounding. DSW, Directed Stockpile Work; RTBF, Readiness in Technical Base and Facilities.

a. Includes Secure Transportation Asset, Nuclear Weapons Incident Response, Facilities and Infrastructure Recapitalization Program, Environmental Projects and Operations, Safeguards and Security, and several adjustments.

The FY2008 request document includes data from NNSA's Future Years Nuclear Security Program (FYNSP), which projects the budget and components through FY2012 (see **Table 12**).

Table 12. NNSA Future Years Nuclear Security Program

($ millions)

	FY2008	FY2009	FY2010	FY2011	FY2012
DSW	$1,447.2	$1,483.4	$1,520.5	$1,558.5	$1,597.5
Campaigns	1,866.2	1,916.6	1,941.1	1,933.7	1,942.0
RTBF	1,662.1	1,698.4	1,765.5	1,862.7	1,952.6
Other[a]	1,535.7	1,606.6	1,677.0	1,756.0	1,831.9
Total	**6,511.3**	**6,705.0**	**6,904.0**	**7,111.0**	**7,324.0**

Source: DOE FY2007 Congressional Budget Request, vol. 1 (NNSA), pp. 59, 60.

Note: Details may not add to totals because of rounding.

a. Includes Secure Transportation Asset, Nuclear Weapons Incident Response, Facilities and Infrastructure Recapitalization Program, Environmental Projects and Operations, Safeguards and Security, and several adjustments.

Nuclear Weapons Complex Reconfiguration. In testimony before the House Appropriations Committee's Energy and Water Subcommittee in March 2004, the Secretary of Energy agreed to conduct a review of reconfiguring the nuclear weapons complex (the "Complex"). The committee's FY2005 energy and water report contained a requirement for that study. The committee was concerned about high costs, the security of fissile material distributed among many sites, and the size and age of the Complex. A task force of the Secretary of Energy Advisory Board released its final report in October 2005. It recommended a Consolidated Nuclear Production Center (CNPC) that would make nuclear components (such as those of uranium or plutonium) and would assemble and dismantle nuclear weapons. It recommended consolidating uranium and plutonium, and probably closing several current sites. The House Appropriations Committee, in its FY2007 report, supported the task force's recommendations and rejected NNSA's "Complex 2030" plan to modernize the Complex with less consolidation. The committee recommended $100.0 million "for transition planning, site selection, and preliminary design and development for a consolidated nuclear production site for reliable replacement warheads and stockpile support." The bill as passed by the House provided this sum. NNSA had not requested funds for this purpose. The Senate Appropriations Committee did not recommend funds for this purpose, and the DOE FY2007 operating plan did not include such funds. For FY2008, NNSA did not request funds for CNPC, but did request funds throughout its proposed budget for upgrading and consolidating the Complex. In January 2007, it submitted a report to Congress on its plan for transforming the Complex. This plan included evaluation of CNPC in a draft Supplement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement for Complex 2030.

The House Appropriations Committee, in its FY2008 report, expressed extreme displeasure with the Administration's rationale for the nuclear weapons program and with NNSA's plan for the Complex. It stated that the Reliable Replacement Warhead program (RRW, discussed below) and Complex 2030 "are being proposed in a policy vacuum without any Administration statement on the national security environment

that the future nuclear deterrent is designed to address." Accordingly, "The Committee believes it is premature to proceed with further development of the RRW or a significant nuclear complex modernization plan, until a three-part planning sequence is completed." This sequence has three elements: "a comprehensive nuclear defense and nonproliferation strategy"; a detailed description translating that strategy into a "specific nuclear stockpile"; and "a comprehensive, long-term expenditure plan, from FY2008 through FY2030 ..." "The Committee views completion of this three-part planning sequence as a necessary condition before considering additional funding for Complex 2030 and RRW activities." It noted its "strong reservations" on Complex 2030 and stated that "NNSA continues to pursue a policy of rebuilding and modernizing the entire complex *in situ* without any thought given to a sensible strategy for long-term efficiency and consolidation."

Directed Stockpile Work (DSW). This program involves work directly on nuclear weapons in the stockpile, such as monitoring their condition; maintaining them through repairs, refurbishment, life extension, and modifications; R&D in support of specific warheads; and dismantlement. The FY2008 DSW request would support life extension programs for the B61 gravity bomb and the W76 warhead for Trident II submarine-launched ballistic missiles. It would fund surveillance and maintenance for eight warhead types, dismantlement and disposition of retired warheads and components, and management and technology work linked to multiple warhead types or to no specific warhead type. It also included funds for the Reliable Replacement Warhead (RRW) program.

RRW originated as a funded program in the FY2005 Consolidated Appropriations Act, P.L. 108-447, which included $9.0 million for the program and described it as a "program to improve the reliability, longevity, and certifiability of existing weapons and their components." For FY2006, Congress appropriated $24.8 million. The FY2007 operating plan included $35.8 million, and the FY2008 request is $88.8 million. Outyear projections are FY2009, $99.8 million; FY2010, $109.2 million; FY2011, $167.4 million; and FY2012, $179.9 million. (See CRS Report RL32929, *The Reliable Replacement Warhead Program: Background and Current Developments*, and CRS Report RL33748, *Nuclear Warheads: The Reliable Replacement Warhead Program and the Life Extension Program*, both by Jonathan Medalia.)

Although RRW is a small part of the NNSA budget, the House Appropriations Committee, in its FY2006 report, viewed it as enabling large changes, such as transitioning the Complex "from a large, expensive Cold War relic into a smaller, more efficient modern complex" and allowing "long-term savings by phasing out the multiple redundant Cold War warhead designs that require maintaining multiple obsolete production technologies." The Senate Appropriations Committee stated that the recommended funding increase for RRW is "to accelerate the planning, development and design for a comprehensive RRW strategy that improves the reliability, longevity and certifiability of existing weapons and their components." The conference report emphasized that RRW "must stay within the military requirements of the existing deployed stockpile" and "must stay within the design parameters validated by past nuclear tests." P.L. 109-163, the FY2006 National Defense Authorization Act, section 3111, set seven objectives for the RRW program, including "[t]o increase the reliability, safety, and security of the United States

nuclear weapons stockpile" and "[t]o further reduce the likelihood of the resumption of underground nuclear weapons testing."

For FY2007, the Administration requested $27.7 million for RRW. The House Appropriations Committee linked RRW with a restructured, smaller, and consolidated nuclear weapons complex: "The Committee supports the RRW, but only if it is part of a larger package of more comprehensive weapons complex reforms." It recommended $52.7 million for RRW but restricted use of the additional $25.0 million until NNSA delivered an infrastructure plan to Congress. The committee also directed NNSA to have the JASON Defense Advisory Group conduct a peer review of competing RRW designs and to analyze the premise of RRW — that a new warhead can be designed and deployed without nuclear testing. The bill as passed by the House left these provisions unchanged.

