

# RECLAMATION

## Management Discussion and Analysis

The Management Discussion and Analysis (MD&A) section of the Bureau of Reclamation's *Annual Report* summarizes Reclamation's fiscal year (FY) 2003 accomplishments and future challenges. More detail on our projects and activities is at our main Web site (<http://www.usbr.gov>). The Government Performance and Results Act (GPRA) requires every agency to define specific performance goals and report how it met these goals. As required by the Federal Accounting Standards Advisory Board guidelines, this report describes Reclamation's goals, accomplishments, performance results, strategies, opportunities, and challenges.

In FY 2003, Reclamation focused on the heart of our mission, which is delivering water and power to customers, while incorporating other demands for water resources, water conservation, new technology, interagency collaboration and coordination, and improving management accountability.

# MD&A

## President Bush's Commitment

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President Bush's Agenda calls for accountability and results. Living up to those expectations is what *The President's Management Agenda* is all about. While the Agenda calls for sweeping reform of how the Government does business, President George W. Bush wants to know how each Government agency, including Reclamation, will deliver on his commitment.

“What matters in the end is completion. Performance. Results. Not just making promises, but making good on promises. In my administration, that will be the standard for the farthest regional office of Government to the highest office in the land,” said President Bush in the opening remarks of his Agenda, which he launched in August 2001. Reclamation will highlight five of the President's initiatives, which are designed to improve processes, services, and products Government-wide. These initiatives are:

- Strategic Management of Human Capital

- Expanded Electronic Government
- Competitive Sourcing
- Budget and Performance Integration
- Improved Financial Performance

The President, through the Office of Management and Budget, will measure our accomplishments using an Executive Branch Management Scorecard. Reclamation will measure our accomplishments not only through the measurements provided by the President, but also by the way we meet our commitments to our customers.

Reclamation faces challenges every day from rapid technology changes, security, shifting demographics, increasing water demands, and aging infrastructure. These initiatives will guide our daily work while we strive to meet our commitments to the American public.

# MD&A

## Reclamation's Commitment

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**R**eclamation has served the American public for more than 100 years, providing water for the Nation's Western farms, cities, recreation, hydropower, and the environment. In our early years, we began to make dependable water supplies available and to make flood protection a reality for settlers. Today, we are committed to making vital contributions to the economy and quality of life in the Western United States.

Reclamation is the Nation's largest wholesale water supplier,

administering 348 reservoirs with a total storage capacity of 245 million acre-feet of water that supply a third of the West with agricultural, municipal, and industrial water. One out of every five Western farmers receives water from Reclamation projects, producing about 60 percent of the Nation's vegetables and 25 percent of its fruits and nuts. In addition, Reclamation provides hydroelectric power to supply the needs of 9 million people. There are more than 90 million visits each year to Reclamation lakes to enjoy outdoor recreation activities.

## The Heart of Reclamation's Mission (2003) Accomplishments

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**T**he following MD&A will highlight accomplishments and strategies that strive to meet the Commissioner's overarching goals to deliver water, generate power, address other requirements, and plan for future water needs.

### Commissioner's Over-arching Goals

- Ensure the reliable delivery of water under Reclamation contracts.
- Optimize power generation, consistent with other project purposes.
- Incorporate other considerations, such as recreation, fish and wildlife, environment, and Native American trust responsibilities, into our water and power operations.
- Identify and plan for future consumptive and nonconsumptive water supply needs by identifying unmet needs in the next 25 years.

