EXHIBIT K6

U.S. Bureau of Reclamation

Niobrara, Lower Platte, and Kansas River Basins

Annual Operating Plans

2005-2009

Annual Operating Plan for 2005: KS003005-3075

Annual Operating Plan for 2006: KS003076-3145

Annual Operating Plan for 2007: KS003146-3213

Annual Operating Plan for 2008: KS003214-3281

Annual Operating Plan for 2009: KS003282-3351

No. 126, Orig.
Ex. K6

SYNOPSIS

General

This year is the 53rd consecutive year that an Annual Operating Plans (AOP) has been prepared for the Federally-owned dams and reservoirs in the Niobrara, Lower Platte, and Kansas River Basins. The plan has been developed by the Water Operations Group in McCook, Nebraska for the 16 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with 9 diversion dams, 9 pumping plants, and 20 canal systems, serve approximately 265,467 acres of project lands in Nebraska and Kansas. In addition to irrigation and municipal water, these features serve flood control, recreation, and fish and wildlife purposes. A map at the end of this report shows the location of these features.

The reservoirs in the Niobrara and Lower Platte River Basins are operated by either irrigation or reclamation districts. The reservoirs in the Kansas River Basin are operated by either the Bureau of Reclamation (Reclamation), or the Corps of Engineers. Kirwin Irrigation District provides operational and maintenance assistance for Kirwin Dam. The diversion dams, pumping plants, and canal systems are operated by either irrigation or reclamation districts.

A Supervisory Control and Data Acquisition System (SCADA) located at McCook is used to assist in operational management of all 11 dams under Reclamation's jurisdiction that are located in the Kansas River Basin. A Hydromet system collects and stores near real-time data at selected stations in the Nebraska-Kansas Projects. The data includes water levels in streams, canals, and reservoirs and also gate openings. This data is transmitted to a satellite and downloaded to a Reclamation receiver in Boise, Idaho. The data can then be accessed by anyone interested in monitoring water levels or water usage in an irrigation system. The Nebraska-Kansas Projects currently has 109 Hydromet stations that can be accessed. The McCook Field Office has installed and maintains 55 Hydromet stations with plans to install more as time permits. When fully implemented, the projects will have a Hydromet station installed to provide real-time data on all reservoirs, most diversion dams, and most of the measuring structures in the irrigation systems. These stations can be found on the Internet by accessing Reclamation's home page at http://www.usbr.gov/gp. From the home page, select "Hydromet Data Center" under the Water Operations heading.

The Headlines 2005 that follows this synopsis is indicative of the awareness that the local people have of the natural resource development and conservation in the Niobrara, Lower Platte, and Kansas River Basins.

2005 Summary

Climatic Conditions

Precipitation at the project dams during 2005 ranged from 92 percent of normal at Cedar Bluff Dam to 143 percent of normal at Kirwin Dam. Temperatures during the first four months of were generally above normal throughout the projects area. Precipitation during the first four months of the year varied throughout the projects area. Precipitation totals were above normal at 12 of the 16 project dams, varying from 78 to 250 percent. Cedar Bluff recorded the second greatest February precipitation total ever recorded at the site while Red Willow Dam recorded the second greatest March precipitation at the site. Precipitation during April at Merritt Dam was 250% of normal which was the greatest ever recorded for the month at that site.

Precipitation during May was generally below normal throughout the basin. Only three project dams recorded above normal precipitation during May. Lovewell Dam recorded the lowest precipitation ever recorded at the site for the month of May. June was generally wetter than normal while July was generally drier than normal. Virginia Smith Dam recorded the lowest July precipitation total ever and Medicine Creek Dam recorded the second lowest July precipitation total at the respective sites. Average temperatures were above normal in May, June and July. August precipitation improved considerably with only three project dams having below normal precipitation for the month. The improvement turned out to be short lived as September precipitation was well below normal at all project dams. Precipitation during September was only 43 percent of normal over the projects. Temperatures in August were generally near to above normal throughout the projects area and well above normal in September.

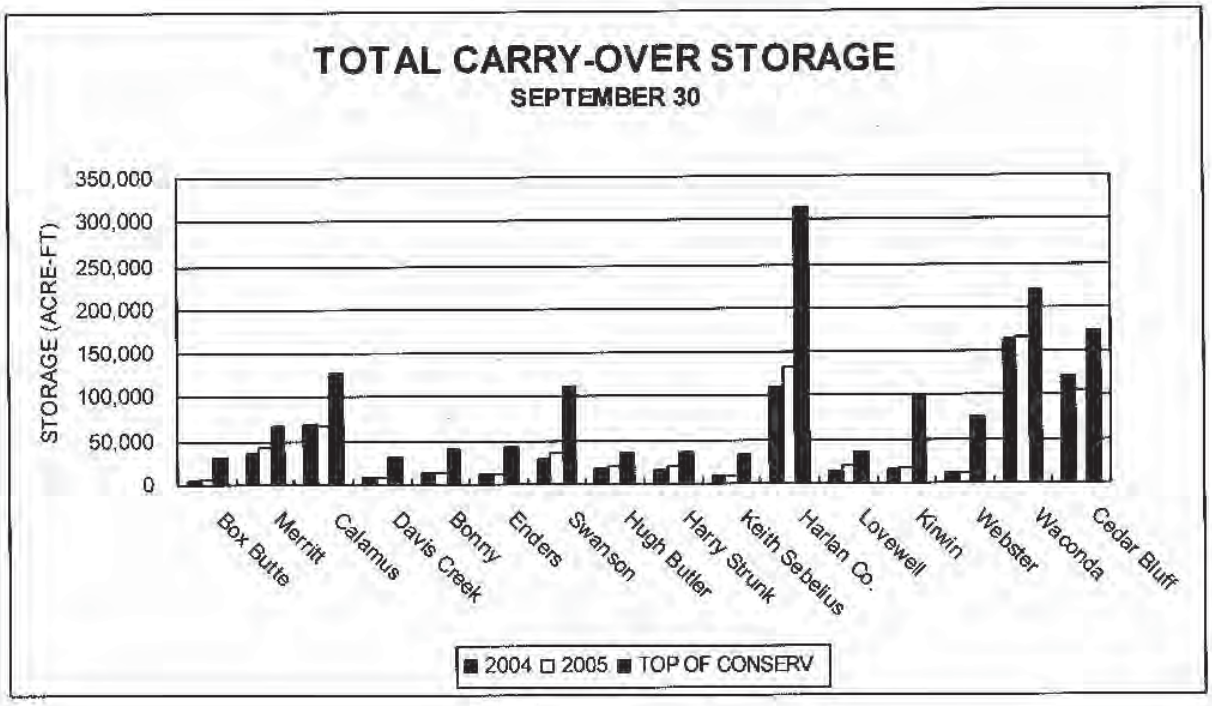
October was generally wetter than normal while November was generally drier than normal. Only five dams recorded below normal precipitation during October and only five dams recorded above normal precipitation during the month of November. Precipitation during December was well below normal at all project dams with the exception of Harry Strunk Lake. Temperatures continued above average during October, November, and December.

Storage Reservoirs

1. Conservation Operations. The 2005 inflow was below the dry-year forecast at Bonny and Enders Reservoirs, and Swanson, Hugh Butler and Harry Strunk Lakes. Box Butte, Merritt, Calamus, Kirwin, Webster, Lovewell and Cedar Bluff Reservoirs along with Harlan County, Keith Sebelius and Waconda Lakes had inflows between the dry- and normal-year forecasts. Davis Creek Reservoir had inflows between the normal-year and wet-year forecast.

All project reservoirs had below average carryover storage from the 2004 water year with the exception of Cedar Bluff Reservoir. Of the 12 project reservoirs in the Kansas River Basin, only Keith Sebelius Lake and Lovewell and Cedar Bluff Reservoirs did not record below average inflows during all 12 months of 2005. Keith Sebelius Lake and Cedar Bluff Reservoir recorded below average inflows during 11 months of 2005. Reservoir releases were made from Merritt and Virginia Smith Dams to maintain reservoir levels prior to the 2005 irrigation season. Just prior to the irrigation season, Enders, Kirwin, Webster and Box Butte Reservoirs, along with Keith Sebelius, Swanson, Hugh Butler, Harry Strunk and Harlan County Lakes, did not have sufficient storage to provide water users with a full water supply. Harry Strunk Lake and Lovewell Reservoir had some flood storage occupied prior to the irrigation season. The high irrigation demand months of July and August significantly reduced storage in those project reservoirs that had storage available for irrigation. Precipitation during late July and August was of little help in reducing the demands on project reservoirs. Storage in the Kansas River Basin project reservoirs was below normal at the end of the irrigation season with the exception of Cedar Bluff Reservoir.

The following summarized graph shows a comparison of 2004 and 2005 carry-over storage conditions as compared to the top of conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins as of September 30th.



2. Flood Control Operations. Harry Strunk Lake and Lovewell Reservoir utilized flood pool storage in 2005. Flood releases were not required to reduce or maintain pool levels. The fiscal year 2005 flood control benefits accrued by the operation of Reclamation's Nebraska-Kansas Projects facilities was $641,000 as determined by the Corps of Engineers. An additional benefit of $464,000 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2005 by facilities in this report total $1,873,552,000 (see Table 5). To date no benefits have been accrued by the operation of Box Butte, Merritt, Calamus, or Davis Creek Reservoirs.

A summary of precipitation, reservoir storage and inflows at Nebraska-Kansas Projects facilities can be found in Table 7.

Water Service

There was 228,542 acre-feet (AF) of water diverted to irrigate approximately 151,173 acres of project lands in the 12 irrigation districts (see tables 3 and 6). The project water supply was either inadequate or limited for 169,024 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, Almena, Bostwick in Nebraska, Kansas Bostwick, Kirwin and Webster Irrigation Districts. The project water supplies for the other units mentioned in this report were more than adequate in 2005.

The water requirements of three municipalities, one rural water district, and two fish hatchery facilities were furnished from storage releases or natural flows.

Irrigation Production

The 2005 crop yields on lands receiving project water in the Nebraska-Kansas Projects were lower than 2004 for three of the five reporting districts. The average corn yield, the principal crop of all reporting districts, was 172 bushels per acre. This was approximately five bushels per acre less than in 2004. The average unit price of corn when harvested was lower than the previous year at approximately $1.75/bu. The start of irrigation releases from project reservoirs varied considerably depending on storage water available. Much of the growing season was warmer and drier than normal. Most districts experienced some relief from the dry conditions during the first part of August. Crop maturity progressed near normal during the growing season. Several irrigation districts had finished making irrigation releases by mid September. Eleven canals did not divert water in 2005 as a result of extremely short water supplies. Nearly all irrigation districts had finished delivering water by the end of September with corn harvest commencing by mid-October.

Fish and Wildlife and Recreation Benefits

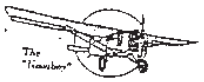
The National Recreational Fisheries Policy declares that the Government's vested stewardship responsibilities must work in concert with the state managing agency's recreational fisheries constituency and the general public to conserve, restore, and enhance recreational fisheries and their habitats. As a result of this policy, Reclamation has developed fishery management guidelines for reservoirs within the Nebraska-Kansas Projects. These guidelines outline a program which considers public use, fisheries, fish habitat, and improved communication and coordination. The Nebraska-Kansas Area Office is available for meetings if requested with Nebraska, Colorado, and Kansas state management agencies to discuss the Annual Operating Plans (AOP). Information is solicited that will allow Reclamation the flexibility to enhance fisheries resources while still meeting contractual obligations with the various irrigation districts.

During the early part of the 2005 season, normal reservoir operations were favorable for recreation and fish and wildlife uses at several project reservoirs. Lower water levels have been experienced at most reservoirs in the Kansas River Basin over the past few years somewhat limiting the recreation benefits. Normal summer drawdown due to irrigation releases did allow for some late summer shoreline revegetation.

Re-authorization of the North Loup Project by the Act of October 18, 1986 [Public Law 99-591, Section 101(e)] authorized the construction of a fish hatchery below Virginia Smith Dam and Calamus Reservoir. The hatchery was constructed under Public Law 89-72 and a cost-sharing agreement with the Nebraska Game and Parks Commission (Commission) with 75 percent federal and 25 percent state funds. Administration of construction was accomplished by the Commission; construction began in July 1989, and was completed in September 1991. The hatchery consists of an office/visitor center, laboratory, 2 residences, a shop and feed storage building, 51 rearing ponds lined with VLDPE and covering 45.5 acres, 24 concrete raceways, 2 lined effluent ponds, 8 groundwater wells, a 36-inch diameter buried pipeline from Virginia Smith Dam, a groundwater degassing tank, and a computerized monitoring and alarm system. The hatchery is operated and maintained by the Commission and in full operation should produce about 53 million fish per year. The water supply is provided by natural flows passed through Virginia Smith Dam and from Calamus Reservoir storage through an agreement dated July 28, 1988, between the Commission and the Twin Loups Reclamation District.

HEADLINES 2005

Much more rain needed to restore lakes



Enders Dam road to be closed for repairs

McCook Daily Gazette

Drought concerns spread

Farmers to be paid not to irrigate

More than water flow important to a river

Irrigators feeling pinch of new water laws, regulations

Lower Republican NRD adopts integrated management plan

High Court says DNR does not have authority over groundwater

Rain welcome, whenever it comes to area

Water rules raise questions for irrigators

The Imperial Republican

Pumping water into the Republican River; retiring thousands of acres possible solution to complying with Kansas pact

Low water hurts lake businesses

Report: Nebraska over its water allocation for Republican River

Game & Parks: groundwater depletion threatens area reservoirs, hatchery

CREP sign-up nears 40,000 acres statewide

Water issues far from over

Reservoirs filling; drought effects remain

Frenchman Creek low flow Blamed for Dec. 31 fish fill

Public weighs in on water regs

Moisture was plentiful first six months, but July is dry

GROUND ZERO

Swanson Lake the front line for saltcedar invasion

CHAPTER I – INTRODUCTION

Purpose of This Report

This AOP advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 2005 and serves as a guideline for the 2006 operations. This report also describes the responsibilities of Reclamation, Corps of Engineers, and the irrigation and reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins.

Operational Responsibilities

Reclamation is responsible for irrigation operations at all federal reservoirs in the Nebraska-Kansas Projects. Reclamation is also responsible for the operation and maintenance (O&M), safety of the structure, and reservoir operations not specifically associated with regulation of the flood control storage at the reservoirs constructed by Reclamation. Regulation of the flood control storage is the responsibility of the Corps of Engineers. In addition to irrigation and flood control, these reservoirs provide recreation, fish and wildlife, and municipal benefits.

By contractual arrangements with Reclamation, the irrigation or reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins are responsible for the O&M of the canals and irrigation distribution facilities constructed or rehabilitated by Reclamation. In addition, the appropriate irrigation or reclamation districts are responsible for operating and maintaining Box Butte, Merritt, Virginia Smith and Davis Creek Dams. The Corps of Engineers operates and maintains Harlan County Dam and Lake. The state of Colorado provides operational guidelines for Bonny Reservoir. Operational guidelines for Cedar Bluff Reservoir will be provided by the State of Kansas. Reclamation operates and maintains 11 dams and reservoirs in the Republican, Solomon, and Smoky Hill River Basins. Under a contract with Reclamation, Kirwin Irrigation District performs certain operational and maintenance functions at Kirwin Dam.

An updated Field Working Agreement was executed on July 17, 2001 between the Corps of Engineers and Reclamation regarding operation of Harlan County Dam and Lake. The agreement provides for a sharing of the decreasing water supply into Harlan County Lake. Storage capacity allocations were redefined based on the latest sediment survey (2000) and a procedure was established for sharing the reduced inflow and summer evaporation among the various lake uses.

The states of Nebraska, Colorado, and Kansas are responsible for the administration and enforcement of their state laws pertaining to the water rights and priorities of all parties concerned with the use of water. The states are also responsible for administering the water surface activities and the federal lands around the reservoir. The U.S. Fish and Wildlife Service administers the water surface activities and most of the federal lands at Kirwin Reservoir.

Reclamation cooperates with all state agencies and compact commissions to ensure that all operations are in compliance with state laws and compact requirements.

Tables and Exhibits

Records for the facilities reported in the AOP are included as tables and exhibits and are located following page 35.

Water Supply

For forecasting purposes, values of annual inflows that will be statistically equaled or exceeded 10, 50, and 90 percent of the time were selected from the probability data to be reasonable maximum (wet year), most probable (normal year), and reasonable minimum (dry year) inflow conditions, respectively.

Inflow records from 1986 through 2005 were used for the analysis of reservoirs in the Niobrara, Lower Platte and Kansas River Basins.

Reservoir Operations

All operations are scheduled for optimum benefits of the authorized project functions. Monthly, or as often as runoff and weather conditions dictate, Reclamation evaluates the carry-over storage and estimated inflow at each reservoir to determine whether excess water is anticipated. If excess inflow is apparent, controlled releases will be made to maximize the downstream benefits, including flood control.

Major Features

The Mirage Flats Project was constructed under the Water Conservation and Utilization Act and includes an irrigation storage reservoir, diversion dam, and canal system. The other features discussed in this report are all a part of the Pick-Sloan Missouri Basin Program and include single and multipurpose reservoirs, diversion dams, pump stations, and canal systems. The 16 storage facilities now in operation are listed below.

Constructed by Reclamation

1. Operated by irrigation or reclamation districts--Box Butte and Merritt Dams in the Niobrara River Basin and Virginia Smith and Davis Creek Dams in the Lower Platte River Basin.

2. Operated by Reclamation--Bonny, Trenton, Enders, Red Willow, Medicine Creek, Norton, Lovewell, Kirwin, Webster, Glen Elder, and Cedar Bluff Dams in the Kansas River Basin. A contract provides for Kirwin Irrigation District to perform certain operational and maintenance functions at Kirwin Dam.

Constructed and Operated by the Corps of Engineers

1. Harlan County Dam in the Kansas River Basin.

Irrigation and Reclamation Districts

Twelve irrigation districts and one reclamation district in the Niobrara, Lower Platte, and Kansas River Basins have contracted with Reclamation for water supply and irrigation facilities. The Twin Loups Irrigation District has contracted their O&M responsibilities to the Twin Loups Reclamation District. Bostwick Irrigation District in Nebraska has contracted their O&M responsibilities for Courtland Canal between the headgates and the Nebraska-Kansas state line to Kansas Bostwick Irrigation District.

The contracted irrigation season for the Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman Valley, H&RW and Frenchman-Cambridge Irrigation Districts is from May 1st through October 15th or such additional period from April 1st through May 1st of each year as determined between the District and Reclamation. The contracted irrigation season for Almena, Bostwick in Nebraska, Kansas-Bostwick and Twin Loups Reclamation District is May1st through September 30th or such additional period from April 1st as determined between the District and Reclamation. For all other districts, the contracted irrigation

Long Term Water Service Contract Renewal

The Ainsworth Irrigation District (AID) notified Reclamation on February 16, 2005 that the Board approved a motion to request renewal of the AID contract with Reclamation. The long-term water service contract with the AID will expire December 31, 2006. The current schedule provides for the completion of the draft Environmental Assessment and contract negotiations in 2006.

Municipal Water

Three municipalities and one rural water district have executed water service contracts for full or supplemental water supplies.

Fish and Wildlife

The State of Kansas is presently using the fish hatchery facility below Cedar Bluff Reservoir for waterfowl habitat. The Calamus Fish Hatchery located below Calamus Reservoir is operated by the State of Nebraska for fish production.

State of Colorado Division of Wildlife

The Colorado Division of Wildlife provides operational guidelines for Bonny Reservoir. The entire conservation pool storage was purchased by the State of Colorado on June 24, 1982.

State of Kansas Department of Wildlife and Parks

The State of Kansas acquired the use and control of portions of the conservation capacity at Cedar Bluff Reservoir following the reformulation of the Cedar Bluff Unit in October of 1992. The City of Russell's existing water storage right and contract with the United States remained unchanged.

Power Interference Considerations

A Power Interference Agreement exists between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District. A Subordination Agreement also exists between Reclamation, the Ainsworth Irrigation District and the Nebraska Public Power District. Provisions of these agreements will be incorporated into the 2006 operations.

Environmental Considerations

A "Statement of Operational Objectives" for Harlan County Lake sets forth the general operational objectives and the specific reservoir uses that are desirable. The operational objectives indicate that fish and wildlife interests are best served by high reservoir levels with minimum fluctuations, and regulation of the outflow in excess of the minimum desired flows. Although the statement recognizes flood control and irrigation as primary purposes, it indicates that comprehensive operational plans should be developed for maximum integration of the secondary uses.

These objectives are also considered in the operation of all Reclamation reservoirs in the Kansas River Basin, Niobrara River Basin, and the Lower Platte River Basin. The regulated outflow will also benefit farmers, ranchers, cities, and other interests below the reservoirs.

Republican River Compact – Kansas v. Nebraska

On May 26, 1998, Kansas filed a petition with the U. S. Supreme Court complaining that Nebraska had violated the Republican River Compact by using more than its share of the Republican River water supply. The three original parties to the Compact; Kansas, Nebraska and Colorado, became parties to the case. Because all of the major water development structures in the Republican River Basin were constructed by the Bureau of Reclamation and the Corps of Engineers, the United States was allowed to participate as an *amicus curiae.* After seventeen months of negotiations the Final Settlement Stipulation was signed by each respective governor and attorney general and was filed with the Special Master on December 16, 2002. The United States Supreme Court approved the settlement and dismissed the case on May 19, 2003.

The settlement provides for a moratorium on new groundwater wells, special rules for administration of water during water-short years, protection of storage releases, minimized flood flow effects on the accounting, recognition by Nebraska of a 1948 priority date for the Kansas-Bostwick Irrigation District, inclusion of the impacts of groundwater pumping from tableland wells in the accounting, and accounting for all reservoirs 15 acre-feet and larger within the river basin.

With the support of Kansas and Nebraska, Reclamation completed an Appraisal Study which analyzed system improvement alternatives in the lower portion of the basin that would provide for more efficient use of the water supply. This study was completed in 2004 and distributed to interested parties in February of 2005. The study met requirements of the Final Settlement Stipulation by investigating system improvements in the Basin, including measures to improve the ability to utilize the water supply below Hardy, Nebraska. This study also met the responsibilities of the Republican River Compact by investigating the most efficient use of the water of the Republican River Basin for multiple purposes.

The appraisal study recommends further Federal participation in a feasibility study and that such a study be undertaken to investigate solutions. Specific congressional authorization is required for Reclamation to perform a feasibility study. The purpose of a feasibility study is to identify, evaluate, and recommend to decision makers an appropriate, viable solution to the identified problems and opportunities. The States have indicated they would provide in-kind support and/or funding for the feasibility study. Both states have expressed interest in pursuing legislation for the study. Legislation for the study was introduced in 2003 but the legislation was not advanced. On February 14th, 2006, congressmen from both Nebraska and Kansas reintroduced

the Lower Republican River Basin Study Act (H.R. 4750).

The Stipulation also required that the States, in cooperation with the United States, form a Conservation Committee to develop a proposed study plan to determine the quantitative effects of non-federal reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska. The Study Plan supported by the three states, the Natural Resources Conservation Service, and Reclamation was completed and signed on April 28, 2004. Cooperative agreements for completing the five year study were developed between Reclamation, the University of Nebraska-Lincoln (UNL), and Kansas State University. Installation of data loggers on 35 reservoirs throughout the basin was completed in 2004. Additional monitoring equipment for terraces and additional reservoirs will be installed by UNL in 2006.

Water-Short Year Administration will be in effect in those years in which the projected or actual irrigation supply is less than 119,000 acre feet of storage available for use from Harlan County Lake as determined by Reclamation. It was determined in 2005 that a "Water-Short Year Administration" was in effect.

Frenchman Valley Appraisal Study

In 2004, the state of Nebraska proposed to Reclamation an appraisal study that will examine opportunities for more efficient management of water supplies in the Frenchman River Valley including Reclamation's Enders Reservoir, a feature of the Frenchman-Cambridge Division in Nebraska. The study will focus on problems and opportunities in an area that has experienced dramatically reduced ground and surface water supplies, including reduced reservoir inflows. Pre-planning activities, including developing a Plan of Study (POS) for the appraisal study, began in 2005 and will continue in 2006. Agencies developing the POS include the NKAO, the Nebraska DNR, the Frenchman Valley and H&RW Irrigation Districts, the Nebraska Game and Parks Commission, the Upper and Middle Republican Natural Resources Districts. The POS is anticipated to be completed in calendar year 2006.

Emergency Management

The Nebraska-Kansas Area Office (NKAO) continued to coordinate with local jurisdictions that could potentially be impacted by flooding from large operational releases and/or dam failure. Four tabletop exercises and one functional exercise were conducted during calendar year 2005. Orientation meetings were held for all of the NKAO dams. Tabletop exercises were held for the Box Butte Dam Emergency Action Plan (EAP), Trenton Dam EAP, Red Willow Dam EAP, and the Medicine Creek Dam EAP. A functional exercise was held for the Merritt Dam EAP. Emergency radios have been installed at all dams. These radios will be used as a backup means of communication when notifying the local emergency management officials in the event of an emergency at the dam. Both the Nebraska-Kansas Area Office and the McCook Field Office have a satellite phone that can be used in an emergency. Management and the dam operators have been trained on the use of these phones.

There was one internal alert declared at NKAO projects in 2005. At Red Willow Dam, an Internal Alert was declared after material was discovered in the outlet works stilling basin under drain system. Additional analysis of the drain system is scheduled to be completed in 2006. An internal alert at Enders Dam is still in effect until the investigation of the stability of the outlet works stilling basin and risk assessment are complete.

One table top exercise and three functional exercises are planned in 2006. EAP orientation meetings will be held at all NKAO dams. Site security plans for each dam are scheduled to be written in 2006.

Public Safety Reviews

The Annual Safety Training was conducted in February 2005. This training provided maintenance personnel the opportunity to acquire a 10 hour certification with respect to OSHA construction standards. First Aid and CPR training was also provided. During the planning stages of this training, an informational letter, and invite was sent to all of the water users within the NKAO jurisdiction. This letter included some safety tips, an invitation to the Annual Safety Training, and promoted the utilization of Reclamation when developing or maintaining safety programs for the water districts.

Life Safety Code Assessments for each structure at all of the reserved works facilities within the NKAO jurisdiction were formally completed during FY 2005. The "Simplified Life Safety Code Assessment" worksheet (developed by the LSC team and the Regional Life Safety Coordinator) was utilized. In addition, assessments for the Grand Island Area Office, and the new McCook Field Office were also performed. Assessments were provided to the Regional Office which included the AHJ determinations, and recommendations for each facility and appurtenances.

The ongoing safety reviews of project facilities continues to identify potential safety hazards to the public and operating personnel. During 2005, NKAO combined the Safety Reviews of the major facilities with the Dam Safety Facility Reviews. This format provides for input from both the Area Safety Manager, and teams of Dam Safety Specialists. Some recommendations included enhanced confined space signage, expanding the public knowledge of safety issues around our facilities, and provide training to employees regarding some of the new OSHA requirements for record keeping.

Automatic External Defibrillators (AEDs) were acquired for the McCook Office, the Grand Island Office, and two field ready models. This process involved developing a protocol with the Federal Occupational and Health Services center in Denver. Formal training will be provided to employees in early 2006.

In order to ensure facility accessibility, reliability and safety, focus continues regarding compliance with accessibility standards. Specialists from the Denver Technical Center performed additional accessibility evaluations at public access sites at three different reservoirs. These evaluations were comprehensive, and set out specific suggestions as to improvements at public facilities. These evaluations are expected to continue throughout 2006.

Attention continues with regards to issues concerning ergonomics, West Nile Virus, hazardous materials, pesticide use, arc flash hazards, extraction of injured personnel, and communications. Employees were provided training, and given information related to these and several other issues.

Several individuals volunteered and were deployed with respect to Hurricane Katrina relief efforts; particular safety concerns were identified and addressed prior to deployment of the individuals.

Facility Reviews, Maintenance and Construction

Periodic Facility Reviews were conducted at Bonny, Norton, Kirwin, Webster, and Cedar Bluff Dams during 2005. Annual Site Inspections were conducted at the other ten NKAO dams in 2005.

Associated Facility Reviews were conducted in 2005 for the following canal systems: Ainsworth, Mirage Flats, Geranium, Mirdan, Scotia, Fullerton, Elba, Franklin, Naponee, Franklin Pump, Superior, Courtland in Nebraska, Courtland above Lovewell Dam, and Courtland below Lovewell Dam.

Technical surveys were completed at Bonny, Red Willow, Virginia Smith, and Davis Creek Dams in 2005.

Construction of a new Reclamation office building in McCook, Nebraska began in June of 2004 to replace the existing structure built more than 70 years ago. The new office building was completed in May 2005.

Video inspections of the toe drain systems at Merritt, Enders, Trenton, Norton, Webster, and Cedar Bluff Dams were attempted with varying degrees of success during 2005. A program to examine all of our toe drain systems was initiated in 2001.

Security enhancements continue at NKAO dams.

Mirage Flats Project in Nebraska

General

Flows in the Niobrara River along with Box Butte Reservoir storage provide a water supply for the 11,662 acre Mirage Flats Project. From 1996 to 2005, the project water supply averaged 12,000 AF, which is about 1.03 acre-feet per irrigable acre. Many irrigators supplement their water supply with private wells.

The Mirage Flats Irrigation District cooperates with the Nebraska Game and Parks Commission (Commission) by operating the Box Butte Dam outlet works gate and the Dunlap Diversion Dam gates in a manner to avoid sudden large changes in the flows of the Niobrara River. A 30-year agreement was made in 1990 between the district and the Commission whereby the district would not draw the reservoir water level below elevation 3978.00 feet (2,819 AF). In return the district received an up-front payment which was used to improve the efficiency of the project's delivery system. On March 17, 2000, the district agreed to increasing the minimum reservoir level by one additional foot to elevation 3979.00 feet (3,244 AF). In return the district received an additional payment from the Commission for the 20 years left on the original agreement.

A data collection platform (DCP) was installed in May of 1992 to monitor the reservoir elevation and outflow at Box Butte Dam. A telephone (primary communication system) and a radio (backup communication system) have been installed at the outlet works for contacting the Region 23 Emergency Management Agency.

2005 Summary

The flows of the Niobrara River plus the carry-over storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. Precipitation at the Mirage Flats Irrigation District Office totaled 17.78 inches, which is 104 percent of normal. The 2005 total inflow of 16,464 AF was between the dry- and normal-year forecasts.

From early July through early September, diversions of 10,617 AF to the Mirage Flats Canal provided irrigation water for approximately 11,092 acres, 95 percent of the service available acreage. The farm deliveries from the project water supply totaled 4,113 AF (0.35 acre-foot per irrigable acre), which is a delivery efficiency of 39 percent. Total reservoir storage was only 5,572 AF at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

On-site dam operator training was conducted in May 2005. A tabletop exercise of the Box Butte Dam EAP took place in June and the Annual Site Inspection of Box Butte Dam was conducted in October.

In 2005, the District installed additional canal lining on the upper end of the Mirage Flats Canal. This extended the 1.0 mile canal lining section an additional 0.5 miles. The District continued to implement water conservation measures as outlined in their Water Management Plan and their Long Range Plan. The district continued to assist irrigators with delivery improvements that provide on-farm efficiency improvements, such as relocation of turnouts, burying pipe for

better access, and on-farm efficiency incentives. The district continues to modify and update their computer software to improve system operations, scheduling, and accounting and continued development of their web page that allows irrigators to place water orders, review water accounts, and keep updated on district operations. The district continues to develop and expand on the canal automation and remote monitoring system.

Ainsworth Unit, Sandhills Division in Nebraska

General

Within the Ainsworth Irrigation District, there are 34,539 acres with service available. The project water supply is provided by storage of Snake River flows in Merritt Reservoir. The reservoir is filled each fall after the irrigation season to elevation 2944.0 feet. This level is approximately two feet below the top of conservation capacity and within the repaired area of soil cement on the upstream face of the dam. The reservoir is regulated to maintain this level until the ice clears each spring. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the older existing soil cement at lower elevations. Upon ice-out the outlet pipe is drained, inspected, and repaired as necessary. The reservoir will then be rapidly filled to elevation 2946.0 feet to reduce shoreline erosion around the reservoir and minimize sand accumulations on the face of the dam. This filling process generally takes place in April. The reservoir level is maintained until irrigation releases begin to draw on the pool around mid May. A minimum release of 75 cubic feet per second (cfs) should be made to the river during spring filling operations if at all possible. This operation enhances the spring fish spawn. Seepage, pickup and toe drain flow normally result in flows of up to 15 cfs below Merritt Dam. Whenever possible, daily changes in releases to the river should be made in no more than 50 cfs increments. This will minimize adverse impacts on the Snake River trout fishery downstream of the dam.

The district has a basic water supply. If available, additional water can be purchased by the district as a supplemental supply.

2005 Summary

Precipitation, as recorded near Merritt Dam, totaled 28.18 inches, which was 140 percent of normal. April and June precipitation was the highest on record for the respective months. The inflow for the year totaled 178,277 AF. This inflow was between the dry- and normal-year forecasts. The water supply was more than adequate to meet the project's irrigation requirement.

There were 71,713 AF diverted from Merritt Reservoir into Ainsworth Canal, with 45,517 AF delivered to the farm headgates (delivery efficiency of 64 percent). There were 34,158 acres of land irrigated in 2005.

The district provided a total of 349 AF of irrigation water from holding ponds located within the district's service area.

New Area-Capacity Tables for Merritt Reservoir became effective on January 1, 2005. These revised tables resulted from a sedimentation survey conducted in June, 2003.

A functional exercise of the Merritt Dam EAP took place in January 2005 and the Annual Site Inspection of Merritt Dam was conducted in September.

The Standing Operating Procedures (SOP) for Merritt Dam was updated and republished in August 2005.

The Ainsworth Irrigation District, along with Reclamation and the local Natural Resource Districts, provided support to the University of Nebraska Extension Service for an irrigation scheduling/nitrogen management demonstration that will educate and improve irrigation management in the area. The first demonstration site included a center pivot in the District and a field day was held in the fall of 2005. A furrow irrigated site may be added to this project in 2006.

North Loup Division in Nebraska

General

The North Loup Division is located in the Loup River drainage basin. Water is diverted from both the Calamus and North Loup Rivers for the irrigation of approximately 55,000 acres of project lands. Operation of the division will also provide a sustained groundwater supply for an additional 17,000 acres. Principal features of the division include Virginia Smith Dam and Calamus Reservoir, Calamus Fish Hatchery, Kent Diversion Dam, Davis Creek Dam and Reservoir, five principal canals, one major and one small pumping plant and numerous open ditch and buried pipe laterals.

Calamus Reservoir is normally regulated at three to four feet below the top of conservation capacity during the winter months. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the soil cement on the upstream face of the dam. After the ice clears in the spring, the reservoir will be filled to conservation capacity. The North Loup Division project operation is restricted to no water diversions from the Calamus and North Loup Rivers during the months of July and August, and also during the month of September whenever sufficient water is available in storage reservoirs to deliver canal design capacity. During this time, inflows to Calamus Reservoir are required to be bypassed under the Power Interference Agreement between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District and as required in the authorizing legislation.

Davis Creek Reservoir will be regulated near elevation 2048.0 feet following the irrigation season and throughout the winter months. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled via Mirdan Canal, starting in April and reaching full content by the end of June. A 160-acre recreation area adjoining the reservoir was constructed and is managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped fishing pier, a day-use area, a primitive camping area, shelter and a hiking path. Kent Diversion Dam is also open to day-use fishing with handicapped accessibility provided.

2005 Summary

Precipitation at Virginia Smith Dam was 21.99 inches which is 93 percent of normal. The inflow totaled 251,935 AF which was between the dry- and normal-year forecasts. There were 72,780 AF of water released into Mirdan Canal and 27,050 AF diverted through Kent Canal from the North Loup River. A total of 43,770 AF was diverted for district use above Davis Creek Reservoir. The farm headgate delivery was 22,944 AF which is a delivery efficiency of 52 percent. Land irrigated in 2005 totaled 33,211 acres above Davis Creek Reservoir. Reservoir inflows were bypassed during July, August, and September as required. The reservoir elevation at the end of the year was at 2238.35 feet. The Calamus Fish Hatchery used bypassed natural flows and storage from Calamus Reservoir totaling 6,623 AF during 2005.

The precipitation of 23.91 inches near Davis Creek Dam was 101 percent of normal. Inflow to Davis Creek Reservoir totaled 48,226 AF during 2005. Beginning in mid April, Davis Creek Reservoir was filled from an elevation of approximately 2047.5 feet to a peak elevation of 2076.12 feet on June 26th using diversions from the North Loup River and Calamus Reservoir. A release of 40,100 AF was made from Davis Creek Dam into Fullerton Canal, with 26,353 AF delivered to the farm headgates (66 percent delivery efficiency). There were 21,430 acres irrigated below

Davis Creek Reservoir. The reservoir elevation at the end of 2005 was near the normal wintering level at 2048.33 feet.

An orientation meeting to review the Virginia Smith Dam and Davis Creek Dam EAPs took place in November 2005.

In December of 2002, the irrigation district reported a small depression along the right side of the river outlet works stilling basin wall at Virginia Smith Dam. Safety of Dams personnel in both Denver and Billings were notified and discussions were conducted with the Technical Service Center. Investigations determined that a problem existed with the under-drain system in the outlet works stilling basin. Gravel material beneath the outlet works chute structure and stilling basin was being transported creating a void. Reclamation personnel drilled holes into the floor of the structure and filled the voids and under-drain system with grout. Grouting was completed in March of 2003. Investigations then began on the under-drain system at the spillway stilling basin because of the similarity to the outlet works system. A risk analysis of the spillway chute and stilling basin under-drain system was completed in September 2003. The risk analysis recommends that the drain system under the spillway basin be grouted. Grouting was originally scheduled to start in October of 2004, but was delayed by the cancellation of the stop log fabrication contract due to contract non performance of the contractor. The stop logs were installed by a different contractor in September 2005. Grouting operations were completed in October 2005.

The Standing Operations Procedures for Virginia Smith Dam were updated and republished in January 2005. Technical surveys of both Davis Creek and Virginia Smith Dams were conducted in October.

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir are primarily for recreation and fish and wildlife support, although water will be available for water right administration and irrigation purposes.

Bonny Reservoir inflows from the South Fork of the Republican River and Landsman Creek are released into Hale Ditch as requested by the Colorado State Engineer. The state will make Bonny storage water available to Hale Ditch and other natural flow appropriators under short-term water service contracts. Most of the 700 acres served by Hale Ditch are now owned and operated by the Division of Wildlife, Colorado Department of Natural Resources.

The normal operation pattern of Bonny Reservoir, with a slowly rising or stable pool, enhances fish spawning in the spring and provides excellent fishing opportunities during the summer and hunting conditions each fall.

Toe drains were added at Bonny Dam in 1988 and 1994 to address Safety of Dams concerns. These drains were constructed to minimize the potential for dam failure due to piping when the reservoir elevation exceeds 3691.0 feet.

2005 Summary

The annual precipitation total of 18.23 inches at Bonny Dam was 106 percent of normal. The annual computed inflow of 7,353 AF to Bonny Reservoir was below the dry-year forecast. Below normal inflows were recorded during every month of the year. February, March and April inflows were the lowest on record for the respective months since first filling. The reservoir level was 17.6 feet below the top of conservation at the first of the year. The reservoir level gradually increased 2.4 feet to a maximum reservoir level of 3655.43 feet on June 13 th. Bonny Dam recorded a maximum one day precipitation total of 1.34 inches overnight on October 11 th. The reservoir level gradually decreased throughout the remainder of the year. A new historical low reservoir elevation of 3652.96 feet was recorded on December 9 th. The reservoir elevation at the end of the year was 19.0 feet below the top of conservation at 3653.05. The Corps of Engineers determined that $91,000 in flood prevention benefits were realized from the operation of Bonny Reservoir during 2005.

As directed by the Colorado Water Commissioner, 89 AF of reservoir inflows from the South Fork of the Republican River and Landsman Creek were passed through Bonny Reservoir into Hale Ditch for irrigation purposes. Releases to Hale Ditch began on May 17 and ended on May 24, 2005.

A Periodic Facility Review of Bonny Dam was conducted in April 2005 and an EAP orientation meeting took place in May.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

The Culbertson Canal and the Culbertson Extension Canal systems serve 9,295 acres in the Frenchman Valley Irrigation District and 11,695 acres in the H&RW Irrigation District. The water supply for these lands is furnished by flows from Frenchman and Stinking Water Creeks and off-season storage in Enders Reservoir located on Frenchman Creek, a tributary of the Republican River in southwest Nebraska. Irrigation releases are conveyed via Frenchman Creek from Enders Reservoir to Culbertson Diversion Dam. Reclamation maintains/clears this section of Frenchman Creek prior to the irrigation season each spring.

The normal operation of Enders Reservoir, with the gradual rise in water surface during the spring months, provides desirable fish spawning conditions. Irrigation releases will normally deplete the conservation storage by late summer, thereby limiting the fishing and recreational usage.

2005 Summary

The annual precipitation total of 21.03 inches at Enders Dam was above normal (111 percent). The 2005 inflow into Enders Reservoir of 4,649 AF was below the dry-year forecast. This inflow was the lowest ever recorded at the site. Due to extensive groundwater pumping above the reservoir, the inflow was only eight percent of the average historical preconstruction runoff at the Enders Dam site (60,700 AF from 1929-1947). This year was the 38 th consecutive year with below-normal inflows in which the conservation pool did not fill. The reservoir level was 26.0 feet below the top of conservation at the first of the year. The reservoir pool gradually increased with late winter and spring inflows peaking at 3088.12 feet (25.2 feet below the top of conservation) on June 22 nd. Due to the extremely low water supply available, no water was released from Enders Reservoir. The greatest 24-hour precipitation total recorded during the year at Enders Dam was 3.08 inches overnight on May 23 rd. The end of the year reservoir level was 26.0 feet below the top of conservation.

The Frenchman Valley Irrigation District reports that approximately 1,482 acres received water in 2005 from natural flow diversions from Frenchman Creek. Farm delivery averaged about 0.05 foot per irrigable acre in the Irrigation District. Some farmers were able to supplement their project water supply from private irrigation wells. Farm delivery efficiency was seven percent for the district. The H&RW Irrigation District did not divert water into Culbertson Extension Canal in 2005 due to the extremely low water supply. This was the fourth consecutive year that the district did not deliver water. H&RW Irrigation District storage water in Enders Reservoir was carried over into 2006.

In August 2004, a small depression was discovered near the outlet works stilling basin at Enders Dam. An Internal Alert remains in effect until investigations to the cause of the depression are completed. Reclamation has installed instrumentation in the area to collect additional data. Investigations and additional analysis are scheduled in 2006.

On-site dam operator training was conducted in March at Enders Dam.

An Annual Site Inspection of Enders Dam was conducted in August 2005 and an orientation meeting to review the Enders Dam EAP took place in October.

A silica fume concrete material overlay was installed on the spillway bridge deck in September 2005.

In 2005, the district (along with Reclamation) again provided support for a Limited Irrigation Demonstration Project with the University of Nebraska Extension Service. One demonstration site was located near Benkelman and demonstrated various irrigation strategies with a short water supply.

Meeker-Driftwood, Red Willow, and Cambridge Units, Frenchman-Cambridge Division in Nebraska

General

During the spring months, Swanson, Hugh Butler, and Harry Strunk Lakes normally have a rising or stable pool which enhances the spawning of northern pike and walleye. These lakes provide excellent opportunities for fishing, water sports, and recreation.

Service is provided for Frenchman-Cambridge Irrigation District by Meeker-Driftwood Canal to 16,562 acres; Red Willow Canal to 4,877 acres; Bartley Canal to 6,435 acres; and Cambridge Canal to 17,297 acres. The water supply for these lands is provided by storage in Swanson, Hugh Butler, and Harry Strunk Lakes, and inflows of the Republican River and Red Willow and Medicine Creeks. The Frenchman-Cambridge Irrigation District has replaced all of the open laterals which were physically or economically feasible with pipe laterals which has significantly increased both system and on-farm efficiencies.

2005 Summary

The annual precipitation total of 20.66 inches at Trenton Dam was 103 percent of normal. The inflow of 15,542 AF to Swanson Lake was well below the dry-year forecast and the third lowest annual computed inflow ever recorded at the lake. The inflow was below normal for all twelve months. The reservoir level began the year approximately 22.5 feet below the top of conservation pool. The reservoir level gradually increased during the spring and summer and peaked at 2733.28 feet on June 21 st (approximately 18.7 feet below full). Due to the extremely low water supply available, no water was released from Swanson Lake. Irrigation diversions were not made into Meeker-Driftwood or Bartley Canals. This was the third consecutive year that the district did not deliver water from the two canals. At the end of the year the reservoir level was 20.6 feet below the top of conservation at 2731.37 feet. The Corps of Engineers determined that $91,000 of flood damages were prevented by the operation of Swanson Lake.

The annual precipitation total of 22.15 inches at Red Willow Dam was 113 percent of normal. The greatest precipitation event recorded at Red Willow Dam in 2005 was 1.97 inches overnight on March 29 . The annual inflow of 9,090 AF into Hugh Butler Lake was below the dry-year forecast and the lowest ever recorded at the site. The computed inflow for all twelve months of the year was below normal with record lows recorded during February and July. The reservoir level at the first of the year was 13.2 feet below the top of conservation. Inflows gradually increased the level of the reservoir to a peak of 2571.49 feet (10.3 feet below full) on June 17 th Releases were not made from Hugh Butler Lake in 2005 due to the extremely low water supply available. Irrigation diversions were not made into Red Willow Canal for the third consecutive year. The level of Hugh Butler Lake at the end of the year was 11.5 feet below the top of conservation, the fifth lowest end of year storage ever recorded. The Corps of Engineers determined that $91,000 of flood damages were prevented by the operation of Hugh Butler Lake.

The annual precipitation total of 22.32 inches at Medicine Creek Dam was 108 percent of normal. The inflow of 30,861 AF was below the dry-year forecast and the fifth lowest annual total ever recorded. The computed inflow was below normal during all twelve months. The reservoir level at the beginning of 2005 was 9.8 feet below the top of conservation. The reservoir pool gradually increased peaking at 2366.64 feet on June 21 st (0.5 foot into flood pool). Precipitation during August (6.45 inches) was the greatest ever recorded at the dam for the month. Irrigation

releases began on June 27th and were shut off on August 30th with nearly 19,000 AF of water released from the reservoir for irrigation. The Nebraska Department of Natural Resources directed that some reservoir inflow be bypassed into Medicine Creek for livestock watering in 2005. Releases were made from September 23rd throughSeptember 25th , September 27th , September 29th through September 30th and again on October 6th. The greatest 24-hour precipitation event recorded at Medicine Creek Dam was 4.41 inches overnight on August 14 th. Harry Strunk Lake was 5.4 feet below the top of conservation at the end of the year. The Corps of Engineers determined that the reservoir prevented $98,000 in flood damages.

The water supply was limited with 19,732 AF of water diverted to irrigate 15,945 acres of land served by the Cambridge Canal (farm delivery efficiency was 50 percent).

A combined tabletop exercise of the Trenton, Red Willow, and the Medicine Creek Dams' EAPs took place in September of 2005. Annual Site Inspections were conducted in February at Medicine Creek Dam, March at Red Willow Dam, and in August at Trenton Dam in 2005.

On-site dam operator training was conducted at Trenton Dam in March.

In July 2005, a small quantity of fine sand was discovered near the river outlet works stilling basin drain outlet during an inspection at Red Willow Dam. An Internal Alert remains in effect until additional analysis of the under drain system is complete. Additional analysis of the drain system is scheduled to be completed in 2006.

The district (along with Reclamation) continued to provide support for a Limited Irrigation Demonstration Project with the University of Nebraska Extension Service. The demonstration site was located just east of Arapahoe and demonstrated various irrigation strategies with a short water supply. The project received water from the Cambridge Canal and a field day was well attended. The district continues to investigate remote monitoring opportunities that will improve delivery system operations.

Almena Unit, Kanaska Division in Kansas

General

Service is available to 5,764 acres in the Almena Irrigation District. The project water supply is provided by Prairie Dog Creek flows and Keith Sebelius Lake storage.

The water service contract for the City of Norton, Kansas, provides for a maximum annual use of 1,600 AF from Keith Sebelius Lake.

2005 Summary

The annual precipitation at Norton Dam totaled 27.69 inches, which is 112 percent of normal. The total inflow of 4,555 AF was between the dry- and normal-year forecasts. The reservoir level was 17.9 feet below the top of conservation on December 31, 2004. Late winter and spring inflows gradually increased the reservoir level to a peak elevation of 2287.65 feet on June 13 th (16.7 feet below full pool). The greatest 24-hour precipitation event occurred overnight on April 5th with 2.68 inches recorded. Irrigation releases were not made from the reservoir in 2005. Keith Sebelius Lake was 17.8 feet below the top of conservation (2286.47 feet) at the end of the year.

The city of Norton used 412 AF of municipal water during 2005.

A Periodic Facility Review of Norton Dam was conducted in April and an orientation meeting to review the Norton Dam EAP took place in September 2005.

A Safety of Dams recommendation was made in 2000 concerning the seepage through the left abutment and around the outlet works house at Norton Dam. Technical Service Center personnel inspected the seepage areas in June 2001 and recommended consideration of monitoring improvement and additional instrumentation. A final issue evaluation report of findings (Technical Memorandum ND-8312-2) in 2003 concluded that the assessed risks for seepage and piping through the foundation in the left abutment falls in the range of "justification to take action to reduce risk." Topographic surveys and additional instrumentation were installed near the outlet works in 2004. In December 2005, a Corrective Action Study Technical Memorandum evaluated various alternatives for risk reduction and produced two new recommendations. Design of a filter drain system is scheduled for completion in 2006 with construction beginning in 2007.

Franklin, Superior-Courtland, and Courtland Units, Bostwick Division in Nebraska and Kansas

General

Harlan County Lake storage and Republican River flows provide a project water supply for 22,935 acres in the Bostwick Irrigation District in Nebraska, and 13,378 acres in the Kansas-Bostwick Irrigation District No. 2 above Lovewell Reservoir. These flows, together with White Rock Creek flows and Lovewell Reservoir storage, furnish a water supply for 29,122 acres below Lovewell Reservoir in the Kansas-Bostwick Irrigation District.

The lands in the Franklin and Superior-Courtland Units are in the Bostwick Irrigation District in Nebraska. The lands in the Courtland Unit downstream of the Kansas state line are in the Kansas-Bostwick Irrigation District.

In accordance with the off-season flow alternative outlined in Reclamation's final environmental assessment dated December 16, 1983, and amended on November 21, 2002, Harlan County Lake releases will be 10 cfs during the months of December, January, and February, except when the reservoir is at low levels. During water-short years releases for these three months will be either zero or 5 cfs depending on reservoir levels. At the request of the State of Nebraska, releases of 30 cfs for a maximum 5-day period may be made to relieve icing conditions in the river.

Natural gain in streamflow, plus irrigation return flows, and operational bypass at Superior-Courtland Diversion Dam will provide some flow downstream.

The Kansas Department of Wildlife and Parks has requested that the Kansas-Bostwick Irrigation District and Reclamation maintain, when possible, a flow of 20 cfs into Lovewell Reservoir when the Courtland Canal is in operation and the conservation pool is below capacity. This recommended inflow provides excellent fishing around the canal inlet to the reservoir. The seepage below Lovewell Dam into White Rock Creek maintains a small live stream throughout the year.

2005 Summary - Bostwick Division - Harlan County Lake Operations

The annual precipitation at Harlan County Dam totaled 22.51 inches of rainfall, which is 98 percent of normal. The 2005 inflow of 53,682 AF was between the dry- and normal-year forecast. The inflow was below normal for all twelve months. A release was not required during January,

February or December in accordance to the environmental assessment and the annual operating plan.

Harlan County Lake began 2005 approximately 20.3 feet below the top of conservation pool, at 1925.44 feet. Inflows during the first six months of the year slowly increased the reservoir pool to a peak of 1929.94 feet on June 26 th (top of conservation pool is elevation 1945.73 feet). Harlan County Dam recorded 1.73 inches of rain overnight on June 9 th (the greatest one day total in 2005). Due to the extremely low water supply available, no water was released from Harlan County Lake. This was the second time since deliveries began in the early 50's that irrigation deliveries were not made from the lake. The reservoir level continued to decline throughout the remainder of the year. The level of Harlan County Lake at the end of 2005 was 1928.31 feet (17.4 feet below the top of conservation). Harlan County Lake prevented $464,000 of downstream flood damages during 2005 according to the Corps of Engineers.

A total of 29,265 AF (approximately 66 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

2005 Summary - Bostwick Division - Nebraska

The Bostwick Irrigation District in Nebraska diverted 4,712 AF of natural flows for the irrigation of 2,800 acres on Superior Canal. Farm delivery efficiency averaged 32 percent in the district. Irrigation diversions were not made into Franklin, Naponee, Franklin Pump, or Courtland Canal in Nebraska in 2005.

The district continued to replace open ditch laterals with buried pipe to reduce losses and improve system operations. The District was selected for a Water 2025 Challenge Grant Project that will replace approximately 10 miles of open ditch laterals with buried pipe. Identified laterals to be placed in pipe include all or portions of Superior Canal Laterals 9.5, 17.5, 21.2, and 27.3. The District started installing pipe on these projects in the fall of 2005 and should complete these projects in 2006. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improve water measurement and accounting by utilizing water meters, and provide on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation.

2005 Summary - Bostwick Division - Kansas

The 2005 precipitation at Lovewell Dam totaled 28.07 inches, which was 103 percent of normal. Lovewell Reservoir began 2005 with a water surface elevation only 8.3 feet below the top of conservation. Inflows during the first six months of the year from White Rock Creek and diversion of Republican River flows via Courtland Canal slowly increased the reservoir filling the reservoir conservation pool on May 13 th (elevation 1582.6 feet), and in filling the reservoir to an elevation of 1584.20 feet on June20 th. Releases were made into the lower Courtland Canal beginning on June 20 th to season the canal and maintain the reservoir level. A strong storm system stalled out over Lovewell Reservoir on the evening of July 25 th dropping 3.33 inches of precipitation overnight. The reservoir pool increased 0.5 foot as a result of the storm. Lovewell Dam recorded another 7.40 inches of rainfall in August, the second greatest precipitation ever recorded for the month. Irrigation demands reduced the pool elevation to 1576.04 feet on August 23 rd. Diversions of Republican River natural flows into Lovewell Reservoir continued after the irrigation release had ended and were maintained throughout the remainder of December. The

water surface elevation gradually increased to 1578.98 feet on December 31, 2005 (3.6 feet below the top of active conservation).

The Kansas-Bostwick Irrigation District diverted a total of 27,780 AF to serve 1,107 acres above Lovewell Dam and 23,439 acres below Lovewell Dam. Farm delivery efficiency averaged 45 percent in the district.

The Standing Operating Procedures for Lovewell Dam were updated and republished in January 2005.

On-site dam operator training was conducted in June at Lovewell Dam. An Annual Site Inspection of Lovewell Dam was conducted in August and an orientation meeting to review the Lovewell Dam EAP took place in November.

In 2005 the district continued to replace open ditch laterals with buried pipe. The district and Reclamation also provided assistance to Kansas State University (KSU) for a sprinkler irrigation demonstration located northeast of Courtland, Kansas. Courtland Canal supplies water for this demonstration and a field day was held at the site in the fall. In the fall of 2005, the District replaced open ditch Courtland West lateral 1.4 with buried pipe. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improve water measurement and accounting by utilizing water meters, and provide on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation. The District is also planning on replacing portions of open ditch Ridge lateral 5.0 and Courtland West lateral 0.3-1.3 with buried pipe in the spring of 2006.

The Kansas Department of Agriculture submitted a Water 2025 Challenge Grant proposal which was selected for funding in 2005. Through this project, the Division of Water Resources will install flow meter data logging equipment and remote monitoring equipment on approximately 100 diversions in the Republican River Basin. The real time monitoring of the diversions will enhance administration of water rights, improve water management, and expand water marketing opportunities between senior and junior water rights holders.

Kirwin Unit, Solomon Division in Kansas

General

The water supply for the 11,465 acres of land in the Kirwin Irrigation District is furnished by Kirwin Reservoir storage and inflows from the North Fork Solomon River and Bow Creek.

The operation of Kirwin Dam and Reservoir affords many opportunities for recreation, fishing, hunting, water sports, fish spawning, and preservation of waterfowl species.

2005 Summary

The annual precipitation total of 33.61 inches at Kirwin Dam was 143 percent of normal and the third highest annual total ever recorded at the site. The inflow of 10,440 AF was between the dry- and normal-year forecast. Kirwin Reservoir was 27.2 feet below the top of conservation pool at the first of the year. Due to extremely low water supply, no water was released from the Kirwin Reservoir. Precipitation during August (7.35 inches) was the greatest ever recorded for the month. The greatest 24-hour precipitation event occurred overnight on August 14 th with 4.10 inches recorded. The reservoir level continued to gradually increase throughout the remainder of the year to a peak elevation of 1705.39 feet (23.9 feet below full) on December 31 st. The reservoir was credited with preventing $11,000 in flood damages as determined by the Corps of Engineers.

A Periodic Facility Review of Kirwin Dam was conducted in May and an orientation meeting to review the Kirwin Dam EAP took place in June 2005.

Webster Unit, Solomon Division in Kansas

General

The Webster Irrigation District has service available to 8,537 acres. The project water supply is provided by Webster Reservoir storage and flows of the South Fork Solomon River.

2005 Summary

In 2005, the precipitation at Webster Dam was 114 percent of normal (26.94 inches). The inflow of 5,967 AF was between the dry- and normal-year forecasts. Webster Reservoir began 2005, 27.2 feet (elevation 1865.23 feet) below the top of conservation pool. The reservoir pool gradually increased to a peak elevation of 1866.85 feet (25.6 feet below full) on June 17th. Irrigation releases were not made from the reservoir in 2005. August precipitation (6.52 inches) was the fifth highest total ever recorded for the month. Webster Dam received 2.43 inches of rainfall overnight on August 28th, the greatest 24-hour precipitation event during the year. The reservoir level continued to decline during the final four months of the year and was 27.1 feet below the top of conservation on December 31, 2005.

A Periodic Facility Review of Webster Dam was conducted in May and an orientation meeting to review the Webster Dam EAP took place in June.

A special inspection was conducted on the spillway counterweights at Webster Dam in 2004. The inspection concluded that deterioration had affected the structural integrity of the counterweights. Repairs to the counterweights were completed by a contractor in November 2005.

The spillway under drain system was inspected in July 2005 and was found to be in good condition.

The district continued to explore opportunities to cost share with Reclamation and district irrigators for the replacement of open ditch laterals with buried pipe. In the fall and winter of 2005, the district replaced open ditch Lateral 25.0 and open ditch lateral 26.1 with buried pipe. These projects provided increased delivery water surface to project irrigators and eliminated approximately 2.0 miles of high loss, high maintenance open ditch lateral.

Glen Elder Unit, Solomon Division in Kansas

General

Releases from Waconda Lake will be regulated as outlined in two memorandums of understanding between the State of Kansas and Reclamation. Releases are made for the city of Beloit, the Mitchell County Rural Water District, the long-term water service contract with Glen Elder Irrigation District, and for water right administration.

The water service contract with Beloit, Kansas, provides for the annual use of up to 2,000 AF of Waconda Lake storage. Water is measured at the Glen Elder Dam river outlet works. In any year that the city's water supply is insufficient and there is surplus water in Waconda Lake, such additional water may be released for the city at a rate of $15.00 per acre-foot.

The water service contract with the Mitchell County Rural Water District No. 2 provides for 1,009 AF of storage water as available from Waconda Lake. Based on the current State of Kansas Certificate of Appropriation, water usage is not to exceed 737 AF per calendar year.

The water service contract with the Glen Elder Irrigation District provides for the use of up to 18,000 AF of storage water each year. Based on the current State of Kansas Certificate of Appropriation, water usage is not to exceed 15,170 AF per calendar year. Water is released and measured through the river outlet works.

The available facilities along the shores of Waconda Lake and the large water surface area afford opportunities to thousands of people for picnics, sightseeing, recreation, water sports, hunting, and fishing.

When compatible with flood control operations, the operating criteria for Waconda Lake provide for a stable or rising pool level during the fish spawning period each spring.

When possible, Waconda Lake will be allowed to fill during the late summer and early fall to flood exposed shoreline vegetation. This flooded aquatic vegetation is very beneficial to waterfowl management.

Waconda Lake will normally be regulated at one to two feet below the top of conservation capacity during the winter months. Maintaining the lake at this level will reduce shoreline erosion, provide a buffer for spring runoff and lessen ice damage to the upstream face of Glen Elder Dam. Releases from Waconda Lake will be regulated each year to maintain a constant water surface level while the lake is ice-covered.

2005 Summary

The annual precipitation total of 27.38 inches at Glen Elder Dam was 106 percent of normal. The inflow of 63,624 AF was between the dry- and normal-year forecast. Waconda Lake began the year 5.3 feet below the top of conservation. The lake level peaked at elevation 1451.91 feet on June 14th (3.7 feet below the top of conservation). This was the lowest annual peak since first filling of the reservoir. Irrigation releases began on May 18th and continued through October 11th reducing the lake level to 1450.68 feet. Rainfall during the first week of June increased the pool level nearly one foot (11,000 AF), with a peak average daily inflow of approximately 3,000 cfs. Glen Elder Dam recorded 3.92 inches of precipitation overnight on July 25th, the greatest 24-hour precipitation event recorded at the dam in 2005. The Corps of Engineers determined Waconda Lake prevented $259,000 in flood damages. On December 31, 2005 the lake level was 1450.50 feet (5.1 feet below full).

A total of 19,907 AF of water was released from Glen Elder Dam in 2005. Storage releases of 3,556 AF combined with natural flow releases of 6,631 AF for the irrigation of 6,509 acres in the Glen Elder Irrigation District. Five individual temporary water service contracts received storage water totaling 175 AF for the irrigation of approximately 274 acres. Storage releases totaling 640 AF were made for the City of Beloit, with an additional 8,025 AF bypassed for quality control as directed by the State Water Commissioner. Releases to the Mitchell County Rural Water District No. 2 totaled 705 AF.

The Standing Operating Procedures (SOP) for Glen Elder Dam was republished in January 2005 and on-site dam operator training at Glen Elder Dam was conducted in June.

An orientation meeting to review the Glen Elder Dam EAP took place in July 2005 and a Annual Site Inspection of Glen Elder Dam was conducted in August.

A new vacuum relief valve was installed at an existing manhole on top of the outlet pipe in September 2005.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff Reservoir storage furnishes a maximum of 2,000 AF each year for the City of Russell, Kansas when required. Prior to 1993, Cedar Bluff Reservoir storage and Smoky Hill River flows had provided a water supply for 6,800 acres in the Cedar Bluff Irrigation District. No water had been available for delivery to the district since 1978. Reformulation of the Cedar Bluff Unit in October of 1992 allowed the Cedar Bluff Irrigation District to begin the proceedings to disband, and the Kansas Water Office and Kansas Department of Wildlife and Parks to acquire the use and control of portions of the reservoir conservation capacity. The district completed all activities necessary to accomplish disbandment in 1994. A "designated operating pool" has been established for Cedar Bluff Reservoir and includes the following sub allocation pools: The City of Russell's existing water storage right which remained unchanged (2,700 AF); an artificial recharge pool under control of the Kansas Water Office (5,110 AF); and a fish, wildlife and recreation pool under control of the Kansas Department of Wildlife and Parks (21,061 AF). A "joint-use pool" has been established between the operating pool and the flood control pool for water supply, flood control, environmental and fish, wildlife and recreation purposes. Water rights for the "joint-use pool" are held jointly between the Kansas Department of Wildlife and Parks and the Kansas Water Office. A Contract Administration Memorandum between the United States of America, represented by Reclamation, the State of Kansas and the City of Russell was signed in November/December of 2003, establishing a continuous accounting procedure for water storage in Cedar Bluff Reservoir.

2005 Summary

The annual precipitation total at Cedar Bluff Dam was 19.51 inches which is 92 percent of normal. The inflow (8,134 AF) was between the dry- and normal-year forecasts. At the beginning of the year, the level of Cedar Bluff Reservoir was 2134.93 feet (top of active conservation is 2144.00 feet). The peak reservoir level recorded during the year was 2135.08 feet on February 13th. Precipitation in February(1.69 inches) was the second greatest total ever recorded for the month. The greatest 24-hour precipitation event occurred overnight on May 23 rd with 2.99 inches of rainfall. The reservoir gradually decreased throughout the remainder of the year and by December 31, 2005, the reservoir level had decreased to 2131.67 feet (12.3 feet below the top of active conservation).

The State of Kansas used the fish hatchery facility located below Cedar Bluff Dam for waterfowl habitat with 4 AF released to the facility. A total of 1,405 AF of water was released from Cedar Bluff Reservoir during 2005 for the City of Russell.

A Periodic Facility Review of Cedar Bluff Dam was conducted in April and an orientation meeting to review the Cedar Bluff Dam EAP took place in December 2005.

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

RESERVOIR		CAPACITY ALLOCATIONS 1/ DEAD	LIVE CONSERVATION Inactive	Active	FLOOD CONTROL
Box Butte	- Elevation Ft.	3969.0	3976.5	4007.0	---
	Total Acre-feet	640	2,275	31,060	---
	Net Acre-feet	640	1,635	28,785	---
Merritt	- Elevation Ft.	2875.0	2896.0	2946.0	---
	Total Acre-feet	774	4,662	66,726	---
	Net Acre-feet	774	3,888	62,064	---
Calamus	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	817	24,646	127,400	---
	Net Acre-feet	817	23,829	102,754	---
Davis Creek	- Elevation Ft.	1998.5	2003.0	2076.0	---
	Total Acre-feet	76	172	31,158	---
	Net Acre-feet	76	96	30,986	---
Bonny	- Elevation Ft.	3635.5	3638.0	3672.0	3710.0
	Total Acre-feet	1,418	2,134	41,340	170,160
	Net Acre-feet	1,418	716	39,206	128,820
Enders	- Elevation Ft.	3080.0	3082.4	3112.3	3127.0
	Total Acre-feet	7,516	8,948	42,910	72,958
	Net Acre-feet	7,516	1,432	33,962	30,048
Swanson	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
Lake	Total Acre-feet	2,118	12,430	112,214	246,291
	Net Acre-feet	2,118	10,312	99,784	134,077
Hugh Butler	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
Lake	Total Acre-feet	5,185	8,921	36,224	85,070
	Net Acre-feet	5,185	3,736	27,303	48,846
Harry Strunk	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
Lake	Total Acre-feet	4,160	8,859	35,705	88,420
	Net Acre-feet	4,160	4,699	26,846	52,715
Keith Sebelius	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
Lake	Total Acre-feet	1,636	3,993	34,510	133,740
	Net Acre-feet	1,636	2,357	30,517	99,230
Harlan County	- Elevation Ft.	1885.0	1927.0	1945.73	1973.5
Lake 3/	Total Acre-feet	0	118,099	314,111	814,111
	Net Acre-feet	0	118,099	196,012	500,000
Lovewell	- Elevation Ft.	1562.07	1571.7	1582.6	1595.3
	Total Acre-feet	1,674	11,644	35,666	86,131
	Net Acre-feet	1,674	9,970	24,022	50,465
Kirwin	- Elevation Ft.	1693.0	1697.0	1729.25	1757.3
	Total Acre-feet	4,969	8,515	98,154	313,290
	Net Acre-feet	4,969	3,546	89,639	215,136
Webster	- Elevation Ft.	1855.5	1860.0	1892.45	1923.7
	Total Acre-feet	1,256	4,231	76,157	259,510
	Net Acre-feet	1,256	2,975	71,926	183,353
Waconda	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
Lake	Total Acre-feet	248	26,237	219,420	942,408
	Net Acre-feet	248	25,989	193,183	722,988
Cedar Bluff	- Elevation Ft.	2090.0	2107.8	2144.0	2166.0
	Total Acre-feet	4,402	28,574	172,452	364,342
	Net Acre-feet	4,402	24,172	143,878	191,890
Total Storage (A.F.)		36,889	274,340	1,475,207	3,909,611 2/
Total Net Acre-feet		36,889	237,451	1,200,867	2,357,568

11 Includes space for sediment storage.

2/ Includes total active storage for Box Butte, Merritt, Calamus, and Davis Creek Reservoirs.

3/ Bottom of irrigation pool for Harlan County Lake is 1932.5 feet, 164,111 AF.

TABLE 2
SUMMARY OF 2005 OPERATIONS
MIRAGE FLATS PROJECT

BOX BUTTE RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	MIRAGE FLATS CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	1,166	61	67	0.00	8,806	0	0
Feb.	1,429	56	91	0.00	10,088	0	0
Mar.	1,469	61	172	0.90	11,324	0	0
Apr.	1,907	60	299	2.15	12,872	0	0
May	1,531	79	375	4.09	13,949	0	0
June	1,788	71	497	5.98	15,169	0	0
July	1,480	6,359	630	1.65	9,660	4,845	1,611
Aug.	1,100	4,407	380	2.05	5,973	4,830	2,367
Sep.	998	718	219	0.00	6,034	942	135
Oct.	1,276	34	167	0.89	7,109	0	0
Nov.	1,175	34	100	0.00	8,150	0	0
Dec.	1,145	65	63	0.07	9,167	0	0
TOTAL	16,464	12,005	3,060	17.78	--	10,617	4,113

NOTE - Acres inigated 2005: Mirage Flats Canal - 11,092 acres.

SANDHILLS DIVISION
AINSWORTH UNIT

MERRITT RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	AINSWORTH CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	14,320	14,083	237	0.42	61,370	0	0
Feb.	12,822	12,793	299	0.23	61,100	0	0
Mar.	15,214	13,983	418	2.14	61,913	0	0
Apr.	17,289	11,752	724	6.42	66,726	0	0
May	14,417	13,458	1,249	3.18	66,436	1,956	8
June	17,035	15,362	1,673	9.23	66,436	3,971	264
July	14,726	30,946	1,555	1.50	48,661	29,897	19,623
Aug.	16,524	25,408	1,005	2.50	38,772	25,630	18,099
Sep.	15,209	11,151	834	1.11	41,996	10,259	7,523
Oct.	13,876	2,777	594	0.71	52,501	0	0
Nov.	12,735	4,264	408	0.47	60,564	0	0
Dec.	14,110	12,992	312	0.27	61,370	0	0
TOTAL	178,277	168,969	9,308	28.18	–	71,713	45,517

NOTE -- Acres inigated 2005: Ainsworth Canal - 34,158 acres.

NORTH LOUP DIVISION
CALAMUS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	ABOVE DAVIS CREEK MIRDAN CANAL Release to Calamus Fish Hatch. (AF)	Release to Canal (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	19,579	7,252	444	0.32	112,532	430	0	0	0
Feb.	18,964	8,313	590	0.94	122,593	424	0	0	0
Mar.	21,286	19,309	1,075	2.50	123,495	362	0	0	0
Apr.	24,117	23,675	1,743	2.86	122,194	693	0	0	0
May	23,504	23,502	1,789	3.10	120,407	623	3,320	1,119	303
June	27,443	24,502	1,901	5.48	121,447	691	10,120	2,470	208
July	19,188	45,423	2,381	0.55	92,831	810	31,380	23,011	13,482
Aug	21,291	38,822	1,400	3.60	73,900	833	23,080	13,609	7,153
Sep.	18,466	24,343	1,163	0.30	66,860	637	4,880	3,561	1,798
Oct.	19,411	11,052	994	0.50	74,225	654	0	0	0
Nov.	17,694	5,587	582	1.39	85,750	128	0	0	0
Dec.	20,992	5,810	371	0.45	100,561	338	0	0	0
TOTAL	251,935	237,590	14,433	21.99	–	6,623	72,780	43,770	22,944

NOTE - Acres inigated 2005: Mirdan Canal - 33,211 acres.

NORTH LOUP DIVISION (Continued)

DAVIS CREEK RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Mo. Content (AF)	BELOW DAVIS CREEK FULLERTON CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	5	165	48	0.10	9,137	0	0
Feb.	30	133	59	0.76	8,975	0	0
Mar.	75	179	104	1.82	8,767	0	0
Apr.	6,690	716	200	1.61	14,541	0	0
May	14,649	2,878	316	4.71	25,996	1,370	3
June	10,578	4,822	515	8.58	31,237	3,490	194
July	6,970	18,359	565	0.88	19,283	17,320	15,039
Aug.	7,956	14,198	276	2.78	12,765	14,190	9,929
Sep.	1,169	3,782	225	0.24	9,927	3,730	1,188
Oct.	43	252	146	1.00	9,572	0	0
Nov.	46	190	78	1.08	9,350	0	0
Dec.	15	125	44	0.35	9,196	0	0
TOTAL	48,226	45,799	2,576	23.91	--	40,100	26,353

NOTE - Acres irrigated 2005: Fullerton Canal - 21,430 acres.

TABLE 2
SUMMARY OF 2005 OPERATIONS

UPPER REPUBLICAN DIVISION
ARMEL UNIT
BONNY RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Outflow To Hale Ditch (AF)
Jan.	562	307	104	0.31	13,905	0
Feb.	601	278	134	0.16	14,094	0
Mar.	599	307	185	0.67	14,201	0
Apr.	907	298	426	1.43	14,384	0
May	902	397	633	2.64	14,256	89
June	1,612	298	824	3.92	14,746	0
July	274	307	983	1.34	13,730	0
Aug.	444	307	687	2.47	13,180	0
Sep.	264	298	605	0.01	12,541	0
Oct.	497	307	245	4.53	12,486	0
Nov.	252	298	197	0.57	12,243	0
Dec.	439	307	110	0.18	12,265	0
TOTAL	7,353	3,709	5,133	18.23	--	89

TABLE 2
SUMMARY OF 2005 OPERATIONS

FRENCHMAN-CAMBRIDGE DIVISION
FRENCHMAN UNIT

ENDERS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of CULBERTSON CANAL Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	CULBERTSON EXT.CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	452	184	54	0.46	11,846	0	0	0	0
Feb.	378	167	69	0.11	11,988	0	0	0	0
Mar.	526	184	110	2.37	12,220	149	0	0	0
Apr.	569	179	208	2.46	12,402	1,250	0	0	0
May	766	155	296	5.29	12,717	1,696	0	0	0
June	723	179	343	3.95	12,918	1,527	3	0	0
July	0	184	506	1.03	12,228	1,288	224	0	0
Aug.	83	184	311	2.05	11,816	652	220	0	0
Sep.	0	179	362	0.05	11,275	0	0	0	0
Oct.	370	184	136	2.84	11,325	0	0	0	0
Nov.	355	179	118	0.24	11,383	0	0	0	0
Dec.	427	184	60	0.18	11,566	0	0	0	0
TOTAL	4,649	2,142	2,573	21.03	–	6,562	447	0	0

NOTE: Acres irrigated 2005: Culbertson Canal - 1,482 acres; Culbertson Extension Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT

SWANSON LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of MEEKER-DRIFTWOOD Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)	BARTLEY CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	1,911	61	171	0.35	32,168	0	0	0	0
Feb.	2,524	56	228	0.11	34,408	0	0	0	0
Mar.	3,081	61	379	2.77	37,049	0	0	0	0
Apr.	2,367	60	746	0.94	38,610	0	0	0	0
May	1,653	61	1,180	2.69	39,022	0	0	0	0
June	2,212	60	1,404	3.02	39,770	0	0	0	0
July	654	61	1,916	1.58	38,447	0	0	0	0
Aug.	373	61	1,391	4.66	37,368	0	0	0	0
Sep.	0	60	1,597	0.92	35,711	0	0	0	0
Oct.	335	61	584	2.77	35,401	0	0	0	0
Nov.	105	60	429	0.63	35,017	0	0	0	0
Dec.	327	61	215	0 22	35,068	0	0	0	0
TOTAL	15,542	723	10,240	20.66	--	0	0	0	0

NOTE: Acres irrigated 2005: Meeker-Driftwood Canal - 0 acres; Bartley Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT

HUGH BUTLER LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	RED WILLOW CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	763	246	72	0.42	18,832	0	0
Feb.	687	222	90	0.12	19,207	0	0
Mar.	1,083	246	155	3.51	19,889	0	0
Apr.	1,022	238	374	0.99	20,299	0	0
May	1,028	246	552	1.87	20,529	0	0
June	1,762	238	613	5.33	21,440	0	0
July	63	246	809	1.10	20,448	0	0
Aug.	666	246	615	**4.94**	20,253	0	0
Sep.	**84**	238	514	0.88	19,585	0	0
Oct.	624	246	277	2.43	19,686	0	0
Nov.	555	238	181	0.33	19,822	0	0
Dec.	753	246	87	0.23	20,242	0	0
TOTAL	9,090	2,896	4,339	22.15	–	0	0

NOTE -- Acres irrigated 2005: Red Willow Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT

HARRY STRUNK LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	CAMBRIDGE CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,612	61	81	0.60	23,647	0	0
Feb.	2,385	56	106	0.38	25,870	0	0
Mar.	2,527	61	193	3.24	28,143	0	0
Apr.	2,757	60	486	1.03	30,354	0	0
May	3,695	61	767	1.56	33,221	0	0
June	5,163	1,343	985	4.66	36,056	1,855	116
July	1,101	10,098	1,107	0.76	25,952	10,452	5,816
Aug.	2,672	7,694	618	6.45	20,312	7,425	3,826
Sep.	1,325	107	520	0.70	21,010	0	0
Oct.	2,021	71	308	1.74	22,652	0	0
Nov.	2,082	60	203	0.81	24,471	0	0
Dec.	2,521	61	98	0.39	26,833	0	0
TOTAL	30,861	19,733	5,472	22.32	--	19,732	9,758

NOTE - Acres irrigated 2005: Cambridge Canal - 15,945 acres.

TABLE 2
SUMMARY OF 2005 OPERATIONS

KANASKA DIVISION
ALMENA UNIT

	KEITH SEBELIUS LAKE						ALMENA CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To City Of Norton (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	248	58	56	0.88	8,381	27	0	0
Feb.	326	44	71	0.69	8,592	16	0	0
Mar.	**444**	**48**	122	2.59	8,866	18	0	0
Apr.	720	57	285	4.37	**9,244**	28	0	0
May	549	81	477	2.91	9,235	50	0	0
June	422	78	556	2.45	9,023	**48**	0	0
July	345	90	729	4.11	8,549	60	0	0
Aug.	396	77	479	**4.04**	8,389	46	0	0
Sep.	415	73	442	1.74	8,289	43	0	0
Oct.	253	65	288	2.34	8,189	**34**	0	0
Nov.	171	53	134	1.33	8,173	23	0	0
Dec.	266	50	67	0.24	8,322	19	0	0
TOTAL	4,555	774	3,706	27.69	–	412	0	0

NOTE: Acres irrigated 2005: Almena Canal - 0 acres.

BOSTWICK DIVISION
FRANKLIN UNIT

	HARLAN COUNTY LAKE Data from Corps of Engineers					FRANKLIN CANAL		NAPONEE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	992	0	446	0.76	107,599	0	0	0	0
Feb.	5,474	0	524	0.85	112,554	0	0	0	0
Mar.	7,002	0	772	2.36	118,779	0	0	0	0
Apr.	11,673	0	1,789	1.67	128,666	0	0	0	0
May	6,040	0	2,952	2.03	131,754	0	0	0	0
June	13,250	0	3,888	5.75	141,112	0	0	0	0
July	2,013	0	5,408	2.81	137,717	0	0	0	0
Aug.	4,076	0	4,821	3.15	136,971	0	0	0	0
Sep.	454	0	5,591	0.74	131,834	0	0	0	0
Oct.	1,694	0	3,831	1.46	129,695	0	0	0	0
Nov.	250	0	1,834	0.67	128,111	0	0	0	0
Dec.	764	0	764	0.26	128,111	0	0	0	0
TOTAL	53,682	0	32,620	22.51	--	0	0	0	0

NOTE: Acres irrigated 2005: Franklin Canal - 0 acres: Naponee Canal - 0 acres.

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

	FRANKLIN PUMP CANAL		SUPERIOR CANAL		COURTLAND CANAL - ABOVE LOVEWELL NEBRASKA USE			KANSAS USE	
Month	Diverted To Canal (AF)	Delivered To Farms (AF)	Diverted To Canal (AF)	Delivered To Farms (AF)	Total Diversion (AF)	Total (AF)	Delivered To Farms (AF)	Diversion To Canal (AF)	Delivered To Farms (AF)
Jan.	0	0	0	0	0	0	0	0	0
Feb.	0	0	0	0	0	0	0	0	0
Mar.	0	0	0	0	0	0	0	0	0
Apr.	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0
June	0	0	2,160	493	0	0	0	541	373
July	0	0	1,982	795	0	0	0	1,221	125
Aug.	0	0	570	195	0	0	0	102	63
Sep.	0	0	0	0	0	0	0	0	0
Oct.	0	0	0	0	0	0	0	0	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
TOTAL	0	0	4,712	1,483	0	0	0	1,864	561

NOTE: Acres irrigated 2005: Franklin Pump Canal - 0 acres: Superior Canal - 2,800 acres.
Courtland Canal-Nebraska use - 0 acres.
Courtland Canal-Kansas use - 1,107 acres.

BOSTWICK DIVISION (Continued)
COURTLAND UNIT
LOVEWELL RESERVOIR

	Est. Flow from White Rock	Inflow from Courtland						COURTLAND (Below)	
Month	Creek (AF)	34.8 (AF)	Total Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	824	1,804	2,628	12	107	1.28	18,413	0	0
Feb.	1,314	3,430	4,744	11	153	1.22	22,993	0	0
Mar.	1,019	3,950	4,969	12	312	2.17	27,638	0	0
Apr.	1,668	5,677	7,345	18	1,035	2.65	33,930	0	0
May	688	3,749	4,437	25	1,347	0.85	36,995	0	0
June	1,005	4,164	5,169	3,687	1,512	3.69	36,965	4,310	1,394
July	3,500	0	3,500	14,595	1,527	4.91	24,343	14,572	7,353
Aug.	2,855	1,562	4,417	7,059	898	7.40	20,803	7,034	3,293
Sep.	293	913	1,206	18	930	1.25	21,061	0	0
Oct.	628	884	1,512	12	558	1.89	22,003	0	0
Nov.	504	1,512	2,016	12	345	0.57	23,662	0	0
Dec.	728	1,620	2,348	12	162	0.19	25,836	0	0
TOTAL	15,026	29,265	44,291	25,473	8,886	28.07	–	25,916	12,040

NOTE: Acres irrigated 2005: Courtland Canal below Lovewell - 23,439 acres.

KS003042

TABLE 2
SUMMARY OF 2005 OPERATIONS

SOLOMON DIVISION
KIMAAN UNIT

	KIRVVIN RESERVOIR					KIRVVIN CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	230	0	**84**	0.89	14560	0	0
Feb.	489	0	114	1.09	14,935	0	0
Mar.	670	0	191	2.94	15,414	0	0
Apr.	2,315	0	486	4.20	17,243	0	0
May	826	0	708	2.70	17,361	0	0
June	1,624	0	844	**4.48**	18,141	0	0
July	677	0	994	4.94	17,824	0	0
Aug.	1,889	0	710	7.35	19,003	0	0
Sep.	605	0	699	1.86	18,909	0	0
Oct.	344	0	406	2.04	18,847	0	0
Nov.	340	0	247	0.87	18,940	0	0
Dec.	431	0	119	0.25	19,252	0	0
TOTAL	10,440	0	5,602	33.61	–	0	0

NOTE: Acres irrigated 2005: Kirwin Canal - 0 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

	WEBSTER RESERVOIR					OSBORNE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	225	0	91	1.03	10,287	0	0
Feb.	247	0	112	0.76	10,422	0	0
Mar.	375	0	199	1.43	10,598	0	0
Apr.	1,892	0	528	1.28	11,962	0	0
May	633	0	747	2.12	11,848	0	0
June	1,039	0	854	5.10	12,033	0	0
July	108	0	1,077	2.69	11,064	0	0
Aug.	828	0	745	6.52	11,147	0	0
Sep.	0	0	725	1.63	10,422	0	0
Oct.	238	0	386	2.66	10,274	0	0
Nov	192	0	219	1.47	10,247	0	0
Dec.	190	0	110	0.25	10,327	0	0
TOTAL	5,967	0	5,793	26.94	–	0	0

NOTE: Acres irrigated 2005: Osborne Canal - 0 acres.

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT

	WACONDA LAKE					OUTFLOW TO RIVER				
						City of Beloit		Irrig.District		
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Storage Release (AF)	Quality Bypass (AF)	Storage Release (AF)	Other Controlled Releases (AF)	Release To Mitchell Co. RWD No. 2 (AF)
Jan.	2,160	979	585	1.10	160,397	0	923	0	0	56
Feb.	4,059	886	771	1.90	162,799	0	833	0	0	53
Mar.	2,782	985	1,394	1.68	163,202	0	922	0	0	63
Apr.	9,302	950	3,137	2.91	168,417	0	893	0	0	57
May	3,278	1,575	5,601	1.35	164,519	0	573	393	549	60
June	17,403	2,426	6,999	3.55	172,497	69	**417**	12	1,867	61
July	13,141	4,842	7,664	6.20	173,132	97	**49**	2,676	1,945	75
Aug.	6,433	3,118	5,108	2.96	171,339	20	401	70	2,566	61
Sep.	501	947	5,151	1.69	165,742	81	812	0	0	**54**
Oct.	2,142	1,273	3,207	2.32	163,404	262	499	405	**54**	53
Nov.	616	943	1,583	1.38	161,494	111	781	0	0	51
Dec.	1,807	983	724	0.34	161,594	0	922	0	0	61
TOTAL	63,624	19,907	41,924	27.38	--	640	8,025	3,556	6,981	705

NOTE: Acres irrigated 2005: Glen Elder District - 6,509 acres.

SMOKY HILL DIVISION
ELLIS UNIT

	CEDAR BLUFF RESERVOIR						
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to City of Russell (AF)	Release To Fish Hatchery (AF)
Jan.	415	0	415	0.87	117,211	0	0
Feb.	1,083	0	505	1.69	117,789	0	0
Mar.	360	0	833	1.17	117,316	0	0
Apr.	668	0	1,868	1.09	116,116	0	0
May	926	0	2,629	2.05	114,413	0	0
June	1,678	3	3,357	3.09	112,731	0	3
July	1,152	1	4,156	2.80	109,726	0	1
Aug.	1,456	0	2,785	2.37	108,397	0	0
Sep.	0	0	2,950	1.20	105,447	0	0
Oct.	396	0	1,489	2.29	104,354	0	0
Nov.	0	0	1,224	0.65	103,130	0	0
Dec.	0	1,405	544	0.24	101,181	1405	0
TOTAL	8,134	1,409	22,755	19.51	--	1,405	4

TABLE 3

ACRES IRRIGATED IN 2005

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2005
Mirage Flats Irrigation District		
Mirage Flats Canal	11,662	11,092
Ainsworth Irrigation District		
Ainsworth Canal	34,539	34,158
Twin Loups Irrigation District		
Above Davis Creek	34,053	33,211
Below Davis Creek	20,851	21,430
Total Twin Loups Irrigation District	54,904	54,641
Frenchman Valley Irrigation District		
Culbertson Canal	9,295	1,482
H & RW Irrigation District		
Culbertson Extension Canal	11,695	0
Frenchman-Cambridge Irrigation District		
Meeker-Driftwood Canal	16,562	0
Red Willow Canal	4,877	0
Bartley Canal	6,435	0
Cambridge Canal	17,297	15,945
Total Frenchman-Cambridge Irrigation District	45,171	15,945
Almena Irrigation District		
Almena Canal	5,764	0
Bostwick Irrigation District in Nebraska		
Franklin Canal	11,262	0
Naponee Canal	1,628	0
Franklin Pump Canal	2,106	0
Superior Canal	5,972	2,800
Courtland Canal (Nebraska)	1,967	0
Total Bostwick Irrigation Dist. in Nebraska	22,935	2,800
Kansas-Bostwick Irrigation District		
Courtland Canal above Lovewell	13,378	1,107
Courtland Canal below Lovewell	29,122	23,439
Total Kansas-Bostwick Irrigation District	42,500	24,546
Kirwin Irrigation District		
Kirwin Canal	11,465	0
Webster Irrigation District		
Osborne Canal	8,537	0
Glen Elder Irrigation District	7,000	6,509
TOTAL PROJECT USES	265,467	151,173
Non-Project Uses		
Hale Ditch	700	0
TOTAL PROJECT AND NON-PROJECT	266,167	151,173

RESERVOIR	DURING FY 2005	PRIOR TO 2005	ACCUMULATED TOTAL
BONNY	$91,000	$2,689,000	$2,780,000
ENDERS	$0	$3,281,000	$3,281,000
SWANSON	$91,000	$19,066,000	$19,157,000
HUGH BUTLER	$91,000	$2,574,000	$2,665,000
HARRY STRUNK	$98,000	$4,924,000	$5,022,000
KEITH SEBELIUS	$0	$3,958,000	$3,958,000
HARLAN COUNTY	$464,000	$150,090,000	$150,554,000
LOVEWELL	$0	$146,608,000	$146,608,000
KIRWIN	$11,000	$86,859,000	$86,870,000
WEBSTER	$0	$110,313,000	$110,313,000
WACONDA	$259,000	$1,213,195,000	$1,213,454,000
CEDAR BLUFF	$0	$128,890,000	$128,890,000
TOTAL	$1,105,000	$1,872,447,000	$1,873,552,000

Estimates of damages prevented are received from the Army Corps of Engineer's Kansas City District Office. The Accumulated Totals date from 1951 through 2005. Cumulative totals are revised by the Corps of Engineers in some cases to reflect data not previously included in the reporting and may not match previous cumulative totals,

Construction Cost of storage dams was $208,954,130.
The reservoirs upstream of Harlan County Lake did not receive benefits for damages prevented from 1972 to 1993.

TABLE 6
WATER DIVERTED IN 2005
(Units - Acre-Feet)

Irrigation District and Canal	2005 Irrigation Operations From	To	10-Year Average Diversion (1995-2004)	2005 Diversion
Mirage Flats Irrigation District				
Mirage Flats Canal	7/10	9/9	12,516	10,617
Ainsworth Irrigation District				
Ainsworth Canal	5/15	9/17	74,501	71,713
Twin Loups Irrigation District				
Above Davis Creek	5/17	9/15	40,591	43,770
Below Davis Creek	5/17	9/15	37,599	40,100
Total Twin Loups Irrigation District			78,190	83,870
Frenchman Valley Irrigation District				
Culbertson Canal	3/29	8/24	8,961	6,562
H & RW Irrigation District				
Culbertson Extension Canal	Did not run.		7,942	0
Frenchman-Cambridge Irrigation District				
Meeker-Driftwood Canal	Did not run.		20,317	0
Red Willow Canal	Did not run.		5,376	0
Bartley Canal	Did not run.		6,168	0
Cambridge Canal	6/20	8/31	23,203	19,732
Total Frenchman-Cambridge Irrigation District			55,064	19,732
Almena Irrigation District				
Almena Canal	Did not run.		4,605	0
Bostwick Irrigation District in Nebraska				
Franklin Canal	Did not run.		26,707	0
Naponee Canal	Did not run.		2,423	0
Franklin Pump Canal	Did not run.		2,712	0
Superior Canal	6/6	8/19	12,829	4,712
Courtland Canal (Nebraska)	Did not run.		1,898	0
Total Bostwick Irrigation District in Nebraska			46,569	4,712
Kansas-Bostwick Irrigation District				
Courtland Canal above Lovewell	6/1	8/15	24,361	1,864
Courtland Canal below Lovewell	6/20	8/23	46,282	25,916
Total Kansas-Bostwick Irrigation District			70,643	27,780
Kirwin Irrigation District				
Kirwin Canal	Did not run.		20,325	0
Webster Irrigation District				
Osborne Canal	Did not run.		13,422	0
Glen Elder Irrigation District	5/18	10/11	5,749	3,556
TOTAL			398,487	228,542

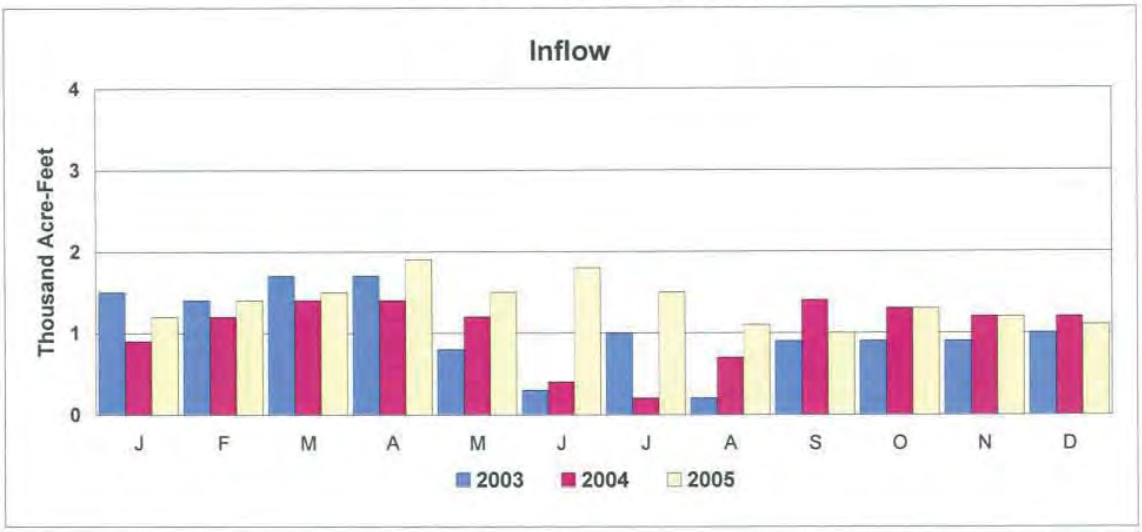
TABLE 7
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2005

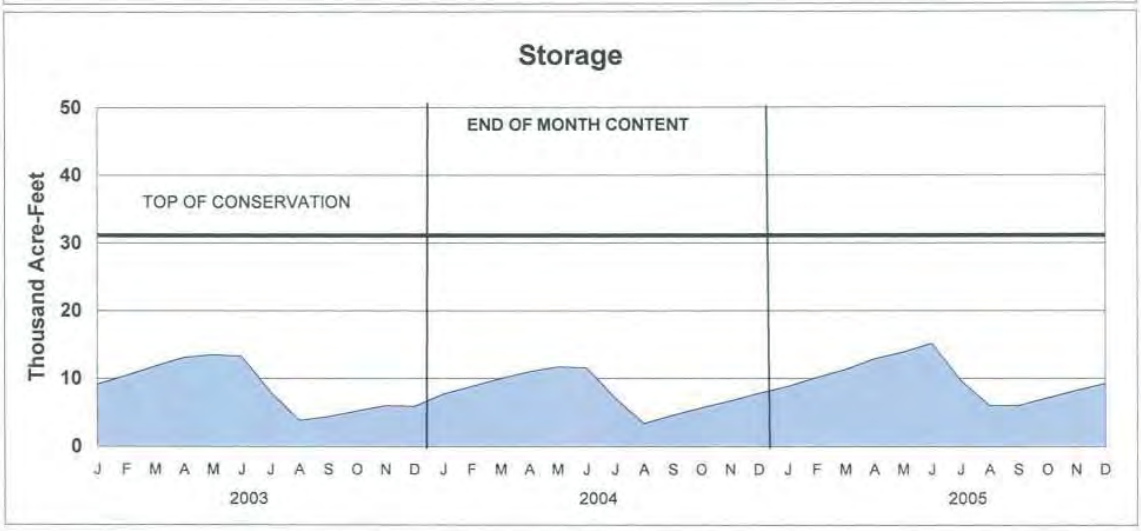
Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-04 AF	Storage 12-31-05 AF	Gain or Loss AF	Maximum Content AF	Storage Date	Minimum Content AF	Storage Date	Total Inflow AF
Box Butte	17.78	104	7,768	9,167	1,399	15,179	JUN 29	5,270	SEP 3	16,464
Merritt	28.18	140	61,370	61,370	0	67,749	APR 24	35,051	SEP 9	178,277
Calamus	21.99	93	100,649	100,561	-88	123,495	MAR 30	66,625	SEP 28	251,935
Davis Creek	23.91	101	9,345	9,196	-149	31,462	JUN 26	8,813	APR 14	48,226
Bonny	18.23	106	13,754	12,265	-1,489	14,916	JUN 13	12,173	DEC 9	7,353
Enders	21.03	111	11,632	11,566	-66	12,981	JUN 22	11,174	OCT 9	4,649
Swanson	20.66	103	30,489	35,068	4,579	40,193	JUN 21	30,559	JAN 1	15,542
Hugh Butler	22.15	113	18,387	20,242	1,855	21,630	JUN 17	18,397	JAN 1	9,090
Harry Strunk	22.32	108	21,177	26,833	5,656	36,707	JUN 21	20,310	AUG 31	30,861
Keith Sebelius	27.69	112	8,247	8,322	75	9,342	JUN 13	8,091	NOV 22	4,555
Harlan County	22.51	98	107,050	128,111	21,061	141,360	JUN 26	106,981	JAN 3	53,682
Lovewell	28.07	103	15,904	25,836	9,932	41,060	JUN 20	15,994	JAN 1	44,291
Kirwin	33.61	143	14,414	19,252	4,838	19,252	DEC 31	14,307	JAN 2	10,440
Webster	26.94	114	10,153	10,327	174	12,405	JUN 17	18,060	NOV 25	5,967
Waconda	27.38	106	159,801	161,594	1,793	176,227	JUN 14	159,603	JAN 2	63,624
Cedar Bluff	19.51	92	117,211	101,181	-16,030	117,999	FEB 13	101,181	DEC 31	8,134

EXHIBIT 1A

BOX BUTTE RESERVOIR

ACTUAL OPERATION





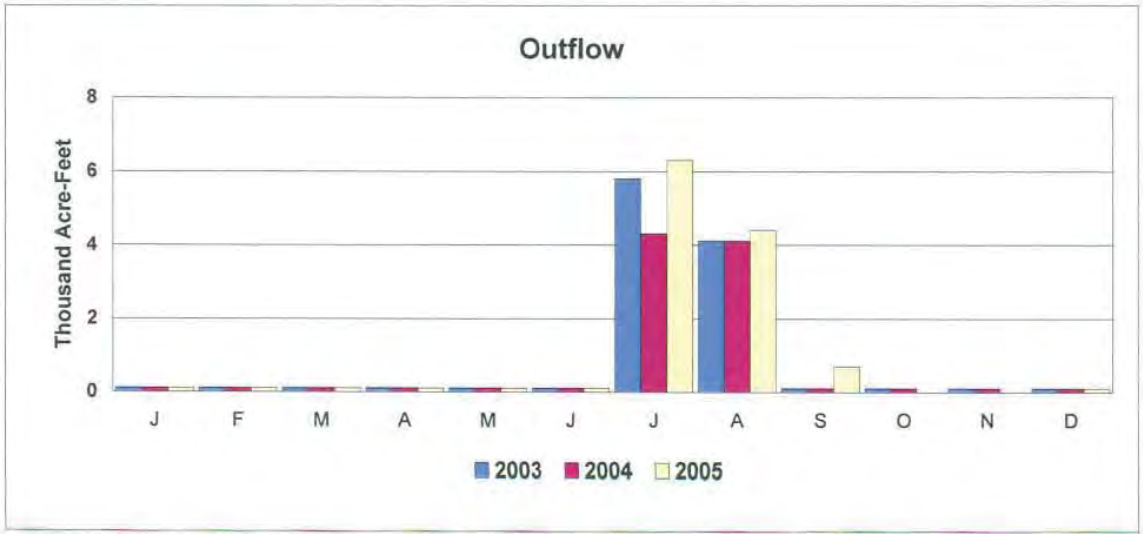
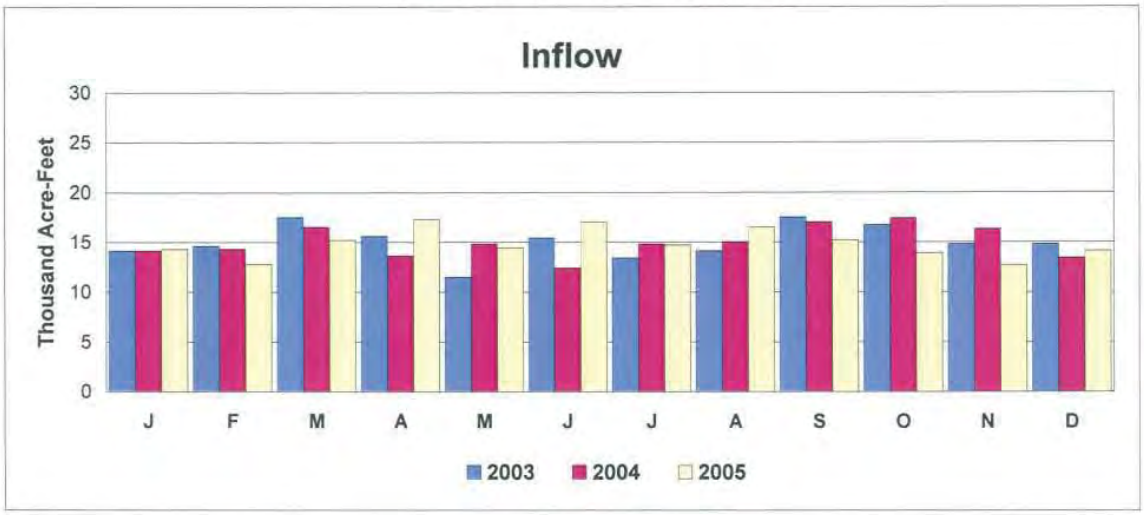
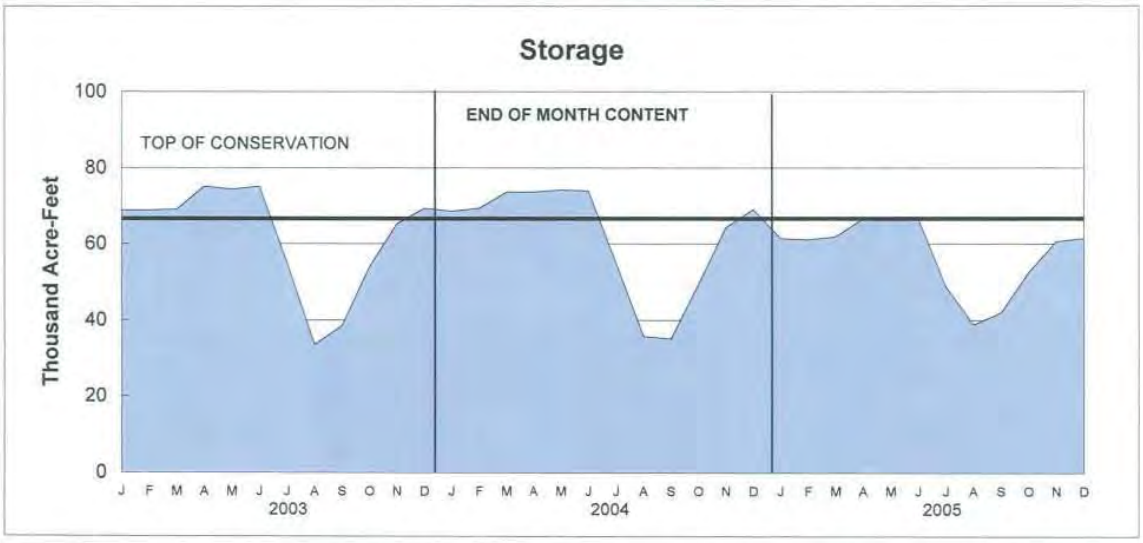


EXHIBIT 2A

MERRITT RESERVOIR

ACTUAL OPERATION





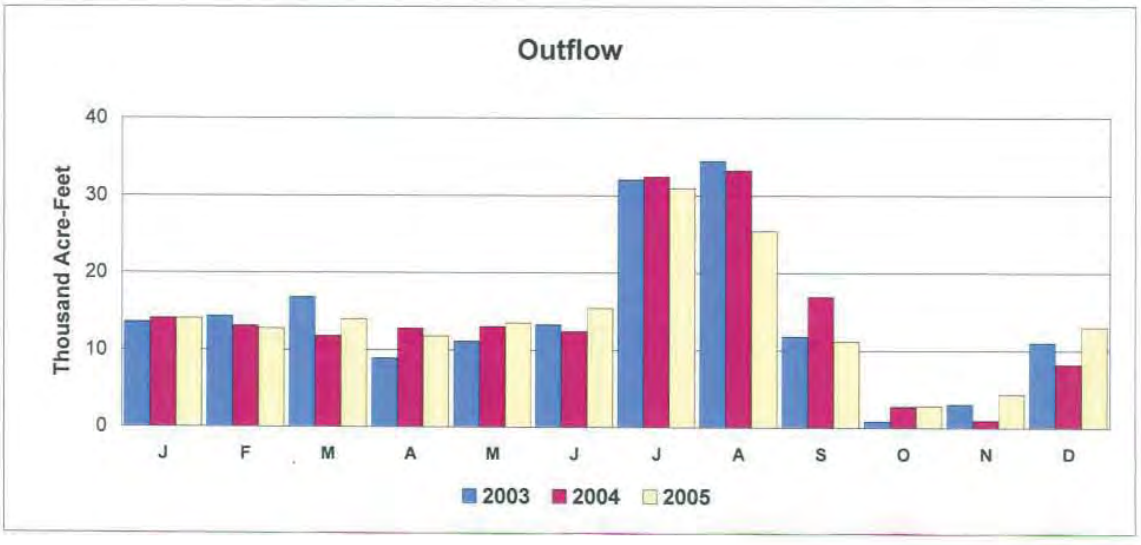
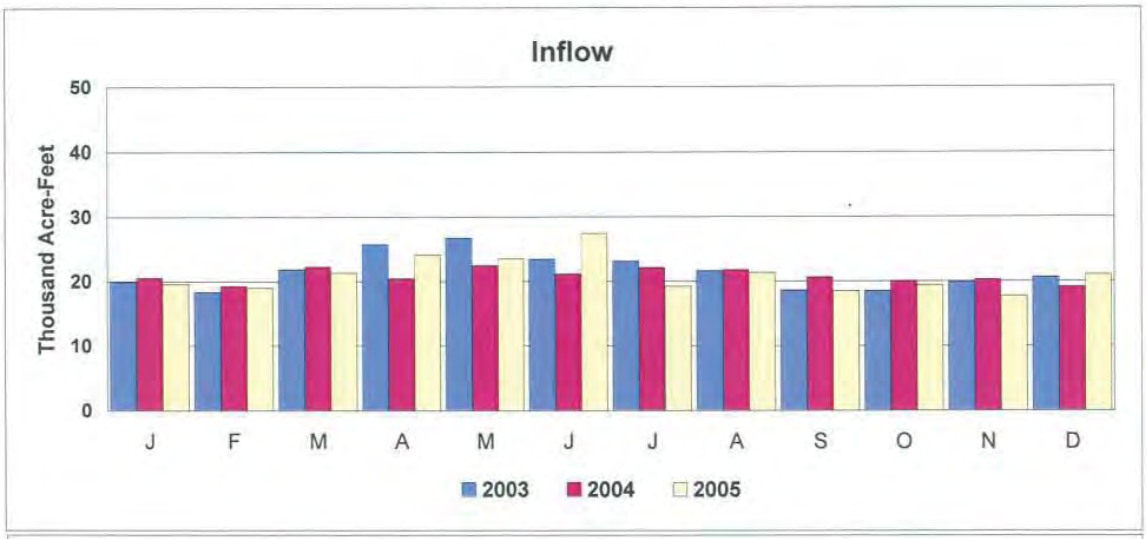
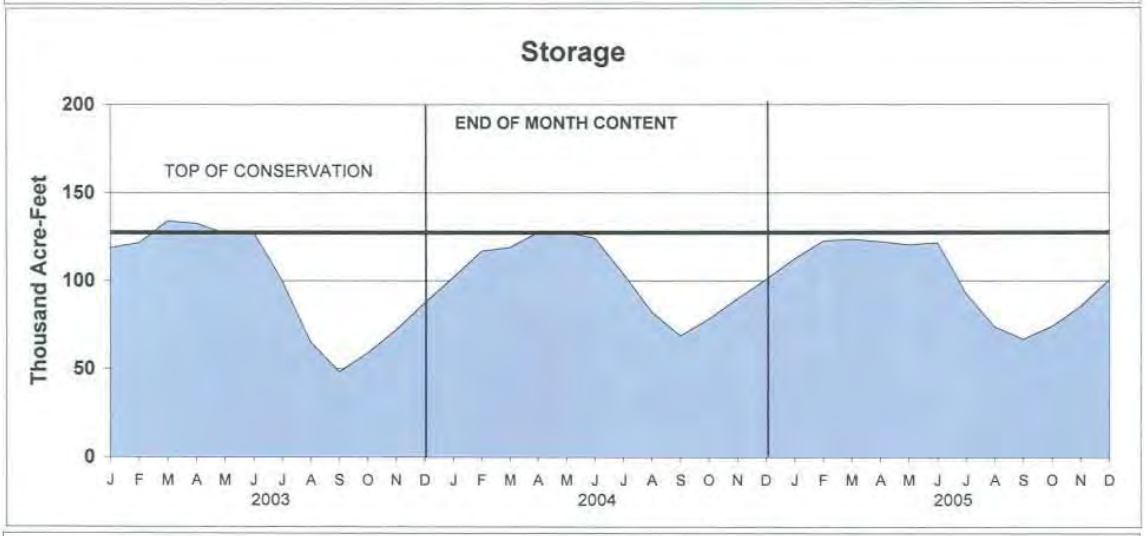