Also under DSW, the committee (1) reduced the $232.7 million request for warhead life extension programs by $80.0 million, directed NNSA to terminate the life extension program for the W80 warhead for cruise missiles, and used the funds to support weapons complex transformation, and (2) increased funding for warhead dismantlement from $75.0 million to $105.0 million to accelerate that activity. The bill as passed by the House left these provisions unchanged.

The Senate Appropriations Committee supported RRW. It found, "The directors of Los Alamos, Sandia and Livermore National Labs and the Commander, U.S. Strategic Command share the belief that maintaining incremental modifications to the existing and highly optimized legacy systems [i.e., life extension programs (LEPs) of warheads now in the stockpile] is not sustainable." It "urges the NNSA to accelerate the transition to a responsive infrastructure and to proceed expeditiously with the RRW design." It noted that DOD and the Nuclear Weapons Council no longer support the W80 LEP, and provided $10.0 million for a design competition for a second RRW in lieu of W80 LEP activities. It recommended $62.7 million for RRW and reducing funds for warhead dismantlement to $35.0 million, preferring to ensure that facilities for disassembling pits and for fabricating mixed-oxide fuel will be built before providing full funding. DOE's FY2007 operating plan included $35.8 million for RRW, $264.4 million for Life Extension Programs, and $75.0 million for weapons dismantlement and disposition.

NNSA requested $88.8 million for RRW for FY2008. (The Navy requested an additional $30.0 million for RRW; those funds are in the defense appropriations bill and are not discussed here.) NNSA plans to use the FY2008 RRW funds, if approved, mainly to develop a detailed cost, scope, and schedule baseline for RRW. Other DSW funds requested for FY2008 include $238.7 million for Life Extension Programs, $346.7 million for Stockpile Systems, $52.3 million for Weapons Dismantlement and Disposition, and $720.8 million for Stockpile Services. The latter category includes, for example, funds for production support, safety, and other work supporting multiple warhead types or otherwise not linked to one specific warhead.

The House Appropriations Committee expressed extreme dissatisfaction with the RRW program. Its report stated, "The Committee finds the RRW program the DoD and NNSA have pursued at the direction of Congress goes far beyond the scope

and purpose of the original congressional language and intent. ... The Committee is unconvinced that pursuing the RRW design competition to a production phase is necessary at this time." Further,

> A particularly troubling issue for the Committee related to the RRW proposal is the contradictory U.S. policy position of demanding other nations give up their nuclear ambitions while the U.S. aggressively pursues a program to build new nuclear warheads. The Administration needs to develop a policy rationale that explains why the RRW program is not contradictory and does not undermine our international nuclear nonproliferation goals.

As noted above, the committee felt it necessary to have the planning sequence described earlier before continuing RRW design activities; accordingly, it recommended providing no funds for RRW for FY2008.

The committee recommended providing $1,336.6 million for DSW, a reduction of $110.6 million from the request. This reflects reductions of $88.8 million for RRW, $27.4 million for Stockpile Systems because of the termination of W80 warhead activities, and $115.5 million for Stockpile Services, and an increase of $121.0 million for weapons dismantlement and disposition. Regarding the latter category, the committee stated that DOE "must view dismantlement as a priority in and of itself, rather than as a workload leveling function to fill-in for down times in the life extension workload at Pantex." The committee also recommended transferring DOE's activity to build a Pit Disassembly and Conversion Facility within NNSA, from the Office of Defense Nuclear Nonproliferation to the Office of Defense Programs, and directed DOE to begin the siting process to build the facility at Pantex Plant (TX) rather than at Savannah River Site (SC) to avoid security risks in transporting pits from Texas to South Carolina.

Campaigns. These are "multi-year, multi-functional efforts" that "provide specialized scientific knowledge and technical support to the directed stockpile work on the nuclear weapons stockpile." The FY2008 request includes six Campaigns, each with multiple components: Science, Engineering, Inertial Confinement Fusion and High Yield, Advanced Simulation and Computing, Pit Manufacturing and Certification, and Readiness. Many items within Campaigns have significance for policy decisions. As one example, the Science Campaign's goals include improving the ability to assess warhead performance without nuclear testing, improving readiness to conduct tests should the need arise, and maintaining the scientific infrastructure of the nuclear weapons laboratories. Campaigns also fund some large experimental facilities, such as the National Ignition Facility at Lawrence Livermore National Laboratory, the Dual-Axis Radiographic Hydrotest Facility at Los Alamos National Laboratory, and the Microsystems and Engineering Sciences Applications Complex at Sandia National Laboratories.

NNSA's proposal to build a Modern Pit Facility (MPF) had been controversial for years. A pit is the fissile core of a nuclear weapon that is used to trigger a thermonuclear explosion. The United States has been unable to manufacture pits that can be certified for use in the stockpile since 1989. Los Alamos has a small-scale pit manufacturing facility, called TA-55; NNSA's plan is that TA-55 would be able to manufacture 10 pits per year by the end of FY2007 and 30-50 RRW pits per year by

FY2012, but NNSA saw that capacity as insufficient to maintain the stockpile and favored building MPF, with a capacity of perhaps 125 pits per year. H.R. 2419, the FY2006 Energy and Water Development Appropriations Bill, as passed by the House, eliminated MPF funds until "capacity requirements tied to the long-term stockpile size are determined" and "until the long-term strategy for the physical infrastructure of the weapons complex has incorporated the Reliable Replacement Warhead strategy." The bill as passed by the Senate provided the amount requested for MPF, $7.7 million. The appropriation bill, as passed, provided no funds for MPF. Conferees on the energy and water bill directed NNSA to focus instead on improving manufacturing capability at TA-55. NNSA requested no funds for MPF for FY2007 and instead planned to increase capacity at TA-55. It requested $237.6 million for the Pit Manufacturing and Certification campaign for FY2007; H.R. 5427 as passed by the House provided that amount, and the Senate Appropriations Committee recommended that amount. The FY2007 operating plan included $242.4 million for this campaign, and the FY2008 request is $281.2 million. NNSA envisions a new pit manufacturing facility able to deliver 125 pits per year to the stockpile by 2022 as part of Complex 2030.[17]

The House Appropriations Committee recommended providing $150.0 million for pit manufacturing and certification for FY2008, a reduction of $131.2 million on grounds that the request has funds in multiple lines "that assume a preferred future programmatic approach" that "ensures unnecessary expenditures and lack of accountability." It linked pit funding to the strategic plan discussed above:

> The Committee will not continue to fund activities that are not part of a clearly articulated facilities strategy. Until the Committee receives a new nuclear weapons strategic plan that addresses the future requirements for plutonium production, including specifically how plutonium facilities factor into supporting the future stockpile, the Committee will not support funding activities that assume a modernization-in-place strategy for the current nuclear weapons complex.
>
> The Committee recommendation includes no funds for the consolidated plutonium center proposal.