# Water 2025: Planning for the Future Today

## *The Six Principles of Water 2025*

- *Recognize and respect State, tribal, and Federal water rights, contracts, and interstate compacts or decrees of the United States Supreme Court that allocate the right to use water*
- *Maintain and modernize existing water facilities so they will continue to provide water and power*
- *Enhance water conservation, use efficiency, and resource monitoring to allow existing water supplies to be used more effectively*
- *Use collaborative approaches and market-based transfers to minimize conflicts*
- *Improve water treatment technology, such as desalination, to help increase water supply*
- *Existing water supply infrastructure can provide additional benefits for existing and emerging needs for water*

The challenge to provide adequate water in the West is more complex than ever before and promises to be one of the greatest challenges the Nation faces in the coming decades. In recognition of this challenge, Interior Secretary Gale Norton recently announced a new initiative: *Water 2025: Preventing Crises and Conflict in the West*. As the Department of the Interior's (Interior) foremost water resources management agency in the West,

Reclamation will be instrumental in making *Water 2025* a reality.

*Water 2025* is Interior's commitment to work with States, tribes, local governments, and the public to address water supply challenges in the West over the next 25 years.

*Water 2025* recognizes that State and local governments should have a leading role in meeting these challenges. The initiative provides for a public discussion of the realities facing limited water supplies in the West. It sets up a framework to identify those watersheds facing the greatest potential risk for water shortages. Finally, it evaluates effective ways to address these challenges and recommends cooperative planning methods and useful tools for reaching viable solutions.

*Water 2025* will ensure that available Federal dollars, expertise, and research are focused in areas that will provide the greatest benefits to the West and the rest of the Nation. Maximizing these resources to address long-term, water supply challenges will help avoid the high costs and consequences of managing from one crisis to the next. Further information on *Water 2025* is available at <<http://www.doi.gov/water2025/>>.

# MD&A

## Delivering Water

Throughout the West, Reclamation fulfills our contractual obligations to deliver water. Several interrelated realities pose potential water management challenges:

- Explosive population growth in areas of the West where water is already scarce.
- Water shortages occur frequently in the West.
- Water facilities are aging
- Crisis management is not effective in dealing with water conflicts.

To help address these challenges, Reclamation considers many resource needs (for example, recreation, fish and wildlife habitat, environmental enhancement, and Native American trust responsibilities), while ensuring reliable water deliveries under Reclamation contracts. Reclamation works with partners and stakeholders to protect and manage resources affected by Reclamation's operations.

Reclamation will continue to focus our attention and resources on areas where scarce Federal dollars can provide the greatest benefits to the West and the rest of the Nation. Our efforts under *Water 2025* will help identify hot spots and allow for pilot or demonstration projects to find potential solutions. These efforts will also encourage



discussions about competing needs to make people aware of the issues and minimize or avoid crises and conflict. The following sections highlight our FY 2003 accomplishments in delivering water.

**California's Central Valley Project transformed American agriculture.**

### Meeting Our Water Delivery Obligations

The amount of water available for delivery varies widely from year to year. Our ability to provide project benefits safely and reliably is affected by nature (for example, floods, droughts, earthquakes, and fires) and people (for example, changes in statutory requirements, litigation, water rights, and contracts). Reclamation must work within these constraints to meet its contract obligations.

**GPRA Goal for Delivering Water**

**Annual Goal/Performance Measure:** In FY 2003, deliver or release water from Reclamation owned and operated facilities, dependent on precipitation and water availability.

**Performance Indicator:** Acre-feet of water delivered.

Annual Target	Results	Goal Status
27,000,000	26,107,033	Behind target—estimated data

**Data Source:** Water records.

**Goal Notes:** Based on performance data estimates, we anticipate that the goal will not be met due to continuing drought conditions in parts of the Western United States. Final data are not available until mid- to late October.