EXHIBIT 3A

CALAMUS RESERVOIR
ACTUAL OPERATION





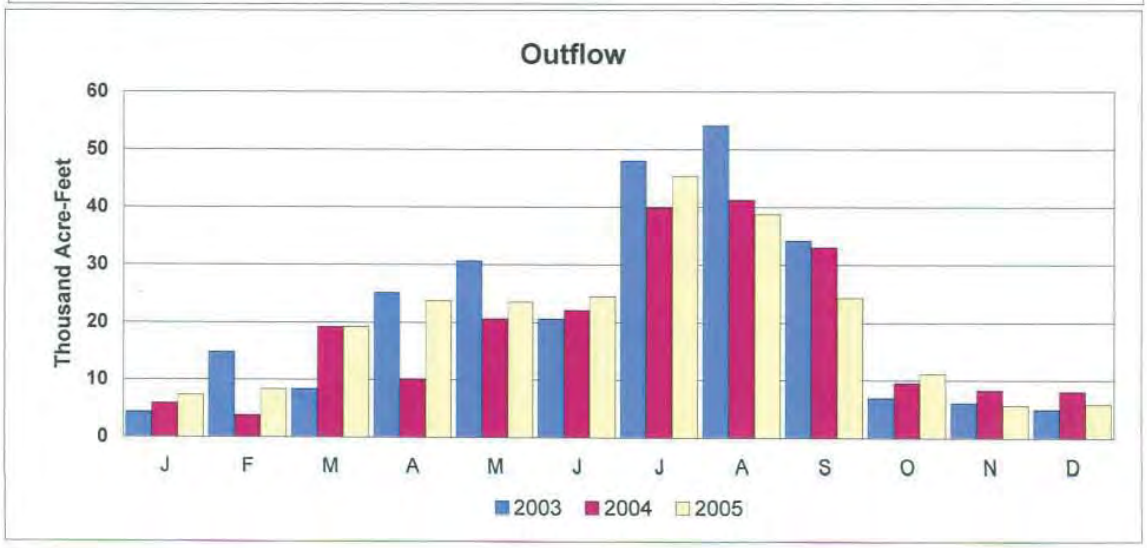
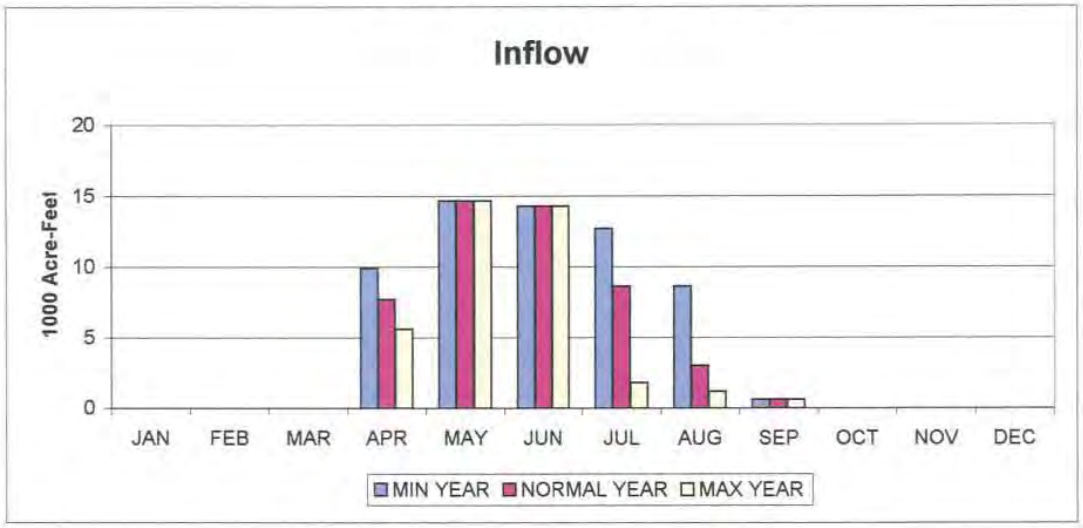
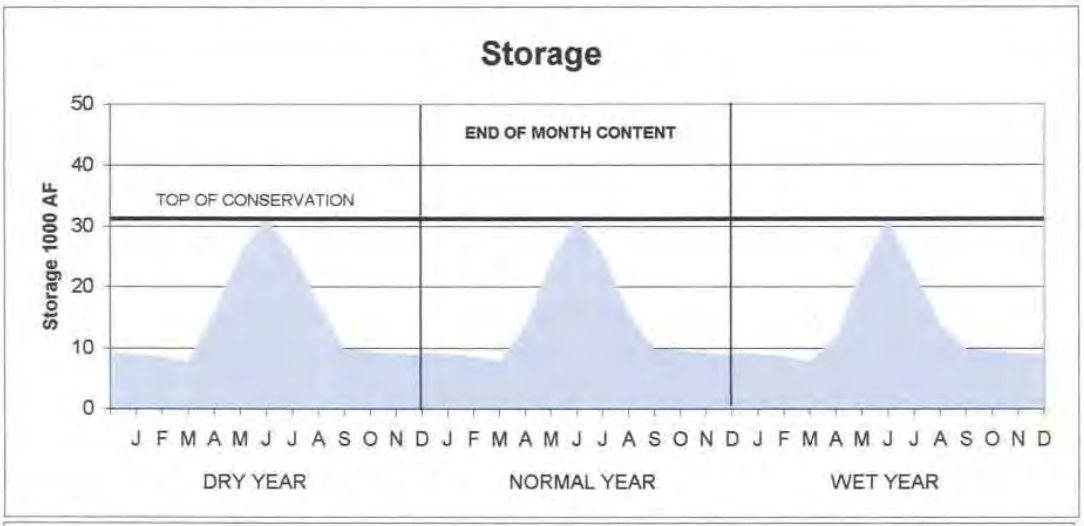


EXHIBIT 4B

DAVIS CREEK RESERVOIR

2005 OPERATION PLAN





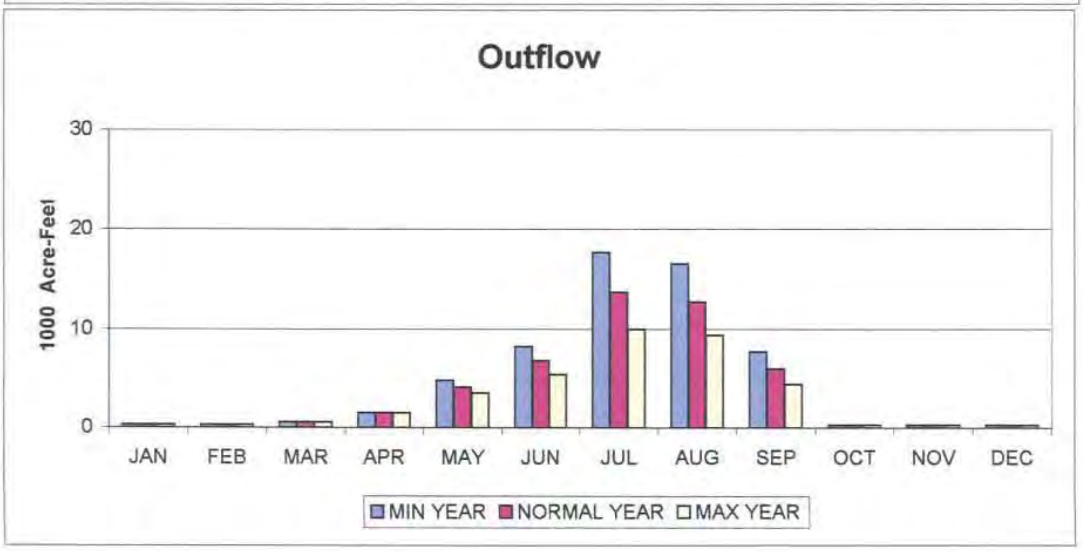
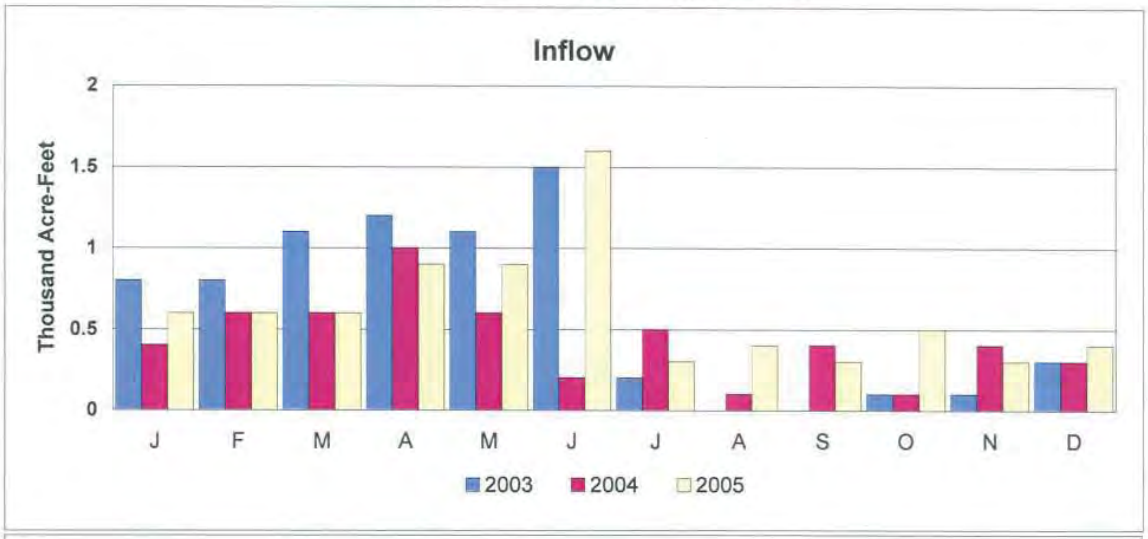
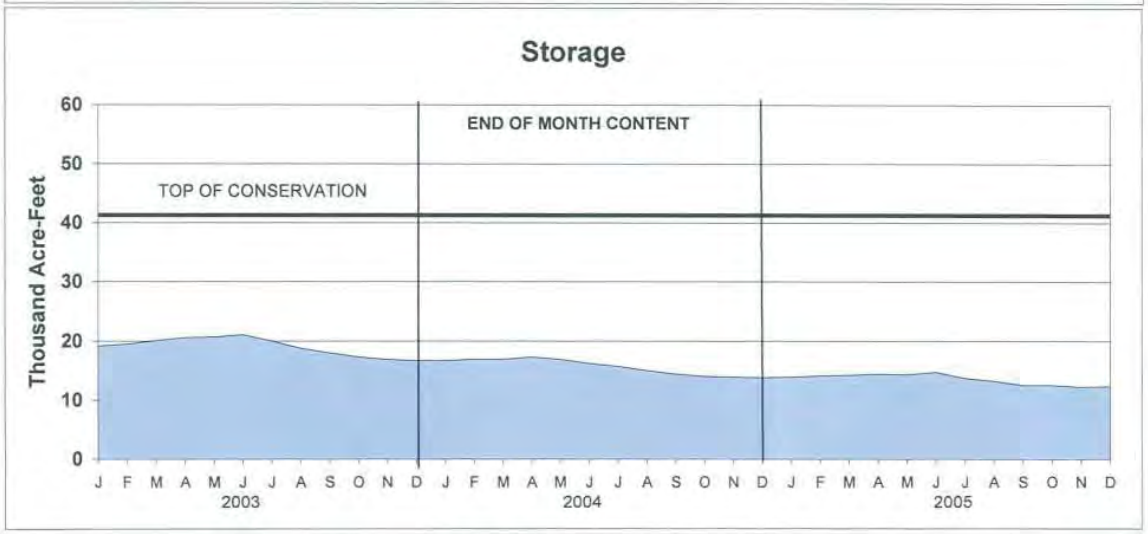


EXHIBIT 5A

BONNY RESERVOIR

ACTUAL OPERATION





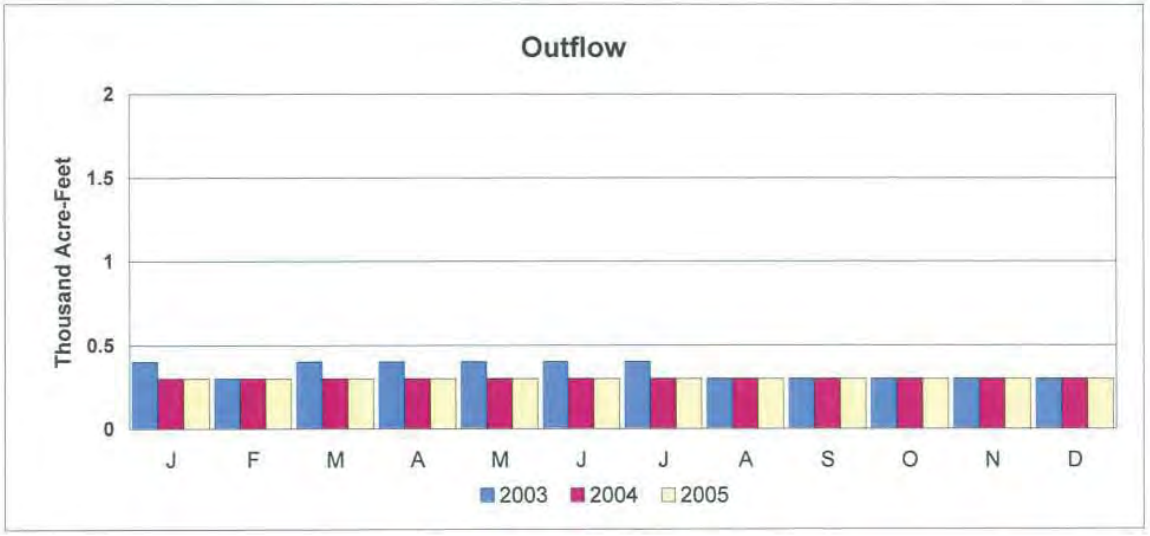
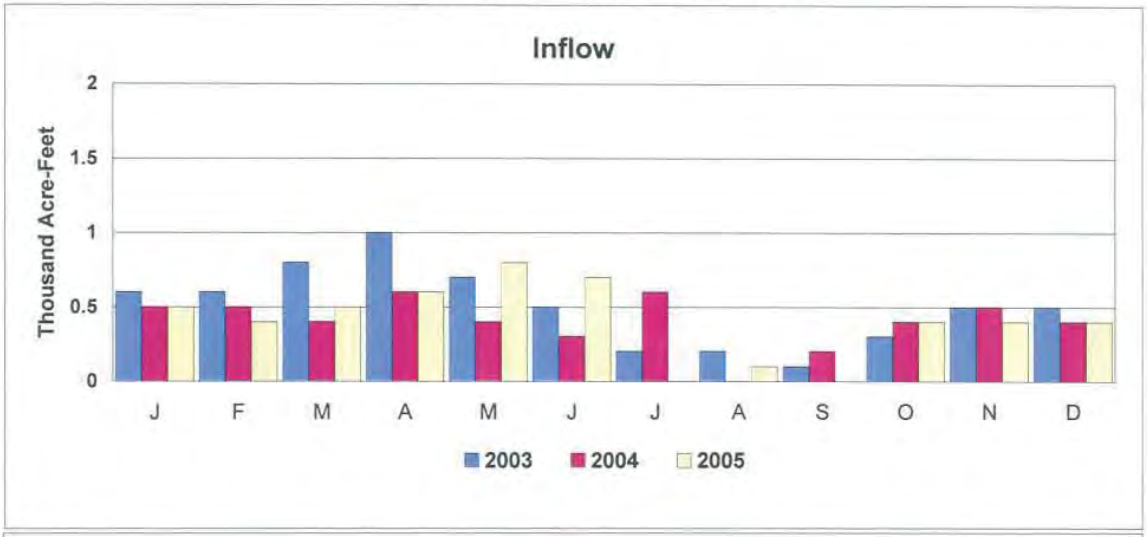
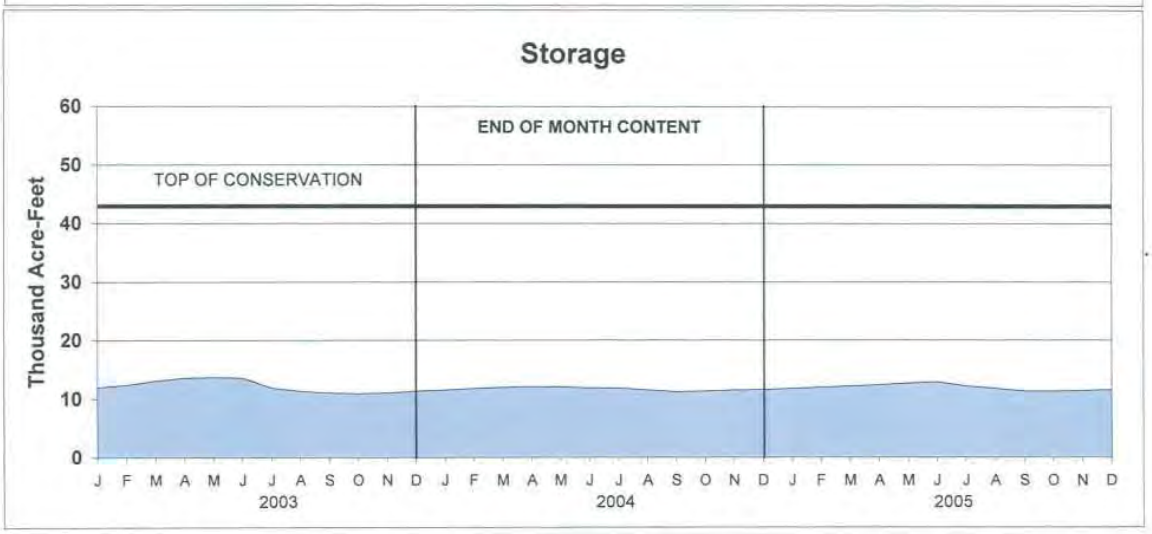


EXHIBIT 6A

ENDERS RESERVOIR

ACTUAL OPERATION





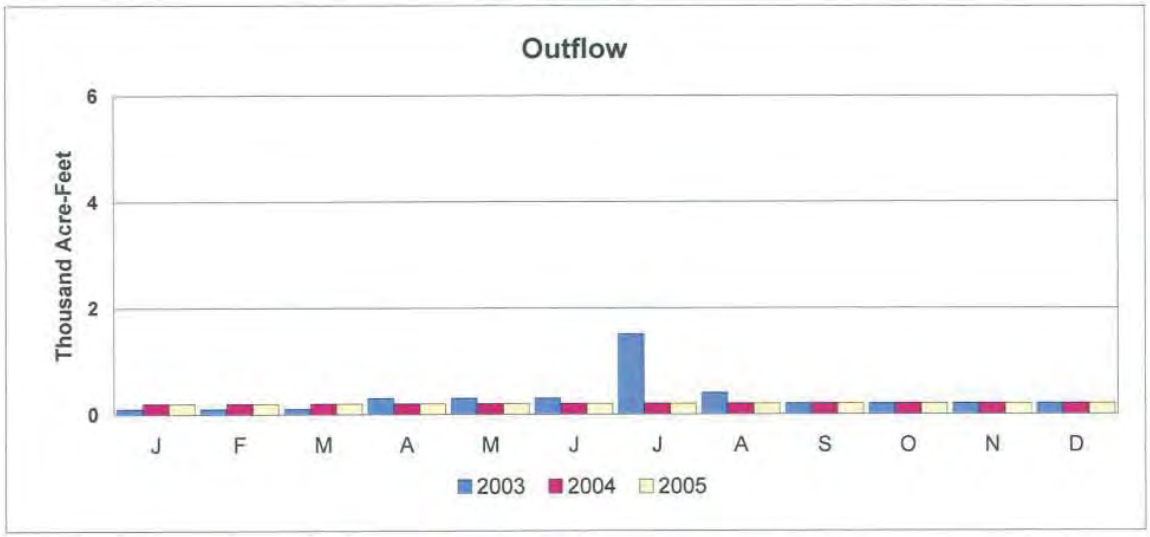
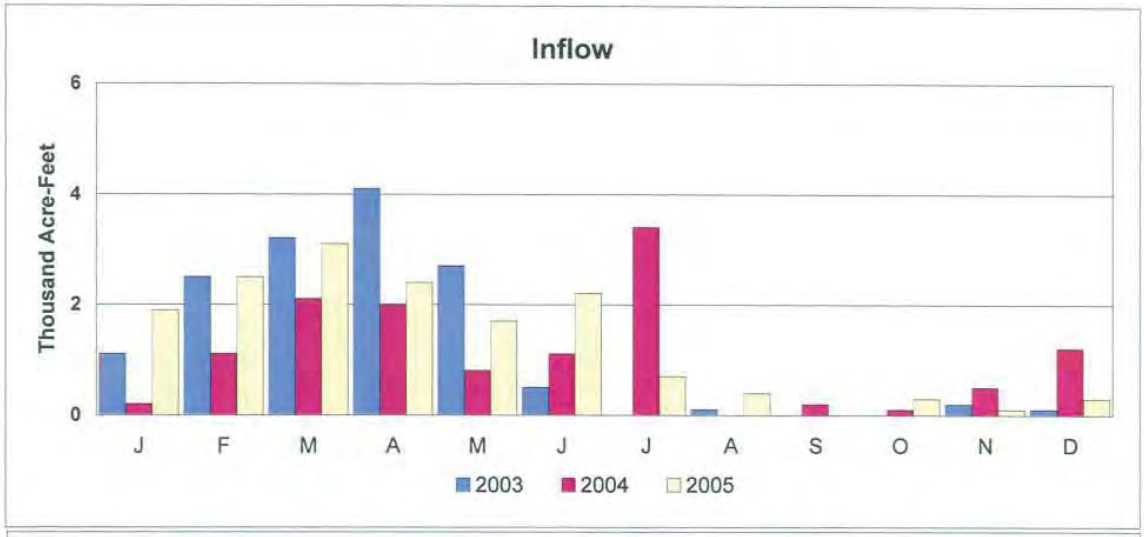
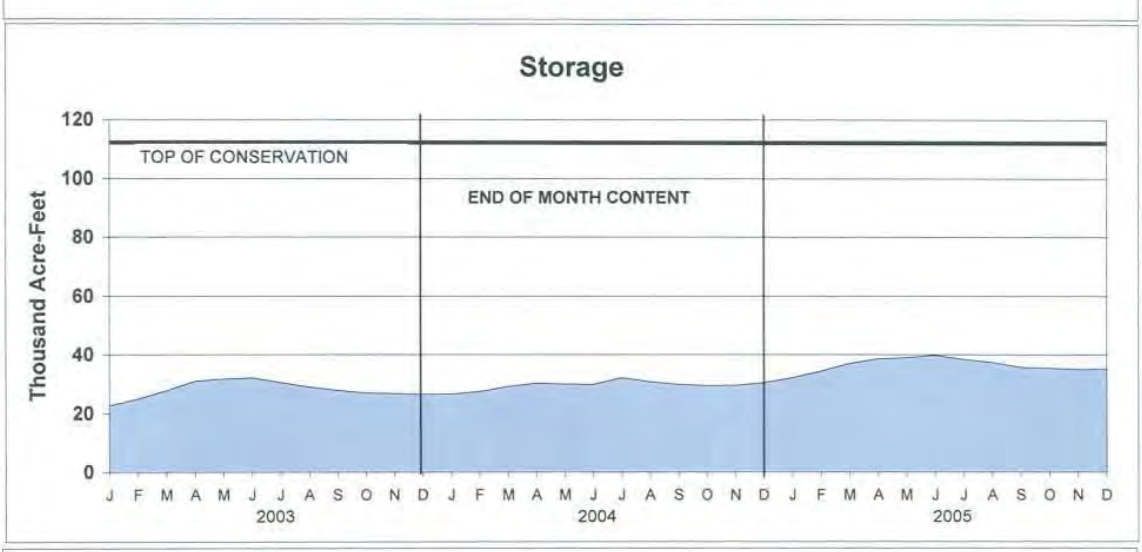


EXHIBIT 7A

SWANSON LAKE

ACTUAL OPERATION





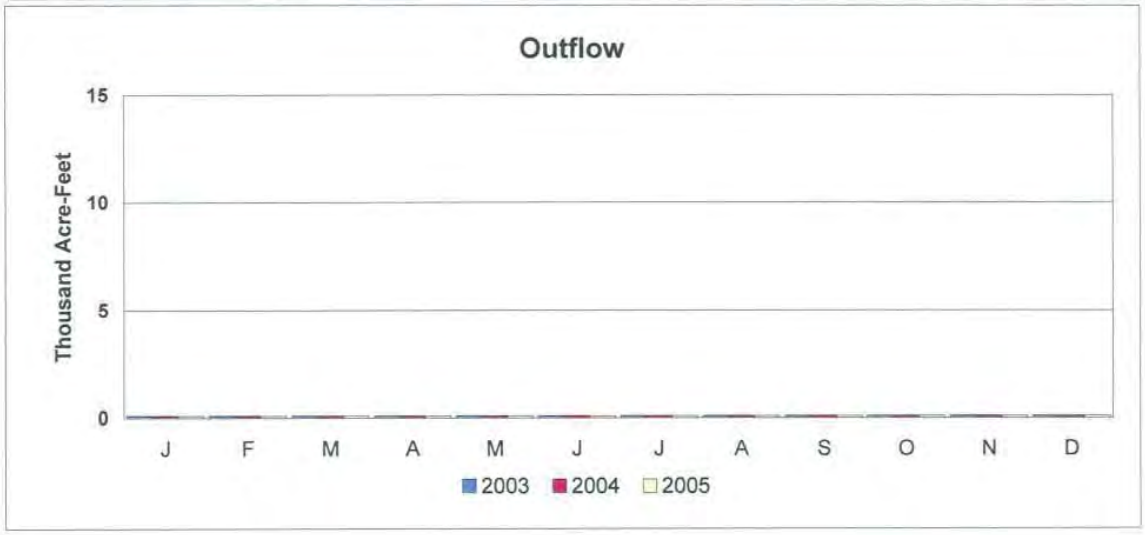
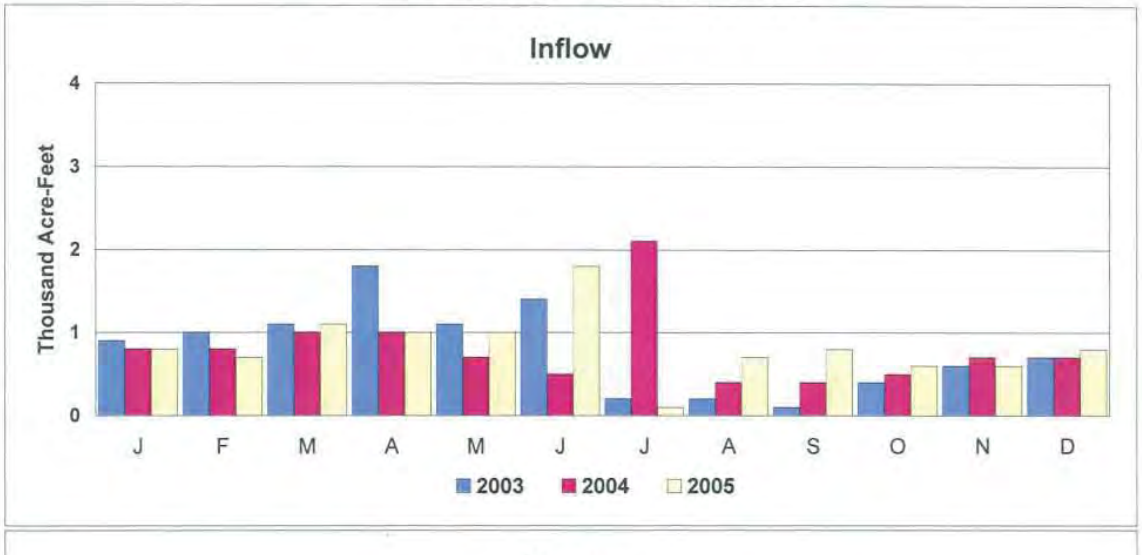
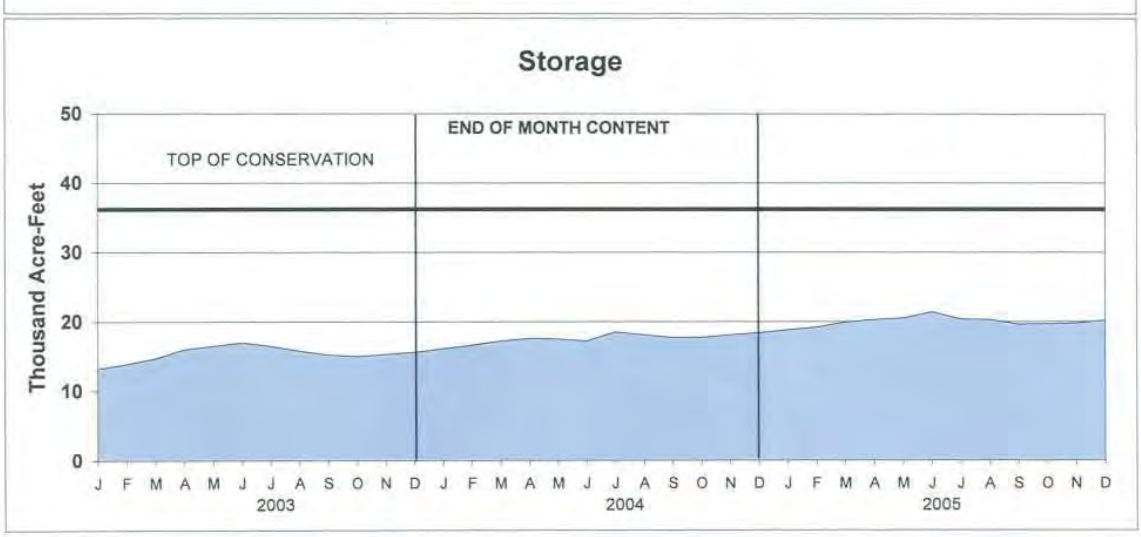


EXHIBIT 8A

HUGH BUTLER LAKE

ACTUAL OPERATION





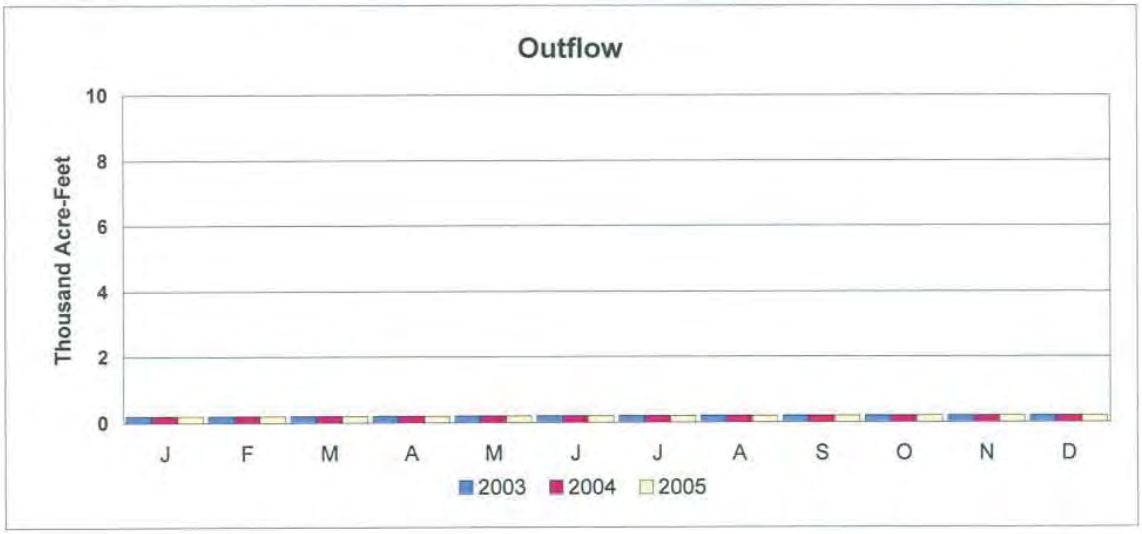
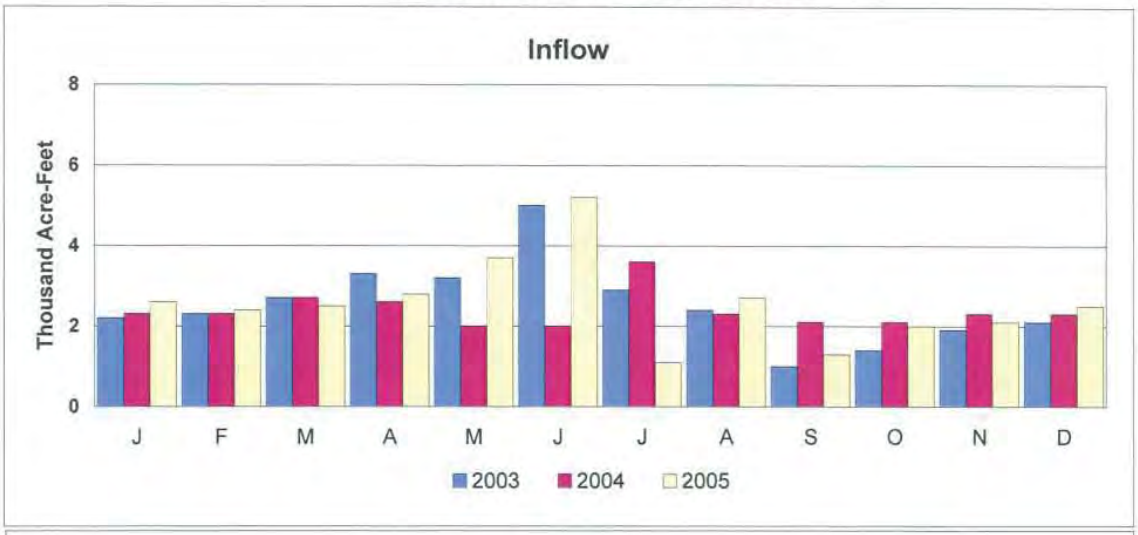
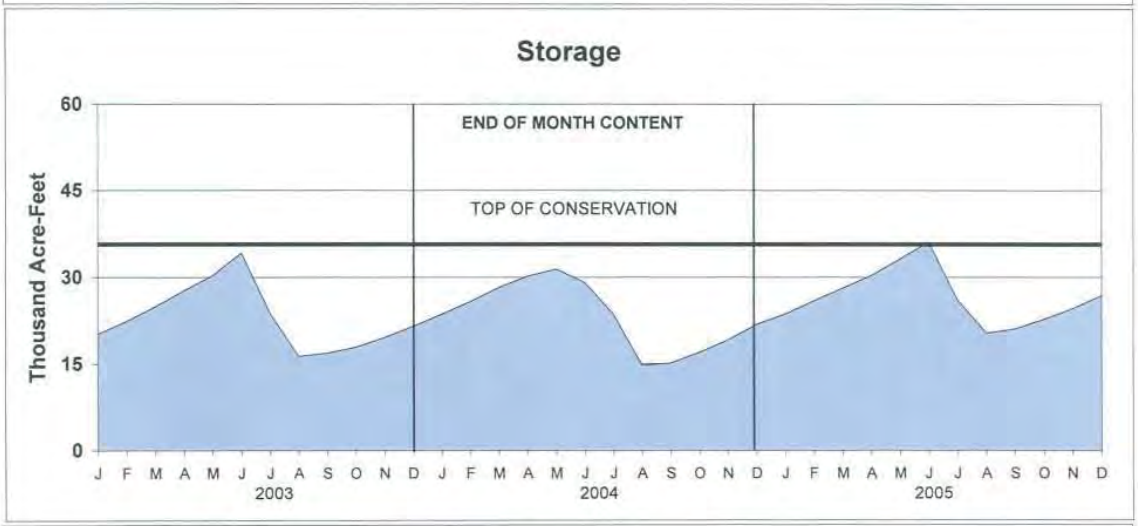


EXHIBIT 9A

HARRY STRUNK LAKE

ACTUAL OPERATION





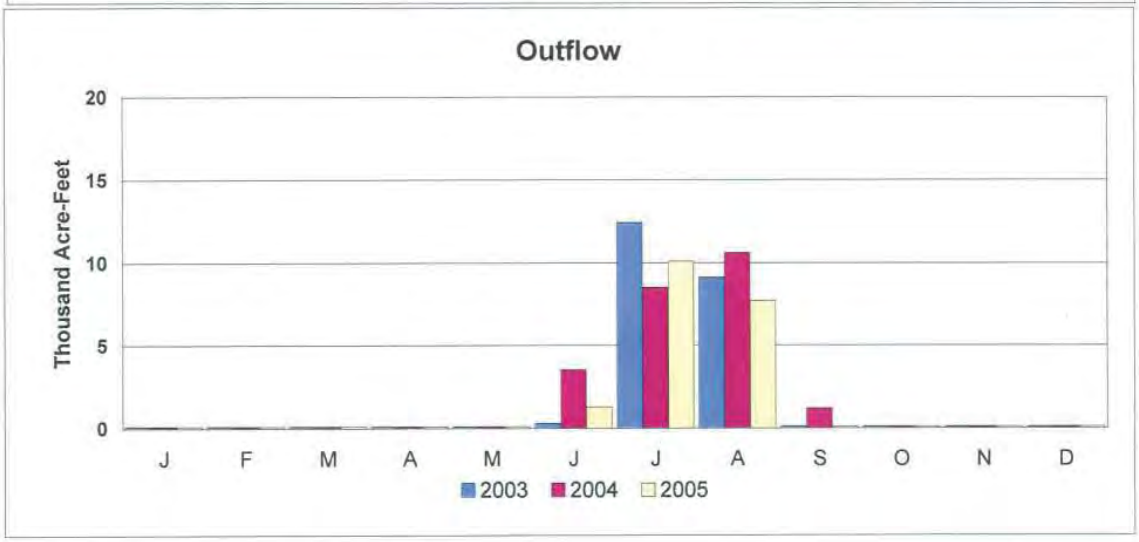
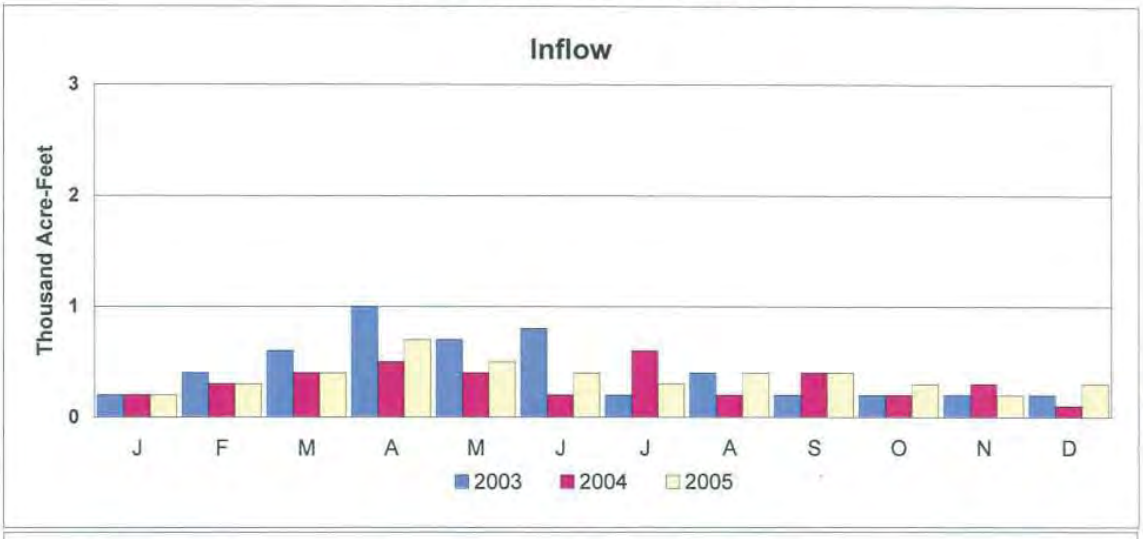
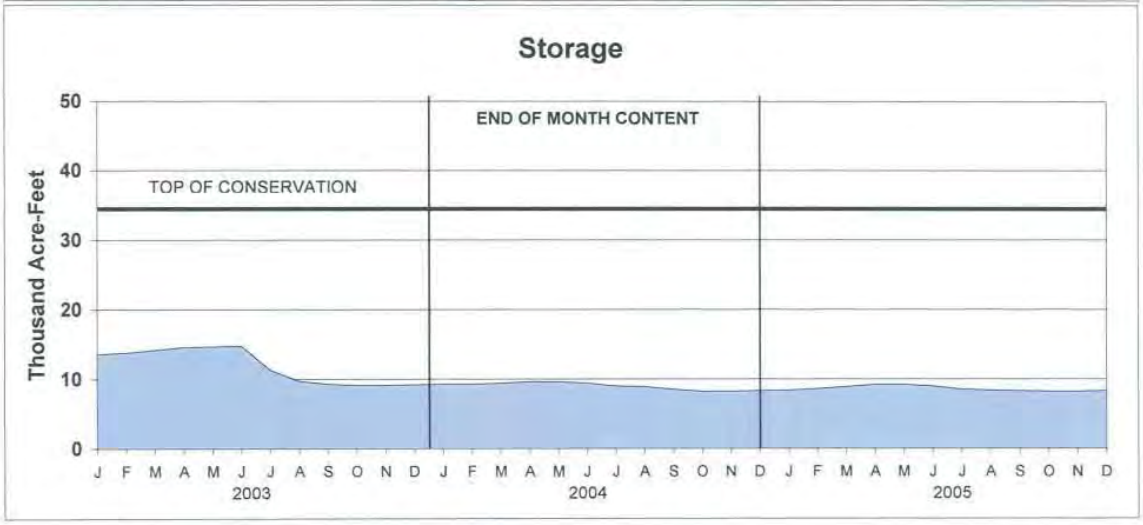


EXHIBIT 10A

KEITH SEBELIUS LAKE

ACTUAL OPERATION





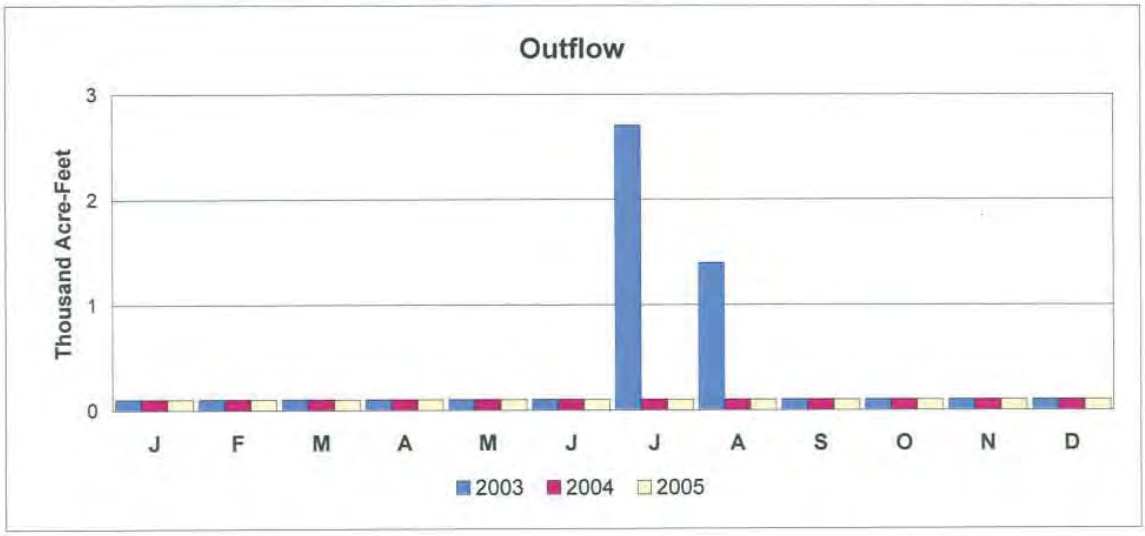
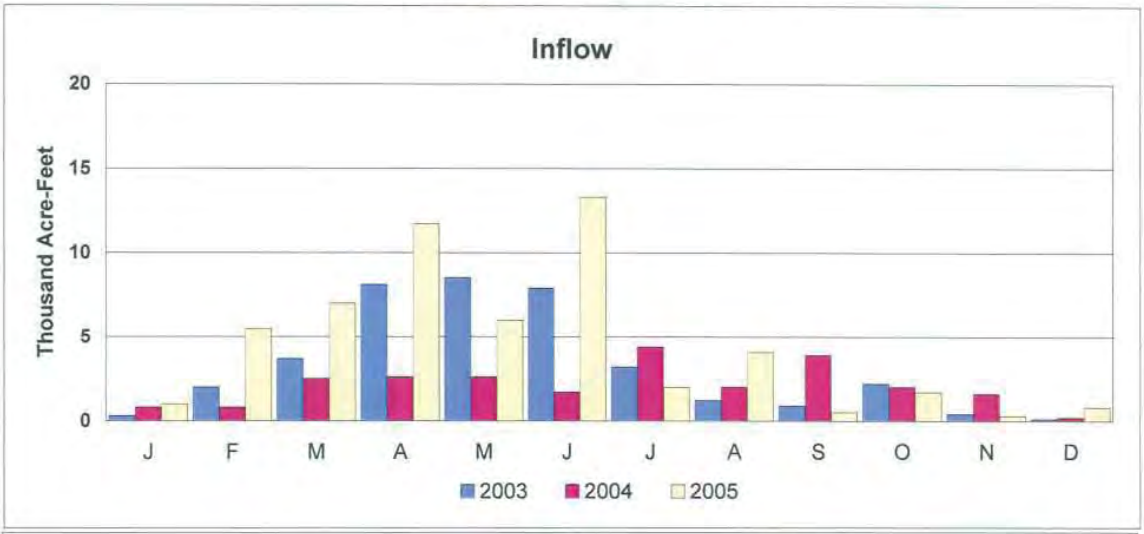
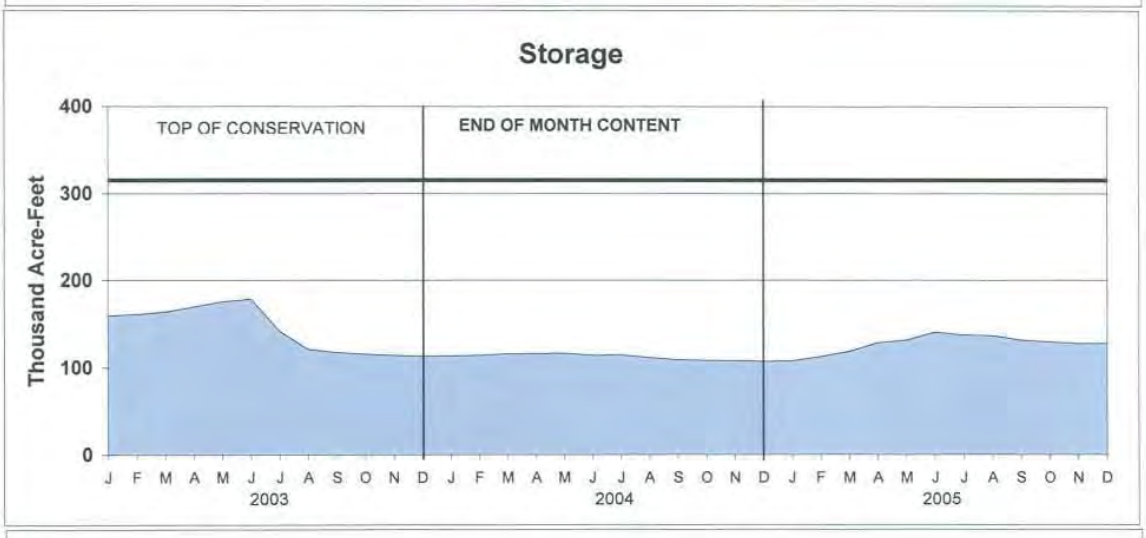


EXHIBIT 11A

HARLAN COUNTY LAKE

ACTUAL OPERATION





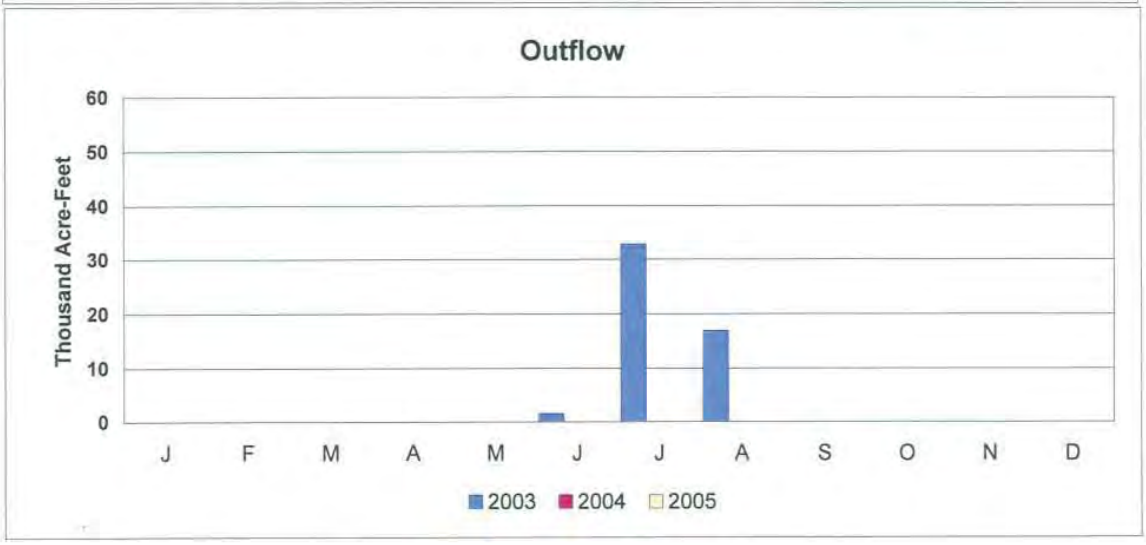
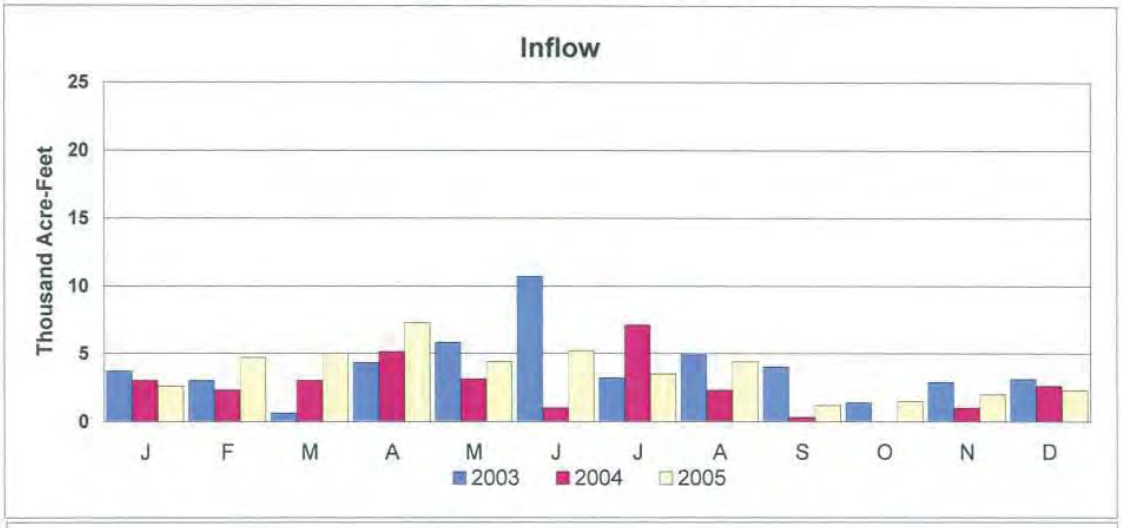
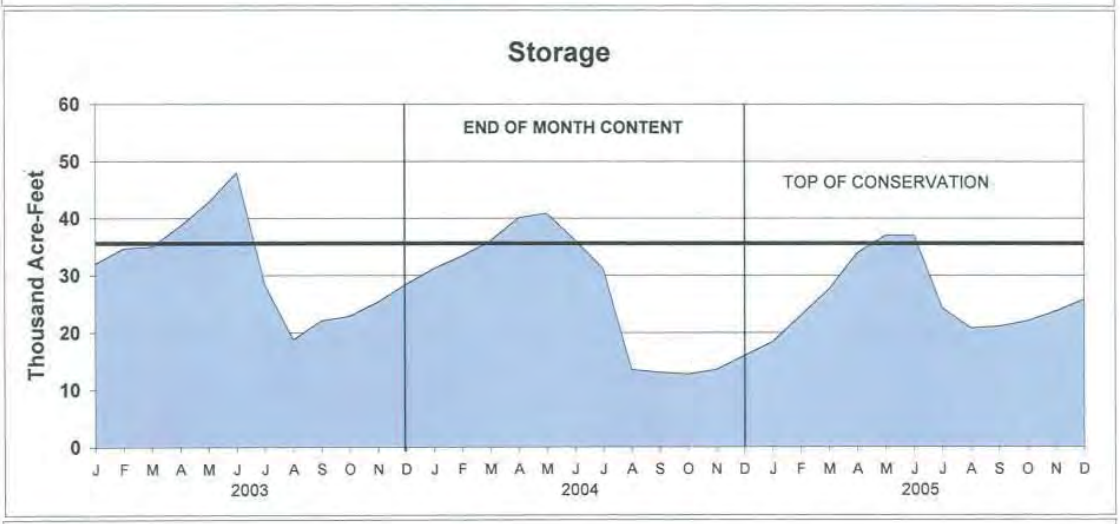


EXHIBIT 12A

LOVEWELL RESERVOIR

ACTUAL OPERATION





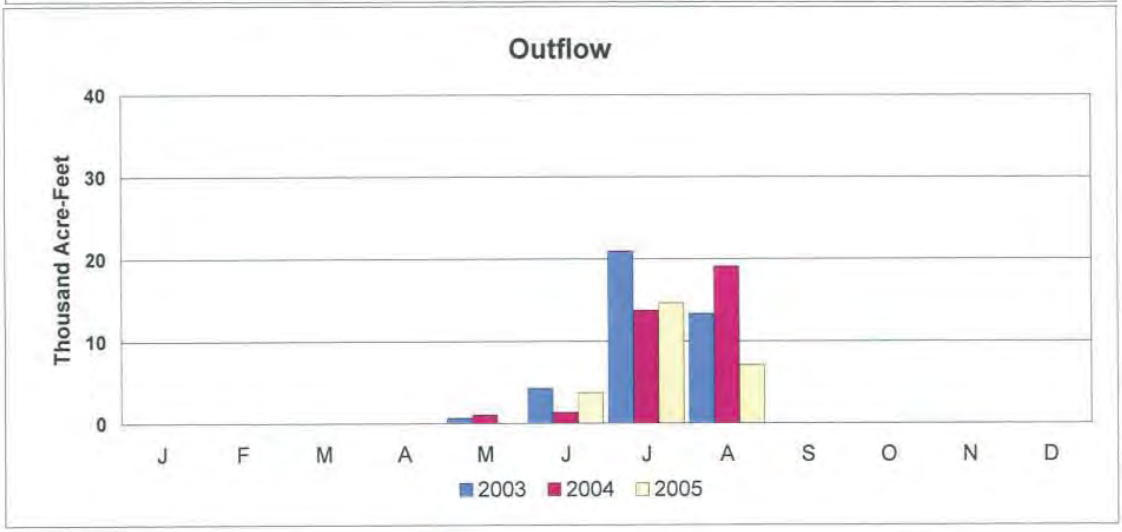
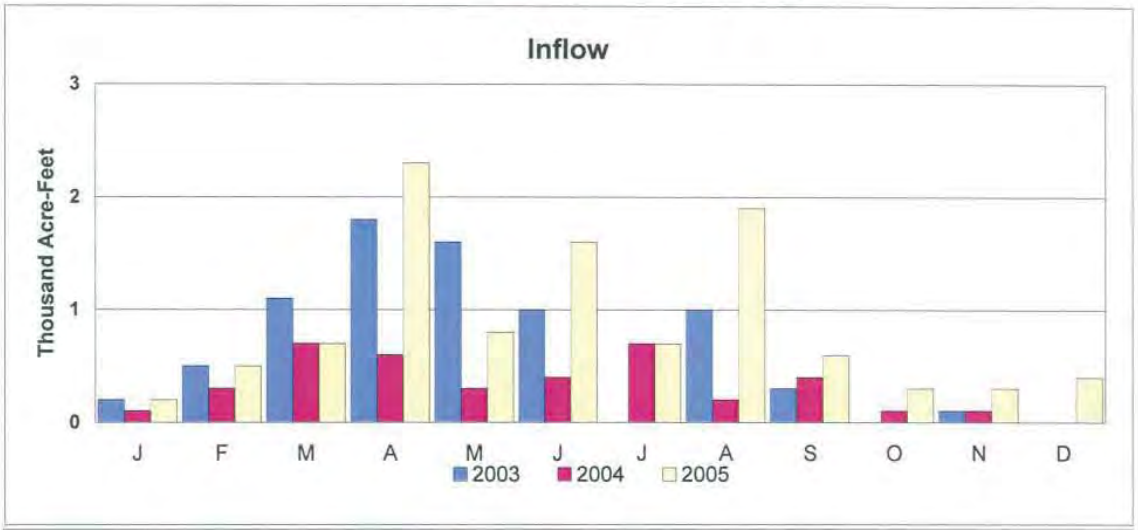
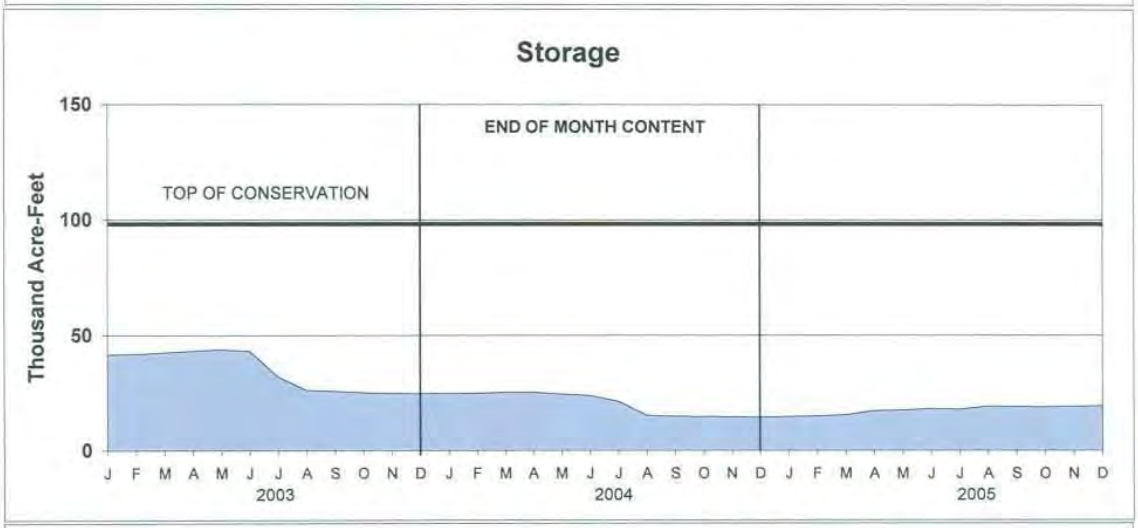


EXHIBIT 13A

KIRWIN RESERVOIR

ACTUAL OPERATION





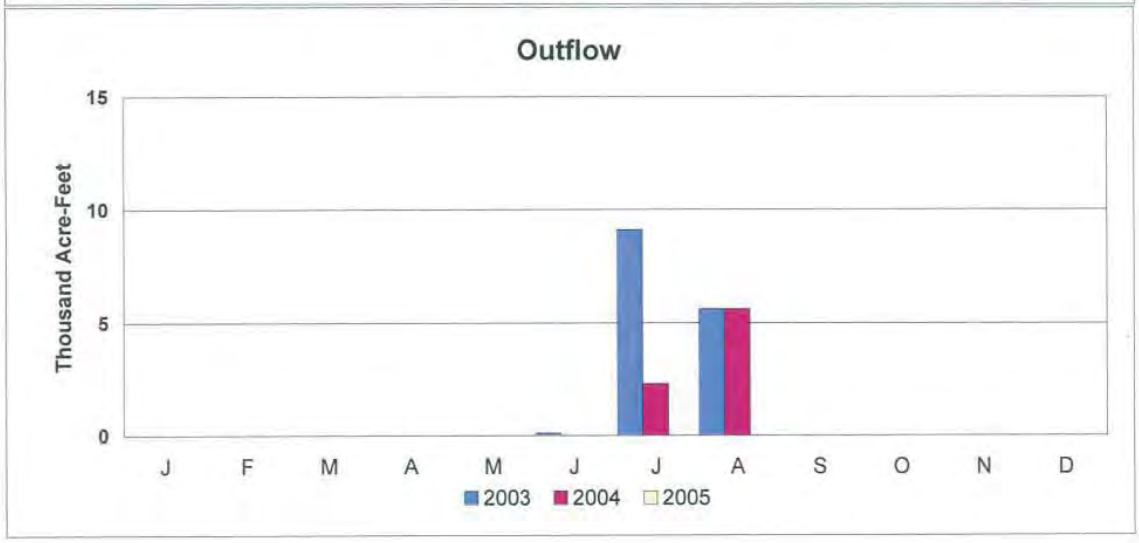
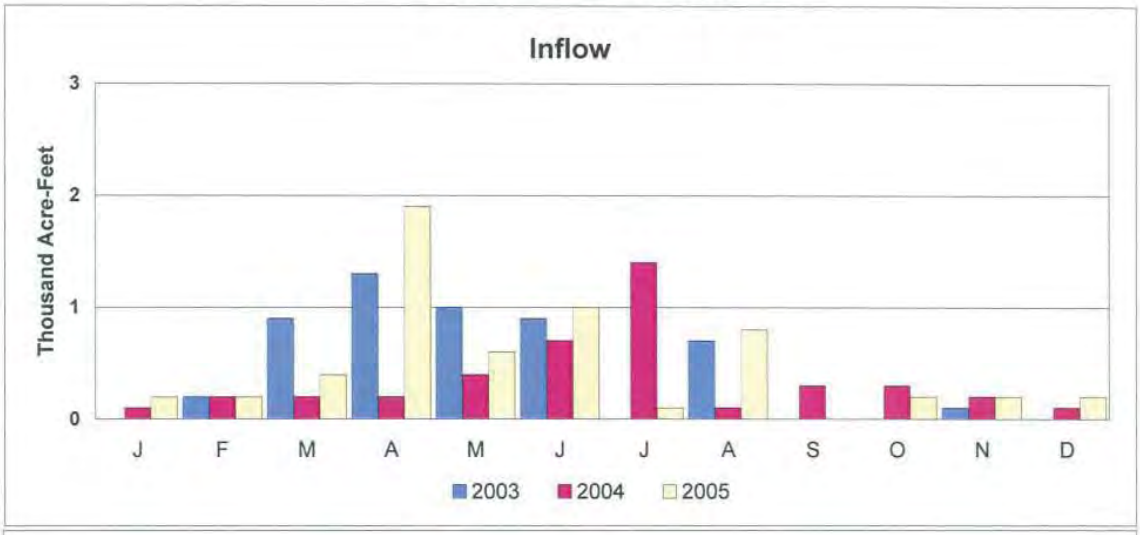
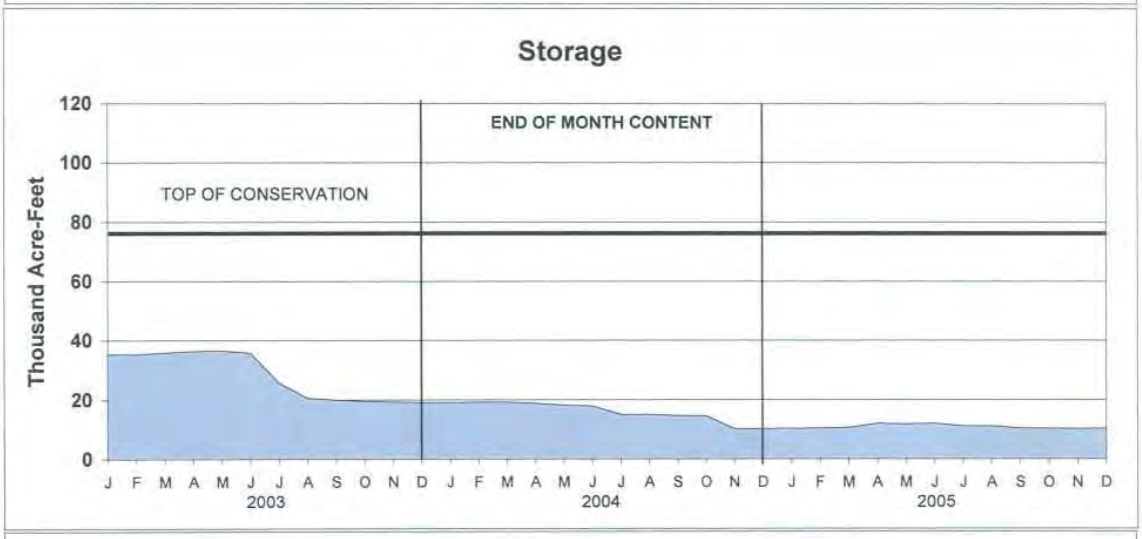


EXHIBIT 14A

WEBSTER RESERVOIR

ACTUAL OPERATION





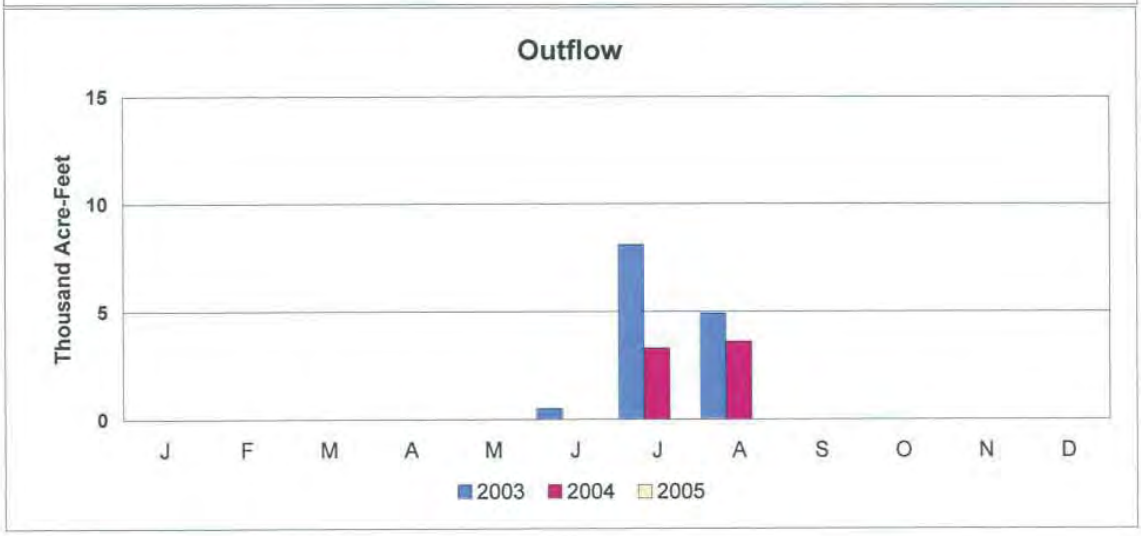
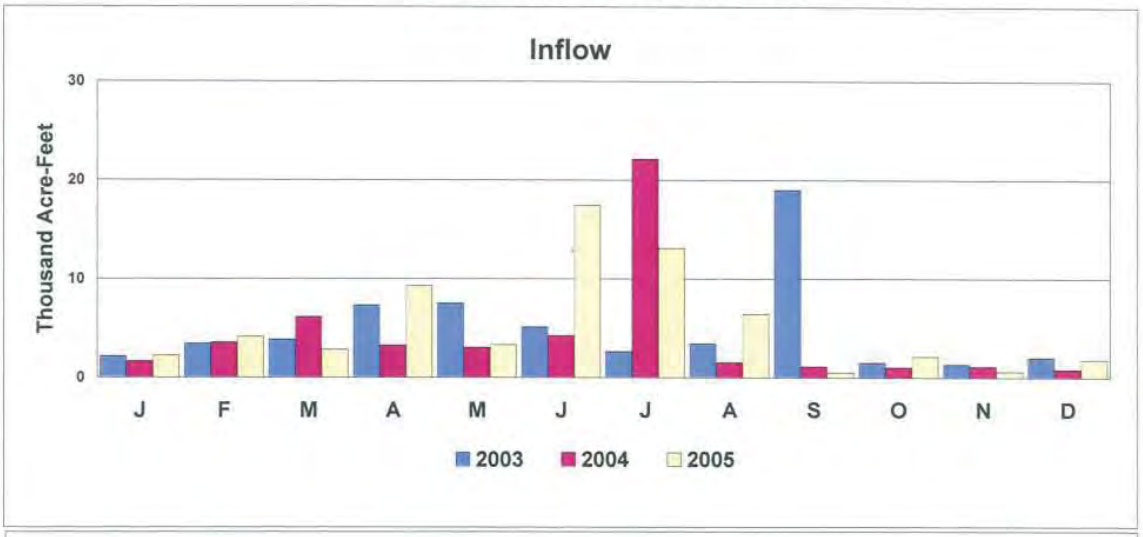
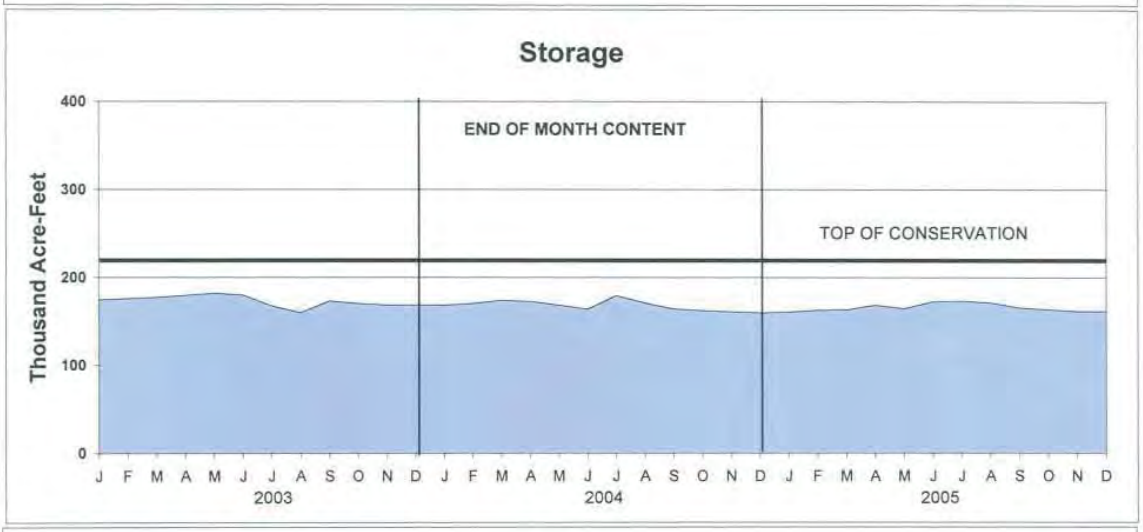


EXHIBIT 15A

WACONDA LAKE

ACTUAL OPERATION





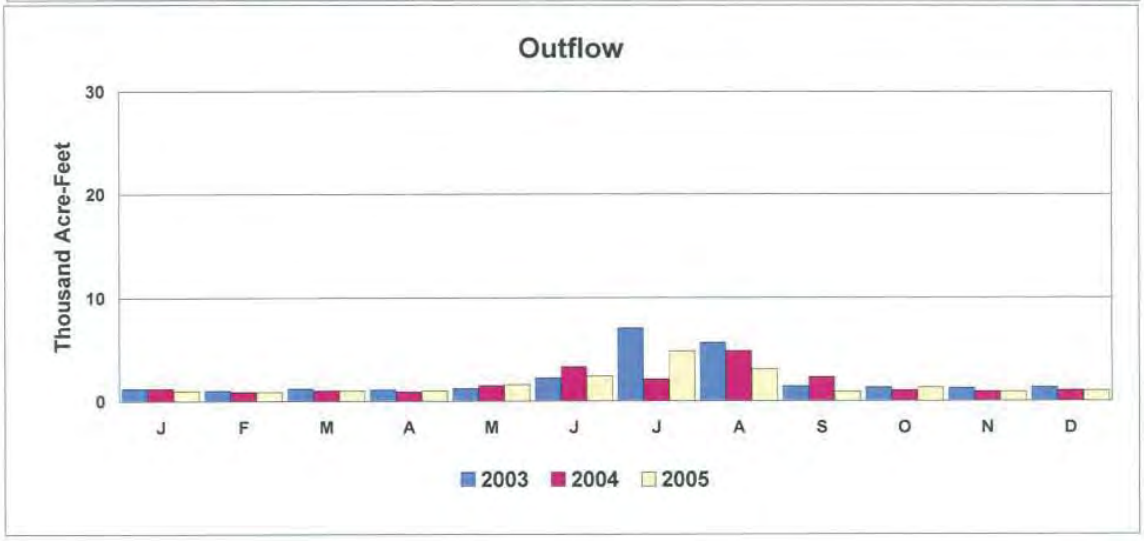
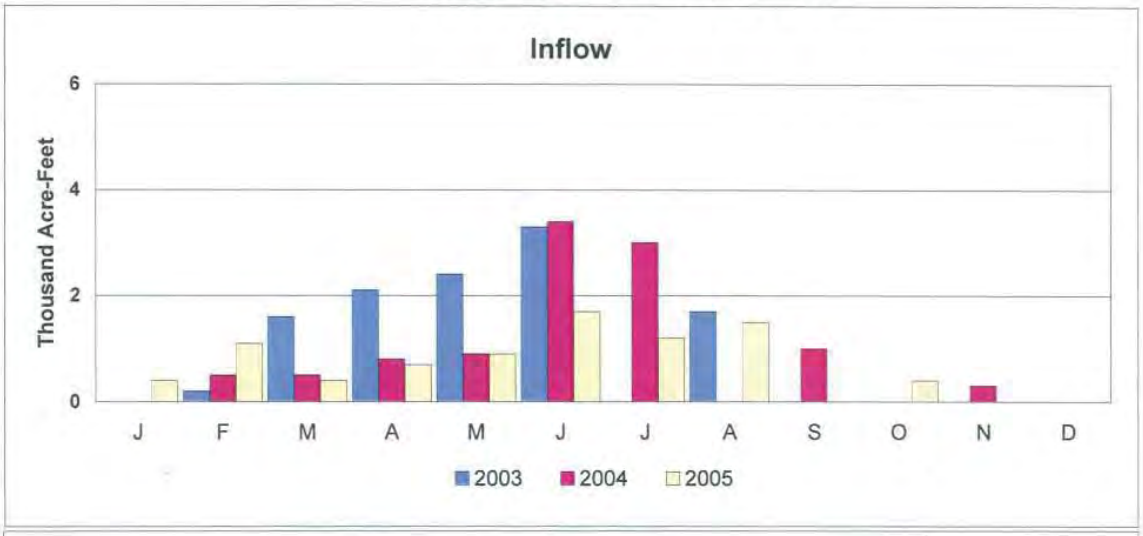
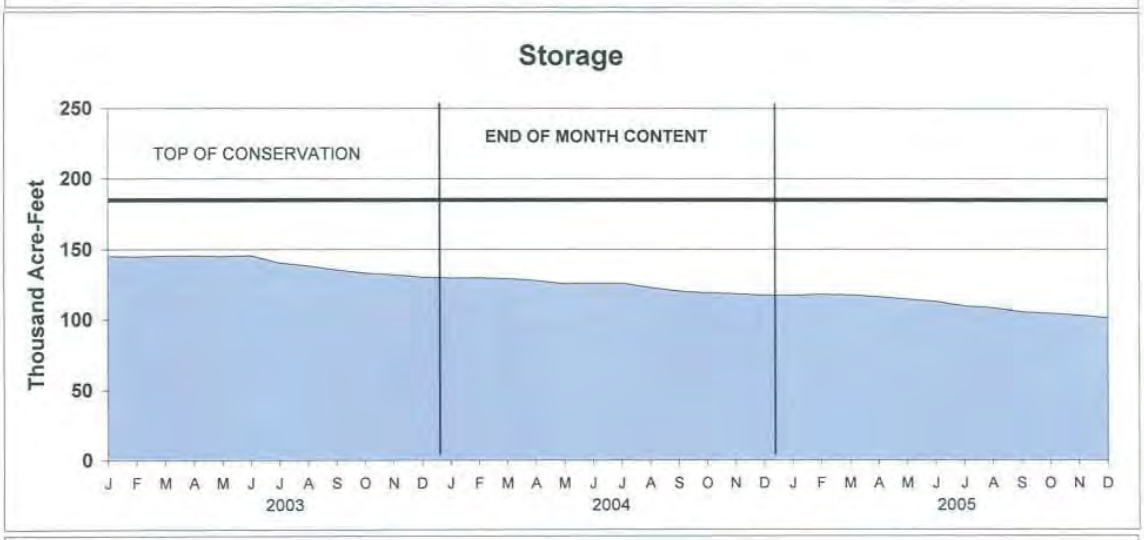


EXHIBIT 16A

CEDAR BLUFF RESERVOIR

ACTUAL OPERATION





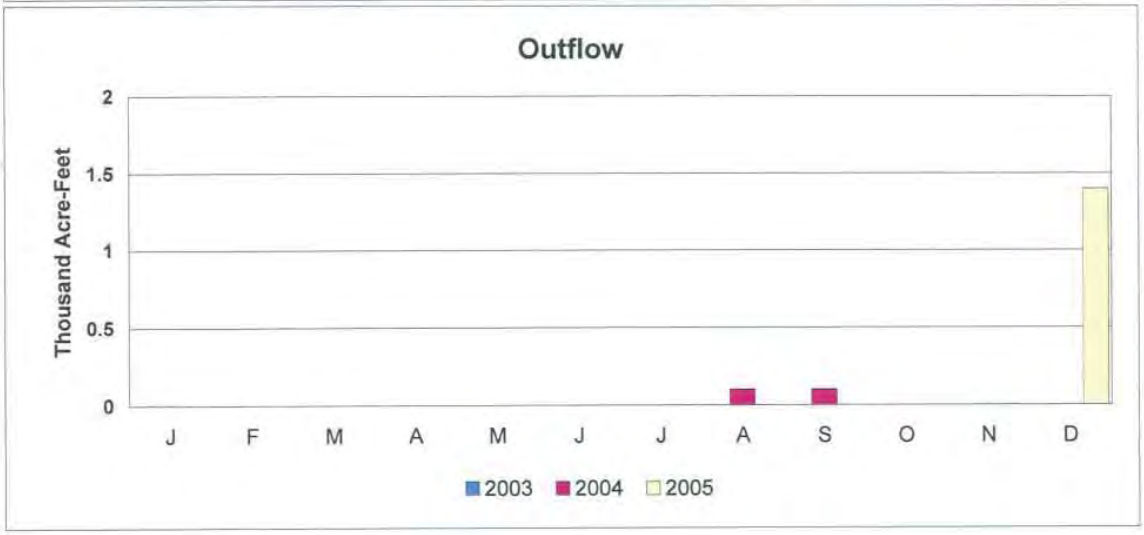
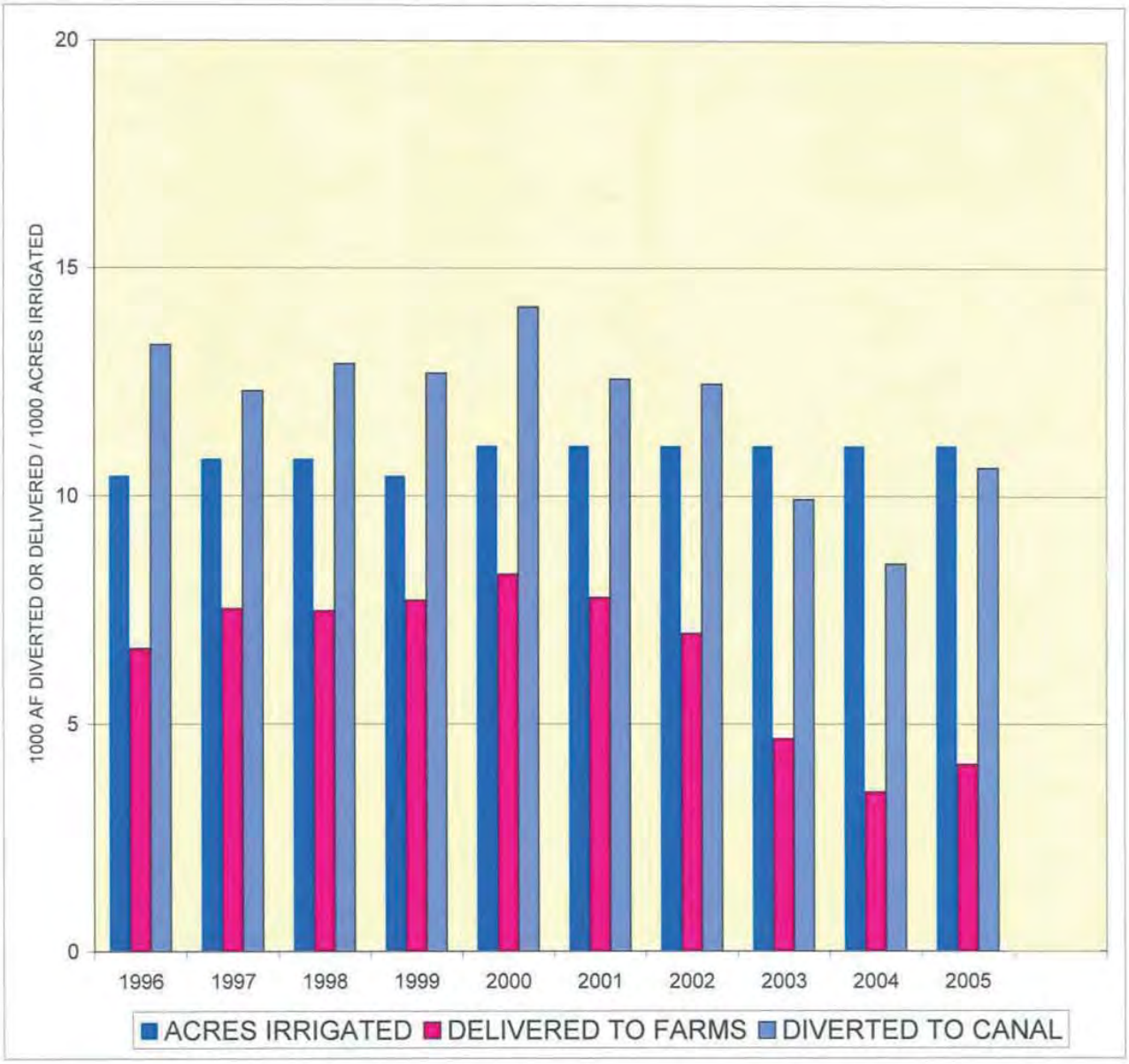


EXHIBIT 17

MIRAGE FLATS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

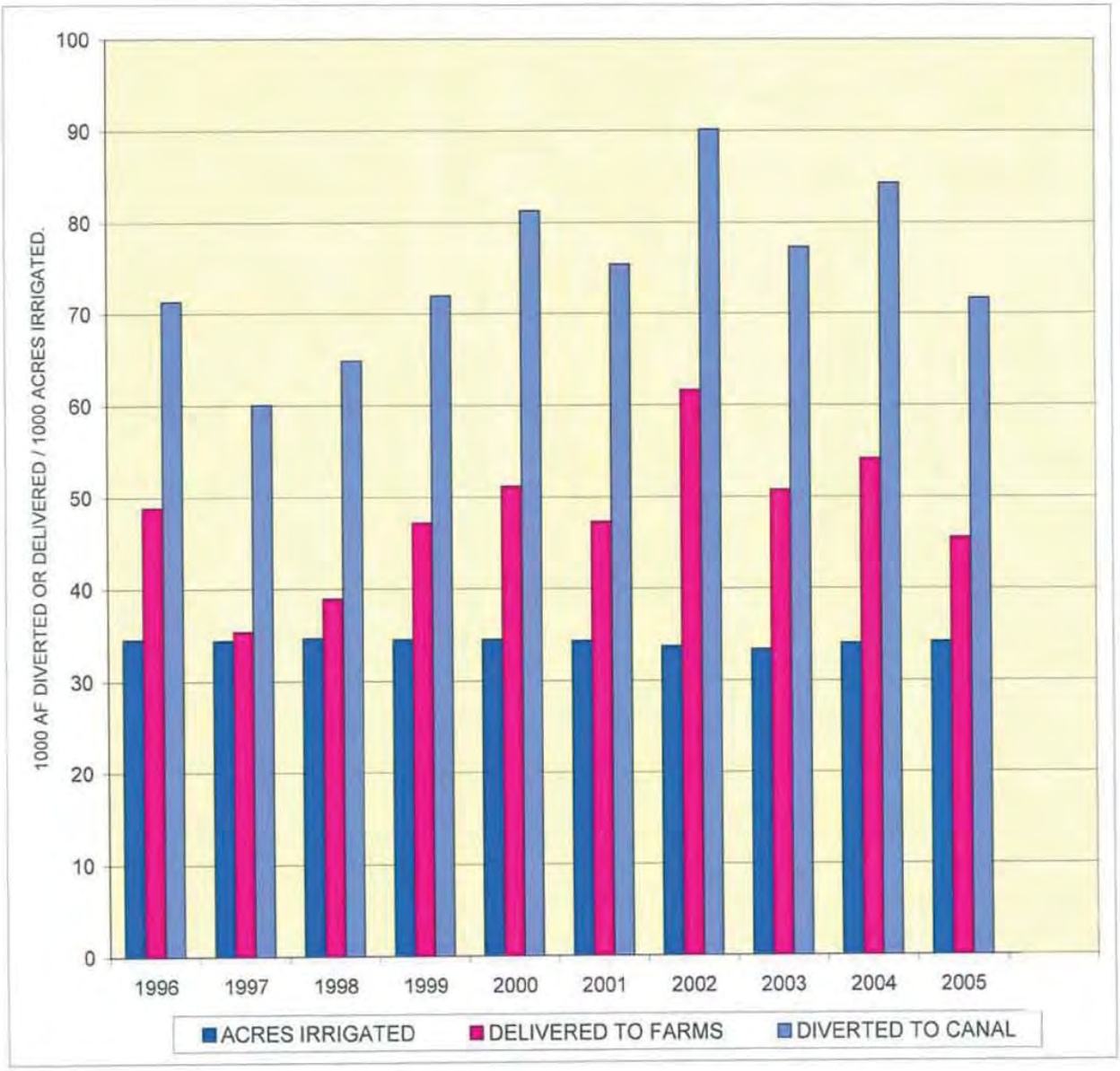


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	1.28	1.14	1.20	1.22	1.28	1.13	1.12	0.90	0.77	0.96
DELIVERED af/acre	0.64	0.70	0.69	0.74	0.75	0.70	0.63	0.42	0.32	0.37
EFFICIENCY	50%	61%	58%	61%	58%	62%	56%	47%	41%	39%

EXHIBIT 18

AINSWORTH IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

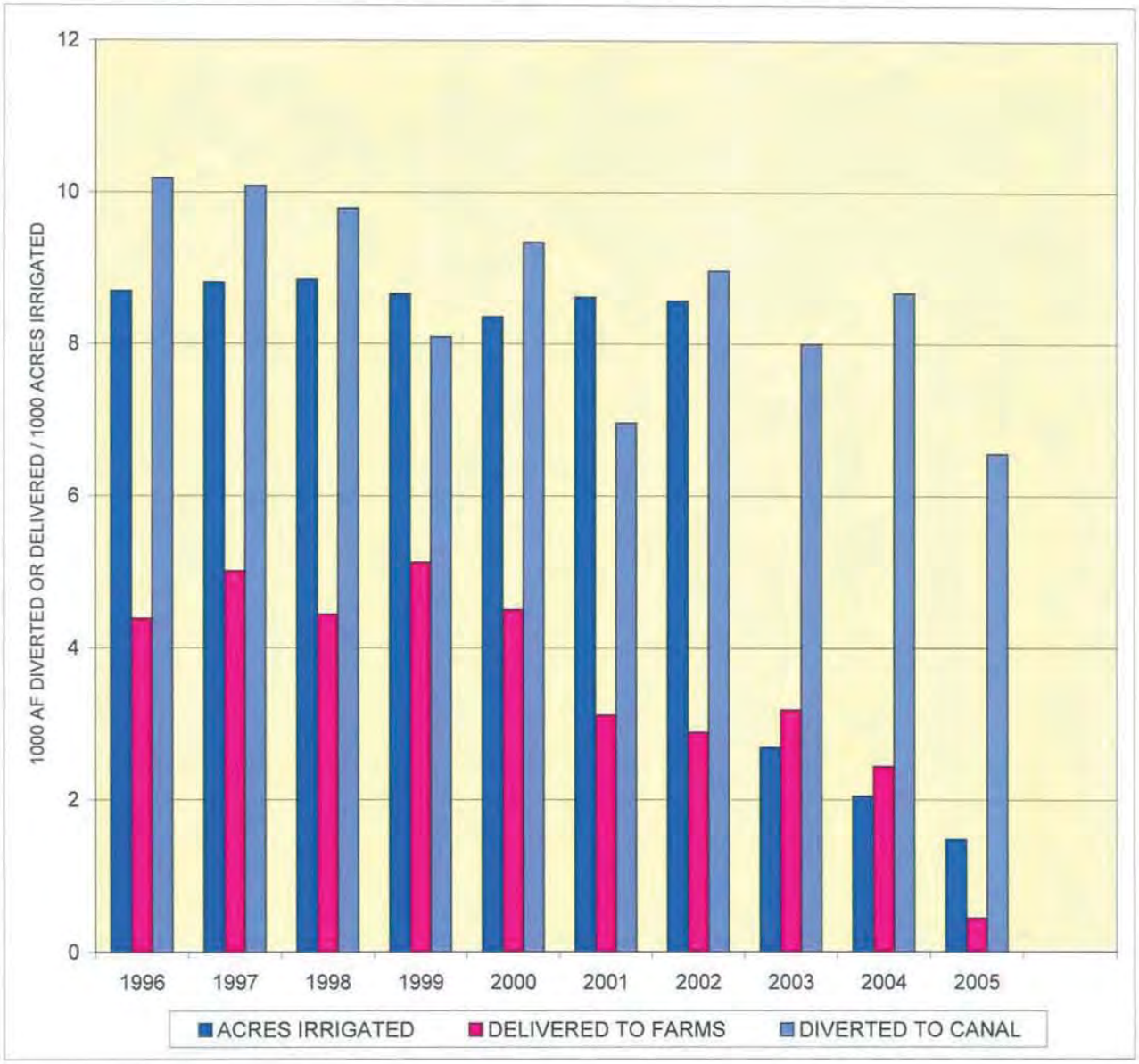


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	2.07	1.75	1.87	2.09	2.36	2.20	2.67	2.31	2.48	2.10
DELIVERED af/acre	1.42	1.03	1.13	1.37	1.49	1.38	1.83	1.52	1.59	1.33
EFFICIENCY	68%	59%	60%	66%	63%	63%	68%	66%	64%	63%

EXHIBIT 20

FRENCHMAN VALLEY IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

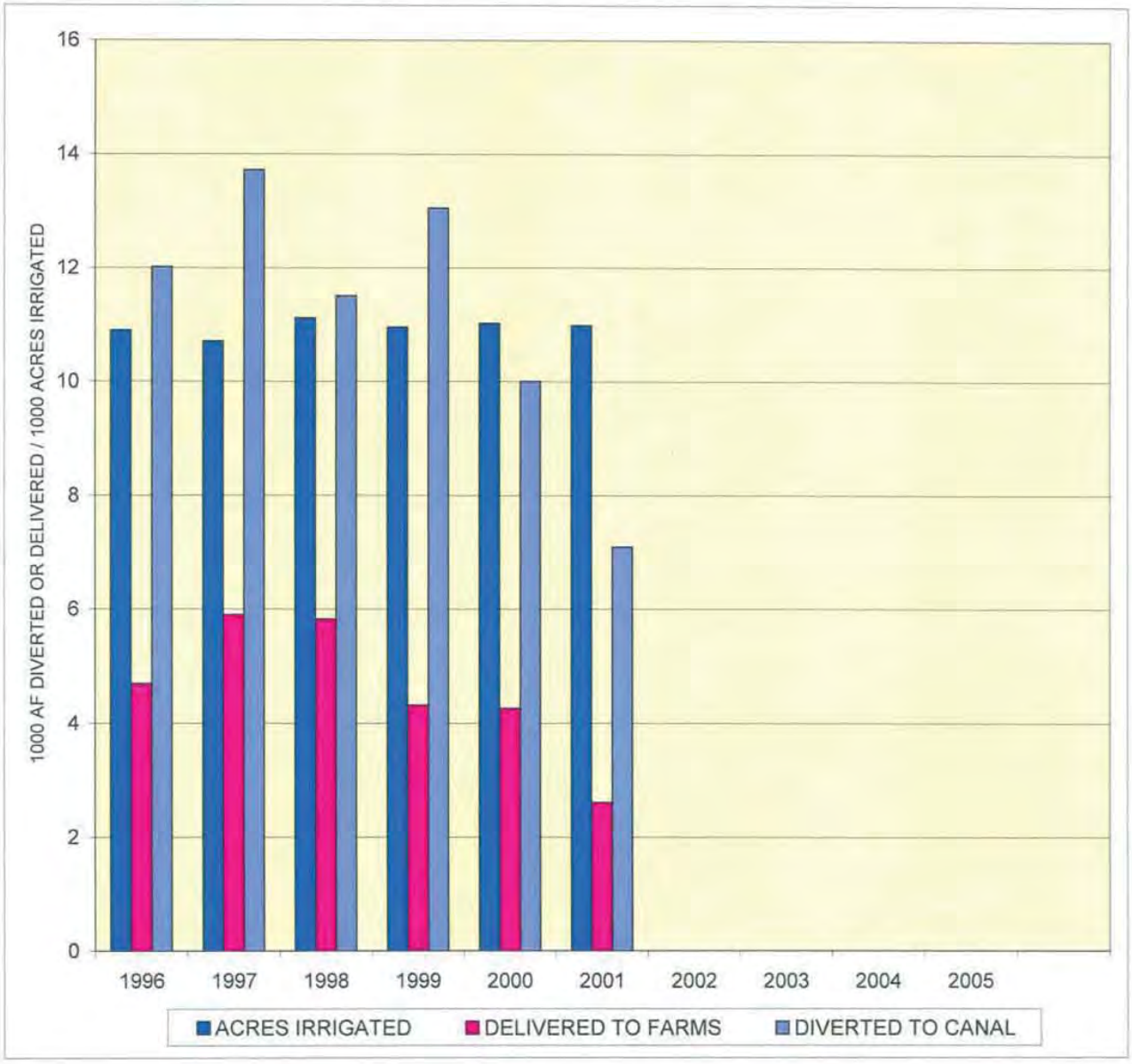


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	1.17	1.14	1.11	0.93	1.12	0.81	1.05	2.97	4.24	4.43
DELIVERED af/acre	0.50	0.57	0.50	0.59	0.54	0.36	0.34	1.18	1.19	0.30
EFFICIENCY	43%	50%	45%	63%	48%	45%	32%	40%	28%	7%

EXHIBIT 21

H AND RW IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

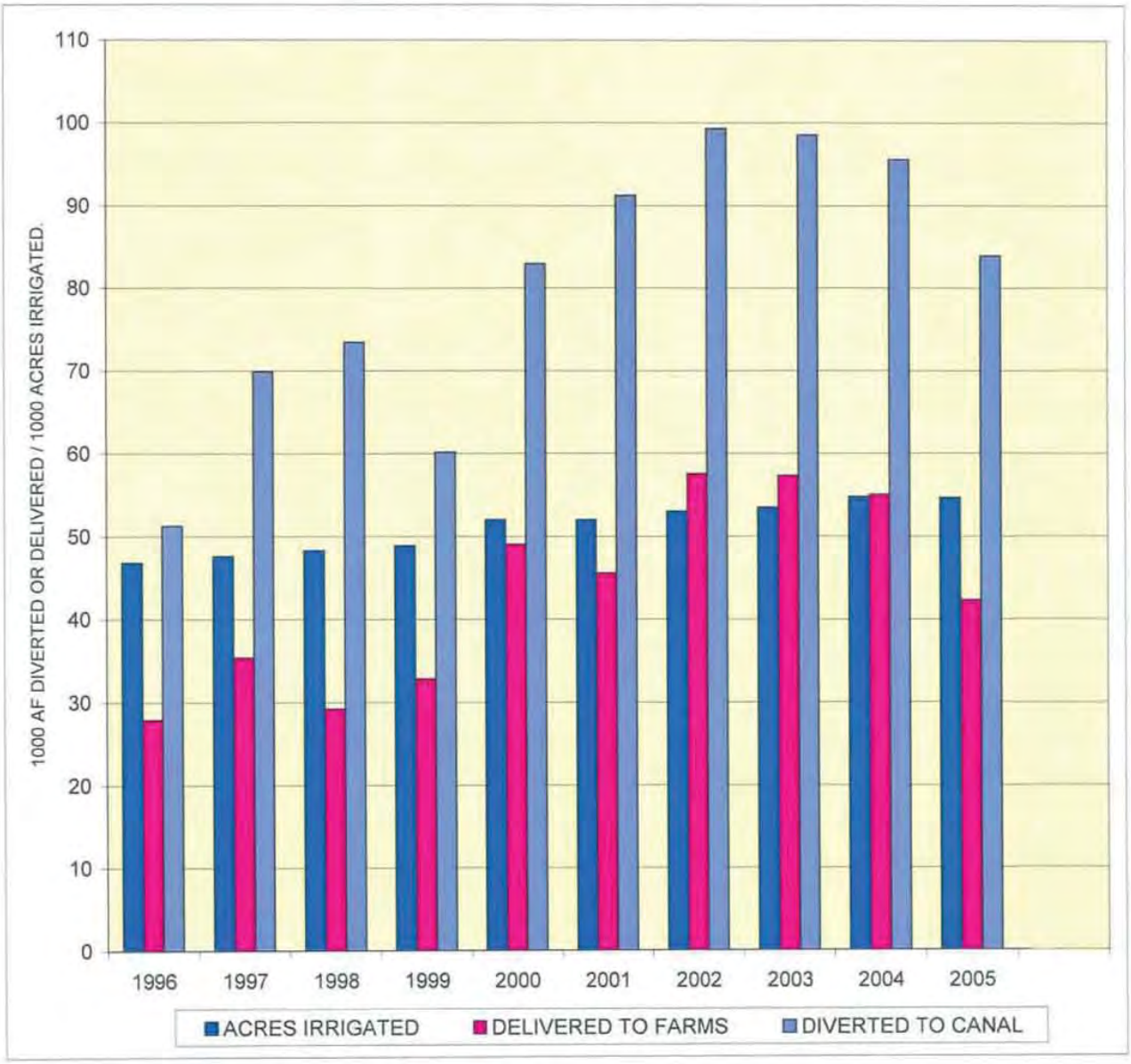


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	1.10	1.28	1.03	1.19	0.91	0.65	0.00	0.00	0.00	0.00
DELIVERED af/acre	0.43	0.55	0.52	0.39	0.39	0.24	0.00	0.00	0.00	0.00
EFFICIENCY	39%	43%	51%	33%	43%	37%	0%	0%	0%	0%

EXHIBIT 19

TWIN LOUPS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

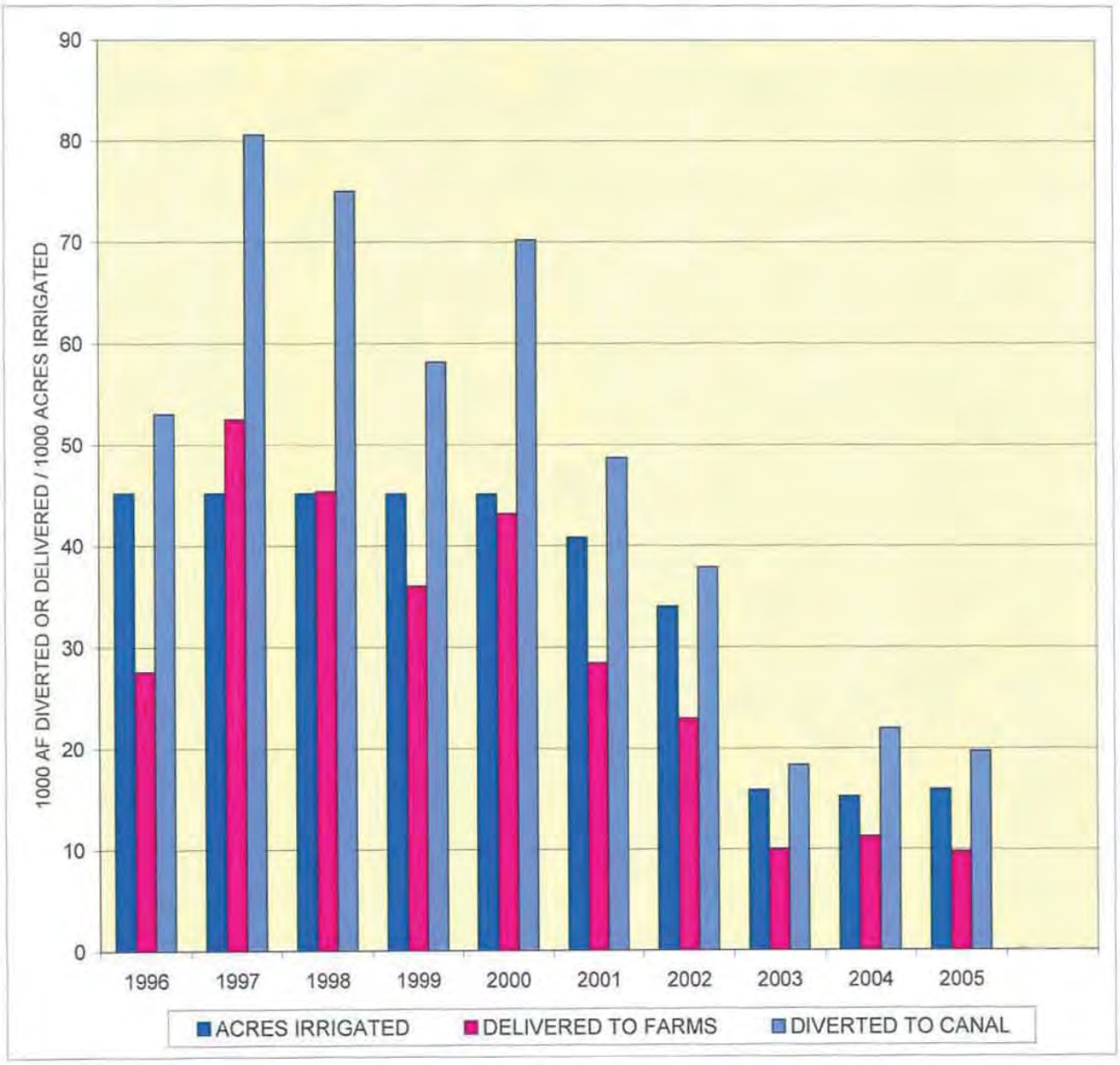


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	1.10	1.47	1.52	1.23	1.60	1.76	1.87	1.84	1.75	1.53
DELIVERED af/acre	0.60	0.74	0.60	0.67	0.94	0.88	1.09	1.07	1.00	0.77
EFFICIENCY	54%	51%	40%	55%	59%	50%	58%	58%	58%	50%

EXHIBIT 22

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

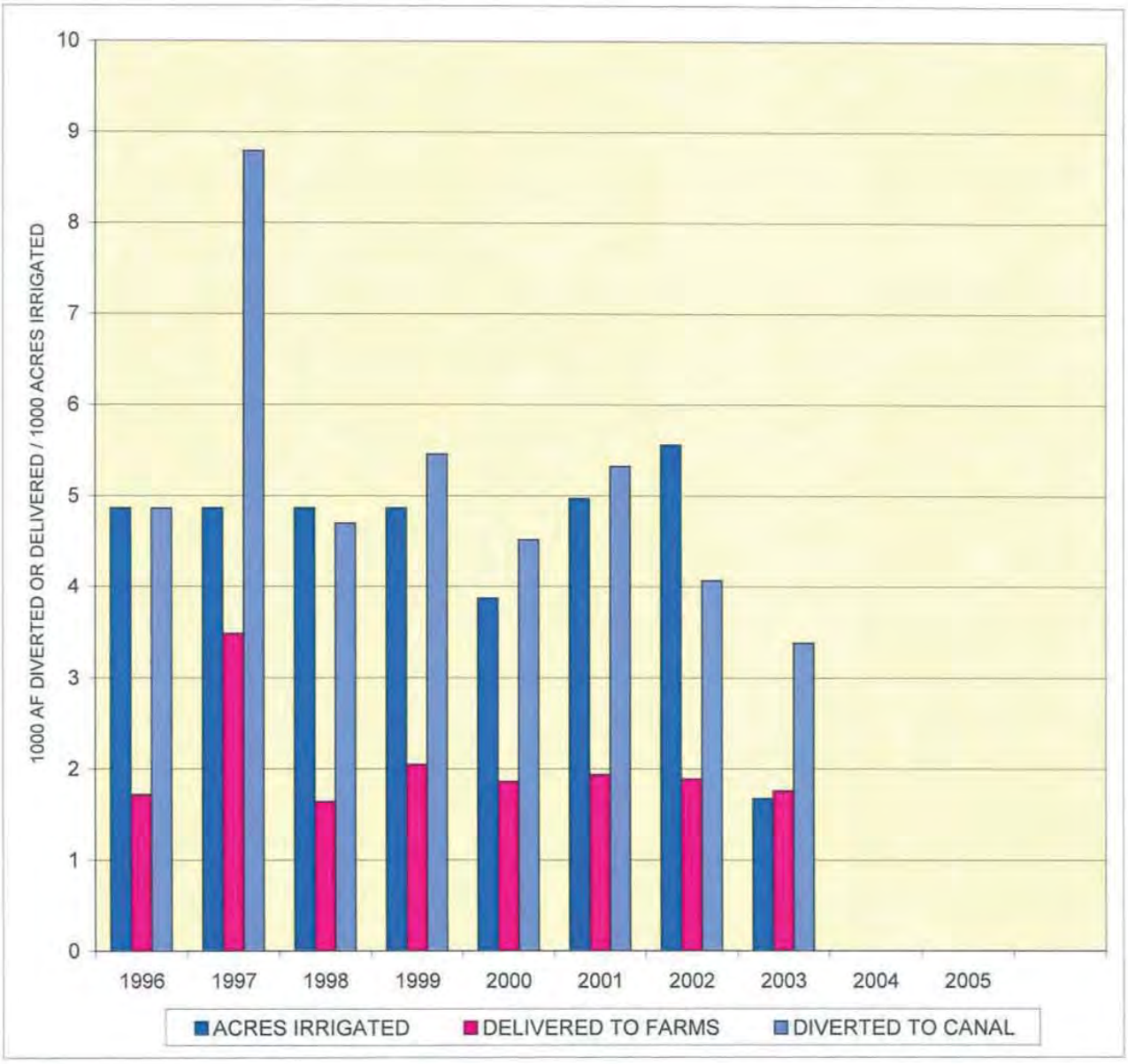


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	1.17	1.79	1.66	1.29	1.56	1.19	1.12	1.15	1.45	1.24
DELIVERED af/acre	0.61	1.16	1.00	0.80	0.96	0.70	0.67	0.63	0.74	0.61
EFFICIENCY	52%	65%	60%	62%	61%	58%	61%	55%	52%	50%

EXHIBIT 23

ALMENA IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

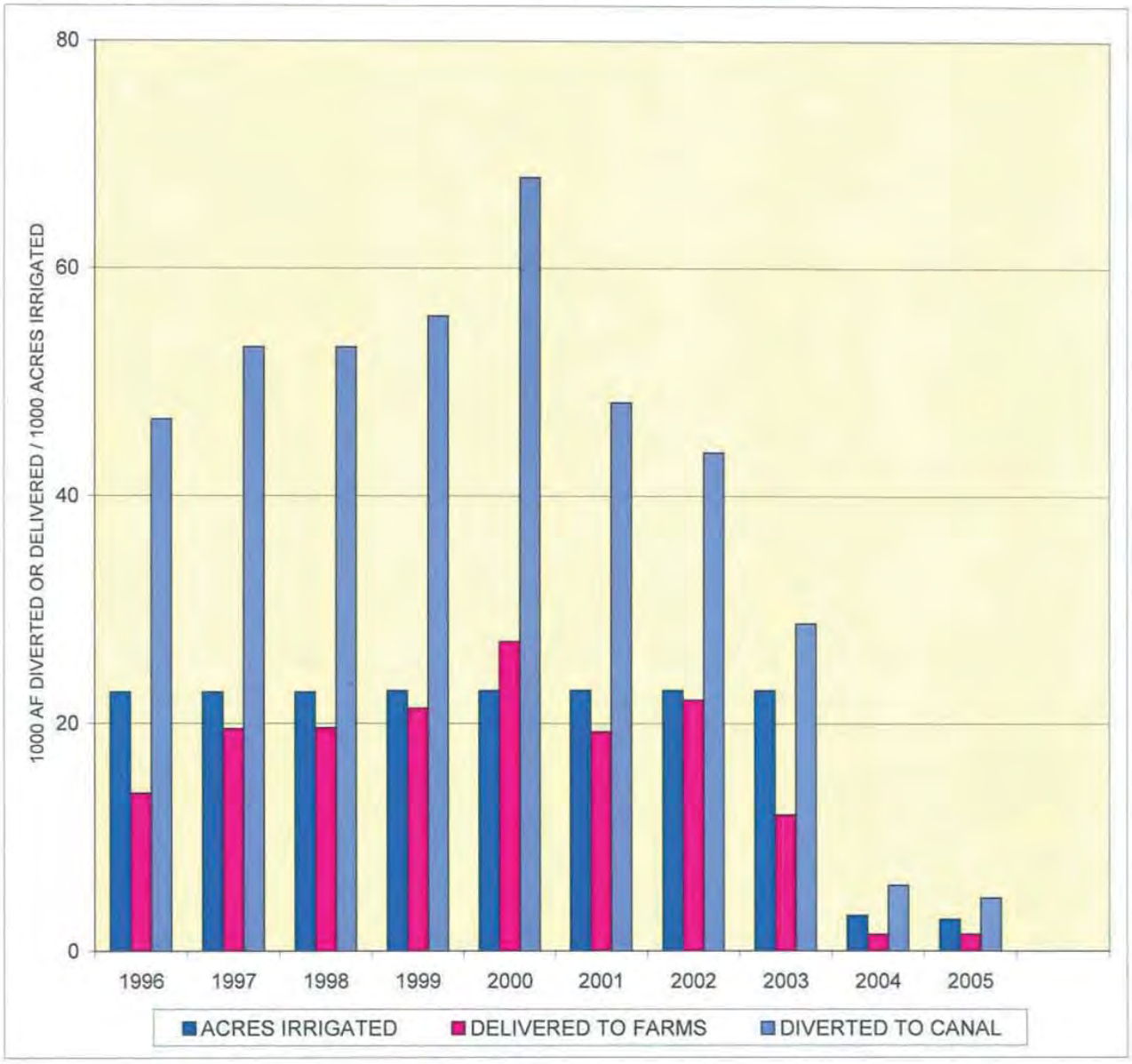


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	1.00	1.81	0.97	1.12	1.17	1.07	0.73	2.02	0.00	0.00
DELIVERED af/acre	0.35	0.72	0.34	0.42	0.48	0.39	0.34	1.05	0.00	0.00
EFFICIENCY	35%	40%	35%	38%	41%	36%	46%	52%	0%	0%

EXHIBIT 24

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

CANAL DIV., FARM DEL., AND ACRES IRRIG.