The appropriate test readiness posture — the time between a presidential order to resume testing and the conduct of the test — has been contentious. The posture was set at 24 to 36 months after the Cold War, but NNSA and others expressed concern that it had become 36 months or more. The Administration and Congress sought to shorten it, but there was a dispute over how much. NNSA and the Armed Services Committees favored an 18-month posture on grounds that it would take that long to prepare a test but that any testing should not be delayed beyond that time. The Appropriations Committees favored a 24-month posture, seeing an 18-month posture as provocative and more costly. The FY2006 appropriation was $19.8 million. In its FY2007 request, NNSA stated that it achieved a 24-month readiness posture in FY2005 and planned to maintain that posture at least through FY2011. It

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[17] U.S. Department of Energy. National Nuclear Security Administration. Office of Defense Programs. *Complex 2030: An Infrastructure Planning Scenario for a Nuclear Weapons Complex Able to Meet the Threats of the 21st Century,* DOE/NA-0013, October 2006, p. 11.

stated that the posture is 18 months "under current law" but that it "has thus far been limited to 24 months by Congressional funding." The FY2007 test readiness request was $14.8 million, and NNSA's operating plan included $14.6 million. NNSA will review this program in FY2007 and examine "new approaches." It requests no funds for this program for FY2008, but plans to request funds for FY2009.

The House Appropriations Committee recommended providing $20.0 million for test readiness to restore funding to this activity and keep it from being degraded. "The Committee is baffled by the Administration's decision to eliminate funding for nuclear test readiness after four budget cycles of insisting that shortening to an 18-month test readiness posture was required for national security reasons."

The Engineering Campaign includes the Enhanced Surveillance Program (ESP), which seeks to develop "predictive capabilities for early identification and assessment of stockpile aging concerns ... to give NNSA a firm basis for determining when systems must be refurbished." It is conducting experiments to determine the service life of pits based on plutonium aging characteristics. The FY2007 request for ESP was $86.5 million, the operating plan provided $87.5 million, and the FY2008 request is $80.6 million. The House Appropriations Committee recommended providing the requested funding both for ESP and for the entire Engineering Campaign, $152.7 million.

According to NNSA, the Inertial Confinement Fusion (ICF) and High Yield Campaign "is to develop laboratory capabilities to create and measure extreme conditions ... approaching those in a nuclear explosion, and conduct weapons-related research in these environments." A key part of this campaign is the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory, which is already the world's most powerful laser. NNSA plans to complete the NIF project by March 30, 2010.

Cost growth of NIF has been of concern to Congress. Total project cost was originally estimated at $1,073.6 million in FY1996; the current estimate is $3,502.4 million.[18] For FY2007, NNSA requested $451.2 million for this campaign, of which $111.4 million was for NIF construction. H.R. 5427, as passed by the House, provided $528.2 million for this campaign, including the requested amount for NIF construction. The Senate Appropriations Committee said NNSA was pursuing "a NIF-at-all-costs strategy." It continued, "The NNSA has pursued this agenda as a means to justify an aggressive spending baseline at the expense of more compelling stewardship responsibilities in the ICF campaign. The NNSA has proven unable to maintain a balanced ICF and high yield research program. As such the Committee has reallocated funding out of NIF demonstration and Construction activities to ensure that there is adequate program balance." It recommended funding the campaign at $412.3 million and, within that sum, funding NIF construction at $81.4 million. The FY2007 operating plan included $489.7 million for this campaign, of which $111.4 million was for NIF construction. The FY2008 request is $412.3 million, including $10.1 million for NIF construction. NNSA states that this latter

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[18] U.S. Department of Energy, *FY 2008 Congressional Budget Request*, vol. 1, National Nuclear Security Administration, DOE/CF-014 (February 2007), p. 160.

decrease "reflects ramp down of construction work as the project nears completion." The House Appropriations Committee recommended increasing the request by $111.8 million to support reaching the 2010 ignition goal.

Readiness in Technical Base and Facilities (RTBF). This program funds infrastructure and operations at nuclear weapons complex sites. The FY2007 operating plan included $1,613.2 million, and the FY2008 request is $1,662.1 million. RTBF has six subprograms. The largest is Operations of Facilities ($1,150.1 million in the FY2007 operating plan, $1,159.3 million requested for FY2008). Others include Program Readiness, which supports activities occurring at multiple sites or in multiple programs ($75.2 million in the FY2007 operating plan, $71.5 million requested for FY2008), and Material Recycle and Recovery, which recovers plutonium, enriched uranium, and tritium from weapons production and disassembly ($70.0 million in the FY2007 operating plan, $70.0 million requested for FY2008). Construction is a separate category within RTBF; the FY2007 operating plan included $262.5 million, and the FY2008 request is $307.1 million.

For FY2007, the House Appropriations Committee recommended reducing RTBF by $27.0 million from the request, including an increase of $73.0 million for Operations of Facilities and a reduction of $100.0 million, from a request of $112.4 million, for a Chemistry and Metallurgy Research Facility Replacement (CMRR) at Los Alamos. CMRR would replace a building about 50 years old that, among other things, conducts research into plutonium and supports pit production at TA-55. The committee stated that CMRR construction should be terminated and "[p]roduction capabilities proposed in the CMRR should be located at the future production site that supports the RRW and long term stockpile requirements." The committee noted that NNSA proposed to build a Consolidated Plutonium Production Center by 2022, so that "CMRR will serve its primary production support function for only eight years before it is made obsolete by the new plutonium facility." The House did not change these provisions in considering H.R. 5427. The Senate Appropriations Committee recommended $1,780.8 million for RTBF, including the amount requested for CMRR: "The Committee firmly believes [CMRR] will continue to play a central role in the plutonium mission at Los Alamos and is needed to support the research and chemistry mission of plutonium activities." The FY2007 operating plan included $53.4 million for CMRR, and the FY2008 request includes $95.6 million.