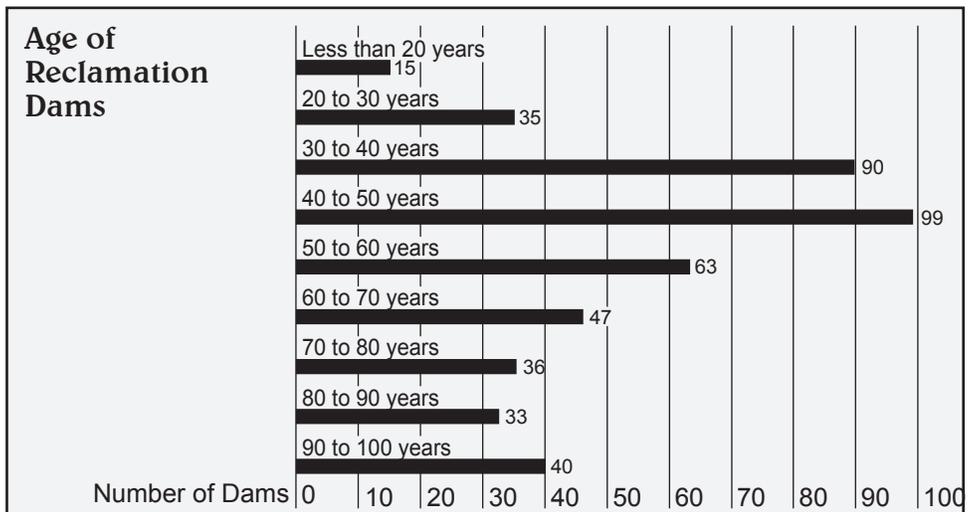
**Estimated Data:** Estimates are based on a 3-year average for water released in the fourth quarter added to actual data of the first three quarters. The final FY 2003 performance data will be provided in a FY 2003 Annual Performance and Accountability Supplemental Report published during the third quarter of FY 2004.

This measure continues into Interior's new strategic plan for FY 2003-FY 2008.

During FY 2003, Reclamation worked closely with water users from the Middle Rio Grande Project and San Juan-Chama Project in the Middle Rio Grande Basin. This is a challenging task. The basin continues to experience moderate-to-extreme drought conditions and contains endangered species that require minimum waterflows. Many of these entities also participate in the Middle Rio Grande Endangered Species Act Collaborative Program to improve the status of endangered species while ensuring that water uses are also protected. The 2003 biological opinion issued by the U.S. Fish and Wildlife Service takes an innovative approach to address water issues by requiring different flows under wet, average, and dry years, rather than mandating flows without regard to drought conditions.

Many projects, such as the Central Valley Project (CVP) in California, are operated to address different demands simultaneously. For example, in 2003, the CVP made available about 7,200,000 acre-feet of water for agriculture, 540,000 acre-feet for municipal and industrial water users, 400,000 acre-feet for wildlife refuges, and 800,000 acre-feet to protect and restore the San Francisco Bay-Delta fishery, as required by the Central Valley Project Improvement Act.

In the lower Colorado River Basin, despite a fourth consecutive year of substantial drought on the Colorado River, Reclamation delivered Arizona, California, and Nevada their full basic annual apportionment of river water. The United States' 1.5-



million-acre-foot obligation to deliver Colorado River water to Mexico under a 1944 Treaty also was met. Since the completion of Hoover Dam in 1935, Reclamation, acting on behalf of the Secretary of the Interior, has delivered to each of these States and to Mexico, at a minimum, their basic annual apportionment of Colorado River water, despite several periodic and severe droughts. In many years, hydrologic conditions in the basin have allowed Reclamation to deliver more than the basic annual apportionments to these entities.

### **Operating, Maintaining, and Upgrading Facilities to Store and Deliver Water**

Reclamation built facilities throughout the 20<sup>th</sup> century, and the older systems and facilities lack current engineering design concepts, which presents special challenges. (See the graph illustrating age range of Reclamation dams.) As Reclamation's infrastructure ages, costs for operating, maintenance, and rehabilitation continue to increase. We operate, maintain, and rehabilitate our facilities to minimize these costs and service disruptions. Reclamation is continuing to explore upgrading facilities to extend their useful life and help address these issues.