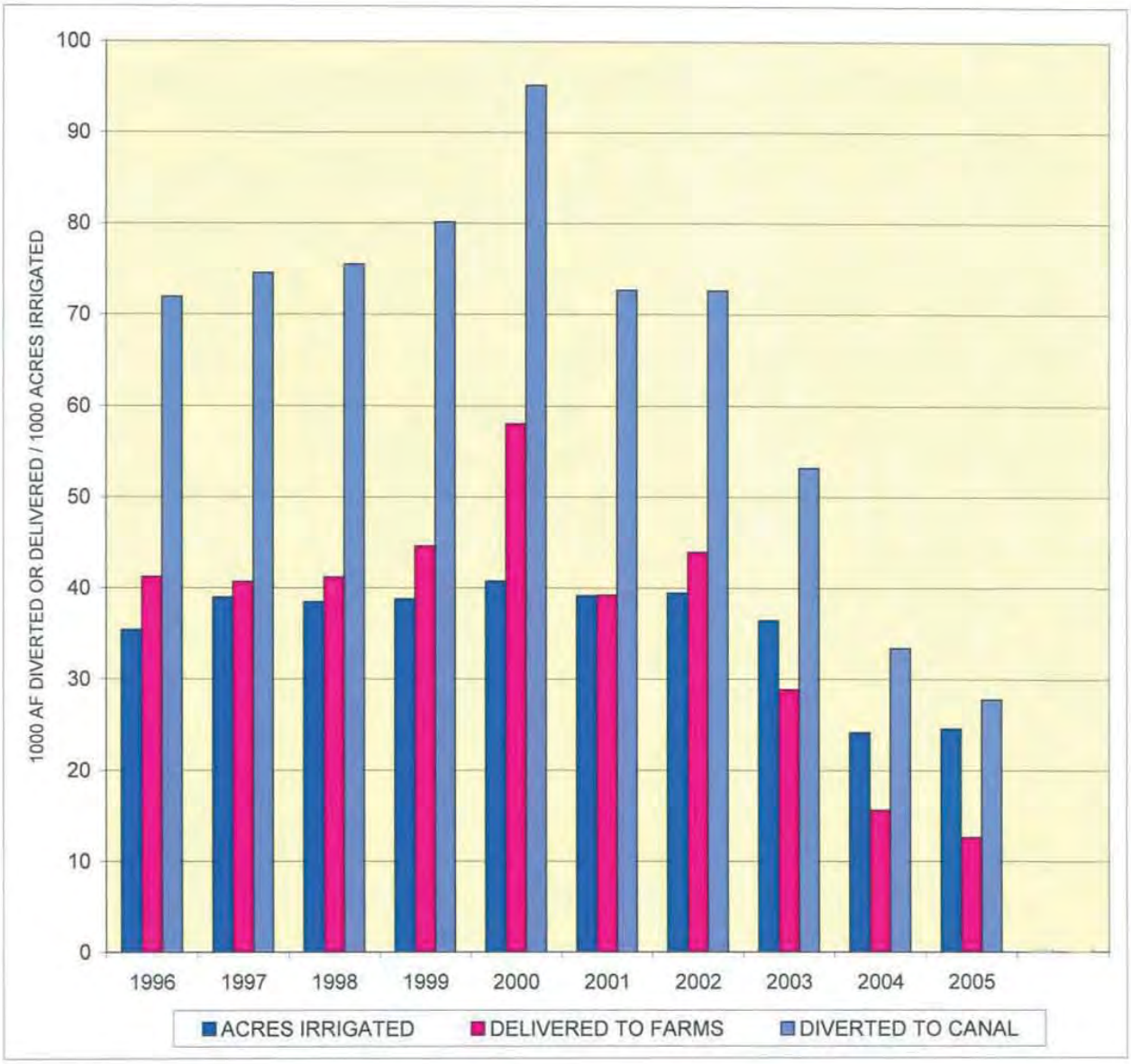


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	2.05	2.33	2.33	2.44	2.97	2.10	1.91	1.25	1.85	1.68
DELIVERED af/acre	0.61	0.86	0.86	0.93	1.19	0.84	0.96	0.52	0.47	0.53
EFFICIENCY	30%	37%	37%	38%	40%	40%	50%	42%	25%	32%

EXHIBIT 25

KANSAS-BOSTWICK IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

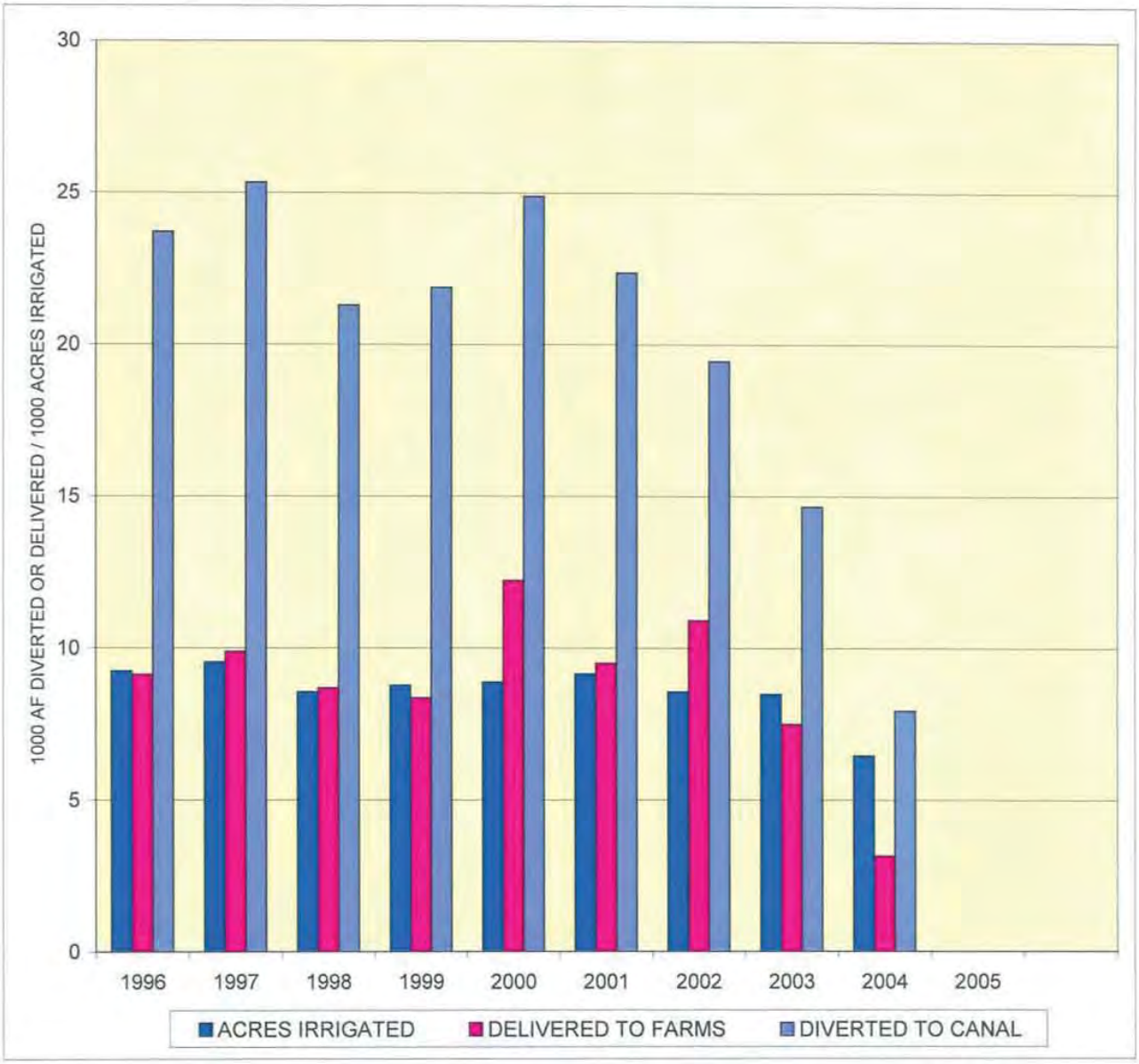


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	2.03	1.91	1.96	2.07	2.33	1.86	1.84	1.46	1.38	1.13
DELIVERED af/acre	1.16	1.04	1.07	1.15	1.42	1.00	1.11	0.79	0.65	0.51
EFFICIENCY	57%	55%	55%	56%	61%	54%	61%	54%	47%	45%

EXHIBIT 26

KIRWIN IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

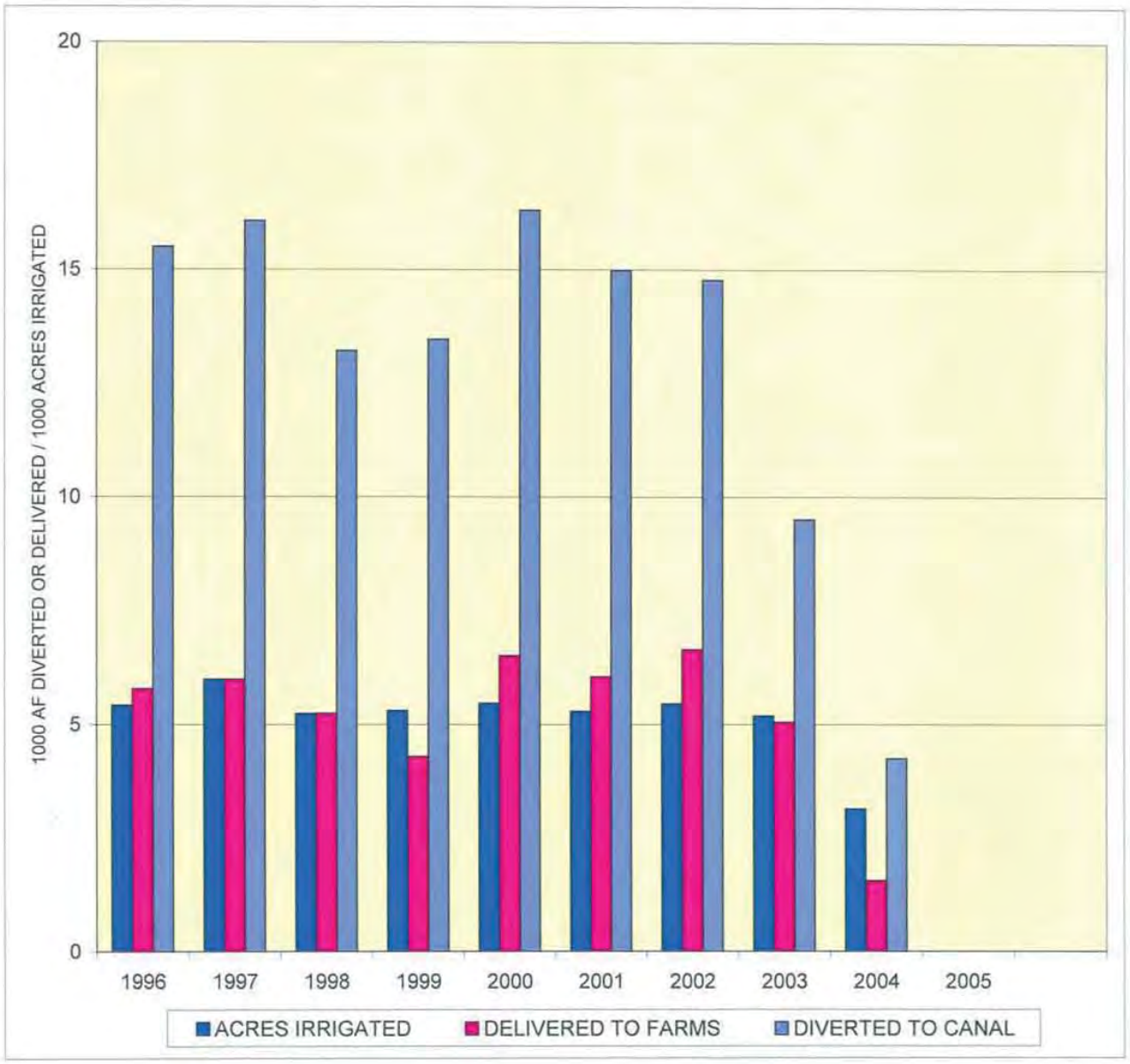


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	2.56	2.65	2.48	2.49	2.80	2.44	2.27	1.73	1.23	0.00
DELIVERED af/acre	0.99	1.04	1.01	0.95	1.37	1.04	1.27	0.88	0.49	0.00
EFFICIENCY	39%	39%	41%	38%	49%	43%	56%	51%	40%	0%

EXHIBIT 27

WEBSTER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

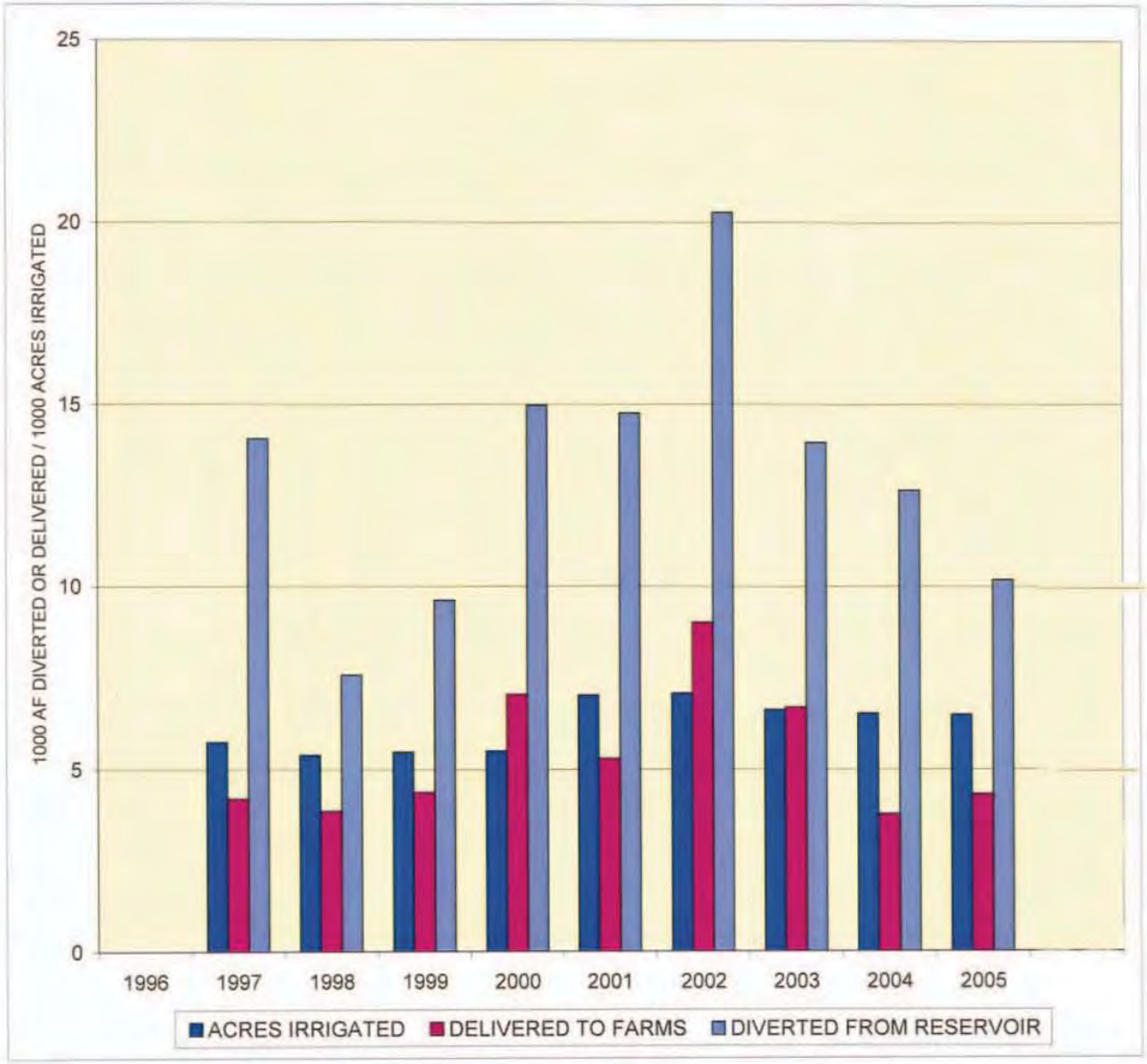


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	2.86	2.68	2.52	2.54	2.98	2.83	2.71	1.83	1.35	0.00
DELIVERED af/acre	1.07	1.00	1.00	0.81	1.19	1.14	1.22	0.97	0.50	0.00
EFFICIENCY	37%	37%	40%	32%	40%	40%	45%	53%	37%	0%

EXHIBIT 28

GLEN ELDER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
DIVERTED af/acre	0.00	2.45	1.41	1.76	2.72	2.10	2.86	2.10	1.93	1.57
DELIVERED af/acre	0.00	0.73	0.71	0.80	1.28	0.75	1.27	1.01	0.58	0.66
EFFICIENCY	0%	30%	51%	45%	47%	36%	44%	48%	30%	42%

SYNOPSIS

General

This year is the 54th consecutive year that an Annual Operating Plans (AOP) has been prepared for the Federally-owned dams and reservoirs in the Niobrara, Lower Platte, and Kansas River Basins. The plan has been developed by the Water Operations Group in McCook, Nebraska for the 16 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with 9 diversion dams, 9 pumping plants, and 20 canal systems, serve approximately 269,532 acres of project lands in Nebraska and Kansas. In addition to irrigation and municipal water, these features serve flood control, recreation, and fish and wildlife purposes. A map at the end of this report shows the location of these features.

The reservoirs in the Niobrara and Lower Platte River Basins are operated by either irrigation or reclamation districts. The reservoirs in the Kansas River Basin are operated by either the Bureau of Reclamation (Reclamation), or the Corps of Engineers. Kirwin Irrigation District provides operational and maintenance assistance for Kirwin Dam. The diversion dams, pumping plants, and canal systems are operated by either irrigation or reclamation districts.

A Supervisory Control and Data Acquisition System (SCADA) located at McCook is used to assist in operational management of all 11 dams under Reclamation's jurisdiction that are located in the Kansas River Basin. A Hydromet system collects and stores near real-time data at selected stations in the Nebraska-Kansas Projects. The data includes water levels in streams, canals, and reservoirs and also gate openings. This data is transmitted to a satellite and downloaded to a Reclamation receiver in Boise, Idaho. The data can then be accessed by anyone interested in monitoring water levels or water usage in an irrigation system. The Nebraska-Kansas Projects currently has 110 Hydromet stations that can be accessed. The McCook Field Office has installed and maintains 56 Hydromet stations with plans to install more as time permits. When fully implemented, the projects will have a Hydromet station installed to provide real-time data on all reservoirs, most diversion dams, and most of the measuring structures in the irrigation systems. These stations can be found on the Internet by accessing Reclamation's home page at http://www.usbr.gov/gp. From the home page, select "Hydromet Data Center" under the Water Operations heading.

The Headlines 2006 that follows this synopsis is indicative of the awareness that the local people have of the natural resource development and conservation in the Niobrara, Lower Platte, and Kansas River Basins.

2006 Summary

Climatic Conditions

Precipitation at the project dams during 2006 ranged from 72 percent of normal at Virginia Smith Dam to 122 percent of normal near Davis Creek Dam. Temperatures during the first four months of the year were generally above normal throughout the projects area. Precipitation during the first four months of the year varied throughout the projects area. Precipitation totals were below normal at 13 of the 16 project dams, varying from 38 to 160 percent. Glen Elder Dam recorded zero precipitation for the month of January while six project dams recorded zero precipitation for the month of February.

Precipitation during May, June and July was generally below normal throughout the basin. All project dams recorded below normal precipitation during May, while nine project dams recorded below normal precipitation in June, and only three project dams recorded above normal precipitation in July. Merritt, Virginia Smith, and Davis Creek dams recorded the lowest precipitation total ever recorded for the month of May at the respective sites. Virginia Smith Dam recorded the lowest July precipitation total ever at the site. Average temperatures were above normal in May, June and July. August and September precipitation improved considerably with only four project dams recording below normal precipitation during August and only three dams recording below normal precipitation in September. Kiriwn Dam recorded the greatest August precipitation total ever for the month and Davis Creek Dam recorded the greatest September precipitation total at the respective sites. Temperatures in August and September were generally normal throughout the projects area.

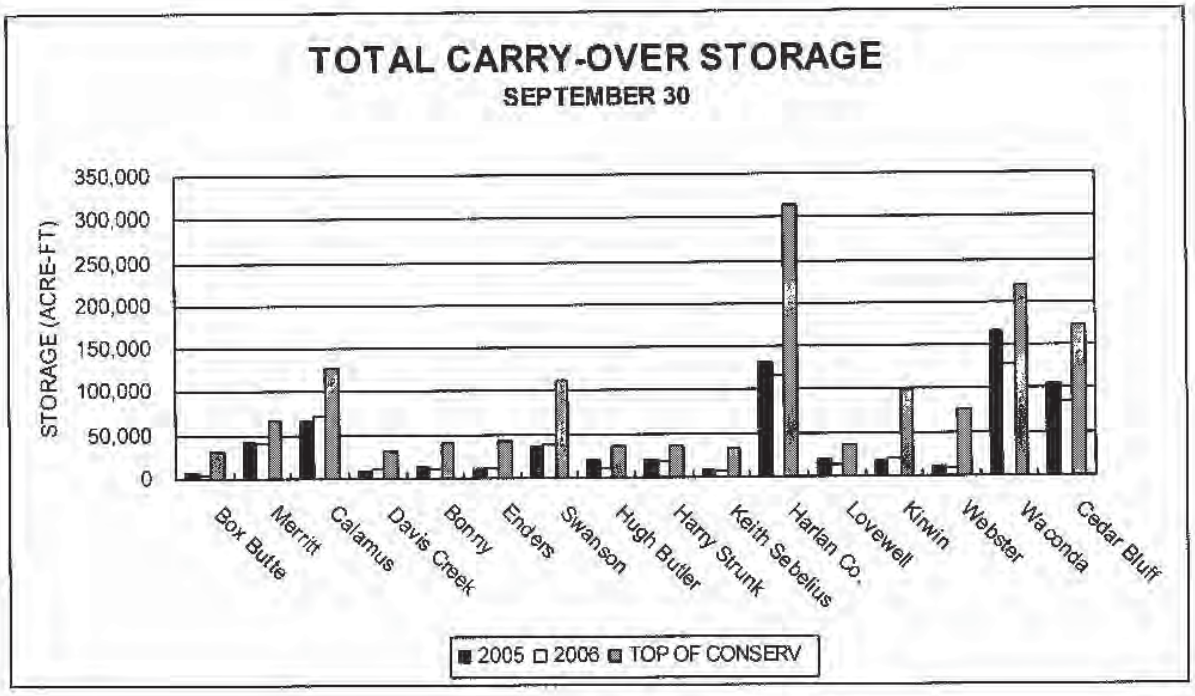
October was generally wetter than normal while November was generally drier than normal. Only five dams recorded below normal precipitation during October and all project dams recorded below normal precipitation during the month of November. Precipitation during November was only 24 percent of normal over the projects. Precipitation during December was well above normal at all project dams. December precipitation was the greatest ever recorded for the month at 13 of the 16 project dams. Temperatures were near normal in October and above normal in November and December.

Storage Reservoirs

1. Conservation Operations. The 2006 inflow was below the dry-year forecast at Box Butte, Bonny, Enders, Lovewell, and Webster Reservoirs, and Swanson, Hugh Butler, Harry Strunk, Harlan County, and Waconda Lakes. Merritt, Calamus, Davis Creek, Kirwin, and Cedar Bluff Reservoirs along with Keith Sebelius Lake had inflows between the dry- and normal-year forecasts. None of the project reservoirs had inflows above the normal-year forecast.

All project reservoirs had below average carryover storage from the 2005 water year with the exception of Box Butte Reservoir. Of the 12 project reservoirs in the Kansas River Basin, only Keith Sebelius Lake, and Lovewell and Cedar Bluff reservoirs did not record below average inflows during all 12 months of 2006. Cedar Bluff Reservoir recorded below average inflows during 11 months of 2006, and Keith Sebelius Lake recorded below average inflows during 10 of the months. Reservoir releases were made from Merritt and Virginia Smith Dams to maintain reservoir levels prior to the 2006 irrigation season. Just prior to the irrigation season, Enders, Kirwin, Webster and Box Butte Reservoirs, along with Keith Sebelius, Swanson, Hugh Butler, Harry Strunk and Harlan County Lakes, did not have sufficient storage to provide water users with a full water supply. Harry Strunk Lake and Lovewell Reservoir had some flood storage occupied prior to the irrigation season. The high irrigation demand months of July and August significantly reduced storage in those project reservoirs that had storage available for irrigation. Precipitation during late July and August was of little help in reducing the demands on project reservoirs. Storage in all the Kansas River Basin project reservoirs was below normal at the end of the irrigation season.

The following summarized graph shows a comparison of 2005 and 2006 carry-over storage conditions as compared to the top of conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins as of September 30th



2. Flood Control Operations. Harry Strunk Lake and Lovewell Reservoir utilized flood pool storage in 2006. Flood releases were not required to reduce or maintain pool levels. The fiscal year 2006 flood control benefits accrued by the operation of Reclamation's Nebraska-Kansas Projects facilities was $36,000 as determined by the Corps of Engineers. An additional benefit of $7,000 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2006 by facilities in this report total $1,873,595,000 (see Table 5). To date no benefits have been accrued by the operation of Box Butte, Merritt, Calamus, or Davis Creek Reservoirs.

A summary of precipitation, reservoir storage and inflows at Nebraska-Kansas Projects facilities can be found in Table 7.

Water Service

There was 266,671 acre-feet (AF) of water diverted to irrigate approximately 156,517 acres of project lands in the 12 irrigation districts (see tables 3 and 6). The project water supply was either inadequate or limited for 169,258 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, Almena, Bostwick in Nebraska, Kansas Bostwick, Kirwin and Webster Irrigation Districts. The project water supplies for the other units mentioned in this report were more than adequate in 2006.

The water requirements of three municipalities, one rural water district, and two fish hatchery facilities were furnished from storage releases or natural flows.

Irrigation Production

The 2006 crop yields on lands receiving project water in the Nebraska-Kansas Projects were lower than 2005 for two of the four reporting districts. The average corn yield, the principal crop of all reporting districts, was 174 bushels per acre. This was approximately four bushels per acre less than in 2005. The average unit price of corn when harvested was higher than the previous year at approximately $3.25/bu. The start of irrigation releases from project reservoirs varied considerably depending on storage water available. Much of the growing season was warmer and drier than normal. Most districts experienced some relief from the dry conditions during the middle part of August. Crop maturity progressed near normal during the growing season. Several irrigation districts had finished making irrigation releases by mid September. Twelve canals did not divert water in 2006 as a result of extremely short water supplies. All irrigation districts had finished delivering water by the end of September with corn harvest commencing by late October.

Fish and Wildlife and Recreation Benefits

The National Recreational Fisheries Policy declares that the Government's vested stewardship responsibilities must work in concert with the state managing agency's recreational fisheries constituency and the general public to conserve, restore, and enhance recreational fisheries and their habitats. The Nebraska-Kansas Area Office is available for meetings if requested with Nebraska, Colorado, and Kansas state management agencies to discuss the Annual Operating Plans (AOP). Information is solicited that will allow Reclamation the flexibility to enhance fisheries resources while still meeting contractual obligations with the various irrigation districts.

During the early part of the 2006 season, normal reservoir operations were favorable for recreation and fish and wildlife uses at project reservoirs with full or nearly full conservation pool levels. Lower water levels have been experienced at most reservoirs in the Kansas River Basin over the past few years somewhat limiting the recreation benefits. Normal summer drawdown due to irrigation releases did allow for some late summer shoreline revegetation.

The Calamus Fish Hatchery is located below Virginia Smith Dam and Calamus Reservoir. The hatchery consists of an office/visitor center, laboratory, 2 residences, a shop and feed storage building, 51 rearing ponds lined with VLDPE and-covering 45.5 acres, 24 concrete raceways, 2 lined effluent ponds, 8 groundwater wells, a 36-inch diameter buried pipeline from Virginia Smith Dam, a groundwater degassing tank, and a computerized monitoring and alarm system. The hatchery is operated and maintained by the Commission and produces approximately 53 million fish per year. The water supply is provided by natural flows passed through Virginia Smith Dam and from Calamus Reservoir storage through an agreement dated July 28, 1988, between the Commission and the Twin Loups Reclamation District.

Headlines 2006

Bureau officially declares 2006 a water-short year

Dedication Wednesday

The U.S. Bureau of Reclamation will dedicate the new McCook Field Office at 1706 W. Third in McCook on Wednesday.

A public open house is set for 1 to 4 p.m., including tours of the new office.

Bureau's role in our area remains vital

■ *Join us in welcoming the agency into a new home in McCook.*

Kansas compact official: 'We want our water'

Interior secretary signs Platte River agreement

NEW DIGS

Public tours Bureau of Reclamation office

Farmers wonder: What's our water worth?

Water: Issue of the Decade

Drought could mean restrictions on water

Gov. Heineman plans meetings to discuss future of Republican River Basin

Compact compliance could get more painful for irrigators in 2008

Lakes recovering, slowly

State officials discuss Republican River

Agreement may boost river flow

McCook Daily Gazette

Farmers being paid not to irrigate

Gauge sought to monitor Cedar Bluff dam leak

CHAPTER I – INTRODUCTION

Purpose of This Report

This AOP advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 2006 and serves as a guideline for the 2007 operations. This report also describes the responsibilities of Reclamation, Corps of Engineers, and the irrigation and reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins.

Operational Responsibilities

Reclamation is responsible for irrigation operations at all federal reservoirs in the Nebraska-Kansas Projects. Reclamation is also responsible for the operation and maintenance (O&M), safety of the structure, and reservoir operations not specifically associated with regulation of the flood control storage at the reservoirs constructed by Reclamation. Regulation of the flood control storage is the responsibility of the Corps of Engineers. In addition to irrigation and flood control, these reservoirs provide recreation, fish and wildlife, and municipal benefits.

By contractual arrangements with Reclamation, the irrigation or reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins are responsible for the O&M of the canals and irrigation distribution facilities constructed or rehabilitated by Reclamation. In addition, the appropriate irrigation or reclamation districts are responsible for operating and maintaining Box Butte, Merritt, Virginia Smith and Davis Creek Dams. The Corps of Engineers operates and maintains Harlan County Dam and Lake. The state of Colorado provides operational guidelines for Bonny Reservoir. Operational guidelines for Cedar Bluff Reservoir will be provided by the State of Kansas. Reclamation operates and maintains 11 dams and reservoirs in the Republican, Solomon, and Smoky Hill River Basins. Under a contract with Reclamation, Kirwin Irrigation District performs certain operational and maintenance functions at Kirwin Dam.

An updated Field Working Agreement was executed on July 17, 2001 between the Corps of Engineers and Reclamation regarding operation of Harlan County Dam and Lake. The agreement provides for a sharing of the decreasing water supply into Harlan County Lake. Storage capacity allocations were redefined based on the latest sediment survey (2000) and a procedure was established for sharing the reduced inflow and summer evaporation among the various lake uses.

The states of Nebraska, Colorado, and Kansas are responsible for the administration and enforcement of their state laws pertaining to the water rights and priorities of all parties concerned with the use of water. As provided by the lease agreement between Reclamation and the states, the states are responsible for administering the water surface activities and the federal lands around the reservoirs. The U.S. Fish and Wildlife Service administers the water surface activities and most of the federal lands at Kirwin Reservoir.

Reclamation cooperates with all state agencies and compact commissions to ensure that all operations are in compliance with state laws and compact requirements.

Tables and Exhibits

Records for the facilities reported in the AOP are included as tables and exhibits and are located following page 35.

Water Supply

For forecasting purposes, values of annual inflows that will be statistically equaled or exceeded 10, 50, and 90 percent of the time were selected from the probability data to be reasonable maximum (wet year), most probable (normal year), and reasonable minimum (dry year) inflow conditions, respectively.

Inflow records from 1987 through 2006 were used for the analysis of reservoirs in the Niobrara, Lower Platte and Kansas River Basins.

Reservoir Operations

All operations are scheduled for optimum benefits of the authorized project functions. Monthly, or as often as runoff and weather conditions dictate, Reclamation evaluates the carry-over storage and estimated inflow at each reservoir to determine whether excess water is anticipated. If excess inflow is apparent, controlled releases will be made to maximize the downstream benefits, including flood control.

Major Features

The Mirage Flats Project was constructed under the Water Conservation and Utilization Act and includes an irrigation storage reservoir, diversion dam, and canal system. The other features discussed in this report are all a part of the Pick-Sloan Missouri Basin Program and include single and multipurpose reservoirs, diversion dams, pump stations, and canal systems. The 16 storage facilities now in operation are listed below.

Constructed by Reclamation

1. Operated by irrigation or reclamation districts--Box Butte and Merritt Dams in the Niobrara River Basin and Virginia Smith and Davis Creek Dams in the Lower Platte River Basin.

2. Operated by Reclamation--Bonny, Trenton, Enders, Red Willow, Medicine Creek, Norton, Lovewell, Kirwin, Webster, Glen Elder, and Cedar Bluff Dams in the Kansas River Basin. A contract provides for Kirwin Irrigation District to perform certain operational and maintenance functions at Kirwin Dam.

Constructed and Operated by the Corps of Engineers

1. Harlan County Dam in the Kansas River Basin.

Irrigation and Reclamation Districts

Twelve irrigation districts and one reclamation district in the Niobrara, Lower Platte, and Kansas River Basins have contracted with Reclamation for water supply and irrigation facilities. The Twin Loups Irrigation District has contracted their O&M responsibilities to the Twin Loups Reclamation District. Bostwick Irrigation District in Nebraska has contracted their O&M responsibilities for Guide Rock Diversion Dam and the Courtland Canal between the headgates and the Nebraska-Kansas state line to Kansas Bostwick Irrigation District.

The contracted irrigation season for the Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman Valley, H&RW and Frenchman-Cambridge Irrigation Districts is from May 1 st through October 15 th or such additional period from April 1 St through May 1 St of each year as determined between the District and Reclamation. The contracted irrigation season for Almena, Bostwick in Nebraska, Kansas-Bostwick and Twin Loups Reclamation District is May 1 st through September 30 th or such additional period from April 1 St through November 15 th of each year as determined between the District and Reclamation. For all other districts, the contracted irrigation season is from May 1 st through September 30th.

Long Term Water Service Contract Renewal

The renewal of the long-term water service contract with Ainsworth Irrigation District (AID) was completed in 2006. Negotiations to renew the long term water service contract began in May 2006 and were completed in September. A draft environmental assessment (EA) was made available for public review in May and the final EA was completed in December. The repayment contract was signed on December 26, 2006, and became effective on January 1, 2007.

Municipal Water

Three municipalities and one rural water district have executed water service contracts for full or supplemental water supplies.

Fish and Wildlife

The State of Kansas is presently using the fish hatchery facility below Cedar Bluff Reservoir for waterfowl habitat. The Calamus Fish Hatchery located below Calamus Reservoir is operated by the State of Nebraska for fish production.

State of Colorado Division of Wildlife

The Colorado Division of Wildlife provides operational guidelines for Bonny Reservoir. The entire conservation pool storage was purchased by the State of Colorado on June 24, 1982.

State of Kansas Department of Wildlife and Parks

The State of Kansas acquired the use and control of portions of the conservation capacity at Cedar Bluff Reservoir following the reformulation of the Cedar Bluff Unit in October of 1992. The City of Russell's existing water storage right and contract with the United States remained unchanged.

Power Interference Considerations

A Power Interference Agreement exists between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District. A Subordination Agreement also exists between Reclamation, the Ainsworth Irrigation District and the Nebraska Public Power District. Provisions of these agreements will be incorporated into the 2007 operations.

Environmental Considerations

A "Statement of Operational Objectives" for Harlan County Lake sets forth the general operational objectives and the specific reservoir uses that are desirable. The operational objectives indicate that fish and wildlife interests are best served by high reservoir levels with minimum fluctuations, and regulation of the outflow in excess of the minimum desired flows. Although the statement recognizes flood control and irrigation as primary purposes, it indicates that comprehensive operational plans should be developed for maximum integration of the secondary uses.

These objectives are also considered in the operation of all Reclamation reservoirs in the Kansas River Basin, Niobrara River Basin, and the Lower Platte River Basin. The regulated outflow will also benefit farmers, ranchers, cities, and other interests below the reservoirs.

Republican River Compact – Kansas v. Nebraska

On May 26, 1998, Kansas filed a petition with the U. S. Supreme Court complaining that Nebraska had violated the Republican River Compact by using more than its share of the Republican River water supply. The three original parties to the Compact; Kansas, Nebraska and Colorado, became parties to the case. Because all of the major water development structures in the Republican River Basin were constructed by the Bureau of Reclamation and the Corps of Engineers, the United States was allowed to participate as an *amicus curiae.* After seventeen months of negotiations the Final Settlement Stipulation was signed by each respective governor and attorney general and was filed with the Special Master on December 16, 2002. The United States Supreme Court approved the settlement and dismissed the case on May 19, 2003.

The settlement provides for a moratorium on new groundwater wells, special rules for administration of water during water-short years, protection of storage releases, minimized flood flow effects on the accounting, recognition by Nebraska of a 1948 priority date for the Kansas-Bostwick Irrigation District, inclusion of the impacts of groundwater pumping from tableland wells in the accounting, and accounting for all reservoirs 15 acre-feet and larger within the river basin.

With the support of Kansas and Nebraska, Reclamation completed the Lower Republican River Basin Appraisal Report, which analyzed system improvement alternatives in the lower portion of the Republican River basin that would provide for more efficient use of the water supply. This report was published and distributed in January 2005. The study met requirements of the Final Settlement Stipulation by investigating system improvements in the Basin, including measures to improve the ability to utilize the water supply below Hardy, Nebraska. This study also met the responsibilities of the Republican River Compact by investigating the most efficient use of the water of the Republican River Basin for multiple purposes.

Nine alternatives were formulated using the recommended proposals provided by the Compact Commissioners. Three other alternatives were investigated for supplying water in meeting Minimum Desirable Streamflow (MDS) related needs in Kansas. The appraisal report concluded that additional water can be made available for storage in Lovewell Reservoir. The appraisal report recommends further Federal participation in a feasibility study and that such a study be undertaken to investigate solutions. Specific congressional authorization is required for Reclamation to perform a feasibility study. The purpose of a feasibility study is to identify, evaluate, and recommend to decision makers an appropriate, viable solution to the identified

problems and opportunities. The States have indicated they would provide in-kind support and/or funding for the feasibility study. Both states have expressed interest in pursuing legislation for the study. Legislation for authorizing the study was introduced in 2003 but the legislation was not advanced. On February 13 th, 2007, congressmen from both Nebraska and Kansas reintroduced the Lower Republican River Basin Study Act (H.R. 1025). The language in the re-introduced legislation is essentially the same as the legislation originally introduced in 2003.

The Stipulation also required that the States, in cooperation with the United States, form a Conservation Committee to develop a proposed study plan to determine the quantitative effects of non-federal reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska. The Study Plan supported by the three states, the Natural Resources Conservation Service, and Reclamation was completed and signed on April 28, 2004. Cooperative agreements for completing the five year study were developed between Reclamation, the University of Nebraska-Lincoln (UNL), and Kansas State University. Installation of data loggers on 35 reservoirs throughout the basin was completed in 2004. Advanced monitoring equipment for terraces and additional reservoirs was installed by UNL in 2006. Data collection and model development will continue in 2007. The study is expected to be complete in 2009.

Water-Short Year Administration will be in effect in those years in which the projected or actual irrigation supply is less than 119,000 acre feet of storage available for use from Harlan County Lake as determined by Reclamation. It was determined in 2006 that a "Water-Short Year Administration" was in effect.

Frenchman Valley Appraisal Study

In 2004, the Nebraska Department of Natural Resources (DNR) requested Reclamation prepare an Appraisal Study (AS) to examine opportunities for more efficient management of water supplies in the Frenchman River Valley including Reclamation's Enders Reservoir, a feature of the Frenchman-Cambridge Division in Nebraska. The study will focus on problems and opportunities in an area that has experienced dramatically reduced ground and surface water supplies, including reduced reservoir inflows. Pre-planning activities, including developing a Plan of Study began in 2005. Agencies participating in the study include, Reclamation, Nebraska DNR, Frenchman Valley and H&RW Irrigation Districts, Nebraska Game and Parks Commission, and the Upper and Middle Republican Natural Resources Districts. The POS is anticipated to be completed in calendar year 2007, along with model development and selection of alternatives.

Emergency Management

The Nebraska-Kansas Area Office (NKAO) continued to coordinate with local jurisdictions that could potentially be impacted by flooding from large operational releases and/or dam failure. Three tabletop exercises and two functional exercises were conducted during calendar year 2006. Orientation meetings were held for all of the NKAO dams. Tabletop exercises were held for the Norton Dam Emergency Action Plan (EAP), Virginia Smith Dam EAP, and the Davis Creek Dam EAP. Functional exercises were held for the Webster Dam EAP and Glen Elder Dam EAP. Emergency radios have been installed at all dams. These radios will be used as a backup means of communication when notifying the local emergency management officials in the event of an emergency at the dam. Both the Nebraska-Kansas Area Office and the McCook Field Office have a satellite phone that can be used in an emergency. Management and the dam operators have been trained on the use of these phones.

An internal alert at Red Willow Dam continues from 2005 due to discovery of material in the outlet works stilling basin under drain system. Additional analysis of the outlet works stilling basin under drain system will continue in 2007. An internal alert at Enders Dam is still in effect until the investigation of the stability of the outlet works stilling basin and risk assessment are complete.

Five functional exercises are planned in 2007. EAP orientation meetings will be held at all other NKAO dams. Site security plans for Trenton, Lovewell, and Glen Elder Dams were finalized and published in 2006. Site security plans for the other 12 project dams are scheduled to be finalized and published in 2007.

Public Safety Reviews

The Annual Safety Training for field personnel was held at the Community College in McCook, NE in February 2006. An invitation letter was sent to all of the water users within the NKAO jurisdiction. This letter included some safety tips, an invitation to the Annual Safety Training, and promoted the utilization of assistance from Reclamation when developing or maintaining safety programs for the water districts. This training provided maintenance personnel the opportunity to renew their 10 hour certification with respect to OSHA construction standards. First Aid and CPR training was also provided to all interested NKAO personnel. The First Aid and CPR training was provided by the McCook Fire Department.

The ongoing safety reviews of project facilities continues to identify potential safety hazards to the public and operating personnel. NKAO combines the Safety Reviews of the major facilities with the Dam Safety Facility Reviews. This format provides for input from both the Area Safety Manager, and teams of Dam Safety Specialists. Some recommendations included enhanced confined space signage, expanding the public knowledge of safety issues around our facilities, and provide training to employees regarding some of the new OSHA requirements for record keeping.

Formal training for the Automatic External Defibrillators (AEDs) was provided to all NKAO employees in early 2006. The AEDs were acquired for the McCook Office, the Grand Island Office, and two field ready models. This process involved developing a protocol with the Federal Occupational and Health Services center in Denver.

An effort to focus on the NKAO Hazardous Communication Program was undertaken during 2006. Training focused on supplying employees the information and equipment to maintain a healthy and safe work environment. This program encouraged compliance with 29 CFR 1910.1200 and our own Reclamation Safety and Health Standard. The training stressed container labeling, material safety data sheets, storage of chemicals, and understanding the different terminologies and definitions. As a result of this type of training, some lead based material was removed from the McCook yard by a hazardous materials removal contractor.

In order to ensure facility accessibility, reliability and safety, achieving compliance with accessibility standards continues. Evaluations and the development of the action plans continued during 2006. The action plans identify work activities and provide estimated funding requirements for the needed accessibility retrofits at public facilities. These improvements are being coordinated with our managing partners, and are implemented as budget allows.

Attention continues with regards to issues concerning ergonomics, West Nile Virus, hazardous materials, pesticide use, arc flash hazards, extraction of injured personnel, and communications. Employees were provided safety and health training, and given information related to these and several other issues throughout the year.

Facility Reviews, Maintenance and Construction

Comprehensive Facility Reviews were conducted at Davis Creek, Medicine Creek, Red Willow Dams during 2006. Periodic Facility Reviews were conducted at Virginia Smith, Merritt, Lovewell, and Glen Elder Dams. Annual Site Inspections were conducted at the other eight NKAO dams in 2006.

Technical surveys were completed at Medicine Creek and Merritt Dams in 2006.

Video inspection of the toe drain system at Box Butte Dam was completed in April 2006. A program to examine all of our toe drain systems was initiated in 2001.

The Reclamation Dive team conducted underwater exams at Red Willow and Glen Elder stilling basins in 2006.

Security enhancements continue at NKAO dams.

Mirage Flats Project in Nebraska

General

Flows in the Niobrara River along with Box Butte Reservoir storage provide a water supply for the 11,662 acre Mirage Flats Project. From 1997 to 2006, the project water supply averaged 11,700 AF, which is about 1.00 acre-foot per irrigable acre. Many irrigators supplement their water supply with private wells.

The Mirage Flats Irrigation District cooperates with the Nebraska Game and Parks Commission (Commission) by operating the Box Butte Dam outlet works gate and the Dunlap Diversion Dam gates in a manner to avoid sudden large changes in the flows of the Niobrara River. A 30-year agreement was made in 1990 between the district and the Commission whereby the district would not draw the reservoir water level below elevation 3978.00 feet (2,819 AF). In return the district received an up-front payment which was used to improve the efficiency of the project's delivery system. On March 17, 2000, the district agreed to increasing the minimum reservoir level by one additional foot to elevation 3979.00 feet (3,244 AF). In return the district received an additional payment from the Commission for the 20 years left on the original agreement.

A data collection platform (DCP) was installed in May of 1992 to monitor the reservoir elevation and outflow at Box Butte Dam. A telephone (primary communication system) and a radio (backup communication system) have been installed at the outlet works for contacting the Region 23 Emergency Management Agency.

2006 Summary

The flows of the Niobrara River plus the carry-over storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. Precipitation at the Mirage Flats Irrigation District Office totaled 14.77 inches, which is 87 percent of normal. The 2006 total inflow of 10,391 AF was below the dry-year forecast and the lowest annual computed inflow ever recorded at the reservoir.

From early July through early September, diversions of 10,423 AF to the Mirage Flats Canal provided irrigation water for approximately 11,092 acres, 95 percent of the service available acreage. The farm deliveries from the project water supply totaled 4,244 AF (0.38 acre-foot per irrigable acre), which is a delivery efficiency of 41 percent. Total reservoir storage was only 3,676 AF at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

An orientation meeting to review the Box Butte Dam EAP took place in April and the Annual Site Inspection of Box Butte Dam was conducted in September.

A video inspection of the toe drain system was conducted in April 2006. The inspections revealed significant sediment deposition in several elements of the toe drain system. Several recommended actions were outlined in a Report of Findings issued in November 2006 including: cleaning the remaining sediments from the toe drains and outfall drain pipes, cleaning and

measuring the sediments from the seepage monitoring weir boxes, and performing a new risk analysis during the next Comprehensive Facility Review process.

The District continued to implement water conservation measures as outlined in their Water Management Plan and their Long Range Plan. Assistance to project irrigators provided by the District include delivery sytem improvements that provide on-farm efficiency improvements, such as relocation of turnouts, burying pipe for better access, and on-farm efficiency incentives. The District continues to modify and update their computer software to improve system operations, scheduling, and accounting and continued development of their web page that allows irrigators to place water orders, review water accounts, and keep updated on district operations. In 2006, Reclamation's Water Resources Research Laboratory (WRRL) visited the District to assist with the continued development of the canal automation and remote monitoring system.

Ainsworth Unit, Sandhills Division in Nebraska

General

Within the Ainsworth Irrigation District, there are approximately 35,000 acres with available service. The project water supply is provided by storage of Snake River flows in Merritt Reservoir. The reservoir is filled to elevation 2944.0 feet each fall after the irrigation season. This level is approximately two feet below the top of conservation capacity and within the repaired area of soil cement on the upstream face of the dam. The reservoir is regulated to maintain this level until the ice clears each spring. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the older existing soil cement at lower elevations. Upon ice-out the outlet pipe is drained, inspected, and repaired as necessary. The reservoir will then be rapidly filled to elevation 2946.0 feet to reduce shoreline erosion around the reservoir and minimize sand accumulations on the face of the dam. This filling process generally takes place in April. The reservoir level is maintained until irrigation releases begin to draw on the pool around mid May. Seepage, pickup and toe drain flow normally result in flows of up to 15 cfs below Merritt Dam.

Reclamation is in the process of developing a Memorandum of Agreement (MOA) between Reclamation, the Nebraska Game and Parks Commission and the Ainsworth Irrigation District for the Development of Criteria for Releases to the Snake River below Merritt Reservoir. The

purpose of this MOA is to establish the protocol that will be used to make future releases of water from Merritt Reservoir to the lower Snake River. The development of the MOA is an environmental commitment outlined in the Ainsworth Irrigation District Final Environmental Assessment (FEA) for the conversion of a Long-Term water Service Contract to a Repayment Contract (December 2006).

Release criteria will be based on the best available scientific data to determine when local conditions warrant releases to the Snake River. When it becomes necessary to release water from Merritt Reservoir, Reclamation will direct the Ainsworth Irrigation District to make the necessary releases to the river.

2006 Summary

Precipitation, as recorded near Merritt Dam, totaled 18.40 inches, which was 90 percent of normal. April and June precipitation was the highest on record for the respective months. The inflow for the year totaled 176,810 AF. This inflow was between the dry- and normal-year forecasts. The water supply was more than adequate to meet the project's irrigation requirement. There were 83,497 AF diverted from Merritt Reservoir into Ainsworth Canal, with 55,339 AF delivered to the farm headgates (delivery efficiency of 66 percent). There were 34,452 acres of land irrigated in 2006.

The district provided a total of 577 AF of irrigation water from holding ponds located within the district's service area.

An orientation meeting to review the Merritt Dam EAP took place in April 2006 and a Periodic Facility Review of Merritt Dam was conducted in October.

A technical survey of Merritt Dam was conducted in October.

The Ainsworth Irrigation District, along with Reclamation and the local Natural Resource District, continued to provide support to the University of Nebraska Extension Service for an irrigation scheduling/nitrogen management demonstration that will educate and improve irrigation management in the area. The first demonstration site included a center pivot in the District and a field day was held in the fall of 2005. In 2006 a furrow irrigated site was added to this project and another filed day was held. This project will continue in 2007.

Working with Reclamation's technical and financial assistance through a cooperative agreement, the District installed a new ramp flume on the Airport Lateral. This flume will improve district delivery operations and reduce operational waste.

North Loup Division in Nebraska

General

The North Loup Division is located in the Loup River drainage basin. Water is diverted from both the Calamus and North Loup Rivers for the irrigation of approximately 54,900 acres of project lands. Operation of the division will also provide a sustained groundwater supply for an additional 17,000 acres. Principal features of the division include Virginia Smith Dam and Calamus Reservoir, Calamus Fish Hatchery, Kent Diversion Dam, Davis Creek Dam and Reservoir, five principal canals, one major and one small pumping plant and numerous open ditch and buried pipe laterals.

Calamus Reservoir is normally regulated at three to four feet below the top of conservation capacity during the winter months. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the soil cement on the upstream face of the dam. After the ice clears in the spring, the reservoir will be filled to conservation capacity. The North Loup Division project operation is restricted to no water diversions from the Calamus and North Loup Rivers during the months of July and August, and also during the month of September whenever sufficient water is available in storage reservoirs to deliver canal design capacity. During this time, inflows to Calamus Reservoir are required to be bypassed under the Power Interference Agreement between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District and as required in the authorizing legislation.

Davis Creek Reservoir will be regulated near elevation 2048.0 feet following the irrigation season and through the winter months. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled via Mirdan Canal, starting in April and reaching full content by the end of June. A 160-acre recreation area adjoining the reservoir continues to be managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped accessible fishing pier, a day-use area, a primitive camping area, shelter and a hiking path. Kent Diversion Dam is managed by the Nebraska Game and Parks Commission and is also open to day-use fishing with handicapped accessibility provided.

2006 Summary

Precipitation at Virginia Smith Dam was 17.80 inches which is 72 percent of normal. The inflow totaled 236,764 AF which was between the dry- and normal-year forecasts. There were 86,054 AF of water released into Mirdan Canal and 26,091 AF diverted through Kent Canal from the North Loup River. A total of 55,376 AF was diverted for district use above Davis Creek

Reservoir. The farm headgate delivery was 31,764 AF which is a delivery efficiency of 57 percent. Land irrigated in 2006 totaled 34,040 acres above Davis Creek Reservoir. Calamus Reservoir inflows were bypassed during July, August, and September as required. The reservoir elevation at the end of the year was at 2239.86 feet. The Calamus Fish Hatchery used bypassed natural flows and storage from Calamus Reservoir totaling 5,908 AF during 2006.

The precipitation of 28.50 inches near Davis Creek Dam was 122 percent of normal. Inflow to Davis Creek Reservoir totaled 50,048 AF during 2006. Beginning in mid April, Davis Creek Reservoir was filled from an elevation of approximately 2047.0 feet to a peak elevation of 2072.65 feet on June 26th using diversions from the North Loup River and Calamus Reservoir. A release of 39,878 AF was made from Davis Creek Dam into Fullerton Canal, with 21,908 AF delivered to the farm headgates (55 percent delivery efficiency). There were 20,861 acres irrigated below Davis Creek Reservoir. The reservoir elevation at the end of 2006 was near the normal wintering level at 2051.24 feet.

A tabletop exercise of the Virginia Smith Dam and Davis Creek Dam EAPs took place in September 2006. A Comprehensive Facility Review of Davis Creek Dam was conducted in May and a Periodic Facility Review of Virginia Smith Dam was conducted in October.

The Standing Operations Procedures for Davis Creek Dam were updated and republished in June 2006.

Through a cooperative agreement with Reclamation, the District began installing remote monitoring equipment at key canal sites to improve delivery system operations. In 2006 the District installed remote monitoring equipment at three sites.

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir are primarily for recreation and fish and wildlife support, although water will be available for water right administration and irrigation purposes.

Bonny Reservoir inflows from the South Fork of the Republican River and Landsman Creek are released into Hale Ditch as requested by the Colorado State Engineer. The state will make Bonny storage water available to Hale Ditch and other natural flow appropriators under short-term water service contracts. Most of the 700 acres served by Hale Ditch are now owned and operated by the Division of Wildlife, Colorado Department of Natural Resources.

The normal operation pattern of Bonny Reservoir, with a slowly rising or stable pool, enhances fish spawning in the spring and provides excellent fishing opportunities during the summer and hunting conditions each fall.

2006 Summary

The annual precipitation total of 16.41 inches at Bonny Dam was 95 percent of normal. The annual computed inflow of 6,350 AF to Bonny Reservoir was below the dry-year forecast and the second lowest ever recorded at the site. Below normal inflows were recorded during every month of the year. April inflows were the lowest on record for the month since first filling. The reservoir level was 19.0 feet below the top of conservation at the first of the year. The reservoir level gradually increased 0.65 foot to a maximum reservoir level of 3653.71 feet on April 12 th. The reservoir level gradually decreased throughout the remainder of the year. Bonny Dam recorded a maximum one day precipitation total of 1.49 inches overnight on July 9 th. A new historical low reservoir elevation of 3650.49 feet was recorded on December 14 th. The reservoir elevation at the end of the year was 21.3 feet below the top of conservation at 3650.69. The Corps of Engineers determined that $7,000 in flood prevention benefits were realized from the operation of Bonny Reservoir during 2006.

The Colorado Water Commissioner did not direct inflows from the South Fork of the Republican River and Landsman Creek passed through Bonny Reservoir into Hale Ditch. Likewise, the Colorado Department of Natural Resources did not request storage releases for irrigation purposes into Hale Ditch.

An EAP orientation meeting and an Annual Site Inspection of Bonny Dam were conducted in June.

Concrete repairs were made on the spillway inlet apron and the crack in the transverse portion of the curved vertical wall in 2006. A large void was discovered during the concrete repairs on the right side of the inlet where the upper horizontal floor slab met the sloping floor slab. Work is planned for 2007 to core the slab and backfill with flowable fill.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

The Culbertson Canal and the Culbertson Extension Canal systems serve 9,292 acres in the Frenchman Valley Irrigation District and 11,915 acres in the H&RW Irrigation District. The water supply for these lands is furnished by flows from Frenchman and Stinking Water Creeks and off-season storage in Enders Reservoir located on Frenchman Creek, a tributary of the Republican River in southwest Nebraska. Irrigation releases are conveyed via Frenchman Creek from Enders Reservoir to Culbertson Diversion Dam. Reclamation maintains/clears this section of Frenchman Creek prior to the irrigation season each spring.

The normal operation of Enders Reservoir, with the gradual rise in water surface during the spring months, provides desirable fish spawning conditions. Irrigation releases will normally deplete the conservation storage by late summer, thereby limiting the fishing and recreational usage.

2006 Summary

The annual precipitation total of 20.08 inches at Enders Dam was above normal (106 percent). The 2006 inflow into Enders Reservoir of 4,284 AF was below the dry-year forecast and the lowest ever recorded at the site. January and April inflows were the lowest ever recorded for the respective months. Due to extensive groundwater pumping above the reservoir, the inflow was only seven percent of the average historical reconstruction runoff at the Enders Dam site (60,700 AF from 1929-1947). This year was the 39th consecutive year with below-normal inflows in which the conservation pool did not fill. The reservoir level was 26.0 feet below the top of conservation at the first of the year. The reservoir pool gradually increased with late winter and spring inflows peaking at 3086.97 feet (25.3 feet below the top of conservation) on April 7th. Due to the extremely low water supply available, no water was released from Enders Reservoir. The greatest 24-hour precipitation total recorded during the year at Enders Dam was 3.08 inches overnight on May 23'. The end of the year reservoir level was 26.4 feet below the top of conservation.

The Frenchman Valley Irrigation District did not divert water into Culbertson Canal in 2006. In the spring of 2006, the Nebraska Department of Natural Resources entered into a Memorandum of Agreement (MOA) with the Frenchman Valley Irrigation District to purchase the district's natural flow rights for calendar year 2006. The MOA, approved by the irrigators within the district, provided that no water would be diverted into the Culbertson Canal during 2006. The

H&RW Irrigation District did not divert water into Culbertson Extension Canal in 2006 due to the extremely low water supply. This was the fifth consecutive year that the district did not deliver water. H&RW Irrigation District storage water in Enders Reservoir was carried over into 2007.

In August 2004, a small depression was discovered near the outlet works stilling basin at Enders Dam. An Internal Alert remains in effect until investigation of the stability of the outlet works stilling basin and risk assessment are complete. A Safety of Dams recommendation in 2006 recommend filling the stilling basin under drain system and potential voids with low-pressure grout and backfilling the existing sinkhole with compacted material after completion of the grouting program.

An Annual Site Inspection of Enders Dam was conducted in June 2006 and an orientation meeting to review the Enders Dam EAP took place in November.

In 2006, the Frenchman Valley Irrigation District (along with Reclamation) again provided support for a Limited Irrigation Demonstration Project with the University of Nebraska Extension Service. One demonstration site was located near Benkelman and demonstrated various irrigation strategies with a very limited water supply.

Meeker-Driftwood, Red Willow, and Cambridge Units, Frenchman-Cambridge Division in Nebraska

General

During the spring months, Swanson, Hugh Butler, and Harry Strunk Lakes normally have a rising or stable pool which enhances the spawning of northern pike and walleye. These lakes provide excellent opportunities for fishing, water sports, and recreation.

Service is provided for Frenchman-Cambridge Irrigation District by Meeker-Driftwood Canal to 16,855 acres; Red Willow Canal to 4,797 acres; Bartley Canal to 6,353 acres; and Cambridge Canal to 17,644 acres. The water supply for these lands is provided by storage in Swanson, Hugh Butler, and Harry Strunk Lakes, and inflows of the Republican River and Red Willow and Medicine Creeks. The Frenchman-Cambridge Irrigation District has replaced all of the open ditch laterals which were economically feasible with buried pipe which has significantly increased both system and on-farm efficiencies. The District is currently placing the lower reaches of the open ditch Cambridge Canal into buried pipe.

2006 Summary

The annual precipitation total of 20.76 inches at Trenton Dam was 104 percent of normal. The inflow of 12,047 AF to Swanson Lake was well below the dry-year forecast and the lowest annual computed inflow ever recorded at the lake. The inflow was below normal for all twelve months. The reservoir level began the year approximately 20.6 feet below the top of conservation pool. The reservoir level gradually increased during the spring and peaked at 2733.69 feet on April 18th (approximately 18.3 feet below full). Due to the extremely low water supply available, no water was released from Swanson Lake. Irrigation diversions were not made into Meeker-Driftwood Canal. This was the fourth consecutive year that the district did not deliver water from the Meeker-Driftwood Canal. At the end of the year the reservoir level was 20.2 feet below the top of conservation at 2731.85 feet.

The annual precipitation total of 19.65 inches at Red Willow Dam was 100 percent of normal. The greatest precipitation event recorded at Red Willow Dam in 2006 was 1.91 inches overnight on July 20th. The annual inflow of 8,638 AF into Hugh Butler Lake was below the dry-year forecast and the lowest ever recorded at the site. The computed inflow for all twelve months of the year was below normal with record lows recorded during January, February, March and April. The reservoir level at the first of the year was 11.5 feet below the top of conservation. Inflows gradually increased the level of the reservoir to a peak of 2571.32 feet (10.5 feet below full) on April 8th. Irrigation releases began on June 24th and were discontinued on August 18th. Approximately 9,200 acre-feet of water was released from Hugh Butler Lake for irrigation in Bartley Canal. Irrigation diversions were not made into Red Willow Canal for the fourth consecutive year. The level of Hugh Butler Lake at the end of the year was 18.6 feet below the top of conservation, the second lowest end of year storage ever recorded.

The water supply was limited with 5,830 AF diverted to irrigate 5,722 acres served by the Bartley Canal (farm delivery efficiency was 45 percent).

The annual precipitation total of 22.88 inches at Medicine Creek Dam was 111 percent of normal. The inflow of 27,009 AF was below the dry-year forecast and the lowest annual total ever recorded. The computed inflow was below normal during all twelve months with record lows

recorded in February and April. The reservoir level at the beginning of 2006 was 5.4 feet below the top of conservation. The reservoir pool gradually increased peaking at 2366.41 feet on June 24th (0.3 foot into flood pool). Irrigation releases began on June 25 th and were shut off on September 1 st with nearly 23,700 AF of water released from the reservoir for irrigation. The greatest 24-hour precipitation event recorded at Medicine Creek Dam was 2.07 inches overnight on June 18th. Harry Strunk Lake was 7.7 feet below the top of conservation at the end of the year. The Corps of Engineers determined that the reservoir prevented $15,000 in flood damages.

The water supply was limited with 19,692 AF of water diverted to irrigate 15,077 acres of land served by the Cambridge Canal (farm delivery efficiency was 47 percent).

An orientation meeting to review the Trenton, Red Willow, and the Medicine Creek Dams' EAPs took place in September 2006. An Annual Site Inspections was conducted in March at Trenton Dam. Comprehensive Facility Reviews were conducted at Medicine Creek and Red Willow Dams in June 2006.

A technical survey of Medicine Creek Dam was completed in May 2006.

In July 2005, a small quantity of fine sand was discovered near the river outlet works stilling basin drain outlet during an inspection at Red Willow Dam. Five piezometers were installed in April 2006 adjacent to the outlet works and spillway stilling basins and temporary plugs were placed in the underdrain outlets in May. An Internal Alert remains in effect until additional analysis of the underdrain system is complete.

Painting of the spillway gate and associated metal work at Trenton Dam began in 2006 but was discontinued due to winter weather. The painting contractor will complete the painting in 2007. Initial site prep work for a new storage building at Trenton Dam was completed in 2006. The building will be completed in 2007.

The District (along with Reclamation) continued to provide support for a Limited Irrigation Demonstration Project with the University of Nebraska Extension Service. The demonstration site was located just east of Arapahoe and demonstrated various irrigation strategies with a short water supply. The project received water from the Cambridge Canal and a field day was well attended.

In 2006 the District began a pipe project that will replace approximate 3 miles of the end section of Cambridge Canal with buried pipe. Reclamation is providing technical and financial assistance for this project through a cooperative agreement with the District. This project will eliminate approximately 3 miles of open ditch canal and will also provide improved delivery service to a number of project irrigators.

A Periodic Facility Review of Trenton Dam is scheduled for 2007. On-site dam operator training is also scheduled to take place at Red Willow and Medicine Creek Dams in 2007.

The Standing Operating Procedures for Trenton Dam are being updated and are expected to be republished in 2007.

The district plans to support the limited irrigation demonstration again in 2007. The district is planning to finish the Cambridge Canal pipe project prior to the 2007 irrigation season. The district is also investigating expanding the operational capabilities of two check structures on Cambridge Canal to improve operations.

Almena Unit, Kanaska Division in Kansas

General

Service is available to 5,764 acres in the Almena Irrigation District. The project water supply is provided by Prairie Dog Creek flows and Keith Sebelius Lake storage.

The water service contract for the City of Norton, Kansas, provides for a maximum annual use of 1,600 AF from Keith Sebelius Lake.

2006 Summary

The annual precipitation at Norton Dam totaled 27.56 inches, which is 113 percent of normal. The total inflow of 4,329 AF was between the dry- and normal-year forecasts. The reservoir level was 17.8 feet below the top of conservation on December 31, 2005. Late winter and early spring inflows gradually increased the reservoir level to a peak elevation of 2287.27 feet on April 14 th (17.0 feet below full pool). Irrigation releases were not made from the reservoir in 2006. Keith Sebelius Lake was 18.1 feet below the top of conservation (2286.22 feet) at the end of the year.

The city of Norton used 456 AF of municipal water during 2006.

An Annual Site Inspection of Norton Dam was conducted in June and a tabletop exercise of the Norton Dam EAP took place in August 2006.

A Safety of Dams recommendation was made in 2000 concerning the seepage through the left abutment and around the outlet works house at Norton Dam. Technical Service Center personnel inspected the seepage areas in June 2001 and recommended consideration of monitoring improvement and additional instrumentation. A final issue evaluation report of findings (Technical Memorandum ND-8312-2) in 2003 concluded that the assessed risks for seepage and piping through the foundation in the left abutment falls in the range of "justification to take action to reduce risk." Topographic surveys and additional instrumentation were installed near the outlet works in 2004. In December 2005, a Corrective Action Study Technical Memorandum evaluated various alternatives for risk reduction and produced two new recommendations. Design of a weighted filter drain system and a seepage stability berm was completed in 2006. Construction is scheduled to occur in 2007.

Franklin, Superior-Courtland, and Courtland Units, Bostwick Division in Nebraska and Kansas

General

Harlan County Lake storage and Republican River flows provide a project water supply for 22,454 acres in the Bostwick Irrigation District in Nebraska, and 13,378 acres in the Kansas-Bostwick Irrigation District No. 2 above Lovewell Reservoir. This storage and natural flows, together with White Rock Creek flows and Lovewell Reservoir storage, furnish a water supply for 29,122 acres below Lovewell Reservoir in the Kansas-Bostwick Irrigation District.

The lands in the Franklin and Superior-Courtland Units are in the Bostwick Irrigation District in Nebraska. The lands in the Courtland Unit downstream of the Kansas state line are in the Kansas-Bostwick Irrigation District.

In accordance with the off-season flow alternative outlined in Reclamation's final environmental assessment dated December 16, 1983, and amended on November 21, 2002, Harlan County Lake releases will be 10 cfs during the months of December, January, and February, except when the reservoir is at low levels. During water-short years releases for these three months will be either zero or 5 cfs depending on reservoir levels. At the request of the State of Nebraska, releases of 30 cfs for a maximum 5-day period may be made to relieve icing conditions in the river.

Natural gain in streamflow, plus irrigation return flows, and operational bypass at Superior-Courtland Diversion Dam will provide some flow **downstream.**

The Kansas Department of Wildlife and Parks has requested that the Kansas-Bostwick Irrigation District and Reclamation maintain, when possible, a flow of 20 cfs into Lovewell Reservoir when the Courtland Canal is in operation and the conservation pool is below capacity. This recommended inflow provides excellent fishing around the canal inlet to the reservoir. The seepage below Lovewell Dam into White Rock Creek maintains a small live stream throughout the year.

2006 Summary - Bostwick Division - Harlan County Lake Operations

The annual precipitation at Harlan County Dam totaled 20.62 inches of rainfall, which is 91 percent of normal. The 2006 inflow of 30,077 AF was below the dry-year forecast and the second lowest ever recorded. The inflow was below normal for all twelve months of the year A release was not required during January, February or December in accordance to the environmental assessment and the annual operating plan.

Harlan County Lake began 2006 approximately 17.4 feet below the top of conservation pool, at 1928.31 feet. Inflows during the late winter and early spring slowly increased the reservoir pool to a peak of 1929.68 feet on May 9 th (top of conservation pool is elevation 1945.73 feet). Harlan County Dam recorded 2.55 inches of rain overnight on June 16 th (the greatest one day total in 2006). Irrigation releases began on June 22 nd and continued until July 23 rd. The reservoir level continued to decline throughout the remainder of the year. The level of Harlan County Lake at the end of 2005 was 1926.75 feet (19.0 feet below the top of conservation). Harlan County Lake prevented $7,000 of downstream flood damages during 2006 according to the Corps of Engineers.

Approximately 5,925 acres in the Kansas Bostwick Irrigation District above Lovewell Dam were furnished a limited water supply.

A total of 19,063 AF (approximately 63 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

2006 Summary - Bostwick Division - Nebraska

Irrigation diversions were not made into Franklin, Naponee, Franklin Pump, Superior, or Courtland Canal in Nebraska in 2006. In the spring of 2006, the Nebraska Department of Natural Resources and the Bostwick Irrigation District entered into a Memorandum of Agreement (MOA) to purchase the district's water supply for the 2006 calendar year. The MOA was approved by the irrigators within the district which provided that the district relinquish the rights to use its share of natural flow and storage water for the 2006 irrigation season.

The district continued to replace open ditch laterals with buried pipe to reduce losses and improve system operations. In 2005 the District was selected for a Water 2025 Challenge Grant Project that will replace approximately 10 miles of open ditch laterals with buried pipe. Identified laterals to be placed in pipe include all or portions of Superior Laterals 9.5, 17.5, 21.2, and 27.3. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improve water measurement and accounting by utilizing water meters, and provide on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation. Due to the rising pipe prices, the District was only able to replace 3 of the 4 planned laterals in 2006.

The District applied and was selected for a 2006 Water 2025 project that will allow the District to complete the original Water 2025 proposal. With this 2006 project, the Distict will be able to complete the Superior Lateral 27.3 pipe project.

2006 Summary - Bostwick Division - Kansas

The 2006 precipitation at Lovewell Dam totaled 23.87 inches, which was 87 percent of normal. Lovewell Reservoir began 2006 with a water surface elevation only 3.6 feet below the top of conservation. Inflows during the first four months of the year from White Rock Creek and diversion of Republican River flows via Courtland Canal slowly increased the reservoir filling the reservoir conservation pool on April 14 th (elevation 1582.6 feet), and in filling the reservoir to an elevation of 1584.20 feet on May 10 th. Releases were made into the lower Courtland Canal beginning on May 11 th to season the canal and maintain the reservoir level. Irrigation demands reduced the pool elevation to 1576.04 feet on August 23 . The greatest 24-hour precipitation total for the year occurred overnight on September 9 th with 1.89 inches recorded. Diversions of Republican River natural flows into Lovewell Reservoir continued after the irrigation release had ended and were maintained throughout the remainder of December. The water surface elevation gradually increased to 1576.22 feet on December 31, 2006 (6.4 feet below the top of active conservation). Lovewell Reservoir prevented $7,000 of downstream flood damages during 2006 according to the Corps of Engineers

The Kansas-Bostwick Irrigation District diverted a total of 38,446 AF to serve 5,925 acres above Lovewell Dam and 22,655 acres below Lovewell Dam. Farm delivery efficiency averaged 47 percent in the district.

An orientation meeting to review the Lovewell Dam EAP and a Periodic Facility Review of Lovewell Dam were conducted in November.

Initial site prep work for a new storage building at Lovewell Dam was completed in 2006. The building will be completed in 2007.

In 2006 the district continued to replace open ditch laterals with buried pipe. The district and Reclamation also provided assistance to Kansas State University (KSU) for a sprinkler irrigation demonstration located northeast of Courtland, Kansas. Courtland Canal supplies water for this demonstration and a field day was held at the site in the fall. In 2006, the District replaced open ditch Ridge lateral 5.0 and Courtland West lateral 0.3-1.3 with buried pipe. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improve water measurement and accounting by utilizing water meters, and provide on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation. The District has identified additional laterals proposed to be replaced with buried pipe in 2007.

Diversions from the Republican River via Courtland Canal will continue through the winter and again in early spring to insure that Lovewell Reservoir is filled prior to the irrigation season. Reclamation submitted a deviation request to the Corps of Engineers that would allow Lovewell Reservoir to be filled to elevation 1584.6 feet (2.0 feet into flood pool) prior to the irrigation season. The Corps of Engineers has approved the storing of 1.6 feet into the flood pool to elevation 1584.2 feet. The additional storage will be used for irrigation purposes due to persistent drought conditions. The Corps of Engineers allowed the reservoir to be filled to elevation 1584.2 feet prior to the irrigation season in 2006.

A functional exercise of the Lovewell Dam EAP is scheduled for 2007.

Both Districts will continue to investigate remote monitoring site installation that will provide system operations improvements. The Bostwick Irrigation District in Nebraska was selected for a Water 2025 challenge grant that would expand the District buried pipe program in 2006. Kansas Bostwick Irrigation District is also providing support to KSU for the installation of a sub-surface drip irrigation project, which was installed in late 2006 and will be operational for the 2007 irrigation season.

The Kansas Department of Agriculture submitted a Water 2025 Challenge Grant proposal which was selected for funding in 2005. Through this project, the Kansas Division of Water Resources (KDWR) will install flow meter data logging equipment and remote monitoring equipment on approximately 100 diversions in the Republican River Basin. The real time monitoring of the diversions will enhance administration of water rights, improve water management, and expand water marketing opportunities between senior and junior water rights holders. 38 sites were installed in 2006, but equipment problems delayed the project. These delays resulting in most sites not operating until the 2006 irrigation season was complete. KDWR believes that they will be close to the target of 100 sites prior to the 2007 irrigation season.

Kirwin Unit, Solomon Division in Kansas

General

The water supply for the 11,465 acres of land in the Kirwin Irrigation District is furnished by Kirwin Reservoir storage and inflows from the North Fork Solomon River and Bow Creek.

The operation of Kirwin Dam and Reservoir affords many opportunities for recreation, fishing, hunting, water sports, fish spawning, and preservation of waterfowl species.

The U.S. Fish and Wildlife Service (Service) has completed the Kirwin National Wildlife Refuge Comprehensive Conservation Plan (CCP). The 1997 National Refuge System Improvement Act required the Service to develop a CCP for each of its refuges. The Kirwin Refuge CCP will guide the refuge management activities through 2025.

2006 Summary

The annual precipitation total of 25.96 inches at Kirwin Dam was 111 percent of normal. The inflow of 6,269 AF was between the dry- and normal-year forecast. Kirwin Reservoir was 23.9 feet below the top of conservation pool at the first of the year. The reservoir level continued to gradually increase to a peak elevation of 1706.23 feet (23.0 feet below full) on May 31 st. Due to the extremely low water supply, no irrigation releases were made from Kirwin Reservoir. Precipitation during August (7.50 inches) was the greatest ever recorded for the month

An orientation meeting to review the Kirwin Dam EAP took place in May and an Annual Site Inspection of Kirwin Dam was conducted in August.

The Standing Operating Procedures (SOP) were updated and republished in 2006.

The District and Reclamation continue to participate in the Solomon Basin Working Group meetings as part of the State of Kansas' Subbasin Water Resources Management Program. This group is designed to take a proactive approach in developing water management strategies that address declines in stream flows and groundwater levels.

Webster Unit, Solomon Division in Kansas

General

The Webster Irrigation District has service available to 8,537 acres. The project water supply is provided by Webster Reservoir storage and flows of the South Fork Solomon River.

2006 Summary

In 2006, the precipitation at Webster Dam was 112 percent of normal (26.33 inches). The inflow of 3,187 AF was below the dry-year forecast and the lowest annual computed inflow ever recorded. Webster Reservoir began 2006, 27.1 feet (elevation 1865.36 feet) below the top of conservation pool. The reservoir pool peaked at an elevation of 1865.39 feet on January 5th and gradually declined throughout the remainder of the year. Irrigation releases were not made from the reservoir in 2006. December precipitation (3.97 inches) was the highest total ever recorded for the month. Webster Dam received 3.87 inches of rainfall overnight on August 18 th, the greatest 24-hour precipitation event during the year. The reservoir level was 28.5 feet below the top of conservation on December 31, 2006. The Corps of Engineers determined Webster Reservoir prevented $7,000 in flood damages.

An Annual Site Inspection of Webster Dam was conducted in June and an functional exercise of the Webster Dam EAP took place in September.

Concrete repairs in the spillway chute began in 2006. Approximately 3,500 ft ^{2} of concrete was repaired in the flat portion of the spillway by NKAO personnel in 2006. Repairs to this area of the spillway will continue in 2007.

The district continued to explore opportunities to cost share with Reclamation and district irrigators for the replacement of open ditch laterals with buried pipe. In late fall of 2005 and spring of 2006, the District replaced open ditch Osborne Laterals 25.0 and 26.1 with buried pipe. Future conservation projects include the possibility of installing remote monitoring equipment at the key canal measurement sites on Osborne Canal. Future conservation projects may be delayed due to the declining water supply and availability of cost-share funding.

In addition to the repairs to the flat portion of the spillway, a concrete repair specification is scheduled to be issued in the spring of 2007 for the sloped portion of the chute floor with the contract awarded and work to be completed during the summer of 2007.

The District is not planning to install any large lateral pipe projects in 2007 but will continue to solicit interest from project irrigators. Interest in investing in delivery system improvements has been hampered by the uncertainty of future water supplies. The District is investigating improvements to the water measurement structure between the 2 nd and 3 rd sections of Osborne Canal. Future conservation projects include the possibility of installing remote monitoring equipment at the wasteways and at the beginning of the second and third sections of Osborne Canal.

The District and Reclamation continue to participate in the Solomon Basin Working Group meetings as part of the State of Kansas' Subbasin Water Resources Management Program. This group is designed to take a proactive approach in developing water management strategies that address declines in stream flows and groundwater levels.

.

Glen Elder Unit, Solomon Division in Kansas

General

Releases from Waconda Lake will be regulated as outlined in two memorandums of understanding between the State of Kansas and Reclamation. Releases are made for the city of Beloit, the Mitchell County Rural Water District, the long-term water service contract with Glen Elder Irrigation District, and for water right administration.

The water service contract with Beloit, Kansas, provides for the annual use of up to 2,000 AF of Waconda Lake storage. Water is measured at the Glen Elder Dam river outlet works. In any year that the city's water supply is insufficient and there is surplus water in Waconda Lake, such additional water may be released for the city at a rate of $15.00 per acre-foot.

The water service contract with the Mitchell County Rural Water District No. 2 provides for 1,009 AF of storage water as available from Waconda Lake.

The water service contract with the Glen Elder Irrigation District provides for the use of up to 18,000 AF of storage water each year. Based on the current State of Kansas Certificate of Appropriation, water usage is not to exceed 15,170 AF per calendar year. Water is released and measured through the river outlet works.

The available facilities along the shores of Waconda Lake and the large water surface area afford opportunities to thousands of people for picnics, sightseeing, recreation, water sports, hunting, and fishing.

When compatible with flood control operations, the operating criteria for Waconda Lake provide for a stable or rising pool level during the fish spawning period each spring.

When possible, Waconda Lake will be allowed to fill during the late summer and early fall to flood exposed shoreline vegetation. This flooded aquatic vegetation is very beneficial to waterfowl management.

Waconda Lake will normally be regulated at one to two feet below the top of conservation capacity during the winter months. Maintaining the lake at this level will reduce shoreline erosion, provide a buffer for spring runoff and lessen ice damage to the upstream face of Glen Elder Dam. Releases from Waconda Lake will be regulated each year to maintain a constant water surface level while the lake is ice-covered.

2006 Summary

The annual precipitation total of 21.54 inches at Glen Elder Dam was 84 percent of normal. The inflow of 27,032 AF was below the dry-year forecast and the lowest ever recorded. Waconda Lake began the year 5.1 feet below the top of conservation. The lake level peaked at elevation 1450.53 feet on January 8th (5.1 feet below the top of conservation). This was the lowest annual peak since first filling of the reservoir. Irrigation releases began on March 8th and continued through September 9th reducing the lake level to 1447.00 feet. The reservoir continued to decline throughout the remainder of the year and a historic low reservoir level of 1446.18 feet was reached on December 19th. On December 31, 2006 the lake level was 1446.51 feet (9.1 feet below full).

A total of 23,174 AF of water was released from Glen Elder Dam in 2006. Storage releases of 13,529 AF combined with natural flow releases of 2,458 AF for the irrigation of 6,693 acres in the Glen Elder Irrigation District. Storage releases totaling 754 AF were made for the City of Beloit, with an additional 5,596 AF bypassed for water quality as directed by the State Water Commissioner. Releases to the Mitchell County Rural Water District No. 2 totaled 837 AF.

A functional exercise of the Glen Elder Dam EAP took place in September 2006 and a Periodic Facility Review of Glen Elder Dam was conducted in November.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff Reservoir storage furnishes a maximum of 2,000 AF each year for the City of Russell, Kansas when required. Prior to 1993, Cedar Bluff Reservoir storage and Smoky Hill River flows had provided a water supply for 6,800 acres in the Cedar Bluff Irrigation District. Reformulation of the Cedar Bluff Unit in October of 1992 resulted in the dissolution of the Cedar Bluff Irrigation District with the Kansas Water Office and Kansas Department of Wildlife and Parks acquiring the use and control of portions of the reservoir conservation capacity. A "designated operating pool" was established for Cedar Bluff Reservoir and includes the following sub allocation pools: The City of Russell's existing water storage right which remained unchanged (2,700 AF); an artificial recharge pool under control of the Kansas Water Office (5,110 AF); and a fish, wildlife and recreation pool under control of the Kansas Department of Wildlife and Parks (21,061 AF). A "joint-use pool" has been established between the operating pool and the flood control pool for water supply, flood control, environmental and fish, wildlife and recreation purposes. Water rights for the "joint-use pool" are held jointly between the Kansas Department of Wildlife and Parks and the Kansas Water Office. A Contract Administration Memorandum between the United States of America, represented by Reclamation, the State of Kansas and the City of Russell was signed in November/December of 2003, establishing an accounting procedure for water storage in Cedar Bluff Reservoir. In January, 2006 a Memorandum of Understanding was signed by the State of Kansas agencies, Kansas Water Office, and Kansas Department of Wildlife and Parks. Kansas Department of Wildlife and Parks will be responsible for the joint pool releases and for the water rights.

2006 Summary

The annual precipitation total at Cedar Bluff Dam was 19.43 inches which is 92 percent of normal. Precipitation in December was the greatest precipitation total ever recorded for the month. The inflow (7,418 AF) was between the dry- and normal-year forecasts. At the beginning of the year, the level of Cedar Bluff Reservoir was 2131.66 feet (top of active conservation is 2144.00 feet). The reservoir level declined throughout the entire year and by December 31, 2006, the reservoir level had decreased to 2127.96 feet (16.0 feet below the top of active conservation).

The State of Kansas used the fish hatchery facility located below Cedar Bluff Dam for waterfowl habitat with 1 AF released to the facility. A total of 1,683 AF of water was released from Cedar Bluff Reservoir during 2006 for the City of Russell. A total of 1,368 AF of water was released from the Artificial Recharge pool at the request of the Kansas Water Office.

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS
CAPACITY ALLOCATIONS 1/

RESERVOIR		DEAD	LIVE CONSERVATION Inactive	Active	FLOOD CONTROL
Box Butte	- Elevation Ft.	3969.0	3979.0	4007.0	---
	Total Acre-feet	640	3,244	31,060	---
	Net Acre-feet	640	2,604	27,816	---
Merritt	- Elevation Ft.	2875.0	2896.0	2946.0	---
	Total Acre-feet	774	4,662	66,726	---
	Net Acre-feet	774	3,888	62,064	---
Calamus	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	817	24,646	127,400	---
	Net Acre-feet	817	23,829	102,754	---
Davis Creek	- Elevation Ft.	1998.5	2003.0	2076.0	---
	Total Acre-feet	76	172	31,158	---
	Net Acre-feet	76	96	30,986	---
Bonny	- Elevation Ft.	3635.5	3638.0	3672.0	3710.0
	Total Acre-feet	1,418	2,134	41,340	170,160
	Net Acre-feet	1,418	716	39,206	128,820
Enders	- Elevation Ft.	3080.0	3082.4	3112.3	3127.0
	Total Acre-feet	7,516	8,948	42,910	72,958
	Net Acre-feet	7,516	1,432	33,962	30,048
Swanson Lake	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
	Total Acre-feet	2,118	12,430	112,214	246,291
	Net Acre-feet	2,118	10,312	99,784	134,077
Hugh Butler Lake	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
	Total Acre-feet	5,185	8,921	36,224	85,070
	Net Acre-feet	5,185	3,736	27,303	48,846
Harry Strunk Lake 4/	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
	Total Acre-feet	3,408	7,897	34,647	87,361
	Net Acre-feet	3,408	4,489	26,750	52,714
Keith Sebelius Lake	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
	Total Acre-feet	1,636	3,993	34,510	133,740
	Net Acre-feet	1,636	2,357	30,517	99,230
Harlan County Lake 3/	- Elevation Ft.	1885.0	1927.0	1945.73	1973.5
	Total Acre-feet	0	118,099	314,111	814,111
	Net Acre-feet	0	118,099	196,012	500,000
Lovewell	- Elevation Ft.	1562.07	1571.7	1582.6	1595.3
	Total Acre-feet	1,659	11,644	35,666	86,131
	Net Acre-feet	1,659	9,970	24,022	50,465
Kirwin	- Elevation Ft.	1693.0	1697.0	1729.25	1757.3
	Total Acre-feet	4,969	8,515	98,154	313,290
	Net Acre-feet	4,969	3,546	89,639	215,136
Webster	- Elevation Ft.	1855.5	1860.0	1892.45	1923.7
	Total Acre-feet	1,256	4,231	76,157	259,510
	Net Acre-feet	1,256	2,975	71,926	183,353
Waconda Lake	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
	Total Acre-feet	248	26,237	219,420	942,408
	Net Acre-feet	248	25,989	193,183	722,988
Cedar Bluff	- Elevation Ft.	2090.0	2107.8	2144.0	2166.0
	Total Acre-feet	4,402	28,574	172,452	364,342
	Net Acre-feet	4,402	24,172	143,878	191,890
Total Storage (A.F.)		36,122	274,347	1,474,149	3,909,611 2/
Total Net Acre-feet		36,122	238,210	1,199,802	2,357,568

1/ Includes space for sediment storage.

2/ Includes total active storage for Box Butte, Merritt, Calamus, and Davis Creek Reservoirs.

3/ Bottom of irrigation pool for Harlan County Lake is 1932.5 feet, 164,111 AF.

4/ New Area-Capacity Tables in effect 1-1-07. Sedimentation survey conducted in May 2006.

TABLE 2
SUMMARY OF 2006 OPERATIONS
MIRAGE FLATS PROJECT

BOX BUTTE RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	MIRAGE FLATS CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	1,328	36	74	0.24	10,385	0	0
Feb.	1,248	34	99	0.47	11,500	0	0
Mar.	2,204	42	187	1.90	13,475	0	0
Apr.	1,575	42	325	0.97	14,683	0	0
May	769	46	482	1.04	14,924	0	0
June	397	555	498	1.84	14,268	0	0
July	315	6,908	525	1.12	7,150	6,446	2,340
Aug.	310	2,908	286	3.80	4,266	3,084	1,553
Sep.	585	853	175	2.32	3,823	893	351
Oct.	494	61	125	0.51	4,131	0	0
Nov.	771	60	72	0.03	4,770	0	0
Dec.	395	40	44	0.53	5 081	0	0
TOTAL	10,391	11,585	2,892	14.77	–	10,423	4,244

NOTE - Acres irrigated 2006: Mirage Flats Canal 11,092 acres.

SANDHILLS DIVISION
AINSWORTH UNIT

MERRITT RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	AINSWORTH CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	14,197	14,231	236	0.26	61,100	0	0
Feb.	12,867	12,298	299	0.40	61,370	0	0
Mar.	16,886	15,372	421	2.37	62,463	0	0
Apr.	16,118	12,000	724	3.34	65,857	0	0
May	13,962	11,792	1,301	0.47	66,726	4,739	1,215
June	14,140	12,982	1,738	3.40	66,146	9,660	3,334
July	14,230	36,218	1,604	0.67	42,554	36,391	26,863
Aug.	16,111	29,147	933	2.67	28,585	29,381	22,610
Sep.	15,815	4,175	402	2.37	39,823	3,326	1,317
Oct.	15,054	2,460	576	0.67	51,841	0	0
Nov.	13,064	3,669	405	0.22	60,831	0	0
Dec.	14 366	13 785	312	1.56	61 100	0	0
TOTAL	176,810	168,129	8,951	18.40	--	83,497	55,339

NOT -Acres irrigated 2006: Ainsworth Canal 34,452 acres.

NORTH LOUP DIVISION
CALAMUS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to Calamus Fish Hatch. (AF)	ABOVE DAVIS CREEK MIRDAN CANAL Release to Canal (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	20,455	6,329	446	0.00	114,241	361	0	0	0
Feb.	16,378	5,825	595	0.05	124,199	326	0	0	0
Mar.	20,611	16,883	1,089	2.26	126,838	371	0	0	0
Apr.	23,703	20,999	1,783	1.66	127,759	571	1,254	0	0
May	18,753	19,611	2,349	0.21	124,552	498	8,243	4,165	2,240
June	19,735	17,280	2,556	2.66	124,451	613	12,637	8,252	4,768
July	18,855	48,607	2,738	0.51	91,961	703	35,058	23,776	14,023
Aug	20,275	39,356	1,515	3.19	71,365	920	24,540	16,529	9,336
Sep.	19,230	18,450	816	3.72	71,329	653	4,322	2,654	1,397
Oct.	20,031	8,118	455	1.24	82,787	366	0	0	0
Nov.	18,595	6,383	621	0.00	94,378	234	0	0	0
Dec.	20,143	6,803	392	2.30	107,326	292	0	0	0
TOTAL	236,764	214,644	15,355	17.80	--	5,908	86,054	55,376	31,764

NOTE -- Acres irrigated 2006: Mirdan Canal 34,040 acres.

NORTH LOUP DIVISION (Continued)

DAVIS CREEK RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Mo. Content (AF)	BELOW DAVIS CREEK FULLERTON CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	1	198	48	0.04	8,951	0	0
Feb.	1	175	58	0.03	8,719	0	0
Mar.	96	93	102	2.45	8,620	0	0
Apr.	5,417	476	193	2.99	13,368	0	0
May	13,301	4,090	352	0.33	22,227	2,723	140
June	12,456	7,622	535	3.63	26,526	6,180	3040
July	9,615	17,869	506	2.65	17,766	16,786	13,447
Aug.	6,731	8,414	327	3.74	15,756	8,269	4,221
Sep.	2,147	6,204	202	7.91	11,497	5,920	1,060
Oct.	124	276	161	1.39	11,184	0	0
Nov.	11	248	86	0.45	10,861	0	0
Dec.	148	248	49	2.89	10 712	0	0
TOTAL	50,048	45,913	2,619	28.50	--	39,878	21,908

NOTE - Acres irrigated 2006: Fullerton Canal 20,861 acres.

TABLE 2
SUMMARY OF 2006 OPERATIONS

UPPER REPUBLICAN DIVISION
ARMEL UNIT
BONNY RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Outflow To Hale Ditch (AF)
Jan.	576	307	114	0.53	12,420	0
Feb.	626	333	117	0.15	12,596	0
Mar.	808	369	174	0.54	12,861	0
Apr.	714	357	478	0.74	12,740	0
May	638	369	629	2.10	12,380	0
June	**464**	357	727	2.24	11,760	0
July	492	369	723	2.95	11,160	0
Aug.	286	369	558	1.17	10,519	0
Sep.	412	357	334	2.45	10,240	0
Oct.	405	369	274	1.84	10,002	0
Nov.	324	357	172	0.04	9,797	0
Dec.	605	369	98	1.66	9 935	0
TOTAL	6,350	4,282	4,398	16.41	—	

TABLE 2
SUMMARY OF 2006 OPERATIONS

FRENCHMAN-CAMBRIDGE DIVISION
FRENCHMAN UNIT

ENDERS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of CULBERTSON CANAL Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	CULBERTSON EXT. CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	375	184	66	0.24	11,691	0	0	0	0
Feb.	387	167	65	0.24	11,846	0	0	0	0
Mar.	464	184	109	0.81	12,017	0	0	0	0
Apr.	397	179	247	0.50	11,988	0	0	0	0
May	440	184	413	1.69	11,831	0	0	0	0
June	315	179	452	2.82	11,515	0	0	0	0
July	349	184	427	4.77	11,253	0	0	0	0
Aug.	74	184	311	2.07	10,832	0	0	0	0
Sep.	280	179	220	3.06	10,713	0	0	0	0
Oct.	295	184	118	1.50	10,706	0	0	0	0
Nov.	364	179	115	0.12	10,776	0	0	0	0
Dec.	544	184	62	2.26	11074	0	0	0	0
TOTAL	4,284	2,171	2,605	20.08	–	0	0	0	0

NOTE: Acres irrigated 2006: Culbertson Canal - 0 acres; Culbertson Extension Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT

SWANSON LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of MEEKER-DRIFTWOOD Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	1,799	61	233	0.19	36,573	0	0
Feb.	1,705	56	236	0.13	37,986	0	0
Mar.	2,920	61	403	0.94	40,442	0	0
Apr.	1,894	60	1,125	0.20	41,151	0	0
May	841	61	1,489	1.60	40,442	0	0
June	621	60	1,684	4.12	39,519	0	0
July	240	61	1,739	1.60	37,959	0	0
Aug.	1,166	61	1,132	4.23	37,932	0	0
Sep.	204	60	815	3.22	37,261	0	0
Oct.	0	61	549	1.78	36,651	0	0
Nov.	1	60	439	0.01	36,153	0	0
Dec.	456	61	238	2.74	36 310	0	0
TOTAL	12,047	723	10,082	20.76	--	0	0

NOTE: Acres irrigated 2006: Meeker-Driftwood Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT

HUGH BUTLER LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of RED WILLOW CANAL Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	BARTLEY CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	627	246	94	0.06	20,529	0	0	0	0
Feb.	537	222	95	0.02	20,749	0	0	0	0
Mar.	933	246	161	1.08	21,275	0	0	0	0
Apr.	725	238	464	0.69	21,298	0	0	0	0
May	557	246	674	1.29	20,935	0	0	424	0
June	543	787	768	3.34	19,923	0	0	349	1,478
July	869	5,835	727	2.96	14,230	0	0	3,263	1,142
Aug.	965	2,874	440	3.24	11,881	0	0	1,794	0
Sep.	703	238	289	2.20	12,057	0	0	0	0
Oct.	724	246	188	1.62	12,347	0	0	0	0
Nov.	713	238	139	0.01	12,683	0	0	0	0
Dec.	742	246	74	3.14	13,105	0	0	0	0
TOTAL	8,638	11,662	4,113	19.65	–	0	0	5,830	2,620

NOTE - Acres irrigated 2006: Red Willow Canal - 0 acres; Bartley Canal 5,722 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT

HARRY STRUNK LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of CAMBRIDGE CANAL Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,033	61	120	0.13	28,685	0	0
Feb.	2,062	56	128	0.12	30,563	0	0
Mar.	2,874	61	224	1.19	33,152	0	0
Apr.	2,618	60	735	0.64	34,975	0	0
May	1,898	61	1,015	1.24	35,797	0	0
June	1,696	1,557	1,123	4.87	34,813	1,163	125
July	2,812	14,202	996	2.44	22,427	11,593	5,826
Aug.	2,552	7,851	531	3.83	16,597	6,854	3,109
Sep.	1,717	266	332	2.48	17,716	82	118
Oct.	2,017	61	245	1.98	19,427	0	0
Nov.	2,043	60	184	0.00	21,226	0	0
Dec.	2,687	61	101	3.96	23,751	0	0
TOTAL	27,009	24,357	5,734	22.88	--	19,692	9,1784

NOTE -- Acres irrigated 2006: Cambridge Canal 15,077 acres.

TABLE 2
SUMMARY OF 2006 OPERATIONS

KANASKA DIVISION
ALMENA UNIT
KEITH SEBELIUS LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To City Of Norton (AF)	ALMENA CANAL Diversions To Canal (AF)	ALMENA CANAL Delivered To Farms (AF)
Jan.	312	56	63	0.02	8,515	25	0	0
Feb.	226	44	71	0.18	8,626	16	0	0
Mar.	428	49	122	1.93	8,883	18	0	0
Apr.	567	65	441	2.11	8,944	35	0	0
May	452	85	497	2.97	8,814	54	0	0
June	637	75	631	5.52	8,745	45	0	0
July	218	103	654	1.49	8,206	73	0	0
Aug.	402	94	520	3.74	7,994	63	0	0
Sep.	146	76	312	2.18	7,752	46	0	0
Oct.	255	66	205	3.13	7,736	34	0	0
Nov.	132	58	130	0.27	7,680	28	0	0
Dec.	554	50	69	4.02	8 115	19	0	0
TOTAL	4,329	821	3,715	27.56	–	456	0	0

NOTE: Acres irrigated 2006: Almena Canal - 0 acres.

BOSTWICK DIVISION
FRANKLIN UNIT

HARLAN COUNTY LAKE
Data from Corps of Engineers

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	FRANKLIN CANAL Release To Canal (AF)	FRANKLIN CANAL Delivered To Farms (AF)	NAPONEE CANAL Release To Canal (AF)	NAPONEE CANAL Delivered To Farms (AF)
Jan.	2,569	0	589	0.03	130,091	0	0	0	0
Feb.	1,874	0	607	0.00	131,358	0	0	0	0
Mar.	5,445	0	825	1.60	135,978	0	0	0	0
Apr.	4,879	0	2,478	1.07	138,379	0	0	0	0
May	2,705	0	3,367	1.17	137,717	0	0	0	0
June	3,104	4,457	4,372	5.16	131,992	0	0	0	0
July	1,305	7,823	4,730	2.04	120,744	0	0	0	0
Aug.	1,732	0	4,226	3.48	118,250	0	0	0	0
Sep.	1,291	0	3,458	2.07	116,083	0	0	0	0
Oct.	1,533	0	2,469	2.40	115,147	0	0	0	0
Nov.	1,002	0	1,722	0.39	114,427	0	0	0	0
Dec.	2,638	0	766	1.21	116299	0	0	0	0
TOTAL	30,077	12,280	29,609	20.62	–	0	0	0	Ir

NOTE: Acres irrigated 2006: Franklin Canal - 0 acres; Naponee Canal - 0 acres.

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

Month	FRANKLIN PUMP CANAL Diverted To Canal (AF)	FRANKLIN PUMP CANAL Delivered To Farms (AF)	SUPERIOR CANAL Diverted To Canal (AF)	SUPERIOR CANAL Delivered To Farms (AF)	Total Diversion (AF)	NEBRASKA USE Total (AF)	NEBRASKA USE Delivered To Farms (AF)	COURTLAND CANAL - ABOVE LOVEWELL KANSAS USE Diversion To Canal (AF)	COURTLAND CANAL - ABOVE LOVEWELL KANSAS USE Delivered To Farms (AF)
Jan.	0	0	0	0	0	0	0	0	0
Feb.	0	0	0	0	0	0	0	0	0
Mar.	0	0	0	0	0	0	0	0	0
Apr.	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	75	15
June	0	0	0	0	0	0	0	2,389	274
July	0	0	0	0	0	0	0	6,514	2,765
Aug.	0	0	0	0	0	0	0	1,423	258
Sep.	0	0	0	0	0	0	0	194	41
Oct.	0	0	0	0	0	0	0	0	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	10,595	3,353

NOTE: Acres irrigated 2006: Franklin Pump Canal - 0 acres; Superior Canal - 0 acres.
Courtland Canal-Nebraska use - 0 acres.
Courtland Canal-Kansas use - 5,925 acres.

BOSTWICK DIVISION (Continued)
COURTLAND UNIT
LOVEWELL RESERVOIR

Month	Est. Flow from White Rock Creek (AF)	Inflow from Courtland 34.8 (AF)	Total Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	COURTLAND (Below) Release To Canal (AF)	COURTLAND (Below) Delivered To Farms (AF)
Jan.	750	2,473	3,223	12	167	0.02	28,880	0	0
Feb.	523	1,968	2,491	11	197	0.00	31,163	0	0
Mar.	1,575	2,862	4,437	12	368	1.69	35,220	0	0
Apr.	905	3,509	4,414	12	1,049	1.96	38,573	0	0
May	2,646	1,004	3,650	463	1,411	2.46	40,349	492	0
June	0	478	478	4,423	1,833	2.37	34,571	4,796	1,601
July	1,110	1,863	2,973	13,641	1,408	3.53	22,495	13,730	7,310
Aug.	851	91	942	9,426	821	3.11	13,190	8,833	5,699
Sep.	1,170	399	1,569	18	501	4.26	14,240	0	0
Oct.	520	873	1,393	18	330	1.46	15,285	0	0
Nov.	215	1,611	1,826	18	274	0.05	16,819	0	0
Dec.	977	1 964	2 941	12	143	2.96	19 605	0	0
TOTAL	11,244	19,093	30,337	28,066	8,502	23.87	–	27,851	14,610

NOTE: Acres irrigated 2006: Courtland Canal below Lovewell 22,655 acres.

TABLE 2
SUMMARY OF 2006 OPERATIONS

SOLOMON DIVISION
KIRVVIN UNIT

	KIRVVIN RESERVOIR					KIRWIN CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	365	0	112	0.05	19,505	0	0
Feb.	232	0	137	0.00	19,600	0	0
Mar.	815	0	224	1.61	20,191	0	0
Apr.	813	0	635	0.98	20,369	0	0
May	1,050	0	822	3.61	20,597	0	0
June	607	0	1,061	3.15	20,143	0	0
July	238	0	1,081	2.00	19,300	0	0
Aug.	1,070	0	786	7.50	19,584	0	0
Sep.	144	0	569	1.99	19,159	0	0
Oct.	124	0	327	1.67	18,956	0	0
Nov.	136	0	245	0.55	18,847	0	0
Dec.	675	0	128	2.85	19 394	0	0
TOTAL	6,269	0	6,127	25.96	--	0	0

NOTE: Acres irrigated 2006: Kirwin Canal - 0 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

	WEBSTER RESERVOIR					OSBORNE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	10	0	103	0.02	10,234	0	0
Feb.	18	0	112	0.00	10,140	0	0
Mar.	277	0	197	1.74	10,220	0	0
Apr.	384	0	611	1.98	9,993	0	0
May	736	0	722	1.85	10,007	0	0
June	430	0	839	4.58	9,598	0	0
July	17	0	840	0.74	8,775	0	0
Aug.	600	0	587	a 58	8,788	0	0
Sep.	99	0	437	2.29	8,450	0	0
Oct.	75	0	200	2.07	8,325	0	0
Nov	49	0	196	0.51	8,178	0	0
Dec.	492	0	108	3.97	8 562	0	0
TOTAL	3,187	0	4,952	26.33		0	0

NOTE: Acres irrigated 2006: Osborne Canal - 0 acres.