The House Appropriations Committee recommended the following amounts for RTBF for FY2008: for the entire program, $1,479.6 million, a reduction of $182.5 million; Operations of Facilities, $1,041.4 million, a reduction of $117.9 million; Program Readiness, $71.5 million, as requested; Material Recycle and Recovery, $73.0 million, an increase of $3.0 million; and construction, $236.5 million, a reduction of $70.6 million. The committee recommended no funds for CMRR, instead of the $95.6 million requested, to halt construction at the facility. It stated,

> Proceeding with the CMRR project as currently designed will strongly prejudice any nuclear complex transformation plan. The CMRR facility has no coherent mission to justify it unless the decision is made to begin an aggressive new nuclear warhead design and pit production mission at Los Alamos National Laboratory. The NNSA is directed to develop a long-term plan to maintain the

nation's nuclear stockpile requirements that does not assume an a priori case for the current program.

Other Programs. Weapons Activities includes four smaller programs in addition to DSW, Campaigns, and RTBF.

- Secure Transportation Asset provides for the transport of nuclear weapons, components, and materials safely and securely. It includes special vehicles used for this purpose, communications and other supporting infrastructure, and threat response. The FY2007 request was $209.3 million and the FY2007 operating plan included $209.5 million. The FY2008 request is $215.6 million, and the House Appropriations Committee recommended that amount.

- Nuclear Weapons Incident Response provides for use of DOE assets to manage and respond to a nuclear or radiological emergency within DOE, in the United States, or abroad. The FY2007 request was $135.4 million and the FY2007 operating plan included $133.5 million. The FY2008 request is $161.7 million, and the House Appropriations Committee recommended that amount.

- Facilities and Infrastructure Recapitalization Program (FIRP) provides for deferred maintenance and infrastructure improvements for the nuclear weapons complex. In contrast, NNSA states RTBF "ensure[s] that facilities necessary for immediate programmatic workload activities are maintained sufficiently." The FY2007 request for FIRP was $291.2 million. The House Appropriations Committee recommended reducing the latter sum by $145.0 million, and "directs the NNSA to reassess its out-year planning for FIRP projects to ensure coordination between FIRP funds and the reduced facility requirements consistent with the consolidation of the complex under the long-term Responsive Infrastructure planning." H.R. 5427, as passed by the House, left these provisions unchanged. The Senate Appropriations Committee made a number of changes to FIRP and recommended $283.2 million. It said the funds were "to restore, rebuild, and revitalize the physical infrastructure of the nuclear weapons complex." The FY2007 operating plan included $169.4 million. The FY2008 request is $293.7 million; the House Appropriations Committee recommended $137.7 million on grounds that NNSA should reassess how it will use the final years of FIRP funding in a way that is consistent with long-term plans for Complex transformation.

- Safeguards and Security (S&S) provides operations and maintenance funds for physical and cyber security, and related construction. In the wake of 9/11, the relevant threats and the Design Basis Threat changed. Ambassador Linton Brooks, then Administrator of NNSA, stated in 2005, "We must now consider the distinct possibility of well-armed and competent terrorist suicide teams seeking to gain access to a warhead in order to detonate it in place. This has driven

our site security posture from one of 'containment and recovery' of stolen warheads to one of 'denial of any access' to warheads. This change has dramatically increased security costs for 'gates, guns, guards' at our nuclear weapons sites." The cost of S&S is a major concern for Congress and NNSA. Many changes have been proposed to reduce Complex security costs, such as reducing the area to be guarded by reducing the footprint of several sites and by consolidating uranium and plutonium at fewer sites. The FY2006 S&S appropriation was $797.8 million. The FY2007 request was $754.4 million, and the FY2007 operating plan included $761.2 million. The FY2008 request is $881.1 million. (The foregoing figures do not reflect S&S offsets for work for others of $32.0 million for FY2006, $33.0 million for FY2007, and $34.0 million for FY2008.) The House Appropriations Committee recommended $911.6 million for S&S, an increase of $30.5 million.

Nonproliferation and National Security Programs. DOE's nonproliferation and national security programs provide technical capabilities to support U.S. efforts to prevent, detect, and counter the spread of nuclear weapons worldwide. These nonproliferation and national security programs are included in the National Nuclear Security Administration (NNSA).

Table 13. DOE Defense Nuclear Nonproliferation Programs

($ millions)

Program	FY2007	FY2008 Request	House	Senate	Conf.
Nonproliferation & Verification R&D	$270.4	$265.3	$440.4		
Nonproliferation & International Security[a]	128.9	124.9	144.9		
International Materials Protection, Control and Accounting (MPC&A)	472.7	371.8	831.8		
Elimination of Weapons-Grade Plutonium Production	225.7	181.6	191.6		
Fissile Materials Disposition	470.1	609.5	66.8[b]		
Global Threat Reduction Initiative	115.5	119.6	251.3		
Total	**1,683.3**	**1,672.6**	**2,070.6**		

Sources: DOE FY2008 Congressional Budget Request; P.L. 110-5; DOE FY2007 Operating Plan; H. Approp. Rept. 110-185.

Note: Numbers may not add due to rounding.

a. Includes funding for two formerly separate programs: Russian Transition Initiatives and HEU Transparency Implementation.
b. Funding for MOX plant transferred to Nuclear Energy, and Pit Disassembly plant to NNSA.

Funding for these programs in FY2007 was $1.818 billion, including $135 million appropriated in the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Act, 2007 (H.R. 2206, P.L. 110-28). For FY2008, the Administration requested $1.673 billion. The House Appropriations Committee recommended $1.684 billion, not including two construction projects for which the Administration requested $393.8 million and which the Appropriations Committee recommended moving to other programs.

The Nonproliferation and Verification R&D program was allotted $262.4 million in DOE's FY2007 Operating Plan; for FY2008, the Administration requested $265.3 million. The House Appropriations Committee, citing "the urgent need to develop advanced proliferation detection technology and nuclear explosion monitoring capability," boosted funding for this activity to $484.3 million.

Nonproliferation and International Security programs include international safeguards, export controls, and treaties and agreements. They would have received $127.41 million in the FY2007 request, including the transfer of two previously independent programs: Russian Transition Initiatives and HEU Transparency Implementation. These three programs received $133.2 million in FY2006. The House bill and the Senate Appropriations Committee recommendation followed the Administration's request. The DOE Operating plan allotted $128.9 million for FY2007. The FY2008 request was $124.9 million. The House Appropriations Committee recommended increasing funding to $144.9 million.

International Materials Protection, Control and Accounting (MPC&A), which is concerned with reducing the threat posed by unsecured Russian weapons and weapons-usable material, would have received $413.18 million under the President's FY2007 request, compared with $422.73 million appropriated for FY2006. P.L. 110-5 specified $472.7 million for this program. The FY2008 request was $371.8 million. The House Appropriations Committee recommended boosting MPC&A funding to $831.8 million, labeling the move "clear congressional direction to the Administration to shift the nuclear nonproliferation issues beyond marginally supported security programs to one accorded the highest priority in the war on world wide terror."