#### **Developing state-of-the-art materials**

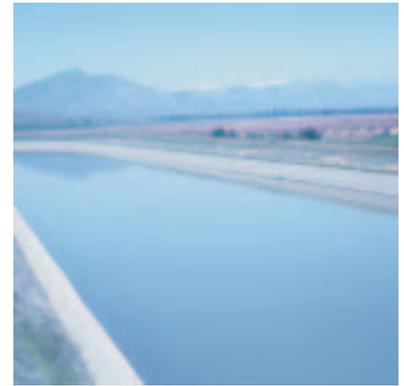
We need cutting edge research, technologies, and methods to save water and money by delivering water

when and where it is needed and avoiding waste. Reclamation evaluates, tests, and demonstrates a wide range of new technologies to conserve water and improve delivery and use. These demonstrations help our partners modernize operations and increase efficiency. Examples include:

- Evaluating current canal lining technologies to promote water savings and increase available water supplies. Reclamation and the Natural Resources Conservation Service worked cooperatively in FY 2003 to reduce canal and ditch seepage by applying polyacrylamide, a long-chain synthetic polymer that binds soil particles together. More than 100 miles of canals and ditches have been treated in this demonstration project in the Upper Colorado Region, Western Colorado Area Office.
- Modernizing operations. Reclamation also finished a 5-year effort to help the Tom Green Water Control and Improvement District No. 1 in Texas increase water delivery efficiency by 30 percent.

Reclamation is also exploring ways to upgrade and improve facilities. We develop state-of-the-art materials and procedures for facility maintenance to cost effectively extend the useful life of the facilities. Examples of this work include:

- Replacing the outlet valves at Arrowrock Dam in Idaho. This project neared completion in



**Reclamation worked with partners to reduce canal and ditch seepage by applying polyacrylamide lining.**

**Reclamation replaced outlet valves at Arrowrock Dam with patented clamshell gates.**



FY 2003. We are replacing the original valves installed in 1915 with modern, more efficient clamshell gates. We patented this clamshell gate design, which needs less frequent maintenance and does not require the reservoir to be drawn down to work on the gates. The new gates will allow for better management of flows for endangered bull trout without reducing the irrigation water supply.

- Preventing damage to stilling basins, which are concrete basins at the lower end of a spillway to prevent water from eroding the structure. Continuous forceful flows in stilling basins can draw in rocks and sand, which destroy the concrete. The damage is costly to water users; repairs may cause interruptions in water deliveries.
- Reclamation's Science and Technology Program developed a flow deflector that can help prevent this damage and significantly increase the reliability and lifespan of many stilling basins by triggering changes in waterflows to make the stilling basins self-cleaning. Reclamation conducted an initial demonstration and testing at Mason Dam in eastern Oregon during 2003.
- Developing new, high-performance concrete materials for underwater repairs of stilling basins at Canyon Ferry Dam in Montana and Red Bluff Dam in

California. Repairs using this technology cost an average of \$200,000, whereas traditional repairs require dewatering the facility, which can cost millions of dollars.

- Evaluating modern technologies to seal cracks at Pueblo Dam in Colorado. Leaking water damages expensive equipment including electrical conduits and controls. This sealing technology can be used across Reclamation projects, but the economic value of the water saved and the maintenance costs avoided at a single location can more than offset the research costs.
- Demonstrating a material to repair concrete on the spillway crest at Green Mountain Dam in Colorado. To reduce future maintenance and associated costs, Reclamation developed material that adheres to the old surfaces better and is more crack resistant than conventional repair material.

### **Restoring capacity by addressing safety**

Temporary operating restrictions, due to safety issues, result in less water storage capacity. Fixing these problems restores structures to full use. Examples include:

- Reclamation substantially completed modifications to the

Reclamation is redesigning the four dams at Horsetooth Reservoir, near Ft. Collins, Colorado, to meet updated standards for dam design and construction, including earthquake compliance and seepage prevention.



Excavator is used to construct a soil-bentonite wall during Keechelus Dam modifications.



storage. Work on Keechelus Dam continues and will be completed in FY 2004 to restore 18,000 acre-feet of storage.