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT

	WACONDA LAKE					OUTFLOW TO RIVER				
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	City of Beloit Storage Release (AF)	City of Beloit Quality Bypass (AF)	Irrig.District Storage Release (AF)	Other Controlled Releases (AF)	Release To Mitchell Co. RWD No. 2 (AF)
Jan.	1,653	982	671	0.00	161,594	0	922	0	0	60
Feb.	833	890	1,736	0.00	159,801	0	833	0	0	57
Mar.	3,252	1,184	1,373	1.93	160,496	0	801	171	149	63
Apr.	3,322	1,255	4,145	2.26	158,418	0	728	339	119	69
May	4,721	1,710	5,552	3.59	155,877	0	509	746	387	68
June	3,079	2,635	6,548	2.95	149,773	10	221	1,640	686	78
July	2,055	6,744	6,790	1.38	138,294	0	0	6,192	452	99
Aug.	2,647	4,297	5,119	2.88	131,525	0	0	3,894	315	88
Sep.	1,902	1,467	3,284	2.44	128,676	125	380	547	349	66
Oct.	169	697	2,281	1.08	125,867	282	351	0	0	64
Nov.	205	636	1,690	0.08	123,746	204	369	0	0	63
Dec.	3,194	677	642	795	in 621	133	482	0		62a
TOTAL	27,032	23,174	39,831	21.54	--	754	5,596	13,529	2,457	837

NOTE: Acres irrigated 2006: Glen Elder District 6,693 acres.

SMOKY HILL DIVISION
ELLIS UNIT

	CEDAR BLUFF RESERVOIR							
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to City of Russell (AF)	Release To Fish Hatchery (AF)	Release to Kansas Water Office (AF)
Jan.	0	0	642	0.03	100,539	0	0	0
Feb.	0	0	865	0.00	99,674	0	0	0
Mar.	266	0	718	0.72	99,222	0	0	0
Apr.	663	0	2,098	0.92	97,787	0	0	0
May	884	0	2,693	1.09	95,978	0	0	0
June	1,426	1	3,202	3.52	94,201	0	1	0
July	905	468	3,361	1.85	91,277	0	0	468
Aug.	1,024	2,583	2,597	2.17	87,121	1683	0	900
Sep.	256	0	1,622	2.67	85,755	0	0	0
Oct.	232	0	1,107	1.61	84,880	0	0	0
Nov.	0	0	907	0.25	83,973	0	0	0
Dec.	1 762	0	378	4.60	85 357	0	0	0
TOTAL	7,418	3,052	20,190	19.43	–	1,683	1	1,368

TABLE 3

ACRES IRRIGATED IN 2006

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2006
Mirage Flats Irrigation District		
Mirage Flats Canal	11,662	11,092
Ainsworth Irrigation District		
Ainsworth Canal	35,000	34,452
Twin Loups Irrigation District		
Above Davis Creek	34,053	34,040
Below Davis Creek	20,851	20,861
Total Twin Loups Irrigation District	54,904	54,901
Frenchman Valley Irrigation District		
Culbertson Canal	9,292	0
H & RW Irrigation District		
Culbertson Extension Canal	11,915	0
Frenchman-Cambridge Irrigation District		
Meeker-Driftwood Canal	16,855	0
Red Willow Canal	4,797	0
Bartley Canal	6,353	5,722
Cambridge Canal	17,664	15,077
Total Frenchman-Cambridge Irrigation District	45,669	20,799
Almena Irrigation District		
Almena Canal	5,764	0
Bostwick Irrigation District in Nebraska		
Franklin Canal	10,920	0
Naponee Canal	1,650	0
Franklin Pump Canal	2,090	0
Superior Canal	5,848	0
Courtland Canal (Nebraska)	1,946	0
Total Bostwick Irrigation Dist. in Nebraska	22,454	0
Kansas-Bostwick Irrigation District		
Courtland Canal above Lovewell	13,378	5,925
Courtland Canal below Lovewell	29,122	22,655
Total Kansas-Bostwick Irrigation District	42,500	28,580
Kirwin Irrigation District		
Kirwin Canal	11,465	0
Webster Irrigation District		
Osborne Canal	8,537	0
Glen Elder Irrigation District	10,370	6,693
TOTAL PROJECT USES	269,532	156,517
Non-Project Uses		
Hale Ditch	700	0
TOTAL PROJECT AND NON-PROJECT	270,232	156,517

TABLE 5

FLOOD DAMAGES PREVENTED BY NEBRASKA-KANSAS PROJECTS RESERVOIRS

'RESERVOIR	DURING FY 2006	PRIOR TO 2006	ACCUMULATED TOTAL
BONNY	$7,000	$2,780,000	$2,787,000
ENDERS	$0	$3,281,000	$3,281,000
SWANSON	$0	$19,157,000	$19,157,000
HUGH BUTLER	$0	$2,665,000	$2,665,000
HARRY STRUNK	$15,000	$5,022,000	$5,037,000
KEITH SEBELIUS	$0	$3,958,000	$3,958,000
HARLAN COUNTY	$7,000	$150,554,000	$150,561,000
LOVEWELL	$7,000	$146,608,000	$146,615,000
KIRWIN	$0	$86,870,000	$86,870,000
WEBSTER	$7,000	$110,313,000	$110,320,000
WACONDA	$0	$1,213,454,000	$1,213,454,000
CEDAR BLUFF	$0	$128,890,000	$128,890,000
TOTAL	$43,000	$1,873,552,000	$1,873,595,000

Estimates of damages prevented are received from the Army Corps of Engineer's Kansas City District Office. The Accumulated Totals date from 1951 through 2006. Cumulative totals are revised by the Corps of Engineers in some cases to reflect data not previously included in the reporting and may not match previous cumulative totals.

Construction Cost of storage dams was $208,954,130.
The reservoirs upstream of Harlan County Lake did not receive benefits for damages prevented from 1972 to 1993.

TABLE 6
WATER DIVERTED IN 2006
(Units - Acre-Feet)

Irrigation District and Canal	2006 Irrigation Operations From	To	10-Year Average Diversion (1996-2005)	2006 Diversion
Mirage Flats Irrigation District				
Mirage Flats Canal	7/5	9/12	11,952	10,423
Ainsworth Irrigation District				
Ainsworth Canal	5/14	9/15	74,842	83,497
Twin Loups Irrigation District				
Above Davis Creek	4/21	9/15	40,984	55,376
Below Davis Creek	5/8	9/16	38,225	39,878
Total Twin Loups Irrigation District			79,209	95,254
Frenchman Valley Irrigation District				
Culbertson Canal	Did not run.		8,664	0
H & RW Irrigation District				
Culbertson Extension Canal	Did not run.		6,740	0
Frenchman-Cambridge Irrigation District				
Meeker-Driftwood Canal	Did not run.		16,780	0
Red Willow Canal	Did not run.		4,478	0
Bartley Canal	4/15	8/20	5,100	5,830
Cambridge Canal	7/1	9/11	22,017	19,692
Total Frenchman-Cambridge Irrigation District			48,375	25,522
Almena Irrigation District				
Almena Canal	Did not run.		4,109	0
Bostwick Irrigation District in Nebraska				
Franklin Canal	Did not run.		23,136	0
Naponee Canal	Did not run.		2,104	0
Franklin Pump Canal	Did not run.		2,316	0
Superior Canal	Did not run.		11,573	0
Courtland Canal (Nebraska)	Did not run.		1,690	0
Total Bostwick Irrigation District in Nebraska			40,819	0
Kansas-Bostwick Irrigation District				
Courtland Canal above Lovewell	5/25	9/5	21,230	10,595
Courtland Canal below Lovewell	5/11	8/16	44,261	27,851
Total Kansas-Bostwick Irrigation District			65,491	38,446
Kirwin Irrigation District				
Kirwin Canal	Did not run.		18,150	0
Webster Irrigation District				
Osborne Canal	Did not run.		11,806	0
Glen Elder Irrigation District	3/8	9/9	5,950	13,529
TOTAL			376,107	266,671

TABLE 7
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2006

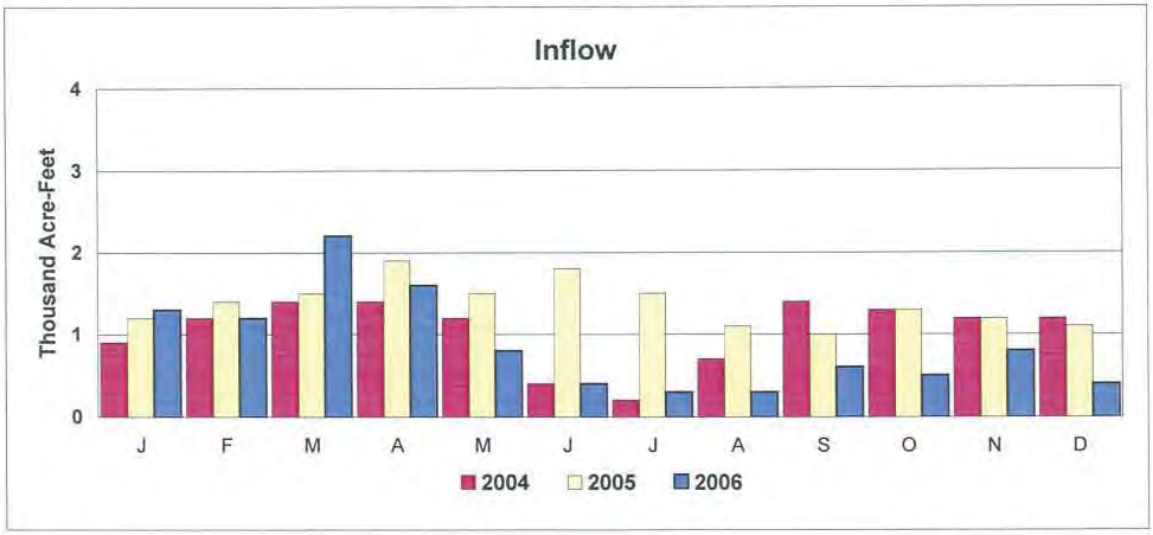
Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-05 AF	Storage 12-31-06 AF	Gain or Loss AF	Maximum Content AF	Storage Date	Minimum Content AF	Storage Date	Total Inflow AF
Box Butte	14.77	87	9,167	5,081	-4,086	15,094	MAY 17	3,676	SEP 11	10,391
Merritt	18.40	90	61,370	61,100	-270	67,222	JUN 16	28,625	AUG 27	176,810
Calamus	17.80	72	100,561	107,326	6,765	129,150	MAR 24	69,542	SEP 8	236,764
Davis Creek	28.50	122	9,196	10,712	1,516	27,492	JUN 26	8,572	APR 16	50,048
Bonny	16.41	95	12,265	9,935	-2,330	12,971	APR 12	9,752	DEC 14	6,350
Enders	20.08	106	11,566	11,074	-492	12,100	APR 7	10,643	SEP 21	4,284
Swanson	20.76	104	35,068	36,310	1,242	41,351	APR 18	35,119	JAN 1	12,047
Hugh Butler	19.65	100	20,242	13,105	-7,137	21,428	APR 18	11,831	AUG 19	8,638
Harry Strunk	22.88	111	26,833	23,751	-3,082	36,280	JUN 24	16,486	SEP 1	27,009
Keith Sebelius	27.56	113	8,322	8,115	-207	9,005	APR 14	7,656	OCT 8	4,329
Harlan County	20.62	91	128,111	116,299	-11,812	139,207	MAY 9	114,066	DEC 8	30,077
Lovewell	23.87	87	25,836	19,605	-6,231	40,931	MAY 11	12,967	AUG 16	30,337
Kirwin	25.96	111	19,252	19,394	142	20,597	MAY 31	18,816	DEC 5	6,269
Webster	26.33	112	10,327	8,562	-1,765	10,368	JAN 5	8,117	DEC 18	3,187
Waconda	21.54	84	161,594	125,621	-35,973	161,895	JAN 8	122,936	DEC 19	26,963
Cedar Bluff	19.43	92	101,181	85,357	-15,824	101,135	JAN 1	83,581	DEC 19	7,418

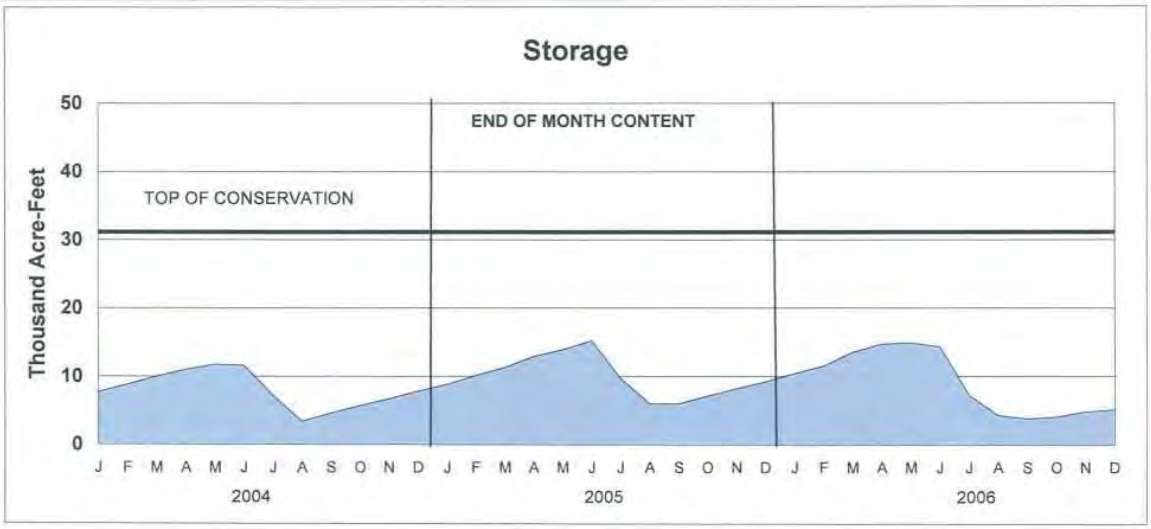
KS003117

EXHIBIT 1A

BOX BUTTE RESERVOIR

ACTUAL OPERATION





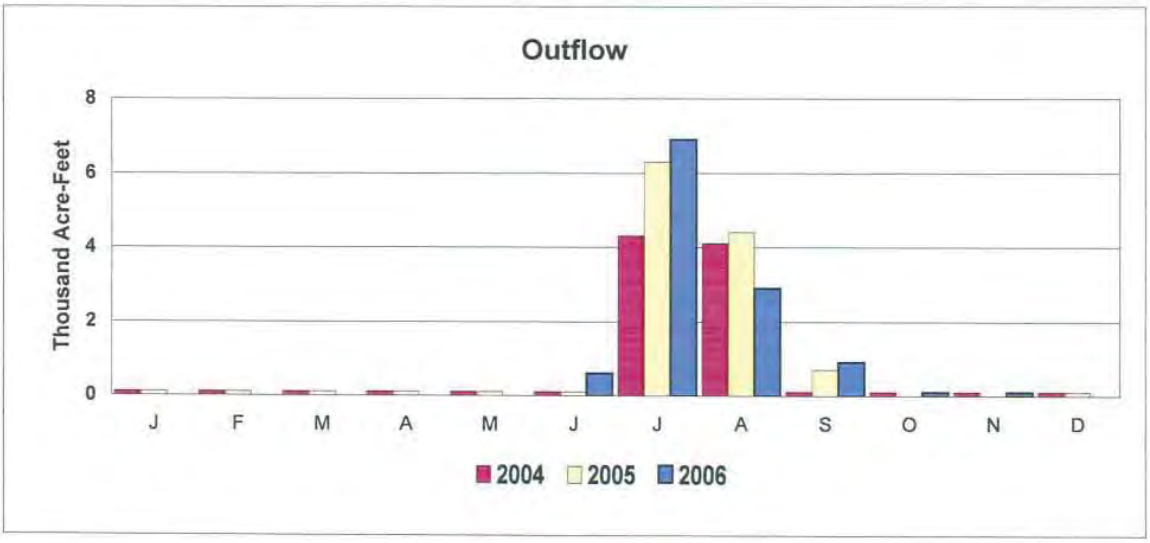
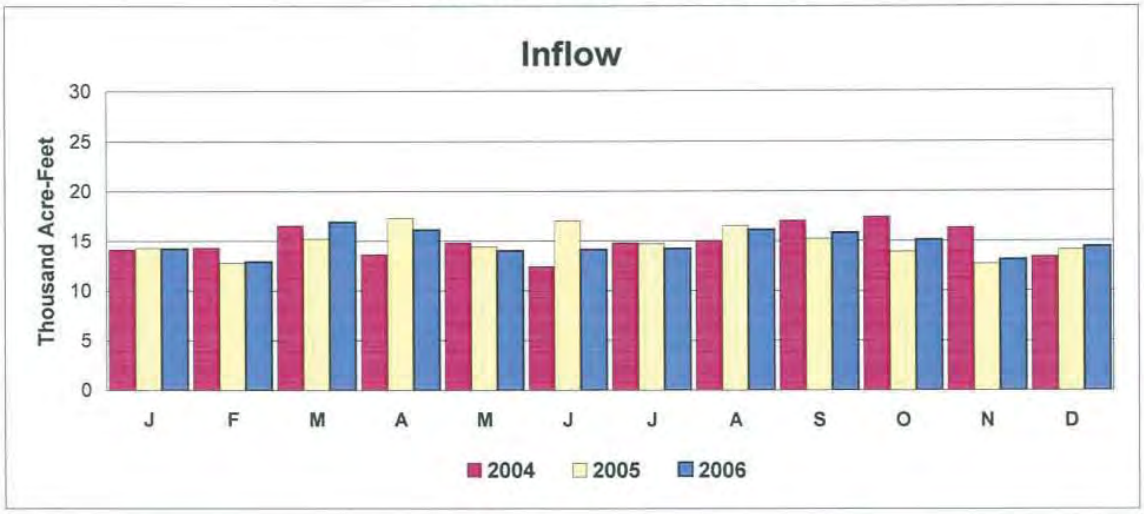
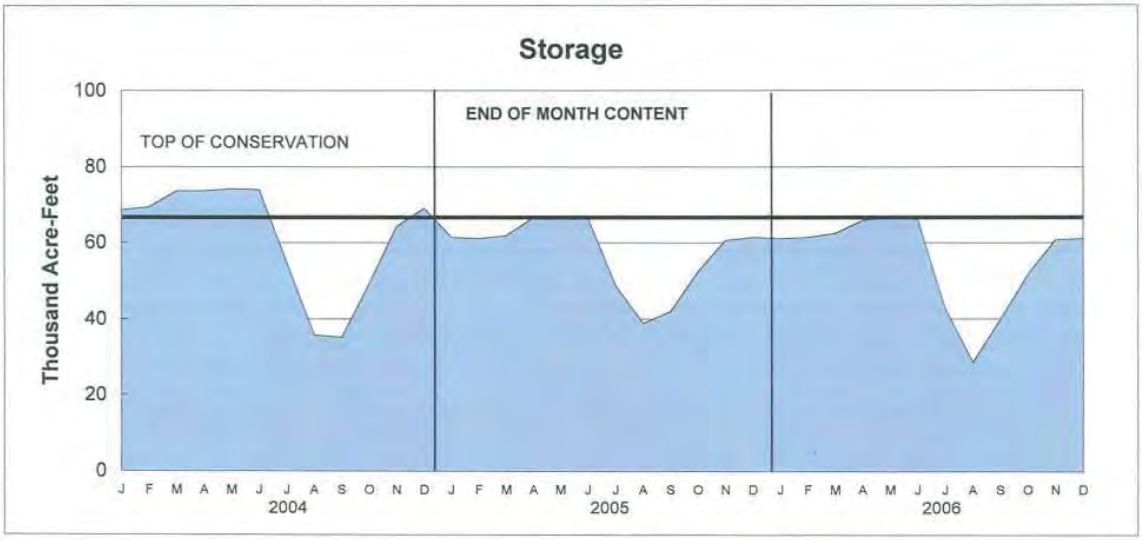


EXHIBIT 2A

MERRITT RESERVOIR

ACTUAL OPERATION





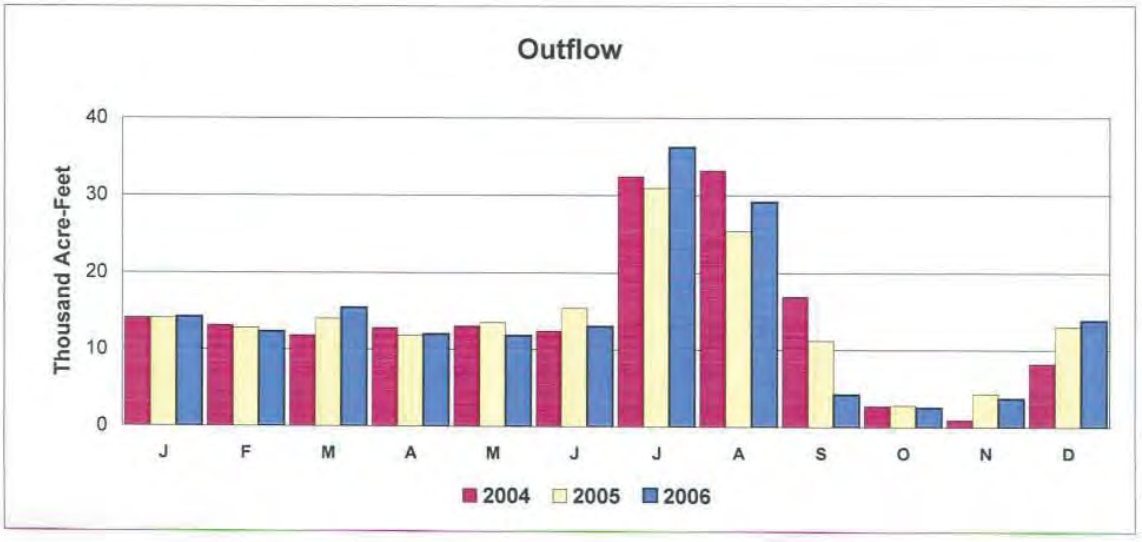
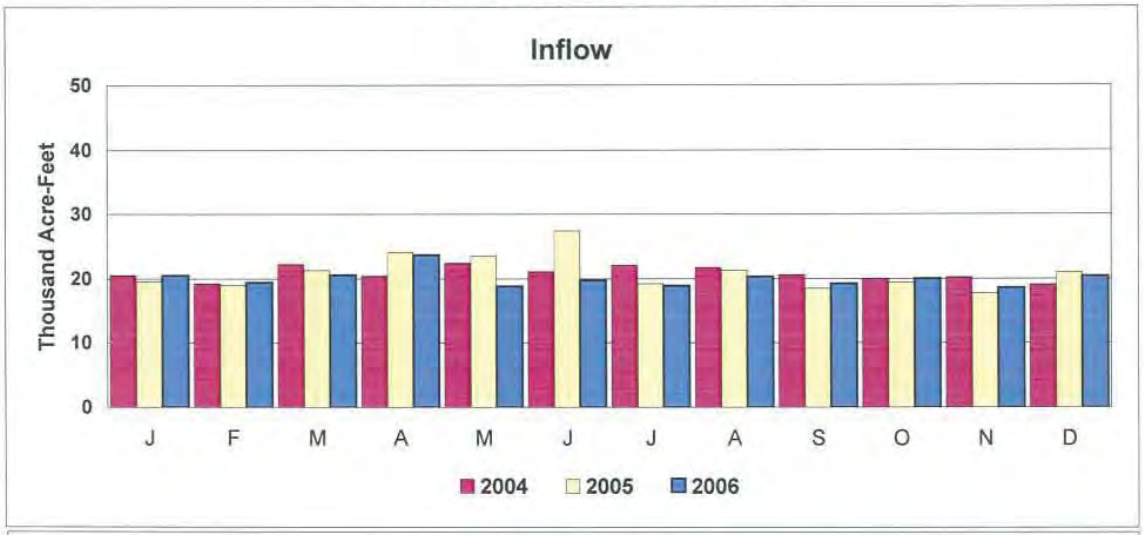
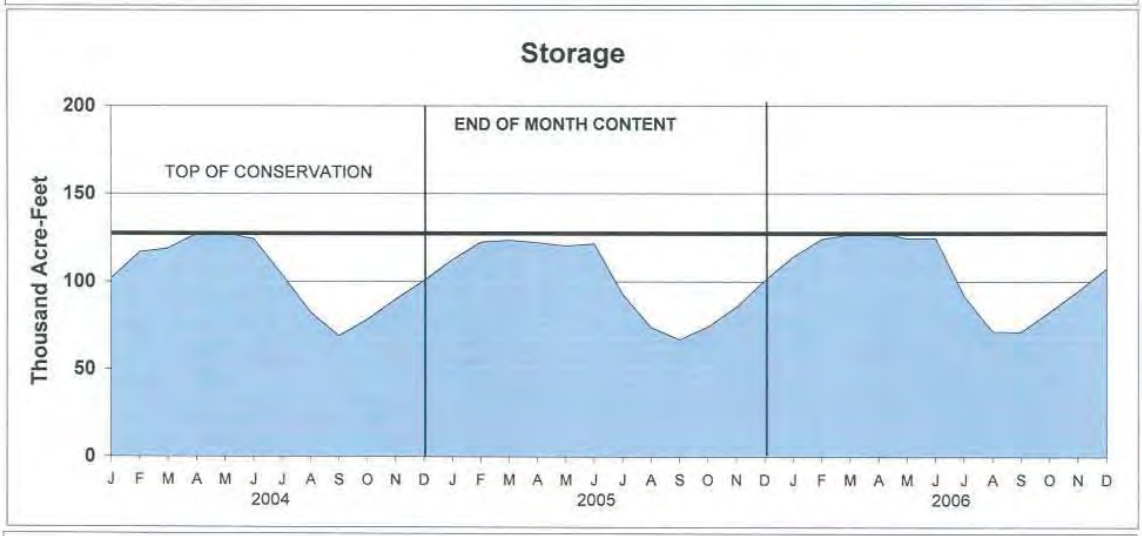


EXHIBIT 3A

CALAMUS RESERVOIR

ACTUAL OPERATION





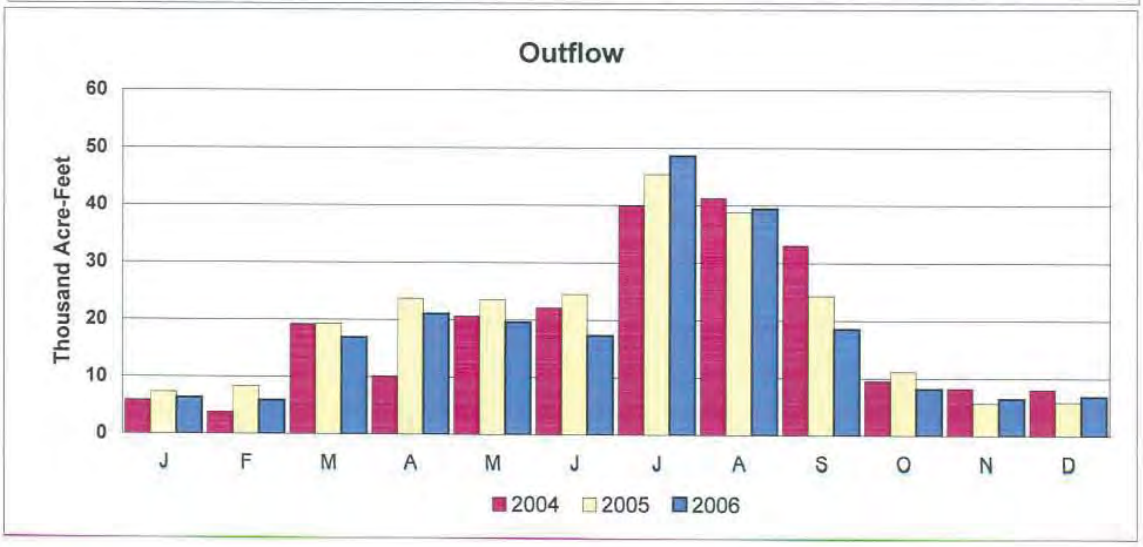
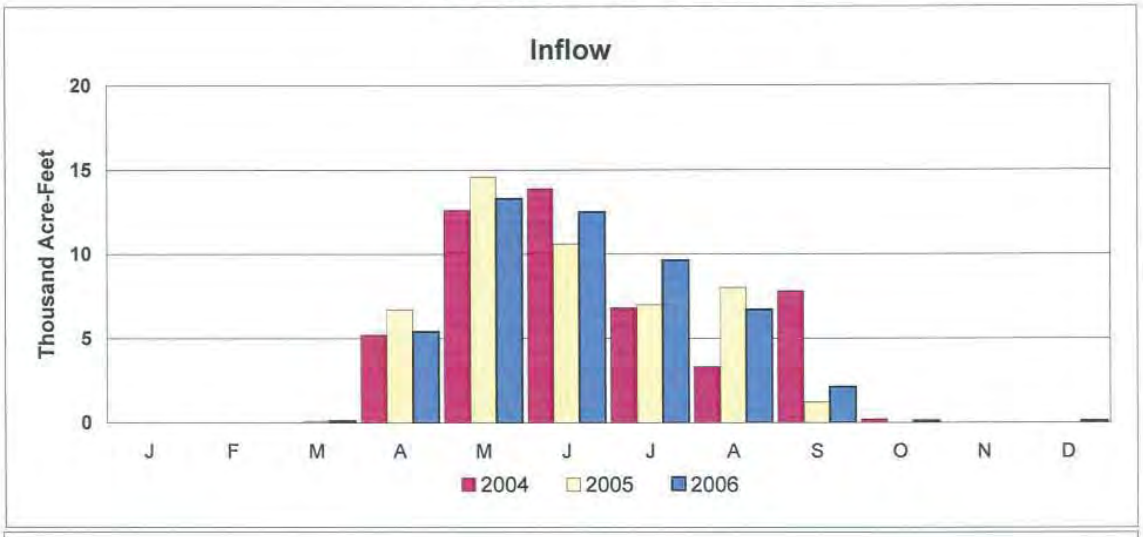
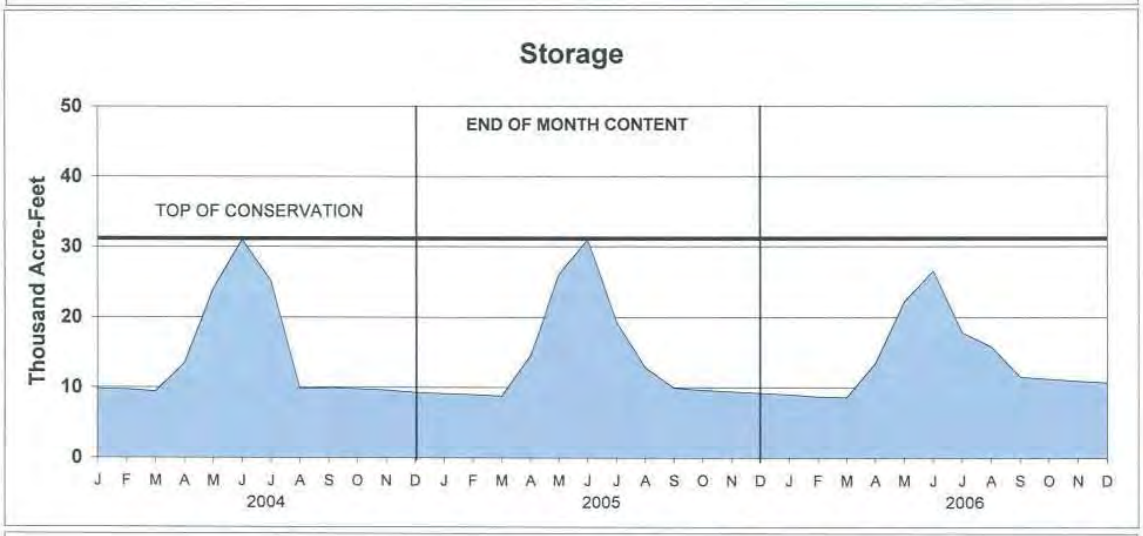


EXHIBIT 4A

DAVIS CREEK RESERVOIR

ACTUAL OPERATION





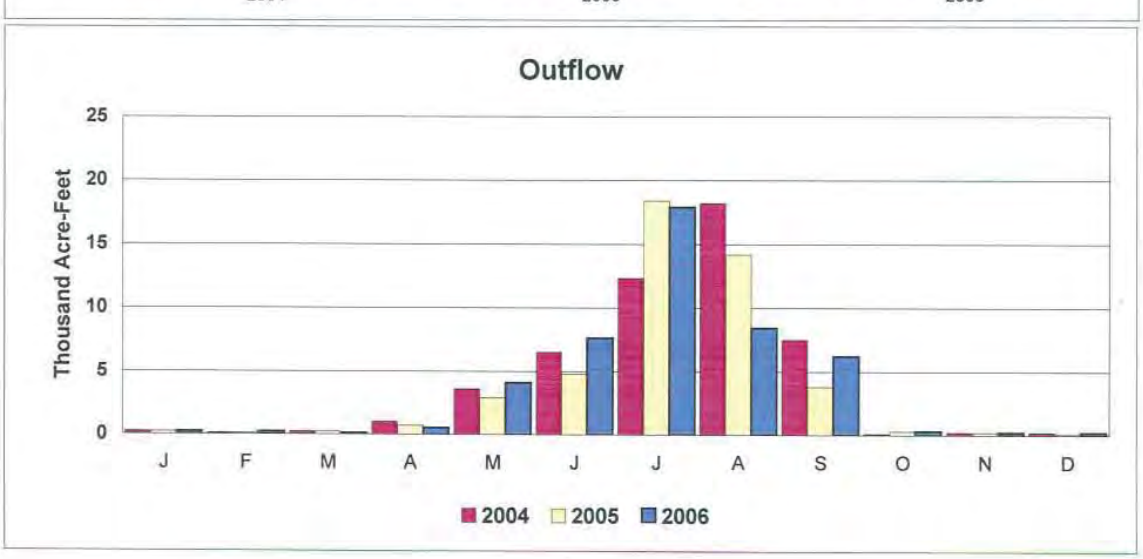
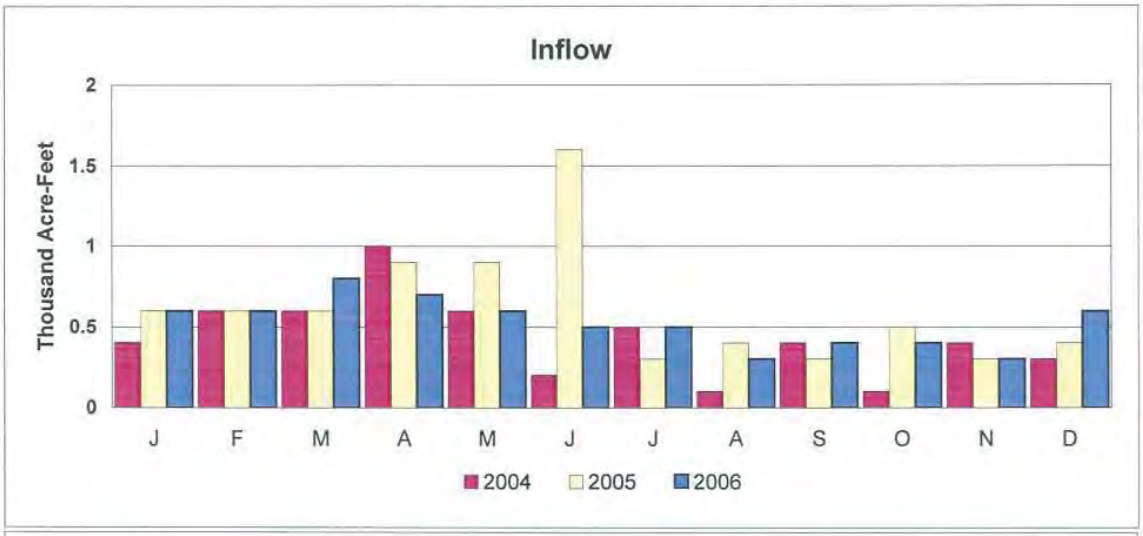
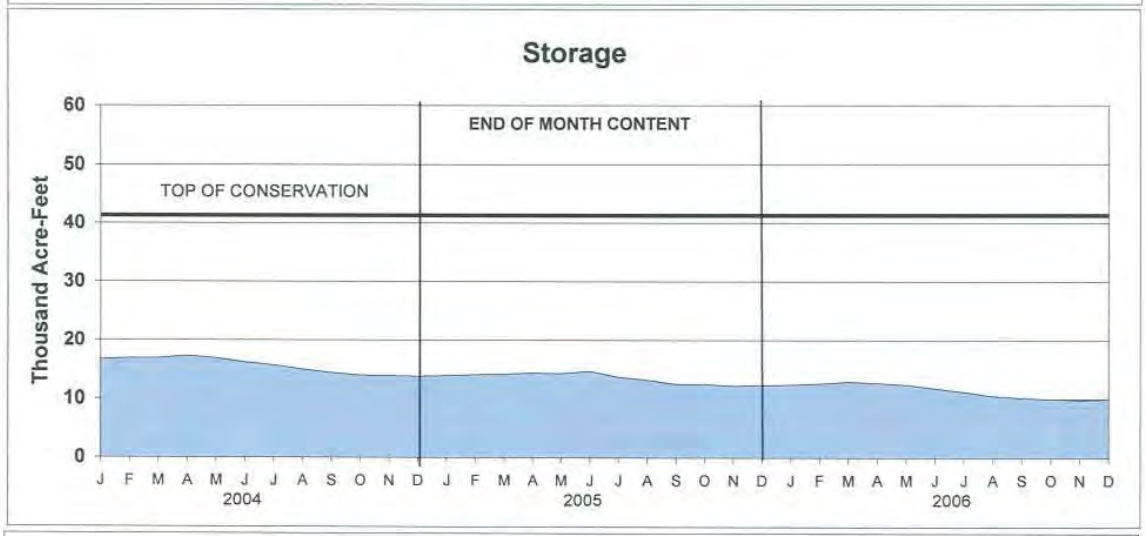


EXHIBIT 5A

BONNY RESERVOIR

ACTUAL OPERATION





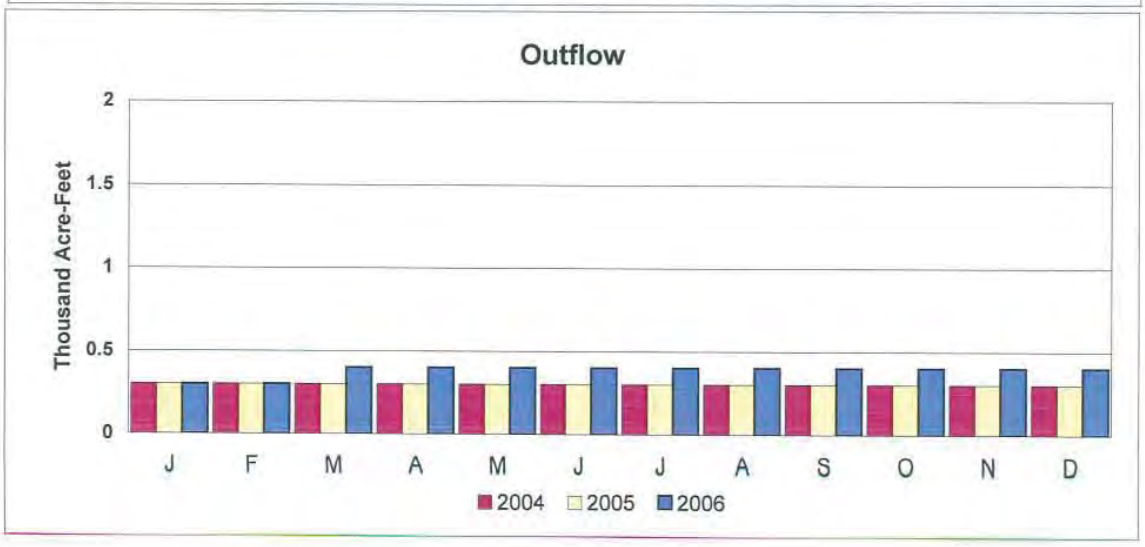
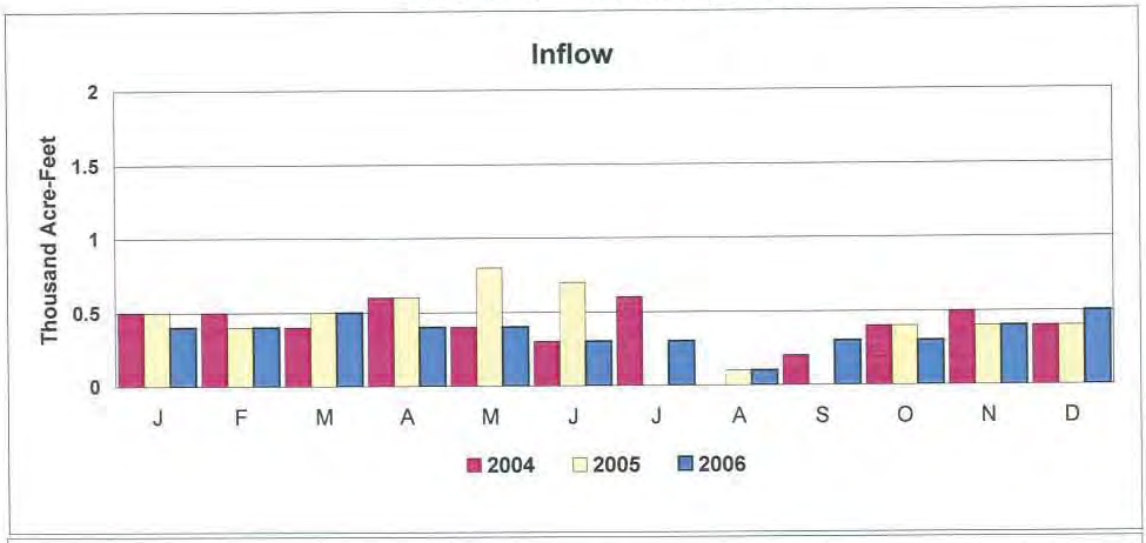
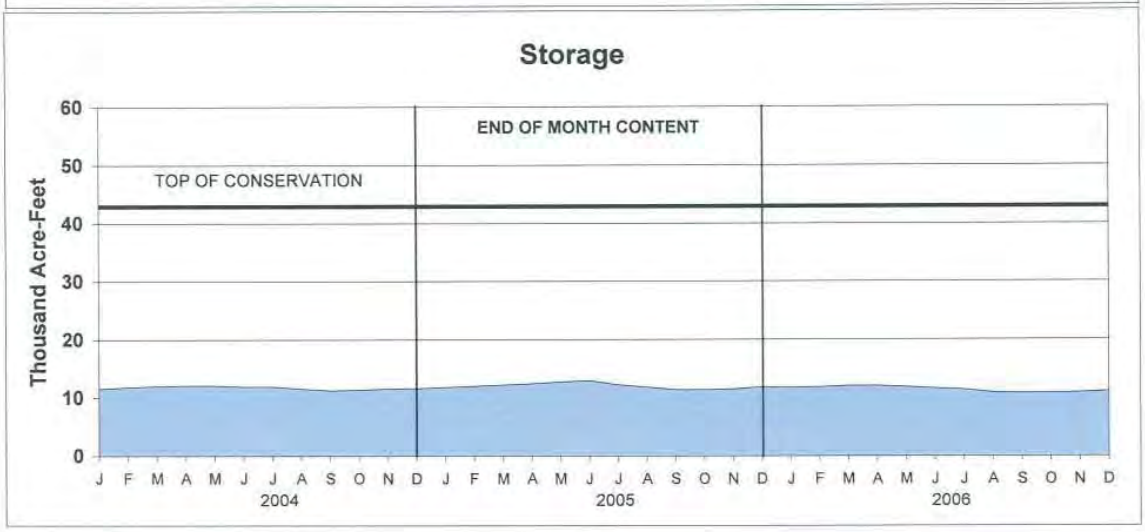


EXHIBIT 6A

ENDERS RESERVOIR

ACTUAL OPERATION





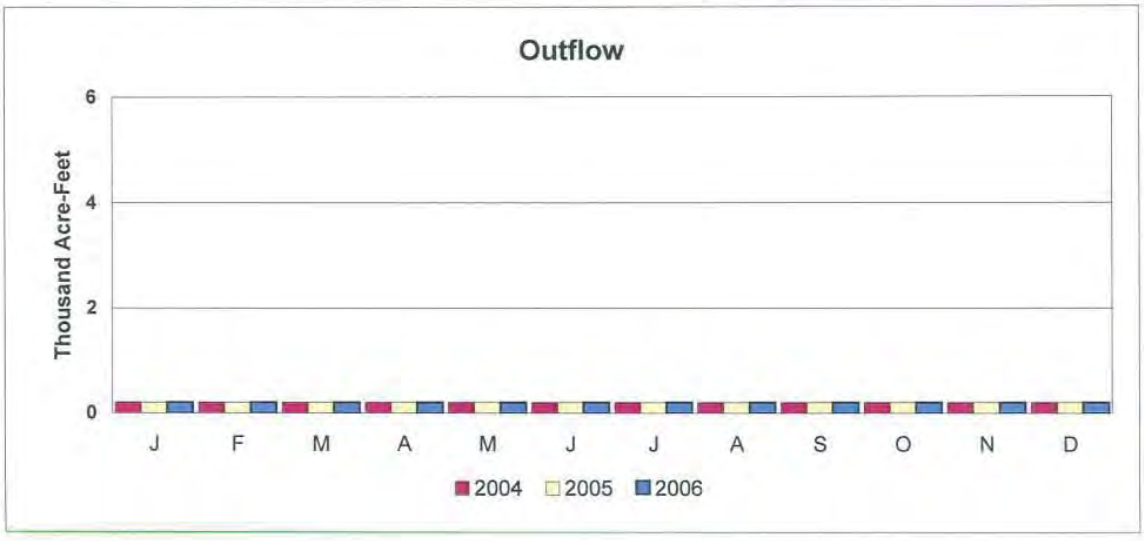
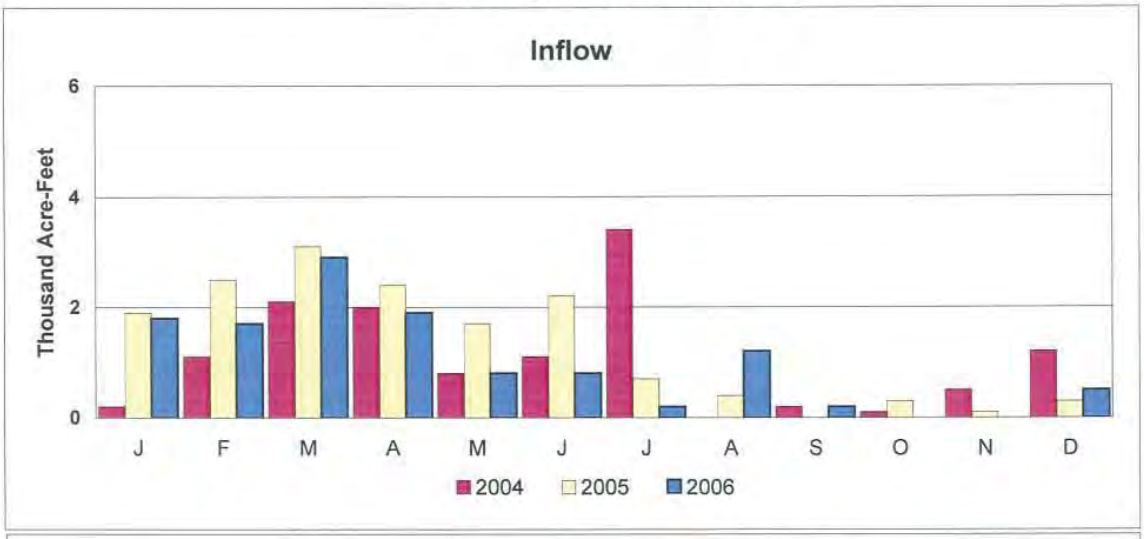
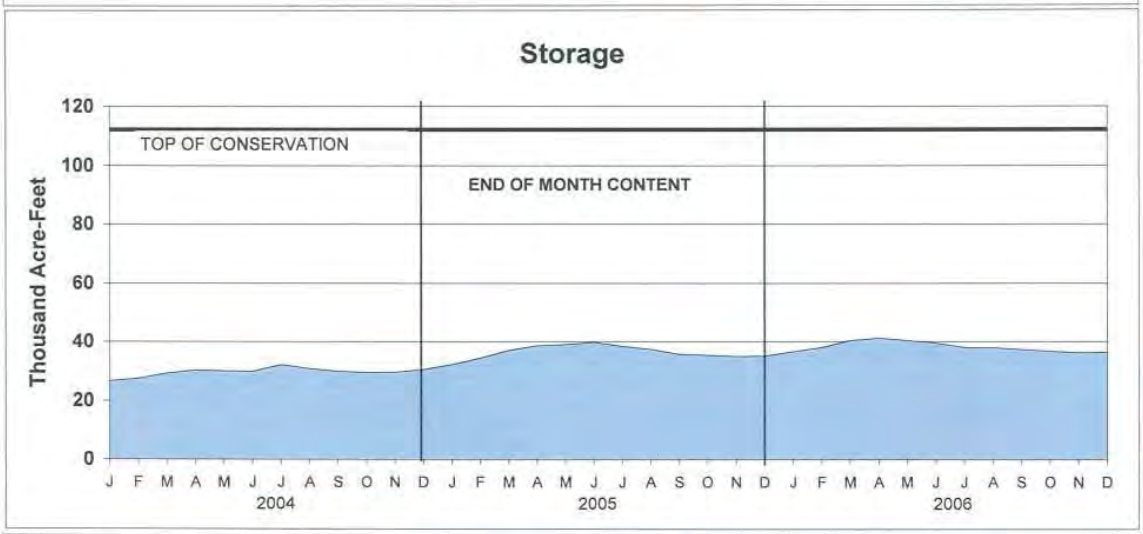


EXHIBIT 7A

SWANSON LAKE
ACTUAL OPERATION





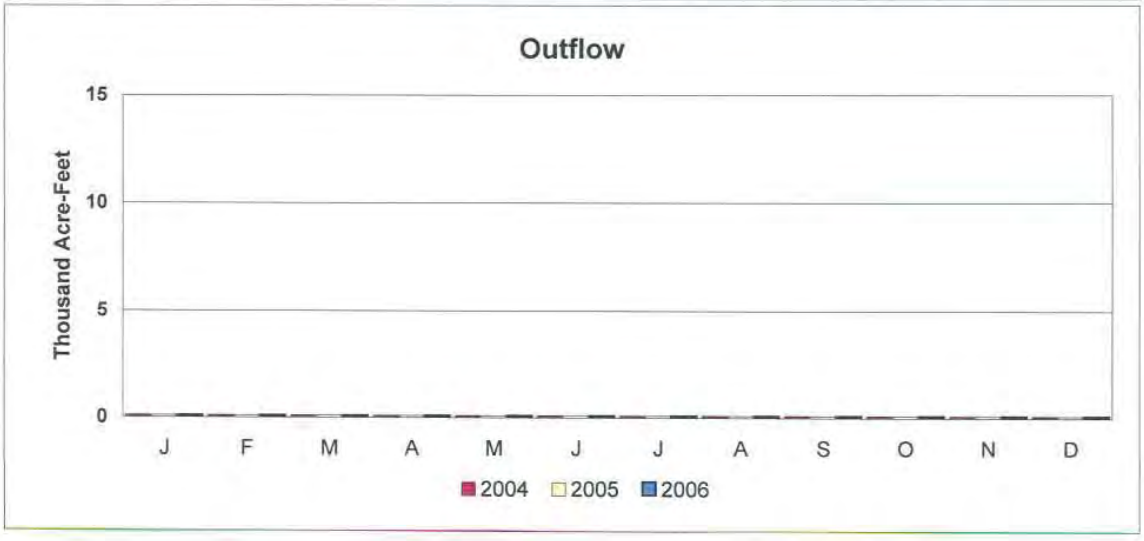
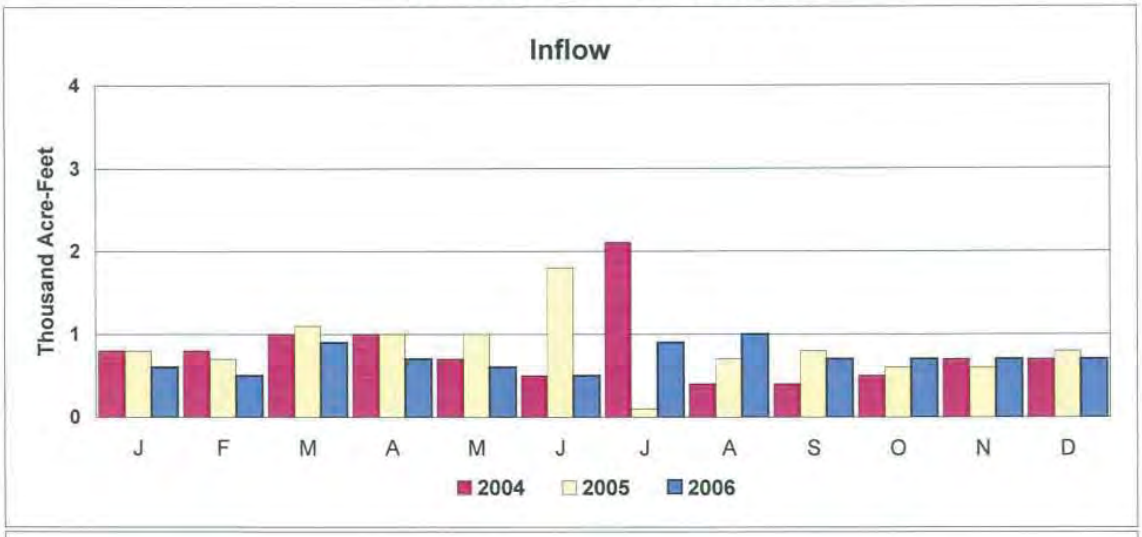
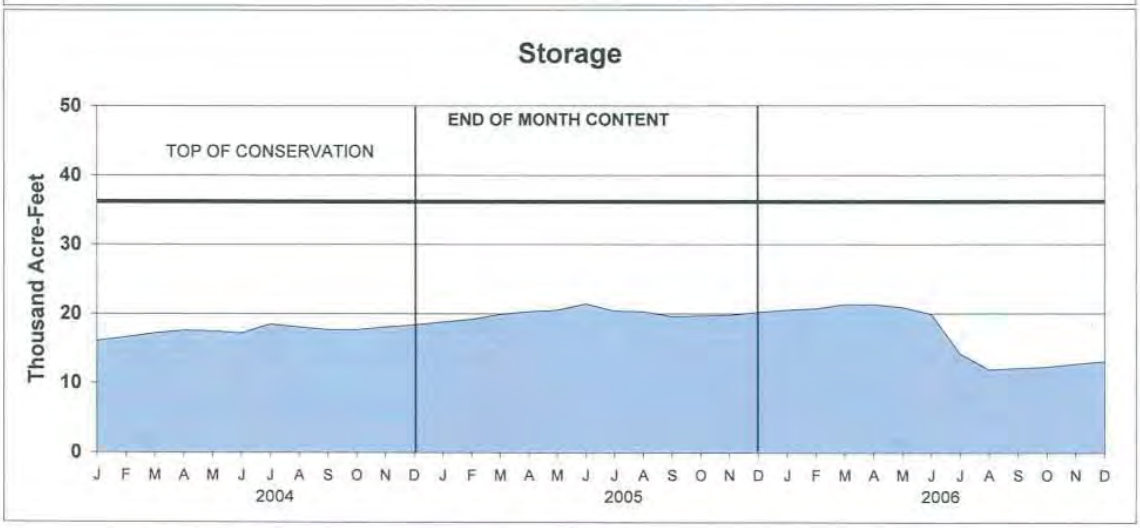


EXHIBIT 8A

HUGH BUTLER LAKE

ACTUAL OPERATION





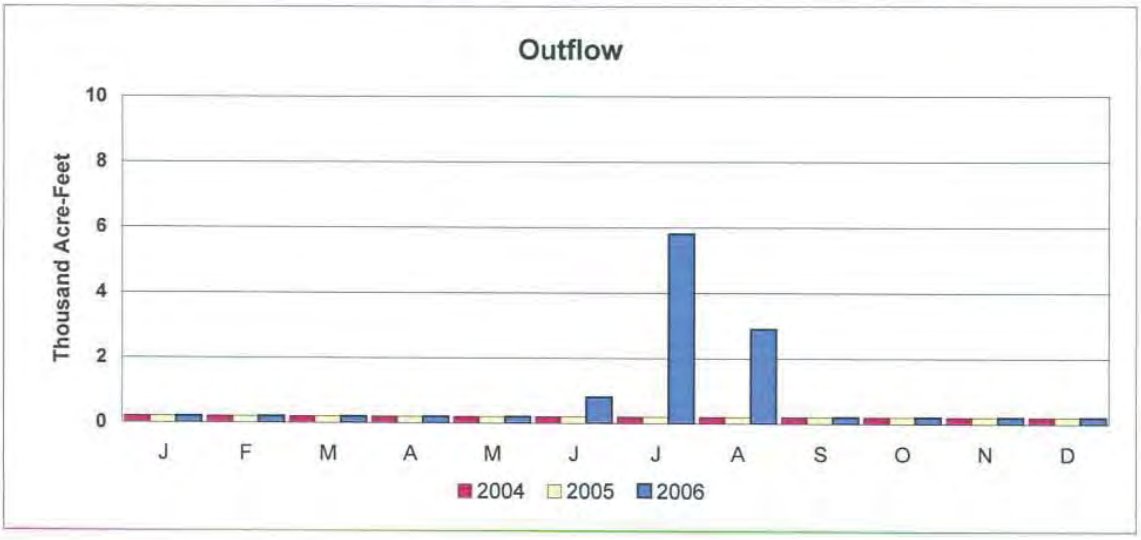
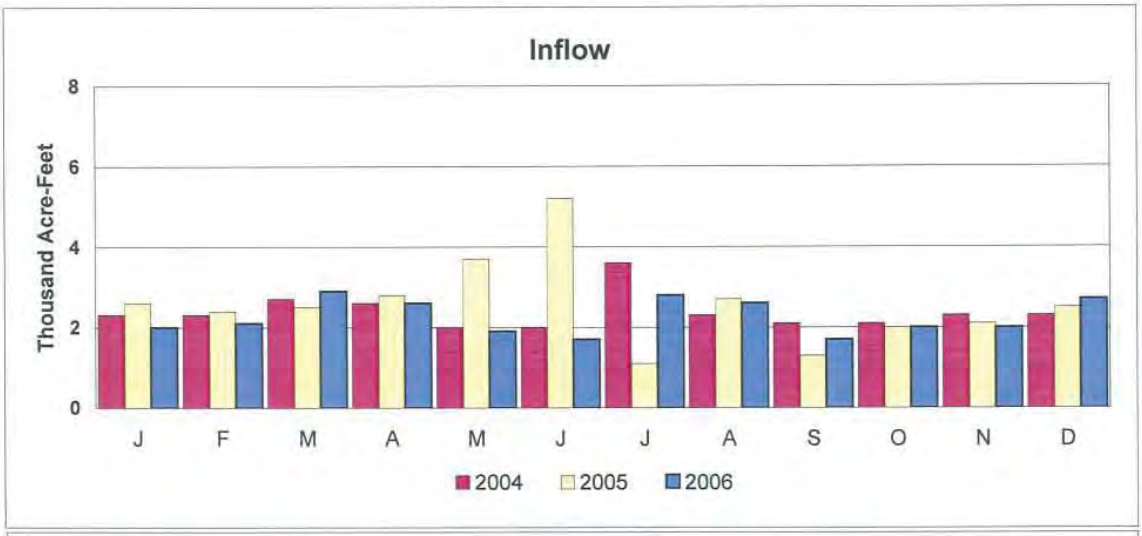
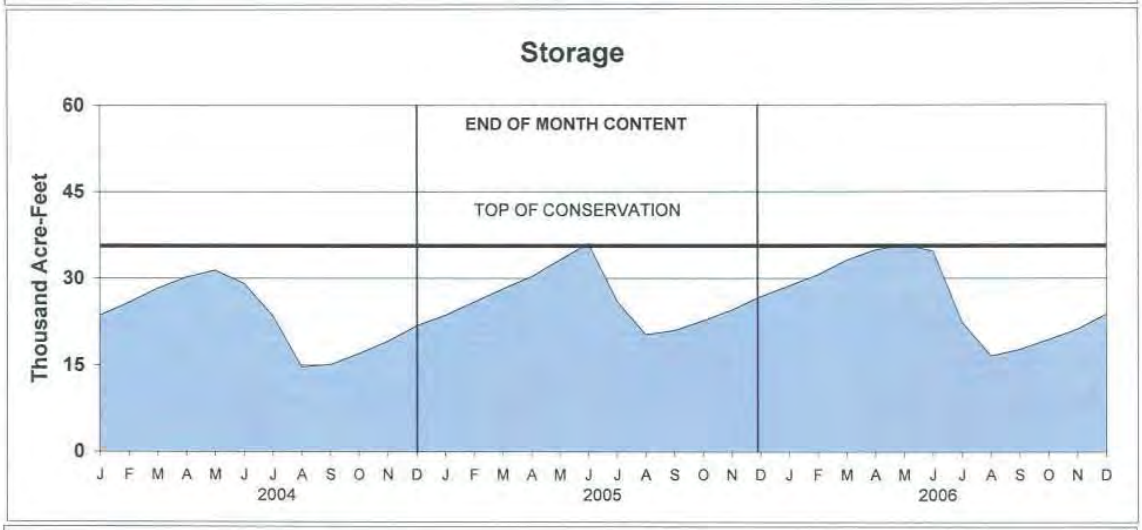


EXHIBIT 9A

HARRY STRUNK LAKE

ACTUAL OPERATION





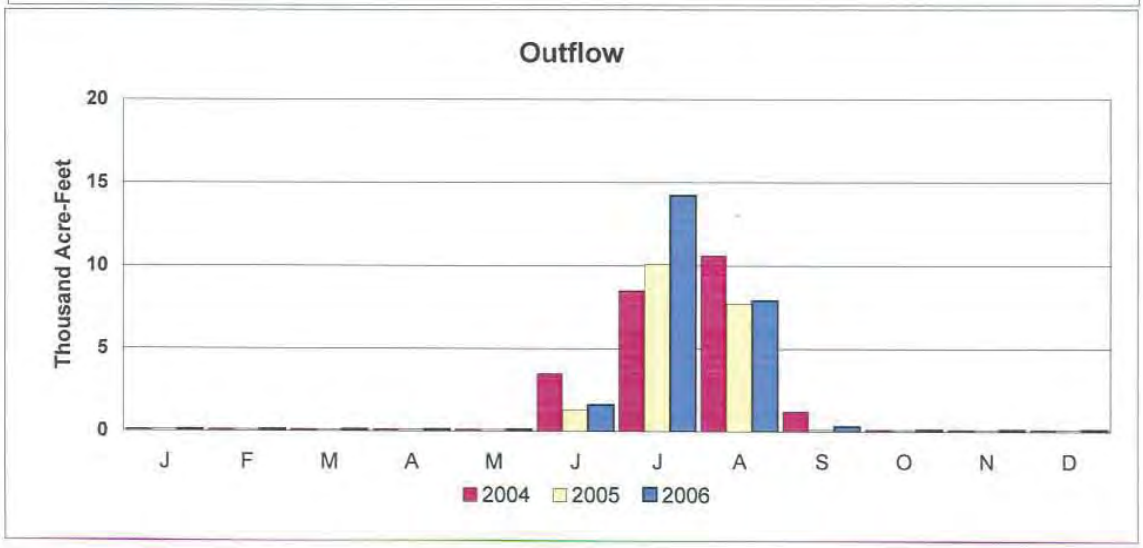
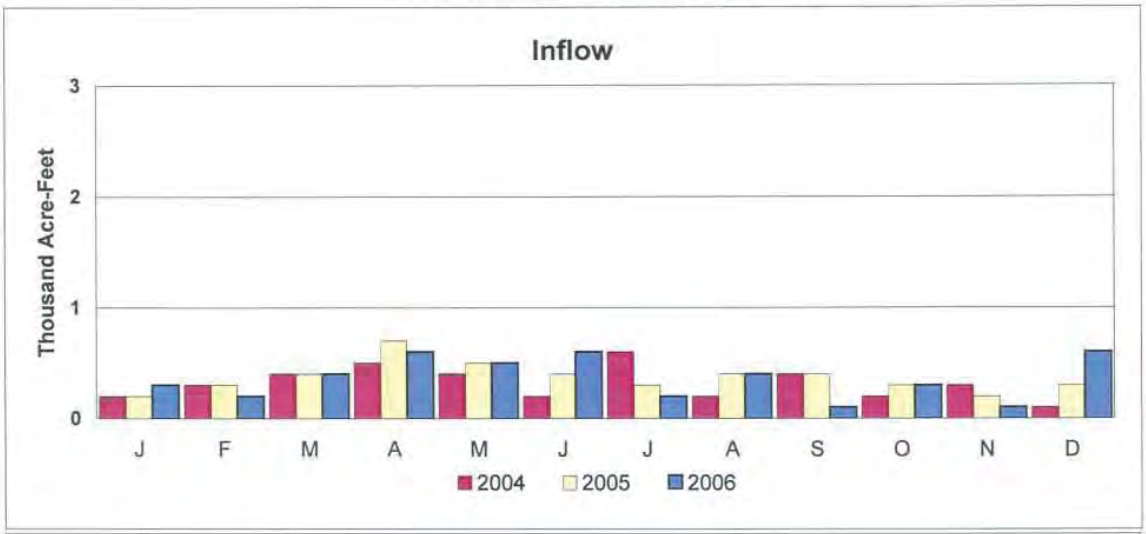
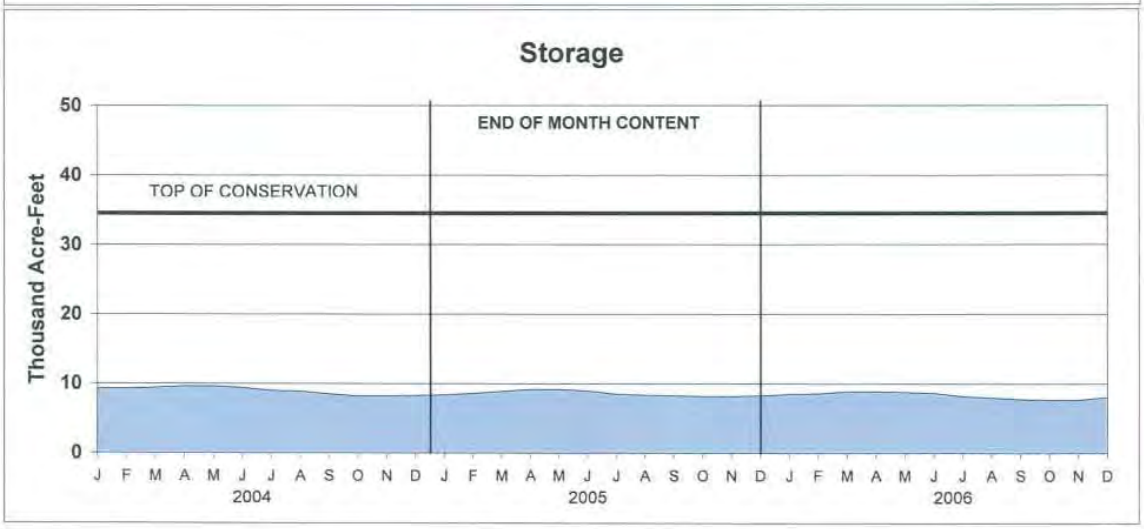


EXHIBIT 10A

KEITH SEBELIUS LAKE

ACTUAL OPERATION





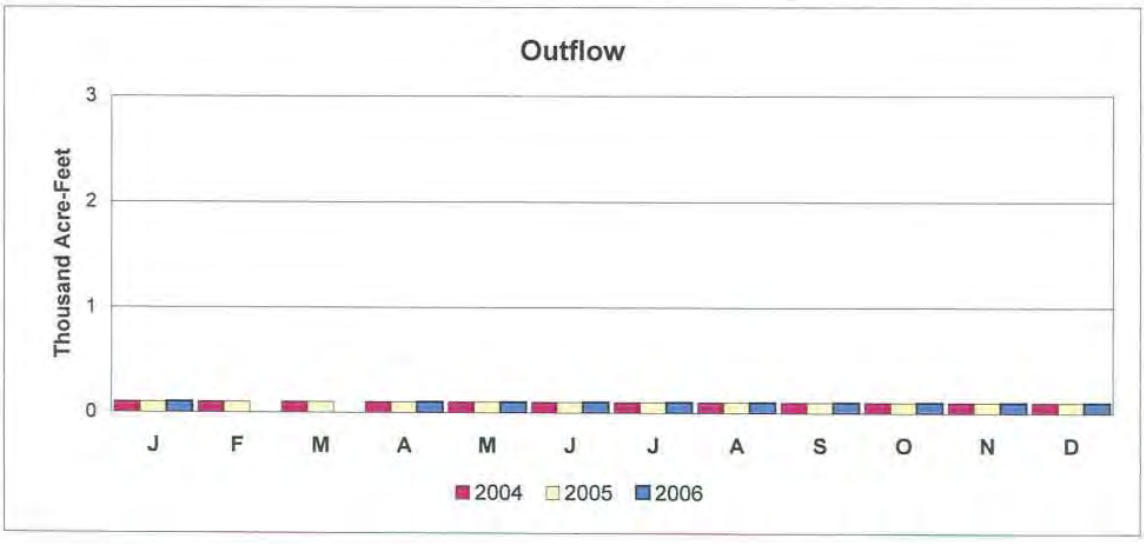
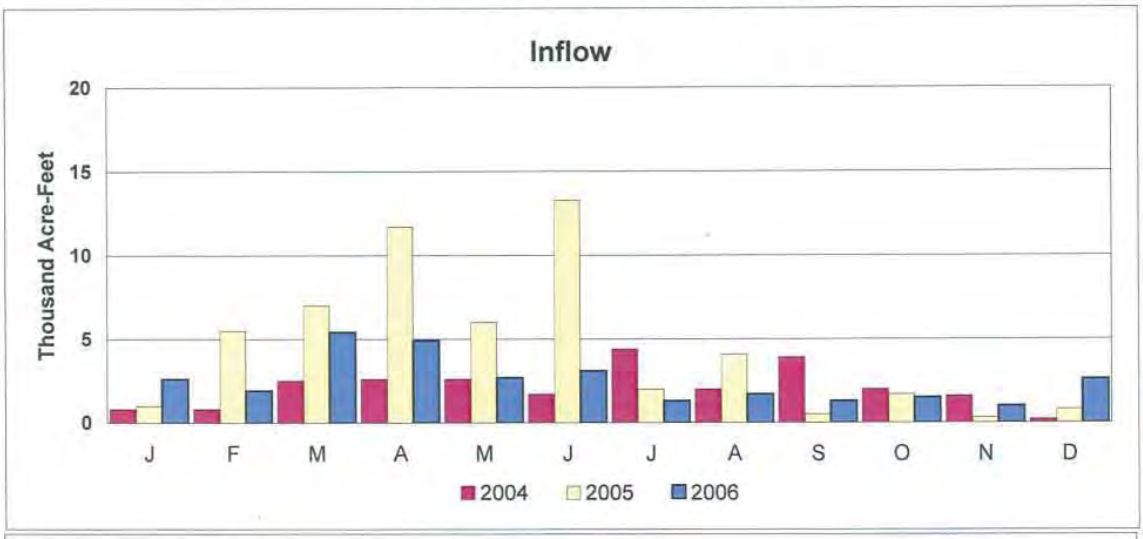
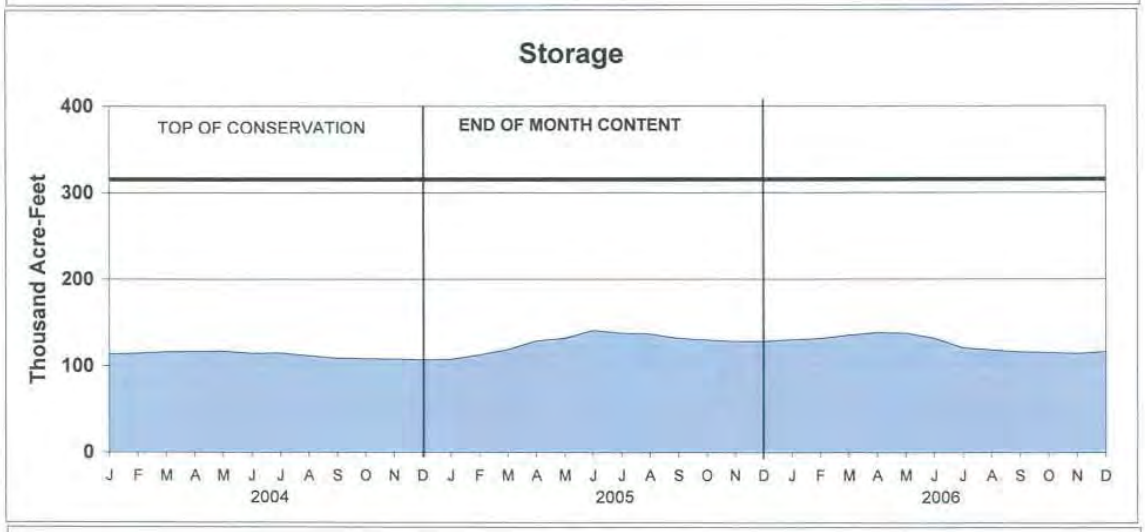


EXHIBIT 11A

HARLAN COUNTY LAKE

ACTUAL OPERATION





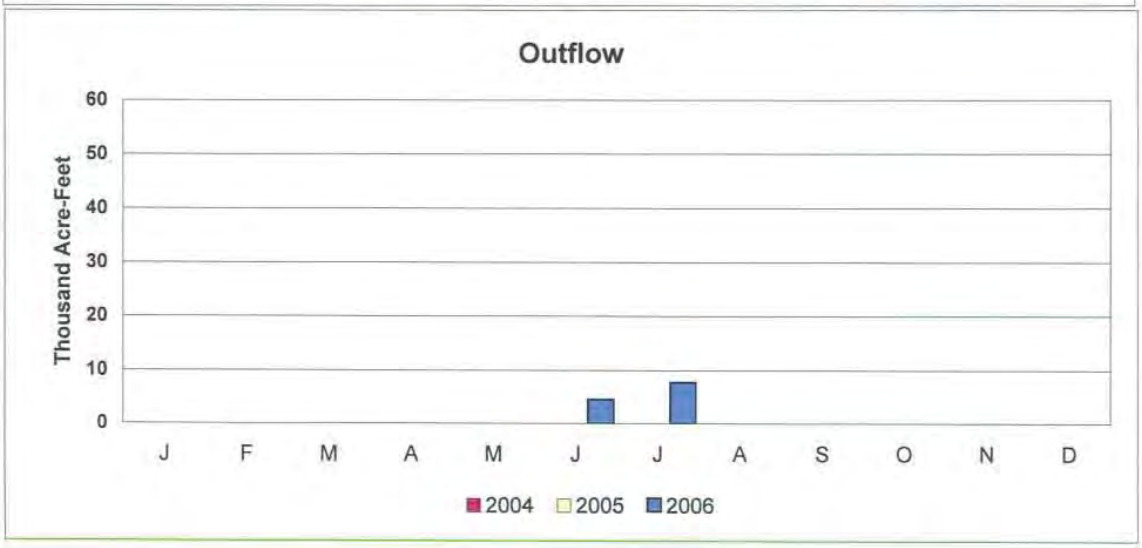
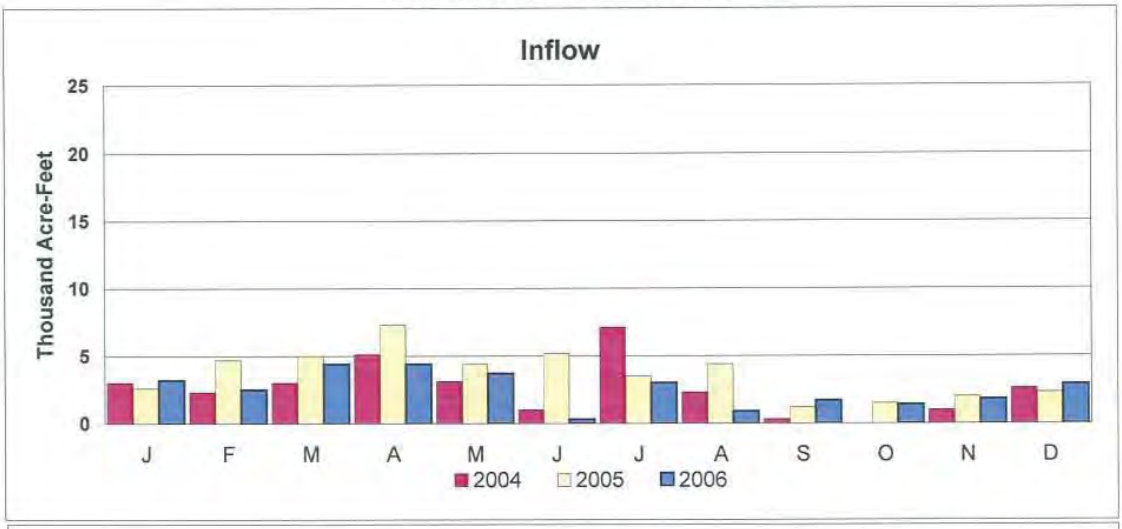
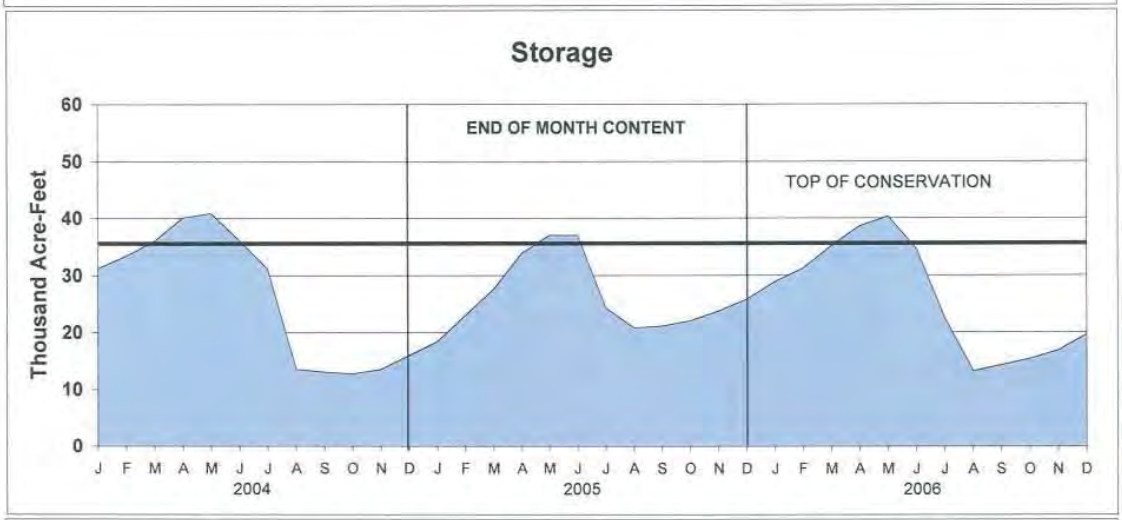


EXHIBIT 12A

LOVEWELL RESERVOIR

ACTUAL OPERATION





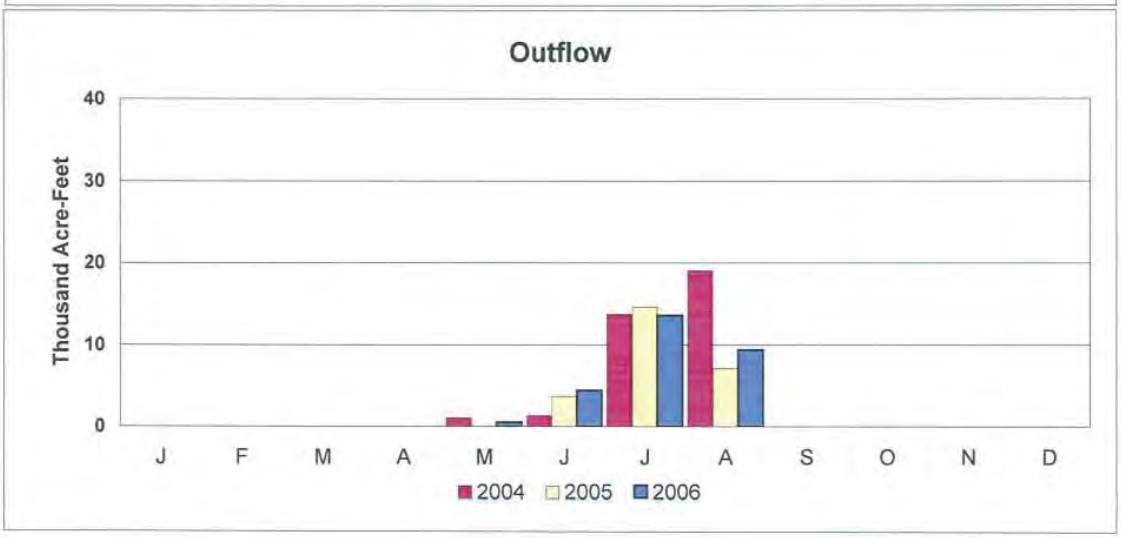
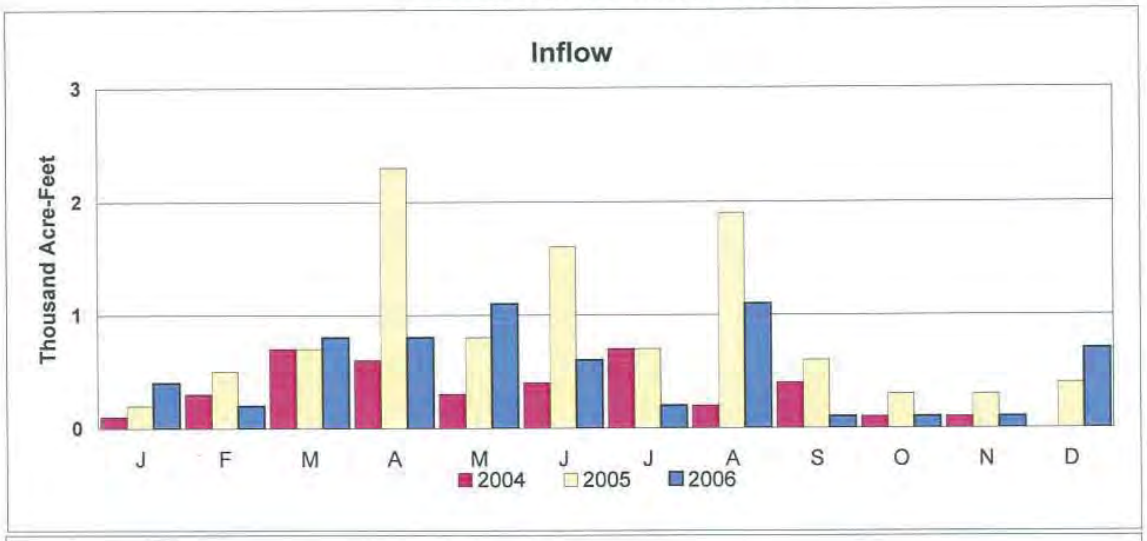
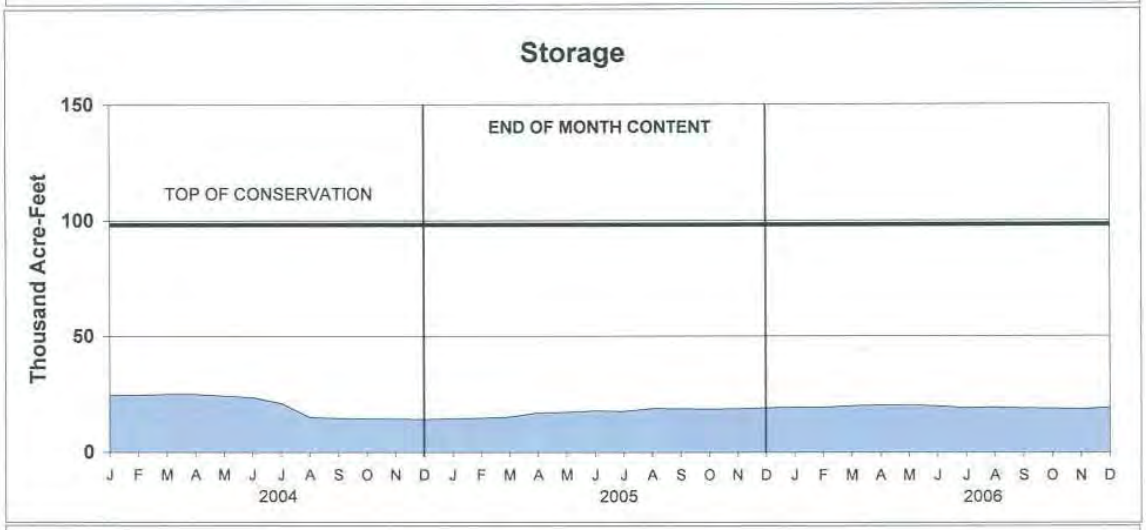


EXHIBIT 13A

KIRWIN RESERVOIR

ACTUAL OPERATION





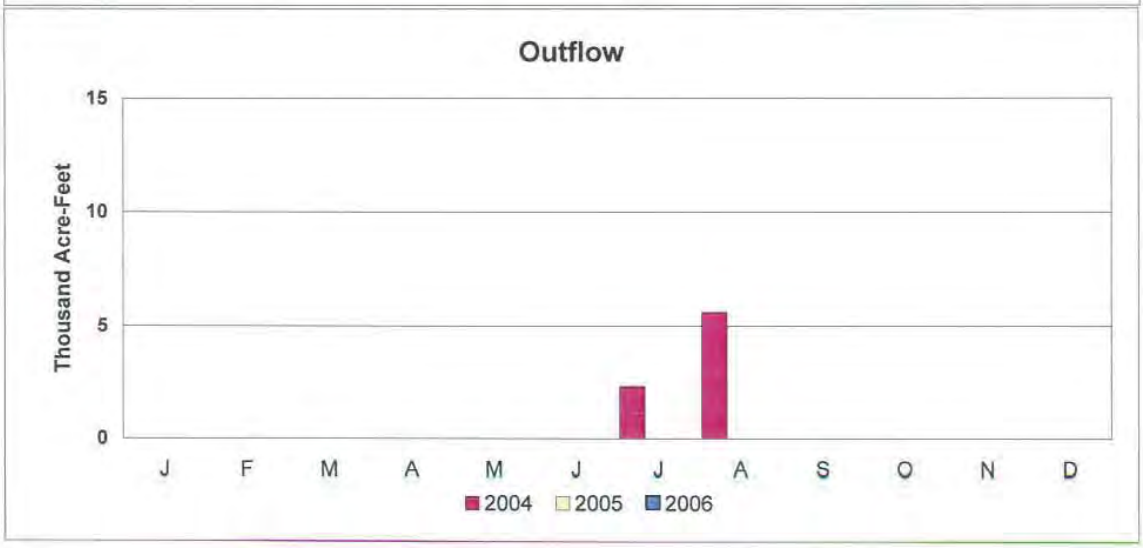
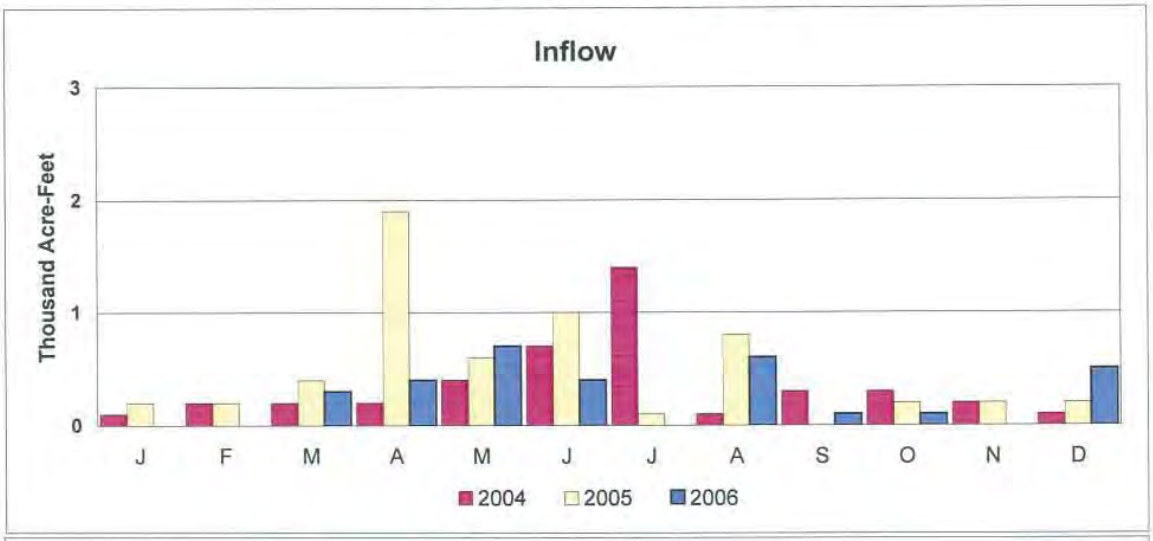
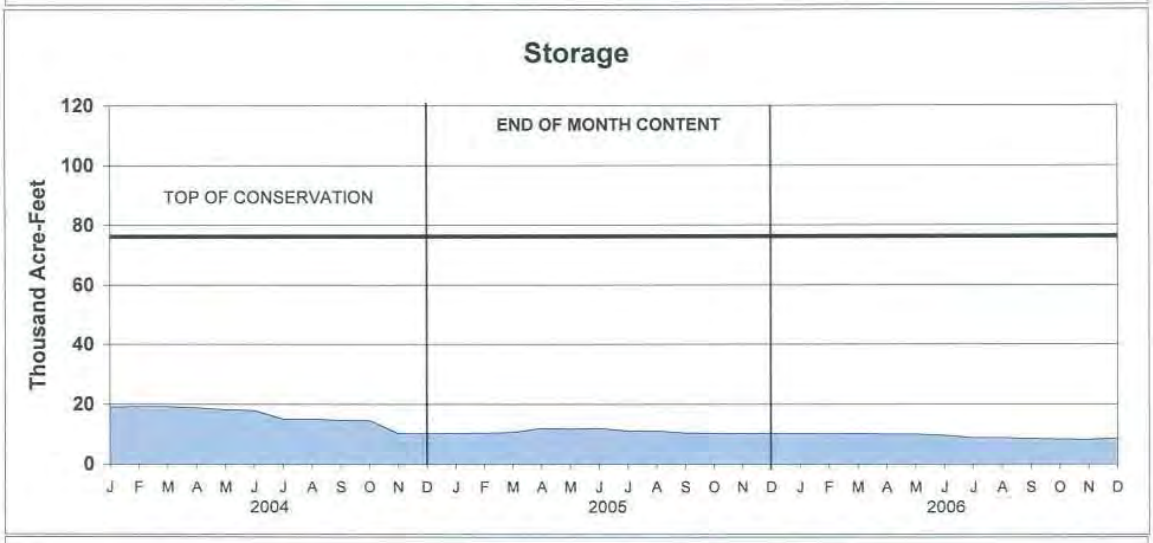


EXHIBIT 14A

WEBSTER RESERVOIR

ACTUAL OPERATION





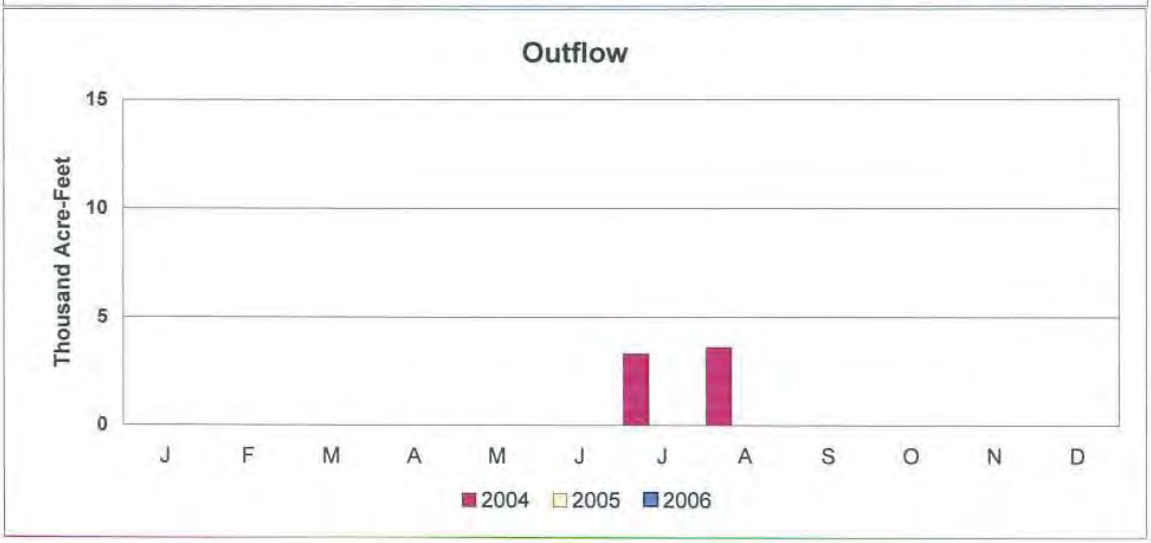
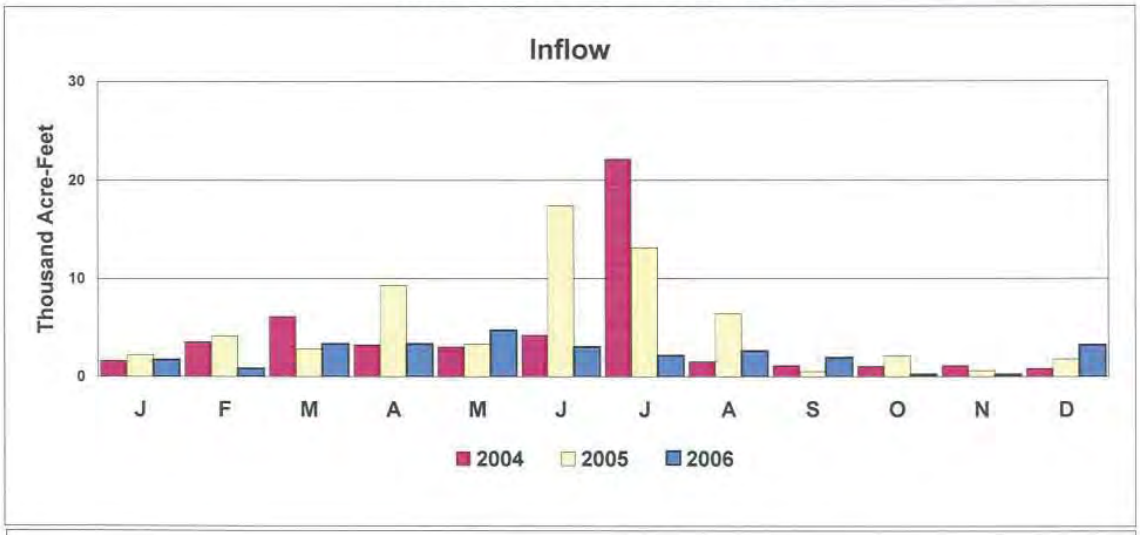
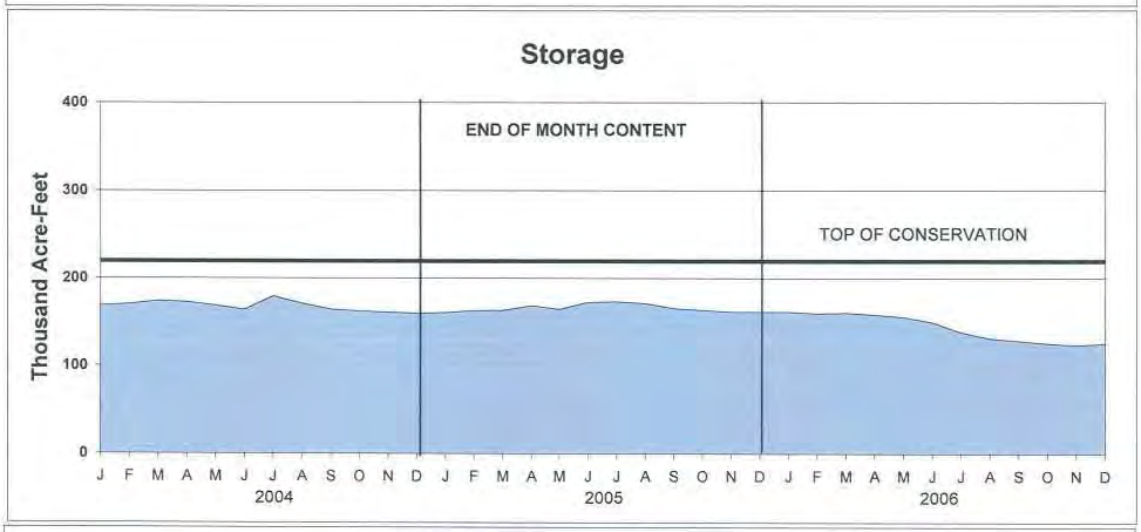


EXHIBIT 15A

WACONDA LAKE
ACTUAL OPERATION





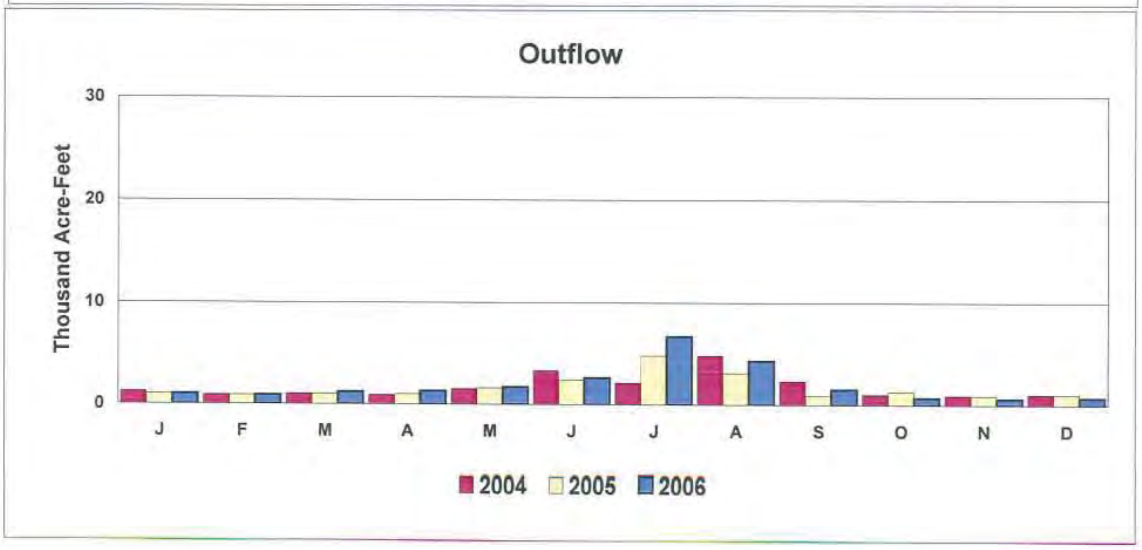
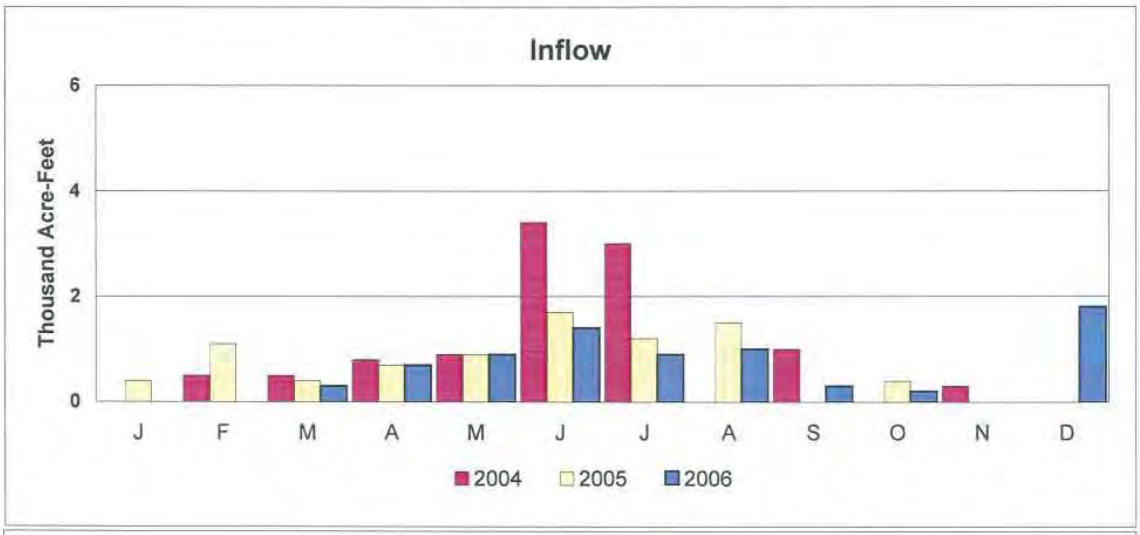
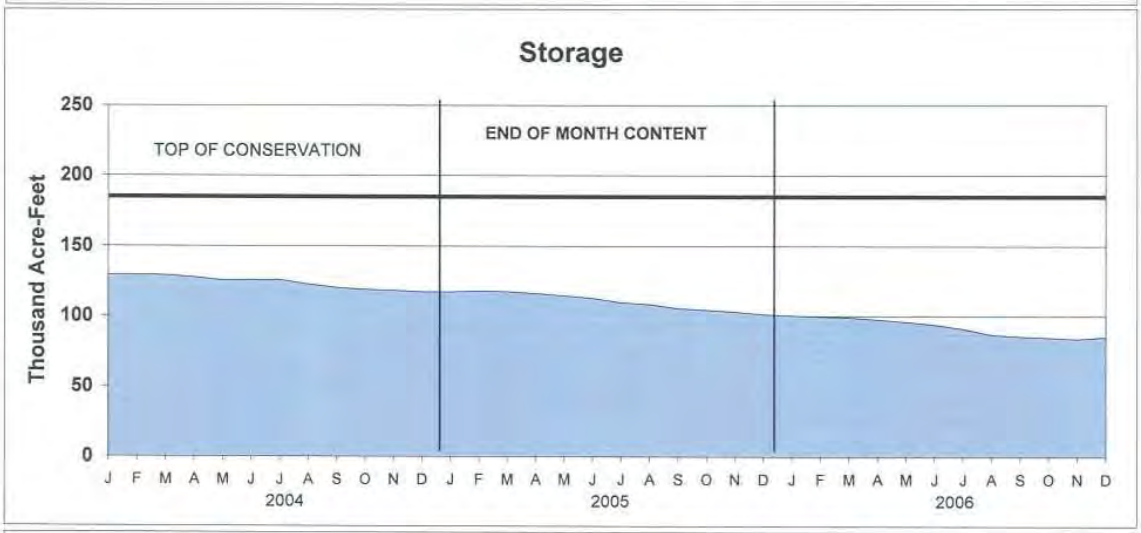


EXHIBIT 16A

CEDAR BLUFF RESERVOIR

ACTUAL OPERATION





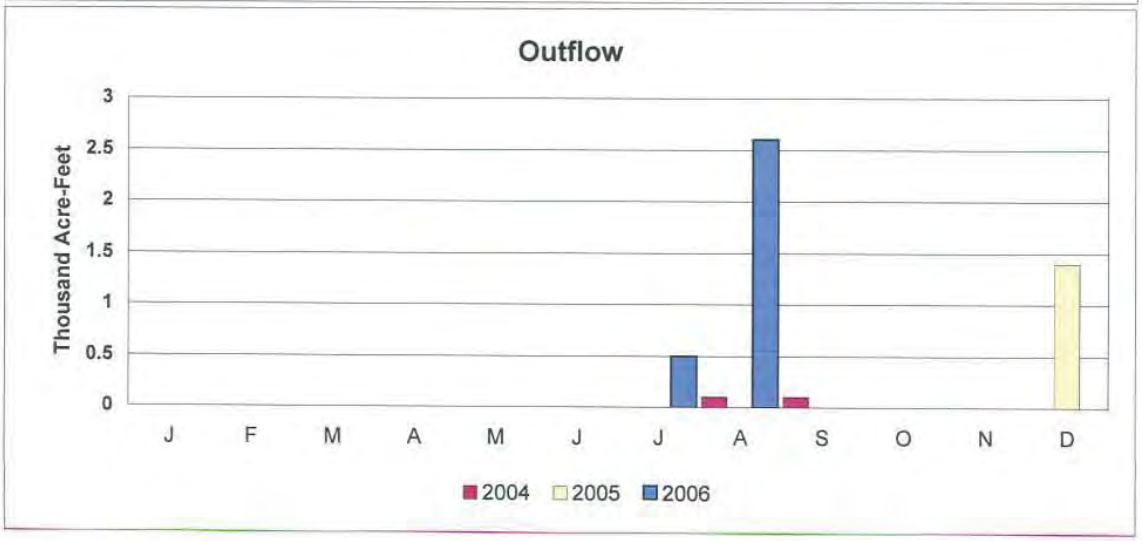
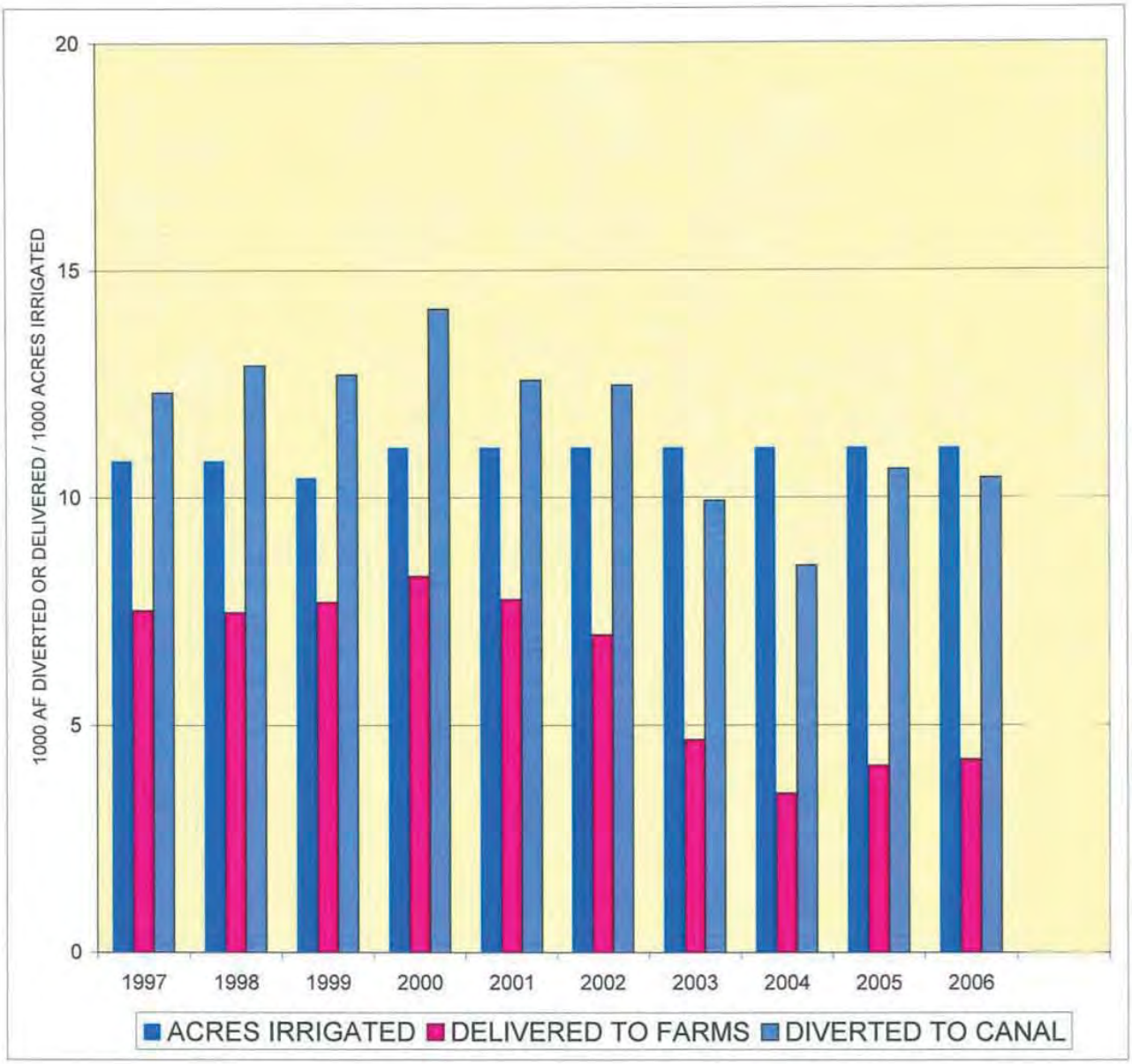