Requested funding for the Fissile Materials Disposition program for FY2006 was $653.1 million. The program's goal is disposal of U.S. surplus weapons plutonium by converting it into fuel for commercial power reactors, including construction of a facility to convert the plutonium to "mixed-oxide" (MOX) reactor fuel at Savannah River, South Carolina, and a similar program in Russia. The House Appropriations Committee cut funding for the Savannah River facility sharply for FY2006, citing delays in agreement with Russia over the program. The final appropriation for FY2006 was $468.8 million.

For FY2007, the Administration, noting that the issue that had delayed the program in Russia had been resolved, requested $603.3 million. However, the House Appropriations Committee report said "in 2006 it has become clear that the Russian government is not going to participate in the MOX-light water reactor" plan that the United States has proposed, and the House-passed version of H.R. 5427 would have

cut the funding drastically to $248.0 million. The move would have shut down the MOX-fuel construction project at Savannah River.

The Senate Appropriations Committee in its FY2007 report likewise expressed disappointment that the Russian government was not pursuing its program to convert surplus weapons plutonium to MOX, but supported the continuation of the U.S. program to convert its own surplus weapons plutonium to MOX with continued construction of the facility at Savannah River. The Senate version of H.R. 5427 would have funded the Fissile Materials Disposition program at $618.4 million, $15 million more than requested by the Administration.

P.L. 110-5 specifies that the "Secretary of Energy may not make available any of the funds provided by this division or previous appropriations Acts for construction activities for Project 99-D-143, mixed oxide fuel fabrication facility, Savannah River Site, South Carolina, until August 1, 2007." DOE's FY2007 Operating Plan allocates $470.1 million for Fissile Materials Disposition, including $262.5 million for Project 99-D-143.

For FY2008 the Administration requested $609.5 million for Fissile Materials Disposition, including $393.8 million for construction. The House Appropriations Committee, noting that Russia had decided in 2006 not to pursue plutonium disposition in light water MOX reactors but to build fast breeder reactors instead, declared the bilateral agreement a failure and asserted that the $1.7 billion previously appropriated for facilities to be used in the U.S. side of the plutonium disposal agreement "without any nuclear nonproliferation benefit accrued to the U.S. taxpayer." The committee recommended transferring the MOX plant and another project, the Pit Disassembly and Conversion Facility (PDCF), both at Savannah River, SC, to the nuclear energy program and NNSA's weapons program respectively.

Environmental Management. In the late 1980s, the United States ceased its production of nuclear weapons, due to military projections that the nuclear weapons stockpile was sufficient to protect national security and respond to future threats. The past production of these weapons generated substantial quantities of radioactive and other hazardous wastes, and resulted in contamination of soil, groundwater, and buildings. As a consequence, environmental problems arising from this past production continue to present challenges today. However, potential health and environmental risks vary considerably among individual sites, depending on the type and quantity of waste and contamination present at each site, and the potential for exposure to wastes and contaminants.

The adequacy of funding to address health and environmental risks resulting from the past production of nuclear weapons is a long-standing issue. DOE established the Office of Environmental Management in 1989 to consolidate its efforts to administer the cleanup of former nuclear weapons sites. These efforts include the disposal of radioactive and other hazardous wastes, management and disposal of surplus nuclear materials, the remediation of soil and groundwater contaminated from such wastes, and the decontamination and decommissioning of excess buildings and facilities. Through this program, DOE also administers the disposal of wastes and remediation of contamination at sites where the federal

government conducted civilian nuclear energy research. Altogether, there were 114 "geographic"[19] sites in 30 states where these activities resulted in the generation of wastes and contamination.

Some of the ongoing issues associated with the disposal of wastes and the cleanup of contamination have been the adequacy of risk-based approaches to address these needs; the technical soundness of waste treatment facility designs; how to safely remove, treat, and dispose of high-level radioactive waste stored in underground tanks;[20] the effectiveness and cost-savings of incentive-based cleanup contracts; and the pace and adequacy of cleanup overall. The challenges of the Environmental Management Program to dispose of wastes and clean up contamination are substantial and require significant resources. As such, this program represents approximately one-fourth of the Department's total budget.

Congressional Action on FY2008 Appropriations. As indicated in **Table 14** below, the House Appropriations Committee recommended a total of $6.21 billion for DOE's Environmental Management Program for FY2008.[21] The recommendation is more than the President's request of $5.66 billion and the FY2007 funding level of $6.19 billion. This recommended increase is partially due to a proposal to consolidate the Office of Legacy Management within the Environmental Management Program. This office has been funded under other accounts, and is responsible for long-term site care after cleanup is complete under the Environmental Management Program.

Although the House committee recommended an overall increase, it recommended the President's requested reductions for "accelerated closure" sites where cleanup is complete. These sites include Rocky Flats (CO), Fernald (OH) and several other defense sites. Congress had increased funding at these sites for several years to speed the pace of cleanup. These sites were suitable for accelerated cleanup because the challenges were more technically feasible to address than those at more complex sites. Now that most of the work is completed, or nearing completion, there has been a corresponding downward trend in funding.

Substantial challenges remain at many sites with large quantities of wastes and contamination, at which cleanup is not complete. For these and other pending sites, there are varying decreases and increases in funding when comparing the House recommendations to the FY2008 request and FY2007 funding. The differences in

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[19] DOE makes a distinction between its "geographic" sites, which represent entire facilities and the lands they occupy, and the thousands of discrete contaminated sites located on each facility that have been, or need to be, cleaned up. One of these geographic sites, the Waste Isolation Pilot Plant in New Mexico, was constructed as a repository to dispose of transuranic radioactive waste from other sites. Although this facility is not a cleanup site, its operation is essential to the cleanup of transuranic waste at many sites where such waste is removed and prepared for permanent disposal off-site.

[20] See CRS Report RS21988, *Radioactive Tank Waste from the Past Production of Nuclear Weapons: Background and Issues for Congress*, by David Bearden and Anthony Andrews.

[21] The $6.21 billion total reflects a $463 million offset that would result from federal payment to the Uranium Enrichment Decontamination and Decommissioning Fund.

funding are due to varying factors at each site, such as the complexity of remaining cleanup needs, the prioritization of remedial actions based on health and environmental risks, the scheduling of specific actions to meet time frames in regulatory agreements, and numerous other considerations.