Tour group attending Water Management Workshop watch hydraulic model of Folsom Dam in Denver's Water Resources Research Laboratory.

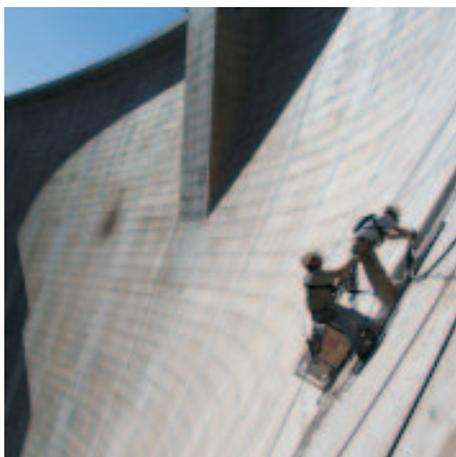
Horsetooth Reservoir dams in Colorado in FY 2003, and the reservoir is refilling to full storage and delivery capability. Reclamation modified the dams rather than imposing a permanent operating restriction on the reservoir, which would have permanently reduced the storage capacity by half (about 85,000 acre-feet).

- In Washington State, dam safety modifications to Salmon Lake Dam were completed in FY 2003 to restore 3,000 acre-feet of

### Promoting effective operation and maintenance

Since water users are responsible for some or all operation and maintenance costs at most facilities, both Reclamation and water users benefit from cost-effective operations. Reclamation is:

- Promoting a preventive maintenance philosophy to regularly inspect facilities and identify and fix deficiencies at an early stage to avoid more significant, costly actions.
- Providing regularly scheduled onsite and classroom training and distributing information to the people responsible for operating Reclamation dams.



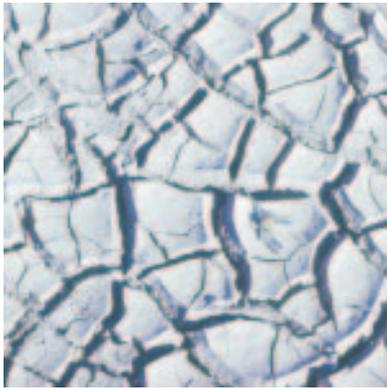
**Workers repair concrete on downstream face of Glen Canyon Dam.**

- Hosting workshops for operation and maintenance personnel. For example, in FY 2003, we held our annual Water Management Workshop which provided technical assistance and information to over 120 attendees from water user organizations, Reclamation, and other Federal agencies.

### **Thinking Outside the Box to Meet Water Demands**

In some cases, thinking outside the box can assist us in meeting additional demands, while protecting existing uses and stakeholder interests. Reclamation works with Federal, State, and local governments; partners; stakeholders; and others to determine new ways to meet demands in the 21<sup>st</sup> century. We use innovative nonstructural measures, such as water banks and markets, so water can be shifted to address unmet demands. In FY 2003, Reclamation developed new ways to meet changing water needs, including:

- Rented storage water and natural flows from willing irrigation districts and individuals in the Snake, Boise, Payette, Lemhi, and John Day Basin of Idaho and Oregon. This resulted in a win-win situation—irrigators received economic support in return for the water they provided to enhance riverflows for endangered salmon.



**Reclamation's Drought Program helps States, tribes, and local entities address the adverse impacts from droughts, including water shortages.**

- In 2003, an off-stream storage rule that became effective in late 2000 was proposed for use for the first time. This rule, which effectively resolved a long-standing prohibition against moving Colorado River water between the States of Arizona, Nevada, and California, is essentially an exchange program. After it was implemented, Nevada and Arizona entered into an agreement under which Nevada has been paying Arizona to pump unused Colorado River water from the river into the central part of that State for storage in ground water aquifers.