EXHIBIT 17

MIRAGE FLATS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

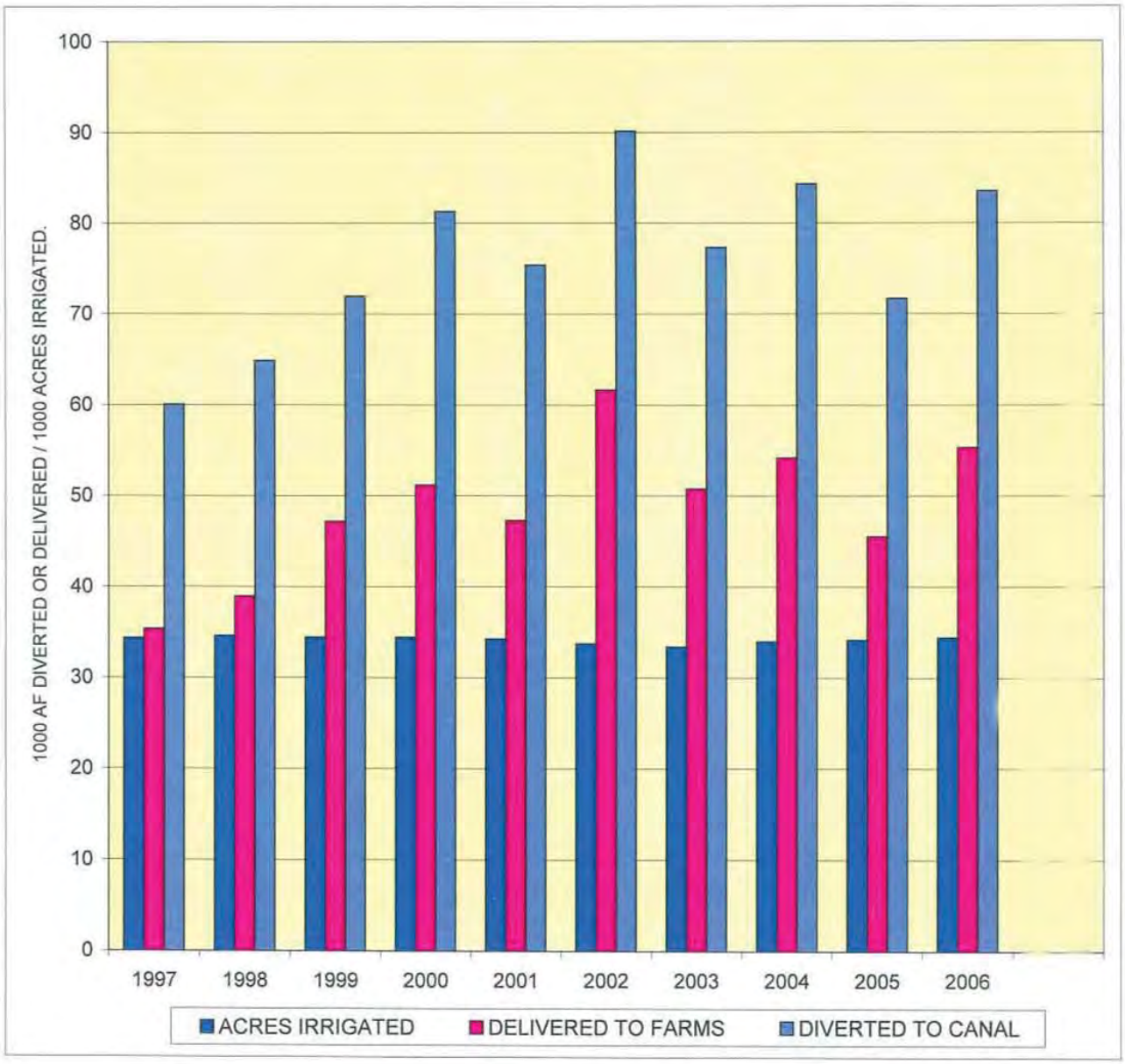


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	1.14	1.20	1.22	1.28	1.13	1.12	0.90	0.77	0.96	0.94
DELIVERED af/acre	0.70	0.69	0.74	0.75	0.70	0.63	0.42	0.32	0.37	0.38
EFFICIENCY	61%	58%	61%	58%	62%	56%	47%	41%	39%	41%

EXHIBIT 18

AINSWORTH IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

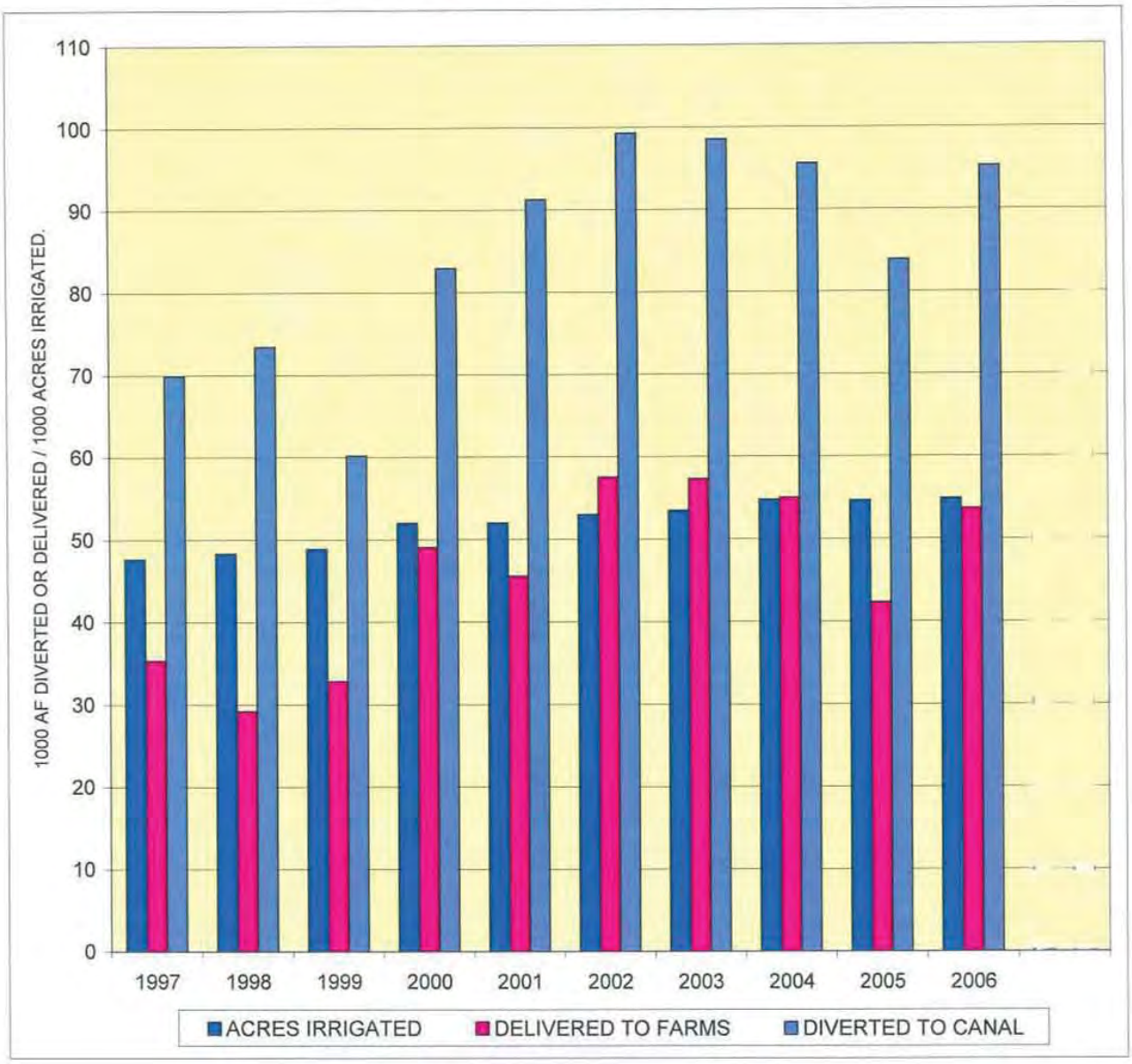


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	1.75	1.87	2.09	2.36	2.20	2.67	2.31	2.48	2.10	2.42
DELIVERED af/acre	1.03	1.13	1.37	1.49	1.38	1.83	1.52	1.59	1.33	1.61
EFFICIENCY	59%	60%	66%	63%	63%	68%	66%	64%	63%	66%

EXHIBIT 19

TWIN LOUPS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

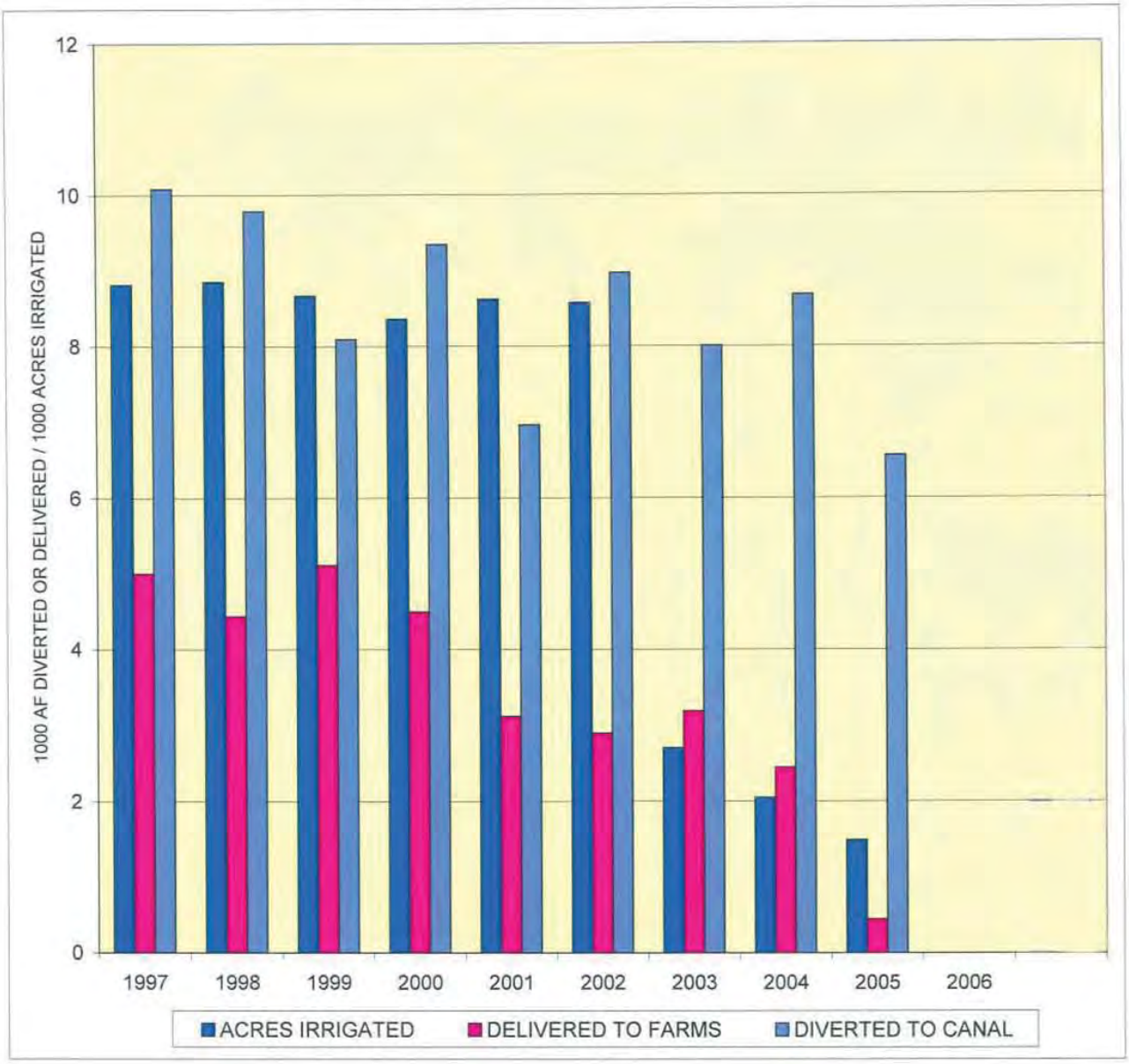


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	1.47	1.52	1.23	1.60	1.76	1.87	1.84	1.75	1.53	1.74
DELIVERED af/acre	0.74	0.60	0.67	0.94	0.88	1.09	1.07	1.00	0.77	0.98
EFFICIENCY	51%	40%	55%	59%	50%	58%	58%	58%	50%	56%

EXHIBIT 20

FRENCHMAN VALLEY IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

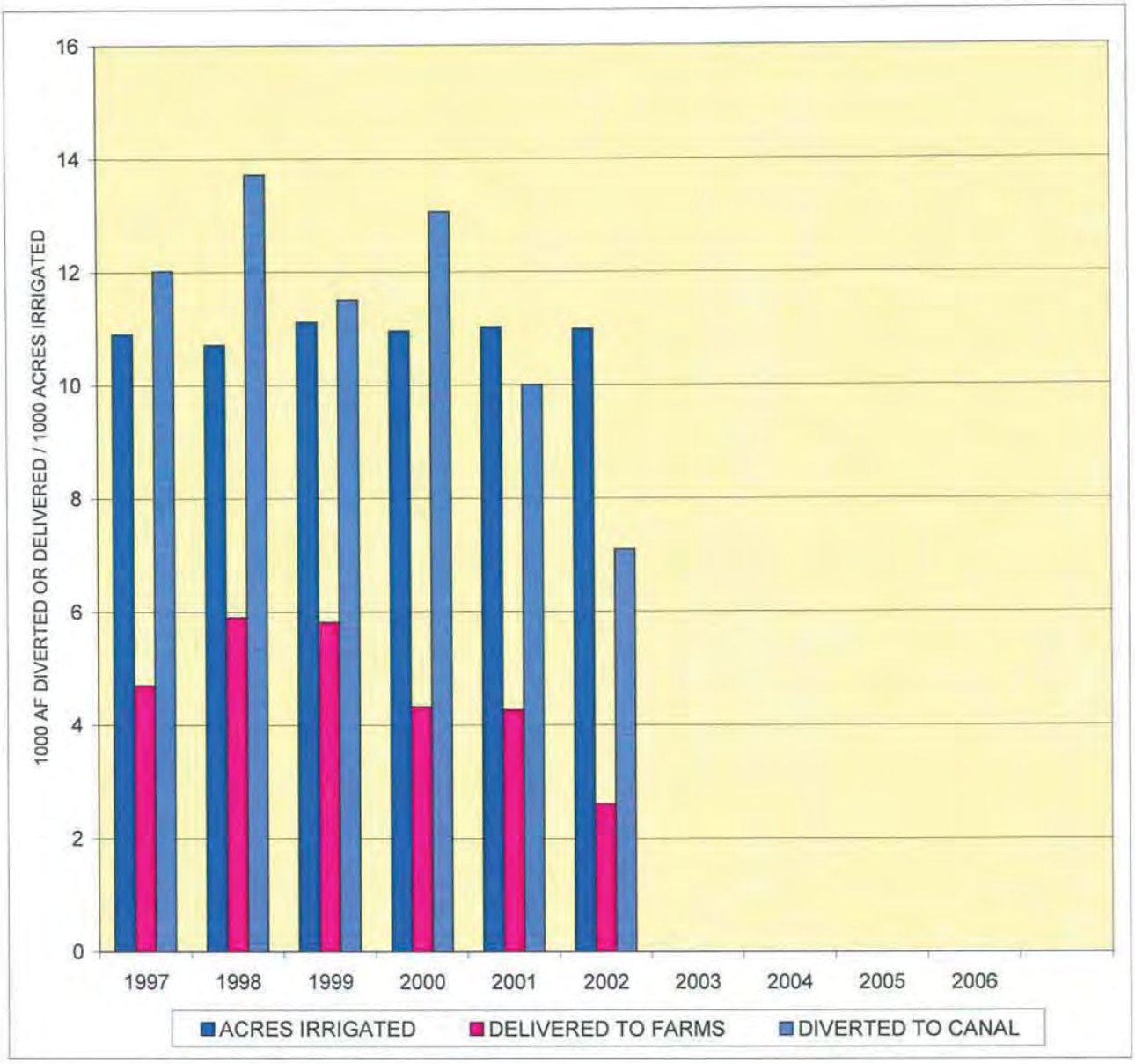


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	1.14	1.11	0.93	1.12	0.81	1.05	2.97	4.24	4.43	0.00
DELIVERED af/acre	0.57	0.50	0.59	0.54	0.36	0.34	1.18	1.19	0.30	0.00
EFFICIENCY	50%	45%	63%	48%	45%	32%	40%	28%	7%	0%

EXHIBIT 21

H AND RW IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

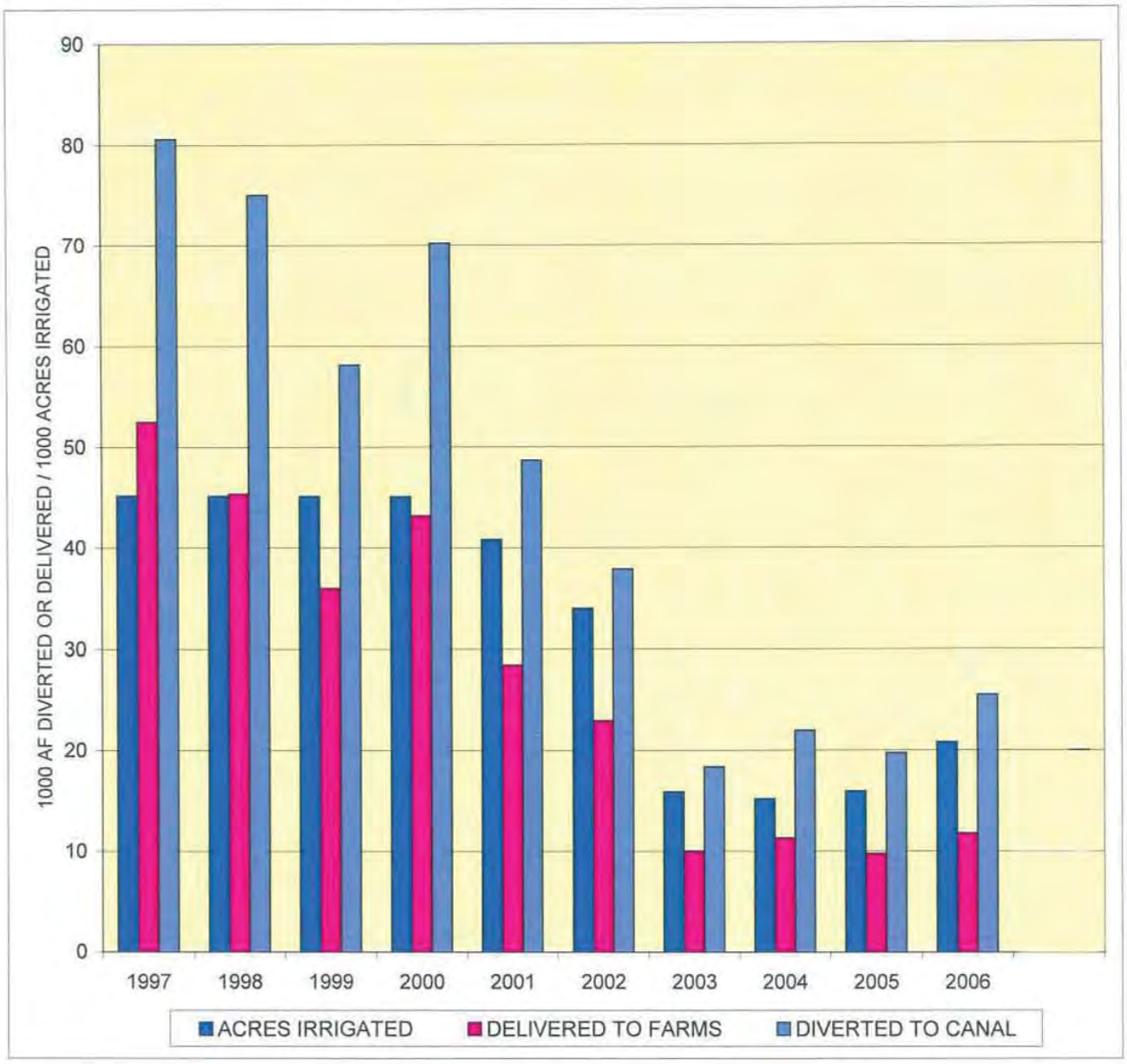


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	1.10	1.28	1.03	1.19	0.91	0.65	0.00	0.00	0.00	0.00
DELIVERED af/acre	0.43	0.55	0.52	0.39	0.39	0.24	0.00	0.00	0.00	0.00
EFFICIENCY	39%	43%	51%	33%	43%	37%	0%	0%	0%	0%

EXHIBIT 22

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

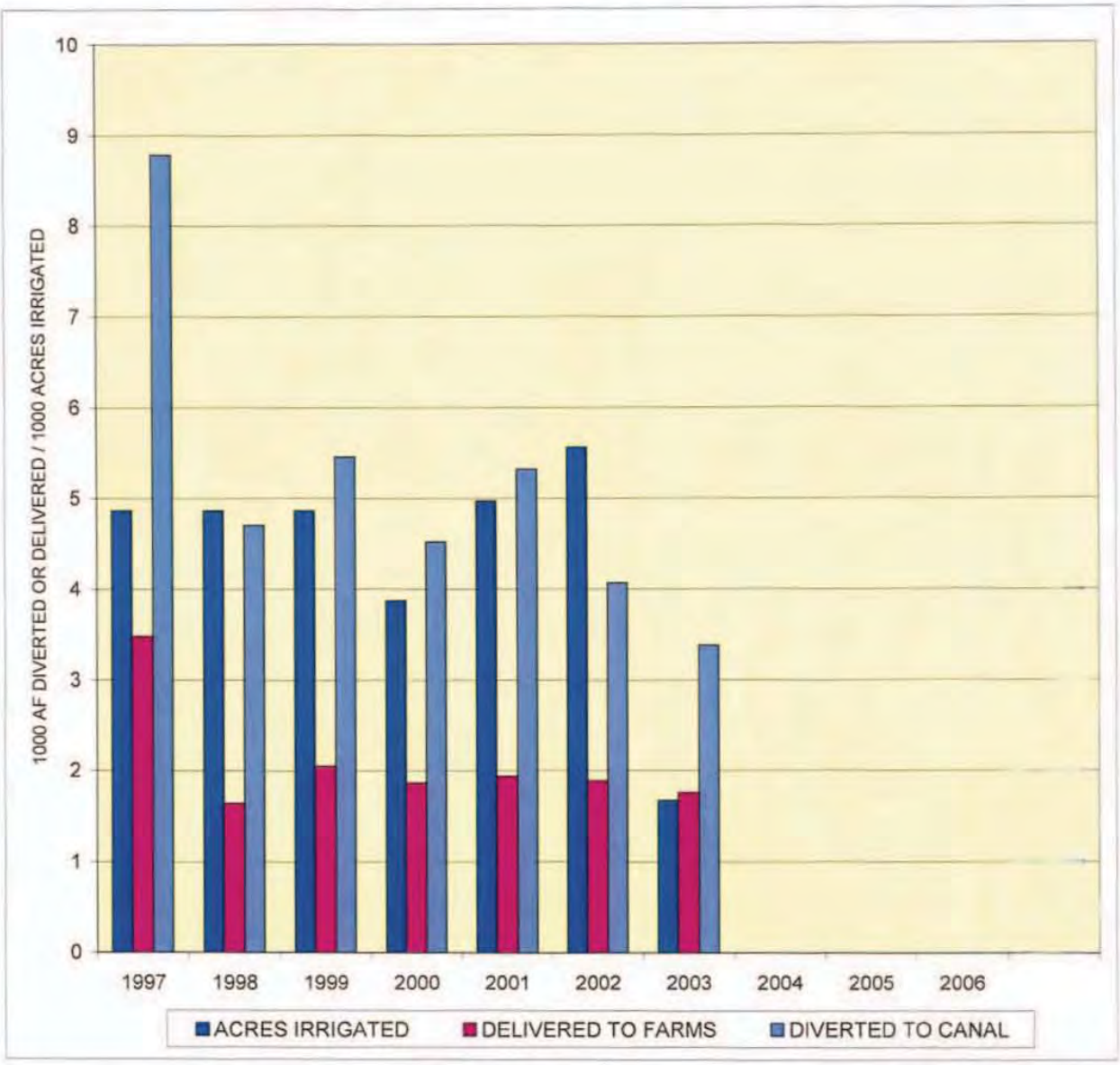


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	1.79	1.66	1.29	1.56	1.19	1.12	1.15	1.45	1.24	1.23
DELIVERED af/acre	1.16	1.00	0.80	0.96	0.70	0.67	0.63	0.74	0.61	0.57
EFFICIENCY	65%	60%	62%	61%	58%	61%	55%	52%	50%	46%

EXHIBIT 23

ALMENA IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

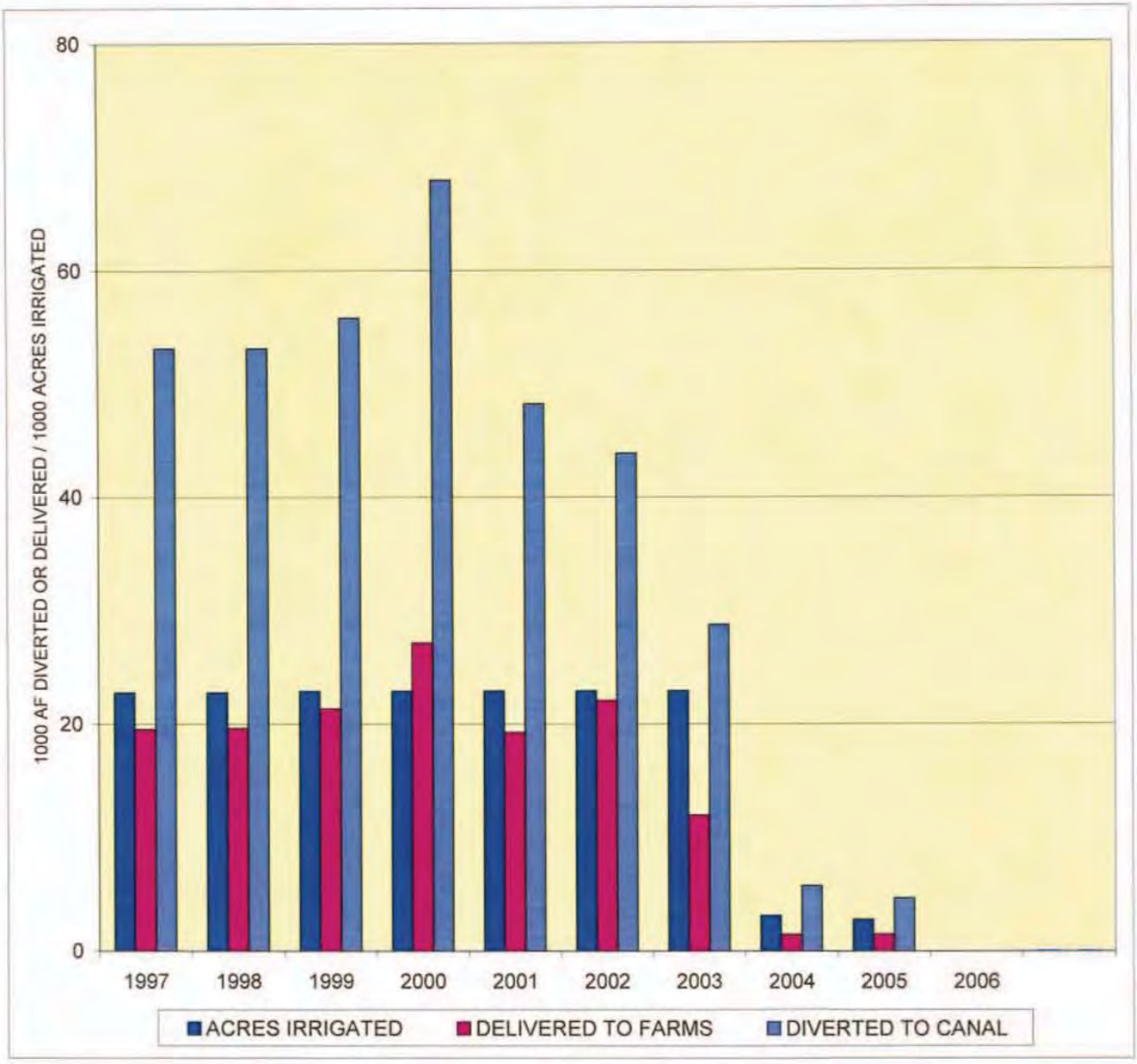


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	1.81	0.97	1.12	1.17	1.07	0.73	2.02	0.00	0.00	0.00
DELIVERED af/acre	0.72	0.34	0.42	0.48	0.39	0.34	1.05	0.00	0.00	0.00
EFFICIENCY	40%	35%	38%	41%	36%	46%	52%	0%	0%	0%

EXHIBIT 24

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

CANAL DIV., FARM DEL., AND ACRES IRRIG.

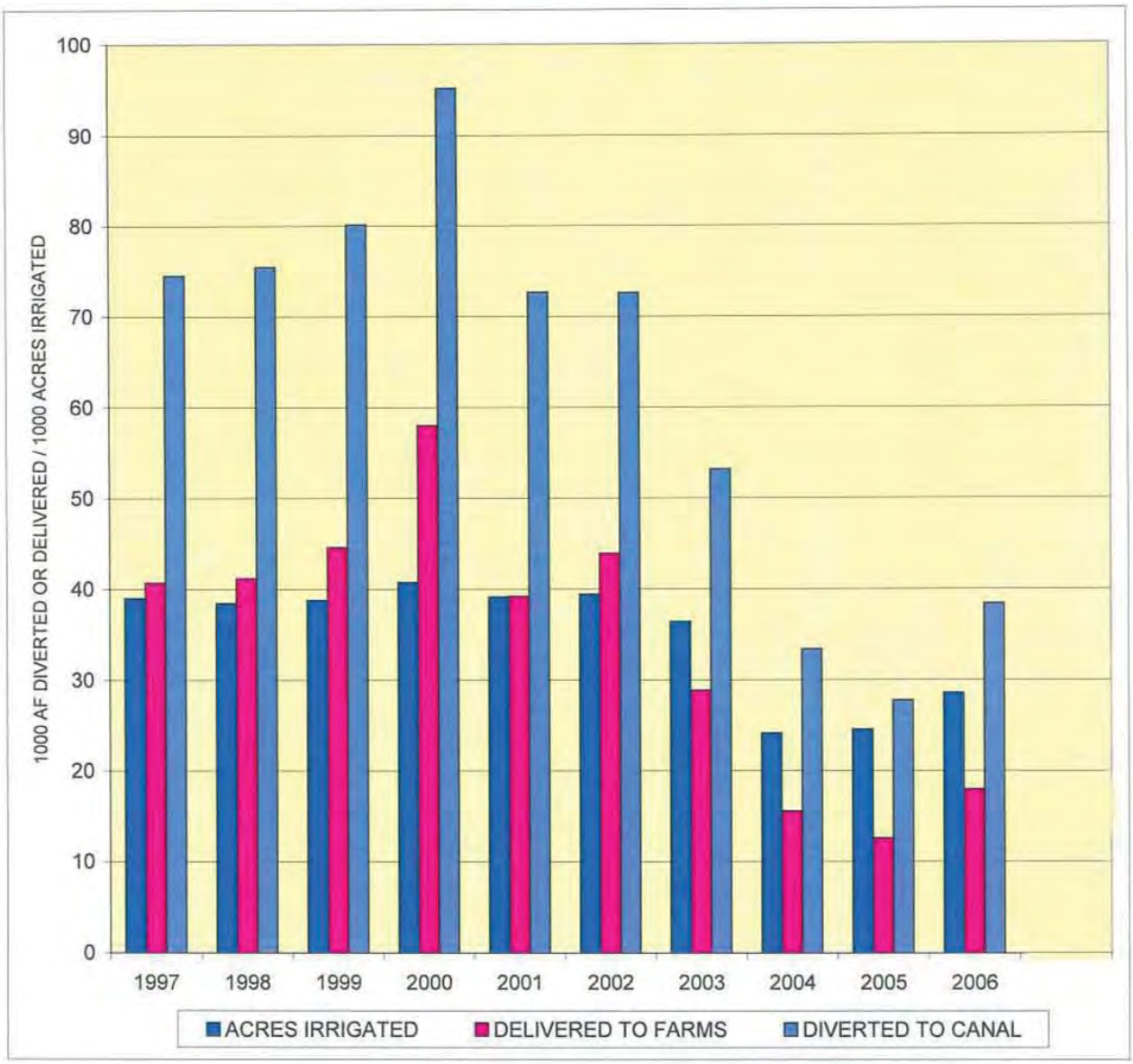


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	2.33	2.33	2.44	2.97	2.10	1.91	1.25	1.85	1.68	0.00
DELIVERED af/acre	0.86	0.86	0.93	1.19	0.84	0.96	0.52	0.47	0.53	0.00
EFFICIENCY	37%	37%	38%	40%	40%	50%	42%	25%	32%	0%

EXHIBIT 25

KANSAS-BOSTWICK IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

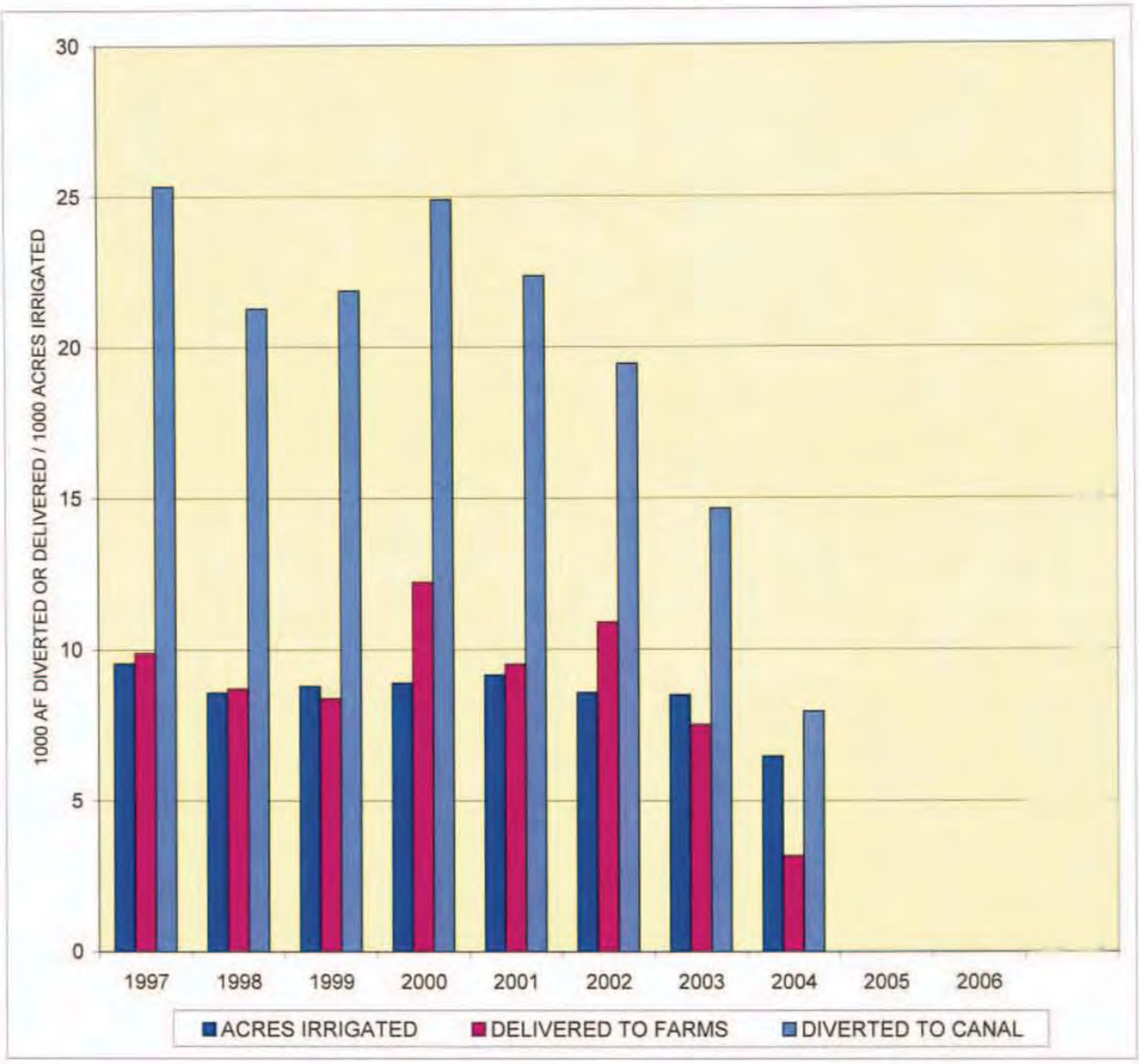


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	1.91	1.96	2.07	2.33	1.86	1.84	1.46	1.38	1.13	1.35
DELIVERED af/acre	1.04	1.07	1.15	1.42	1.00	1.11	0.79	0.65	0.51	0.63
EFFICIENCY	55%	55%	56%	61%	54%	61%	54%	47%	45%	47%

EXHIBIT 26

KIRWIN IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

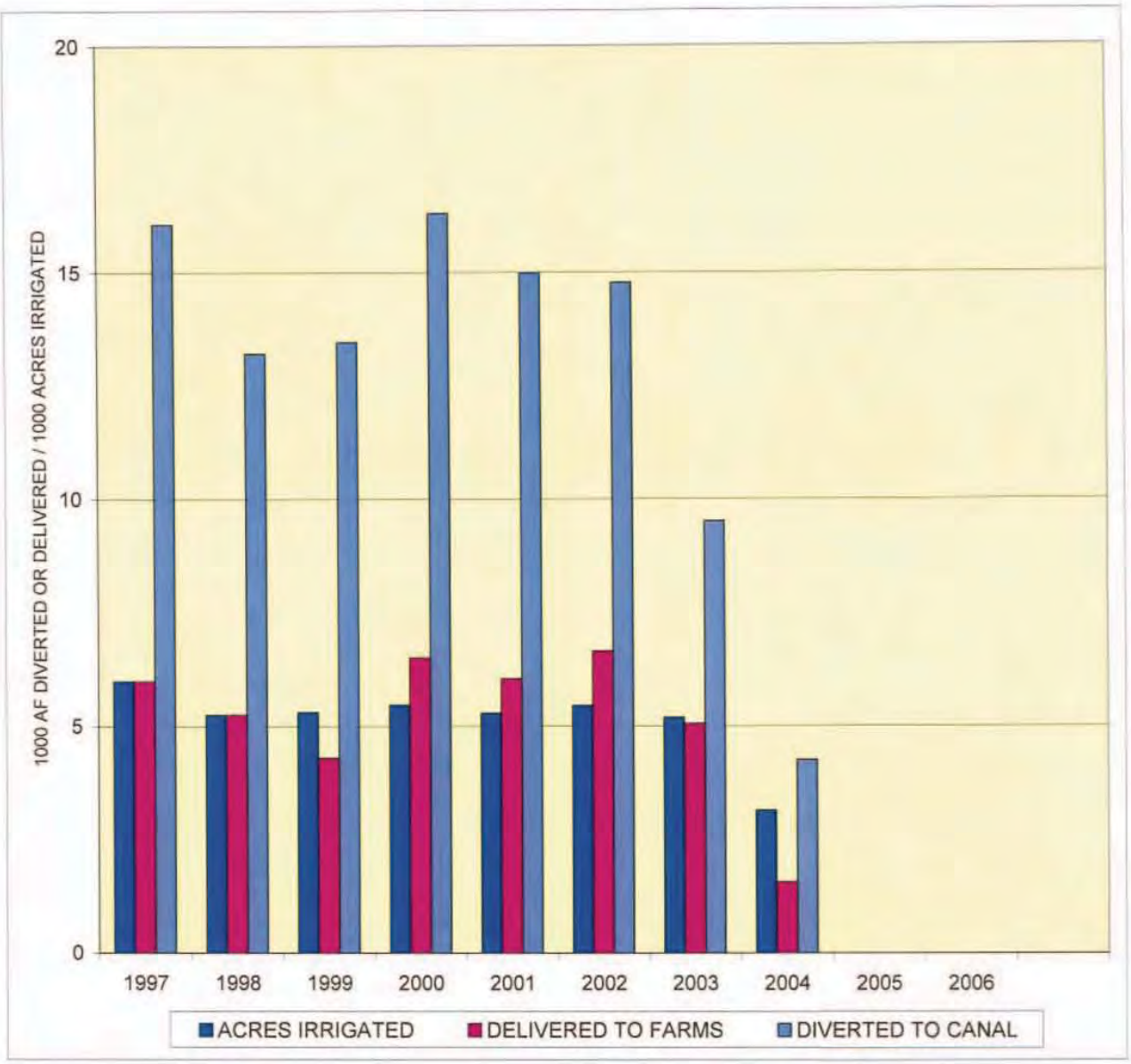


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	2.65	2.48	2.49	2.80	2.44	2.27	1.73	1.23	0.00	0.00
DELIVERED af/acre	1.04	1.01	0.95	1.37	1.04	1.27	0.88	0.49	0.00	0.00
EFFICIENCY	39%	41%	38%	49%	43%	56%	51%	40%	0%	0%

EXHIBIT 27

WEBSTER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

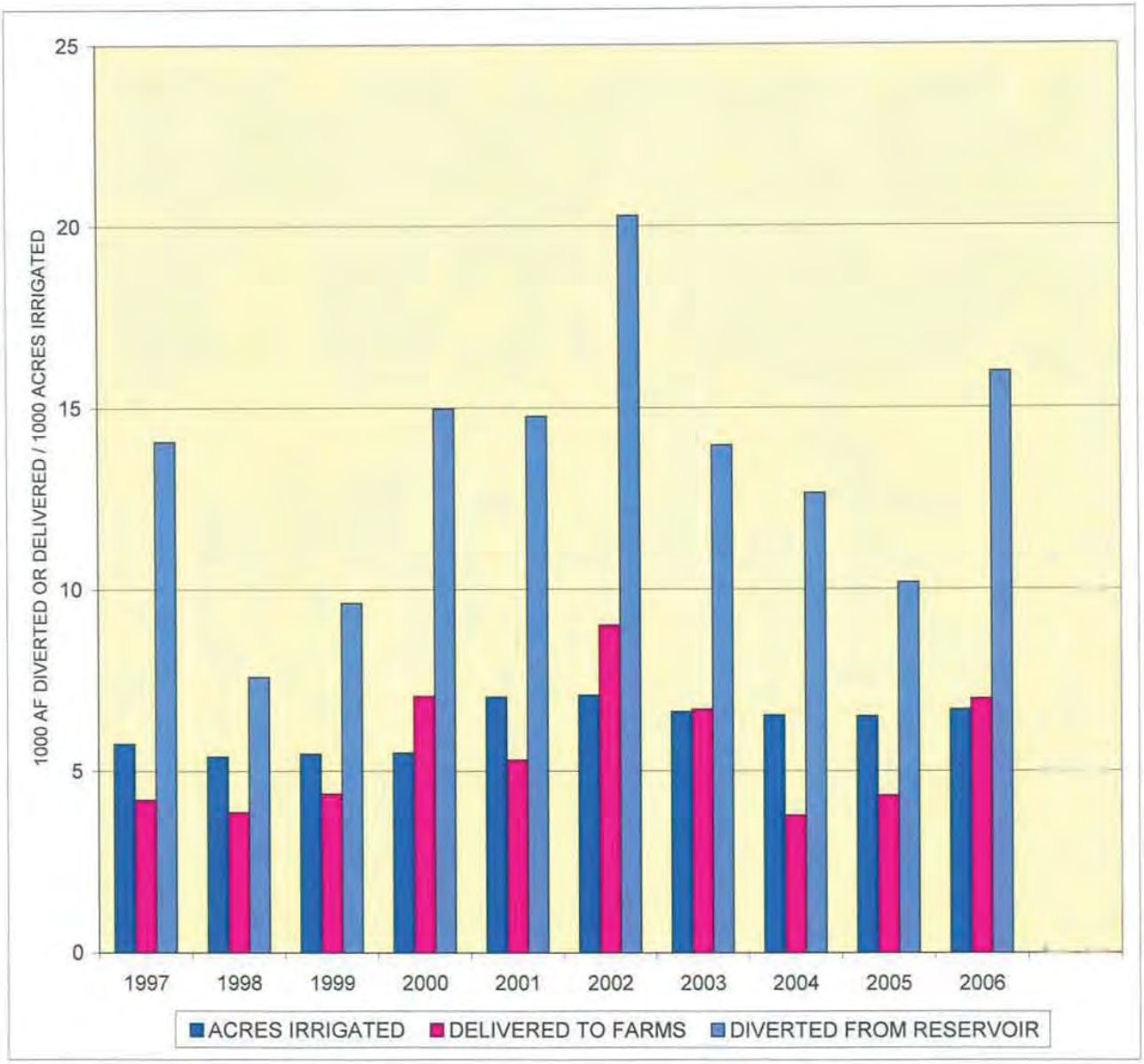


	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	2.68	2.52	2.54	2.98	2.83	2.71	1.83	1.35	0.00	0.00
DELIVERED af/acre	1.00	1.00	0.81	1.19	1.14	1.22	0.97	0.50	0.00	0.00
EFFICIENCY	37%	40%	32%	40%	40%	45%	53%	37%	0%	0%

EXHIBIT 28

GLEN ELDER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DIVERTED af/acre	2.45	1.41	1.76	2.72	2.10	2.86	2.10	1.93	1.57	2.39
DELIVERED af/acre	0.73	0.71	0.80	1.28	0.75	1.27	1.01	0.58	0.66	1.04
EFFICIENCY	30%	51%	45%	47%	36%	44%	48%	30%	42%	44%

SYNOPSIS

General

This year is the 55th consecutive year that an Annual Operating Plans (AOP) has been prepared for the Federally-owned dams and reservoirs in the Niobrara, Lower Platte, and Kansas River Basins. The plan has been developed by the Water Operations Group in McCook, Nebraska for the 16 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with 9 diversion dams, 9 pumping plants, and 20 canal systems, serve approximately 269,532 acres of project lands in Nebraska and Kansas. In addition to irrigation and municipal water, these features serve flood control, recreation, and fish and wildlife purposes. A map at the end of this report shows the location of these features.

The reservoirs in the Niobrara and Lower Platte River Basins are operated by either irrigation or reclamation districts. The reservoirs in the Kansas River Basin are operated by either the Bureau of Reclamation (Reclamation), or the Corps of Engineers. Kirwin Irrigation District provides operational and maintenance assistance for Kirwin Dam. The diversion dams, pumping plants, and canal systems are operated by either irrigation or reclamation districts.

A Supervisory Control and Data Acquisition System (SCADA) located at McCook is used to assist in operational management of all 11 dams under Reclamation's jurisdiction that are located in the Kansas River Basin. A Hydromet system collects and stores near real-time data at selected stations in the Nebraska-Kansas Projects. The data includes water levels in streams, canals, and reservoirs and also gate openings. This data is transmitted to a satellite and downloaded to a Reclamation receiver in Boise, Idaho. The data can then be accessed by anyone interested in monitoring water levels or water usage in an irrigation system. The Nebraska-Kansas Projects currently has 109 Hydromet stations that can be accessed. The McCook Field Office has installed and maintains 55 Hydromet stations with plans to install more as time permits. When fully implemented, the projects will have a Hydromet station installed to provide real-time data on all reservoirs, most diversion dams, and most of the measuring structures in the irrigation systems. These stations can be found on the Internet by accessing Reclamation's home page at http://www.usbr.gov/gp. From the home page, select "Hydromet Data Center" under the Water Operations heading.

The Headlines 2007 that follows this synopsis is indicative of the awareness that the local people have of the natural resource development and conservation in the Niobrara, Lower Platte, and Kansas River Basins.

2007 Summary

Climatic Conditions

Precipitation at the project dams during 2007 ranged from 77 percent of normal at Box Butte Dam to 152 percent of normal near Virginia Smith Dam. Temperatures during the first two months of the year were generally well below normal throughout the projects area. Precipitation during the first two months of the year varied throughout the projects area. Precipitation totals were above normal at 9 of the 16 project dams, varying from 62 to 350 percent. Temperatures were above normal during March and May and near normal in April. Precipitation during March, April, and May was generally above normal throughout the basin. Red Willow and Medicine

Creek Dams recorded the greatest precipitation total ever during the month of April while Davis Creek Dam recorded the greatest precipitation total ever for the month of May.

Average temperatures were near normal in June and July and above normal in August. Precipitation during June, July, and August was generally below normal throughout the basin. Twelve project dams recorded below normal precipitation in June, while eight project dams recorded below normal precipitation in July, and eleven project dams had below normal precipitation in August. Merritt Dam recorded the lowest precipitation total ever recorded for the month of July at the site.

September precipitation was generally below normal while precipitation in October was generally above normal. Both Virginia Smith and Davis Creek Dams recorded the greatest October precipitation total ever for the month at the respective sites. Temperatures in September and October were generally above normal throughout the projects area.

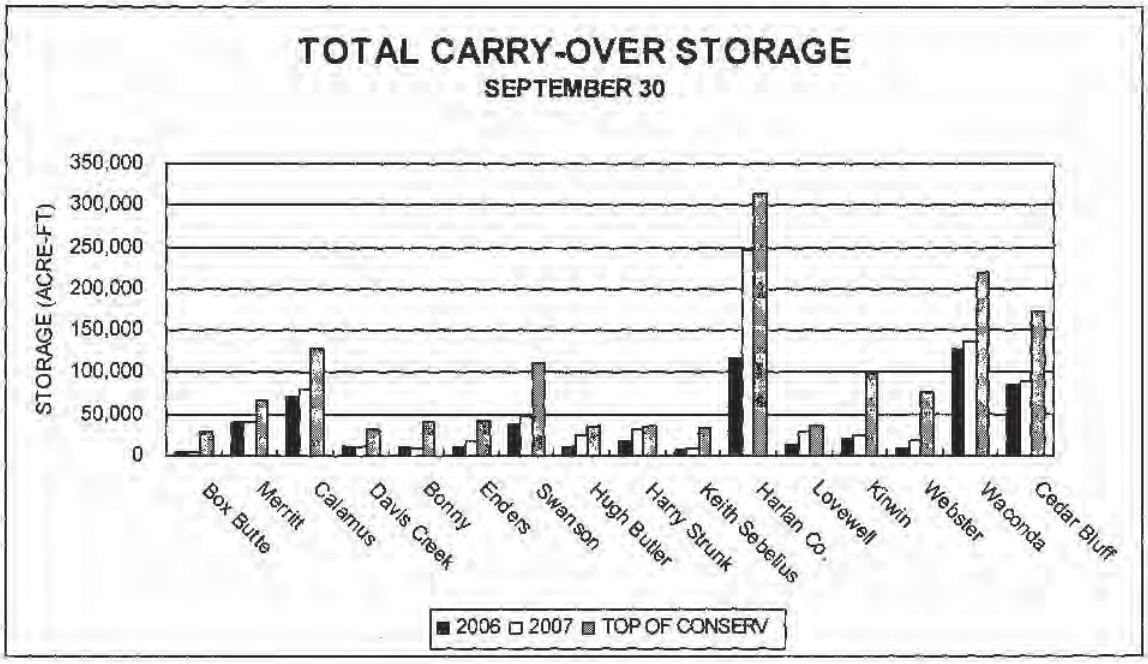
Precipitation during November was only 12 percent of normal over the projects with all project dams recording below normal precipitation. Virginia Smith and Harlan County Dams recorded zero precipitation for the month of November. Precipitation during December was well above normal at all project dams. December precipitation ranked within the top five greatest ever recorded for the month at 13 of the 16 project dams. Temperatures were above normal in November and below normal in December.

Storage Reservoirs

1. Conservation Operations. The 2007 inflow was above the dry-year forecast at all project reservoirs with the exception of Box Butte Reservoir. Merritt, Davis Creek, Bonny, Enders, Lovewell, and Webster Reservoirs, and Swanson and Waconda Lakes had inflows between the dry- and normal-year forecasts. Calamus, Kirwin, and Cedar Bluff Reservoirs along with Hugh Butler, Keith Sebelius, and Harlan County Lakes had inflows between the normal- and wet-year forecasts. Harry Strunk Lake had inflows above the wet-year forecast.

All project reservoirs had below average carryover storage from the 2006 water year. Swanson Lake in Southwest Nebraska and Bonny Reservoir in Eastern Colorado recorded below average inflows during all 12 months of 2007. Enders, Webster, and Box Butte Reservoirs, and Waconda Lake recorded below average inflows during 11 months of 2007. Reservoir releases were made from Merritt, Virginia Smith, Medicine Creek, and Lovewell Dams to maintain or reduce reservoir levels prior to the 2007 irrigation season. Just prior to the irrigation season, Enders, Kirwin, Webster and Box Butte Reservoirs, along with Keith Sebelius, Swanson, Hugh Butler, Harry Strunk and Harlan County Lakes, did not have sufficient storage to provide water users with a full water supply. Harry Strunk Lake and Lovewell Reservoir had some flood storage occupied prior to the irrigation season. The high irrigation demand months of July and August significantly reduced storage in those project reservoirs that had storage available for irrigation. Precipitation during July and August was of little help in reducing the demands on project reservoirs. Reservoir storage remained near or below normal in all the project reservoirs at the end of the irrigation season with the exception of Harry Strunk Lake.

The following summarized graph shows a comparison of 2006 and 2007 carry-over storage conditions as compared to the top of conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins as of September 30th



2. Flood Control Operations. Harry Strunk Lake and Lovewell Reservoir utilized flood pool storage in 2007. A flood release was made from Lovewell Reservoir from June 28th through July 6th to reduce pool levels. The fiscal year 2007 flood control benefits accrued by the operation of Reclamation's Nebraska-Kansas Projects facilities was $13,802,000 as determined by the Corps of Engineers. An additional benefit of $27,002,000 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2007 by facilities in this report total $1,914,399,000 (see Table 5). To date no benefits have been accrued by the operation of Box Butte, Merritt, Calamus, or Davis Creek Reservoirs.

A summary of precipitation, reservoir storage and inflows at Nebraska-Kansas Projects facilities can be found in Table 7.

Water Service

There was 230,949 acre-feet (AF) of water diverted to irrigate approximately 144,170 acres of project lands in the 12 irrigation districts (see tables 3 and 6). The project water supply was either inadequate or limited for 169,258 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, Almena, Bostwick in Nebraska, Kansas Bostwick, Kirwin and Webster Irrigation Districts. The project water supplies for the other units mentioned in this report were more than adequate in 2007.

The water requirements of three municipalities, one rural water district, and two fish hatchery facilities were furnished from storage releases or natural flows.

Irrigation Production

The 2007 crop yields on lands receiving project water in the Nebraska-Kansas Projects were higher than 2006 for two of the three reporting districts. The average corn yield, the principal crop of all reporting districts, was 167 bushels per acre. This was approximately seven bushels per acre less than in 2006. The average unit price of corn when harvested was higher than the previous year at approximately $3.30/bu. The start of irrigation releases from project reservoirs varied considerably depending on storage water available. Much of the growing season was drier than normal with near normal temperatures. Crop maturity progressed near normal during the growing season. Several irrigation districts had finished making irrigation releases by mid September. Twelve canals did not divert water in 2007 as a result of extremely short water supplies. All irrigation districts had finished delivering water by the end of September with corn harvest commencing by mid October.

Fish and Wildlife and Recreation Benefits

The National Recreational Fisheries Policy declares that the Government's vested stewardship responsibilities must work in concert with the state managing agency's recreational fisheries constituency and the general public to conserve, restore, and enhance recreational fisheries and their habitats. The Nebraska-Kansas Area Office is available for meetings if requested with Nebraska, Colorado, and Kansas state management agencies to discuss the Annual Operating Plans (AOP). Information is solicited that will allow Reclamation the flexibility to enhance fisheries resources while still meeting contractual obligations with the various irrigation districts.

During the early part of the 2007 season, normal reservoir operations were favorable for recreation and fish and wildlife uses at project reservoirs with full or nearly full conservation pool levels. Lower water levels have been experienced at most reservoirs in the Kansas River Basin over the past few years somewhat limiting the recreation benefits. Normal summer drawdown due to irrigation releases did allow for some late summer shoreline revegetation.

The Calamus Fish Hatchery is located below Virginia Smith Dam and Calamus Reservoir. The hatchery consists of an office/visitor center, laboratory, 2 residences, a shop and feed storage building, 51 rearing ponds lined with VLDPE and covering 45.5 acres, 24 concrete raceways, 2 lined effluent ponds, 8 groundwater wells, a 36-inch diameter buried pipeline from Virginia Smith Dam, a groundwater degassing tank, and a computerized monitoring and alarm system. The hatchery is operated and maintained by the Commission and produces approximately 53 million fish per year. The water supply is provided by natural flows passed through Virginia Smith Dam and from Calamus Reservoir storage through an agreement dated July 28, 1988, between the Commission and the Twin Loups Reclamation District.

HEADLINES 2007

Drought enters eighth year in region

Kansas adding up water bill

Dam road Closed for maintenance

Harlan County Lake level up from flooding

State has eye on Harry Strunk Lake

Enders making a comeback

Curtis Company wins Norton contract

Niobrara irrigators suing Nebraska DNR

Groundwater Improves in Parts of state

Groundwater Allocations At issue again

Lawsuit puts brakes On water payments

Governor signs water bill into law

Republican River Basin Study Act passes U.S. House of Representatives

Colorado threatens irrigation cutoff

Override of Bush Veto is expected

Another storm rolls through area

Republican River project affected

NRD board sets special Hearing on integrated Management plan

Bostwick board OKs sale of district water

Vegetation control meetings Planned for Republican River

Flood water raises Enders Lake To its highest level since 2000

Weed Management Area rolling into operation on Republican River

New rules could shut down Colorado farmers' wells

NRDs discuss timetable with irrigation districts

More control Likely to end Up in Lincoln

Rains wash out Hayes County

Kansas starts dispute with Nebraska on compact compliance

Split NRD board OKs water allocations

State announces purchase of water

Bureau working on Enders Dam basin

State responds to Kansas' Republican River letter

Kansas says it will act 'quickly,' 'decisively' to get their water

CHAPTER I — INTRODUCTION

Purpose of This Report

This AOP advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 2007 and serves as a guideline for the 2008 operations. This report also describes the responsibilities of Reclamation, Corps of Engineers, and the irrigation and reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins.

Operational Responsibilities

Reclamation is responsible for irrigation operations at all federal reservoirs in the Nebraska-Kansas Projects. Reclamation is also responsible for the operation and maintenance (O&M), safety of the structure, and reservoir operations not specifically associated with regulation of the flood control storage at the reservoirs constructed by Reclamation. Regulation of the flood control storage is the responsibility of the Corps of Engineers. In addition to irrigation and flood control, these reservoirs provide recreation, fish and wildlife, and municipal benefits.

By contractual arrangements with Reclamation, the irrigation or reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins are responsible for the O&M of the canals and irrigation distribution facilities constructed or rehabilitated by Reclamation. In addition, the appropriate irrigation or reclamation districts are responsible for operating and maintaining Box Butte, Merritt, Virginia Smith and Davis Creek Dams. The Corps of Engineers operates and maintains Harlan County Dam and Lake. The state of Colorado provides operational guidelines for Bonny Reservoir. Operational guidelines for Cedar Bluff Reservoir will be provided by the State of Kansas. Reclamation operates and maintains 11 dams and reservoirs in the Republican, Solomon, and Smoky Hill River Basins. Under a contract with Reclamation, Kirwin Irrigation District performs certain operational and maintenance functions at Kirwin Dam.

An updated Field Working Agreement was executed on July 17, 2001 between the Corps of Engineers and Reclamation regarding operation of Harlan County Dam and Lake. The agreement provides for a sharing of the decreasing water supply into Harlan County Lake. Storage capacity allocations were redefined based on the latest sediment survey (2000) and a procedure was established for sharing the reduced inflow and summer evaporation among the various lake uses.

The states of Nebraska, Colorado, and Kansas are responsible for the administration and enforcement of their state laws pertaining to the water rights and priorities of all parties concerned with the use of water. As provided by the lease agreement between Reclamation and the states, the states are responsible for administering the water surface activities and the federal lands around the reservoirs. The U.S. Fish and Wildlife Service administers the water surface activities and most of the federal lands at Kirwin Reservoir.

Reclamation cooperates with all state agencies and compact commissions to ensure that all operations are in compliance with state laws and compact requirements.

Tables and Exhibits

Records for the facilities reported in the AOP are included as tables and exhibits and are located following page 32.

Water Supply

For forecasting purposes, values of annual inflows that will be statistically equaled or exceeded 10, 50, and 90 percent of the time were selected from the probability data to be reasonable maximum (wet year), most probable (normal year), and reasonable minimum (dry year) inflow conditions, respectively.

Inflow records from 1988 through 2007 were used for the analysis of reservoirs in the Niobrara, Lower Platte and Kansas River Basins.

Reservoir Operations

All operations are scheduled for optimum benefits of the authorized project functions. Monthly, or as often as runoff and weather conditions dictate, Reclamation evaluates the carry-over storage and estimated inflow at each reservoir to determine whether excess water is anticipated. If excess inflow is apparent, controlled releases will be made to maximize the downstream benefits, including flood control.

Major Features

The Mirage Flats Project was constructed under the Water Conservation and Utilization Act and includes an irrigation storage reservoir, diversion dam, and canal system. The other features discussed in this report are all a part of the Pick-Sloan Missouri Basin Program and include single and multipurpose reservoirs, diversion dams, pump stations, and canal systems. The 16 storage facilities now in operation are listed below.

Constructed by Reclamation

1. Operated by irrigation or reclamation districts--Box Butte and Merritt Dams in the Niobrara River Basin and Virginia Smith and Davis Creek Dams in the Lower Platte River Basin.

2. Operated by Reclamation--Bonny, Trenton, Enders, Red Willow, Medicine Creek, Norton, Lovewell, Kirwin, Webster, Glen Elder, and Cedar Bluff Dams in the Kansas River Basin. A contract provides for Kirwin Irrigation District to perform certain operational and maintenance functions at Kirwin Dam.

Constructed and Operated by the Corps of Engineers

1. Harlan County Dam in the Kansas River Basin.

Irrigation and Reclamation Districts

Twelve irrigation districts and one reclamation district in the Niobrara, Lower Platte, and Kansas River Basins have contracted with Reclamation for water supply and irrigation facilities. The Twin Loups Irrigation District has contracted their O&M responsibilities to the Twin Loups Reclamation District. Bostwick Irrigation District in Nebraska has contracted their O&M responsibilities for Guide Rock Diversion Dam and the Courtland Canal between the headgates and the Nebraska-Kansas state line to Kansas Bostwick Irrigation District.

The contracted irrigation season for the Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman Valley, H&RW and Frenchman-Cambridge Irrigation Districts is from May 1st through October 15th or such additional period from April 1St through May 1st of each year as determined between the District and Reclamation. The contracted irrigation season for Almena, Bostwick in Nebraska, Kansas-Bostwick and Twin Loups Reclamation District is May 1st through September 30th or such additional period from April 1st through November 15th of each year as determined between the District and Reclamation. For all other districts, the contracted irrigation season is from May 1st through September 30th.

Municipal Water

Three municipalities and one rural water district have executed water service contracts for full or supplemental water supplies.

Fish and Wildlife

The State of Kansas is presently using the fish hatchery facility below Cedar Bluff Reservoir for waterfowl habitat. The Calamus Fish Hatchery located below Calamus Reservoir is operated by the State of Nebraska for fish production.

State of Colorado Division of Wildlife

The Colorado Division of Wildlife provides operational guidelines for Bonny Reservoir. The entire conservation pool storage was purchased by the State of Colorado on June 24, 1982.

State of Kansas Department of Wildlife and Parks

The State of Kansas acquired the use and control of portions of the conservation capacity at Cedar Bluff Reservoir following the reformulation of the Cedar Bluff Unit in October of 1992. The City of Russell's existing water storage right and contract with the United States remained unchanged.

Power Interference Considerations

A Power Interference Agreement exists between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District. A Subordination Agreement also exists between Reclamation, the Ainsworth Irrigation District and the Nebraska Public Power District. Provisions of these agreements will be incorporated into the 2008 operations.

Environmental Considerations

A "Statement of Operational Objectives" for Harlan County Lake sets forth the general operational objectives and the specific reservoir uses that are desirable. The operational objectives indicate that fish and wildlife interests are best served by high reservoir levels with minimum fluctuations, and regulation of the outflow in excess of the minimum desired flows. Although the statement recognizes flood control and irrigation as primary purposes, it indicates that comprehensive operational plans should be developed for maximum integration of the secondary uses.

These objectives are also considered in the operation of all Reclamation reservoirs in the Kansas River Basin, Niobrara River Basin, and the Lower Platte River Basin. The regulated outflow will also benefit farmers, ranchers, cities, and other interests below the reservoirs.

Republican River Compact — Kansas v. Nebraska

On May 26, 1998, Kansas filed a petition with the U. S. Supreme Court complaining that Nebraska had violated the Republican River Compact by using more than its share of the Republican River water supply. The three original parties to the Compact; Kansas, Nebraska and Colorado, became parties to the case. Because all of the major water development structures in the Republican River Basin were constructed by the Bureau of Reclamation and the Corps of Engineers, the United States was allowed to participate as an *amicus curiae.* After seventeen months of negotiations the Final Settlement Stipulation was signed by each respective governor and attorney general and was filed with the Special Master on December 16, 2002. The United States Supreme Court approved the settlement and dismissed the case on May 19, 2003.

The settlement provides for a moratorium on new groundwater wells, special rules for administration of water during water-short years, protection of storage releases, minimized flood flow effects on the accounting, recognition by Nebraska of a 1948 priority date for the Kansas-Bostwick Irrigation District, inclusion of the impacts of groundwater pumping from tableland wells in the accounting, and accounting for all reservoirs 15 acre-feet and larger within the river basin.

With the support of Kansas and Nebraska, Reclamation completed the Lower Republican River Basin Appraisal Report, which analyzed system improvement alternatives in the lower portion of the Republican River basin that would provide for more efficient use of the water supply. This report was published and distributed in January 2005. The study met requirements of the Final Settlement Stipulation by investigating system improvements in the Basin, including measures to improve the ability to utilize the water supply below Hardy, Nebraska. This study also met the responsibilities of the Republican River Compact by investigating the most efficient use of the water of the Republican River Basin for multiple purposes.

Nine alternatives were formulated using the recommended proposals provided by the Compact Commissioners. Three other alternatives were investigated for supplying water in meeting Minimum Desirable Streamflow (MDS) related needs in Kansas. The appraisal report concluded that additional water can be made available for storage in Lovewell Reservoir. The appraisal report recommends further Federal participation in a feasibility study and that such a study be undertaken to investigate solutions. Specific congressional authorization is required for Reclamation to perform a feasibility study. The purpose of a feasibility study is to identify, evaluate, and recommend to decision makers an appropriate, viable solution to the identified problems and opportunities. The States have indicated they would provide in-kind support and/or funding for the feasibility study. Both states have expressed interest in pursuing legislation for the study. Legislation for authorizing the study was introduced in 2003 but the legislation was not advanced. On February 13th, 2007, congressmen from both Nebraska and Kansas reintroduced the Lower Republican River Basin Study Act (H.R. 1025). The language in the re-introduced legislation is essentially the same as the legislation originally introduced in 2003.

The Stipulation also required that the States, in cooperation with the United States, form a Conservation Committee to develop a proposed study plan to determine the quantitative effects of non-federal reservoirs and land terracing practices on water supplies in the Republican River Basin

above Hardy, Nebraska. The Study Plan supported by the three states, the Natural Resources Conservation Service, and Reclamation was completed and signed on April 28, 2004. Cooperative agreements for completing the five year study were developed between Reclamation, the University of Nebraska-Lincoln (UNL), and Kansas State University. Installation of data loggers on 35 reservoirs throughout the basin was completed in 2004. Advanced monitoring equipment for terraces and additional reservoirs was installed by UNL in 2006. Data collection and model development will continue in 2008. The study is expected to be complete in 2009.

Water-Short Year Administration will be in effect in those years in which the projected or actual irrigation supply is less than 119,000 acre feet of storage available for use from Harlan County Lake as determined by Reclamation. It was determined in 2007 that a "Water-Short Year Administration" was in effect.

Frenchman Valley Appraisal Study

In 2004, the Nebraska Department of Natural Resources (DNR) requested Reclamation prepare an Appraisal Study (AS) to examine opportunities for more efficient management of water supplies in the Frenchman River Valley including Reclamation's Enders Reservoir, a feature of the Frenchman-Cambridge Division in Nebraska. The study will focus on problems and opportunities in an area that has experienced dramatically reduced ground and surface water supplies, including reduced reservoir inflows. Pre-planning activities, including developing a Plan of Study began in 2005. Agencies participating in the study include, Reclamation, Nebraska DNR, Frenchman Valley and H&RW Irrigation Districts, Nebraska Game and Parks Commission, and the Upper and Middle Republican Natural Resources Districts. The AS is scheduled to be completed by September 2008.

Emergency Management

The Nebraska-Kansas Area Office (NKAO) continued to coordinate with local jurisdictions that could potentially be impacted by flooding from large operational releases and/or dam failure. Three tabletop exercises and two functional exercises were conducted during calendar year 2007. Orientation meetings were held for all of the NKAO dams. Functional exercises were held for the Bonny Dam Emergency Action Plan (EAP), Enders Dam EAP, Kirwin Dam EAP, and the Cedar Bluff Dam EAP. Emergency radios have been installed at all dams. These radios will be used as a backup means of communication when notifying the local emergency management officials in the event of an emergency at the dam. Both the Nebraska-Kansas Area Office and the McCook Field Office have a satellite phone that can be used in an emergency. Management and the dam operators have been trained on the use of these phones.

There was one internal alert declared at NKAO projects in 2007. At Davis Creek Dam, an internal alert was declared after a sinkhole was discovered immediately adjacent to the outlet works building. The underdrain system's outfalls were plugged with temporary mechanical packers. The effect of plugging the underdrains and the need for additional drainage is being evaluated. An internal alert at Red Willow Dam continues from 2005 due to discovery of material in the outlet works stilling basin under drain system. Additional analysis of the outlet works stilling basin under drain system will continue in 2008. An internal alert at Enders Dam is still in effect until the investigation of the stability of the outlet works stilling basin and risk assessment are complete.

One tabletop exercise and five functional exercises are planned in 2008. EAP orientation meetings will be held at all other NKAO dams. Site security plans for Box Butte, Merritt, Bonny, Enders, Red Willow, Medicine Creek, Norton, Kirwin, Webster and Cedar Bluff Dams were finalized and published in 2007. Site security plans for Virginia Smith and Davis Creek Dams will continue to be developed in 2008.

Public Safety Reviews

The Annual Safety Training for field personnel was held at the Community College in McCook, NE in February 2007. An invitation letter was sent to all of the water users within the NKAO jurisdiction. This letter included some safety tips, an invitation to the Annual Safety Training, and promoted the utilization of assistance from Reclamation when developing or maintaining safety programs for the water districts. This training provided maintenance personnel the opportunity to renew their 10 hour certification with respect to OSHA construction standards. First Aid and CPR training was also provided to all interested NKAO personnel. The First Aid and CPR training was provided by the McCook Fire Department.

The ongoing safety reviews of project facilities continues to identify potential safety hazards to the public and operating personnel. NKAO combines the Safety Reviews of the major facilities with the Dam Safety Facility Reviews. This format provides for input from both the Area Safety Manager, and teams of Dam Safety Specialists. Some recommendations included enhanced confined space signage, expanding the public knowledge of safety issues around our facilities, and provide training to employees regarding some of the new OSHA requirements for record keeping.

Formal training for the Automatic External Defibrillators (AEDs) was provided to all NKAO employees in early 2006. The AEDs were acquired for the McCook Office, the Grand Island Office, and two field ready models. This process involved developing a protocol with the Federal Occupational and Health Services center in Denver.

In order to ensure facility accessibility, reliability and safety, achieving compliance with accessibility standards continues. Evaluations and the development of the action plans continued during 2007. The action plans identify work activities and provide estimated funding requirements for the needed accessibility retrofits at public facilities. These improvements are being coordinated with our managing partners, and are implemented as budget allows.

Attention continues with regards to issues concerning ergonomics, West Nile Virus, hazardous materials, pesticide use, arc flash hazards, extraction of injured personnel, and communications. Employees were provided safety and health training, and given information related to these and several other issues throughout the year.

Facility Reviews, Maintenance and Construction

Periodic Facility Reviews were conducted at Box Butte, Enders, and Trenton Dams during 2007. Annual Site Inspections were conducted at Davis Creek, Bonny, Red Willow, Medicine Creek, Norton, Webster, and Cedar Bluff Dams in 2007.

Technical surveys were completed at Trenton Dam in 2007.

The Reclamation Dive team conducted underwater exams at Davis Creek and Lovewell stilling basins in 2007.

Mirage Flats Project in Nebraska

General

Flows in the Niobrara River along with Box Butte Reservoir storage provide a water supply for the 11,662 acre Mirage Flats Project. From 1998 to 2007, the project water supply averaged 11,100 AF, which is about 0.95 AF per irrigable acre. Many irrigators supplement their water supply with private wells.

The Mirage Flats Irrigation District cooperates with the Nebraska Game and Parks Commission (Commission) by operating the Box Butte Dam outlet works gate and the Dunlap Diversion Dam gates in a manner to avoid sudden large changes in the flows of the Niobrara River. A 30-year agreement was made in 1990 between the district and the Commission whereby the district would not draw the reservoir water level below elevation 3978.00 feet (2,819 AF). In return the district received an up-front payment which was used to improve the efficiency of the project's delivery system. On March 17, 2000, the district agreed to increase the minimum reservoir level by one additional foot to elevation 3979.00 feet (3,244 AF). In return the district received an additional payment from the Commission for the 20 years left on the original agreement.

A data collection platform (DCP) was installed in May of 1992 to monitor the reservoir elevation and outflow at Box Butte Dam. A telephone (primary communication system) and a radio (backup communication system) have been installed at the outlet works for contacting the Region 23 Emergency Management Agency.

2007 Summary

The flows of the Niobrara River plus the carry-over storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. Precipitation at the Mirage Flats Irrigation District Office totaled 13.06 inches, which is 77 percent of normal. The 2007 total inflow of 11,674 AF was below the dry-year forecast and the lowest annual computed inflow ever recorded at the reservoir.

From early July through mid August, diversions of 6,963 AF to the Mirage Flats Canal provided irrigation water for approximately 11,092 acres, 95 percent of the service available acreage. The farm deliveries from the project water supply totaled 2,504 AF (0.23 acre-foot per irrigable acre), which is a delivery efficiency of 36 percent. Total reservoir storage was only 3,264 AF at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

An orientation meeting to review the Box Butte Dam EAP took place in May and a Periodic Facility Review of Box Butte Dam was conducted in June.

The District continued to implement water conservation measures as outlined in their Water Management Plan and their Long Range Plan. Assistance to project irrigators provided by the District include delivery system improvements that provide on-farm efficiency improvements, such as relocation of turnouts, burying pipe for better access, and on-farm efficiency incentives. The District continues to modify and update their computer software to improve system

operations, scheduling, and accounting and continued development of their web page that allows irrigators to place water orders, review water accounts, and keep updated on district operations.

Ainsworth Unit, Sandhills Division in Nebraska

General

Within the Ainsworth Irrigation District, there are approximately 35,000 acres with available service. The project water supply is provided by storage of Snake River flows in Merritt Reservoir. The reservoir is filled to elevation 2944.0 feet each fall after the irrigation season. This level is approximately two feet below the top of conservation capacity and within the repaired area of soil cement on the upstream face of the dam. The reservoir is regulated to maintain this level until the ice clears each spring. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the older existing soil cement at lower elevations. Upon ice-out the outlet pipe is drained, inspected, and repaired as necessary. The reservoir will then be rapidly filled to elevation 2946.0 feet to reduce shoreline erosion around the reservoir and minimize sand accumulations on the face of the dam. This filling process generally takes place in April. The reservoir level is maintained until irrigation releases begin to draw on the pool around mid May. Seepage, pickup and toe drain flow normally result in flows of up to 15 cfs below Merritt Dam.

Reclamation has executed a Memorandum of Agreement (MOA) between Reclamation, the Nebraska Game and Parks Commission and the Ainsworth Irrigation District for Snake River Releases below Merritt Dam. The purpose of this MOA is to establish the protocol that will be used to make future releases of water from Merritt Dam to the lower Snake River. The development of the MOA was an environmental commitment outlined in the Ainsworth Irrigation District Final Environmental Assessment (FEA) for the Conversion of a Long-Term water Service Contract to a Repayment Contract (December 2006).

Release criteria will be based on the best available scientific data to determine when local conditions warrant releases to the Snake River. When it becomes necessary to release water from Merritt Reservoir, Reclamation will direct the Ainsworth Irrigation District to make the necessary releases to the river.

2007 Summary

Precipitation, as recorded near Merritt Dam, totaled 26.76 inches, which was 132 percent of normal. July precipitation was the lowest on record for the month since construction. The inflow for the year totaled 174,371 AF. This inflow was between the dry- and normal-year forecasts. The water supply was more than adequate to meet the project's irrigation requirement. There were 75,646 AF diverted from Merritt Reservoir into Ainsworth Canal, with 48,052 AF delivered to the farm headgates (delivery efficiency of 64 percent). There were 34,577 acres of land irrigated in 2007.

The district provided a total of 433 AF of irrigation water from holding ponds located within the district's service area.

An orientation meeting to review the Merritt Dam EAP took place in June 2007.

The Ainsworth Irrigation District, along with Reclamation and the local Natural Resource District, continued to provide support to the University of Nebraska Extension Service for an irrigation scheduling/nitrogen management demonstration that will educate and improve irrigation management in the area. The first demonstration site included a center pivot in the District and a field day was held in the fall of 2005. In 2006 a furrow irrigated site was added to this project. Field days were subsequently held in 2006 and 2007. This project may continue in 2008

Working with Reclamation's technical and financial assistance through a cooperative agreement, the District installed a new ramp flume on the Sand Draw Lateral. This flume, along with the flume placed on the Airport Lateral in 2006, will improve district delivery operations and reduce operational waste.

North Loup Division in Nebraska

General

The North Loup Division is located in the Loup River drainage basin. Water is diverted from both the Calamus and North Loup Rivers for the irrigation of approximately 54,900 acres of project lands. Operation of the division will also provide a sustained groundwater supply for an additional 17,000 acres. Principal features of the division include Virginia Smith Dam and Calamus Reservoir, Calamus Fish Hatchery, Kent Diversion Dam, Davis Creek Dam and Reservoir, five principal canals, one major and one small pumping plant and numerous open ditch and buried pipe laterals.

Calamus Reservoir is normally regulated at three to four feet below the top of conservation capacity during the winter months. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the soil cement on the upstream face of the dam. After the ice clears in the spring, the reservoir will be filled to conservation capacity. The North Loup Division project operation is restricted to no water diversions from the Calamus and North Loup Rivers during the months of July and August, and also during the month of September whenever sufficient water is available in storage reservoirs to deliver canal design capacity. During this time, inflows to Calamus Reservoir are required to be bypassed under the Power Interference Agreement between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District and as required in the authorizing legislation.

Davis Creek Reservoir level will be maintained at an average elevation of 2048.0 feet from the end of the irrigation season through the winter months. Off season seepage and evaporation has historically resulted in a reservoir drawdown of 2.5 to 3.0 feet requiring an end of season reservoir level of 2050.0 feet or less. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled via Mirdan Canal, starting in April and reaching full content by the end of June. A 160-acre recreation area adjoining the reservoir continues to be managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped accessible fishing pier, a day-use area, a primitive camping area, shelter and a hiking path. Kent Diversion Dam is managed by the Nebraska Game and Parks Commission and is also open to day-use fishing with handicapped accessibility provided.

2007 Summary

Precipitation at Virginia Smith Dam was 35.96 inches which is 152 percent of normal. The inflow totaled 263,302 AF which was between the normal- and wet-year forecasts. There were 85,789 AF of water released into Mirdan Canal and 6,962 AF diverted through Kent Canal from the North Loup River. A total of 38,126 AF was diverted for district use above Davis Creek Reservoir. The farm headgate delivery was 20,346 AF which is a delivery efficiency of 53 percent. Land irrigated in 2007 totaled 33,999 acres above Davis Creek Reservoir. Calamus Reservoir inflows were bypassed during July, August, and September as required. The reservoir

elevation at the end of the year was at 2240.70 feet. The Calamus Fish Hatchery used bypassed natural flows and storage from Calamus Reservoir totaling 6,519 AF during 2007.

The precipitation of 32.81 inches near Davis Creek Dam was 135 percent of normal. Inflow to Davis Creek Reservoir totaled 50,424 AF during 2007. Beginning in mid April, Davis Creek Reservoir was filled from an elevation of approximately 2050.0 feet to a peak elevation of 2075.23 feet on June 29th using diversions from the North Loup River and Calamus Reservoir. A release of 43,352 AF was made from Davis Creek Dam into Fullerton Canal, with 20,547 AF delivered to the farm headgates (47 percent delivery efficiency). There were 20,922 acres irrigated below Davis Creek Reservoir. The reservoir elevation at the end of 2007 was near the normal wintering level at 2049.30 feet.

In May an Internal Alert was issued at Davis Creek Dam after a sinkhole was discovered immediately adjacent to the outlet works building. The sinkhole was monitored throughout the irrigation season which verified the sinkhole was still active. The underdrain system was videoed which showed significant amount of material located in the eyebrow outfall pipe indicating a failure of the underdrain system. The underdrain system's outfalls were plugged with temporary mechanical packers. An Internal Alert remains in effect until the need for additional drainage and the effect of plugging the underdrains is evaluated.

An orientation meeting to review the Virginia Smith and Davis Creek Dams EAPs took place in May 2007.

On-site dam operator training and an Annual Site Inspection of Davis Creek Dam were conducted in September 2007.

Through a cooperative agreement with Reclamation, the District began installing remote monitoring equipment at key canal sites to improve delivery system operations. In 2007 equipment was placed at the Parshall flume located below Virginia Smith Dam, at the 9.5 check structure, and at the 13.4 check structure.

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir are primarily for recreation and fish and wildlife support, although water will be available for water right administration and irrigation purposes.

Bonny Reservoir inflows from the South Fork of the Republican River and Landsman Creek are released into Hale Ditch as requested by the Colorado State Engineer. The state will make Bonny storage water available to Hale Ditch and other natural flow appropriators under short-term water service contracts. Most of the 700 acres served by Hale Ditch are now owned and operated by the Division of Wildlife, Colorado Department of Natural Resources.

The normal operation pattern of Bonny Reservoir, with a slowly rising or stable pool, enhances fish spawning in the spring and provides excellent fishing opportunities during the summer and hunting conditions each fall.

2007 Summary

The annual precipitation total of 15.43 inches at Bonny Dam was 90 percent of normal. The annual computed inflow of 8,094 AF to Bonny Reservoir was between the dry-year and the normal-year forecasts. The reservoir level was 21.3 feet below the top of conservation at the first of the year. The reservoir level increased 2.1 feet to a maximum reservoir level of 3652.78 feet on May 2". The reservoir level gradually decreased throughout the remainder of the year. Bonny Dam recorded a maximum one day precipitation total of 1.44 inches overnight on June 13th. A new historical low reservoir elevation of 3648.39 feet was recorded on December 2nd. The reservoir elevation at the end of the year was 23.6 feet below the top of conservation at 3648.39 feet. The Corps of Engineers determined that $4,000 in flood prevention benefits were realized from the operation of Bonny Reservoir during 2007.

The Colorado Water Commissioner directed inflows from the South Fork of the Republican River and Landsman Creek be passed through Bonny Reservoir into Hale Ditch during early June for a total of 87 acre-feet. The Colorado Department of Natural Resources also ordered releases be made for compact compliance purposes into the river. A total of 1,359 acre-feet was released for this purpose from May 22" through June 5th.

An EAP functional exercise was conducted in September and an Annual Site Inspection of Bonny Dam was performed in June.

Concrete repairs were made on the spillway inlet apron and the crack in the transverse portion of the curved vertical wall in 2006. A large void was discovered during the concrete repairs on the right side of the inlet where the upper horizontal floor slab met the sloping floor slab. A decision document was drafted in 2007 to include the issue evaluation as part of the 2008 CFR rather than initiate a special issue evaluation.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

The Culbertson Canal and the Culbertson Extension Canal systems serve 9,292 acres in the Frenchman Valley Irrigation District and 11,915 acres in the H&RW Irrigation District. The water supply for these lands is furnished by flows from Frenchman and Stinking Water Creeks and off-season storage in Enders Reservoir located on Frenchman Creek, a tributary of the Republican River in southwest Nebraska. Irrigation releases are conveyed via Frenchman Creek from Enders Reservoir to Culbertson Diversion Dam. Reclamation maintains/clears this section of Frenchman Creek prior to the irrigation season each spring.

The normal operation of Enders Reservoir, with the gradual rise in water surface during the spring months, provides desirable fish spawning conditions. Irrigation releases will normally deplete the conservation storage by late summer, thereby limiting the fishing and recreational usage.

2007 Summary

The annual precipitation total of 25.39 inches at Enders Dam was above normal (134 percent). The 2007 inflow into Enders Reservoir of 13,258 AF was between the dry- and normal-year forcasts This was the 40th consecutive year with below-normal inflows in which the conservation pool did not fill. The reservoir level was 26.7 feet below the top of conservation at the first of the year. The reservoir pool increased with late winter and spring inflows peaking at 3097.11 feet (15.2 feet below the top of conservation) on June 18th. Enders Dam recorded 6.02 inches of rainfall from June 11th though June 13th. Runoff from these storms increased the reservoir storage by approximately 9,400 AF. Due to the extremely low water supply available, no water was released from Enders Reservoir. The end of the year reservoir level was 19.7 feet below the top of conservation.

The Frenchman Valley Irrigation District did not divert water into Culbertson Canal in 2007. In the spring of 2007, the Nebraska Department of Natural Resources entered into a Memorandum of Agreement (MOA) with the Frenchman Valley Irrigation District to purchase the district's natural flow rights for calendar year 2007. The MOA, approved by the irrigators within the district, provided that no water would be diverted into the Culbertson Canal during 2007. The H&RW Irrigation District did not divert water into Culbertson Extension Canal in 2007 due to the extremely low water supply. This was the fifth consecutive year that the district did not deliver water. H&RW Irrigation District storage water in Enders Reservoir was carried over into 2008.

In August 2004, a small depression was discovered near the outlet works stilling basin at Enders Dam. An Internal Alert remains in effect until investigation of the stability of the outlet works stilling basin and risk assessment are complete. A Safety of Dams recommendation in 2006 recommend filling the stilling basin under drain system and potential voids with low-pressure grout and backfilling the existing sinkhole with compacted material after completion of the grouting program. The rapid increase in reservoir elevation in June 2007 prompted the addition of 50,000 pounds of concrete weights to be placed on the outlet works to counter any uplift on the structure.

A Periodic Facility Review of Enders Dam was conducted in June 2007 and a Functional EAP exercise took place in September.

In 2007, the Frenchman Valley Irrigation District (along with Reclamation) again provided support for a Limited Irrigation Demonstration project with the University of Nebraska Extension Service.

Meeker-Driftwood, Red Willow, and Cambridge Units, Frenchman-Cambridge Division in Nebraska

General

During the spring months, Swanson, Hugh Butler, and Harry Strunk Lakes normally have a rising or stable pool which enhances the spawning of northern pike and walleye. These lakes provide excellent opportunities for fishing, water sports, and recreation.

Service is provided for Frenchman-Cambridge Irrigation District by Meeker-Driftwood Canal to 16,855 acres; Red Willow Canal to 4,797 acres; Bartley Canal to 6,353 acres; and Cambridge Canal to 17,664 acres. The water supply for these lands is provided by storage in Swanson, Hugh Butler, and Harry Strunk Lakes, and inflows of the Republican River and Red Willow and Medicine Creeks. The Frenchman-Cambridge Irrigation District has replaced all of the open ditch laterals which were economically feasible with buried pipe which has significantly increased both system and on-farm efficiencies.

2007 Summary

The annual precipitation total of 21.20 inches at Trenton Dam was 106 percent of normal. The inflow of 21,582 AF to Swanson Lake was between the dry-year and normal-year forecast. The reservoir level began the year approximately 20.2 feet below the top of conservation pool. The reservoir level gradually increased during the spring and peaked at 2737.14 feet on June 22nd (approximately 14.9 feet below full). Due to the extremely low water supply available, no water was released from Swanson Lake. Irrigation diversions were not made into Meeker-Driftwood Canal. This was the fifth consecutive year that the district did not deliver water from the Meeker-Driftwood Canal. At the end of the year the reservoir level was 17.0 feet below the top of conservation at 2735.00 feet. The Corps of Engineers determined that the reservoir prevented $3,828,000 in flood damages.

The annual precipitation total of 22.36 inches at Red Willow Dam was 114 percent of normal. The greatest precipitation event recorded at Red Willow Dam in 2007 was 2.32 inches overnight on April 23th. The annual inflow of 19,478 AF into Hugh Butler Lake was near the wet-year forecast. This was due to flood water in late May that increased the lake elevation 7.8 feet for a total of over 9,000 AF. The reservoir level at the first of the year was 18.6 feet below the top of conservation. Inflows increased the level of the reservoir to a peak of 2576.26 feet (5.5 feet below full) on June 6th. No irrigation releases were made in 2007. Irrigation diversions were not made into Red Willow Canal for the fifth consecutive year. The level of Hugh Butler Lake at the end of the year was 7.6 feet below the top of conservation. The Corps of Engineers determined that the reservoir prevented $286,000 in flood damages in 2007.

The annual precipitation total of 27.41 inches at Medicine Creek Dam was 133 percent of normal. The inflow of 67,732 AF was above the wet-year forecast. The reservoir level at the beginning of 2007 was 7.7 feet below the top of conservation. The reservoir pool gradually increased, filling the conservation capacity on April 23rd (2366.1 feet). The reservoir level increased to elevation 2372.19 feet (6.1 feet into the flood pool) on June 3rd due to large storms. Theses storms increased the storage approximately 11,000 AF with a peak average inflow of 3,500 cfs. Frenchman-Cambridge Irrigation District sold their 2007 water rights to the Republican River NRD's to aid in compact compliance. Water was released to mimic normal reservoir operations. Harry Strunk Lake was 0.3 foot below the top of conservation at the end of the year. The Corps of Engineers determined that the reservoir prevented $4,306,000 in flood damages.

An orientation meeting to review the Trenton, Red Willow, and the Medicine Creek Dams' EAPs took place in August 2007. An Annual Site Inspections was conducted in July at Red Willow Dam and August at Medicine Creek Dam. A Periodic Facility Review was conducted at Trenton Dam in June 2007. The Standing Operating Procedures for Trenton Dam was updated and republished in 2007. On-site dam operator training took place in September at both Red Willow and Medicine Creek Dams.

A technical survey of Trenton Dam was completed in September 2007.

In July 2005, a small quantity of fine sand was discovered near the river outlet works stilling basin drain outlet during an inspection at Red Willow Dam. Five piezometers were installed in April 2006 adjacent to the outlet works and spillway stilling basins, and temporary plugs were placed in the underdrain outlets in May. An Internal Alert remains in effect until additional analysis of the underdrain system is complete.

Painting of the spillway gate and associated metal work at Trenton Dam began in 2006 but was discontinued due to winter weather. The painting contractor completed the painting in 2007. A new storage building at Trenton Dam was completed in 2007.

In 2007, the District completed a pipe project that replaced approximate 3 miles of the end section of Cambridge Canal with buried pipe. Reclamation provided technical and financial assistance for this project through a cooperative agreement with the District. This project eliminated approximately 3 miles of open ditch canal and will also provide improved delivery service to a number of project irrigators.

Almena Unit, Kanaska Division in Kansas

General

Service is available to 5,764 acres in the Almena Irrigation District. The project water supply is provided by Prairie Dog Creek flows and Keith Sebelius Lake storage.

The water service contract for the City of Norton, Kansas, provides for a maximum annual use of 1,600 AF from Keith Sebelius Lake.

2007 Summary

The annual precipitation at Norton Dam totaled 24.66 inches, which is 101 percent of normal. The total inflow of 7,801 AF was slightly above the normal-year forecast. The reservoir level was 18.1 feet below the top of conservation on December 31, 2006. Late winter and early spring inflows increased the reservoir level to a peak elevation of 2290.56 feet on June 19th (13.7 feet

below full pool). Irrigation releases were made from the reservoir in 2007. A total of 1,099 AF was released into Almena Canal with 403 AF delivered to farms (37 percent efficiency). Keith Sebelius Lake was 16.2 feet below the top of conservation (2288.08 feet) at the end of the year.

The city of Norton used 399 AF of municipal water during 2007.

An Annual Site Inspection of Norton Dam was conducted in April and an orientation exercise of the Norton Dam EAP took place in August 2007.

A Safety of Dams recommendation was made in 2000 concerning the seepage through the left abutment and around the outlet works house at Norton Dam. Technical Service Center personnel inspected the seepage areas in June 2001 and recommended consideration of monitoring ¡mprovement and additional instrumentation. A final issue evaluation report of findings (Technical Memorandum ND-8312-2) in 2003 concluded that the assessed risks for seepage and piping through the foundation in the left abutment falls in the range of "justification to take action to reduce risk." Topographic surveys and additional instrumentation were installed near the outlet works in 2004. In December 2005, a Corrective Action Study Technical Memorandum evaluated various alternatives for risk reduction and produced two new recommendations. Design of a weighted filter drain system and a seepage stability berm was completed in 2006. Construction of the drain was completed in 2007.

Franklin, Superior-Courtland, and Courtland Units, Bostwick Division in Nebraska and Kansas

General

Harlan County Lake storage and Republican River flows provide a project water supply for 22,454 acres in the Bostwick Irrigation District in Nebraska, and 13,378 acres in the Kansas-Bostwick Irrigation District No. 2 above Lovewell Reservoir. This storage and natural flows, together with White Rock Creek flows and Lovewell Reservoir storage, furnish a water supply for 29,122 acres below Lovewell Reservoir in the Kansas-Bostwick Irrigation District.

The lands in the Franklin and Superior-Courtland Units are in the Bostwick Irrigation District in Nebraska. The lands in the Courtland Unit downstream of the Kansas state line are in the Kansas-Bostwick Irrigation District.

In accordance with the off-season flow alternative outlined in Reclamation's final environmental assessment dated December 16, 1983, and amended on November 21, 2002, Harlan County Lake releases will be 10 cfs during the months of December, January, and February, except when the reservoir is at low levels. During water-short years releases for these three months will be either zero or 5 cfs depending on reservoir levels. At the request of the State of Nebraska, releases of 30 cfs for a maximum 5-day period may be made to relieve icing conditions in the river.

Natural gain in streamflow, plus irrigation return flows, and operational bypass at Superior-Courtland Diversion Dam will provide some flow downstream.

The Kansas Department of Wildlife and Parks has requested that the Kansas-Bostwick Irrigation District and Reclamation maintain, when possible, a flow of 20 cfs into Lovewell Reservoir when the Courtland Canal is in operation and the conservation pool is below capacity. This recommended inflow provides excellent fishing around the canal inlet to the reservoir. The seepage below Lovewell Dam into White Rock Creek maintains a small live stream throughout the year.

2007 Summary - Bostwick Division - Harlan County Lake Operations

The annual precipitation at Harlan County Dam totaled 26.92 inches of rainfall, which is 119 percent of normal. The 2007 inflow of 198,528 AF was between the normal- and wet-year forecasts. A release was not required during January, February or December in accordance to the environmental assessment and the annual operating plan.

Harlan County Lake began 2007 approximately 19.0 feet below the top of conservation pool, at 1926.75 feet. Above normal temperatures the week of February 18th rapidly melted snow cover resulting in above normal inflows into Harlan County Lake. Storage in Harlan County increased over 22,000 AF with a peak average daily inflow of approximately 1,700 cfs. The reservoir level increased to 1929.90 feet at the end of February. Isolated thunderstorms in the basin above Harlan County produced some localized short term runoff during April and May. Strong storms dumped some heavy rainfall in the basin from April 20th through April 24th. Runoff from these storms increased the storage in Harlan County by approximately 24,000 AF with a peak average daily inflow of 2,300 cfs. The lake level increased to 1934.77 at the end of April. The basin received another 4 to 8 inches of rainfall in late May. Storm runoff from these storms peaked at approximately 1,000 cfs and increased the storage in Harlan County nearly 17,000 AF. The lake level at the end of June was 1939.36 feet, a storage increase of approximately 126,000 AF since the beginning of 2007. Irrigation releases began on June 21st and continued through August 31st. Flood releases were not required in 2007. The lake level continued to increase throughout the remainder of the year peaking at 1941.08 on December 31st Harlan County Lake prevented $27,002,000 of downstream flood damages during 2007 according to the Corps of Engineers.

Approximately 8,923 acres in the Kansas Bostwick Irrigation District above Lovewell Dam were furnished a limited water supply.

A total of 34,687 AF (approximately 61 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

2007 Summary - Bostwick Division - Nebraska

Irrigation diversions were not made into Franklin, Naponee, Franklin Pump, Superior, or Courtland Canals in Nebraska in 2007. In the spring of 2007, the Nebraska Department of Natural Resources and the Bostwick Irrigation District in Nebraska entered into a Memorandum of Agreement (MOA) to purchase the district's water supply for the 2007 calendar year. The MOA was approved by the irrigators within the district which provided that the district relinquish the rights to use its share of natural flow and storage water for the 2007 irrigation season.

The district continued to replace open ditch laterals with buried pipe to reduce losses and improve system operations. In 2005 the District was selected for a Water 2025 Challenge Grant Project that will replace approximately 10 miles of open ditch laterals with buried pipe. Identified laterals to be placed in pipe include all or portions of Superior Laterals 9.5, 17.5, 21.2, and 27.3. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improve water measurement and accounting by utilizing water meters, and provide on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation. Due to the rising pipe prices, the District was only able to replace 3 of the 4 planned laterals in 2006.

The District applied and was selected for a 2006 Water 2025 project that will allow the District to complete the original Water 2025 proposal. The District completed the pipe installation on Superior Lateral 27.3 in the fall of 2007.

2007 Summary - Bostwick Division - Kansas

The 2007 precipitation at Lovewell Dam totaled 31.52 inches, which was 115 percent of normal. Lovewell Reservoir began 2007 with a water surface elevation 6.4 feet below the top of conservation. Inflows during the first four months of the year from White Rock Creek and diversion of Republican River flows via Courtland Canal slowly increased the reservoir filling the reservoir conservation pool on April 25th (elevation 1582.6 feet). Overnight on June 27th, an isolated thunderstorm dropped 3.29 inches of rainfall at the dam. The reservoir peaked at elevation 1585.11 feet on June 28th. Releases were made into White Rock Creek beginning on June 28th and discontinued on July 6th to lower the reservoir level. Diversions of Republican River natural flows into Lovewell Reservoir continued after the irrigation release had ended and were discontinued in October. The water surface elevation gradually increased to 1581.07 feet on December 31, 2007 (1.5 feet below the top of active conservation). Lovewell Reservoir prevented $4,000 of downstream flood damages during 2007 according to the Corps of Engineers

The Kansas-Bostwick Irrigation District diverted a total of 49,849 AF to serve 8,923 acres above Lovewell Dam and 24,055 acres below Lovewell Dam. Farm delivery efficiency averaged 46 percent in the district.

A dive inspection of the outlet works inlet and spillway were conducted in September 2007.

A new storage building at Lovewell Dam was completed in 2007.

In 2007, the Kansas Bostwick Irrigation District No. 2 was awarded a Water 2025 Challenge Grant that will allow the District to replace approximately 9 miles of open ditch lateral with buried pipe. The District began placing pipe in the fall of 2007, and this project will continue for the next 2 years.

Kirwin Unit, Solomon Division in Kansas

General

The water supply for the 11,465 acres of land in the Kirwin Irrigation District is furnished by Kirwin Reservoir storage and inflows from the North Fork Solomon River and Bow Creek.

The operation of Kirwin Dam and Reservoir affords many opportunities for recreation, fishing, hunting, water sports, fish spawning, and preservation of waterfowl species.

The U.S. Fish and Wildlife Service (Service) has completed the Kirwin National Wildlife Refuge Comprehensive Conservation Plan (CCP). The 1997 National Refuge System Improvement Act required the Service to develop a CCP for each of its refuges. The Kirwin Refuge CCP will guide the refuge management activities through 2025.

2007 Summary

The annual precipitation total of 29.49 inches at Kirwin Dam was 126 percent of normal. The inflow of 21,000 AF was between the normal- and wet-year forecasts. Kirwin Reservoir was 23.8 feet below the top of conservation pool at the first of the year. The reservoir level continued to increase to a peak elevation of 1711.96 feet (17.3 feet below full) on June 4th. Due to the spring runoff, irrigation releases were made from Kirwin Reservoir. A total of 2,810 acres received project water during 2007 with 2,939 AF delivered to farms. Farm Delivery efficiency was 35 percent. The Corps of Engineers determined Kirwin reservoir prevented $18,000 in flood damages.

A functional exercise of the Kirwin Dam EAP took place in August and an Annual Site Inspection of Kirwin Dam was conducted in September.

Webster Unit, Solomon Division in Kansas

General

The Webster Irrigation District has service available to 8,537 acres. The project water supply is provided by Webster Reservoir storage and flows of the South Fork Solomon River.

2007 Summary

In 2007, the precipitation at Webster Dam was 128 percent of normal (30.04 inches). The inflow of 15,574 AF was below the normal-year forecast. Webster Reservoir began 2007 approximately 28.5 feet (elevation 1864.00 feet) below the top of conservation pool. The reservoir pool peaked at an elevation of 1871.45 feet on June 24th and gradually declined throughout the remainder of the year. Irrigation releases were not made from the reservoir in 2007. The reservoir level was 22.2 feet below the top of conservation on December 31, 2007. The Corps of Engineers determined Webster Reservoir prevented $20,000 in flood damages.

An Annual Site Inspection of Webster Dam was conducted in September and an orientation meeting to review the Webster Dam EAP took place in June.

Concrete repairs in the spillway chute continued in 2007. Approximately 3,100 ft^2 of concrete was repaired in the flat portion of the spillway by NKAO personnel in 2007. Repairs to the other areas of the spillway were contracted to Vieco Development and Construction Company, Inc. Vieco repaired approximately 6000 ft^2 of spillway.

The district continued to explore opportunities to cost share with Reclamation and district irrigators for the replacement of open ditch laterals with buried pipe. Future conservation projects include the possibility of installing remote monitoring equipment at the key canal measurement sites on Osborne Canal. Future conservation projects may be delayed due to the declining water supply and availability of cost-share funding.

Glen Elder Unit, Solomon Division in Kansas

General

Releases from Waconda Lake will be regulated as outlined in two memorandums of understanding between the State of Kansas and Reclamation. Releases are made for the city of Beloit, the Mitchell County Rural Water District, the long-term water service contract with Glen Elder Irrigation District, and for water right administration.

The water service contract with Beloit, Kansas, provides for the annual use of up to 2,000 AF of Waconda Lake storage. Water is measured at the Glen Elder Dam river outlet works. In any year that the city's water supply is insufficient and there is surplus water in Waconda Lake, such additional water may be released for the city at a rate of $15.00 per acre-foot.

The water service contract with the Mitchell County Rural Water District No. 2 provides for 1,009 AF of storage water as available from Waconda Lake.

The water service contract with the Glen Elder Irrigation District provides for the use of up to 18,000 AF of storage water each year. Based on the current State of Kansas Certificate of Appropriation, water usage is not to exceed 15,170 AF per calendar year. Water is released and measured through the river outlet works.

The available facilities along the shores of Waconda Lake and the large water surface area afford opportunities to thousands of people for picnics, sightseeing, recreation, water sports, hunting, and fishing.

When compatible with flood control operations, the operating criteria for Waconda Lake provide for a stable or rising pool level during the fish spawning period each spring.

When possible, Waconda Lake will be allowed to fill during the late summer and early fall to flood exposed shoreline vegetation. This flooded aquatic vegetation is very beneficial to waterfowl management.

Waconda Lake will normally be regulated at one to two feet below the top of conservation capacity during the winter months. Maintaining the lake at this level will reduce shoreline erosion, provide a buffer for spring runoff and lessen ice damage to the upstream face of Glen Elder Dam.

Releases from Waconda Lake will be regulated each year to maintain a constant water surface level while the lake is ice-covered.

2007 Summary

The annual precipitation total of 26.39 inches at Glen Elder Dam was 103 percent of normal. The inflow of 68,767 AF was below the normal-year forecast. Waconda Lake began the year 9.1 feet below the top of conservation. The lake level peaked at elevation 1448.95 feet on August 8th (6.7 feet below the top of conservation). This was the lowest annual peak since first filling of the reservoir. Irrigation releases began on June 8th and continued through September 19th reducing the lake level to 1448.03 feet. On December 31, 2007 the lake level was 1448.54 feet (7.1 feet below full).

A total of 19,388 AF of water was released from Glen Elder Dam in 2007. Storage releases of 7,473 AF combined with natural flow releases of 5,891 AF for the irrigation of 6,092 acres in the Glen Elder Irrigation District. The district delivered 4,706 AF to the farms resulting in a delivery efficiency of 35 percent. Storage releases totaling 77 AF were made for the City of Beloit, with an additional 4,913 AF bypassed for water quality as directed by the State Water Commissioner. Releases to the Mitchell County Rural Water District No. 2 totaled 698 AF.

A functional exercise of the Glen Elder Dam EAP took place in August 2007.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff Reservoir storage furnishes a maximum of 2,000 AF each year for the City of Russell, Kansas when required. Prior to 1993, Cedar Bluff Reservoir storage and Smoky Hill River flows had provided a water supply for 6,800 acres in the Cedar Bluff Irrigation District. Reformulation of the Cedar Bluff Unit in October of 1992 resulted in the dissolution of the Cedar Bluff Irrigation District with the Kansas Water Office and Kansas Department of Wildlife and Parks acquiring the use and control of portions of the reservoir conservation capacity. A "designated operating pool" was established for Cedar Bluff Reservoir and includes the following sub allocation pools: The City of Russell's existing water storage right which remained unchanged (2,700 AF); an artificial recharge pool under control of the Kansas Water Office (5,110 AF); and a fish, wildlife and recreation pool under control of the Kansas Department of Wildlife and Parks (21,061 AF). A "joint-use pool" has been established between the operating pool and the flood control pool for water supply, flood control, environmental and fish, wildlife and recreation purposes. Water rights for the "joint-use pool" are held jointly between the Kansas Department of Wildlife and Parks and the Kansas Water Office. A Contract Administration Memorandum between the United States of America, represented by Reclamation, the State of Kansas and the City of Russell was signed in November/December of 2003, establishing an accounting procedure for water storage in Cedar Bluff Reservoir. In January, 2006 a Memorandum of Understanding was signed by the State of Kansas agencies, Kansas Water Office, and Kansas Department of Wildlife and Parks. Kansas Department of Wildlife and Parks will be responsible for the joint pool releases and for the water rights.

2007 Summary

The annual precipitation total at Cedar Bluff Dam was 20.76 inches which is 99 percent of normal. The inflow (17,303 AF) was between the normal- and wet-year forecasts. At the beginning of the year, the level of Cedar Bluff Reservoir was 2127.96 feet (top of active conservation is 2144.00 feet). The reservoir level increased throughout the spring peaking at 2130.23 feet on June 22'[1]. On December 31, 2007, the reservoir level had decreased to 2128.25 feet (15.8 feet below the top of active conservation).

The State of Kansas used the fish hatchery facility located below Cedar Bluff Dam with 1 AF released to the facility. No water was released from Cedar Bluff Reservoir during 2007 for the City of Russell.

An Annual Site Inspection of Cedar Bluff Dam was conducted in July and a functional exercise of the Cedar Bluff Dam EAP took place in August 2007.