The Hanford site is the largest and most complex site administered under the Environmental Management Program. This site alone represents roughly one-third of the funding for the entire program. The adequacy of funding to clean up Hanford has been particularly controversial for many reasons, including potential risks from radioactive contamination migrating through groundwater into the Columbia River and the delayed construction of the Waste Treatment and Immobilization Plant. This facility is a key element in DOE's plans to treat the substantial volume of high-level radioactive waste to be removed from the underground tanks at Hanford, and to solidify that waste for permanent disposal in a geologic repository. This task is one of the more costly cleanup challenges across the complex of sites.

Construction of the Waste Treatment and Immobilization Plant has been delayed as a result of various engineering and design issues. The President's FY2008 budget request included $690 million for this facility, the same as provided in FY2007. The request included $273 million for the management of the wastes still stored in the underground tanks, nearly the same as in FY2007. The House committee recommended $100 million less than the President requested for the Waste Treatment and Immobilization Plant, and the same amount as requested for the management of wastes still left in the tanks. The House report indicated that the funding shortfall for the plant could be met with $100 million in "uncosted balances" carried over from FY2007 because of slowdowns in construction progress

Table 14 below indicates funding for the Environmental Management Program in FY2007 and proposed for FY2008, including the FY2007 appropriation, the President's FY2008 budget request, and funding recommended by the House Appropriations Committee. Amounts are indicated for each of the three statutory accounts that fund the Environmental Management Program, and for selected sites and program activities within those accounts in which there has been broad congressional interest.

Table 14. Environmental Management Program Appropriations

($ millions)

Environmental Management Program Accounts	FY2007	FY2008 Request	House Committee	Senate	Conf.
Defense Environmental Cleanup					
Accelerated Closure Sites	$468.1	$42.4	$42.4		
Ashtabula	$1.3	$0.3	$0.3		
Fernald	$254.8	$0.0	$0.0		
Miamisburg	$39.9	$30.3	$30.3		
Rocky Flats	$115.5	$0.0	$0.0		
Closure Sites Administration	$56.6	$11.8	$11.8		
Hanford	$1,802.4	$1,840.5	$1,813.4		
Richland Office	$835.3	$877.1	$950.0		
Office of River Protection	$967.1	$963.4	$863.4		
Waste Treatment Plant	*$690.0*	*$690.0*	*$590.0*		
Tank Farm Activities	*$277.1*	*$273.4*	*$273.4*		
Savannah River Site	$1,113.4	$1,206.1	$1,160.5		
Idaho National Laboratory	$526.9	$504.0	$600.8		
Oak Ridge Reservation	$203.9	$179.3	$235.3		
Waste Isolation Pilot Plant	$228.8	$219.7	$219.7		
NNSA and Nevada Off-Sites	$306.5	$271.1	$271.1		
Technology Development	$21.4	$21.4	$108.1		
Safeguards and Security	$275.9	$273.4	$278.4		
Program Direction [a]	$294.5	$309.8	$341.8		
Program Support	$38.0	$33.1	$35.1		
Federal Payment to Uranium Enrichment D&D Fund [b]	$452.0	$463.0	$463.0		
Defense Legacy Management [a]	$0.0	$0.0	$148.1		
Material Consolidation [c]	$0.0	$0.0	$50.3		
Subtotal Defense Environmental Cleanup [d]	$5,731.8	$5,363.9	$5,768.0		
Transfer to ES & H [e]	$0.0	$0.0	$-1.5		
Total Defense Environmental Cleanup	$5,731.8	$5,363.9	$5,766.6		
Non-Defense Environmental Cleanup [a]	$349.9	$180.9	$286.0		
Uranium Enrichment D&D Fund [b]	$556.6	$573.5	$618.8		
Uranium Enrichment D&D Fund Offset [b]	$-452.0	$-463.0	$-463.0		
Total Environmental Management	$6,186.3	$5,655.3	$6,208.4		

Sources: Prepared by the Congressional Research Service with information from H.Rept. 110-185.

a. The House report recommended the consolidation of the Office of Legacy Management into the Environmental Management Program, including $11.0 million within the Program Direction line-item in the Defense Environmental Cleanup account, $148.1 million as a separate line-item within that defense account, and $35.1 million as a separate line-item within the Non-Defense Environmental Cleanup account. Combined, the House report recommended a total of $194.2 million for the Office of Legacy Management. The President requested this same amount, but in different accounts in which Congress has provided this funding in past years. The President requested $159.1 million for *defense* Legacy Management within the Other Defense Activities account, and $35.1 million for *non-defense* Legacy Management within the Energy Supply and Conservation account, for a total of $194.2 million.

b. D&D = Decontamination and Decommissioning. Federal payment to the Uranium Enrichment D&D Fund is typically treated as an offset to the total for the Environmental Management Program.

c. The House report recommended a new Office of Materials Consolidation, which was not included in the President's FY2008 request.

d. P.L. 110-5 provided a total of $5,730,448,000 for the Defense Environmental Cleanup account. DOE allocated $5,731,839,000 for this account in its FY2007 Operating Plan, but did not explain the difference from the statutory appropriation provided in P.L. 110-5. The House report specifies the same amount of funding for FY2007, as in DOE's Operating Plan.

e. ES & H = Environmental Safety and Health account. The House report recommended a transfer of $1.5 million from the Dense Environmental Cleanup account to the Environmental Safety and Health account in FY2008.

Estimated Future Funding Needs. The need for annual appropriations of several billion dollars to clean up nuclear waste sites has motivated ongoing concern within Congress about the long-term financial liability of the United States to meet these needs. Accordingly, there has been much debate about how to ensure public health and safety, and the protection of the environment, in the most expedient and cost-effective manner. DOE reports that it had cleaned up 81 of the 114 geographic sites as of the end of FY2006.[22] Although DOE has disposed of substantial quantities of waste and remediated many areas of contamination at the remaining sites, much work remains to be done to complete cleanup at many of them. DOE expects to complete cleanup at certain sites within the next few years. However, the Department anticipates cleanup to continue for decades at the larger and more complex sites, such as Hanford, Savannah River, and the Idaho National Laboratory, where high-level radioactive waste is in need of treatment and disposal, and soil and groundwater contamination are generally more severe. Based on recent assumptions, DOE expects cleanup and disposal of wastes to be complete at Savannah River in 2031, at the Idaho National Laboratory in 2035, and at Hanford in 2042.[23]

Accurately assessing the time and funding needed to complete cleanup and dispose of all radioactive and other hazardous wastes is difficult at best. Developing

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[22] DOE, Office of the Chief Financial Officer, FY2008 Congressional Budget Request, February 2007, vol. 5, Environmental Management, p. 31. DOE referenced 108 geographic sites, as it excluded six Nevada off-sites proposed for transfer to the Office of Legacy Management. The total of 114 geographic sites noted above includes these six sites.