This year, Nevada determined it might need as much as 10,000 acre-feet of extra water above its basic Colorado River entitlement. Since surplus water was not available from the river, Nevada began proceedings to obtain this extra water under its agreement with Arizona. Essentially, Nevada asked Arizona to be prepared to forebear its use of as much as 10,000 acre-feet of Colorado River water, using the stored water to meet its needs instead. Then, Nevada notified Interior that it might be seeking approval to use as much as 10,000 acre-feet of extra water from the Colorado River to meet its needs. Because of an aggressive drought management plan, Nevada did not need the extra water this year. However, the Secretary of the Interior was prepared, and remains prepared, to approve this request or future requests for such water exchanges, after proper

certifications are made, to ensure Colorado River water use in the Lower Basin does not exceed approved amounts and to help the three States meet their future water needs.

Reclamation is working under the Reclamation States Drought Relief Act of 1991 to respond to drought conditions in the Western States. During FY 2003, Reclamation's actions included:

- Allowing storage of nonproject water in Reclamation facilities.
- Providing emergency assistance for Indian and non-Indian domestic water supplies in Montana, New Mexico, and Arizona.
- Purchasing water for endangered species requirements under the Endangered Species Act, thus allowing deliveries to continue to contractors.

### **Improving Water Management Information to Provide Effective Water Deliveries**

Determining water needs and the most efficient ways to manage water is a complex task. Knowing weather conditions, instream flow uses, and crop water use is vital to managing water under a variety of conditions and to creating water management plans. To help provide the most accurate information to the water managers, we develop more accurate water measurement devices, real-time monitoring networks, and



**The Milk River Project is a cooperative effort looking at current canal efficiencies.**

decision support systems that track and predict basinwide flows, weather conditions, crop and riparian water use, and actual depletions on a daily basis. These systems provide more accurate real-time data, improving water delivery management and enhancing operational responsiveness so water is provided when and where it is needed—and in the right amount. For example, we helped design and install more than 40 water measurement devices in the Wilder Irrigation District in Idaho's irrigation delivery system, which quantified deliveries for more effective crop irrigation.

Knowing surface and ground water interactions is crucial to managing water and understanding watersheds. For example, we are currently involved in a hydrology and water management study to determine how large the Arbuckle-Simpson aquifer in Oklahoma is and to evaluate ground water-surface water

interaction to understand the effects of withdrawing water from the aquifer.

Information of this kind is vital to developing water management plans. Reclamation goes further and helps districts with effective water management planning. Our Water Conservation Field Services Program (<http://www.usbr.gov/waterconservation/>) works on many projects to improve water delivery systems. Since the program's inception in 1997, Reclamation has helped 539 agricultural and urban water districts develop water management plans to improve water delivery, system operations, and water use efficiency. For example, in FY 2003, we helped develop a water budget and determined canal efficiencies for the Milk River Project in Montana to reveal inefficiencies and find solutions to use water more effectively.

We also work with local entities to plan and implement water conservation measures and improve monitoring and management. For example, we worked with 10 major water users to develop and endorse a plan on the San Juan River in New Mexico to share water in light of the historic low water levels and continuing drier-than-average forecasts. This cooperatively developed plan avoided litigation and laid the foundation for more efficient water management.

To improve water management plan effectiveness, Reclamation provides water information and training to water users. In FY 2003, we supported workshops and hands-on demonstrations to teach farmers about irrigation management, irrigation scheduling, estimating crop water use, and improving irrigation efficiencies. We worked with various educational institutions, such as North Dakota State University and South Dakota State University, to present workshops. Further, we hosted the Northern Colorado Stretching Agricultural Water Supplies Workshop to present new methods for irrigation management and other results from our research.