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

CAPACITY ALLOCATIONS 1/
LIVE CONSERVATION

RESERVOIR		DEAD	Inactive	Active	FLOOD CONTROL
Box Butte 4/	- Elevation Ft.	3969.0	3979.0	4007.0	---
	Total Acre-feet	188	2,392	29,161	---
	Net Acre-feet	188	2,204	26,769	
Merritt	- Elevation Ft.	2875.0	2896.0	2946.0	---
	Total Acre-feet	774	4,662	66,726	---
	Net Acre-feet	774	3,888	62,064	
Calamus	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	817	24,646	127,400	---
	Net Acre-feet	817	23,829	102,754	
Davis Creek	- Elevation Ft.	1998.5	2003.0	2076.0	---
	Total Acre-feet	76	172	31,158	---
	Net Acre-feet	76	96	30,986	
Bonny	- Elevation Ft.	3635.5	3638.0	3672.0	3710.0
	Total Acre-feet	1,418	2,134	41,340	170,160
	Net Acre-feet	1,418	716	39,206	128,820
Enders	- Elevation Ft.	3080.0	3082.4	3112.3	3127.0
	Total Acre-feet	7,516	8,948	42,910	72,958
	Net Acre-feet	7,516	1,432	33,962	30,048
Swanson	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
Lake	Total Acre-feet	2,118	12,430	112,214	246,291
	Net Acre-feet	2,118	10,312	99,784	134,077
Hugh Butler	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
Lake	Total Acre-feet	5,185	8,921	36,224	85,070
	Net Acre-feet	5,185	3,736	27,303	48,846
Harry Strunk	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
Lake	Total Acre-feet	3,408	7,897	34,647	87,361
	Net Acre-feet	3,408	4,489	26,750	52,714
Keith Sebelius	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
Lake	Total Acre-feet	1,636	3,993	34,510	133,740
	Net Acre-feet	1,636	2,357	30,517	99,230
Harlan County	- Elevation Ft.	1885.0	1927.0	1945.73	1973.5
Lake 3/	Total Acre-feet	0	118,099	314,111	814,111
	Net Acre-feet	0	118,099	196,012	500,000
Lovewell	- Elevation Ft.	1562.07	1571.7	1582.6	1595.3
	Total Acre-feet	1,659	11,644	35,666	86,131
	Net Acre-feet	1,659	9,970	24,022	50,465
Kirwin	- Elevation Ft.	1693.0	1697.0	1729.25	1757.3
	Total Acre-feet	4,969	8,515	98,154	313,290
	Net Acre-feet	4,969	3,546	89,639	215,136
Webster	- Elevation Ft.	1855.5	1860.0	1892.45	1923.7
	Total Acre-feet	1,256	4,231	76,157	259,510
	Net Acre-feet	1,256	2,975	71,926	183,353
Waconda	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
Lake	Total Acre-feet	248	26,237	219,420	942,408
	Net Acre-feet	248	25,989	193,183	722,988
Cedar Bluff	- Elevation Ft.	2090.0	2107.8	2144.0	2166.0
	Total Acre-feet	4,402	28,574	172,452	364,342
	Net Acre-feet	4,402	24,172	143,878	191,890
Total Storage (A.F.)		35,670	273,495	1,472,250	3,909,611 2/
Total Net Acre-feet		35,670	237,810	1,198,755	2,357,568

1/ Includes space for sediment storage.

2/ Includes total active storage for Box Butte, Merritt, Calamus, and Davis Creek Reservoirs.

3/ Bottom of irrigation pool for Harlan County Lake is 1932.5 feet, 164,111 AF.

4/ New Area Capacity Tables in effect 1-1-08. Sedimentation survey finished in April 2007.

TABLE 2
SUMMARY OF 2007 OPERATIONS
MIRAGE FLATS PROJECT

BOX BUTTE RESERVOIR — MIRAGE FLATS CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	742	42	51	0.17	5,730	0	0
Feb.	873	36	69	0.36	6,498	0	0
Mar.	3,705	47	145	0.87	10,011	0	0
Apr.	1,438	49	278	1.57	11,122	0	0
May	515	53	343	1.38	11,241	0	0
June	490	48	432	2.31	11,251	0	0
July	299	6,399	392	3.00	4,759	5,423	1,620
Aug.	765	1,666	240	1.17	3,618	1,540	884
Sep.	601	32	169	0.54	4,018	0	0
Oct.	757	36	131	1.01	4,608	0	0
Nov.	702	41	77	0.02	5,192	0	0
Dec.	788	38	47	0.66	5 895	0	0
TOTAL	11,674	8,486	2,374	13.06	–	6,963	2,504

NOTE -- Acres irrigated 2007: Mirage Flats Canal 11,092 acres.

SANDHILLS DIVISION
AINSWORTH UNIT

MERRITT RESERVOIR — AINSWORTH CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	14,418	14,182	236	0.33	61,100	0	0
Feb.	13,759	13,190	299	0.75	61,370	0	0
Mar.	15,915	14,678	420	1.93	62,187	0	0
Apr.	16,363	10,513	728	3.38	67,309	0	0
May	15,211	13,488	1,430	6.81	67,602	2,785	161
June	12,317	12,278	1,495	4.13	66,146	5,627	642
July	14,626	36,615	1,416	0.10	42,741	35,433	25,220
Aug.	16,314	26,331	785	3.70	31,939	26,471	18,679
Sep.	14,019	5,264	694	1.03	40,000	5,330	3,350
Oct.	14,846	1,537	585	3.61	52,724	0	0
Nov.	12,903	4,116	411	0.07	61,100	0	0
Dec.	13 680	13 637	312	0.92	60,831	0	0
TOTAL	174,371	165,829	8,811	26.76	–	75,646	48,052

NOTE -- Acres irrigated 2007: Ainsworth Canal 34,577 acres.

NORTH LOUP DIVISION
CALAMUS RESERVOIR — ABOVE DAVIS CREEK MIRDAN CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to Calamus Fish Hatch. (AF)	Release to Canal (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	18,795	8,340	459	0.60	117,322	319	0	0	0
Feb.	20,064	15,989	595	2.06	120,802	287	0	0	0
Mar.	23,666	20,256	1,069	2.21	123,143	301	0	0	0
Apr.	27,550	21,626	1,205	6.31	127,862	743	4,274	0	0
May	27,582	25,819	1,917	7.10	127,708	504	12,280	1,017	130
June	24,164	24,960	2,107	2.80	124,805	636	13,819	2,308	82
July	22,095	42,189	2,386	5.00	102,325	791	27,854	18,279	11,045
Aug	21,933	37,080	1,349	2.14	85,829	885	20,840	12,442	6,792
Sep.	17,618	21,228	1,235	1.56	80,984	705	6,722	4,080	2,297
Oct.	21,586	10,819	531	4.86	91,220	811	0	0	0
Nov.	18,690	7,459	657	0.00	101,794	339	0	0	0
Dec.	19 559	9 732	406	1.32	111 215	199	0	0	0
TOTAL	263,302	245,496	13,916	35.96	--	6,519	85,789	38,126	20,346

NOTE -- Acres irrigated 2007: Mirdan Canal 33,999 acres.

NORTH LOUP DIVISION (Continued)

DAVIS CREEK RESERVOIR — BELOW DAVIS CREEK FULLERTON CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Mo. Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	49	235	53	0.69	10,473	0	0
Feb.	211	210	65	0.69	10,409	0	0
Mar.	367	365	115	3.56	10,296	0	0
Apr.	2,919	349	199	4.78	12,667	0	0
May	14,275	3,370	296	8.30	23,276	2,200	0
June	13,563	6,035	515	3.74	30,289	4,419	432
July	8,495	17,199	499	2.33	21,086	16,564	12,097
Aug.	7,561	14,418	290	2.23	13,939	14,138	6,807
Sep.	2,586	6,176	170	2.32	10,179	6,031	1,211
Oct.	289	218	150	3.11	10,100	0	0
Nov.	12	202	81	0.01	9,829	0	0
Dec.	98	197	46	1.05	9,684	0	0
TOTAL	50,424	48,973	2,479	32.81	--	43,352	20,547

NOTE - Acres irrigated 2007: Fullerton Canal 20,922 acres.

TABLE 2
SUMMARY OF 2006 OPERATIONS

UPPER REPUBLICAN DIVISION
ARMEL UNIT
BONNY RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Outflow To Hale Ditch (AF)
Jan.	631	369	84	0.45	10,113	0
Feb.	1,113	321	95	0.37	10,810	0
Mar.	1,209	369	160	0.30	11,490	0
Apr.	1,176	357	339	1.91	11,970	0
May	626	1,254	562	1.96	10,780	0
June	700	986	527	3.04	9,880	87
July	785	482	631	1.70	9,552	0
Aug.	216	430	481	2.88	8,857	0
Sep.	287	417	445	0.95	8,282	0
Oct.	584	430	343	0.42	8,093	0
Nov.	253	305	151	0.16	7,890	0
Dec.	513	369	87	1.29	7,947	0
TOTAL	8,094	6,090	3,905	15.43	–	87

TABLE 2
SUMMARY OF 2007 OPERATIONS

FRENCHMAN-CAMBRIDGE DIVISION
FRENCHMAN UNIT

	ENDERS RESERVOIR					CULBERTSON CANAL		CULBERTSON EXT.CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	472	184	51	0.59	11,311	0	0	0	0
Feb.	550	167	55	0.88	11,639	0	0	0	0
Mar.	573	184	108	0.30	11,920	0	0	0	0
Apr.	603	179	184	3.61	12,160	0	0	0	0
May	588	185	297	3.62	12,266	0	0	0	0
June	9,312	179	399	6.88	21,000	0	0	0	0
July	233	738	643	4.66	19,852	0	0	0	0
Aug.	109	639	694	1.61	18,628	0	0	0	0
Sep.	62	555	444	1.68	17,691	0	0	0	0
Oct.	96	307	413	0.48	17,067	0	0	0	0
Nov.	196	298	156	0.25	16,809	0	0	0	0
Dec.	464	307	81	0.83	16,885	0	0	0	0
TOTAL	13,258	3,922	3,525	25.39	--	0	0	0	0

NOTE: Acres irrigated 2007: Culbertson Canal - 0 acres; Culbertson Extension Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT

	SWANSON LAKE					MEEKER-DRIFTWOOD	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	856	61	189	0.41	36,916	0	0
Feb.	2,897	56	210	0.16	39,547	0	0
Mar.	5,999	61	425	1.64	45,060	0	0
Apr.	6,563	60	767	4.93	50,796	0	0
May	2,275	62	1,472	2.18	51,537	0	0
June	1,594	60	1,599	1.25	51,472	0	0
July	359	62	1,867	2.65	49,902	0	0
Aug.	655	62	1,606	4.58	48,889	0	0
Sep.	0	60	1,750	1.36	47,079	0	0
Oct.	0	61	1,167	0.70	45,851	0	0
Nov.	0	60	640	0.12	45,151	0	0
Dec.	385	61	264	1 - 22	45 211	0	0
TOTAL	21,582	726	11,956	21.20	--	0	0

NOTE: Acres irrigated 2007: Meeker-Driftwood Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT

	HUGH BUTLER LAKE					RED WILLOW CANAL		BARTLEY CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	942	246	58	0.42	13,743	0	0	0	0
Feb.	2,026	222	66	0.18	15,481	0	0	0	0
Mar.	1,348	246	136	1.52	16,447	0	0	0	0
Apr.	1,973	238	256	5.67	17,926	0	0	0	0
May	9,359	246	588	2.27	26,451	0	0	0	0
June	1,949	238	689	2.23	27,473	0	0	0	0
July	499	246	808	4.56	26,918	0	0	0	0
Aug.	210	246	743	2.12	26,139	0	0	0	0
Sep.	73	238	612	1.63	25,362	0	0	0	0
Oct.	152	246	419	0.74	24,849	0	0	0	0
Nov.	265	238	210	0.10	24,666	0	0	0	0
Dec.	682	246	109	0.92	24,993	0	0	0	0
TOTAL	19,478	2,896	4,694	22.36	–	0	0	0	

NOTE -- Acres irrigated 2007: Red Willow Canal - 0 acres; Bartley Canal 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT

	HARRY STRUNK LAKE					CAMBRIDGE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,430	61	86	0.72	25,211	0	0
Feb.	7,525	56	106	0.86	32,574	0	0
Mar.	3,364	1,908	238	0.95	33,792	0	0
Apr.	5,483	2,394	452	6.61	36,429	0	0
May	11,522	3,243	960	3.05	43,748	0	0
June	15,194	21,335	852	2.14	36,755	0	0
July	7,840	12,452	857	6.71	31,286	0	0
Aug.	4,275	4,770	708	2.48	30,083	0	0
Sep.	2,281	60	668	2.11	31,636	0	0
Oct.	2,351	62	455	0.68	33,470	0	0
Nov.	2,422	1,619	283	0.07	33,990	0	0
Dec.	3,045	2,737	145	1.03	34 153	0	0
TOTAL	67,732	50,698	5,810	27.41	--	0	0

NOTE -- Acres irrigated 2007: Cambridge Canal 0 acres.

TABLE 2
SUMMARY OF 2007 OPERATIONS

KANASKA DIVISION
ALMENA UNIT

	KEITH SEBELIUS LAKE						ALMENA CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To City Of Norton (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	319	49	55	0.55	8,330	18	0	0
Feb.	2,774	45	74	0.26	10,985	17	0	0
Mar.	749	49	158	1.84	11,527	19	0	0
Apr.	884	50	403	3.17	11,958	20	0	0
May	791	65	571	3.97	12,113	34	0	0
June	632	81	618	3.14	12,046	51	0	0
July	631	1,287	728	3.47	10,662	65	1,099	403
Aug.	185	80	593	2.37	10,174	49	0	0
Sep.	23	71	481	1.19	9,645	41	0	0
Oct.	355	66	321	3.14	9,613	35	0	0
Nov.	72	56	152	0.08	9,477	26	0	0
Dec.	386	55	76	1.48	9,732	24	0	0
TOTAL	7,801	1,954	4,230	24.66	--	399	1,099	403

NOTE: Acres irrigated 2007: Almena Canal - 1,700 acres.

BOSTWICK DIVISION
FRANKLIN UNIT

	HARLAN COUNTY LAKE Data from Corps of Engineers					FRANKLIN CANAL		NAPONEE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	3,035	0	479	2.77	118,855	0	0	0	0
Feb.	22,631	0	457	0.31	141,029	0	0	0	0
Mar.	17,425	0	899	2,52	157,555	0	0	0	0
Apr.	30,803	0	2,390	2.78	185,968	0	0	0	0
May	24,476	0	3,171	5.29	207,273	0	0	0	0
June	41,187	2,088	4,313	2.78	242,059	0	0	0	0
July	26,130	12,238	6,174	2.79	249,777	0	0	0	0
Aug.	11,702	6,911	5,981	1.56	248,587	0	0	0	0
Sep.	4,304	0	5,970	2.41	246,921	0	0	0	0
Oct.	5,355	0	4,165	2.18	248,111	0	0	0	0
Nov.	4,284	0	3,094	0.00	249,301	0	0	0	0
Dec.	7,196	0	1,104	1.53	255,393	0	0	0	0
TOTAL	198,528	21,237	38,197	26.92	--	0	0	0	0

NOTE: Acres irrigated 2007: Franklin Canal - 0 acres; Naponee Canal - 0 acres.

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

	FRANKLIN PUMP CANAL		SUPERIOR CANAL			COURTLAND CANAL - ABOVE LOVEWELL NEBRASKA USE		KANSAS USE	
Month	Diverted To Canal (AF)	Delivered To Farms (AF)	Diverted To Canal (AF)	Delivered To Farms (AF)	Total Diversion (AF)	Total (AF)	Delivered To Farms (AF)	Diversion To Canal (AF)	Delivered To Farms (AF)
Jan.	0	0	0	0	0	0	0	0	0
Feb.	0	0	0	0	0	0	0	0	0
Mar.	0	0	0	0	0	0	0	0	0
Apr.	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	3,114	66
July	0	0	0	0	0	0	0	7,041	3,266
Aug.	0	0	0	0	0	0	0	4,593	2,457
Sep.	0	0	0	0	0	0	0	0	0
Oct.	0	0	0	0	0	0	0	0	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	14,748	5,789

NOTE: Acres irrigated 2007: Franklin Pump Canal - 0 acres; Superior Canal - 0 acres.
Courtland Canal-Nebraska use - 0 acres.
Courtland Canal-Kansas use - 8,923 acres.

BOSTWICK DIVISION (Continued)
COURTLAND UNIT

	LOVEWELL RESERVOIR							COURTLAND (Below)	
Month	Est. Flow from White Rock Creek (AF)	Inflow from Courtland 34.8 (AF)	Total Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	549	2,047	2,596	12	120	0.43	22,069	0	0
Feb.	1,485	4,076	5,561	11	160	0.71	27,459	0	0
Mar.	2,052	3,602	5,654	12	347	2.44	32,754	0	0
Apr.	682	3,941	4,623	12	766	1.57	36,599	0	0
May	2,410	4,447	6,857	1,836	1,142	5.61	40,478	1,695	0
June	7,402	1,806	9,208	4,924	1,390	8.11	43,372	4,637	196
July	558	5,318	5,876	16,318	1,215	1.94	31,715	15,064	8,735
Aug.	2,879	5,975	8,854	13,489	1,219	2.98	25,861	13,505	8,233
Sep.	1,372	3,227	4,599	12	908	2.83	29,540	0	0
Oct.	1,795	248	2,043	12	683	3.05	30,888	0	0
Nov.	0	0	0	12	424	0.02	30,452	0	0
Dec.	1,024	0	11024	12	191	1.83	31,273	0	0
TOTAL	22,208	34,687	56,895	36,663	8,565	31.52	--	35,101	17,164

NOTE: Acres irrigated 2007: Courtland Canal below Lovewell 24,055 acres.

TABLE 2
SUMMARY OF 2007 OPERATIONS

SOLOMON DIVISION
KIRVVIN UNIT

KIRVVIN RESERVOIR — KIRVVIN CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	606	0	98	0.45	19,902	0	0
Feb.	6,445	0	148	0.69	26,199	0	0
Mar.	3,550	0	307	3.34	29,442	0	0
Apr.	2,657	0	621	1.55	31,478	0	0
May	1,930	0	1,130	2.85	32,278	0	0
June	898	0	1,275	1.66	31,901	0	0
July	1,827	5,187	1,373	7.16	27,168	5,233	1,652
Aug.	1,217	3,306	1,115	5.19	23,964	3,208	1,287
Sep.	591	0	780	2.28	23,775	0	0
Oct.	402	0	514	2.98	23,663	0	0
Nov.	167	0	296	0.12	23,534	0	0
Dec.	710	O	148	1 22	24 096	0	O
TOTAL	21,000	8,493	7,805	29.49	–	8,441	2,939

NOTE: Acres irrigated 2007: Kihvin Canal - 2,810 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

WEBSTER RESERVOIR — OSBORNE CANAL

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	591	0	85	0.67	9,068	0	0
Feb.	3,910	0	109	0.15	12,869	0	0
Mar.	2,965	0	223	4.61	15,611	0	0
Apr.	3,118	0	388	1.83	18,341	0	0
May	1,851	0	807	3.04	19,385	0	0
June	1,048	0	858	1.19	19,575	0	0
July	614	0	1,046	5.37	19,143	0	0
Aug.	491	0	1,056	5.09	18,578	0	0
Sep.	565	0	735	4.33	18,408	0	0
Oct.	0	0	622	1.18	17,786	0	0
Nov	0	0	348	0.21	17,438	0	0
Dec.	421	0	139	2.37	17720	0	0
TOTAL	15,574	0	6,416-	30.04	--	0	0

NOTE: Acres irrigated 2007: Osborne Canal - 0 acres.

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT

WACONDA LAKE — OUTFLOW TO RIVER

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	City of Beloit Storage Release (AF)	Quality Bypass (AF)	Irrig.District Storage Release (AF)	Other Controlled Releases (AF)	Release To Mitchell Co. RWD No. 2 (AF)
Jan.	1,149	676	473	0.49	125,621	0	615	0	0	61
Feb.	4,346	615	593	1.21	128,759	0	555	0	0	60
Mar.	3,841	677	1,156	2.31	130,767	0	615	0	0	62
Apr.	4,990	650	2,399	2.16	132,708	0	595	0	0	55
May	6,634	667	3,835	4.56	134,840	0	615	0	0	52
June	6,265	2,451	4,328	2.66	134,326	0	277	1,131	990	53
July	11,935	5,944	5,220	3.81	135,097	0	0	3,057	2,814	73
Aug.	15,473	3,559	5,460	2.30	141,551	0	95	1,559	1,841	64
Sep.	2,138	2,188	3,988	2.04	137,513	77	86	1,726	246	53
Oct.	7,418	545	2,835	2.57	141,551	0	492	0	0	53
Nov.	781	536	1,396	0.12	140,400	0	476	0	0	60
Dec.	3,797	544	670	2.16	142,983	0	492	0	0	52
TOTAL	68,767	19,052	32,353	26.39	--	77	4,913	7,473	5,891	698

NOTE: Acres irrigated 2007: Glen Elder District 6,092 acres.

SMOKY HILL DIVISION
ELLIS UNIT

CEDAR BLUFF RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to City of Russell (AF)	Release To Fish Hatchery (AF)	Release to Kansas Water Office (AF)
Jan.	449	0	290	0.36	85,516	0	0	0
Feb.	2,754	0	338	0.21	87,932	0	0	0
Mar.	1,713	0	649	4.27	88,996	0	0	0
Apr.	2,015	0	1,025	2.64	89,986	0	0	0
May	1,877	0	1,753	3.43	90,110	0	0	0
June	6,279	0	2,016	1.80	94,373	0	0	0
July	1,143	0	2,552	2.76	92,964	0	0	0
Aug.	314	1	2,501	1.00	90,776	0	1	0
Sep.	15	0	1,878	1.72	88,913	0	0	0
Oct.	0	0	1,468	0.81	87,445	0	0	0
Nov.	0	0	1,290	0.16	86,155	0	0	0
Dec.	744	0	382	1.60	86 517	0	0	0
TOTAL	17,303	1	16,142	20.76	--			

TABLE 3

ACRES IRRIGATED IN 2007

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2007
Mirage Flats Irrigation District		
Mirage Flats Canal	11,662	11,092
Ainsworth Irrigation District		
Ainsworth Canal	35,000	34,577
Twin Loups Irrigation District		
Above Davis Creek	34,053	33,999
Below Davis Creek	20,851	20,922
Total Twin Loups Irrigation District	54,904	54,921
Frenchman Valley Irrigation District		
Culbertson Canal	9,292	0
H & RW Irrigation District		
Culbertson Extension Canal	11,915	0
Frenchman-Cambridge Irrigation District		
Meeker-Driftwood Canal	16,855	0
Red Willow Canal	4,797	0
Bartley Canal	6,353	0
Cambridge Canal	17,664	0
Total Frenchman-Cambridge Irrigation District	45,669	0
Almena Irrigation District		
Almena Canal	5,764	1,700
Bostwick Irrigation District in Nebraska		
Franklin Canal	10,920	0
Naponee Canal	1,650	0
Franklin Pump Canal	2,090	0
Superior Canal	5,848	0
Courtland Canal (Nebraska)	1,946	0
Total Bostwick Irrigation Dist. in Nebraska	22,454	0
Kansas-Bostwick Irrigation District		
Courtland Canal above Lovewell	13,378	8,923
Courtland Canal below Lovewell	29,122	24,055
Total Kansas-Bostwick Irrigation District	42,500	32,978
Kirwin Irrigation District		
Kirwin Canal	11,465	2,810
Webster Irrigation District		
Osborne Canal	8,537	0
Glen Elder Irrigation District	10,370	6,092
TOTAL PROJECT USES	269,532	144,170
Non-Project Uses		
Hale Ditch	700	0
TOTAL PROJECT AND NON-PROJECT	270,232	144,170

TABLE 5

FLOOD DAMAGES PREVENTED BY NEBRASKA-KANSAS PROJECTS RESERVOIRS

RESERVOIR	DURING FY 2007	PRIOR TO 2007	ACCUMULATED TOTAL
BONNY	$4,000	$2,787,000	$2,791,000
ENDERS	$277,000	$3,281,000	$3,558,000
SWANSON	$3,828,000	$19,157,000	$22,985,000
HUGH BUTLER	$286,000	$2,665,000	$2,951,000
HARRY STRUNK	$4,306,000	$5,037,000	$9,343,000
KEITH SEBELIUS	$31,000	$3,958,000	$3,989,000
HARLAN COUNTY	$27,002,000	$150,561,000	$177,563,000
LOVEWELL	$4,000	$146,615,000	$146,619,000
KIRWIN	$18,000	$86,870,000	$86,888,000
WEBSTER	$20,000	$110,320,000	$110,340,000
WACONDA	$3,880,000	$1,213,454,000	$1,217,334,000
CEDAR BLUFF	$1,148,000	$128,890,000	$130,038,000
TOTAL	$40,804,000	$1,873,595,000	$1,914,399,000

Estimates of damages prevented are received from the Army Corps of Engineer's Kansas City District Office. The Accumulated Totals date from 1951 through 2007. Cumulative totals are revised by the Corps of Engineers in some cases to reflect data not previously included in the reporting and may not match previous cumulative totals.

Construction Cost of storage dams was $208,954,130.
The reservoirs upstream of Harlan County Lake did not receive benefits for damages prevented from 1972 to 1993.

TABLE 6
WATER DIVERTED IN 2007
(Units - Acre-Feet)

Irrigation District and Canal	2007 Irrigation Operations From	To	10-Year Average Diversion (1997-2006)	2007 Diversion
Mirage Flats Irrigation District				
Mirage Flats Canal	7/6	8/13	11,663	6,963
Ainsworth Irrigation District				
Ainsworth Canal	5/15	9/15	76,058	75,646
Twin Loups Irrigation District				
Above Davis Creek	4/18	9/17	44,864	38,126
Below Davis Creek	5/14	9/19	39,919	43,352
Total Twin Loups Irrigation District			84,783	81,478
Frenchman Valley Irrigation District				
Culbertson Canal	Did not run.		7,646	0
H & RW Irrigation District				
Culbertson Extension Canal	Did not run.		5,538	0
Frenchman-Cambridge Irrigation District				
Meeker-Driftwood Canal	Did not run.		14,080	0
Red Willow Canal	Did not run.		3,957	0
Bartley Canal	Did not run.		5,058	0
Cambridge Canal	Did not run.		22,532	0
Total Frenchman-Cambridge Irrigation District			45,627	0
Almena Irrigation District				
Almena Canal	7/22	7/31	3,623	1,099
Bostwick Irrigation District in Nebraska				
Franklin Canal	Did not run.		20,392	0
Naponee Canal	Did not run.		1,958	0
Franklin Pump Canal	Did not run.		2,093	0
Superior Canal	Did not run.		10,150	0
Courtland Canal (Nebraska)	Did not run.		1,549	0
Total Bostwick Irrigation District in Nebraska			36,142	0
Kansas-Bostwick Irrigation District				
Courtland Canal above Lovewell	6/18	8/28	19,789	14,748
Courtland Canal below Lovewell	5/14	8/30	42,351	35,101
Total Kansas-Bostwick Irrigation District			62,140	49,849
Kirwin Irrigation District				
Kirwin Canal	7/10	8/17	15,779	8,441
Webster Irrigation District				
Osborne Canal	Did not run.		10,256	0
Glen Elder Irrigation District	6/9	9/19	7,306	7,473
TOTAL			366,561	230,949

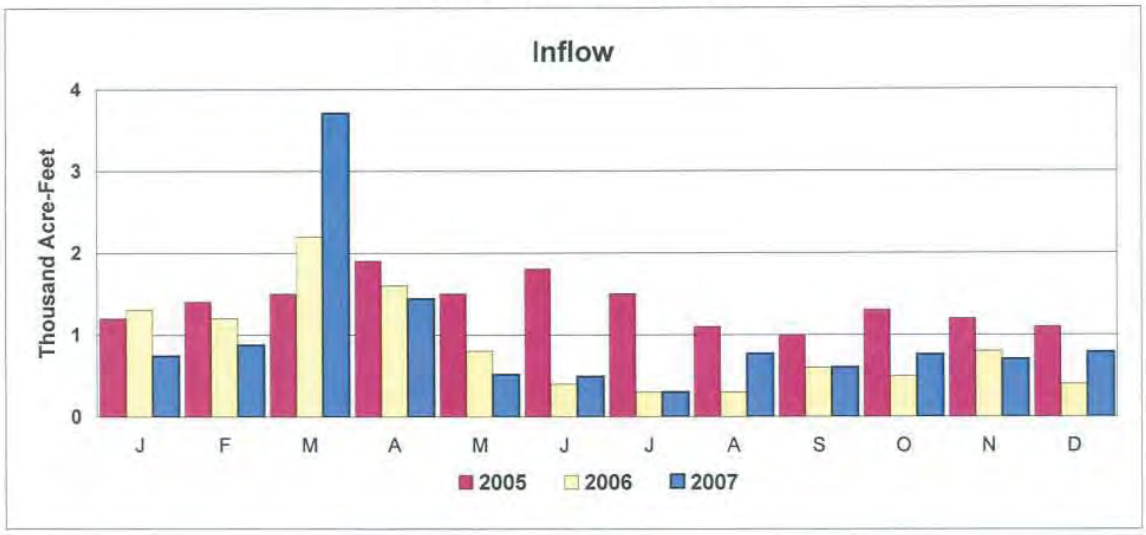
TABLE 7
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2007

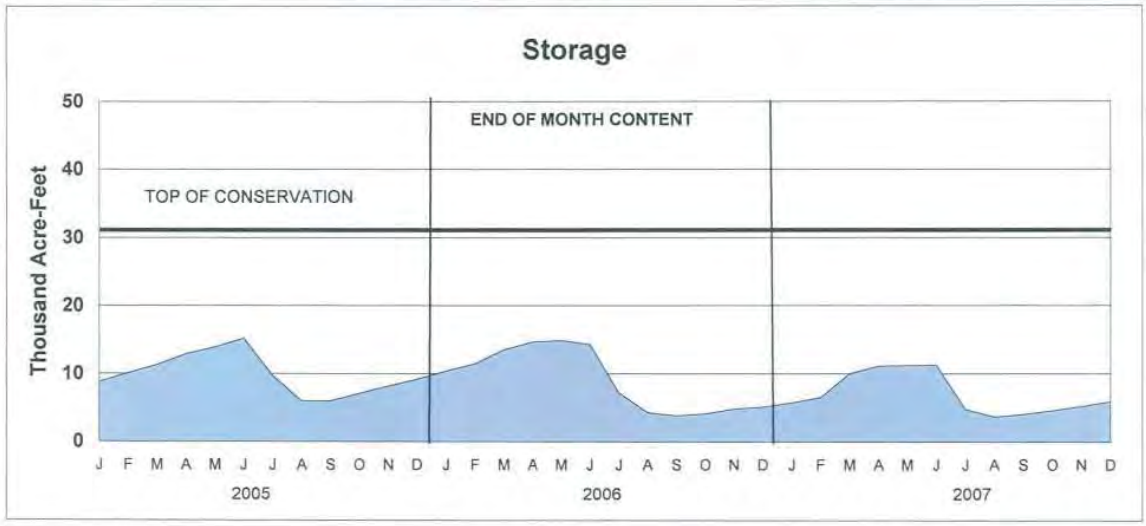
Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-06 AF	Storage 12-31-07 AF	Gain or Loss AF	Maximum Storage Content AF	Maximum Storage Date	Minimum Storage Content AF	Minimum Storage Date	Total Inflow AF
Box Butte	13.06	77	5,081	5,895	814	11,444	JUN 21	3,204	AUG 13	11,674
Merritt	26.76	132	61,100	60,831	-269	67,720	MAY 30	31,230	SEP 6	174,371
Calamus	35.96	152	107,326	111,215	3,889	129,253	APR 16	79,922	SEP 16	263,302
Davis Creek	32.81	135	10,712	9,684	-1,028	30,289	JUN 29	9,608	SEP 17	50,424
Bonny	15.43	90	9,935	7,947	-1,988	13,048	MAY 2	7,874	DEC 2	8,094
Enders	25.39	134	11,074	16,885	5,811	21,577	JUN 18	11,081	JAN 1	13,258
Swanson	21.20	106	36,310	45,211	8,901	51,925	JUN 22	36,310	JAN 1	21,582
Hugh Butler	22.36	114	13,105	24,993	11,888	27,824	JUN 22	13,123	JAN 1	19,478
Harry Strunk	27.41	133	23,751	34,153	10,402	47,271	JUN 3	22,941	JAN 1	67,732
Keith Sebelius	24.66	101	8,115	9,732	1,617	12,256	JUN 19	8,132	JAN 1	7,801
Harlan County	26.92	119	116,299	255,393	139,094	255,393	DEC 31	116,761	JAN 1	198,528
Lovewell	31.52	115	19,605	31,273	11,668	43,809	JUN 28	19,688	JAN 1	56,895
Kirwin	29.49	126	19,394	24,096	4,702	32,379	JUN 4	19,473	JAN 1	21,000
Webster	30.04	128	8,562	17,720	9,158	19,715	JUN 24	8,587	JAN 1	15,574
Waconda	26.39	103	125,621	142,983	17,362	146,709	AUG 8	146,710	AUG 8	68,7676
Cedar Bluff	20.76	99	85,357	86,517	1,160	94,761	JUN 24	85,357	JAN 19	17,303

EXHIBIT 1A

BOX BUTTE RESERVOIR

ACTUAL OPERATION





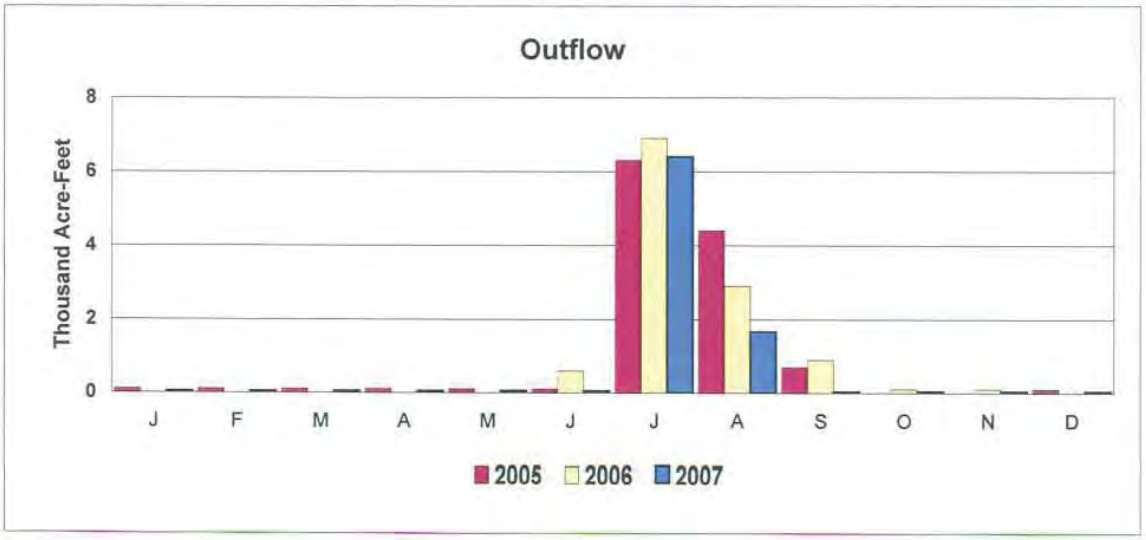
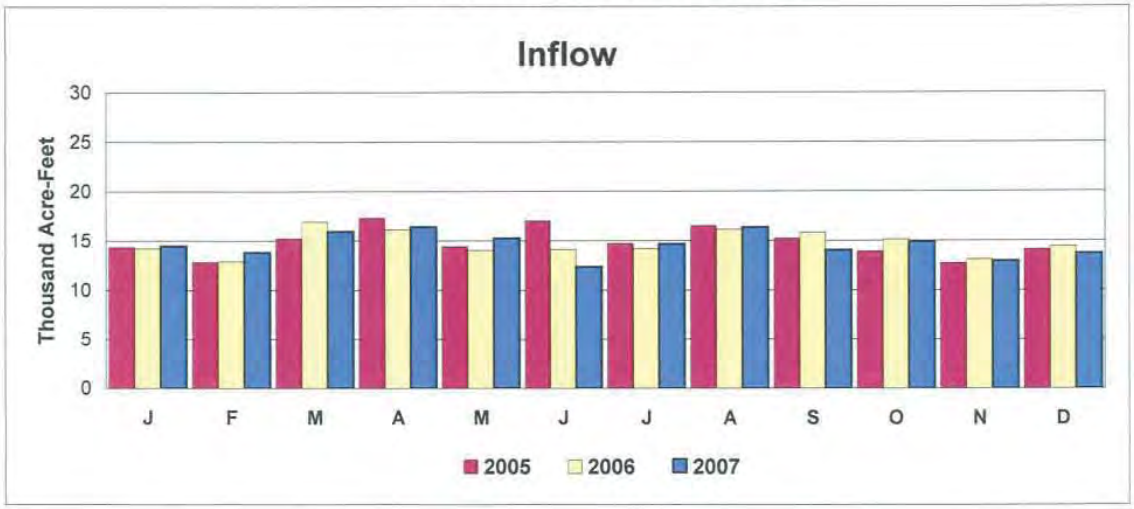
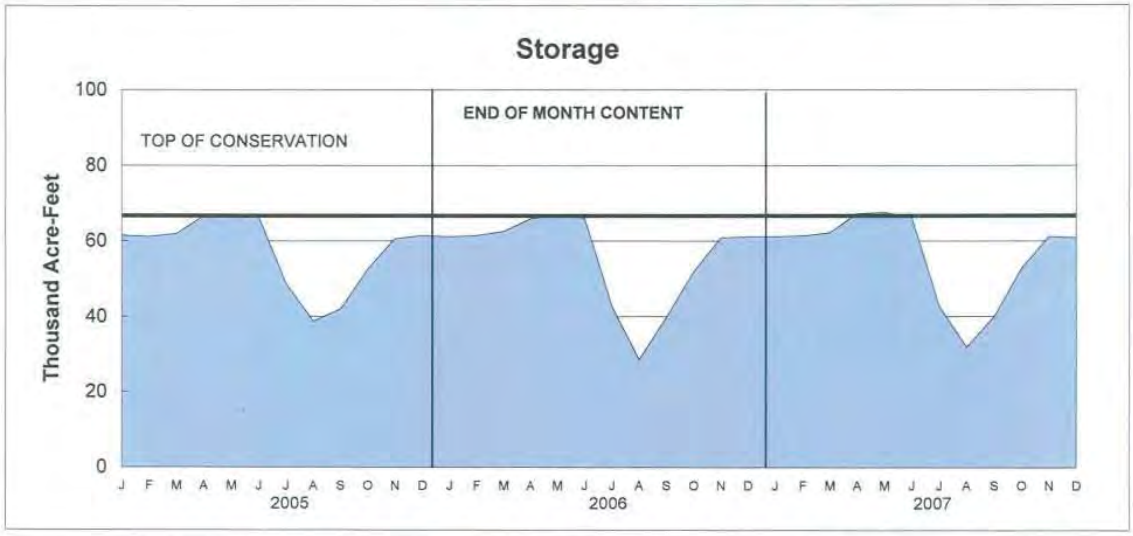


EXHIBIT 2A

MERRITT RESERVOIR
ACTUAL OPERATION





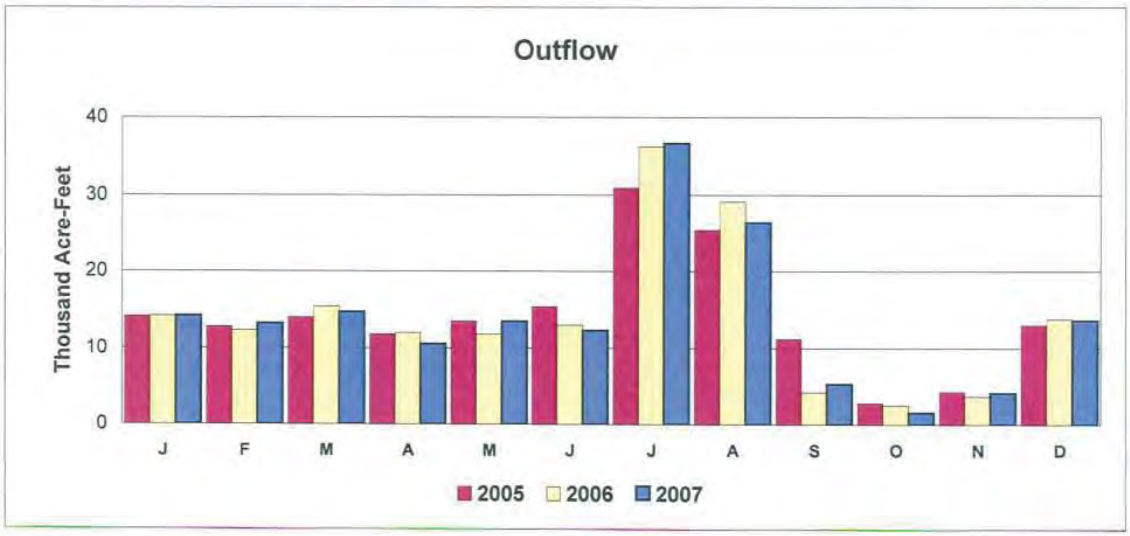
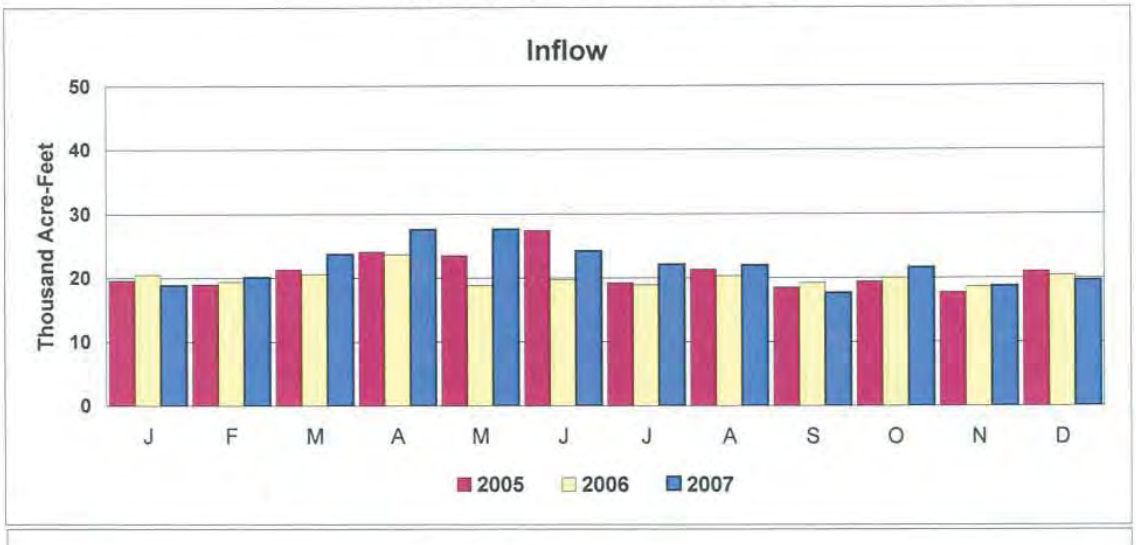
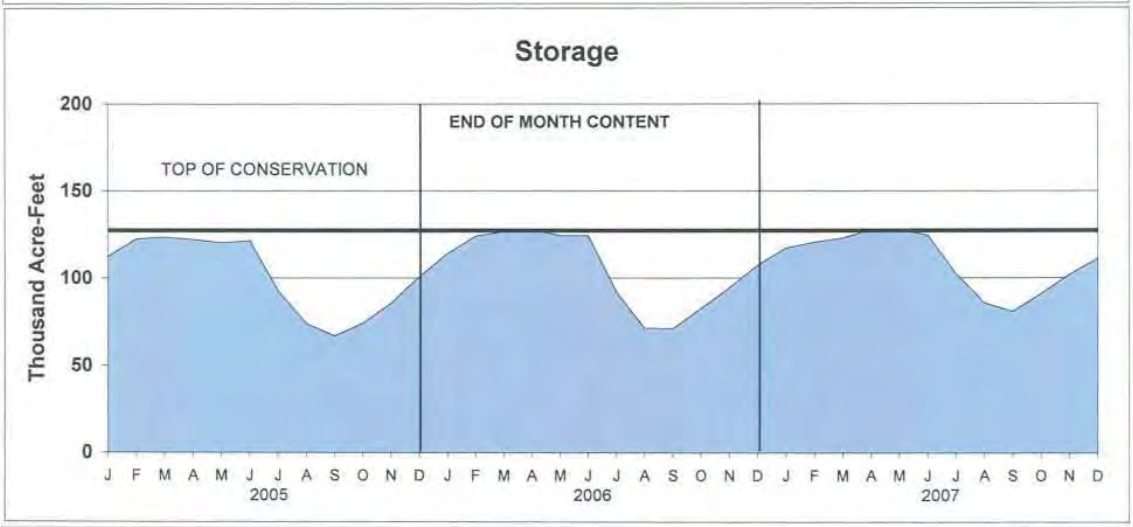


EXHIBIT 3A

CALAMUS RESERVOIR

ACTUAL OPERATION





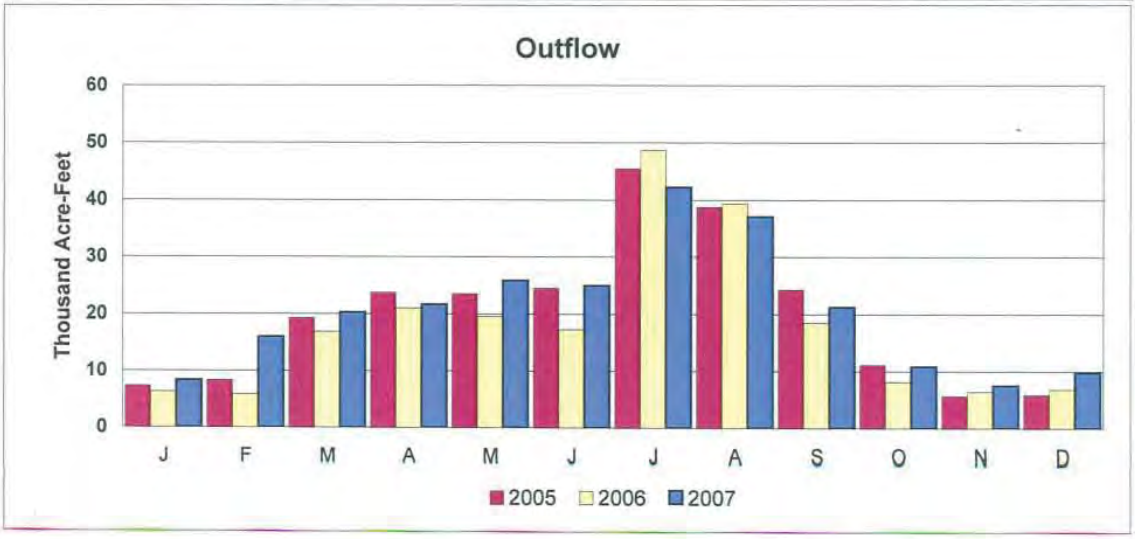
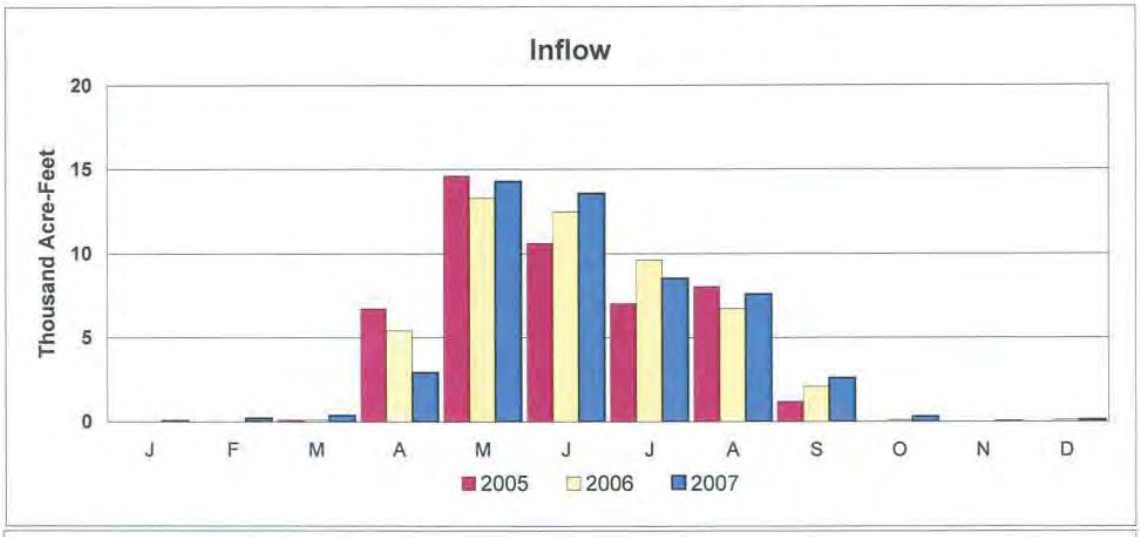
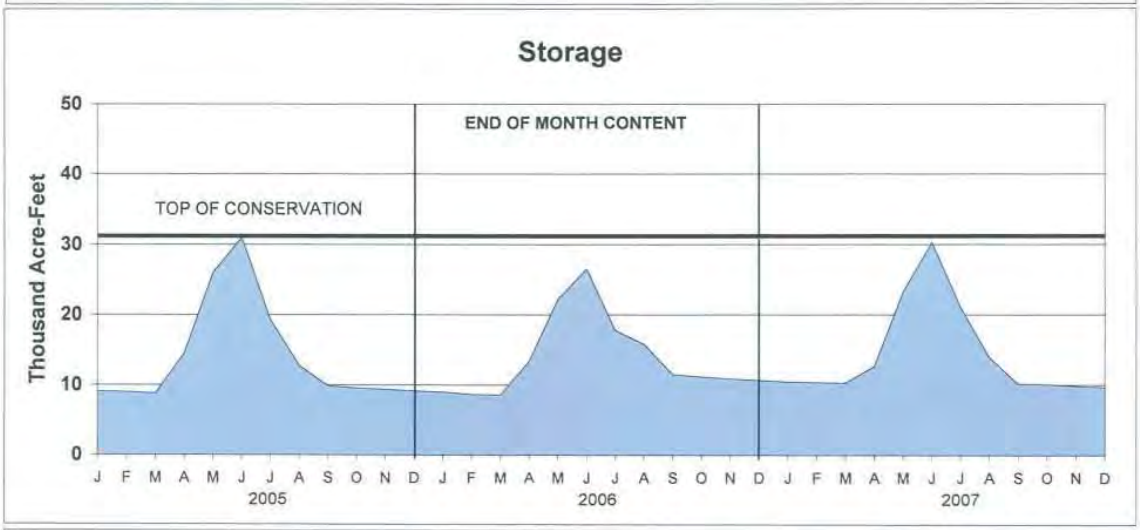


EXHIBIT 4A

DAVIS CREEK RESERVOIR

ACTUAL OPERATION





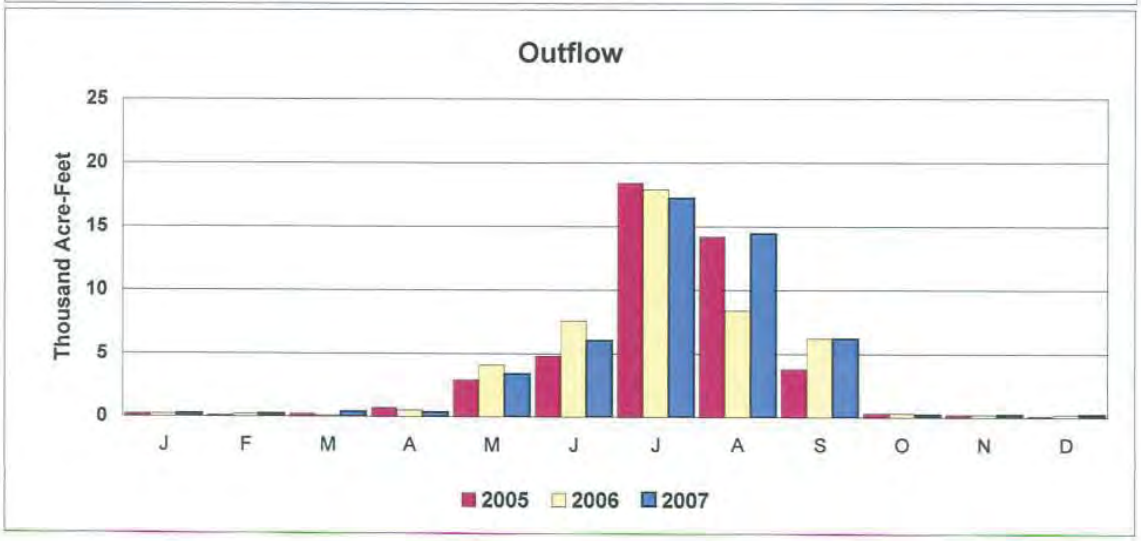
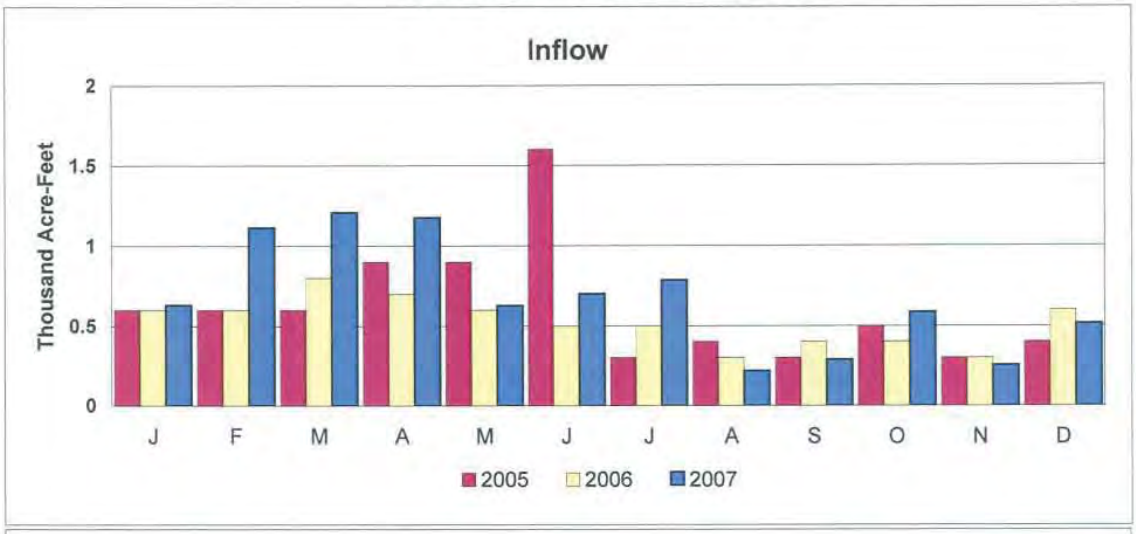
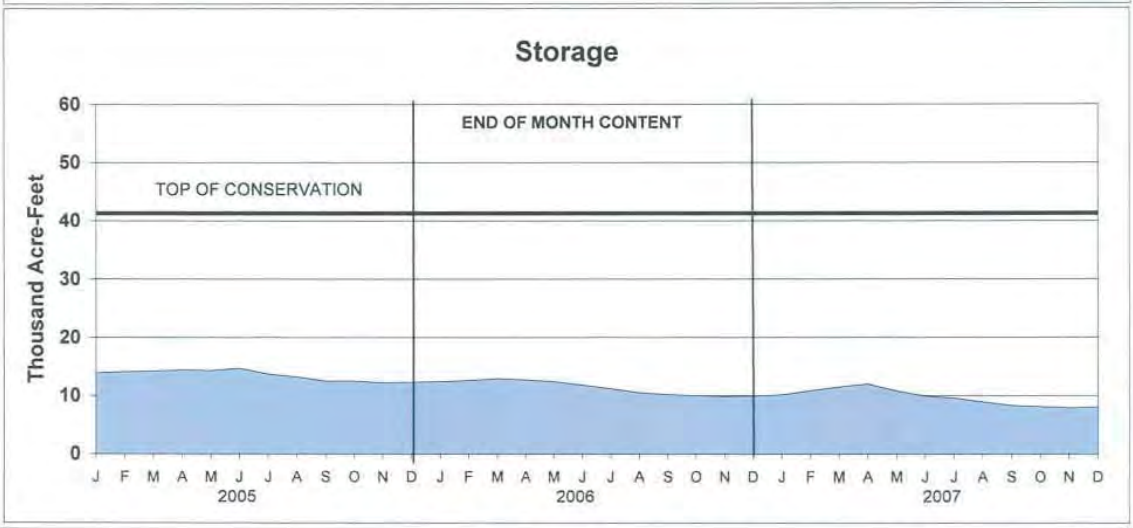


EXHIBIT 5A

BONNY RESERVOIR

ACTUAL OPERATION





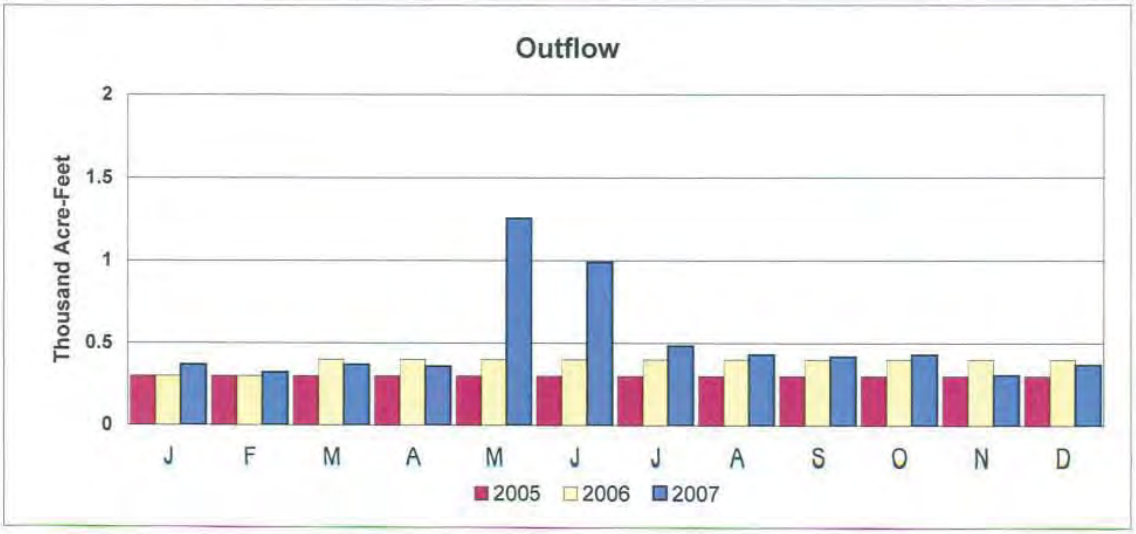
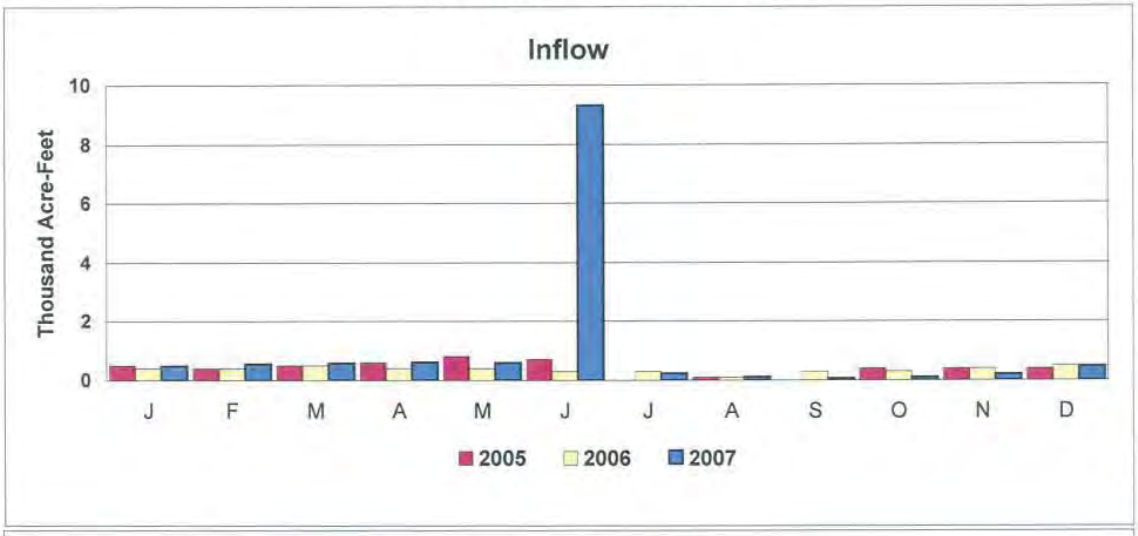
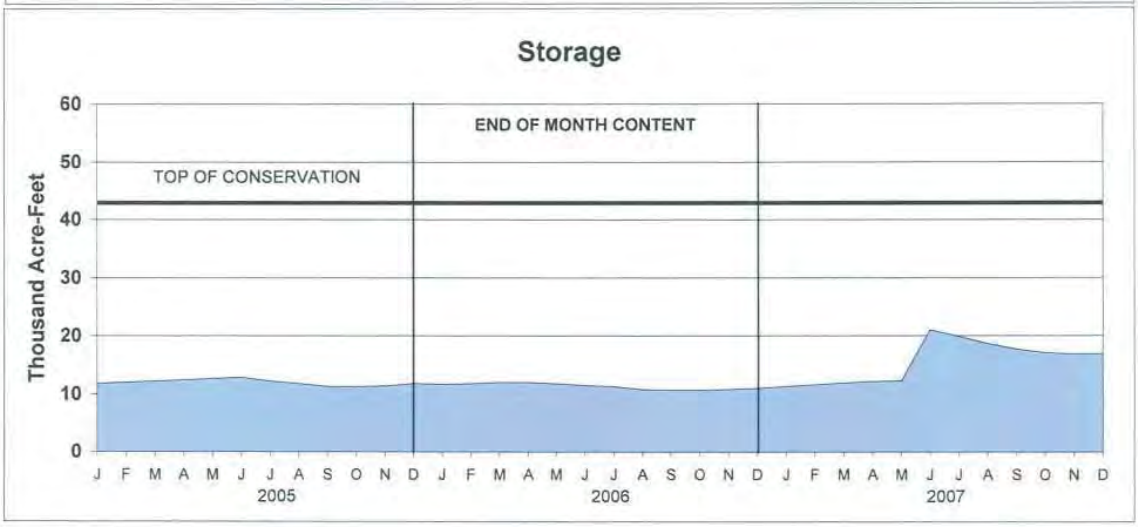


EXHIBIT 6A

ENDERS RESERVOIR

ACTUAL OPERATION





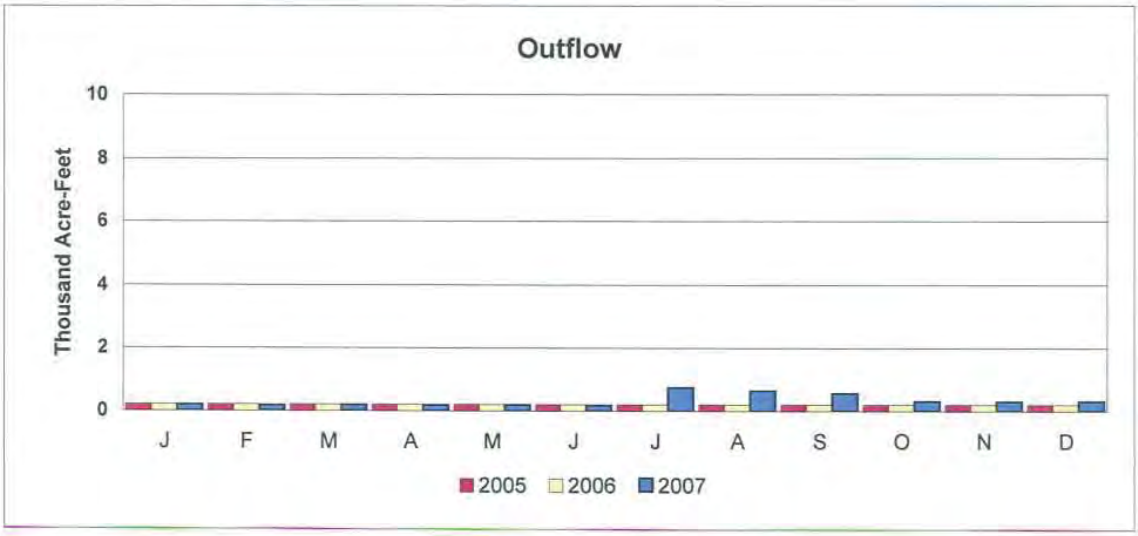
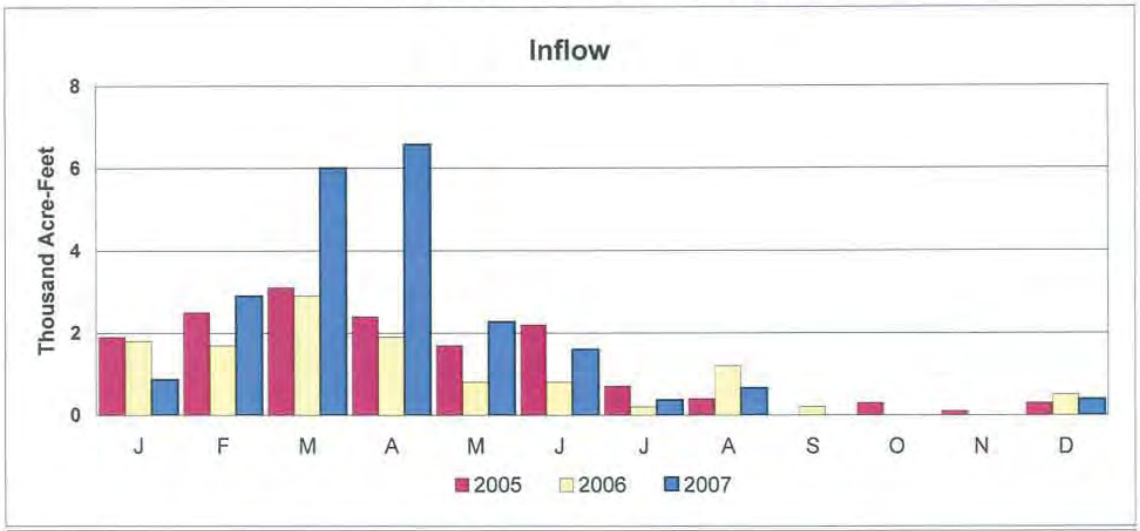
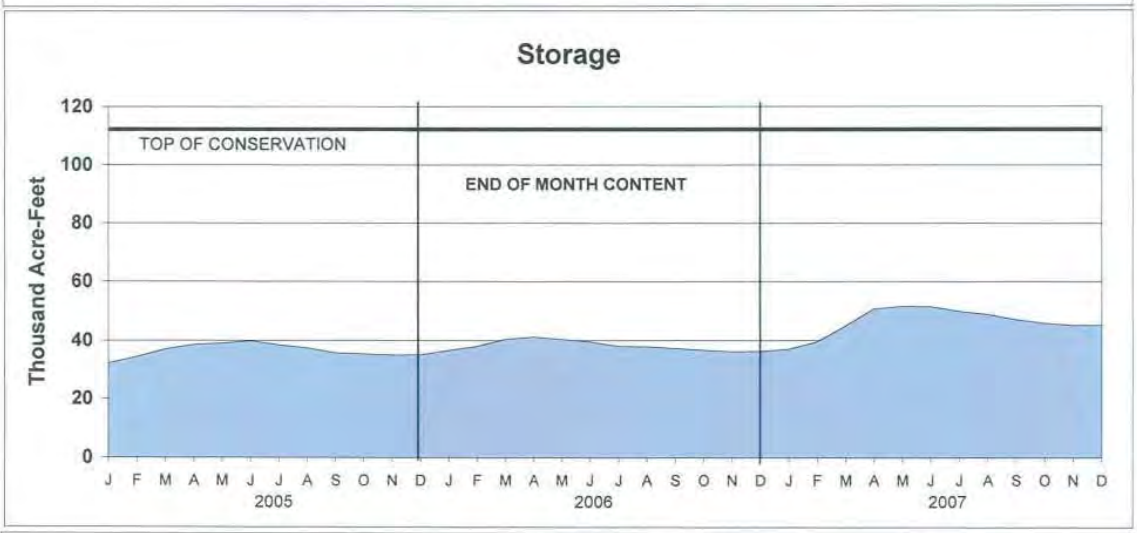


EXHIBIT 7A

SWANSON LAKE
ACTUAL OPERATION





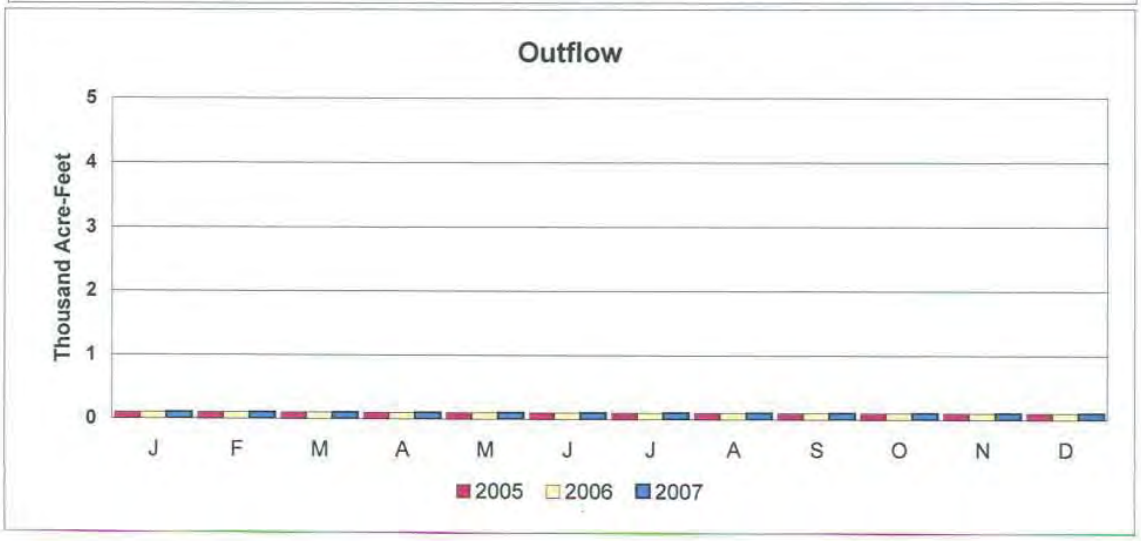
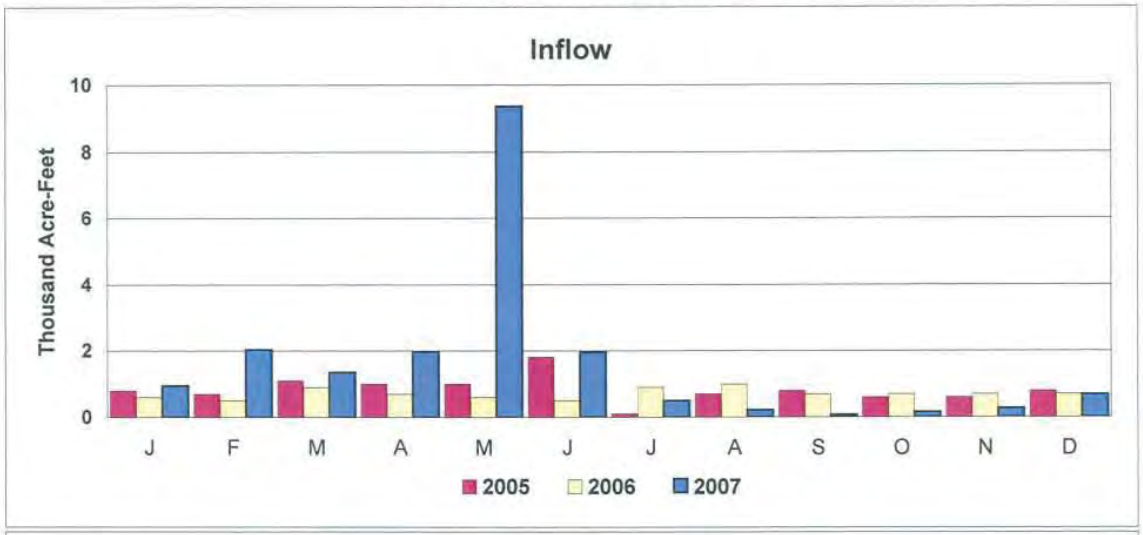
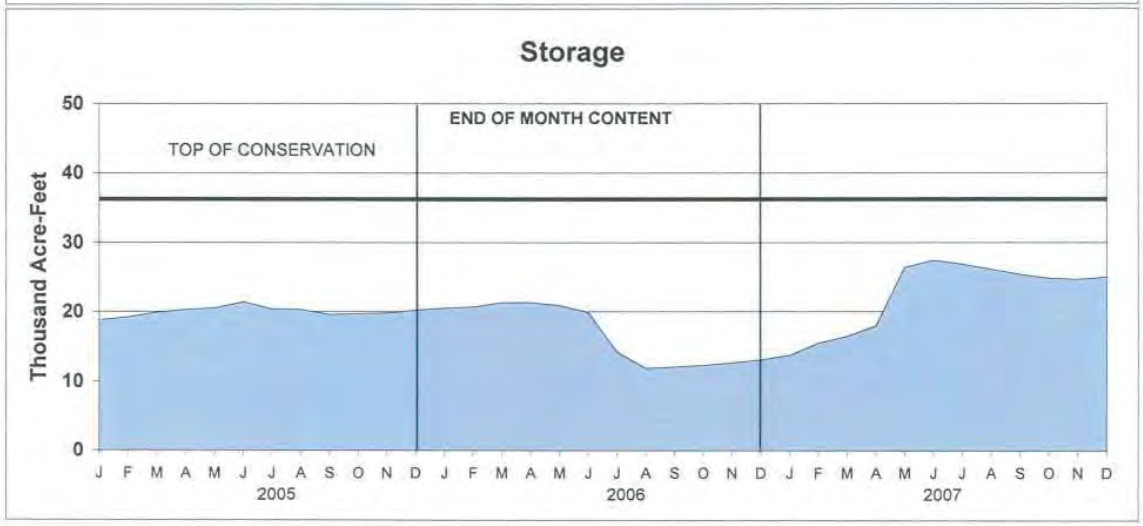


EXHIBIT 8A

HUGH BUTLER LAKE

ACTUAL OPERATION





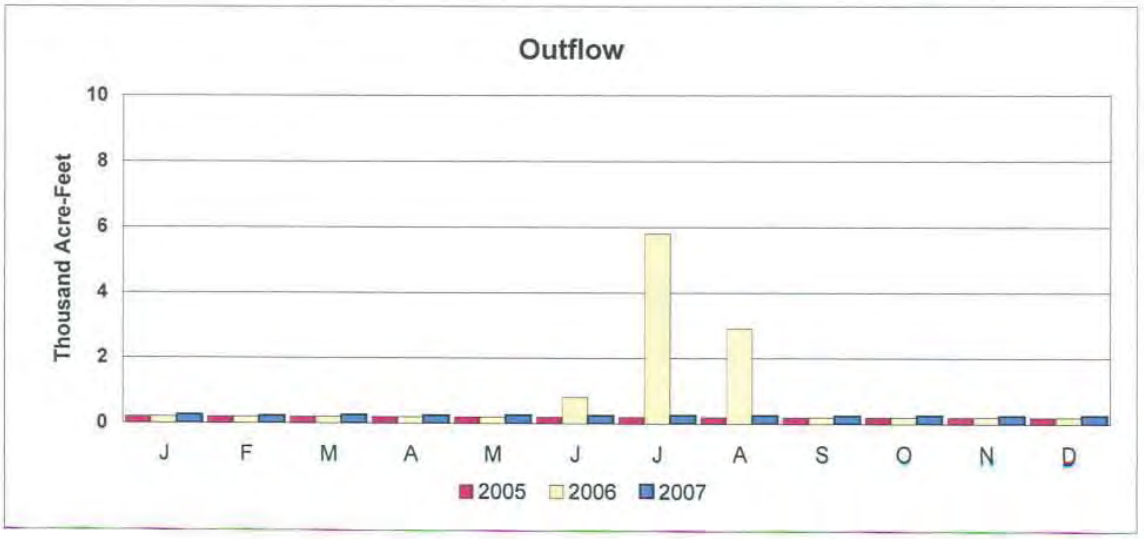
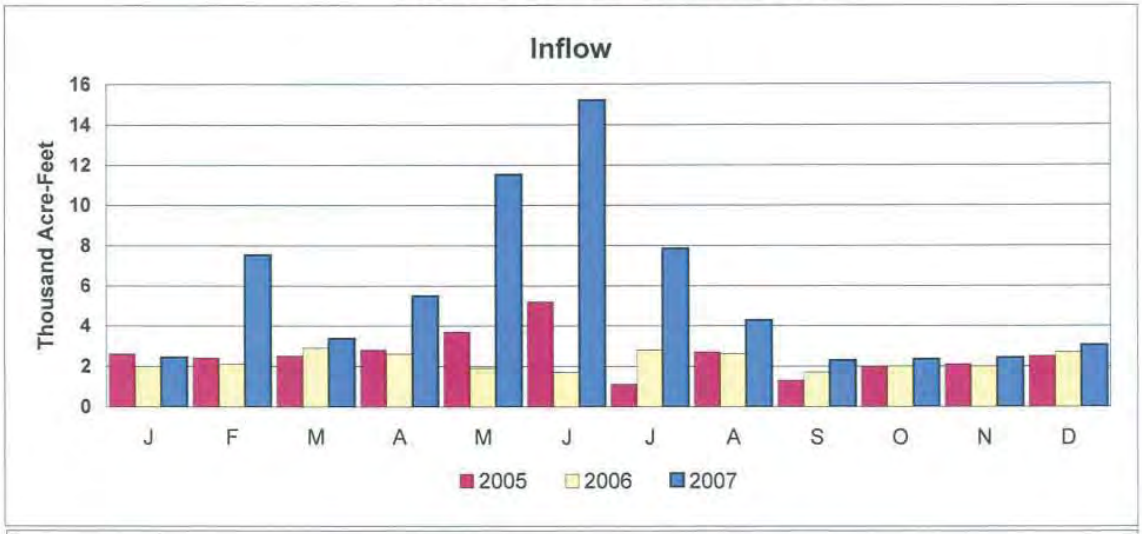
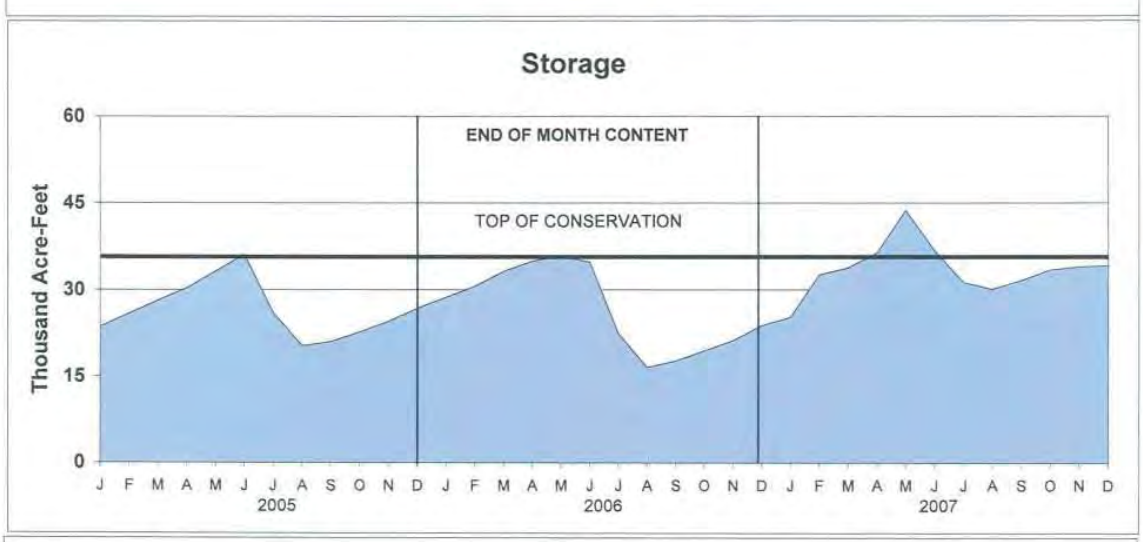


EXHIBIT 9A

HARRY STRUNK LAKE

ACTUAL OPERATION





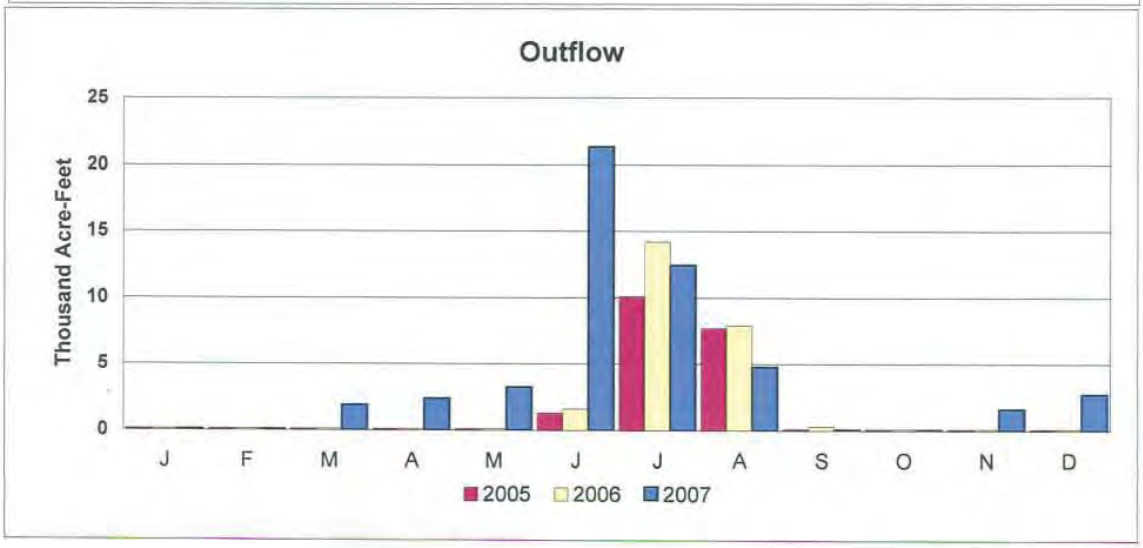
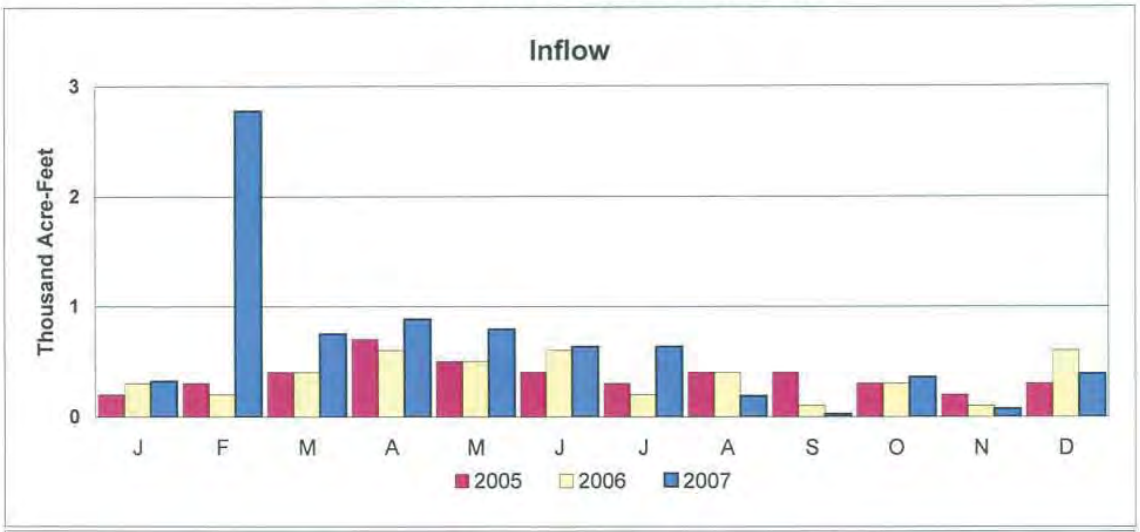
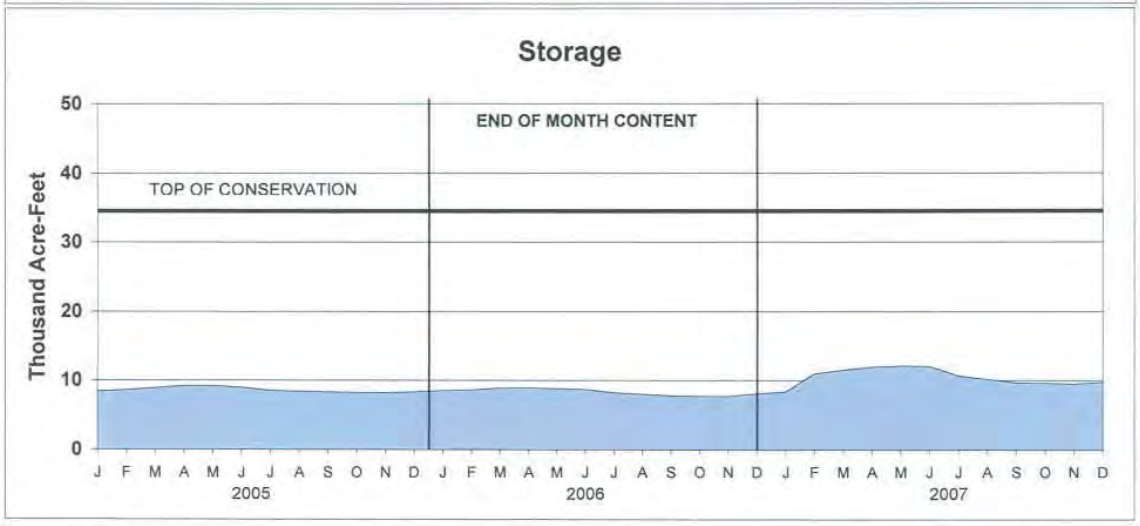


EXHIBIT 10A

KEITH SEBELIUS LAKE

ACTUAL OPERATION





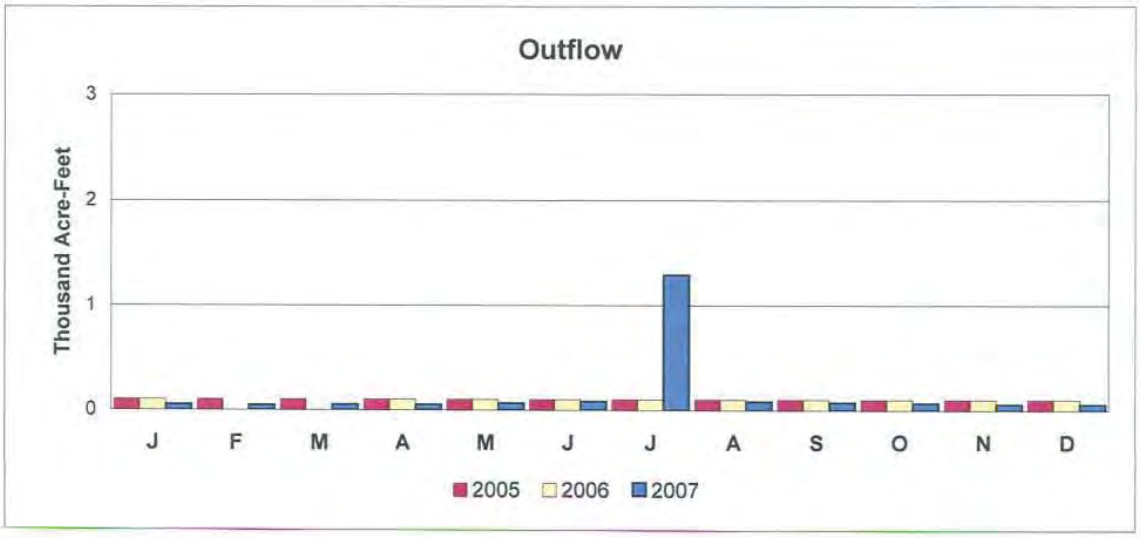
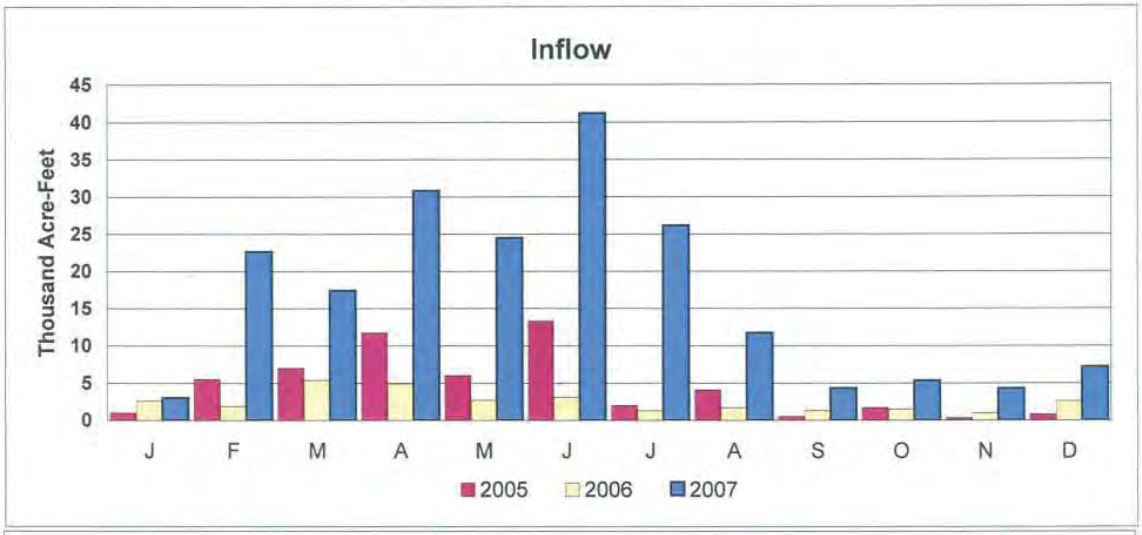
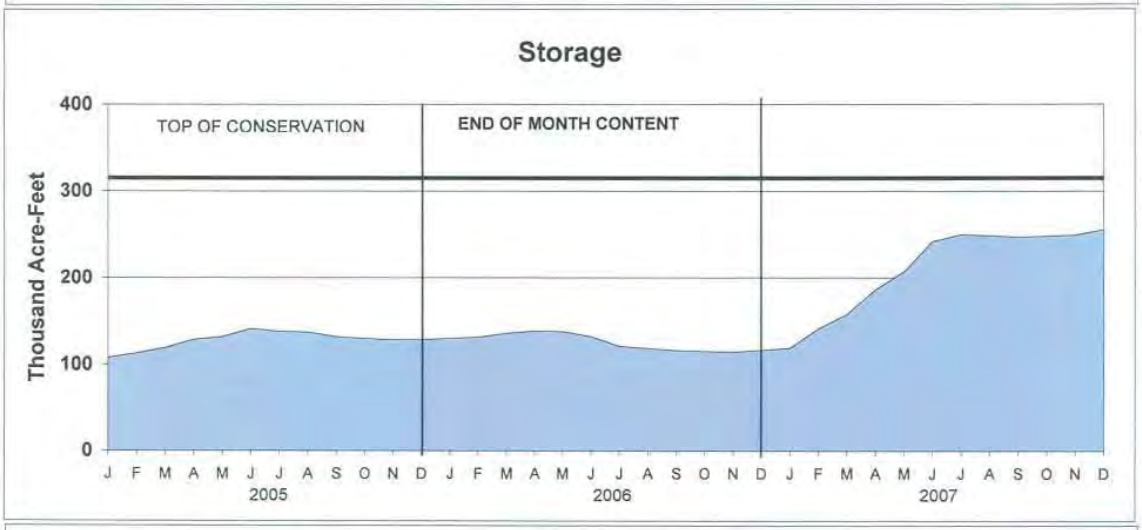


EXHIBIT 11A

HARLAN COUNTY LAKE

ACTUAL OPERATION





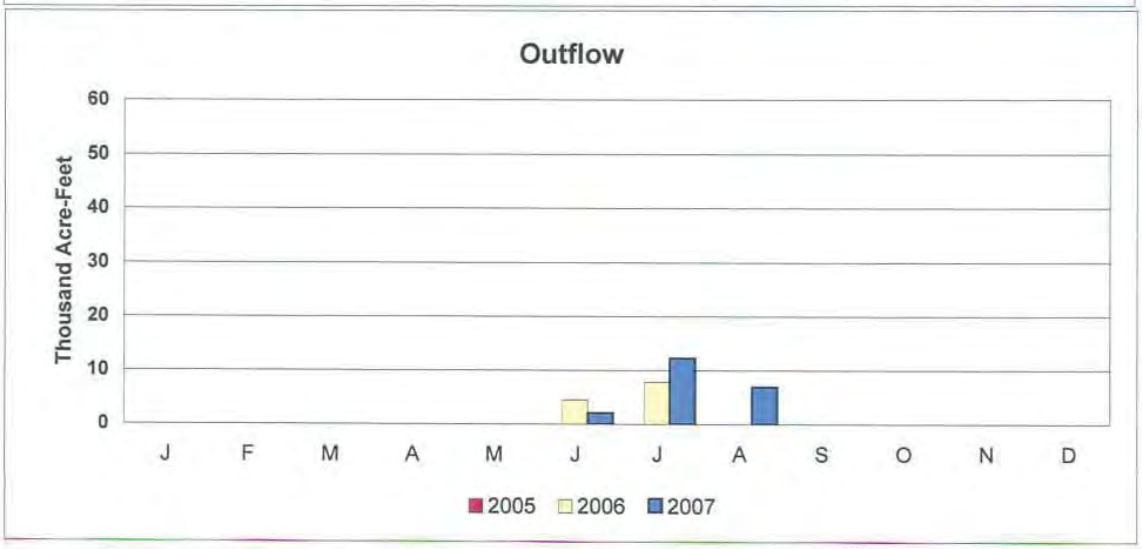
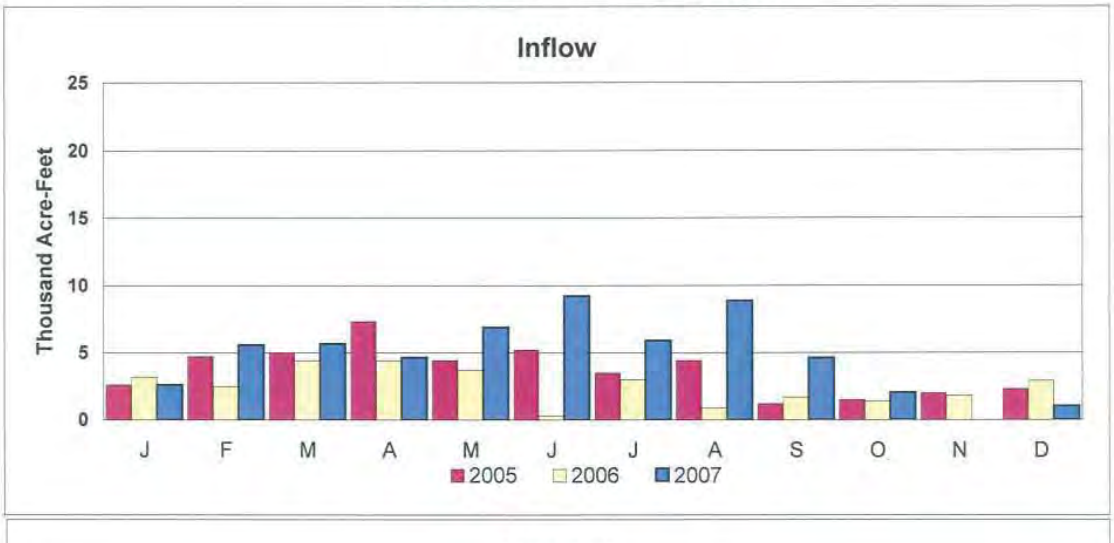
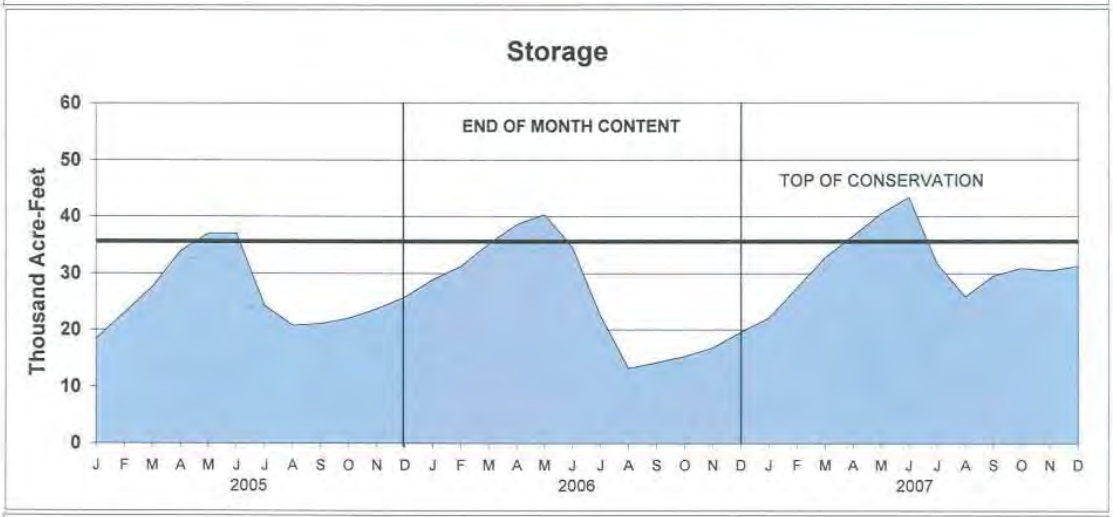


EXHIBIT 12A

LOVEWELL RESERVOIR

ACTUAL OPERATION





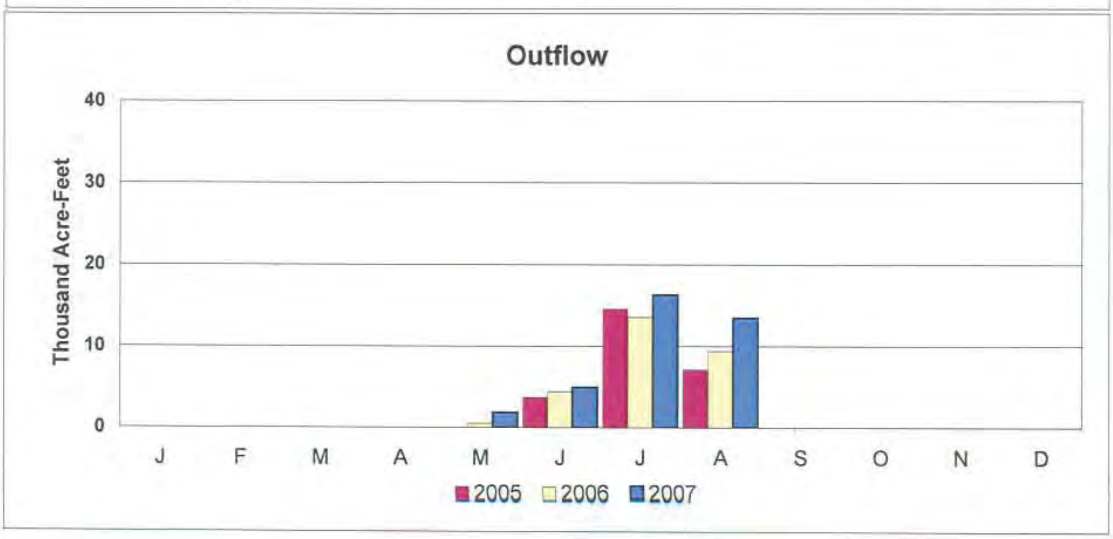
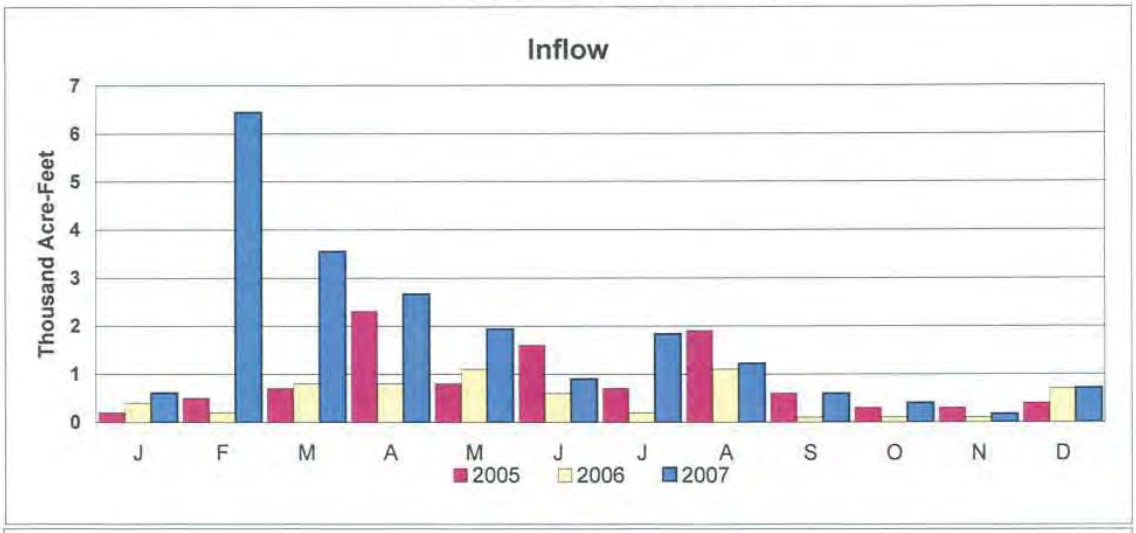
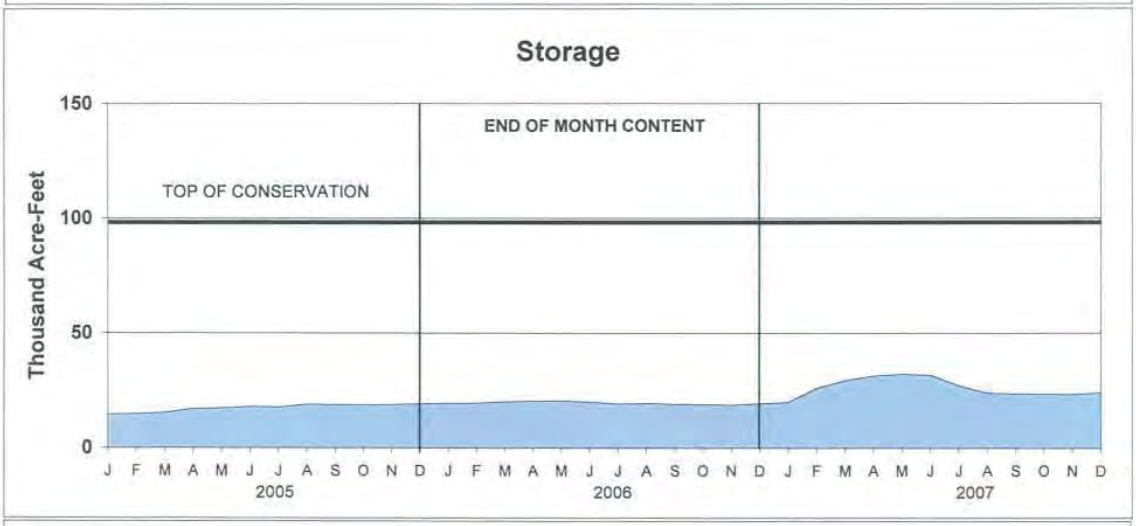


EXHIBIT 13A

KIRWIN RESERVOIR

ACTUAL OPERATION





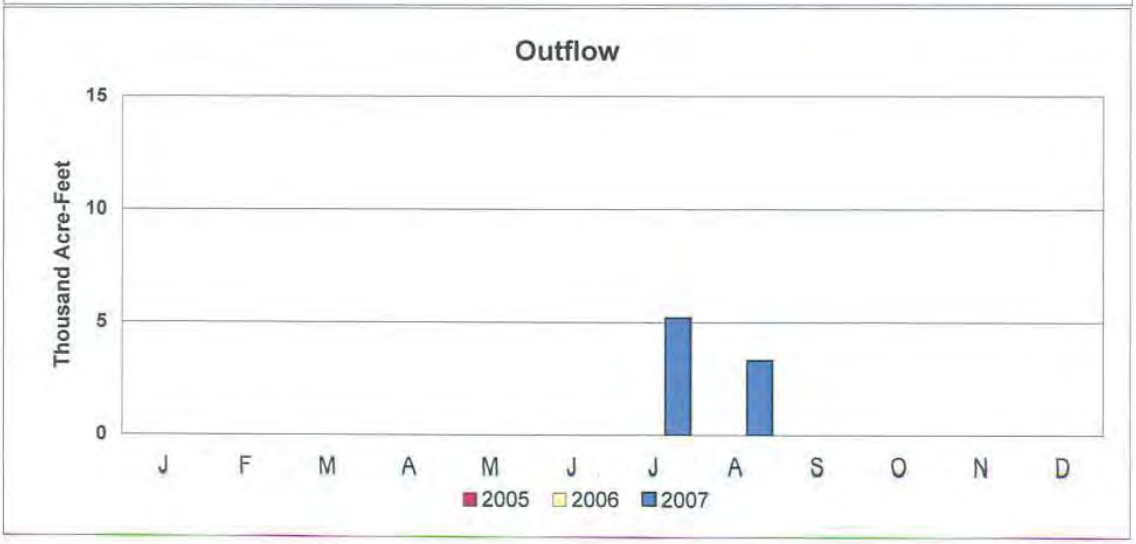
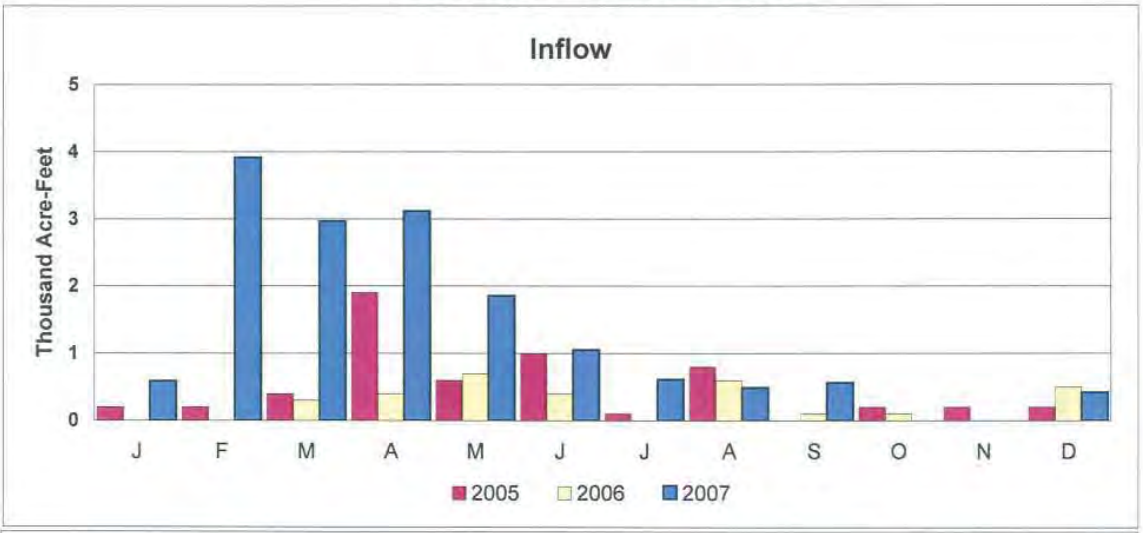
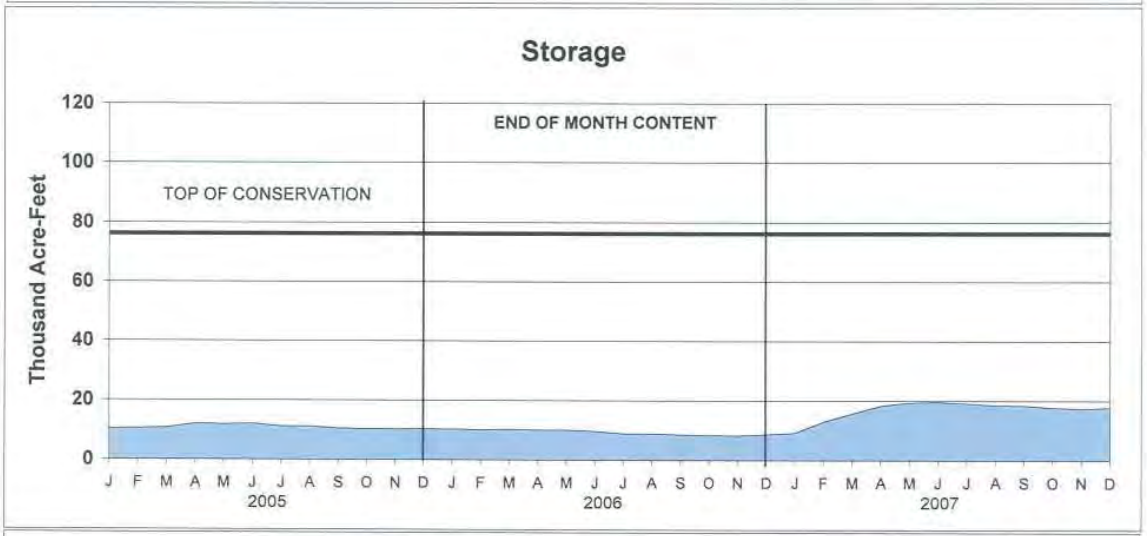