[23] Ibid., p. 40. Two separate offices within the Environmental Management Program administer cleanup and disposal of wastes at Hanford: the Richland Office and the Office of River Protection. The projected completion date for activities of the Richland Office is 2035, and the projected completion date for activities of the Office of River Protection is 2042. The primary purpose of this latter office is to remove, treat, and dispose of high-level radioactive waste stored in underground tanks near the Columbia River.

reliable estimates is especially challenging for the larger, more complex sites where many final decisions have yet to be made because of technical limitations and uncertainties, such as the "end state"[24] of many sites. DOE periodically revises its estimates of outstanding costs to complete cleanup and dispose of wastes as individual project baselines and assumptions change. These estimates have varied widely over time by many billions of dollars. DOE reports its financial liabilities for the Environmental Management Program, and all of its other program responsibilities, in its annual financial statements contained in the Department's performance and accountability reports. DOE's *Performance and Accountability Report for FY200*6 estimated that, as of the end of FY2006, $159 billion would be needed to complete cleanup and dispose of wastes at the remaining sites administered under DOE's Environmental Management Program.[25] The $159 billion estimate is not adjusted for inflation and is in FY2006 dollars. As DOE acknowledged, future inflation could result in actual costs being substantially higher than estimated.

In addition to inflation, other factors could cause actual costs to exceed the $159 billion estimate. For example, actual costs could be higher than expected, depending on whether federal and state regulators may require more stringent and costlier cleanup actions than DOE plans to take. Costs also could rise if initial cleanup actions prove inadequate to protect human health and the environment over the long-term. Future performance of cleanup actions is especially critical for nuclear waste sites because of the rate of decay of radioactivity, which can be thousands of years, depending on the particular radionuclide. Predicting the effectiveness of methods to contain radioactive wastes over such long periods of time is challenging, if not impracticable, in some cases. Consequently, additional funding could be needed at sites where cleanup was thought to be complete, if the initial cleanup proves inadequate over time.

DOE's $159 billion estimate also does not include the costs of long-term care of sites once wastes are disposed of, and cleanup remedies are in place, to ensure the protection of human health and the environment into the future. DOE's *Performance and Accountability Report for FY2006* estimated that, as of the end of FY2006, $18 billion would be needed for cleanup and post-closure site responsibilities after work under the Environmental Management Program is completed.[26] These responsibilities include surveillance and monitoring, long-term operation and maintenance of soil and groundwater cleanup remedies, and disposal of excess materials remaining on-site after closeout under the Environmental Management Program. DOE estimated that this $18 billion cost would be incurred over 75 years

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[24] DOE uses the term "end state" to denote the intended condition or land use of a contaminated site once cleanup is complete. Determining the end state is critical to making cleanup decisions, as the degree of cleanup required, and the specific action to achieve that degree of cleanup, are dependent on the potential pathways of human exposure that would occur as a result of how the land will be used in the future. Land uses resulting in greater potential for human exposure generally require a greater degree of cleanup.

[25] DOE, *Performance and Accountability Report for FY2006*, pp. 173-175.

[26] Ibid.

through FY2081.[27] DOE expects some long-term site care to be needed beyond this time, requiring additional funding. However, the Department "believes" that costs beyond 75 years cannot "reasonably" be estimated because of uncertainties inherent to such distant time frames.[28] The President's FY2008 budget request for long-term site care, and other related responsibilities at these sites, is discussed below.

Long-Term Site Care. Once a site is cleaned up and there is no continuing DOE mission, responsibility for long-term care of the site is transferred to DOE's Office of Legacy Management.[29] This office also manages the payment of pensions and post-retirement benefits of former contractor personnel who worked at these sites.[30] The House Appropriations Committee draft FY2008 report recommended the President's FY2008 budget request of $194 million for the Office of Legacy Management. Of this amount, $159 million would be allocated to defense sites, and $35 million would be allocated to non-defense sites.

As specified in **Table 14**, the House report recommended consolidating the funding for this office within the Environmental Management Program's accounts. In this report, the expectation was noted that the Office of Legacy Management would continue to operate as a separate office within the Environmental Management Program. The effect of this proposed consolidation would appear to be a shift in funds among accounts, rather than a change in the office's administration or function. The recommendation in the House report is $130 million more than the $64 million provided for FY2007. The increase is primarily due to greater funding needs for long-term care, and pension and post-retirement benefits, at defense sites transferred from the Environmental Management Program after physical cleanup is complete. As more sites are transferred upon the completion of cleanup in future years, funding needs for Legacy Management will grow accordingly.

Table 15. Office of Legacy Management Appropriations

($ millions)

Type of Site	FY2007	FY2008 Request	House Committee	Senate	Conf.
Defense	$30.9	$159.1	$159.1		
Non-defense	$33.2	$35.1	$35.1		
Total	$64.1	$194.2	$194.2		

Sources: Prepared by the Congressional Research Service with information from H.Rept. 110-185.

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[27] Ibid.

[28] Ibid.

[29] When there is a continuing mission, long-term site care is transferred to the program office within DOE responsible for administering that mission or is the "landlord" of the site.

[30] Likewise, at sites with a continuing mission, payment of pensions and post-retirement benefits is assigned to the program office within DOE that is responsible for administering that mission or is the "landlord" of the site, rather than the Office of Legacy Management.

Power Marketing Administrations. DOE's four Power Marketing Administrations (PMAs) — Bonneville Power Administration (BPA), Southeastern Power Administration (SEPA), Southwestern Power Administration (SWPA), and Western Area Power Administration (WAPA) — were established in response to the construction of dams and multipurpose water projects operated by the Bureau of Reclamation and the Army Corps of Engineers. In many cases, conservation and management of water resources — including irrigation, flood control, recreation or other objectives — were the primary purpose of federal projects. However, these facilities often generated electricity to meet project needs; PMAs were established to market the excess power. (For more information, see CRS Report RS22564, *Power Marketing Administrations: Background and Current Issues*, by Nic Lane.)

Priority for PMA power is extended to "preference customers," which include municipal utilities, co-ops, and other "public" bodies. The PMAs sell power to these entities "at the lowest possible rates" consistent with what they describe as "sound business practice." The PMAs are responsible for covering their expenses and for repaying debt and the federal investment in the generating facilities.

The Administration's net FY2008 request for the PMAs is $217.4 million. This includes $2.5 million for the Falcon and Amistad O&M fund as well as -$23 million for the anticipated difference between WAPA's Colorado River Basins Power Marketing Fund expenses and offsetting collections. The FY2008 request is a reduction of 5.0% from the FY2007 request of $229.0 million. House Committee funding recommendations for the PMAs are the same the Department of Energy's FY2008 Budget Request.