In 2003, Reclamation conducted several informational workshops in Arizona, Nevada, and California to make lower Colorado River water users aware of a new "era of limited water availability" in the lower Colorado River Basin. At these workshops, Reclamation presented information about projected future

water supplies for the lower basin, possible operating regimes for Lake Mead, and other data that could be used to help with long-range water management planning. The three States have, for the past 60-plus years, been able to essentially use as much Colorado River water as they could put to beneficial consumptive use. Now, with each of these States using its full entitlement, the Upper Basin States' increasing use of their Colorado River entitlements, and a severe drought that exacerbates the water supply situation, Reclamation foresees a time in which the surplus water is not as likely to be available as in previous years. Consequently, the three Lower Basin States will most likely receive only their basic annual apportionment of Colorado River water in most years.

### **Improving Water Treatment Technology to Tap Currently Unused Water**

To ensure the maximum benefit from available water, we develop new technologies to conserve and recycle, remediate impaired ground and surface water, and desalinate seawater and brackish ground water.

Projects to purify, reclaim, and reuse municipal and industrial wastewater, salty water, and other impaired water are now underway throughout the West. Reclamation supports technological advances and research

to reduce advanced water treatment costs, and facilitates research to speed acceptance and implementation of these technologies.

Reclamation's focus on improved interagency coordination of research and investment in advanced desalination and water treatment technologies will lead to increased local water supplies.

For example, Reclamation is working with the Big Bear Area Regional Wastewater Agency and the Big Bear Community Services District in Big Bear, California, to examine the feasibility of advanced treatment of impaired ground water to provide additional supplies to the community. The Big Bear Valley depends completely on ground water. Four successive years of drought have depleted this rural community's supplies.

## Finding Ways to Enhance the Current Water Supply

Reclamation is also exploring ways to enhance the current water supply. For example, the Mid-Pacific Region, as an implementing agency for the CALFED Bay-Delta Program, is pursuing a comprehensive Water Supply Reliability Program composed of water supply storage, water use efficiency, water transfers, water conveyance improvements, and project operation improvements. The Water Supply Reliability Program is one element of the comprehensive CALFED Program that encompasses an array of projects and approaches to improve water supplies and the health of the Sacramento/San Joaquin River Delta. The Water Supply Reliability Program has identified actions that could increase California water



**Reclamation's research laboratory in Denver explores a variety of engineering techniques to improve water deliveries.**

supplies by nearly 3 million acre-feet over the next 10 years—enough water to meet the needs of 6 million families annually. The goals of the program are as follows:

- Maximize use of available water supplies through conservation, water recycling, and water quality improvements. In FY 2003, \$600,000 was invested in water conservation field services programs to provide technical assistance to project water contractors.
- Increase the flexibility of water systems at the State, Federal, and local level through improvements in conveyance, storage, and water project operations. Reclamation acquired about 350,000 acre-feet of water to protect fish and improve habitat and, as a result, achieved project operational flexibility to replace water used to implement these fishery actions.

- Develop ground water and surface water storage projects to boost flexibility and provide additional supplies for agriculture, urban, and environmental use. In FY 2003, three feasibility level planning studies were initiated to investigate the potential to improve water supply reliability and system flexibility as part of the CALFED Program. The four storage investigations include Los Vaqueros Expansion, Shasta Enlargement, North-of-Delta-Offstream Storage, and Upper San Joaquin Storage Investigation. These storage investigations have the potential to increase water supply yield by 600,000-900,000 acre-feet per year. The four proposed surface storage investigations are in the third year of joint State and Federal planning with an anticipated completion date of late 2006.

**Excavation of Ridges Basin Dam, Colorado/New Mexico, viewed from top of right abutment.**



The Colorado Ute Settlement Act of 2000 allowed construction to begin on the Animas-La Plata (A-LP) Project in Colorado. This project implements the final settlement of related tribal water rights, provides municipal and industrial water for tribal and nontribal water users, and delivers domestic water on the Navajo Reservation. Reclamation's FY 2003 A-LP construction included completing the inlet conduit sleeve, rerouting three natural gas pipelines with related cultural resource mitigation, excavating, and other preparatory activities for the Ridges Basin Dam outlet works and the Durango Pumping Plant.