EXHIBIT 14A

WEBSTER RESERVOIR

ACTUAL OPERATION





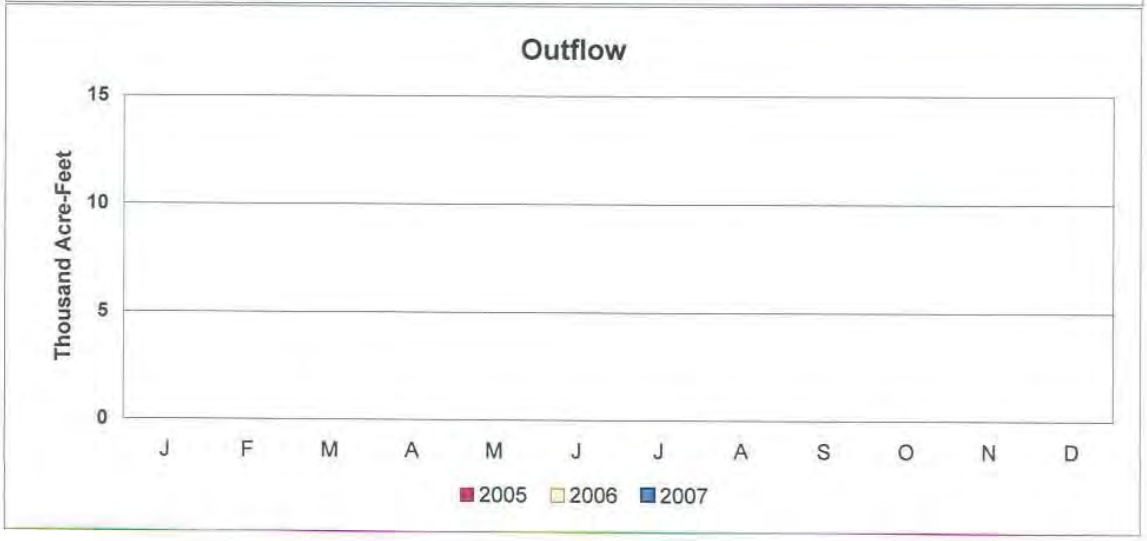
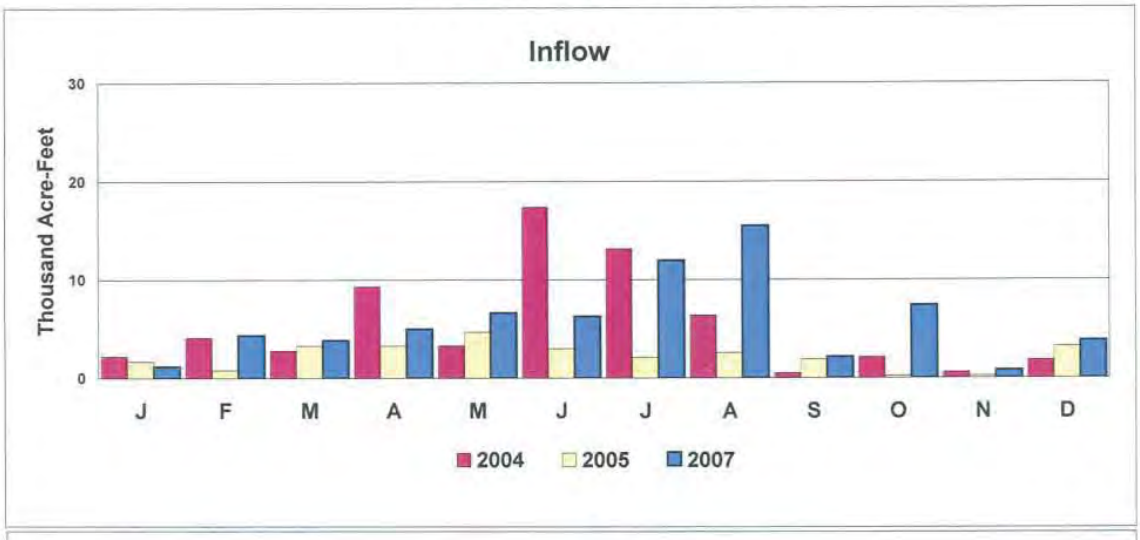
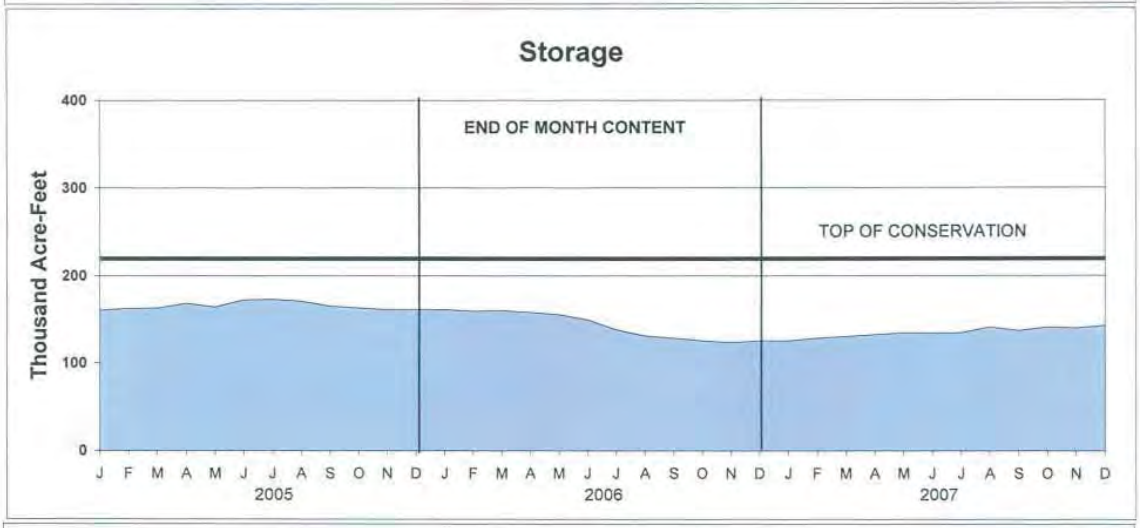


EXHIBIT 15A

WACONDA LAKE
ACTUAL OPERATION





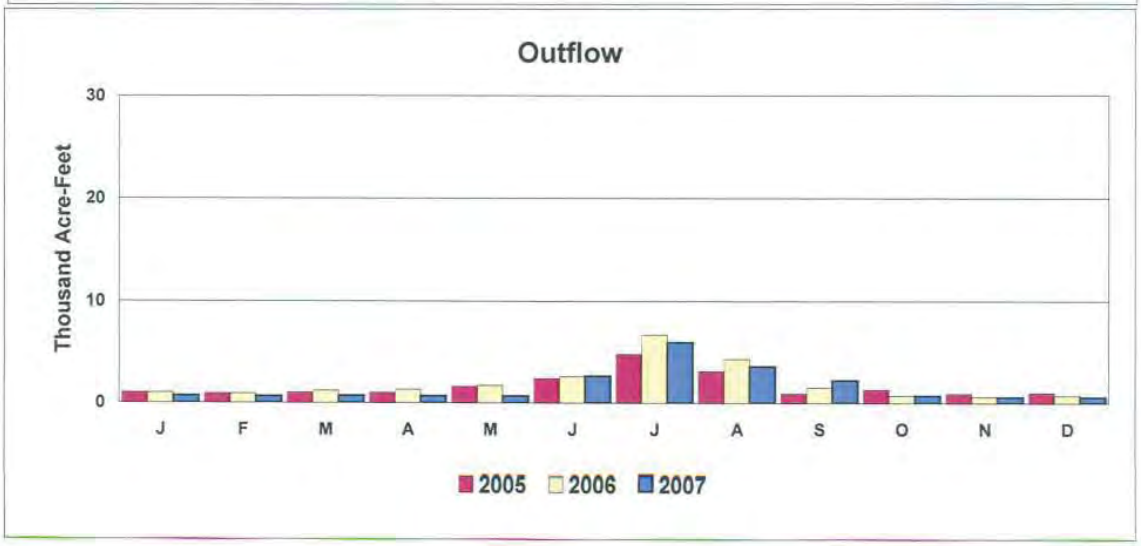
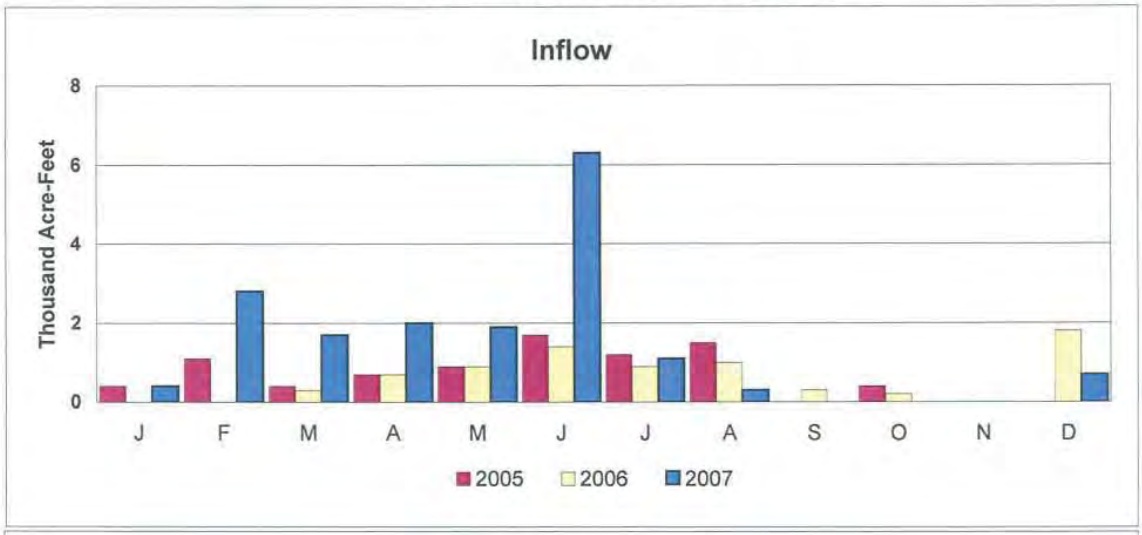
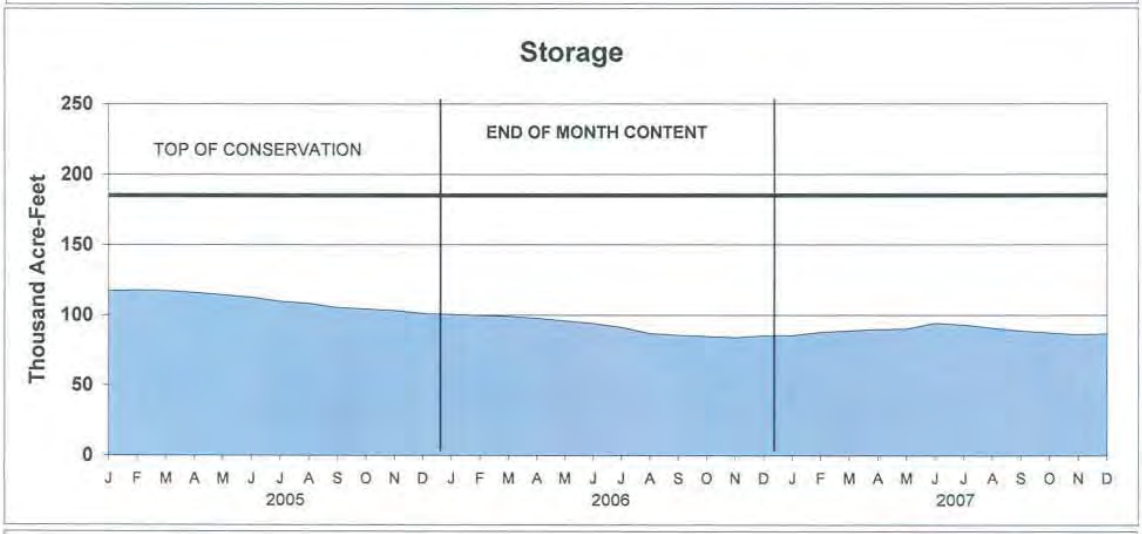


EXHIBIT 16A

CEDAR BLUFF RESERVOIR

ACTUAL OPERATION





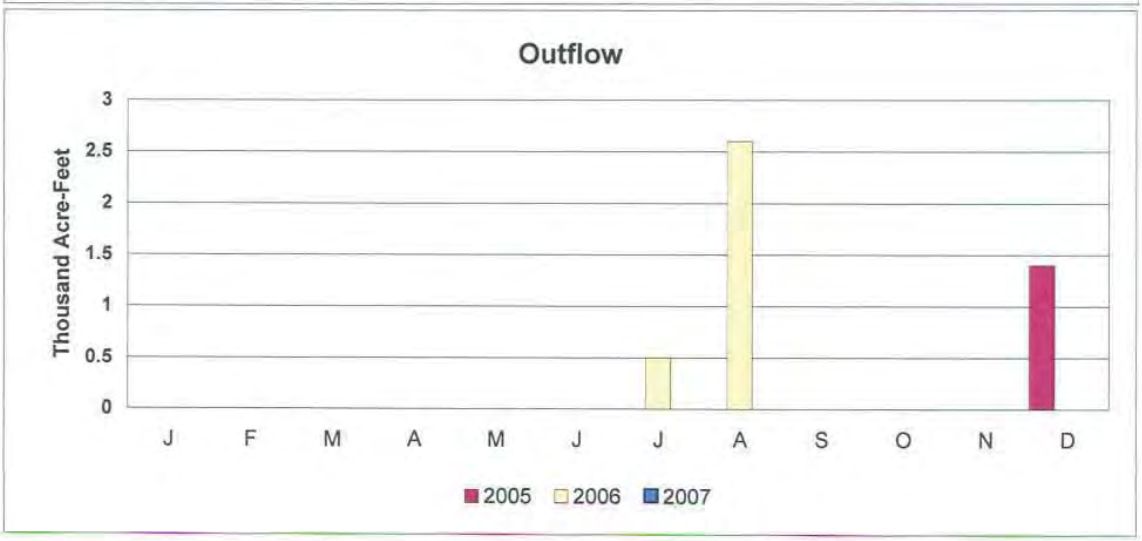
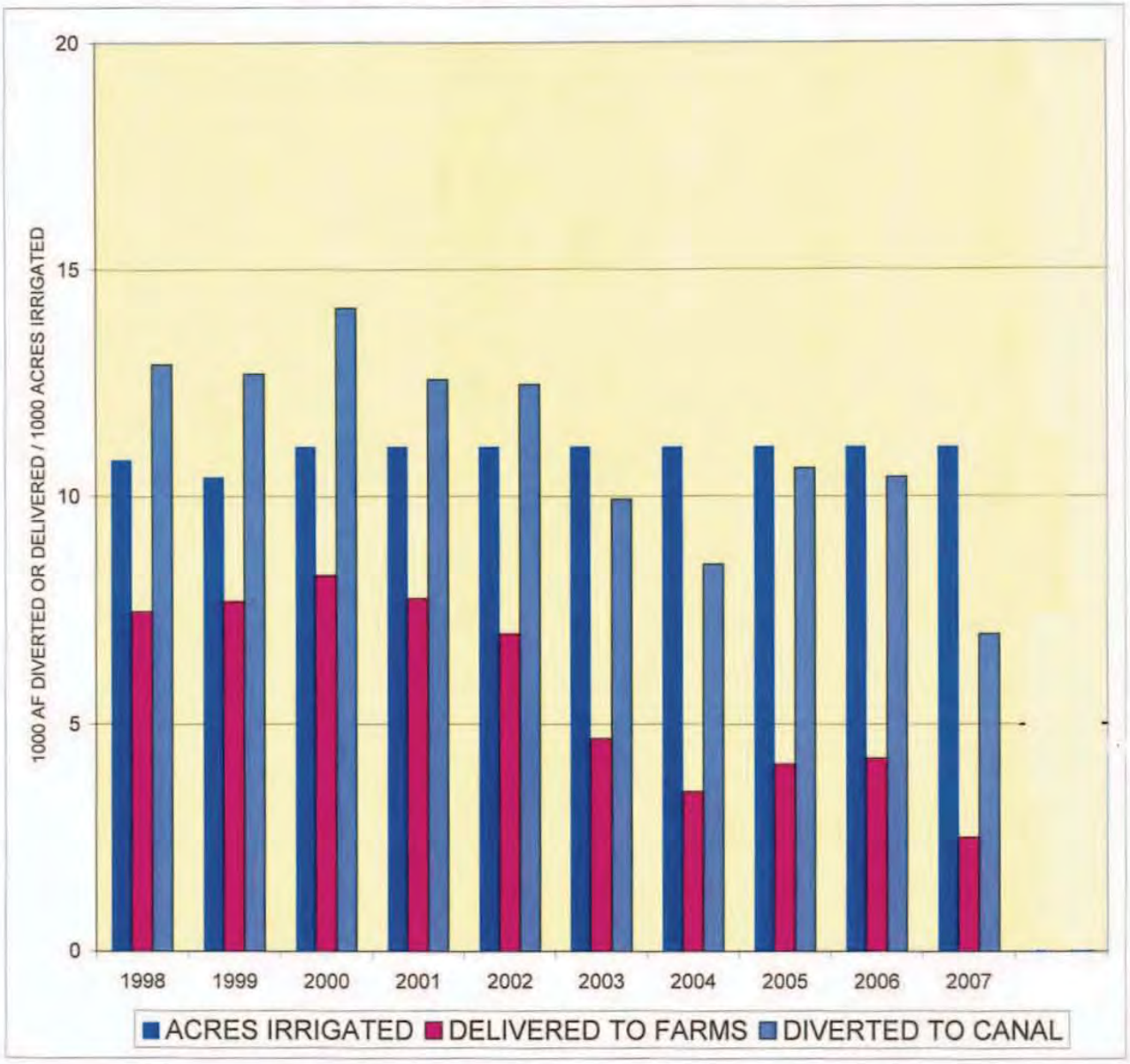


EXHIBIT 17

MIRAGE FLATS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

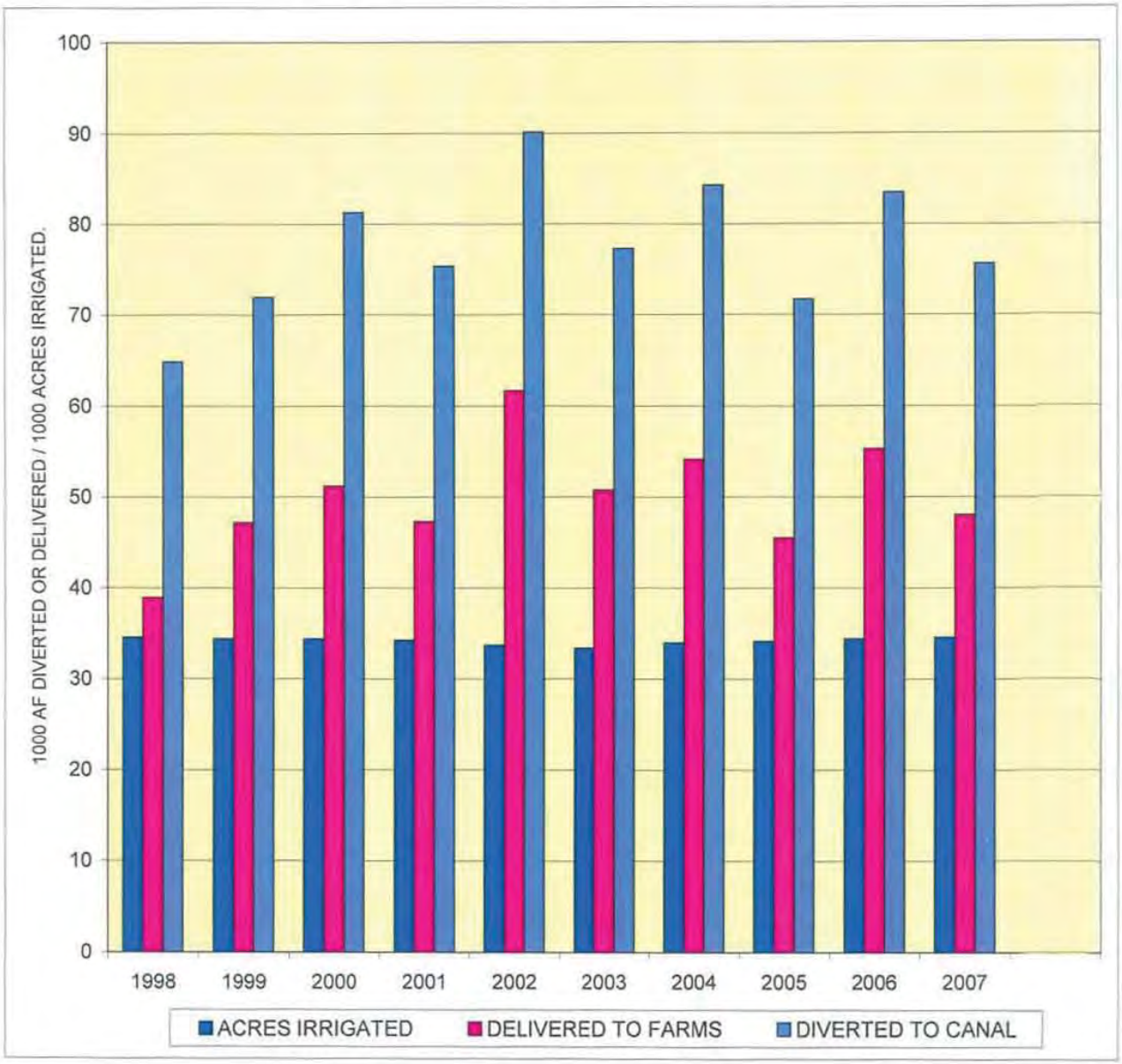


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	1.20	1.22	1.28	1.13	1.12	0.90	0.77	0.96	0.94	0.63
DELIVERED af/acre	0.69	0.74	0.75	0.70	0.63	0.42	0.32	0.37	0.38	0.23
EFFICIENCY	58%	61%	58%	62%	56%	47%	41%	39%	41%	36%

EXHIBIT 18

AINSWORTH IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

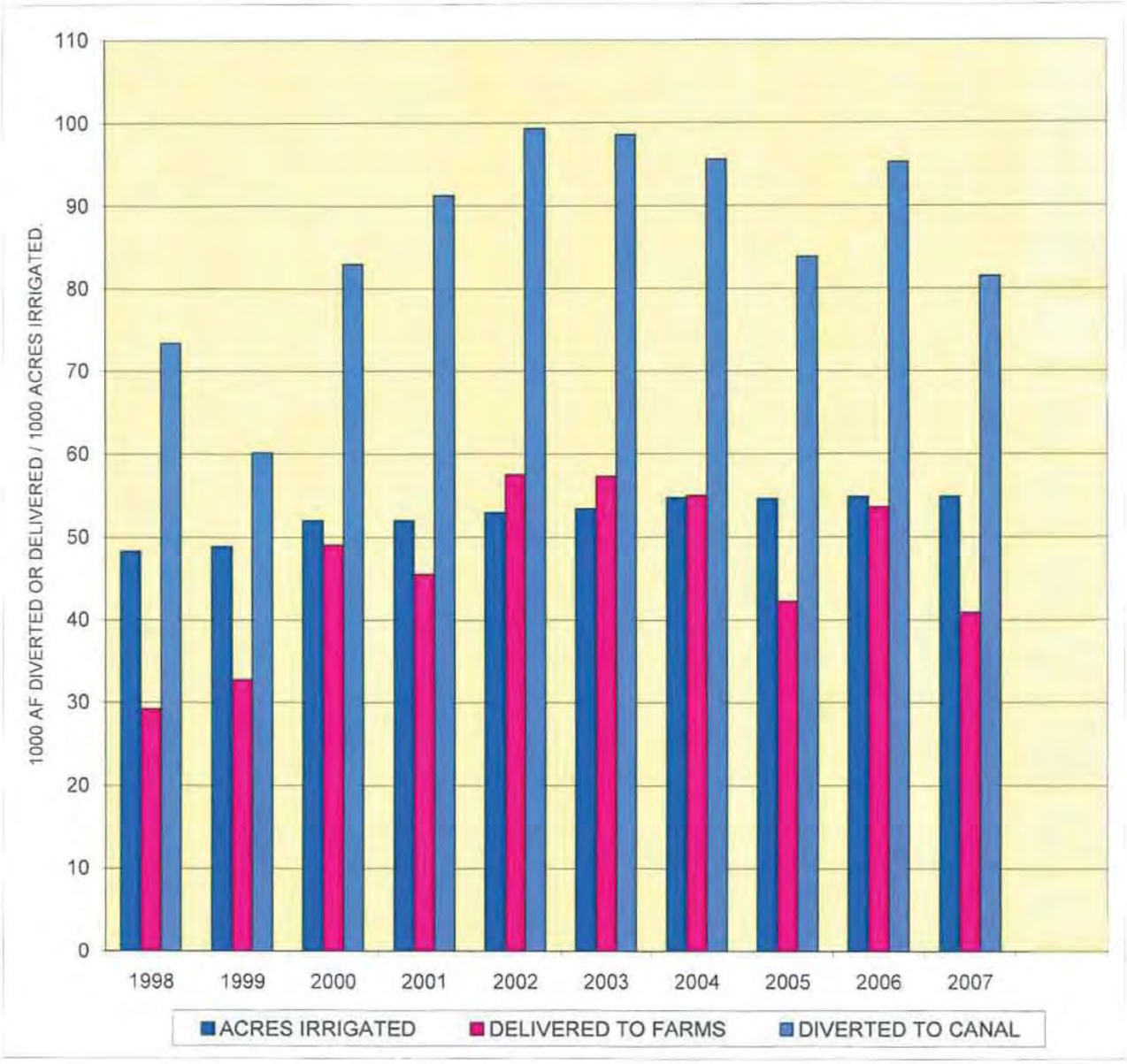


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	1.87	2.09	2.36	2.20	2.67	2.31	2.48	2.10	2.42	2.19
DELIVERED af/acre	1.13	1.37	1.49	1.38	1.83	1.52	1.59	1.33	1.61	1.39
EFFICIENCY	60%	66%	63%	63%	68%	66%	64%	63%	66%	64%

EXHIBIT 19

TWIN LOUPS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

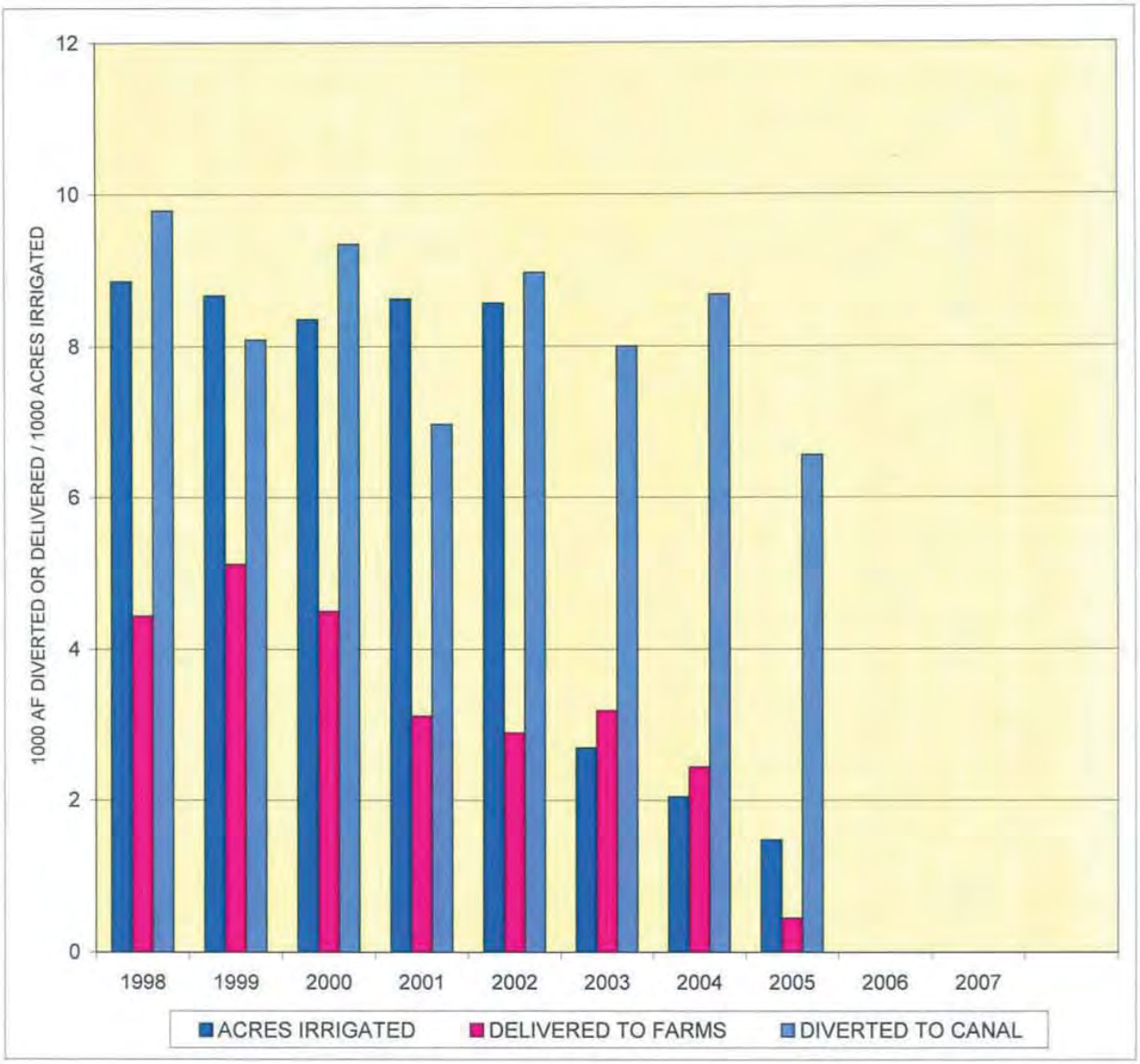


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	1.52	1.23	1.60	1.76	1.87	1.84	1.75	1.53	1.74	1.48
DELIVERED af/acre	0.60	0.67	0.94	0.88	1.09	1.07	1.00	0.77	0.98	0.74
EFFICIENCY	40%	55%	59%	50%	58%	58%	58%	50%	56%	50%

EXHIBIT 20

FRENCHMAN VALLEY IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

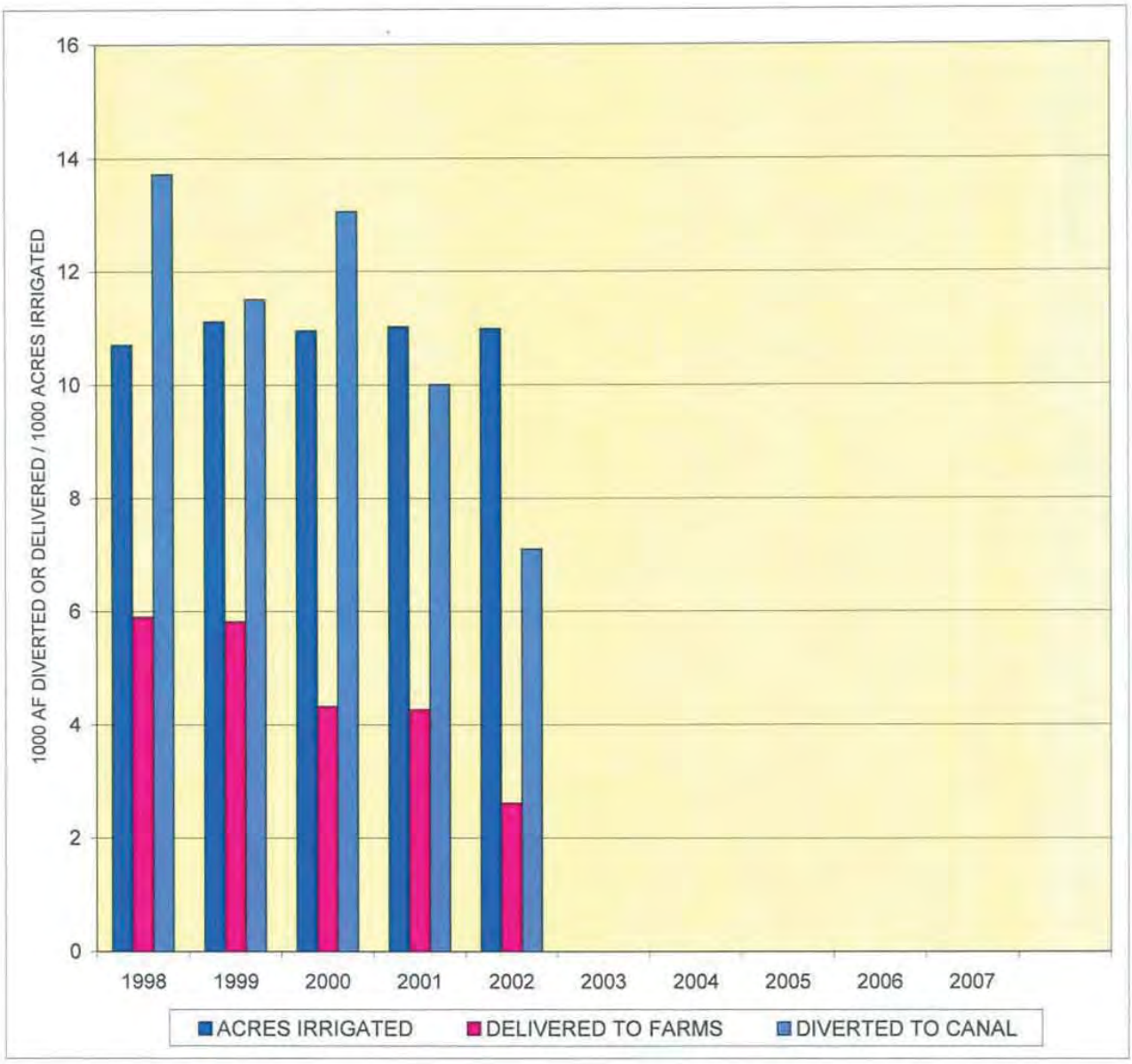


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	1.11	0.93	1.12	0.81	1.05	2.97	4.24	4.43	0.00	0.00
DELIVERED af/acre	0.50	0.59	0.54	0.36	0.34	1.18	1.19	0.30	0.00	0.00
EFFICIENCY	45%	63%	48%	45%	32%	40%	28%	7%	0%	0%

EXHIBIT 21

H AND RW IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

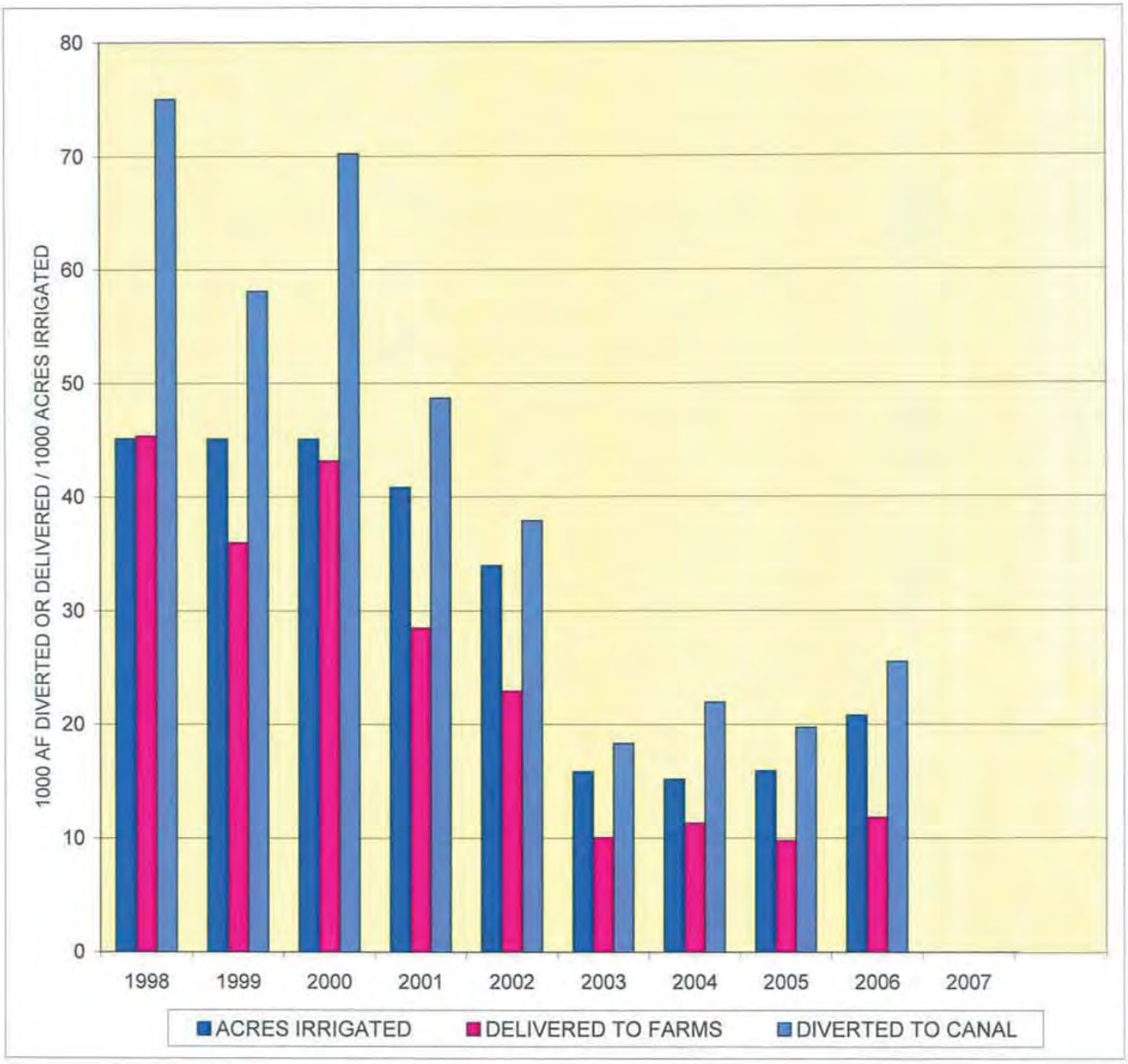


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	1.28	1.03	1.19	0.91	0.65	0.00	0.00	0.00	0.00	0.00
DELIVERED af/acre	0.55	0.52	0.39	0.39	0.24	0.00	0.00	0.00	0.00	0.00
EFFICIENCY	43%	51%	33%	43%	37%	0%	0%	0%	0%	0%

EXHIBIT 22

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

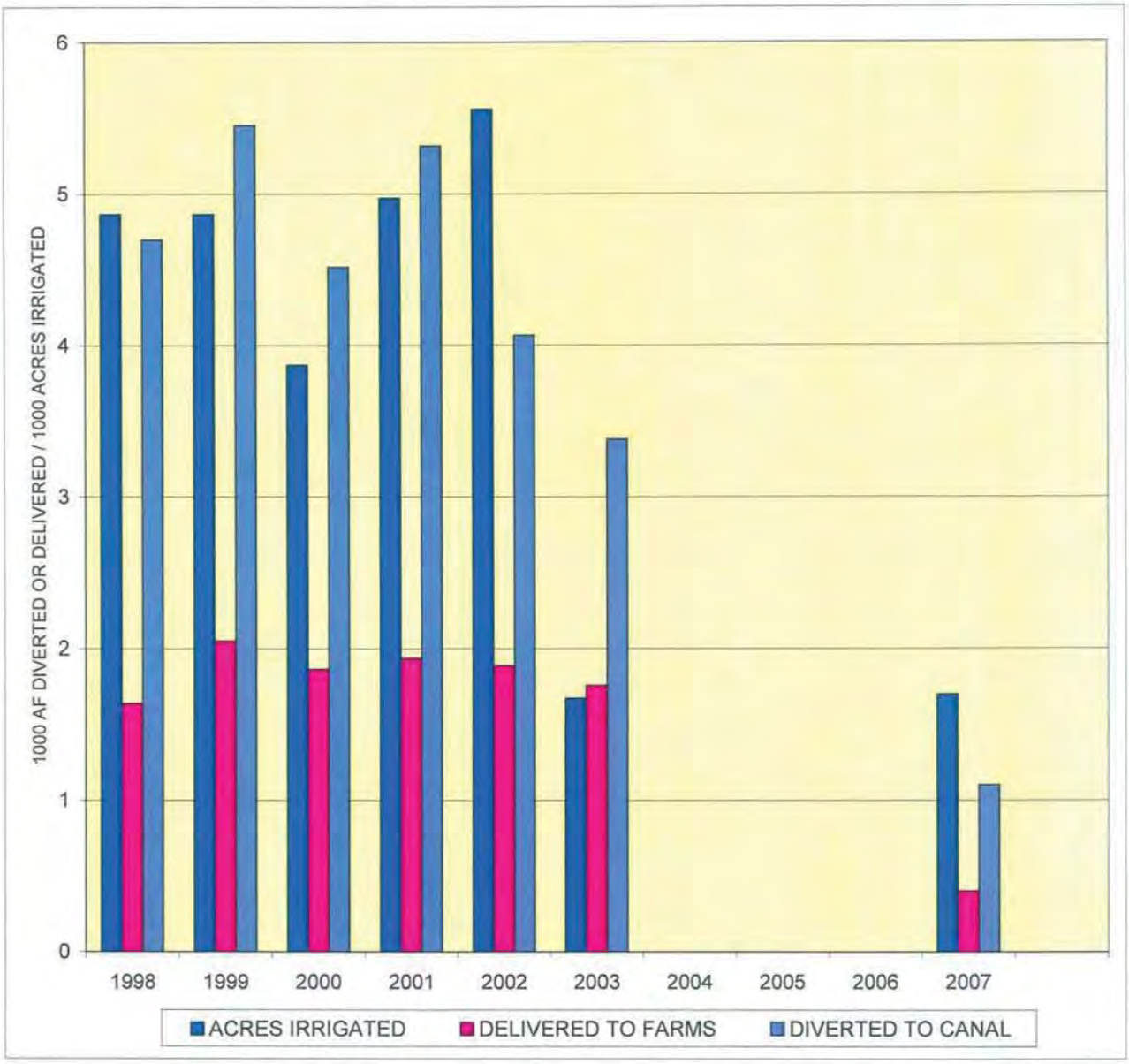


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	1.66	1.29	1.56	1.19	1.12	1.15	1.45	1.24	1.23	0.00
DELIVERED af/acre	1.00	0.80	0.96	0.70	0.67	0.63	0.74	0.61	0.57	0.00
EFFICIENCY	60%	62%	61%	58%	61%	55%	52%	50%	46%	0%

EXHIBIT 23

ALMENA IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

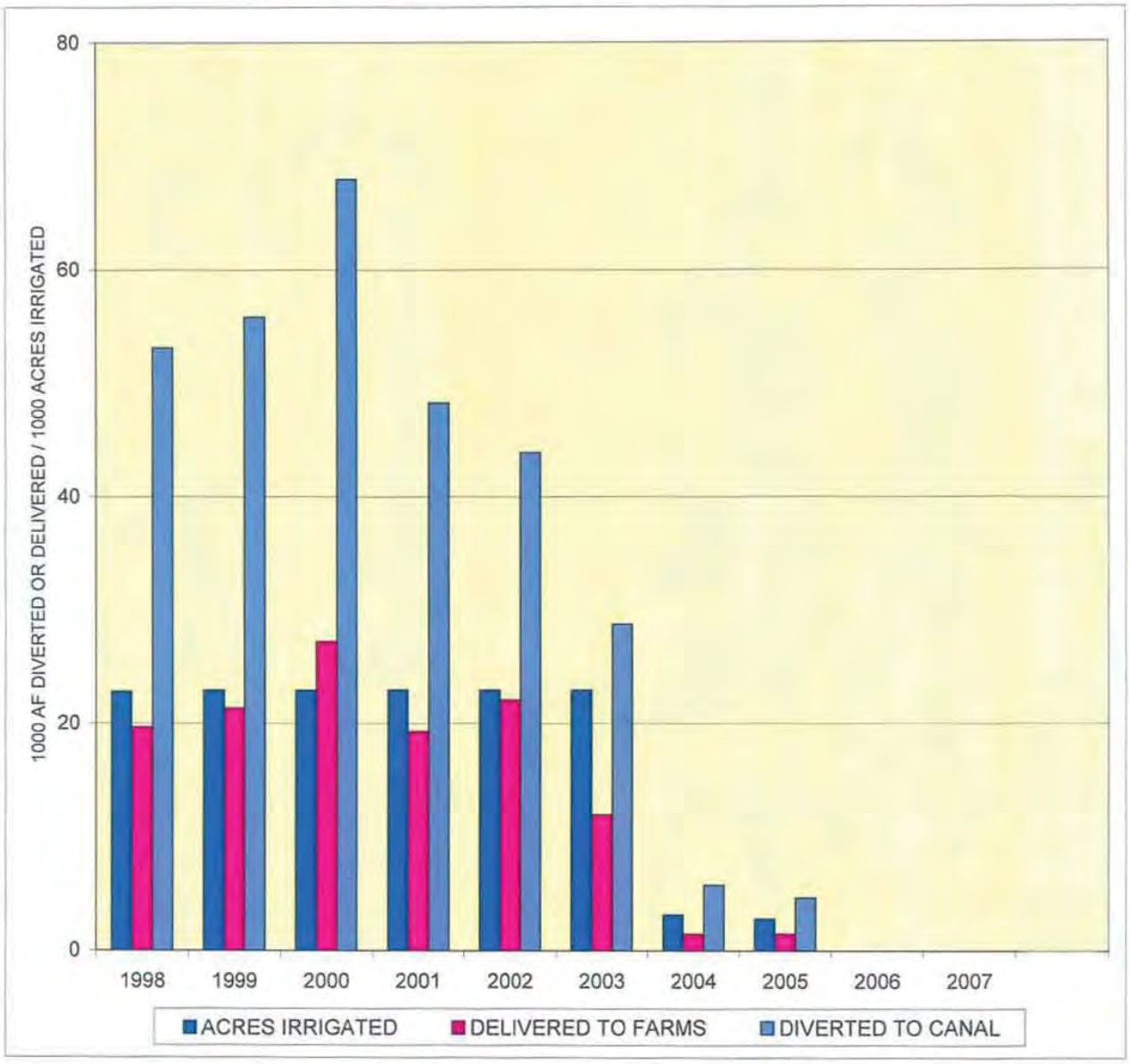


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	0.97	1.12	1.17	1.07	0.73	2.02	0.00	0.00	0.00	0.65
DELIVERED af/acre	0.34	0.42	0.48	0.39	0.34	1.05	0.00	0.00	0.00	0.24
EFFICIENCY	35%	38%	41%	36%	46%	52%	0%	0%	0%	36%

EXHIBIT 24

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

CANAL DIV., FARM DEL., AND ACRES IRRIG.

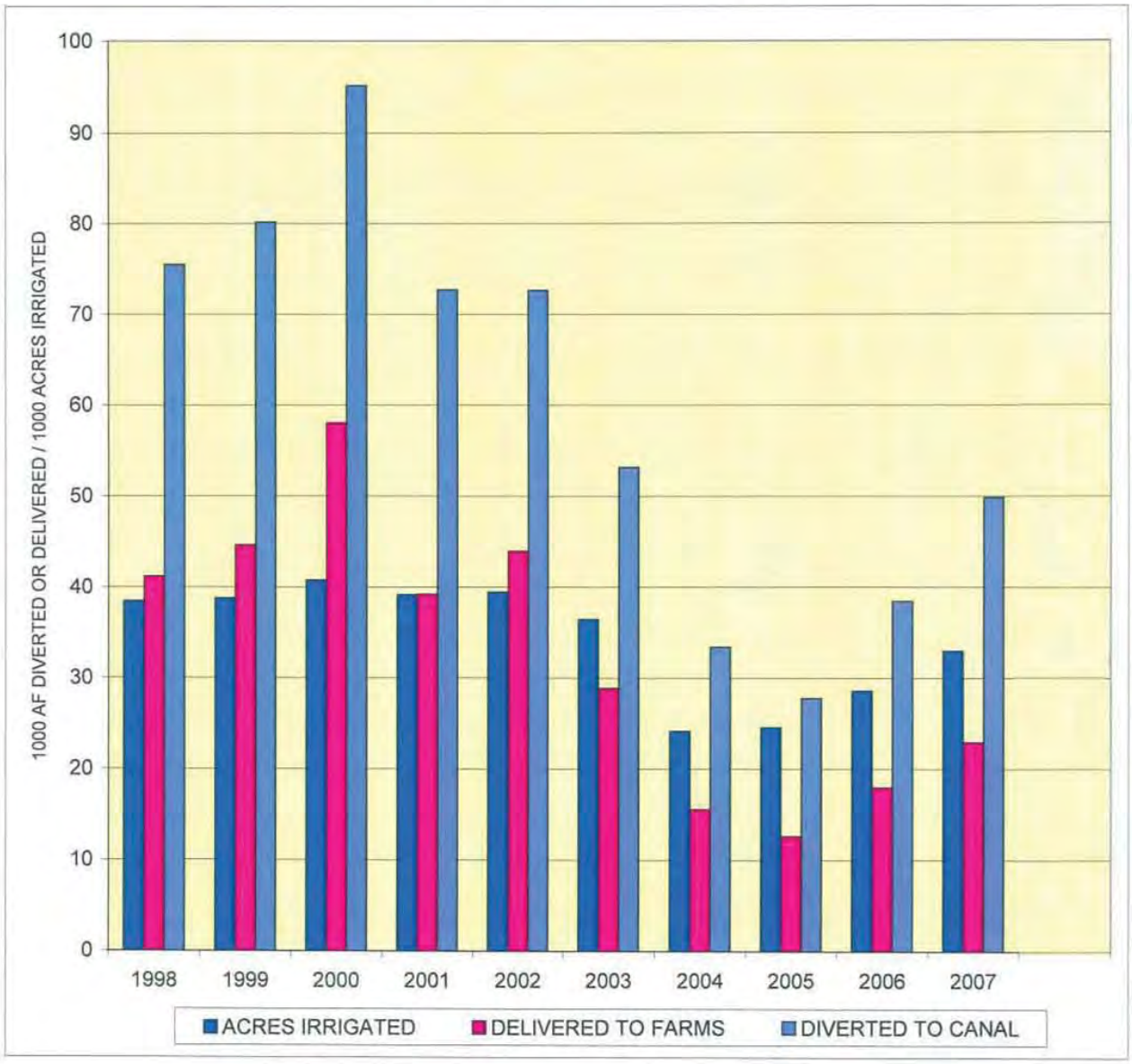


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	2.33	2.44	2.97	2.10	1.91	1.25	1.85	1.68	0.00	0.00
DELIVERED af/acre	0.86	0.93	1.19	0.84	0.96	0.52	0.47	0.53	0.00	0.00
EFFICIENCY	37%	38%	40%	40%	50%	42%	25%	32%	0%	0%

EXHIBIT 25

KANSAS-BOSTWICK IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

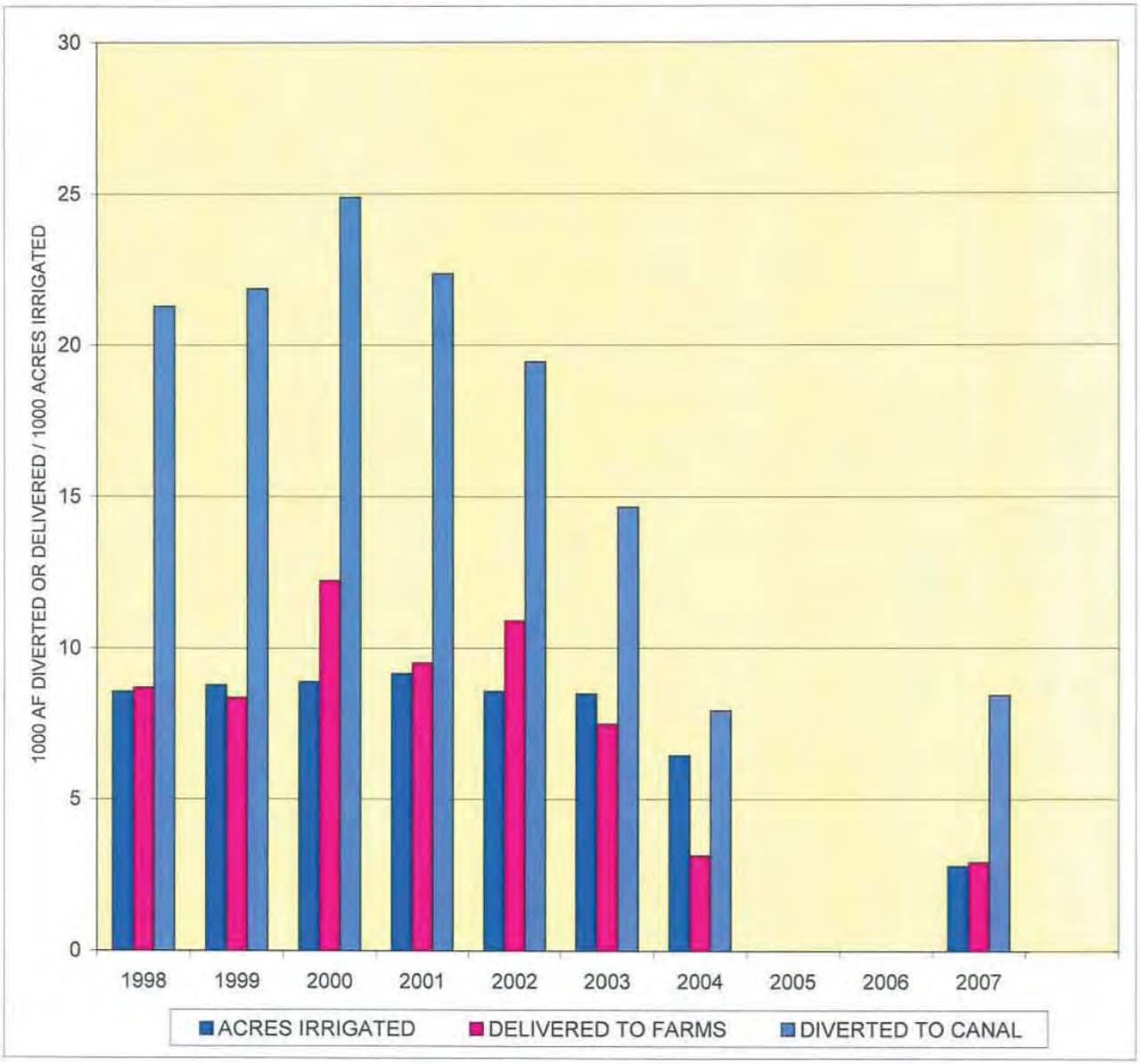


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	1.96	2.07	2.33	1.86	1.84	1.46	1.38	1.13	1.35	1.51
DELIVERED af/acre	1.07	1.15	1.42	1.00	1.11	0.79	0.65	0.51	0.63	0.70
EFFICIENCY	55%	56%	61%	54%	61%	54%	47%	45%	47%	46%

EXHIBIT 26

KIRWIN IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

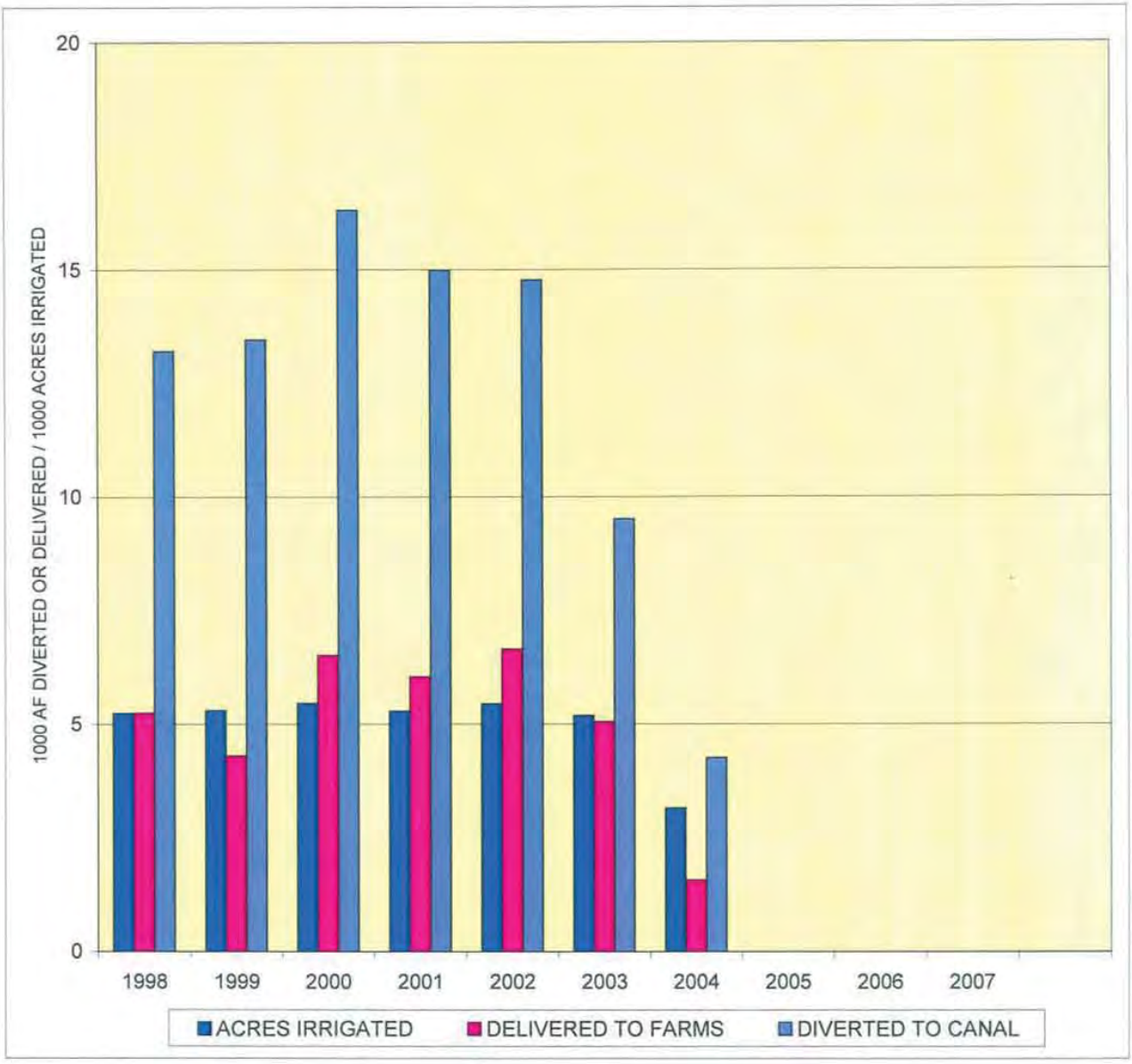


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	2.48	0.95	2.80	2.44	2.27	1.73	1.23	0.00	0.00	3.00
DELIVERED af/acre	1.01	0.95	1.37	1.04	1.27	0.88	0.49	0.00	0.00	1.05
EFFICIENCY	41%	38%	49%	43%	56%	51%	40%	0%	0%	35%

EXHIBIT 27

WEBSTER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

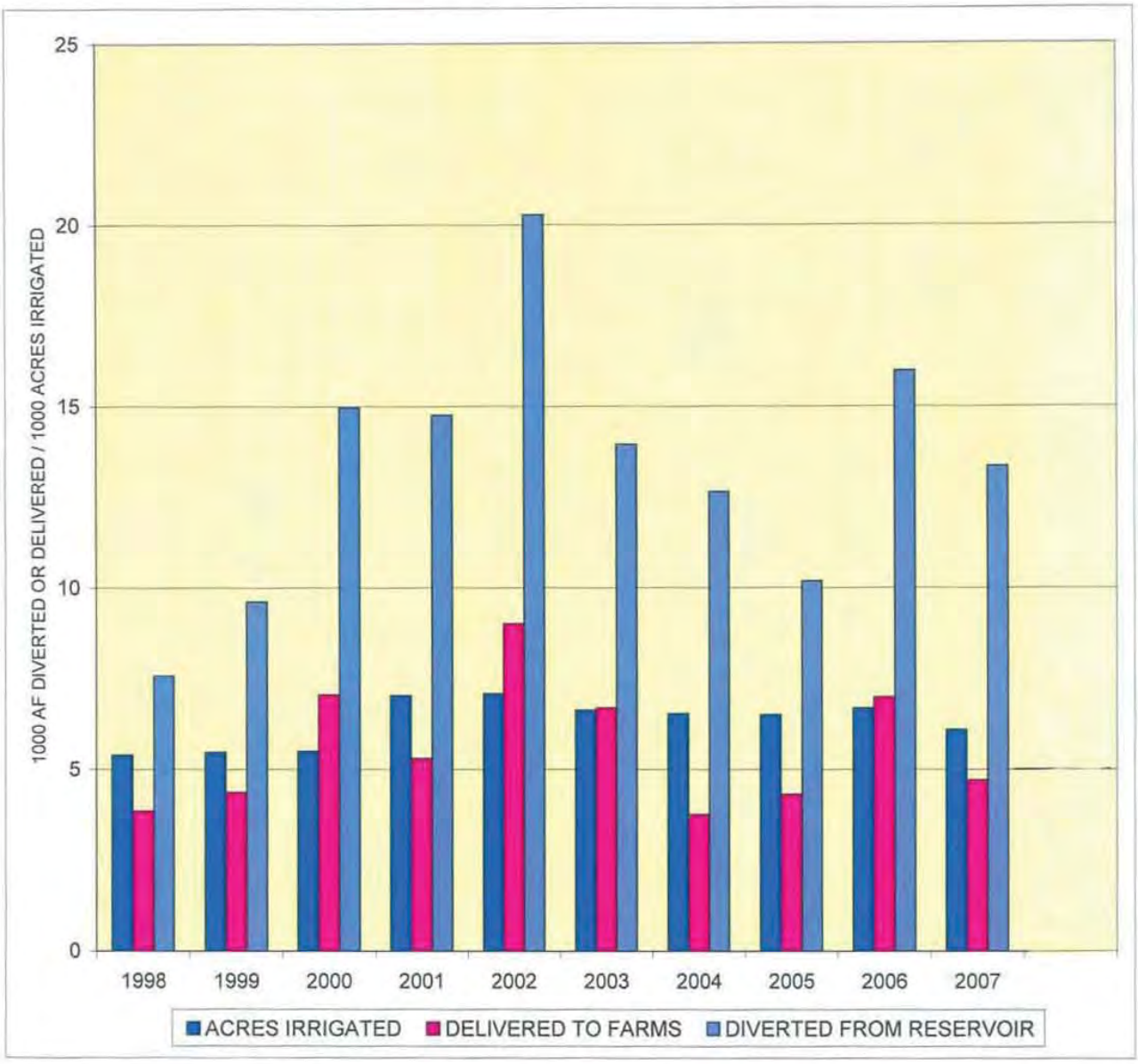


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	2.52	2.54	2.98	2.83	2.71	1.83	1.35	0.00	0.00	0.00
DELIVERED af/acre	1.00	0.81	1.19	1.14	1.22	0.97	0.50	0.00	0.00	0.00
EFFICIENCY	40%	32%	40%	40%	45%	53%	37%	0%	0%	0%

EXHIBIT 28

GLEN ELDER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
DIVERTED af/acre	1.41	1.76	2.72	0.75	1.27	1.01	1.93	1.57	2.39	2.19
DELIVERED af/acre	0.71	0.80	1.28	0.75	1.27	1.01	0.58	0.66	1.04	0.77
EFFICIENCY	51%	45%	47%	36%	44%	48%	30%	42%	44%	35%

SYNOPSIS

General

This year is the 56th consecutive year that an Annual Operating Plans (AOP) has been prepared for the Federally-owned dams and reservoirs in the Niobrara, Lower Platte, and Kansas River Basins. The plan has been developed by the Water Operations Group in McCook, Nebraska for the 16 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with 9 diversion dams, 9 pumping plants, and 20 canal systems, serve approximately 269,744 acres of project lands in Nebraska and Kansas. In addition to irrigation and municipal water, these features serve flood control, recreation, and fish and wildlife purposes. A map at the end of this report shows the location of these features.

The reservoirs in the Niobrara and Lower Platte River Basins are operated by either irrigation or reclamation districts. The reservoirs in the Kansas River Basin are operated by either the Bureau of Reclamation (Reclamation), or the Corps of Engineers. Kirwin Irrigation District provides operational and maintenance assistance for Kirwin Dam. The diversion dams, pumping plants, and canal systems are operated by either irrigation or reclamation districts.

A Supervisory Control and Data Acquisition System (SCADA) located at McCook is used to assist in operational management of all 11 dams under Reclamation's jurisdiction that are located in the Kansas River Basin. A Hydromet system collects and stores near real-time data at selected stations in the Nebraska-Kansas Projects. The data includes water levels in streams, canals, and reservoirs and also gate openings. This data is transmitted to a satellite and downloaded to a Reclamation receiver in Boise, Idaho. The data can then be accessed by anyone interested in monitoring water levels or water usage in an irrigation system. The Nebraska-Kansas Projects currently has 70 Hydromet stations that can be accessed. The McCook Field Office has installed and maintains 55 Hydromet stations with plans to install more as time permits. When fully implemented, the projects will have a Hydromet station installed to provide real-time data on all reservoirs, most diversion dams, and most of the measuring structures in the irrigation systems. These stations can be found on the Internet by accessing Reclamation's home page at http://www.usbr.gov/gp. From the home page, select "Hydromet Data Center" under the Water Operations heading.

The Headlines 2008 that follows this synopsis is indicative of the awareness that the local people have of the natural resource development and conservation in the Niobrara, Lower Platte, and Kansas River Basins.

2008 Summary

Climatic Conditions

Precipitation at the project dams during 2008 ranged from 86 percent of normal near Box Butte Dam to 172 percent of normal at Kirwin Dam. Temperatures during the first two months of the year were generally well below normal throughout the projects area. Precipitation during the first three months of the year was below normal throughout most of the projects area. Precipitation totals varied from 27 to 122 percent. Temperatures were near normal during the spring. Precipitation during April, and May was generally above normal throughout the basin.

Average temperatures were near normal in June and July and above normal in August. Precipitation during June and July was only slightly below normal project wide. August precipitation was generally well above normal in the Kansas River Basin and well below normal in north central Nebraska. Eleven project dams recorded below normal precipitation in June, while ten project dams recorded below normal precipitation in July. Only five project dams had below normal precipitation in August.

September precipitation varied considerably throughout the projects while precipitation in October was well above normal with the exception of Box Butte Dam. Virginia Smith, Davis Creek, Medicine Creek, Harlan County, Norton, Kirwin, Webster, and Cedar Bluff Dams recorded the greatest October precipitation totals ever for the month at the respective sites. Temperatures in September and October were generally above normal throughout the projects area.

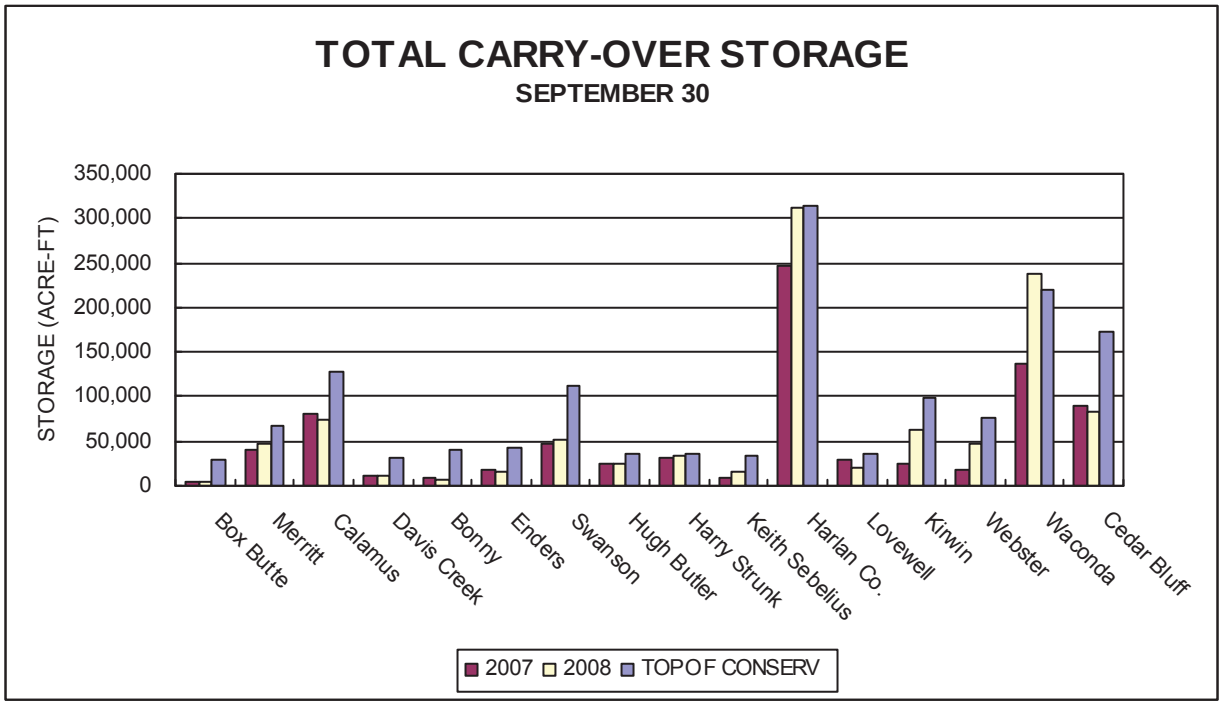
Precipitation during November and December averaged only 82 percent of normal over the projects with Box Butte Dam recording zero precipitation in December. Temperatures were above normal in November and below normal in December.

Storage Reservoirs

1. Conservation Operations. The 2008 inflow was above the dry-year forecast at project reservoirs with the exception of Box Butte and Enders Reservoirs. Merritt, Davis Creek and Cedar Bluff Reservoirs, and Hugh Butler and Swanson Lakes had inflows between the dry- and normal-year forecasts. Bonny, Calamus and Webster Reservoirs along with Keith Sebelius, Waconda, and Harlan County Lakes had inflows between the normal- and wet-year forecasts. Lovewell and Kirwin Reservoirs as well as Harry Strunk Lake had inflows above the wet-year forecast.

Twelve of the sixteen project reservoirs had below average carryover storage from the 2007 water year. Swanson Lake and Enders Reservoir in southwest Nebraska recorded below average inflows during all 12 months of 2008. Box Butte and Cedar Bluff Reservoirs recorded below average inflows during 11 months of 2008. Reservoir releases were made from Merritt, Virginia Smith, Medicine Creek, Harlan County and Lovewell Dams to maintain or reduce reservoir levels prior to the 2008 irrigation season. Just prior to the irrigation season, Enders, Webster and Box Butte Reservoirs, along with Keith Sebelius, Swanson, Hugh Butler and Harry Strunk Lakes, did not have sufficient storage to provide water users with a full water supply. Harry Strunk and Harlan County Lakes and Lovewell Reservoir had some flood storage occupied prior to the irrigation season. The irrigation demand months of July and August did little to reduce storage in those project reservoirs that had storage available for full irrigation as inflows maintained reservoir pools. Precipitation during July and August helped in reducing the demands on project reservoirs. Reservoir storage was below normal at ten project reservoirs at the end of 2008.

The following summarized graph shows a comparison of 2007 and 2008 carry-over storage conditions as compared to the top of conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins as of September 30th.



2. Flood Control Operations. Harry Strunk, Harlan County and Waconda Lakes, and Lovewell Reservoir utilized flood pool storage and made flood releases in 2008. The fiscal year 2008 flood control benefits accrued by the operation of Reclamation's Nebraska-Kansas Projects facilities was $7,871,700 as determined by the Corps of Engineers. An additional benefit of $9,103,300 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2008 by facilities in this report total $1,931,373,900 (see Table 5). Box Butte, Merritt, Calamus, and Davis Creek Reservoirs do not have a designated flood pool and have not accrued any flood benefits to date.

A summary of precipitation, reservoir storage and inflows at Nebraska-Kansas Projects facilities can be found in Table 7.

Water Service There was 252,098 acre-feet (AF) of water diverted to irrigate approximately 186,380 acres of project lands in the 12 irrigation districts (see tables 3 and 6). The project water supply was either inadequate or limited for 75,175 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, Almena, and Webster Irrigation Districts. The project water supplies for the other units mentioned in this report were more than adequate in 2008.

The water requirements of three municipalities, one rural water district, and two fish hatchery facilities were furnished from storage releases or natural flows.

Irrigation Production

The 2008 crop yields on lands receiving project water in the Nebraska-Kansas Projects were higher than 2007. The average corn yield, the principal crop of all reporting districts, was 179 bushels per acre. This was approximately twelve bushels per acre more than in 2007.

The start of irrigation releases from project reservoirs varied considerably depending on May rainfall amounts and storage water available. Normal rainfall was experienced during much of the early growing season with near normal temperatures. August was generally much wetter and warmer than normal. Crop maturity progressed near normal during the growing season. Most irrigation districts had finished making irrigation releases by mid September. Five canals did not divert water in 2008 as a result of short water supplies. All irrigation districts had finished delivering water by the end of September with corn harvest delayed until early winter due to an extremely wet October.

Fish and Wildlife and Recreation Benefits

The National Recreational Fisheries Policy declares that the Government's vested stewardship responsibilities must work in concert with the state managing agency's recreational fisheries constituency and the general public to conserve, restore, and enhance recreational fisheries and their habitats. The Nebraska-Kansas Area Office is available for meetings if requested with Nebraska, Colorado, and Kansas state management agencies to discuss the Annual Operating Plans (AOP). Information is solicited that will allow Reclamation the flexibility to enhance fisheries resources while still meeting contractual obligations with the various irrigation districts.

During the 2008 season, normal reservoir operations were favorable for recreation and fish and wildlife uses at project reservoirs with full or nearly full conservation pool levels. Higher water levels in late 2008 were experienced at most reservoirs in the Kansas River Basin providing increased recreation benefits. Higher than normal inflows prevented summer drawdown from irrigation releases and thus did not allow for some late summer shoreline revegetation. Increased water levels did however submerge existing shoreline vegetation.

The Calamus Fish Hatchery is located below Virginia Smith Dam and Calamus Reservoir. The hatchery consists of an office/visitor center, laboratory, 2 residences, a shop and feed storage building, 51 rearing ponds lined with VLDPE and covering 45.5 acres, 24 concrete raceways, 2 lined effluent ponds, 8 groundwater wells, a 36-inch diameter buried pipeline from Virginia Smith Dam, a groundwater degassing tank, and a computerized monitoring and alarm system. The hatchery is operated and maintained by the Commission and produces approximately 53 million fish per year. The water supply is provided by natural flows passed through Virginia Smith Dam and from Calamus Reservoir storage through an agreement dated July 28, 1988, between the Commission and the Twin Loups Reclamation District.

HEADLINES 2008

What would flooding be if not for Dams, conservation practices?

Republican River Riparian Partnership meeting to Address 'water balance'

Two lakes on algae alert

Five departments fight fire at Enders Lake

Flood warnings posted

Arbiter is named in States' water dispute

Pipeline proposal advances

Irrigators finally paid

For surface-water sale

DNR director Ann Bleed resigns post

Compact disagreements Between states likely headed for arbitration

Supreme Court To review LB701

Authorities Keep watch Over rivers

Nine twisters sighted

NRDs study Pipeline To Kansas

New water Restrictions considered

Compact talks with Kansas Moving into critical stage

Judge rules property Tax levy in LB 701 is unconstitutional

From Bonnie Reservoir in Colorado

Bureau ordered to release water

KS003218

CHAPTER I – INTRODUCTION

Purpose of This Report

This AOP advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 2008 and serves as a guideline for the 2009 operations. This report also describes the responsibilities of Reclamation, Corps of Engineers, and the irrigation and reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins.

Operational Responsibilities

Reclamation is responsible for irrigation operations at all federal reservoirs in the Nebraska-Kansas Projects. Reclamation is also responsible for the operation and maintenance (O&M), safety of the structure, and reservoir operations not specifically associated with regulation of the flood control storage at the reservoirs constructed by Reclamation. Regulation of the flood control storage is the responsibility of the Corps of Engineers. In addition to irrigation and flood control, these reservoirs provide recreation, fish and wildlife, and municipal benefits.

By contractual arrangements with Reclamation, the irrigation or reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins are responsible for the O&M of the canals and irrigation distribution facilities constructed or rehabilitated by Reclamation. In addition, the appropriate irrigation or reclamation districts are responsible for operating and maintaining Box Butte, Merritt, Virginia Smith and Davis Creek Dams. The Corps of Engineers operates and maintains Harlan County Dam and Lake. The State of Colorado provides operational guidelines for Bonny Reservoir. Operational guidelines for Cedar Bluff Reservoir will be provided by the State of Kansas. Reclamation operates and maintains 11 dams and reservoirs in the Republican, Solomon, and Smoky Hill River Basins. Under a contract with Reclamation, Kirwin Irrigation District performs certain operational and maintenance functions at Kirwin Dam.

An updated Field Working Agreement was executed on July 17, 2001 between the Corps of Engineers and Reclamation regarding operation of Harlan County Dam and Lake. The agreement provides for a sharing of the decreasing water supply into Harlan County Lake. Storage capacity allocations were redefined based on the latest sediment survey (2000) and a procedure was established for sharing the reduced inflow and summer evaporation among the various lake uses.

The states of Nebraska, Colorado, and Kansas are responsible for the administration and enforcement of their state laws pertaining to the water rights and priorities of all parties concerned with the use of water. As provided by the lease agreement between Reclamation and the states, the states are responsible for administering the water surface activities and the federal lands around the reservoirs. The U.S. Fish and Wildlife Service administer the water surface activities and most of the federal lands at Kirwin Reservoir.

Reclamation cooperates with all state agencies and compact commissions to ensure that all operations are in compliance with state laws and compact requirements.

Tables and Exhibits

Records for the facilities reported in the AOP are included as tables and exhibits and are located following page 32.

Water Supply

For forecasting purposes, values of annual inflows that will be statistically equaled or exceeded 10, 50, and 90 percent of the time were selected from the probability data to be reasonable maximum (wet year), most probable (normal year), and reasonable minimum (dry year) inflow conditions, respectively.

Inflow records from 1989 through 2008 were used for the analysis of reservoirs in the Niobrara, Lower Platte and Kansas River Basins.

Reservoir Operations

All operations are scheduled for optimum benefits of the authorized project functions. Monthly, or as often as runoff and weather conditions dictate, Reclamation evaluates the carry-over storage and estimated inflow at each reservoir to determine whether excess water is anticipated. If excess inflow is apparent, controlled releases will be made to maximize the downstream benefits.

Major Features

The Mirage Flats Project was constructed under the Water Conservation and Utilization Act and includes an irrigation storage reservoir, diversion dam, and canal system. The other features discussed in this report are all a part of the Pick-Sloan Missouri Basin Program and include single and multipurpose reservoirs, diversion dams, pump stations, and canal systems. The 16 storage facilities now in operation are listed below.

Constructed by Reclamation

1. Operated by irrigation or reclamation districts--Box Butte and Merritt Dams in the Niobrara River Basin and Virginia Smith and Davis Creek Dams in the Lower Platte River Basin.

2. Operated by Reclamation--Bonny, Trenton, Enders, Red Willow, Medicine Creek, Norton, Lovewell, Kirwin, Webster, Glen Elder, and Cedar Bluff Dams in the Kansas River Basin. A contract provides for Kirwin Irrigation District to perform certain operational and maintenance functions at Kirwin Dam.

Constructed and Operated by the Corps of Engineers

1. Harlan County Dam in the Kansas River Basin.

Irrigation and Reclamation Districts

Twelve irrigation districts and one reclamation district in the Niobrara, Lower Platte, and Kansas River Basins have contracted with Reclamation for water supply and irrigation facilities. The Twin Loups Irrigation District has contracted their O&M responsibilities to the Twin Loups Reclamation District. Bostwick Irrigation District in Nebraska has contracted their O&M responsibilities for Guide Rock Diversion Dam and the Courtland Canal between the headgates and the Nebraska-Kansas state line to Kansas Bostwick Irrigation District.

The contracted irrigation season for the Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman Valley, H&RW and Frenchman-Cambridge Irrigation Districts is from May 1st through October 15th or such additional period from April 1st through May 1st of each year as determined between the District and Reclamation. The contracted irrigation season for Twin Loups Reclamation District and Almena, Bostwick in Nebraska, and Kansas-Bostwick Irrigation Districts is May 1st through September 30th or such additional period from April 1st through November 15th of each year as determined between the District and Reclamation. For Ainsworth, Kirwin, Webster and Glen Elder Irrigation Districts, the contracted irrigation season is from May 1st through September 30th.

Municipal Water

Three municipalities in Kansas (Norton, Russell, and Beloit) and one rural water district in Kansas (Mitchell County Rural Water District No. 2) have executed water service contracts for full or supplemental water supplies.

Fish and Wildlife

The State of Kansas is presently using the fish hatchery facility below Cedar Bluff Reservoir for waterfowl habitat. The Calamus Fish Hatchery located below Calamus Reservoir is operated by the Nebraska Game and Parks Commission for fish production.

State of Colorado Division of Wildlife

The Colorado Division of Wildlife provides operational guidelines for Bonny Reservoir. The entire conservation pool storage was purchased by the State of Colorado on June 24, 1982.

State of Kansas Department of Wildlife and Parks

The State of Kansas acquired the use and control of portions of the conservation capacity at Cedar Bluff Reservoir following the reformulation of the Cedar Bluff Unit in October of 1992. The City of Russell's existing water storage right and contract with the United States remained unchanged.

Power Interference Considerations

A Power Interference Agreement exists between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District. A Subordination Agreement also exists between Reclamation, the Ainsworth Irrigation District and the Nebraska Public Power District. Provisions of these agreements will be incorporated into the 2009 operations.

Environmental Considerations

A "Statement of Operational Objectives" for Harlan County Lake sets forth the general operational objectives and the specific reservoir uses that are desirable. The operational objectives indicate that fish and wildlife interests are best served by high reservoir levels with minimum fluctuations, and regulation of the outflow in excess of the minimum desired flows. Although the statement recognizes flood control and irrigation as primary purposes, it indicates that comprehensive operational plans should be developed for maximum integration of the secondary uses.

These operational objectives are also considered in the operation of all Reclamation reservoirs in the Kansas River Basin, Niobrara River Basin, and the Lower Platte River Basin. The regulated outflow can also benefit farmers, ranchers, cities, and other interests below the reservoirs.

Republican River Compact – Kansas v. Nebraska

On May 26, 1998, Kansas filed a petition with the U. S. Supreme Court complaining that Nebraska had violated the Republican River Compact (Compact) by using more than its share of the Republican River water supply. The three original parties to the Compact; Kansas, Nebraska and Colorado, became parties to the case. Because the major water development structures in the Republican River Basin were constructed by the Bureau of Reclamation and the Corps of Engineers, the United States was allowed to participate as *amicus curiae.* After seventeen months of negotiations the Final Settlement Stipulation (Stipulation) was signed by each respective governor and attorney general and was filed with the Special Master on December 16, 2002. The United States Supreme Court approved the settlement and dismissed the case on May 19, 2003.

The settlement provides for a moratorium on new groundwater wells, special rules for administration of water during water-short years, protection of storage releases, minimized flood flow effects on the accounting, recognition by Nebraska of a 1948 priority date for the Kansas-Bostwick Irrigation District, inclusion of the impacts of groundwater pumping from tableland wells in the accounting, and accounting for all reservoirs 15 acre-feet and larger within the river basin.

The Stipulation also required that the States, in cooperation with the United States, form a Conservation Committee to develop a proposed study plan to determine the quantitative effects of non-federal reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska. The Study Plan supported by the three states, the Natural Resources Conservation Service, and Reclamation was completed and signed on April 28, 2004. Cooperative agreements for completing the five year study were developed between

Reclamation, the University of Nebraska-Lincoln (UNL), and Kansas State University. Installation of data loggers on 35 reservoirs throughout the basin was completed in 2004. Advanced monitoring equipment for terraces and additional reservoirs was installed by UNL in 2006. Data collection and model development continued in 2008. The study is expected to be completed in 2009 and will be presented to the Compact Commissioners at their 2009 annual meeting.

Water-Short Year Administration will be in effect in those years in which the projected or actual irrigation supply is less than 119,000 acre feet of storage available for use from Harlan County Lake as determined by Reclamation. It was determined in 2008 that a "Water-Short Year Administration" was not in effect.

Lower Republican River Basin Appraisal Study / Feasibility Study

With the support of Kansas and Nebraska, Reclamation completed the Lower Republican River Basin Appraisal Report in January, 2005. This study analyzed system improvement alternatives in the lower portion of the Republican River basin that would provide for more efficient use of the water supply. The study met requirements of the Final Settlement Stipulation by investigating system improvements in the Basin, including measures to improve the ability to utilize the water supply below Hardy, Nebraska. This study also met the responsibilities of the Compact by investigating the most efficient use of the water of the Republican River Basin for multiple purposes.

Nine alternatives were formulated using the recommended proposals provided by the Compact Commissioners. Three other alternatives were investigated for supplying water in meeting Minimum Desirable Streamflow (MDS) related needs in Kansas. The appraisal report concluded that additional water can be made available for storage in Lovewell Reservoir. The appraisal report recommends further Federal participation in a feasibility study and that such a study be undertaken to investigate solutions. Specific congressional authorization is required for Reclamation to perform a feasibility study. The purpose of a feasibility study is to identify, evaluate, and recommend to decision makers an appropriate, viable solution to the identified problems and opportunities. The States have indicated they would provide in-kind support and/or funding for the feasibility study. Both states have expressed interest in pursuing legislation for the study.

Legislation authorizing a feasibility study was introduced in 2003 but was not advanced. Congressmen from both Nebraska and Kansas reintroduced legislation authorizing the feasibility study in 2007, but again it was not advanced. Language authorizing the feasibility study was included in Senate bill S2739, which was passed by the Senate and the House of Representatives in April of 2008. On May 8, 2008, the President signed the Consolidated Natural Resources Act of 2008 (P.L. 110-229). Section 510 of Title V of the Act authorizes the Secretary of the Interior, acting through the Bureau of Reclamation and in consultation and cooperation with the States of Nebraska, Kansas, and Colorado, to conduct a study to determine the feasibility of implementing a water supply and conservation project that will ; 1) improve water supply reliability in the Republican River Basin between Harlan County Lake in Nebraska and Milford Lake in Kansas; 2) increase the capacity of water storage through modification of existing projects or through new projects that serve areas in the Republican River Basin; and 3) improve water management efficiency in the Republican River Basin through conservation and other

available means and, where appropriate, evaluate integrated water resource management and supply needs in the Republican River Basin. Funds must be appropriated before Reclamation can begin the feasibility study.

Frenchman Valley Appraisal Study

In 2004, the Nebraska Department of Natural Resources (DNR) requested Reclamation prepare an Appraisal Study (AS) to examine opportunities for more efficient management of water supplies in the Frenchman River Valley including Reclamation's Enders Reservoir, a feature of the Frenchman-Cambridge Division in Nebraska. The study focused on problems and opportunities in an area that has experienced dramatically reduced ground and surface water supplies, including reduced reservoir inflows. Agencies participating in the study include Reclamation, Nebraska DNR, Frenchman Valley, H&RW, and Riverside Irrigation Districts, Nebraska Game and Parks Commission, and the Upper and Middle Republican Natural Resources Districts. In September, 2008 a draft report was distributed to participating agencies for review. . Comments have been incorporated and following Reclamation's final review process, the report will be released in early 2009.

Emergency Management

The Nebraska-Kansas Area Office (NKAO) continues to coordinate with local jurisdictions that could potentially be impacted by flooding from large operational releases and/or dam failure. One tabletop exercise and three functional exercises were conducted during calendar year 2008. Functional exercises were held for Box Butte Dam and Lovewell Dam; while the third functional exercise included Medicine Creek Dam, Red Willow Dam and Trenton Dam which have common downstream counties. A tabletop exercise was conducted for Merritt Dam. Orientation Meetings were held for all of NKAO dams.

Emergency radios have been installed at all dams. These radios will be used as a backup means of communication when notifying the local emergency management officials in the event of an emergency at the dam. Both the Nebraska-Kansas Area Office and the McCook Field Office have a satellite phone that can be used in an emergency. Management and dam operators have been trained on the use of these phones.

Public Safety Reviews

The Annual Safety Training for field personnel was held at the McCook Field Office and at the Community College in McCook, NE in February 2008. This training provided maintenance personnel the opportunity to update their training in Hazardous Communications/HAZCOM, Confined Space Training, Severe Weather Recognition and Reporting, and Respirator Fit Tests and Training. First Aid and CPR training was provided by the McCook Fire Department, to all field personnel, as well as any other Reclamation employees interested in taking the class to become certified.

The ongoing safety reviews of project facilities continue to identify potential safety hazards to the public and operating personnel. NKAO combines elements of the Annual Safety Inspections of the major facilities with the Dam Safety Facility Reviews when possible, and conducts follow up inspections when deficiencies aren't on-the-spot correctible. This format provides for enhanced communication and coordination between both the Area Safety Manager and Staff, and teams of Dam Safety Specialists.

Formal training for the Automated External Defibrillators (AEDs) was provided, as part of the CPR Certification Training, in February 2008. AEDs are located at the McCook Field Office and the Grand Island Office, along with an additional field ready AED at each location for employees to take to the field when activities are being conducted. NKAO continues to involve Great Plains Region Occupational Health in Billings, Montana and the Federal Occupational and Health Services Center in Denver, Colorado when maintenance and operational items, such as replacing AED batteries and pads, and reprogramming CPR protocol, is required.

Attention continues with regards to issues concerning lock out/tag out, personal protective equipment (PPE), welding and coating safety procedures, pesticide and herbicide use (MSDS), fall protection/slips, trips, and falls, working alone, near-miss accident reporting, and completing job hazard analysis (JHAs). Employees were provided safety and health training, and given information related to these and several other issues throughout the year.

Mirage Flats Project in Nebraska

General

Flows in the Niobrara River along with Box Butte Reservoir storage provide a water supply for the 11,662 acre Mirage Flats Project. From 1999 to 2008, the project water supply averaged 10,400 AF, which is about 0.89 AF per irrigable acre. Many irrigators supplement their water supply with private wells.

The Mirage Flats Irrigation District cooperates with the Nebraska Game and Parks Commission (Commission) by operating the Box Butte Dam outlet works gate and the Dunlap Diversion Dam gates in a manner to avoid sudden large changes in the flows of the Niobrara River. A 30-year agreement was made in 1990 between the district and the Commission whereby the district would not draw the reservoir water level below elevation 3978.00 feet (2,026 AF). In return the district received an up-front payment which was used to improve the efficiency of the project's delivery system. On March 17, 2000, the district agreed to increase the minimum reservoir level by one additional foot to elevation 3979.00 feet (2,392 AF). In return the district received an additional payment from the Commission for the 20 years left on the original agreement.

A data collection platform (DCP) was installed in May of 1992 to monitor the reservoir elevation and outflow at Box Butte Dam. A telephone (primary communication system) and a radio (backup communication system) have been installed at the outlet works for contacting the Region 23 Emergency Management Agency.

2008 Summary

The flows of the Niobrara River plus the carry-over storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. Precipitation at the Mirage Flats Irrigation District Office totaled 14.56 inches, which is 86 percent of normal. The 2008 total inflow of 11,286 AF was below the dry-year forecast and the lowest annual computed inflow ever recorded at the reservoir.

From early July through mid August, diversions of 5,786 AF to the Mirage Flats Canal provided irrigation water for approximately 7,372 acres, 63 percent of the service available acreage. The farm deliveries from the project water supply totaled 1,203 AF (0.16 acre-foot per irrigated acre), which is a delivery efficiency of 21 percent. Total reservoir storage was only 3,608 AF at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

A Functional Exercise to review the Box Butte Dam EAP took place in April and an Annual Site Inspection of Box Butte Dam was conducted in August.

The District continued to implement water conservation measures as outlined in their Water Management Plan and their Long Range Plan. Assistance to project irrigators provided by the District include delivery system improvements that provide on-farm efficiency improvements, such as relocation of turnouts, burying pipe for better access, and on-farm efficiency incentives. The District continues to modify and update their computer software to improve system operations, scheduling, and accounting and continued development of their web page that allows irrigators to place water orders, review water accounts, and keep updated on district operations.

Ainsworth Unit, Sandhills Division in Nebraska

General

Within the Ainsworth Irrigation District, there are approximately 35,000 acres with available service. The project water supply is provided by storage of Snake River flows in Merritt Reservoir. The reservoir is filled to elevation 2944.0 feet each fall after the irrigation season. This level is approximately two feet below the top of conservation capacity and within the repaired area of soil cement on the upstream face of the dam. The reservoir is regulated to maintain this level until the ice clears each spring. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the older existing soil cement at lower elevations. Upon ice-out the outlet pipe is drained, inspected, and repaired as necessary. The reservoir will then be rapidly filled to elevation 2946.0 feet to reduce shoreline erosion around the reservoir and minimize sand accumulations on the face of the dam. This filling process generally takes place in April. The reservoir level is maintained until irrigation releases begin to draw on the pool around mid May. Seepage, pickup and toe drain flow normally result in flows of up to 15 cfs below Merritt Dam.

Reclamation has executed a Memorandum of Agreement (MOA) between Reclamation, the Nebraska Game and Parks Commission and the Ainsworth Irrigation District for Snake River Releases below Merritt Dam. The purpose of this MOA is to establish the protocol that will be used to make future releases of water from Merritt Dam to the lower Snake River.

The development of the MOA was an environmental commitment outlined in the Ainsworth Irrigation District Final Environmental Assessment (FEA) for the Conversion of a Long-Term water Service Contract to a Repayment Contract (December 2006).

Release criteria will be based on the best available scientific data to determine when local conditions warrant releases to the Snake River. When it becomes necessary to release water from Merritt Reservoir, Reclamation will direct the Ainsworth Irrigation District to make the necessary releases to the river.

2008 Summary

Precipitation, as recorded near Merritt Dam, totaled 21.35 inches, which was 104 percent of normal. The inflow for the year totaled 182,099 AF. This inflow was between the dry- and normal-year forecasts. The water supply was more than adequate to meet the project's irrigation requirement. There were 62,616 AF diverted from Merritt Reservoir into Ainsworth Canal, with 35,298 AF delivered to the farm headgates (delivery efficiency of 56 percent). There were 34,577 acres of land irrigated in 2008.

The district provided a total of 349 AF of irrigation water from holding ponds located within the district's service area.

A tabletop exercise was conducted for the Merritt Dam EAP in 2008.

The Ainsworth Irrigation District, along with Reclamation and the local Natural Resource District, continued to provide support to the University of Nebraska Extension Service for an irrigation scheduling/nitrogen management demonstration that will educate and improve irrigation management in the area. The first demonstration site included a center pivot in the District and a field day was held in the fall of 2005. Field days were subsequently held in 2006, 2007, and 2008. This project is expected to continue in 2009.

Working with Reclamation's technical and financial assistance through a cooperative agreement, the District installed new ramp flumes on the Sand Draw Lateral and Airport Lateral. Efforts continue to fully automate these structures to improve district delivery operations and reduce operational waste. In addition to these existing flumes, the District also has plans to construct two additional flumes and continue automation efforts.

North Loup Division in Nebraska

General

The North Loup Division is located in the Loup River drainage basin. Water is diverted from both the Calamus and North Loup Rivers for the irrigation of approximately 55,100 acres of project lands. Operation of the division will also provide a sustained groundwater supply for an additional 17,000 acres. Principal features of the division include Virginia Smith Dam and Calamus Reservoir, Calamus Fish Hatchery, Kent Diversion Dam, Davis Creek Dam and Reservoir, five principal canals, one major and one small pumping plant and numerous open ditch and buried pipe laterals.

Calamus Reservoir is normally regulated at three to four feet below the top of conservation capacity during the winter months. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the soil cement on the upstream face of the dam. After the ice clears in the spring, the reservoir will be filled to conservation capacity. The North Loup Division project operation is restricted to no water diversions from the Calamus and North Loup Rivers during the months of July and August, and also during the month of September whenever sufficient water is available in storage reservoirs to deliver canal design capacity. During this time, inflows to Calamus Reservoir are required to be bypassed under the Power Interference Agreement between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District and as required in the authorizing legislation.

Davis Creek Reservoir level will be maintained at an average elevation of 2048.0 feet from the end of the irrigation season through the winter months. Off season seepage and evaporation has historically resulted in a reservoir drawdown of 2.5 to 3.0 feet requiring an end of September reservoir level of 2050.0 feet or less. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled via Mirdan Canal, starting in April and reaching full content by the end of June.

A 160-acre recreation area adjoining the reservoir continues to be managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped accessible fishing pier, a day-use area, a primitive camping area, shelter and a hiking path. Public lands adjoining Kent Diversion Dam are managed by the Nebraska Game and Parks Commission and is also open to day-use fishing with handicapped accessibility provided.

2008 Summary

Precipitation at Virginia Smith Dam was 27.82 inches which is 115 percent of normal. The inflow totaled 266,651 AF which was between the normal- and wet-year forecasts. There were 85,220 AF of water released into Mirdan Canal and 6,045 AF diverted through Kent Canal from the North Loup River. A total of 38,460 AF was diverted for district use above Davis Creek Reservoir. The farm headgate delivery was 19,442 AF which is a delivery efficiency of 51 percent. Land irrigated in 2008 totaled 34,194 acres above Davis Creek Reservoir. Calamus Reservoir inflows were bypassed during July, August, and September as required. Virginia Smith Dam recorded 5.04 inches of precipitation during October, the most ever recorded for the month. The reservoir elevation at the end of the year was at 2240.23 feet. The Calamus Fish Hatchery used bypassed natural flows and storage from Calamus Reservoir totaling 5,842 AF during 2008.

The precipitation total of 35.85 inches near Davis Creek Dam was 145 percent of normal. The site recorded 9.04 inches of precipitation during May and 7.67 inches during October (both record highs for the respective months). Inflow to Davis Creek Reservoir totaled 46,785 AF during 2008. Beginning in late April, Davis Creek Reservoir was filled from an elevation of approximately 2048.0 feet to a peak elevation of 2075.13 feet on July 8th using diversions from the North Loup River and Calamus Reservoir. A release of 38,859 AF was made from Davis Creek Dam into Fullerton Canal, with 20,087 AF delivered to the farm headgates (52 percent delivery efficiency). There were 20,637 acres irrigated below Davis Creek Reservoir. The reservoir elevation at the end of 2008 was slightly higher than the normal wintering level at 2050.15 feet.

A review of the Virginia Smith and Davis Creek Dams EAPs took place in January 2008.

An Annual Site Inspection and COW Dive Exam of Davis Creek Dam were conducted in June 2008.

Through a cooperative agreement with Reclamation, the District began installing remote monitoring equipment at key canal sites to improve delivery system operations. In 2008 equipment was placed at the Parshall flume located below Virginia Smith Dam, at the 9.5 check structure, and at the 13.4 check structure. Further work is anticipated to equip each of the sites with remote control capabilities.

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir are primarily for recreation and fish and wildlife support, although water will be available for water right administration and irrigation purposes.

Bonny Reservoir inflows from the South Fork of the Republican River and Landsman Creek are released into Hale Ditch as requested by the Colorado State Engineer. The state will make Bonny Reservoir storage water available to Hale Ditch and other natural flow appropriators under short-term water service contracts. Most of the 700 acres served by Hale Ditch are now owned and operated by the Division of Wildlife, Colorado Department of Natural Resources.

The normal operation pattern of Bonny Reservoir, with a slowly rising or stable pool, enhances fish spawning in the spring and provides excellent fishing opportunities during the summer and hunting conditions each fall.

2008 Summary

The annual precipitation total of 22.20 inches at Bonny Dam was 130 percent of normal. The annual computed inflow of 12,159 AF to Bonny Reservoir was between the normal-year and the wet-year forecasts. The reservoir level began the year at elevation 3648.39 feet and gradually increased throughout the spring to elevation 3650.08 feet before summer evaporation slowly decreased the elevation to 3648.97 feet on August 4th. Above average rainfall during the month of August caused the reservoir level to increase to a peak elevation of 3651.25 feet on August 15th. Beginning on August 15th releases were made in accordance with orders of the State of Colorado for Republican River Compact compliance. A total of 4,087 AF of river outflow was recorded for this purpose from August 15th through October 2nd. The release caused the reservoir to reach a new historic low elevation of 3648.05 feet on October 9th. No flood release was required during 2008 as the reservoir elevation remained well within the conservation pool. The reservoir elevation at the end of the year was 22.0 feet below the top of conservation at 3649.96 feet (second lowest end of December storage on record). The Corps of Engineers determined that $11,300 of flood prevention benefits was realized from the operation of Bonny Reservoir during 2008.

The Colorado State Water Commissioner directed inflows from the South Fork of the Republican River and Landsman Creek be passed through Bonny Reservoir into Hale Ditch from August 21st through September 3rd for a total of 193 AF.

An EAP Orientation Seminar was conducted in June and a Comprehensive Facility Review of Bonny Dam was performed in July.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

The Culbertson Canal and the Culbertson Extension Canal systems serve 9,292 acres in the Frenchman Valley Irrigation District and 11,915 acres in the H&RW Irrigation District. The water supply for these lands is furnished by flows from Frenchman and Stinking Water Creeks and off-season storage in Enders Reservoir located on Frenchman Creek, a tributary of the Republican River in southwest Nebraska. Irrigation releases are conveyed via Frenchman Creek from Enders Reservoir to Culbertson Diversion Dam. Reclamation maintains/clears this section of Frenchman Creek prior to the irrigation season each spring.

The normal operation of Enders Reservoir, with the gradual rise in water surface during the spring months, provides desirable fish spawning conditions. Irrigation releases will normally deplete the conservation storage by late summer, thereby limiting the fishing and recreational usage.

2008 Summary

The annual precipitation total of 22.45 inches at Enders Dam was above normal (118 percent). The 2008 inflow into Enders Reservoir of 4,770 AF was below the dry-year forecast 2008 was the 41st consecutive year with below-normal inflows in which the conservation pool did not fill. The reservoir level began the year at elevation 3092.64 feet (19.7 feet below top of conservation). The reservoir increased slightly during the spring to a peak elevation of 3092.90 feet on June 8th. The reservoir gradually decreased the remainder of the year. The minimum elevation (3090.54 ft) occurred October 11th. Due to the extremely low water supply available, no water was released from Enders Reservoir. The end of the year reservoir level was 21.3 feet below the top of conservation. The Corps of Engineers determined that the reservoir prevented $6,300 in flood damages in 2008.

The Frenchman Valley Irrigation District did not divert water into Culbertson Canal in 2008. In the spring of 2008, the Nebraska Department of Natural Resources entered into a Memorandum of Agreement (MOA) with the Frenchman Valley Irrigation District to purchase the district's natural flow rights for calendar year 2008. The MOA, approved by the irrigators

within the district, provided that no water would be diverted into the Culbertson Canal during 2008. The H&RW Irrigation District did not divert water into Culbertson Extension Canal in 2008 due to the extremely low water supply. This was the sixth consecutive year that the district did not deliver water.

In August 2004, a small depression was discovered near the outlet works stilling basin at Enders Dam. An Internal Alert remains in effect until investigation of the stability of the outlet works stilling basin and risk assessment are complete. A Safety of Dams recommendation in 2006 recommend filling the stilling basin under drain system and potential voids with low-pressure grout and backfilling the existing sinkhole with compacted material after completion of the grouting program. The rapid increase in reservoir elevation in June 2007 prompted the addition of 50,000 pounds of concrete weights to be placed on the outlet works to counter any uplift on the structure.

An Annual Site Inspection and an Orientation Seminar of the Enders Dam EAP was conducted in June 2008.

In 2008, the Frenchman Valley Irrigation District (along with Reclamation) again provided support for a Limited Irrigation Demonstration project with the University of Nebraska Extension Service.

Meeker-Driftwood, Red Willow, and Cambridge Units, Frenchman-Cambridge Division in Nebraska

General

Service is provided for Frenchman-Cambridge Irrigation District by Meeker-Driftwood Canal to 16,855 acres; Red Willow Canal to 4,797 acres; Bartley Canal to 6,353 acres; and Cambridge Canal to 17,664 acres. The water supply for these lands is provided by storage in Swanson, Hugh Butler, and Harry Strunk Lakes, and inflows of the Republican River and Red Willow and Medicine Creeks. The Frenchman-Cambridge Irrigation District has replaced all of the open ditch laterals which were economically feasible with buried pipe which has significantly increased both system and on-farm efficiencies.

2008 Summary

The annual precipitation total of 22.93 inches at Trenton Dam was 115 percent of normal. The inflow of 19,296 AF to Swanson Lake was between the dry-year and normal-year forecast. The lake level began the year at elevation 2735.00 feet and peaked at 2738.49 feet (13.5 feet below the top of conservation) on June 7th. The reservoir level gradually decreased to an elevation of 2736.58 feet on October 13th. Due to the extremely low water supply available, no water was released from Swanson Lake. Irrigation diversions were not made into Meeker-Driftwood Canal. This was the sixth consecutive year that the district did not deliver water from the Meeker-Driftwood Canal. At the end of the year the reservoir level was 14.8 feet below the top of conservation at 2737.16 feet. The Corps of Engineers determined that Swanson Lake prevented $61,900 in flood damages.

The annual precipitation total of 29.38 inches at Red Willow Dam was 150 percent of normal and the second highest ever recorded at the dam. The annual inflow of 13,743 AF into Hugh Butler Lake was between the dry-year and normal-year forecast. The reservoir level at the first of the year was 2574.18 ft, 7.6 feet below the top of conservation. May precipitation totaled 8.32 inches at the dam, the most ever recorded for the month. The reservoir level gradually filled to a peak of 2577.44 feet (4.4 feet below full) on June 27th. Irrigation releases began on June 22nd and ended on September 4th dropping the pool level 2.4 feet. Flood releases were not required in 2008. The level of Hugh Butler Lake at the end of the year was 6.5 feet below the top of conservation. The Corps of Engineers determined that Hugh Butler Lake prevented $65,500 of flood damages during 2008.

The annual precipitation total of 28.89 inches at Medicine Creek Dam was 140 percent of normal and the second highest ever recorded at the dam. The inflow of 69,752 AF was above the wet-year forecast. The reservoir level at the beginning of 2008 was only .3 foot below the top of conservation. Releases were made during early 2008 to regulate the reservoir elevation approximately .5 foot below the flood pool in cooperation with the Nebraska Game and Parks Commission. The reservoir was allowed to fill on April 29th. The dam received 10.40 inches of precipitation during May, the greatest ever for the month. The reservoir level increased to elevation 2373.83 feet (7.7 feet into flood pool) on May 25th as a result of runoff from storms that occurred above the lake during May 23rd and 24th.