In FY2008 WAPA, SEPA, and SWPA propose to assign "Agency Rates" to new obligations. The Agency Rate is the rate at which federal corporations and BPA borrow. This change was expected to have a rate impact of less than 1% (the Agency Rate was 0.4% higher on average than PMA rates from 1997-2005). The House Appropriations Committee did not address agency rates. The Committee did, however, reject the proposal to change PMA rates to market-based rates or to recover O&M expenses through offsetting collections.

BPA receives no annual appropriation but funds some of its activities from permanent borrowing authority, which was increased in FY2003 from $3.75 billion to $4.45 billion (a $700 million increase). BPA plans to use $538 million of its borrowing authority in FY2008. The House Appropriations Committee recommendation is for no additional borrowing authority for BPA.

Beginning in FY2008, BPA proposes to use secondary net revenues beyond $500 million to make advance amortization payments to the Treasury on BPA's bond obligations. BPA is expecting this additional revenue to be $130 million in FY2008. P.L. 110-28, §6202 prevents this use of BPA revenue.

Title IV: Independent Agencies

Independent agencies that receive funding from the Energy and Water Development bill include the Nuclear Regulatory Commission (NRC), the Appalachian Regional Commission (ARC), and the Denali Commission.

Table 16. Energy and Water Development Appropriations
Title IV: Independent Agencies
($ millions)

Program	FY2007	FY2008 Request	House	Senate	Conf.
Appalachian Regional Commission	$65.0	$65.0	$35.0		
Nuclear Regulatory Commission (Revenues) Net NRC	821.6 (667.4) 154.2	916.6 (765.1) 151.5	933.8 (765.1) 168.9		
Defense Nuclear Facilities Safety Board	21.8	22.5	22.5		
Nuclear Waste Technical Review Board	3.6	3.6	3.6		
Denali Commission	49.5	2.0	1.8		
Delta Regional Authority	11.9	6.0	6.0		
Total	**306.0**	**251.5**	**237.8**		

Source: FY2008 Budget Request; H.Rept. 110-185.

Key Policy Issues — Independent Agencies

Nuclear Regulatory Commission. The Nuclear Regulatory Commission (NRC) requested a total budget of $916.6 million for FY2008, including $8.1 million for the NRC inspector general's office. The request was about 10% above the FY2007 funding level of $821.6 million. Major activities conducted by NRC include safety regulation and licensing of commercial nuclear reactors, licensing of nuclear waste facilities, and oversight of nuclear materials users.

The NRC budget request included $216.9 million for new reactor activities, largely to handle anticipated new nuclear power plant license applications. No commercial reactor license applications have been submitted to NRC since the 1970s, but higher fossil fuel prices and incentives provided by the Energy Policy Act of 2005 (P.L. 109-58) have prompted electric utilities to announce plans for more than 30 reactor license applications over the next few years.

NRC's proposed budget included $37.3 million for licensing DOE's planned Yucca Mountain nuclear waste repository, with the expectation that DOE will submit a repository license application in FY2008.

For reactor oversight and incident response, NRC's FY2008 budget request included $246.4 million. NRC plans to oversee about 150 annual reactor security inspections, including 21 force-on-force exercises, during FY2008. (For more information on protecting licensed nuclear facilities, see CRS Report RS21131, *Nuclear Power Plants: Vulnerability to Terrorist Attack*, by Mark Holt and Anthony Andrews.)

The Energy Policy Act of 2005 permanently extended a requirement that 90% of NRC's budget be offset by fees on licensees. Not subject to the offset are expenditures from the Nuclear Waste Fund to pay for waste repository licensing, spending on generic homeland security, and DOE defense waste oversight. The budget request included offsets resulting in a net appropriation of $151.5 million.

The House Appropriations Committee recommended a $17.2 million increase in NRC's net appropriation, for academic scholarships and fellowships and for international program activities.

For Additional Reading

CRS Products

CRS Report RL31975. *CALFED Bay-Delta Program: Overview of Institutional and Water Use Issues*, by Pervaze Sheikh and Betsy A. Cody.

CRS Report RL33461. *Civilian Nuclear Waste Disposal*, by Mark Holt.

CRS Report RS20866. *The Civil Works Program of the Army Corps of Engineers: A Primer*, by Nicole T. Carter and Betsy A. Cody.

CRS Report RL32543. *Energy Saving Performance Contracts: Reauthorization Issues*, by Anthony Andrews.

CRS Report RS21331. *Everglades Restoration: Modified Water Deliveries Project*, by Pervaze A. Sheikh.

CRS Report RL30478. *Federally Supported Water Supply and Wastewater Treatment Programs*, by Betsy A. Cody, Claudia Copeland, Mary Tiemann, Nicole T. Carter, and Jeffrey A. Zinn.

CRS Report RL33298. *FY2006 Supplemental Appropriations: Iraq and Other International Activities; Additional Hurricane Katrina Relief*, coordinated by Paul M. Irwin and Larry Nowels.

CRS Report RS21442. *Hydrogen and Fuel Cell Vehicle R&D: FreedomCAR and the President's Hydrogen Fuel Initiative*, by Brent D. Yacobucci.

CRS Report RL31098. *Klamath River Basin Issues: An Overview of Water Use Conflicts*, coordinated by Betsy A. Cody.

CRS Report RL33558. *Nuclear Energy Policy*, by Mark Holt.

CRS Report RS21131. *Nuclear Power Plants: Vulnerability to Terrorist Attack*, by Mark Holt, and Anthony Andrews.

CRS Report RL31993. *Nuclear Warhead "Pit" Production: Background and Issues for Congress*, by Jonathan Medalia.

CRS Report RL32130. *Nuclear Weapon Initiatives: Low-Yield R&D, Advanced Concepts, Earth Penetrators, Test Readiness*, by Jonathan Medalia.

CRS Report RL32131. *Phosphorus Mitigation in the Everglades*, by Pervaze A. Sheikh and Barbara Johnson.

CRS Report RL32798. *Power Marketing Administrations: Proposals for Market-Based Rates*, by Kyna Powers.

CRS Report RL32163. *Radioactive Waste Streams: Waste Classification for Disposal*, by Anthony Andrews.

CRS Report RL33588. *Renewable Energy Policy: Tax Credit, Budget, and Regulatory Issues*, by Fred Sissine.

CRS Report RL32347. *"Bunker Busters": Robust Nuclear Earth Penetrator Issues, FY2005-FY2007*, by Jonathan Medalia.

CRS Report RL32189. *Terrorism and Security Issues Facing the Water Infrastructure Sector*, by Claudia Copeland.