These storms increased the storage in Harry Strunk Lake approximately 9,900 AF with a peak average daily inflow of approximately 4,500 cfs. Lake inflows exceeded historic highs for the month of May. Uncontrolled releases through the spillway reached over 1000 cfs. The reservoir level dropped from the flood pool on August 2nd. Scheduled releases during July, August and early September reduced the reservoir elevation to 2364.31 feet on September 6th. Medicine Creek Dam recorded 4.35 inches of precipitation during October, the most ever recorded for the month. Harry Strunk Lake was only 0.8 foot below the top of conservation at the end of the year. The Corps of Engineers determined that Harry Strunk Lake prevented $758,400 in flood damages.

A Functional Exercise to review the Trenton, Red Willow, and the Medicine Creek Dams' EAPs took place in August 2008. Annual Site Inspections were conducted in September at Red Willow Dam and July at Medicine Creek Dam and Trenton Dam. The Standing Operating Procedures for Trenton Dam was updated in 2008

In July 2005, a small quantity of fine sand was discovered near the river outlet works stilling basin drain outlet during an inspection at Red Willow Dam. Five piezometers were installed in April 2006 adjacent to the outlet works and spillway stilling basins, and temporary plugs were placed in the underdrain outlets in May. An Internal Alert remains in effect. Grouting of the underdrain system is scheduled for the fall of 2009.

In 2008, the District began making water measurement improvement upgrades on Meeker, Red Willow, and Cambridge canals, including improving farm turnouts, lateral turnouts, and canal measurement structures. Reclamation provided financial assistance for this project through a cooperative agreement with the District.

Almena Unit, Kanaska Division in Kansas

General

Service is available to 5,764 acres in the Almena Irrigation District. The project water supply is provided by Prairie Dog Creek flows and Keith Sebelius Lake storage.

The water service contract for the City of Norton, Kansas, provides for a maximum annual use of 1,600 AF from Keith Sebelius Lake.

2008 Summary

The annual precipitation at Norton Dam totaled 33.74 inches, which is 138 percent of normal. The total inflow of 14,265 AF was slightly below the wet-year forecast. The reservoir was 16.2 feet below the top of conservation pool at the first of the year. The reservoir level gradually increased 1.0 foot by mid-May. A storm system on May 22nd and 23rd produced significant rainfall across the region. Norton Dam recorded 5.05 inches over the two day period. Storage in the lake increased nearly 8,500 AF (6.8 feet in lake level), as a result of the runoff. The lake level peaked at elevation 2295.87 feet on June 4th. Irrigation releases were made during July and August reducing the lake level by 2.5 feet. Norton Dam recorded 8.94 inches of precipitation during October, the greatest ever recorded for the month. The lake level ended the year at elevation 2293.86 feet (10.4 feet below the top of conservation). The Corps of Engineers determined that Keith Sebelius Lake prevented $700 in flood damages.

The city of Norton used 228 AF of municipal water during 2008.

A Comprehensive Facility Review of Norton Dam was conducted in May and an orientation exercise of the Norton Dam EAP took place in August 2008.

A Safety of Dams recommendation was made in 2000 concerning the seepage through the left abutment and around the outlet works house at Norton Dam. Technical Service Center personnel inspected the seepage areas in June 2001 and recommended consideration of monitoring improvement and additional instrumentation. A final issue evaluation report of findings (Technical Memorandum ND-8312-2) in 2003 concluded that the assessed risks for seepage and piping through the foundation in the left abutment falls in the range of "justification to take action to reduce risk." Topographic surveys and additional instrumentation were installed near the outlet works in 2004. In December 2005, a Corrective Action Study Technical Memorandum evaluated various alternatives for risk reduction and produced two new recommendations. Design of a weighted filter drain system and a seepage stability berm was completed in 2006. Construction of the drain was completed in 2007.

Franklin, Superior-Courtland, and Courtland Units, Bostwick Division in Nebraska and Kansas

General

Harlan County Lake storage and Republican River flows provide a project water supply for 22,454 acres in the Bostwick Irrigation District in Nebraska, and 13,378 acres in the Kansas-Bostwick Irrigation District No. 2 above Lovewell Reservoir. This storage and natural flows, together with White Rock Creek flows and Lovewell Reservoir storage, furnish a water supply for 29,122 acres below Lovewell Reservoir in the Kansas-Bostwick Irrigation District.

The lands in the Franklin and Superior-Courtland Units are in the Bostwick Irrigation District in Nebraska. The lands in the Courtland Unit downstream of the Kansas state line are in the Kansas-Bostwick Irrigation District.

In accordance with the off-season flow alternative outlined in Reclamation's final environmental assessment dated December 16, 1983, and amended on November 21, 2002, Harlan County Lake releases will be 10 cfs during the months of December, January, and February, except when the reservoir is at low levels. During water-short years releases for these three months will be either zero or 5 cfs depending on reservoir levels. At the request of the State of Nebraska, releases of 30 cfs for a maximum 5-day period may be made to relieve icing conditions in the river.

Natural gain in streamflow, plus irrigation return flows, and operational bypass at Superior-Courtland Diversion Dam will provide some flow downstream.

The Kansas Department of Wildlife and Parks has requested that the Kansas-Bostwick Irrigation District and Reclamation maintain, when possible, a flow of 20 cfs into Lovewell Reservoir when the Courtland Canal is in operation and the conservation pool is below capacity. This recommended inflow provides excellent fishing around the canal inlet to the reservoir. The seepage below Lovewell Dam into White Rock Creek maintains a small live stream throughout the year.

2008 Summary - Bostwick Division - Harlan County Lake Operations

The annual precipitation at Harlan County Dam totaled 30.31 inches of rainfall, which is 133 percent of normal. The 2008 inflow of 224,841 AF was between the normal- and wet-year forecasts. The COE's Water Management Section in Kansas City, Missouri, determined that a release was not required during January and February, but was required during December in accordance to the environmental assessment and the annual operating plan.

Harlan County Lake began 2008 approximately 4.7 feet below the top of conservation pool, at 1941.08 feet. The reservoir increased rapidly during the spring. On May 22nd and again on May 23rd storms produced rainfall totals of 4 to 8 inches across the basin. The reservoir level increased 4.2 feet as a result of the runoff. The reservoir content gained 56,100 AF attributed directly to theses storms. The peak average daily inflow was approximately 7,600 cfs. Flood releases began on May 28th and continued through June 25th at which time irrigation demands exceeded inflows and the lake level reached 1948.0 feet. Irrigation releases continued through September 5th reducing the lake level to elevation 1945.64 feet. Harlan County Dam recorded 8.60 inches of precipitation during October, the greatest ever recorded for the month. Runoff from the October storms increased the lake level to 1947.31 feet on November 3rd. Flood releases began on November 3rd and were made throughout the remainder of the year to reduce lake levels back to the top of conservation. The reservoir elevation was 1946.12 ft (0.4 foot in the flood pool) on December 31, 2008. Harlan County Lake prevented $9,103,300 of downstream flood damages during 2008 according to the Corps of Engineers.

A total of 7,657 AF (approximately 8 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

2008 Summary - Bostwick Division - Nebraska

Irrigation diversions were made into Franklin, Naponee, Franklin Pump, Superior, and Courtland Canals in Nebraska in 2008. Water was supplied to 22,454 acres with an average of 2.64 inches delivered to the farm.

The district continued to replace open ditch laterals with buried pipe to reduce losses and improve system operations. In 2005 and 2006, the District was selected for a Water 2025 Challenge Grant Projects that will replace approximately 10 miles of open ditch laterals with buried pipe. Identified laterals to be placed in pipe include all or portions of Superior Laterals 9.5, 17.5, 21.2, and 27.3. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improve water measurement and accounting by utilizing water meters, and provide on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation. The District completed the pipe installation on Superior Lateral 27.3 in the fall of 2007.

2008 Summary - Bostwick Division - Kansas

The 2008 precipitation at Lovewell Dam totaled 34.10 inches, which was 124 percent of normal. The reservoir elevation at the beginning of 2008 was 1.5 feet (elevation 1581.07 feet) below the top of conservation pool. The pool level gradually increased, filling the conservation capacity on April 26th (1582.6 feet). Storms in late May produced significant runoff that raised the elevation 3.3 feet and increased the content 11,000 AF. The reservoir level peaked at 1587.31 feet on June 4th (4.7 feet into the flood pool). A flood release of 200 cfs to the creek began on May 28th and was increased to 500 cfs on June 3rd. The flood release was discontinued on June 25th. Irrigation releases to the canal began on May 27th and continued throughout the irrigation season. Flood releases resumed from July 21st through July 31st dropping the reservoir level from the flood pool. Releases were made to the creek from August 14th through September 15th to lower the reservoir pool to elevation 1576.50 feet for maintenance activities. The reservoir had refilled to elevation 1582.38 feet by late October when a release resumed to the creek. The release continued into late December. The reservoir level at the end of the year was 1581.13 feet (1.5 feet below the top of conservation). Lovewell Reservoir prevented $2,919,800 of downstream flood damages during 2008 according to the Corps of Engineers

The Kansas-Bostwick Irrigation District diverted a total of 47,449 AF to serve 9,791 acres above Lovewell Dam and 25,561 acres below Lovewell Dam. Farm delivery efficiency averaged 38 percent in the district.

A contractor excavated approximately 3,000 cubic yards of sediment from the spillway and outlet works inlet channel at Lovewell Dam following the 2008 irrigation season.

A functional exercise of the Lovewell Dam EAP took place in 2008.

In 2007, the Kansas Bostwick Irrigation District No. 2 was awarded a Water 2025 Challenge Grant that will allow the District to replace approximately 9 miles of open ditch lateral with buried pipe. The District began placing pipe in the fall of 2007, and this project will continue for the next 2 years.

Kirwin Unit, Solomon Division in Kansas

General

The water supply for the 11,465 acres of land in the Kirwin Irrigation District is furnished by Kirwin Reservoir storage and inflows from the North Fork Solomon River and Bow Creek.

The operation of Kirwin Dam and Reservoir affords many opportunities for recreation, fishing, hunting, water sports, fish spawning, and preservation of waterfowl species.

The U.S. Fish and Wildlife Service (Service) has completed the Kirwin National Wildlife Refuge Comprehensive Conservation Plan (CCP). The 1997 National Refuge System Improvement Act required the Service to develop a CCP for each of its refuges. The Kirwin Refuge CCP will guide the refuge management activities through 2025.

2008 Summary

The annual precipitation total of 40.49 inches at Kirwin Dam (172 percent of normal) was the greatest ever recorded at the dam. The inflow of 85,559 AF was above the wet-year forecast. The reservoir level was 21.0 feet below the top of conservation pool at the first of the year. Runoff from storms increased the reservoir level approximately 10.3 feet in late May. Storage in the reservoir increased nearly 30,200 AF as a result of the runoff. May total precipitation was 10.37 inches, the second greatest total ever for the month. Irrigation releases began on July 7th and continued through August 19th, reducing the pool level to 1719.58 feet. The reservoir level continued to increase after irrigation releases ended peaking at elevation 1727.27 feet on December 31st (2.0 feet below the top of conservation pool). Kirwin Dam recorded 8.56 inches of precipitation in October, the most ever recorded for the month. The reservoir level increased 4.2 feet during the month. Reservoir inflows were near record highs from May through December. No flood release was required during 2008 as the lake elevation remained within the conservation pool. The Corps of Engineers determined that Kirwin Reservoir prevented $79,900 in flood damages.

A total of 6,037 acres received project water during 2008 with 3,518 AF delivered to farms. Farm Delivery efficiency was 37 percent.

An Orientation Seminar of the Kirwin Dam EAP took place in July and a Comprehensive Facility Review of Kirwin Dam was conducted in May.

Webster Unit, Solomon Division in Kansas

General

The Webster Irrigation District has service available to 8,537 acres. The project water supply is provided by Webster Reservoir storage and flows of the South Fork Solomon River.

2008 Summary

In 2008, the precipitation at Webster Dam was 154 percent of normal (36.39 inches). This was the second greatest annual precipitation ever recorded at the dam. The inflow of 59,868 AF was well above the normal-year forecast. The reservoir level was approximately 22.2 feet (elevation 1870.28 feet) below the top of conservation pool at the first of the year. A storm on May 23rd produced the greatest 24-hour precipitation event for the year with 5.79 inches of rainfall. Storage in the reservoir increased approximately 13,200 AF, an increase of about 6.4 feet in pool level. The reservoir level increased another 2.8 feet during August and 3.6 feet during October. Precipitation in October totaled 7.59 inches at Webster Dam, the greatest ever recorded for the month. The pool level steadily increased throughout the rest of the year and peaked at elevation 1890.46 feet on December 31st (2 feet below the top of conservation). Reservoir inflows were near record highs from August through December. No flood release was required during 2008 as the reservoir elevation remained within the conservation pool. The Corps of Engineers determined that Webster Reservoir prevented $27,900 in flood damages.

Due to the extremely low water supply prior to the irrigation season beginning, a decision was made by the Webster Irrigation District not to deliver water in 2008.

A Comprehensive Facility Review of Webster Dam was conducted in May and an orientation meeting to review the Webster Dam EAP took place in July.

Concrete repairs in the spillway chute continued in 2008. Approximately 2,500 ft^2 of concrete was repaired in the flat portion of the spillway by NKAO personnel in 2008. Repairs to the other areas of the spillway were contracted to Vieco Development and Construction Company, Inc. Vieco repaired approximately 15,000 ft^2 of spillway.

The district continued to explore opportunities to cost share with Reclamation and district irrigators for the replacement of open ditch laterals with buried pipe. Future conservation projects include the possibility of installing remote monitoring equipment at the key canal measurement sites on Osborne Canal. Future conservation projects may be delayed due to the declining water supply and availability of cost-share funding.

Glen Elder Unit, Solomon Division in Kansas

General

Releases from Waconda Lake will be regulated as outlined in two memorandums of understanding between the State of Kansas and Reclamation. Releases are made for the city of Beloit, the Mitchell County Rural Water District, the long-term water service contract with Glen Elder Irrigation District, and for water right administration.

Renewal of the long term water service contract with the City of Beloit, Kansas was completed in 2008. The new repayment contract became effective on January 1, 2009. The repayment contract with Beloit, Kansas, provides for the annual use of up to 2,000 AF of Waconda Lake storage. Water is measured at the Glen Elder Dam river outlet works.

The water service contract with the Mitchell County Rural Water District No. 2 provides for 1,009 AF of storage water as available from Waconda Lake.

The water service contract with the Glen Elder Irrigation District provides for the use of up to 18,000 AF of storage water each year. Based on the current State of Kansas Certificate of Appropriation, water usage is not to exceed 15,170 AF per calendar year. Water is released and measured through the river outlet works.

When compatible with flood control operations, the operating criteria for Waconda Lake provide for a stable or rising pool level during the fish spawning period each spring.

When possible, Waconda Lake will be allowed to fill during the late summer and early fall to flood exposed shoreline vegetation. This flooded aquatic vegetation is very beneficial to waterfowl management.

Waconda Lake will normally be regulated at one to two feet below the top of conservation capacity during the winter months. Maintaining the lake at this level will reduce shoreline erosion, provide a buffer for spring runoff and lessen ice damage to the upstream face of Glen Elder Dam. Releases from Waconda Lake will be regulated each year to maintain a constant water surface level while the lake is ice-covered.

2008 Summary

The annual precipitation total of 31.11 inches at Glen Elder Dam was 122 percent of normal. The inflow of 407,850 AF was well above the normal-year forecast. The lake level at the beginning of the year was 7.1 feet below the top of conservation. A storm system stalled out over north central Kansas on May 22nd and 23rd. Runoff from this storm system increased Waconda Lake storage approximately 55,000 AF and 5 feet in elevation (peak daily average inflow of 9,600 cfs). Waconda Lake filled on June 1st. The lake level continued to increase and a flood release was started on June 3rd. Flood releases varied from 150 to 1000 cfs throughout the summer as inflows increased the lake level to approximately 3 feet into the flood pool.

Flood releases were adjusted throughout the fall to maintain an elevation of one to two feet above conservation in cooperation with the Kansas Wildlife and Parks. Glen Elder Dam recorded 5.61 inches of precipitation in October (second highest on record) with greater amounts recorded upstream. The peak reservoir level recorded during the year was 1462.66 feet on October 27th (7.1 feet and 100,000 AF in the flood pool). A release of 2,000 cfs was made throughout the month of November and the flood pool was finally evacuated on December 20th. Lake inflows were near record highs from August through December. The level of Waconda Lake at the end of the year was 1.1 feet (elevation 1454.55 feet) below the top of conservation. Waconda Lake prevented $3,247,600 of downstream flood damages during 2008 according to the Corps of Engineers.

A total of 300,951 AF of water was released from Glen Elder Dam in 2008. Storage releases of 863 AF combined with natural flow releases of 5,032 AF for the irrigation of 5,601 acres in the Glen Elder Irrigation District. The district delivered 2,857 AF to the farms resulting in a delivery efficiency of 49 percent. No storage releases were made for the City of Beloit, however, 2,398 AF was bypassed for water quality as directed by the State Water Commissioner. Releases to the Mitchell County Rural Water District No. 2 totaled 691 AF.

An Orientation Seminar of the Glen Elder Dam EAP took place in March 2008.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff Reservoir storage furnishes a maximum of 2,000 AF each year for the City of Russell, Kansas when required. Prior to 1993, Cedar Bluff Reservoir storage and Smoky Hill River flows had provided a water supply for 6,800 acres in the Cedar Bluff Irrigation District. Reformulation of the Cedar Bluff Unit in October of 1992 resulted in the dissolution of the Cedar Bluff Irrigation District with the Kansas Water Office and Kansas Department of Wildlife and Parks acquiring the use and control of portions of the reservoir conservation capacity. A "designated operating pool" was established for Cedar Bluff Reservoir and includes the following sub allocation pools: The City of Russell's existing water storage right which remained unchanged (2,700 AF); an artificial recharge pool under control of the Kansas Water Office (5,110 AF); and a fish, wildlife and recreation pool under control of the Kansas Department of Wildlife and Parks (21,061 AF). A "joint-use pool" has been established between the operating pool and the flood control pool for water supply, flood control, environmental and fish, wildlife and recreation purposes. Water rights for the "joint-use pool" are held jointly between the Kansas Department of Wildlife and Parks and the Kansas Water Office. A Contract Administration Memorandum between the United States of America, represented by Reclamation, the State of Kansas and the City of Russell was signed in November/December of 2003, establishing an accounting procedure for water storage in Cedar Bluff Reservoir. In January, 2006 a Memorandum of Understanding was signed by the State of Kansas agencies, Kansas Water Office, and Kansas Department of Wildlife and Parks. Kansas Department of Wildlife and Parks will be responsible for the joint pool releases and for the water rights.

2008 Summary

The annual precipitation total at Cedar Bluff Dam was 26.84 inches which is 128 percent of normal. The inflow (12,383 AF) was below the normal-year forecast. The reservoir level at the beginning of the year was 2128.25 feet (15.8 feet below top of conservation). Cedar Bluff Reservoir received above normal inflows in late May and June that increased the reservoir slightly. The peak reservoir level recorded during the year was 2128.91 feet on June 3rd. The reservoir level gradually decreased throughout the remainder of the year. No flood release was made from the dam in 2008. The reservoir level at the end of the year was 2127.50 feet (16.5 feet below the top of conservation). The Corps of Engineers determined that Cedar Bluff Reservoir prevented $692,300 in flood damages in 2008.

The State of Kansas utilized the fish hatchery facility located below Cedar Bluff Dam with 1 AF released to the facility. No water was released from Cedar Bluff Reservoir during 2008 for the City of Russell.

A Comprehensive Facility Review of Cedar Bluff Dam was conducted in May

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

RESERVOIR		CAPACITY ALLOCATIONS 1/ DEAD	LIVE CONSERVATION Inactive	LIVE CONSERVATION Active	FLOOD CONTROL
Box Butte	- Elevation Ft.	3969.0	3979.0	4007.0	---
	Total Acre-feet	188	2,392	29,161	---
	Net Acre-feet	188	2,204	26,769	---
Merritt	- Elevation Ft.	2875.0	2896.0	2946.0	---
	Total Acre-feet	774	4,662	66,726	---
	Net Acre-feet	774	3,888	62,064	---
Calamus	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	817	24,646	127,400	---
	Net Acre-feet	817	23,829	102,754	---
Davis Creek	- Elevation Ft.	1998.5	2003.0	2076.0	---
	Total Acre-feet	76	172	31,158	---
	Net Acre-feet	76	96	30,986	---
Bonny	- Elevation Ft.	3635.5	3638.0	3672.0	3710.0
	Total Acre-feet	1,418	2,134	41,340	170,160
	Net Acre-feet	1,418	716	39,206	128,820
Enders	- Elevation Ft.	3080.0	3082.4	3112.3	3127.0
	Total Acre-feet	7,516	8,948	42,910	72,958
	Net Acre-feet	7,516	1,432	33,962	30,048
Swanson	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
Lake	Total Acre-feet	2,118	12,430	112,214	246,291
	Net Acre-feet	2,118	10,312	99,784	134,077
Hugh Butler	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
Lake	Total Acre-feet	5,185	8,921	36,224	85,070
	Net Acre-feet	5,185	3,736	27,303	48,846
Harry Strunk	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
Lake	Total Acre-feet	3,408	7,897	34,647	87,361
	Net Acre-feet	3,408	4,489	26,750	52,714
Keith Sebelius	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
Lake	Total Acre-feet	1,636	3,993	34,510	133,740
	Net Acre-feet	1,636	2,357	30,517	99,230
Harlan County	- Elevation Ft.	1885.0	1927.0	1945.73	1973.5
Lake 3/	Total Acre-feet	0	118,099	314,111	814,111
	Net Acre-feet	0	118,099	196,012	500,000
Lovewell	- Elevation Ft.	1562.07	1571.7	1582.6	1595.3
	Total Acre-feet	1,674	11,644	35,666	86,131
	Net Acre-feet	1,674	9,970	24,022	50,465
Kirwin	- Elevation Ft.	1693.0	1697.0	1729.25	1757.3
	Total Acre-feet	4,969	8,515	98,154	313,290
	Net Acre-feet	4,969	3,546	89,639	215,136
Webster	- Elevation Ft.	1855.5	1860.0	1892.45	1923.7
	Total Acre-feet	1,256	4,231	76,157	259,510
	Net Acre-feet	1,256	2,975	71,926	183,353
Waconda	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
Lake	Total Acre-feet	248	26,237	219,420	942,408
	Net Acre-feet	248	25,989	193,183	722,988
Cedar Bluff	- Elevation Ft.	2090.0	2107.8	2144.0	2166.0
	Total Acre-feet	4,402	28,574	172,452	364,342
	Net Acre-feet	4,402	24,172	143,878	191,890
Total Storage (A.F.)		35,685	273,495	1,472,250	3,909,611 2/
Total Net Acre-feet		35,685	237,810	1,198,755	2,357,568

1/ Includes space for sediment storage.

2/ Includes total active storage for Box Butte, Merritt, Calamus, and Davis Creek Reservoirs.

3/ Bottom of irrigation pool for Harlan County Lake is 1932.5 feet, 164,111 AF.

TABLE 2
SUMMARY OF 2008 OPERATIONS
MIRAGE FLATS PROJECT

BOX BUTTE RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	MIRAGE FLATS CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	594	33	50	0.22	5,275	0	0
Feb.	1,244	29	65	0.69	5,914	0	0
Mar.	1,514	37	120	0.80	7,271	0	0
Apr.	1,276	41	145	0.50	8,361	0	0
May	1,207	47	300	2.00	9,221	0	0
June	743	39	396	3.38	9,529	0	0
July	878	4,645	387	2.28	5,375	4,128	697
Aug.	875	1,974	263	2.12	4,013	1,658	506
Sep.	739	30	186	1.05	4,536	0	0
Oct.	699	31	142	0.50	5,062	0	0
Nov.	853	35	83	1.02	5,797	0	0
Dec.	665	36	51	0.00	6,375	0	0
TOTAL	11,286	6,976	2,188	14.56	--	5,786	1,203

NOTE -- Acres irrigated 2008: Mirage Flats Canal 7,372 acres.

SANDHILLS DIVISION
AINSWORTH UNIT

MERRITT RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	AINSWORTH CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	13,397	12,893	235	0.15	61,100	0	0
Feb.	13,885	13,587	298	0.73	61,100	0	0
Mar.	15,467	15,323	413	0.98	60,831	0	0
Apr.	15,743	9,422	716	2.72	66,436	0	0
May	15,441	13,845	1,015	3.90	67,017	2,743	89
June	20,458	18,486	1,387	5.17	67,602	3,800	267
July	13,391	23,247	1,518	1.23	56,228	22,179	12,646
Aug.	15,330	26,143	1,152	0.72	44,263	24,401	15,660
Sep.	15,626	13,210	654	2.66	46,025	9,493	6,636
Oct.	15,494	1,075	673	2.43	59,771	0	0
Nov.	14,593	13,091	442	0.26	60,831	0	0
Dec.	13,275	12,694	312	0.40	61,100	0	0
TOTAL	182,099	173,015	8,815	21.35	--	62,616	35,298

NOTE -- Acres irrigated 2008: Ainsworth Canal 34,577 acres.

NORTH LOUP DIVISION

CALAMUS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to Calamus Fish Hatch. (AF)	ABOVE DAVIS CREEK MIRDAN CANAL Release to Canal (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	17,559	16,114	458	0.38	112,202	319	0	0	0
Feb.	18,845	19,356	570	0.05	111,121	291	0	0	0
Mar.	21,572	10,011	1,036	0.62	121,646	483	0	0	0
Apr.	23,172	15,950	1,211	3.09	127,657	723	1,956	0	0
May	28,715	26,359	1,843	6.95	128,170	384	12,904	2,019	733
June	26,117	29,239	2,255	2.56	122,793	583	17,058	2,237	229
July	23,002	40,291	2,245	4.30	103,259	966	20,598	11,020	5,741
Aug	20,511	42,453	1,509	0.95	79,808	797	25,448	20,191	11,414
Sep.	19,480	24,736	940	2.44	73,612	891	7,256	2,993	1,325
Oct.	26,133	9,479	1,084	5.04	89,182	209	0	0	0
Nov.	21,527	7,375	654	0.89	102,680	60	0	0	0
Dec.	20,020	13,268	405	0.55	109,027	136	0	0	0
TOTAL	266,651	254,629	14,210	27.82	--	5,842	85,220	38,460	19,442

NOTE -- Acres irrigated 2008: Mirdan Canal 34,194 acres.

NORTH LOUP DIVISION (Continued)

DAVIS CREEK RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Mo. Content (AF)	BELOW DAVIS CREEK FULLERTON CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	27	185	50	0.04	9,476	0	0
Feb.	39	164	61	0.17	9,290	0	0
Mar.	15	166	106	0.74	9,033	0	0
Apr.	1,768	224	179	3.63	10,398	0	0
May	13,737	2,953	254	9.04	20,928	2,400	0
June	12,802	4,689	507	6.75	28,534	3,394	17
July	8,682	11,968	480	1.82	24,768	10,856	6,928
Aug.	4,560	17,939	317	1.21	11,072	17,502	10,909
Sep.	4,530	4,935	167	2.83	10,500	4,707	2,233
Oct.	454	240	154	7.67	10,560	0	0
Nov.	82	220	83	1.04	10,339	0	0
Dec.	90	256	47	0.91	10,126	0	0
TOTAL	46,785	43,938	2,405	35.85	--	38,859	20,087

NOTE - Acres irrigated 2008: Fullerton Canal 20,637 acres.

TABLE 2
SUMMARY OF 2008 OPERATIONS

UPPER REPUBLICAN DIVISION
ARMEL UNIT
BONNY RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Outflow To Hale Ditch (AF)
Jan.	437	307	73	0.15	8,004	0
Feb.	778	288	87	0.25	8,407	0
Mar.	834	307	137	0.59	8,797	0
Apr.	899	298	342	1.71	9,056	0
May	823	307	455	2.04	9,117	0
June	683	298	490	2.63	9,012	0
July	578	307	725	3.51	8,558	0
Aug.	2,654	1,961	411	5.21	8,840	145
Sep.	1,558	2,255	357	2.22	7,786	48
Oct.	1,117	387	226	3.23	8,290	0
Nov.	1,006	298	158	0.37	8,840	0
Dec.	793	266	91	0.29	9,276	0
TOTAL	12,159	7,278	3,552	22.20	--	193

TABLE 2
SUMMARY OF 2008 OPERATIONS

FRENCHMAN-CAMBRIDGE DIVISION
FRENCHMAN UNIT

	ENDERS RESERVOIR					CULBERTSON CANAL		CULBERTSON EXT.CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	346	307	68	0.07	16,856	0	0	0	0
Feb.	358	288	79	0.25	16,847	0	0	0	0
Mar.	370	307	139	0.59	16,771	0	0	0	0
Apr.	650	298	295	2.58	16,828	0	0	0	0
May	742	307	340	4.97	16,923	0	0	0	0
June	638	298	407	3.13	16,856	0	0	0	0
July	146	307	504	2.18	16,191	0	0	0	0
Aug.	84	307	377	2.52	15,591	0	0	0	0
Sep.	182	298	310	1.64	15,165	0	0	0	0
Oct.	470	181	210	3.27	15,244	0	0	0	0
Nov.	399	131	144	1.12	15,368	0	0	0	0
Dec.	385	307	78	0.13	15,368	0	0	0	0
TOTAL	4,770	3,336	2,951	22.45	--	0	0	0	0

NOTE: Acres irrigated 2008: Culbertson Canal - 0 acres; Culbertson Extension Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT

	SWANSON LAKE					MEEKER-DRIFTWOOD	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	1,195	61	219	0.04	46,126	0	0
Feb.	2,701	58	257	0.25	48,512	0	0
Mar.	3,099	61	465	0.48	51,085	0	0
Apr.	3,777	60	1,014	2.71	53,788	0	0
May	3,386	61	1,263	5.27	55,850	0	0
June	1,642	60	1,716	3.66	55,716	0	0
July	409	62	2,077	2.14	53,986	0	0
Aug.	2	62	1,839	1.69	52,087	0	0
Sep.	0	60	1,327	1.56	50,700	0	0
Oct.	881	62	787	4.38	50,732	0	0
Nov.	951	60	538	0.67	51,085	0	0
Dec.	1,256	62	290	0.08	51,989	0	0
TOTAL	19,296	726	11,792	22.93	--	0	0

NOTE: Acres irrigated 2008: Meeker-Driftwood Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT

	HUGH BUTLER LAKE					RED WILLOW CANAL		BARTLEY CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	554	246	85	0.01	25,216	0	0	0	0
Feb.	663	230	101	0.25	25,548	0	0	0	0
Mar.	712	246	185	0.29	25,829	0	0	0	0
Apr.	1,084	238	414	1.46	26,261	0	0	0	0
May	2,723	246	589	8.32	28,149	0	0	0	0
June	2,569	720	688	4.45	29,310	230	0	0	0
July	639	2,559	884	3.53	26,506	2,269	728	0	0
Aug.	2,417	1,932	513	5.76	26,478	1,391	405	0	0
Sep.	302	476	569	0.93	25,735	199	82	0	0
Oct.	912	246	303	3.68	26,098	0	0	0	0
Nov.	687	238	218	0.58	26,329	0	0	0	0
Dec.	481	246	113	0.12	26,451	0	0	0	0
TOTAL	13,743	7,623	4,662	29.38	--	4,089	1,215	0	0

NOTE -- Acres irrigated 2008: Red Willow Canal - 2,688 acres; Bartley Canal 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT

	HARRY STRUNK LAKE					CAMBRIDGE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	2,983	2,829	118	0.02	34,189	0	0
Feb.	3,093	3,035	130	0.43	34,117	0	0
Mar.	3,362	3,426	243	0.34	33,810	0	0
Apr.	3,861	2,386	509	2.30	34,776	0	0
May	26,515	14,006	789	10.40	46,496	0	0
June	11,158	16,298	1,092	3.55	40,264	1,556	84
July	3,737	7,930	1,129	2.78	34,942	9,396	4,835
Aug.	3,293	5,085	783	2.93	32,367	7,098	3,311
Sep.	2,214	1,206	679	0.86	32,696	1,337	529
Oct.	3,566	1,744	401	4.35	34,117	0	0
Nov.	3,063	3,551	283	0.67	33,346	0	0
Dec.	2,909	2,965	139	0.26	33,151	0	0
TOTAL	69,752	64,459	6,295	28.89	--	19,387	8,759

NOTE -- Acres irrigated 2008: Cambridge Canal 15,768 acres.

TABLE 2
SUMMARY OF 2008 OPERATIONS

SOLOMON DIVISION
KIRWIN UNIT

	KIRWIN RESERVOIR					KIRWIN CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	463	0	119	0.23	24,440	0	0
Feb.	686	0	159	0.48	24,967	0	0
Mar.	919	0	280	1.04	25,606	0	0
Apr.	1,248	0	634	2.50	26,220	0	0
May	31,407	0	921	10.37	56,706	0	0
June	7,519	0	2,015	2.57	62,210	0	0
July	3,597	5,512	2,387	4.89	57,908	5,695	1,904
Aug.	8,736	3,888	1,574	6.44	61,182	3,723	1,614
Sep.	2,282	0	1,598	1.97	61,866	0	0
Oct.	18,499	0	1,047	8.56	79,318	0	0
Nov.	6,307	0	723	1.21	84,902	0	0
Dec.	3,896	0	373	0.23	88,425	0	0
TOTAL	85,559	9,400	11,830	40.49	--	9,418	3,518

NOTE: Acres irrigated 2008: Kirwin Canal - 6,037 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

	WEBSTER RESERVOIR					OSBORNE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	380	0	113	0.33	17,987	0	0
Feb.	884	0	140	0.54	18,731	0	0
Mar.	1,114	0	253	1.21	19,592	0	0
Apr.	1,654	0	544	2.93	20,702	0	0
May	14,302	0	804	9.10	34,200	0	0
June	6,744	0	1,412	2.88	39,532	0	0
July	1,845	0	1,768	3.99	39,609	0	0
Aug.	8,589	0	1,059	4.94	47,139	0	0
Sep.	1,898	0	1,100	2.00	47,937	0	0
Oct.	11,730	0	665	7.59	59,002	0	0
Nov	6,462	0	543	0.46	64,921	0	0
Dec.	4,266	0	302	0.42	68,885	0	0
TOTAL	59,868	0	8,703	36.39	--	0	0

NOTE: Acres irrigated 2008: Osborne Canal - 0 acres.

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT

	WACONDA LAKE					OUTFLOW TO RIVER				
						City of Beloit		Irrig.District		
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Storage Release (AF)	Quality Bypass (AF)	Storage Release (AF)	Other Controlled Releases (AF)	Release To Mitchell Co. RWD No. 2 (AF)
Jan.	4,712	547	530	0.40	146,618	0	492	0	0	55
Feb.	5,673	516	685	0.37	151,090	0	460	0	0	56
Mar.	4,251	558	1,315	1.05	153,468	0	492	0	0	66
Apr.	7,343	535	3,132	2.92	157,144	0	476	0	0	59
May	60,440	839	4,566	3.88	212,179	0	428	274	81	56
June	39,990	16,896	6,928	3.36	228,345	0	50	97	16,693	56
July	20,562	14,941	8,448	3.28	225,518	0	0	171	14,702	68
Aug.	65,524	29,578	5,657	6.08	255,807	0	0	321	29,198	59
Sep.	20,895	33,301	5,264	2.85	238,137	0	0	0	33,251	50
Oct.	115,399	33,012	3,719	5.61	316,805	0	0	0	32,960	52
Nov.	40,575	118,807	2,282	0.93	236,291	0	0	0	118,754	53
Dec.	22,486	51,421	936	0.38	206,420	0	0	0	51,360	61
TOTAL	407,850	300,951	43,462	31.11	--	0	2,398	863	296,999	691

NOTE: Acres irrigated 2008: Glen Elder District 5,601 acres.

SMOKY HILL DIVISION
ELLIS UNIT

	CEDAR BLUFF RESERVOIR							
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to City of Russell (AF)	Release To Fish Hatchery (AF)	Release to Kansas Water Office (AF)
Jan.	153	0	314	0.31	86,356	0	0	0
Feb.	408	0	368	0.63	86,396	0	0	0
Mar.	155	0	636	0.48	85,915	0	0	0
Apr.	964	0	1,323	2.04	85,556	0	0	0
May	5,205	0	1,642	7.72	89,119	0	0	0
June	1,778	1	2,433	2.25	88,463	0	1	0
July	886	0	2,913	3.04	86,436	0	0	0
Aug.	914	0	2,112	2.60	85,238	0	0	0
Sep.	0	0	1,657	1.38	83,581	0	0	0
Oct.	1,833	0	810	5.62	84,604	0	0	0
Nov.	87	0	678	0.62	84,013	0	0	0
Dec.	0	0	471	0.15	83,542	0	0	0
TOTAL	12,383	1	15,357	26.84	--	0	1	0

TABLE 3

ACRES IRRIGATED IN 2008

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2008
Mirage Flats Irrigation District		
Mirage Flats Canal	11,662	7,372
Ainsworth Irrigation District		
Ainsworth Canal	35,000	34,577
Twin Loups Irrigation District		
Above Davis Creek	34,053	34,194
Below Davis Creek	21,063	20,637
Total Twin Loups Irrigation District	55,116	54,831
Frenchman Valley Irrigation District		
Culbertson Canal	9,292	0
H & RW Irrigation District		
Culbertson Extension Canal	11,915	0
Frenchman-Cambridge Irrigation District		
Meeker-Driftwood Canal	16,855	0
Red Willow Canal	4,797	2,688
Bartley Canal	6,353	0
Cambridge Canal	17,664	15,768
Total Frenchman-Cambridge Irrigation District	45,669	18,456
Almena Irrigation District		
Almena Canal	5,764	1,700
Bostwick Irrigation District in Nebraska		
Franklin Canal	10,920	10,920
Naponee Canal	1,650	1,650
Franklin Pump Canal	2,090	2,090
Superior Canal	5,848	5,848
Courtland Canal (Nebraska)	1,946	1,946
Total Bostwick Irrigation Dist. in Nebraska	22,454	22,454
Kansas-Bostwick Irrigation District		
Courtland Canal above Lovewell	13,378	9,791
Courtland Canal below Lovewell	29,122	25,561
Total Kansas-Bostwick Irrigation District	42,500	35,352
Kirwin Irrigation District		
Kirwin Canal	11,465	6,037
Webster Irrigation District		
Osborne Canal	8,537	0
Glen Elder Irrigation District	10,370	5,601
TOTAL PROJECT USES	269,744	186,380
Non-Project Uses		
Hale Ditch	700	0
TOTAL PROJECT AND NON-PROJECT	270,444	186,380

TABLE 5

FLOOD DAMAGES PREVENTED BY NEBRASKA-KANSAS PROJECTS RESERVOIRS

RESERVOIR	DURING FY 2008	PRIOR TO 2008	ACCUMULATED TOTAL
BONNY	$11,300	$2,791,000	$2,802,300
ENDERS	$6,300	$3,558,000	$3,564,300
SWANSON	$61,900	$22,985,000	$23,046,900
HUGH BUTLER	$65,500	$2,951,000	$3,016,500
HARRY STRUNK	$758,400	$9,343,000	$10,101,400
KEITH SEBELIUS	$700	$3,989,000	$3,989,700
HARLAN COUNTY	$9,103,300	$177,563,000	$186,666,300
LOVEWELL	$2,919,800	$146,619,000	$149,538,800
KIRWIN	$79,900	$86,888,000	$86,967,900
WEBSTER	$27,900	$110,340,000	$110,367,900
WACONDA	$3,247,600	$1,217,334,000	$1,220,581,600
CEDAR BLUFF	$692,300	$130,038,000	$130,730,300
TOTAL	$16,974,900	$1,914,399,000	$1,931,373,900

Estimates of damages prevented are received from the Army Corps of Engineer's Kansas City District Office. The Accumulated Totals date from 1951 through 2008. Cumulative totals are revised by the Corps of Engineers in some cases to reflect data not previously included in the reporting and may not match previous cumulative totals.

Construction Cost of storage dams was $208,954,130.
The reservoirs upstream of Harlan County Lake did not receive benefits for damages prevented from 1972 to 1993.

TABLE 6
WATER DIVERTED IN 2008
(Units - Acre-Feet)

Irrigation District and Canal	2008 Irrigation Operations From	To	10-Year Average Diversion (1998-2007)	2008 Diversion
Mirage Flats Irrigation District				
Mirage Flats Canal	7/10	8/16	11,128	5,786
Ainsworth Irrigation District				
Ainsworth Canal	5/11	9/22	77,605	62,616
Twin Loups Irrigation District				
Above Davis Creek	4/25	9/26	44,228	38,460
Below Davis Creek	5/12	9/15	40,370	38,859
Total Twin Loups Irrigation District			84,598	77,319
Frenchman Valley Irrigation District				
Culbertson Canal	Did not run.		6,638	0
H & RW Irrigation District				
Culbertson Extension Canal	Did not run.		4,166	0
Frenchman-Cambridge Irrigation District				
Meeker-Driftwood Canal	Did not run.		10,859	0
Red Willow Canal	6/24	9/5	3,094	4,089
Bartley Canal	Did not run.		4,033	0
Cambridge Canal	6/19	9/20	19,563	19,387
Total Frenchman-Cambridge Irrigation District			37,549	23,476
Almena Irrigation District				
Almena Canal	7/14	8/11	2,853	2,217
Bostwick Irrigation District in Nebraska				
Franklin Canal	6/26	8/17	17,089	16,085
Naponee Canal	7/9	8/22	1,638	316
Franklin Pump Canal	7/1	8/29	1,791	576
Superior Canal	6/26	8/25	8,919	5,666
Courtland Canal (Nebraska)	6/17	9/10	1,394	311
Total Bostwick Irrigation District in Nebraska			30,831	22,954
Kansas-Bostwick Irrigation District				
Courtland Canal above Lovewell	6/18	9/24	18,656	17,433
Courtland Canal below Lovewell	5/27	9/8	40,978	30,016
Total Kansas-Bostwick Irrigation District			59,634	47,449
Kirwin Irrigation District				
Kirwin Canal	7/7	8/19	14,089	9,418
Webster Irrigation District				
Osborne Canal	Did not run.		8,649	0
Glen Elder Irrigation District	5/20	8/20	7,514	863
TOTAL			345,254	252,098

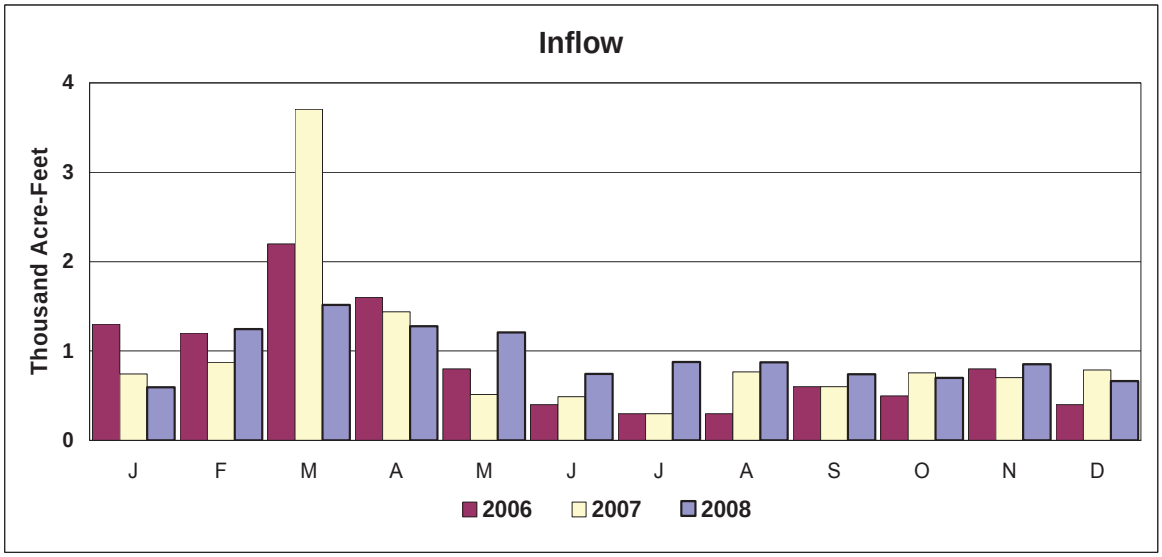
TABLE 7
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2008

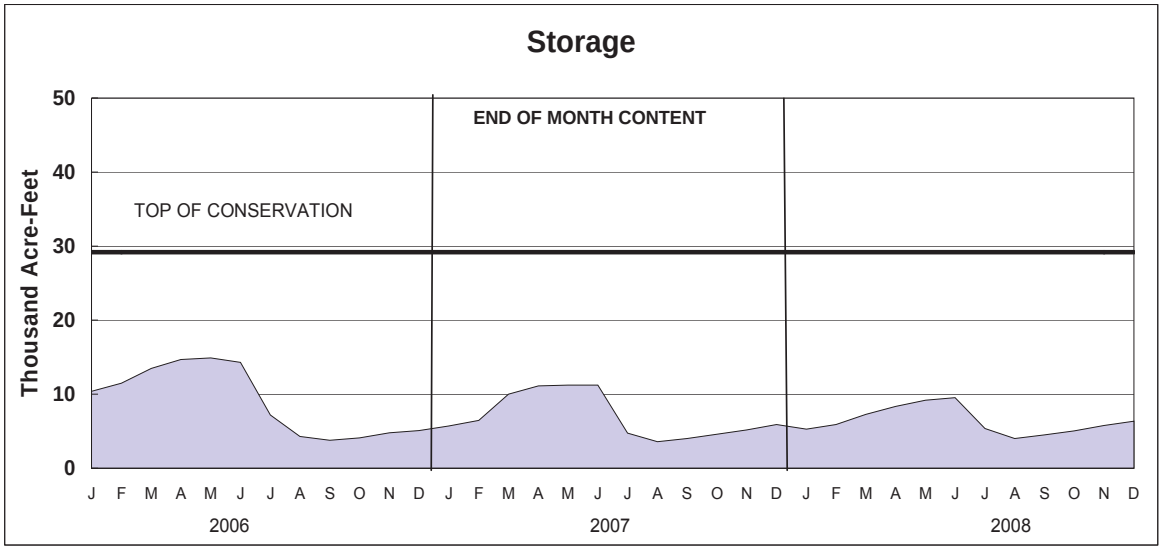
Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-07 AF	Storage 12-31-08 AF	Gain or Loss AF	Maximum Content AF	Storage Date	Minimum Content AF	Storage Date	Total Inflow AF
Box Butte	14.56	86	5,895	6,375	480	9,572	JUN 25	3,608	AUG 14	11,286
Merritt	21.35	104	60,831	61,100	269	66,959	JUN 1	41,554	SEP 7	182,099
Calamus	27.82	115	111,215	109,027	-2,188	128,582	MAY 27	73,324	SEP 16	266,651
Davis Creek	35.85	145	9,684	10,126	442	30,177	JUL 8	8,791	APR 23	46,785
Bonny	22.20	130	7,947	9,276	1,329	10,460	AUG 15	7,675	OCT 9	12,159
Enders	22.45	118	16,885	15,368	-1,517	17,134	JUN 8	14,973	OCT 11	4,770
Swanson	22.93	115	45,211	51,989	6,778	56,388	JUN 7	44,427	JAN 1	19,296
Hugh Butler	29.38	150	24,993	26,451	1,458	29,513	JUN 27	24,993	JAN 1	13,743
Harry Strunk	28.89	140	34,153	33,151	-1,002	51,158	MAY 25	31,502	SEP 5	69,752
Keith Sebelius	33.74	138	9,732	16,313	6,581	19,166	JUN 4	9,722	JAN 1	14,265
Harlan County	30.31	133	255,393	319,311	63,918	357,333	JUN 6	255,637	JAN 1	224,841
Lovewell	34.10	124	31,273	31,438	165	51,414	JUN 4	20,187	SEP 17	90,852
Kirwin	40.49	172	24,096	88,425	64,329	88,615	DEC 31	24,077	JAN 2	85,559
Webster	36.39	154	17,720	68,885	51,165	68,885	DEC 31	17,686	JAN 2	59,868
Waconda	31.11	122	142,983	206,420	63,437	319,346	OCT 27	142,713	JAN 3	407,850
Cedar Bluff	26.84	128	86,517	83,542	-2,975	89,201	JUN 3	83,035	DEC 27	12,383

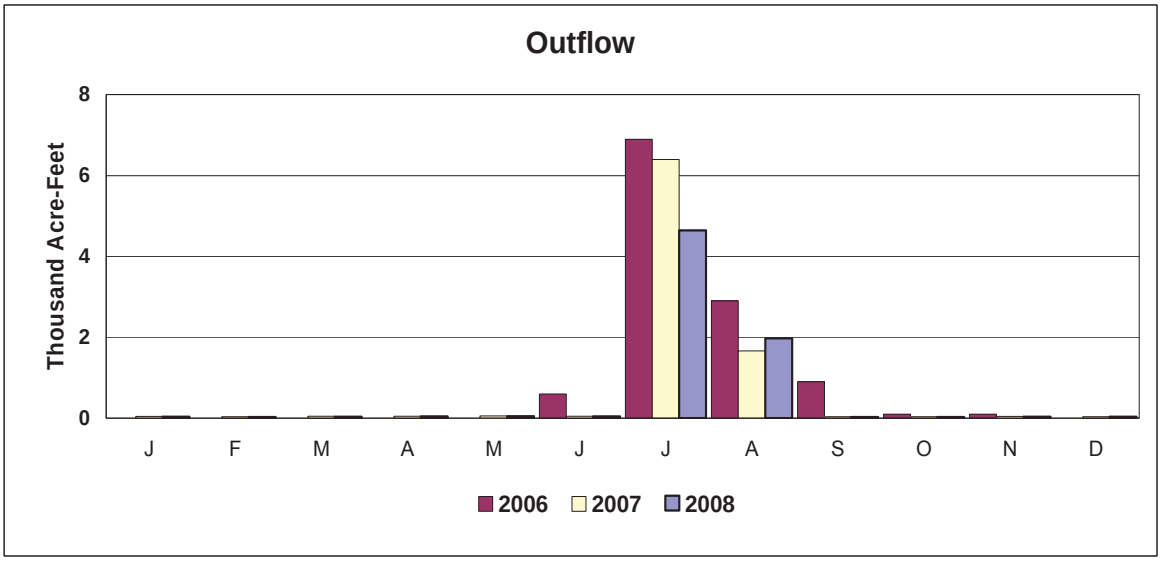
KS003253

BOX BUTTE RESERVOIR

ACTUAL OPERATION

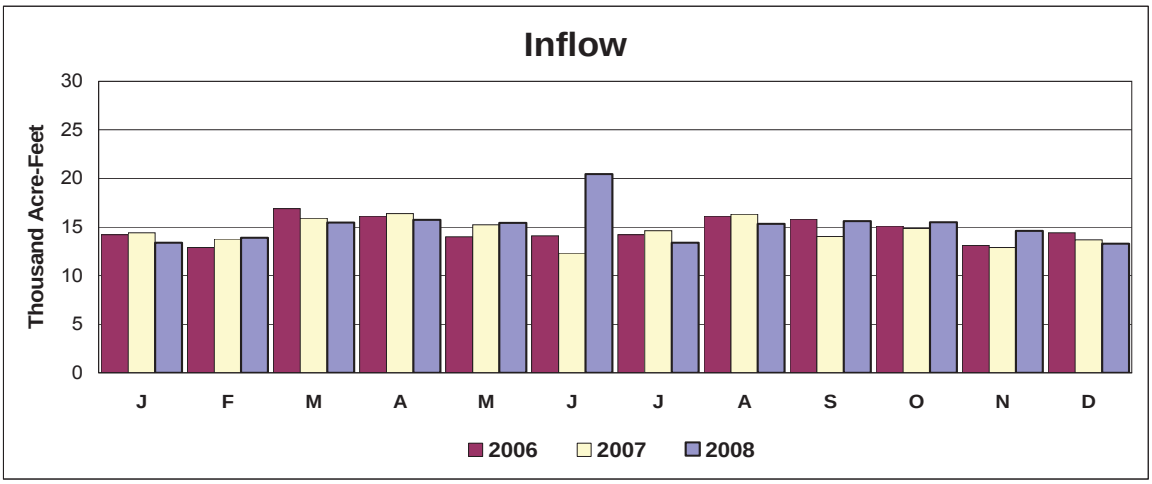


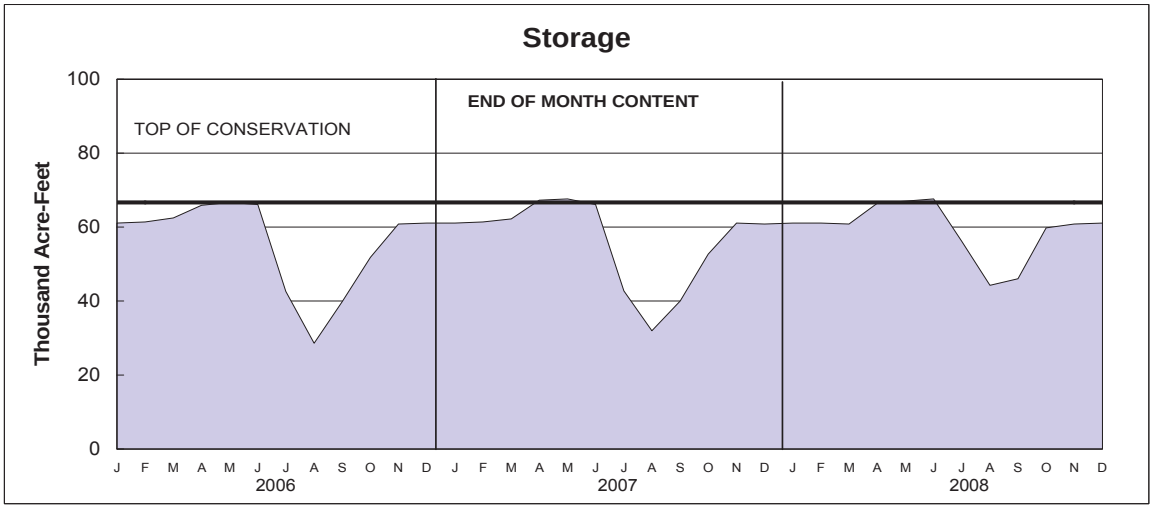


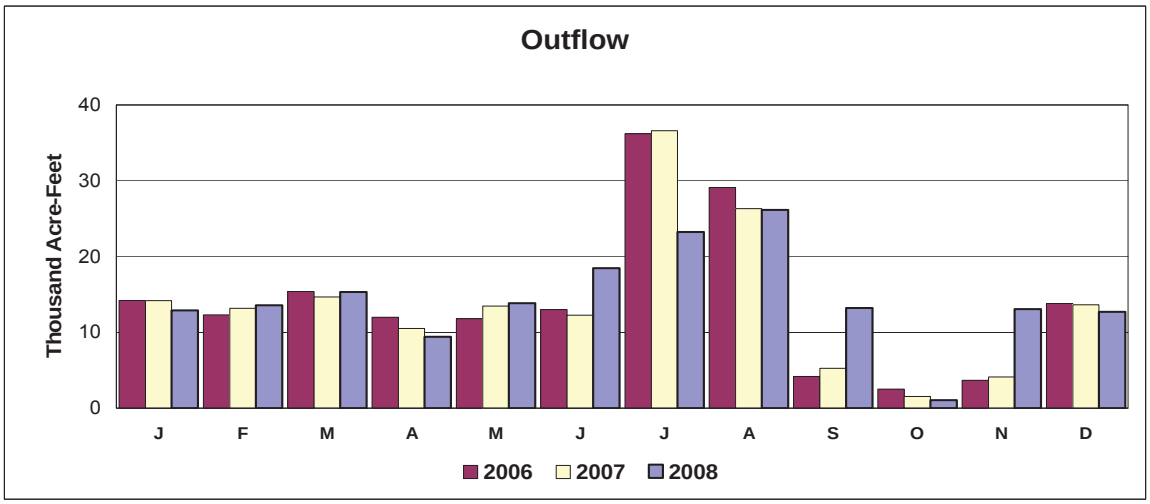


KS003254

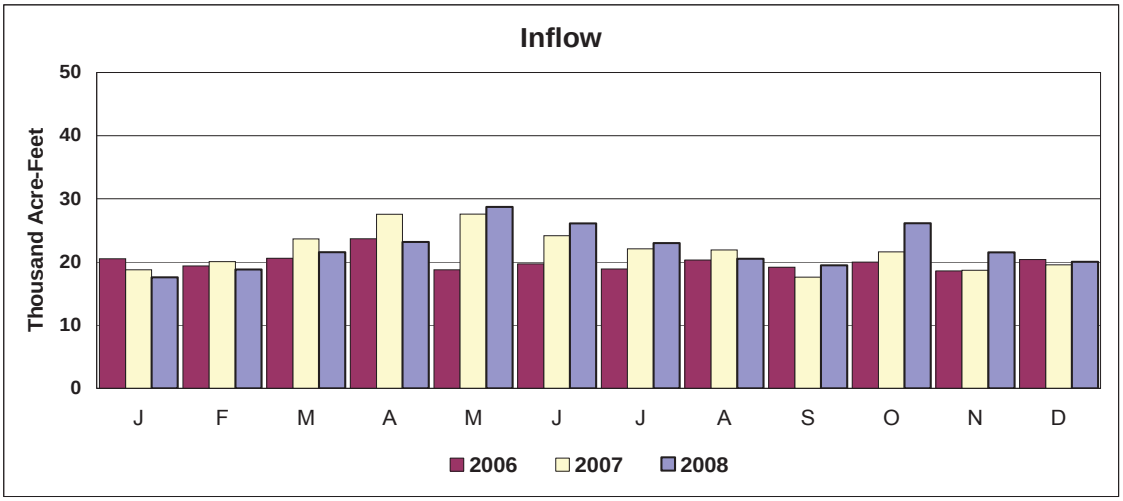
MERRITT RESERVOIR
ACTUAL OPERATION

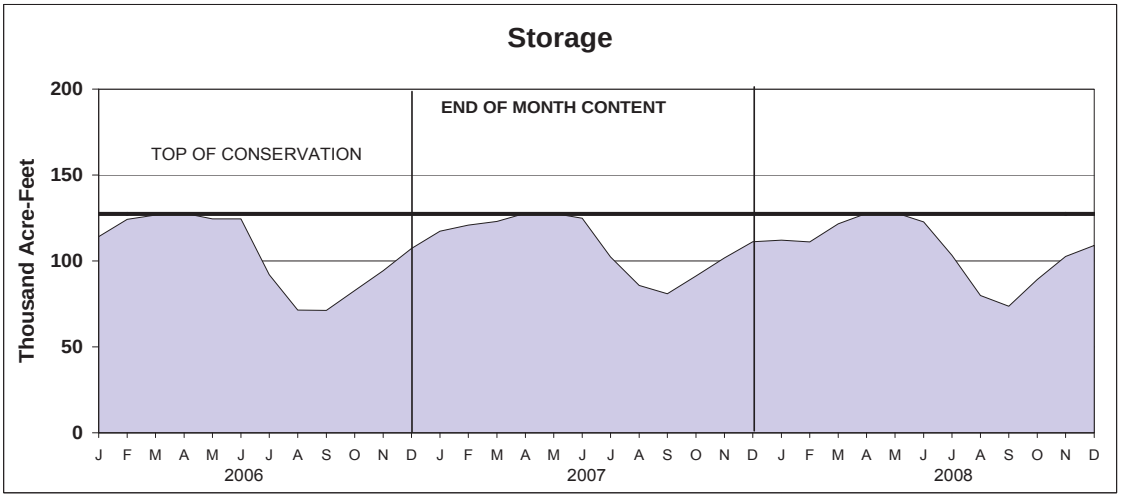


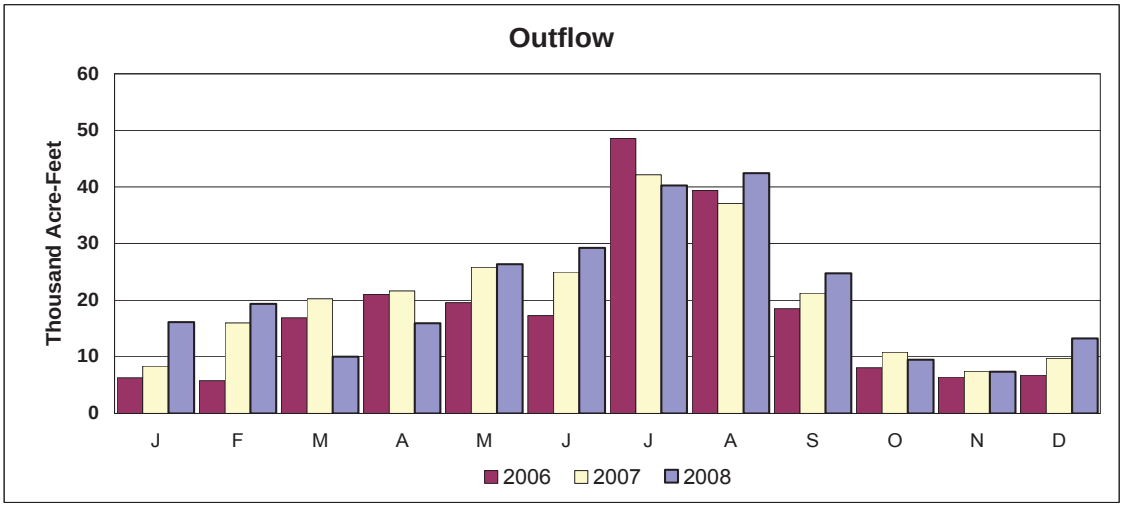




CALAMUS RESERVOIR
ACTUAL OPERATION

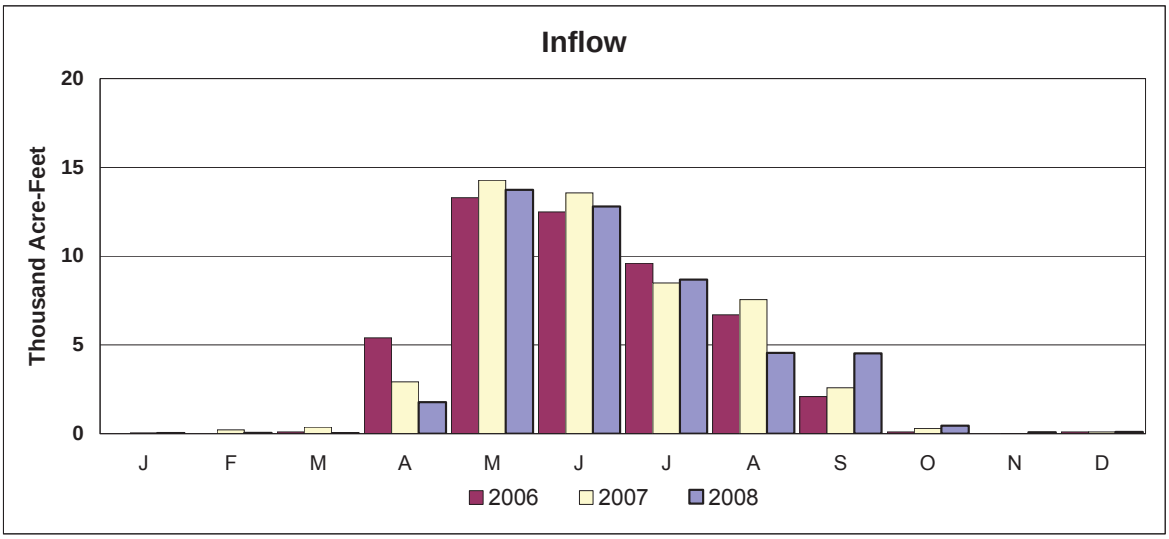


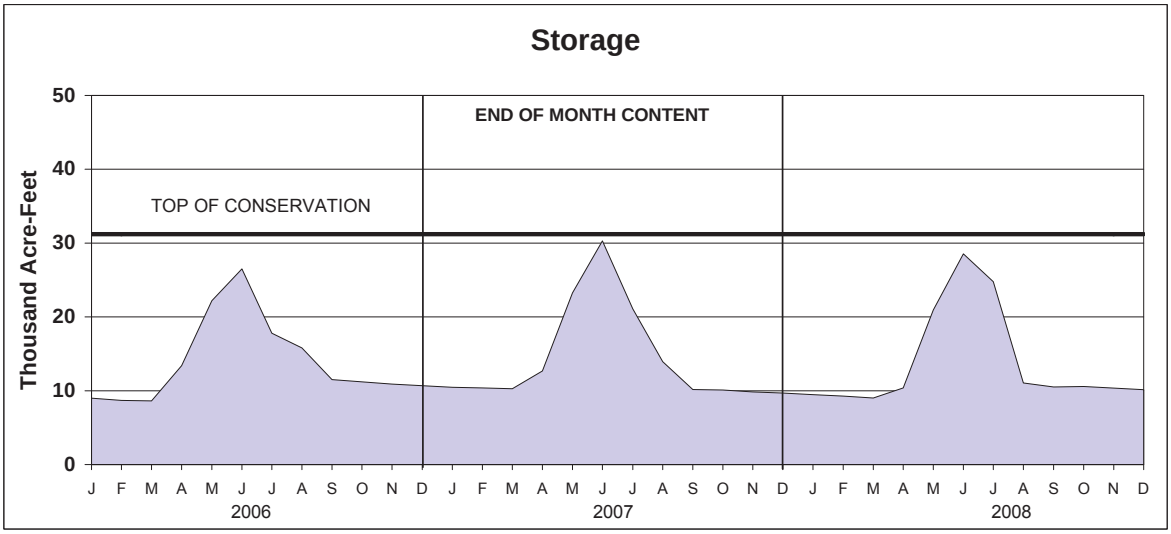


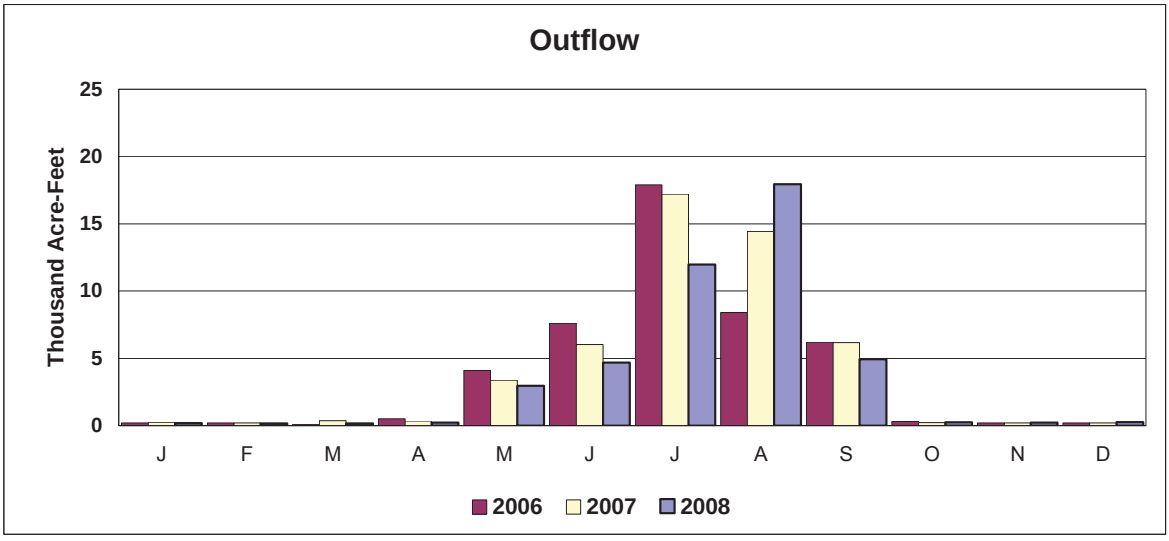


DAVIS CREEK RESERVOIR

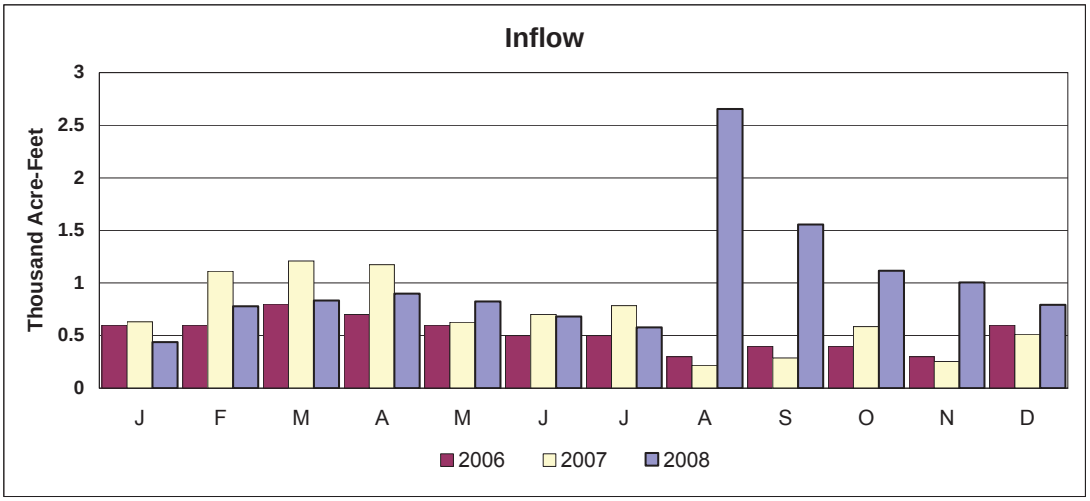
ACTUAL OPERATION

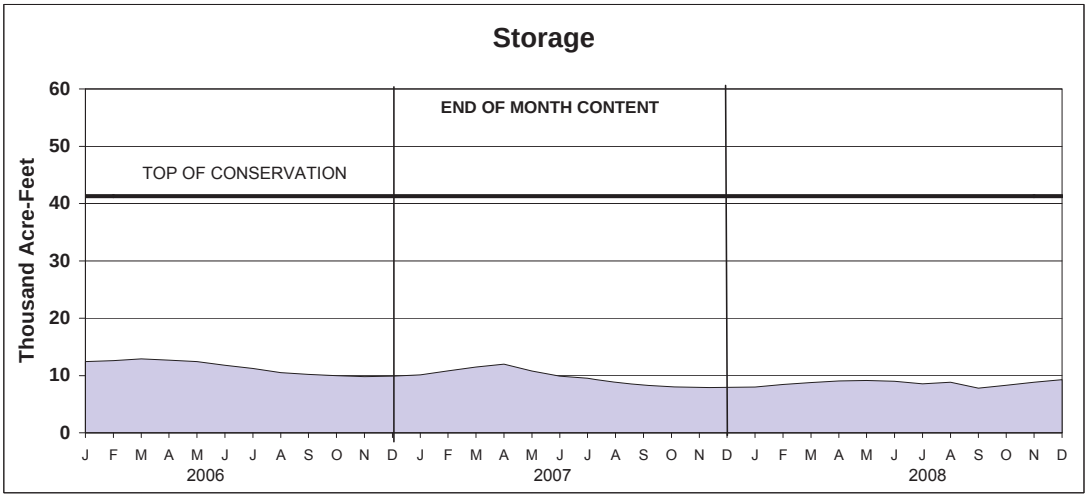


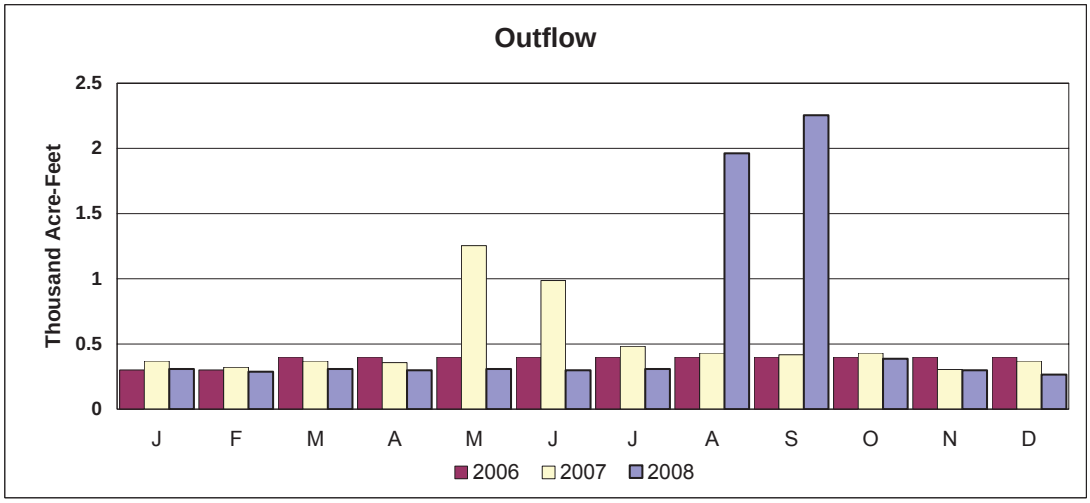




BONNY RESERVOIR
ACTUAL OPERATION

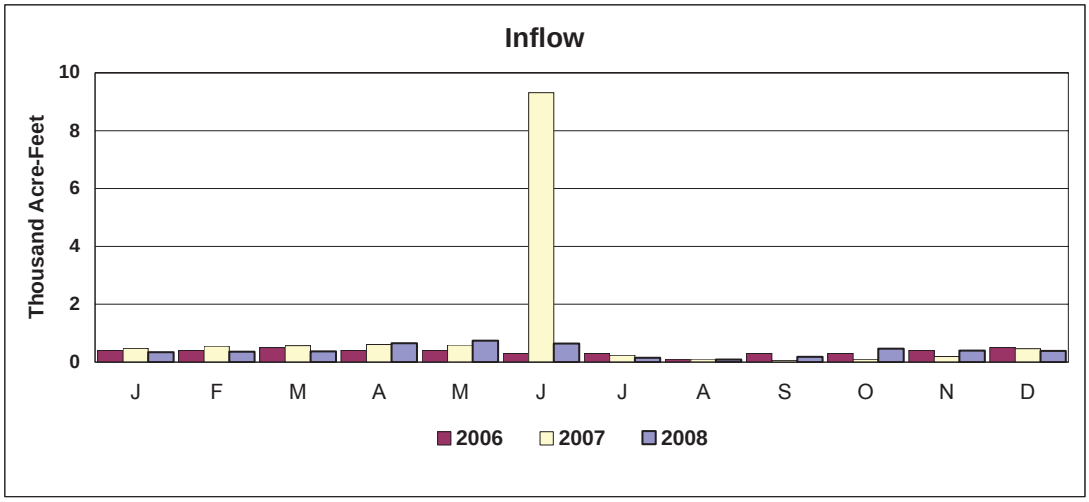


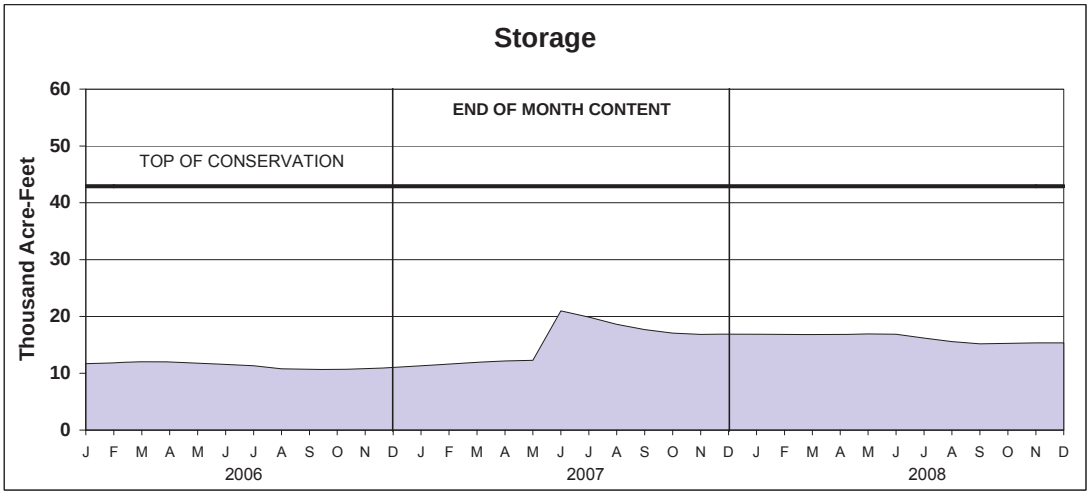


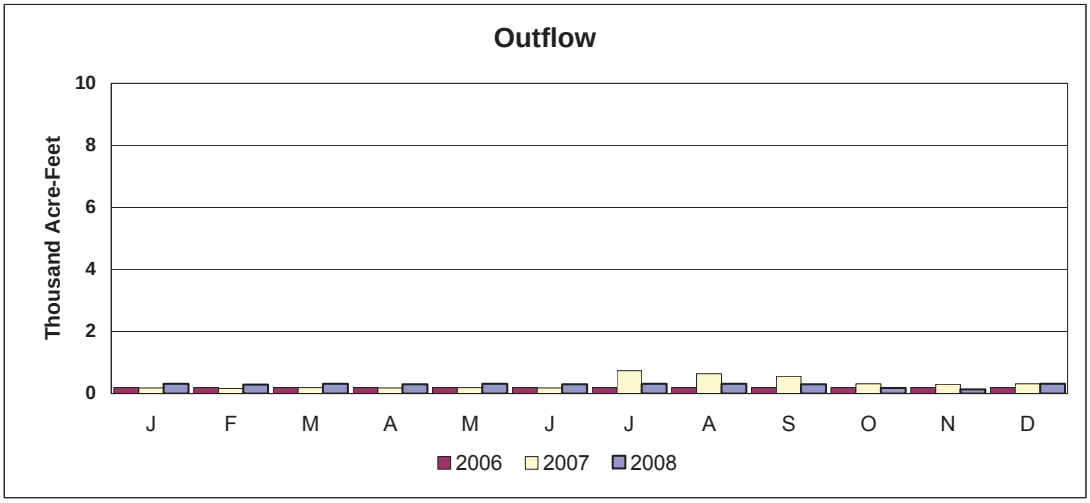


ENDERS RESERVOIR

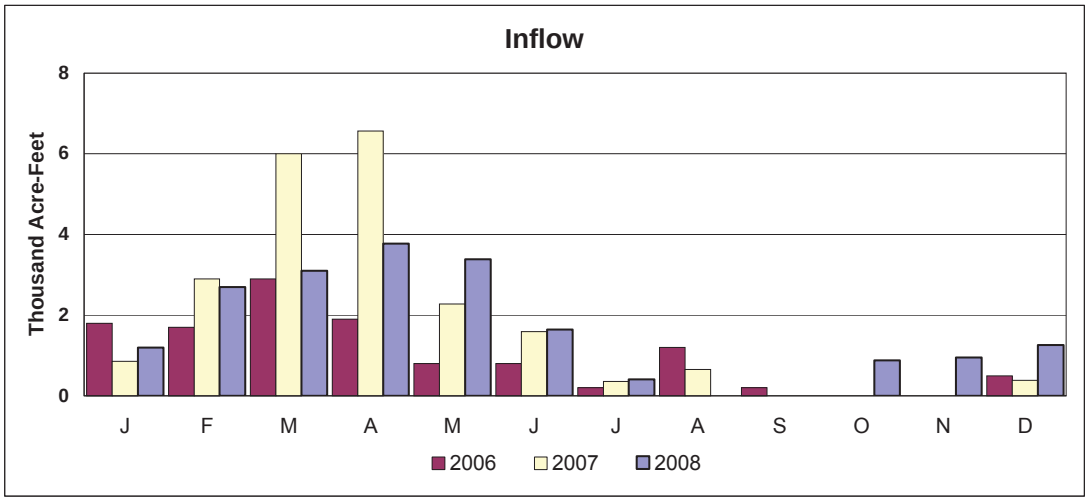
ACTUAL OPERATION

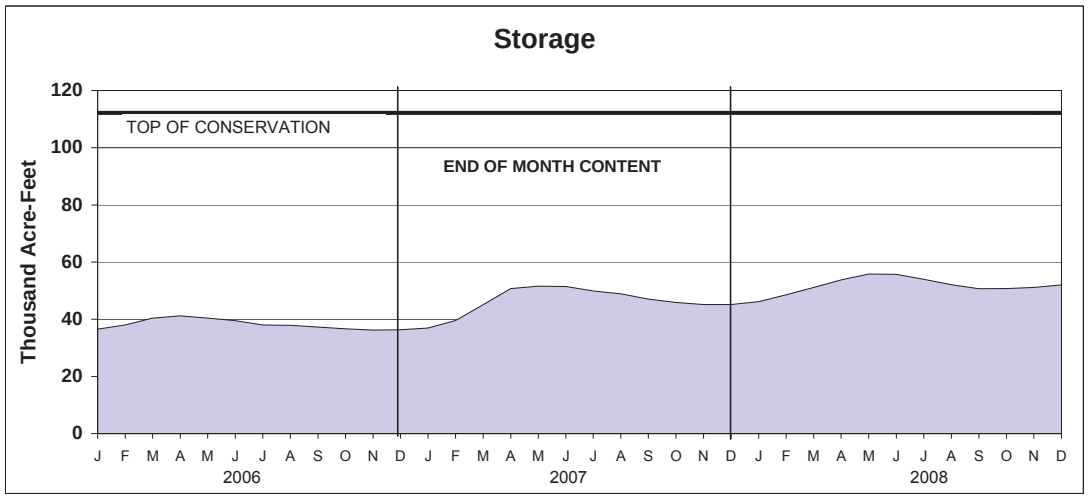


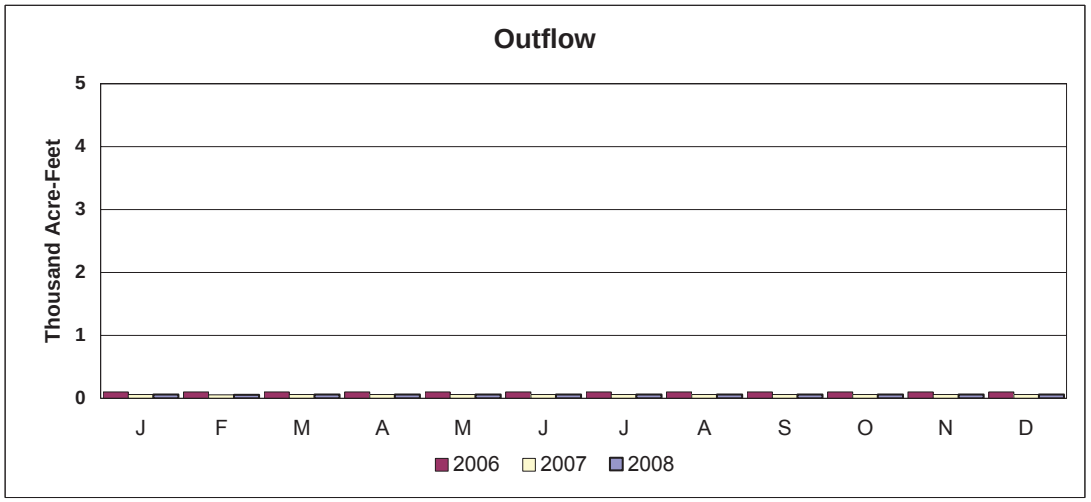




SWANSON LAKE
ACTUAL OPERATION

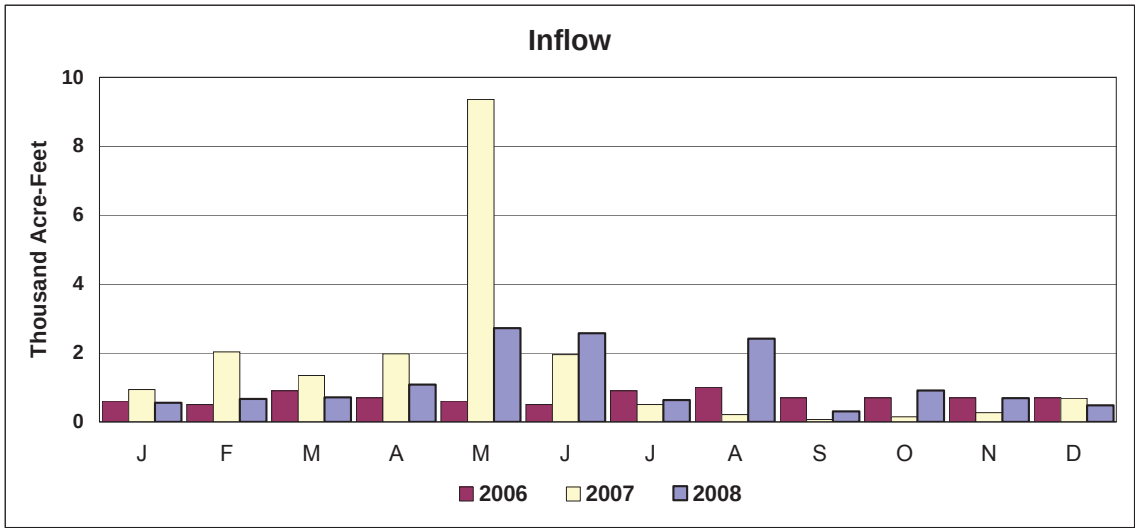


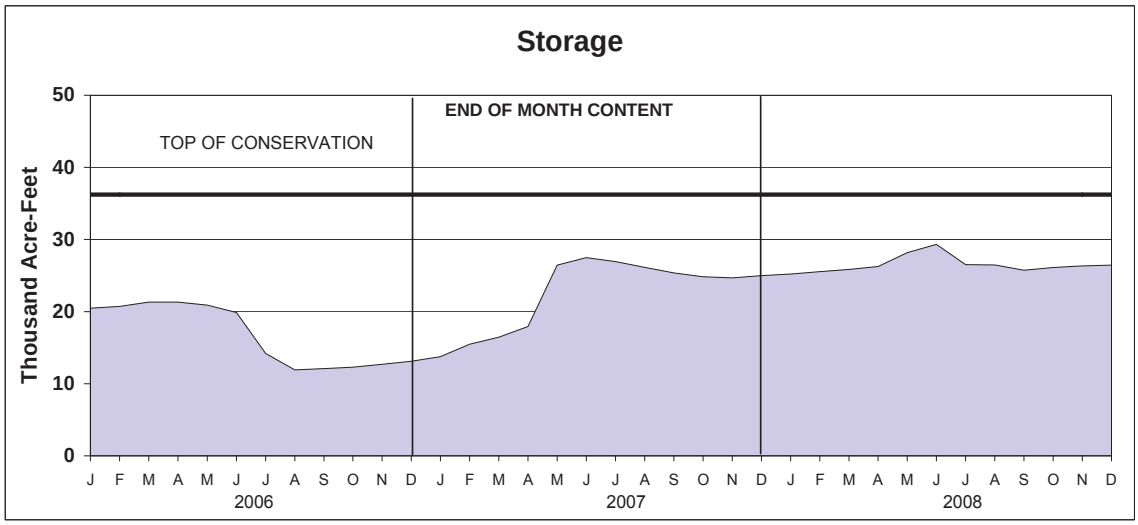


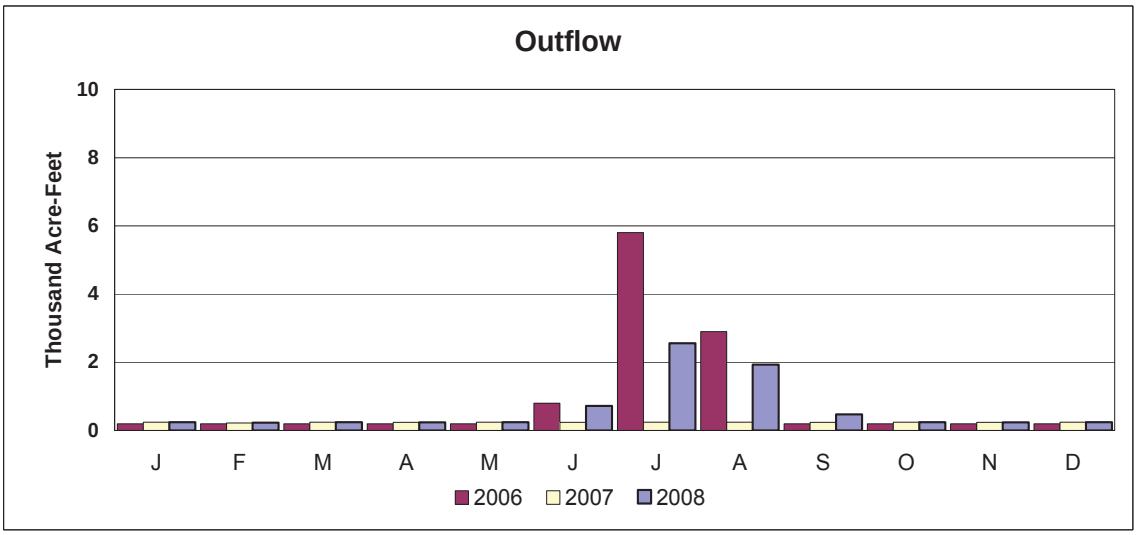


HUGH BUTLER LAKE

ACTUAL OPERATION

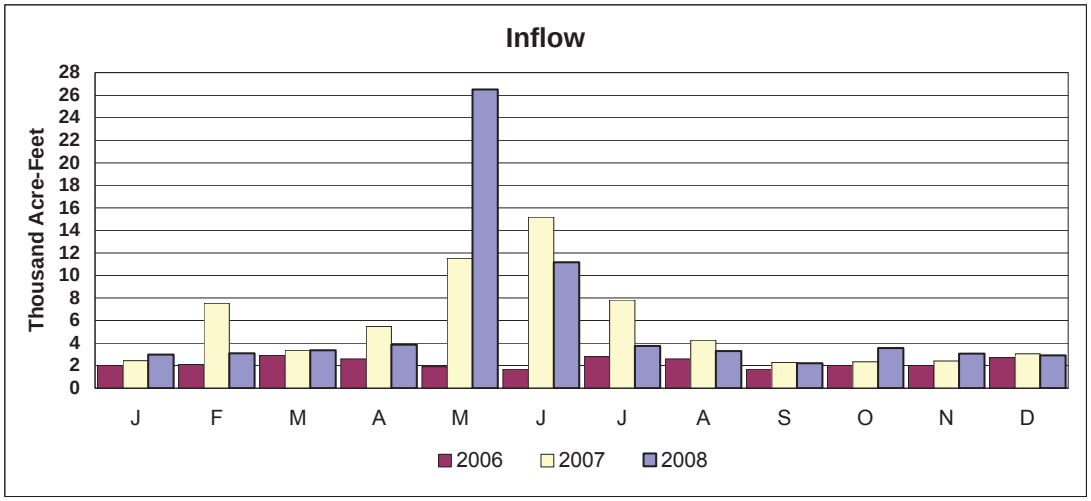


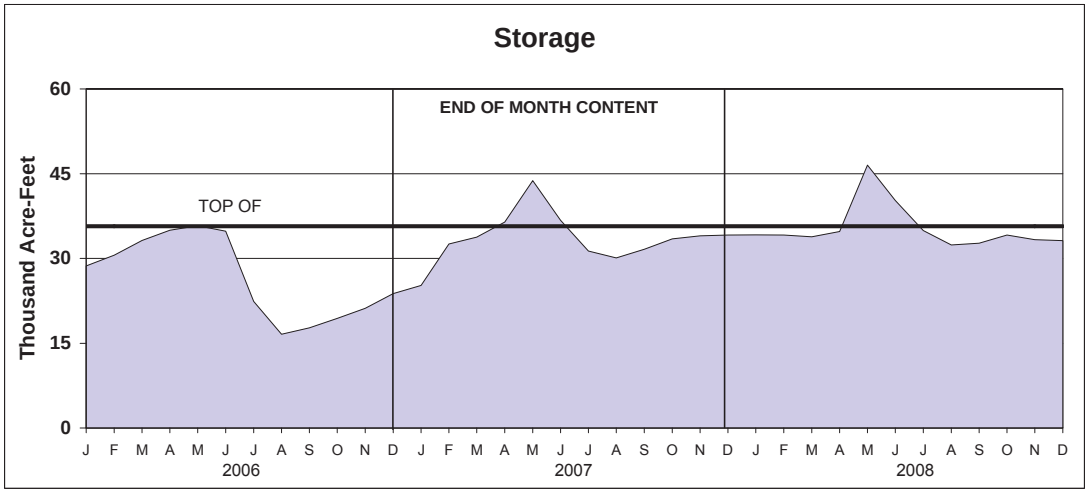


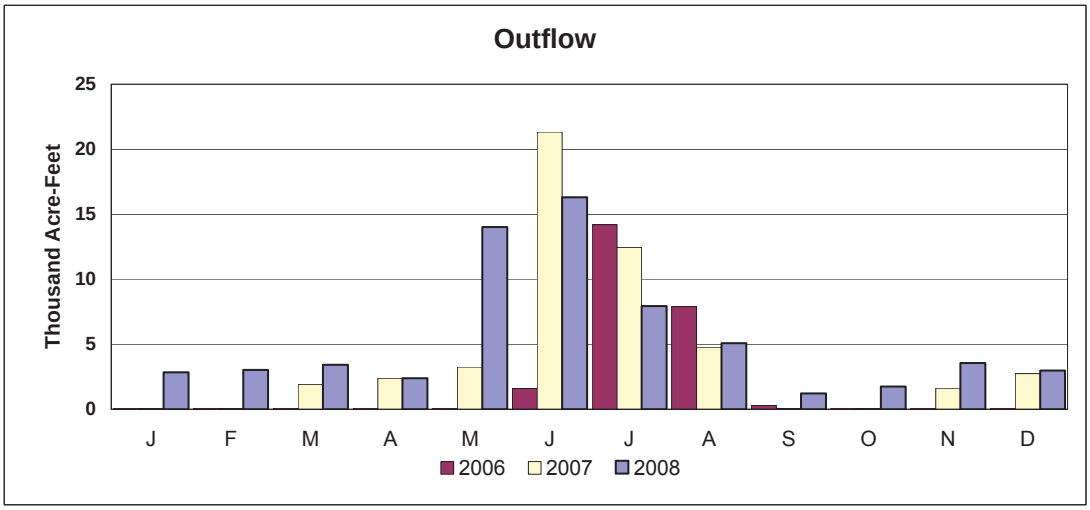


HARRY STRUNK LAKE

ACTUAL OPERATION

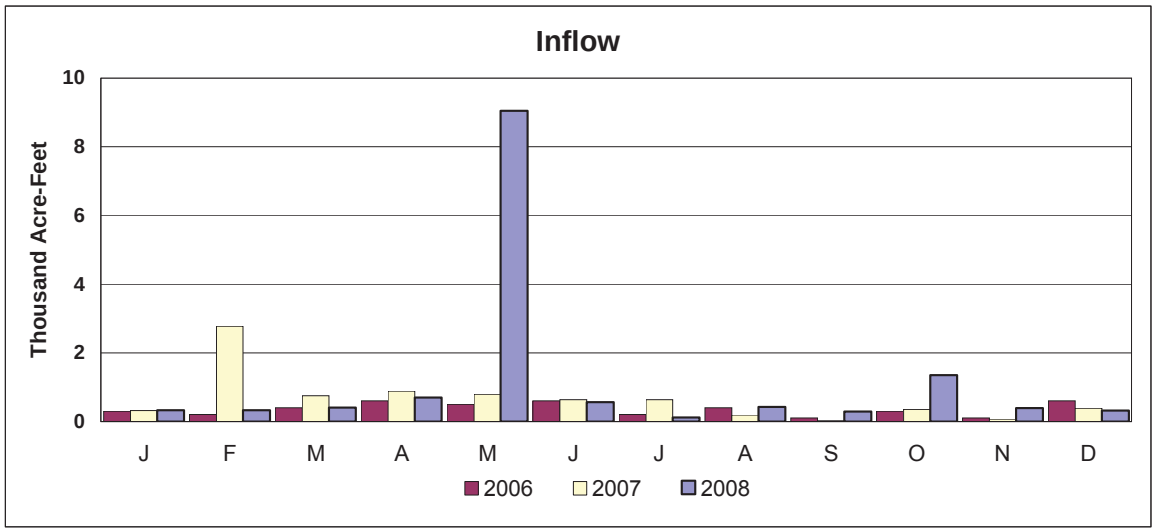


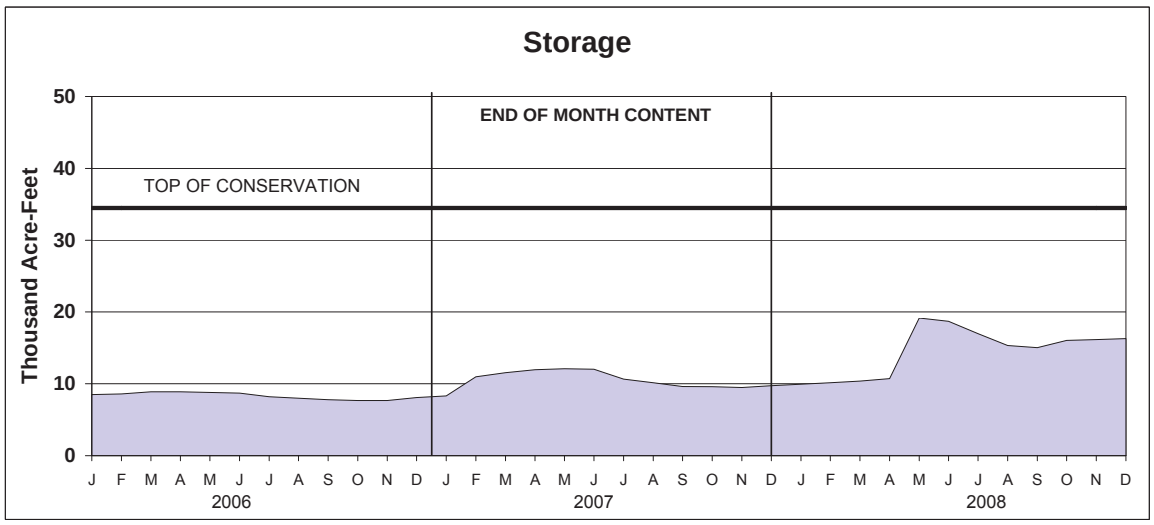


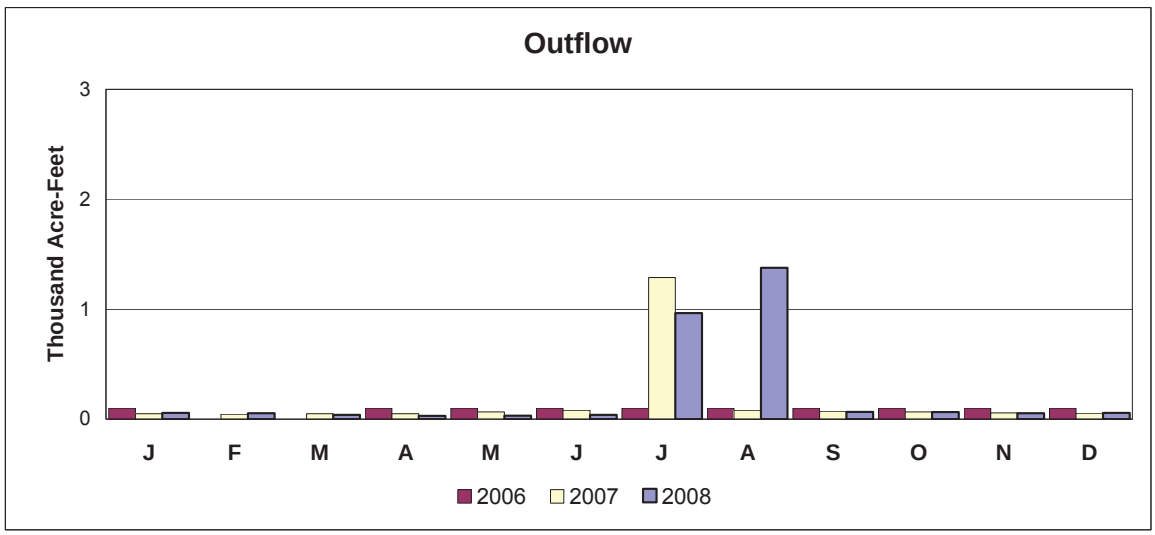


KEITH SEBELIUS LAKE

ACTUAL OPERATION

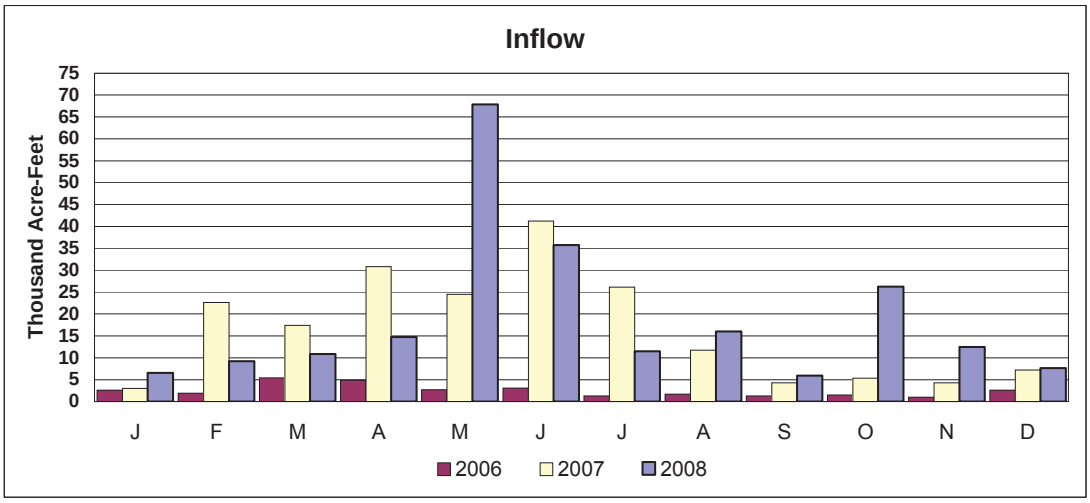


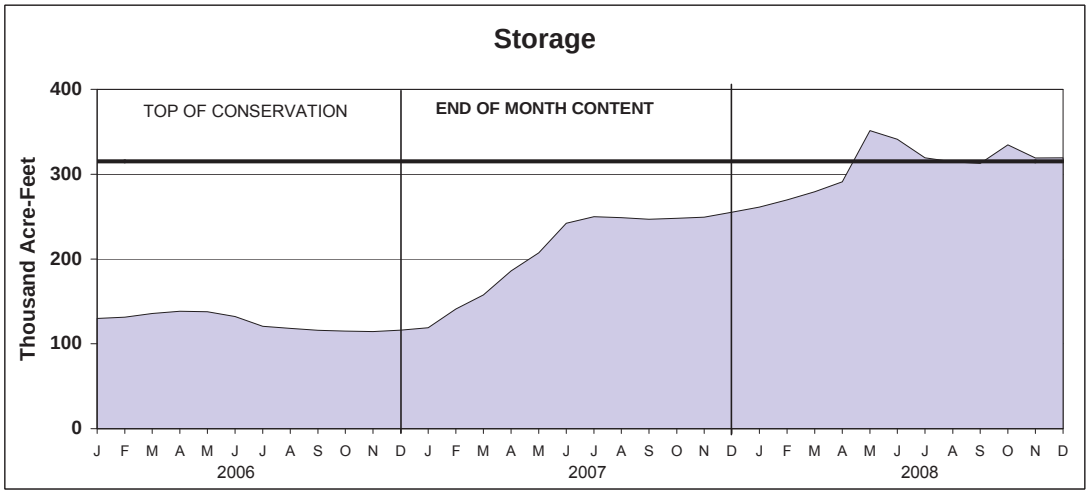


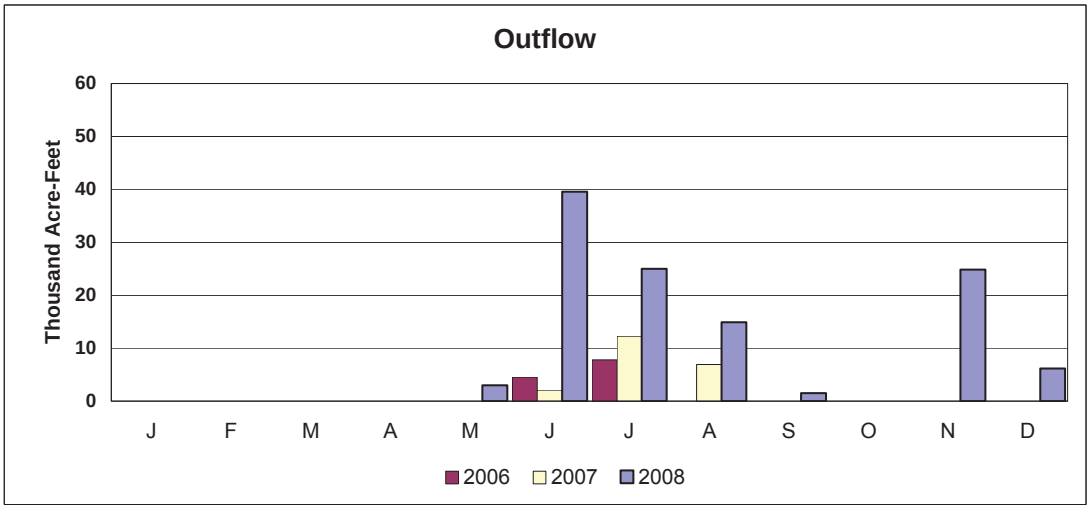


HARLAN COUNTY LAKE

ACTUAL OPERATION

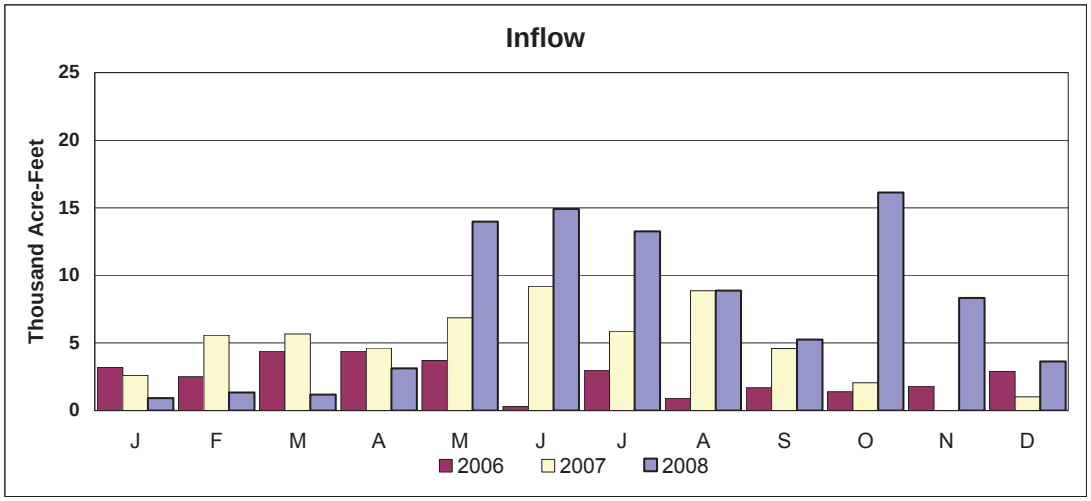


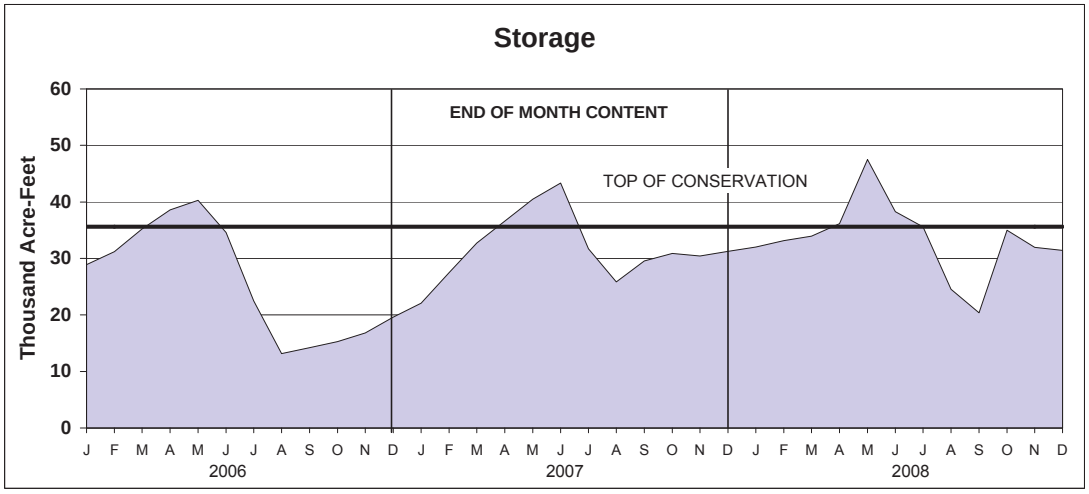


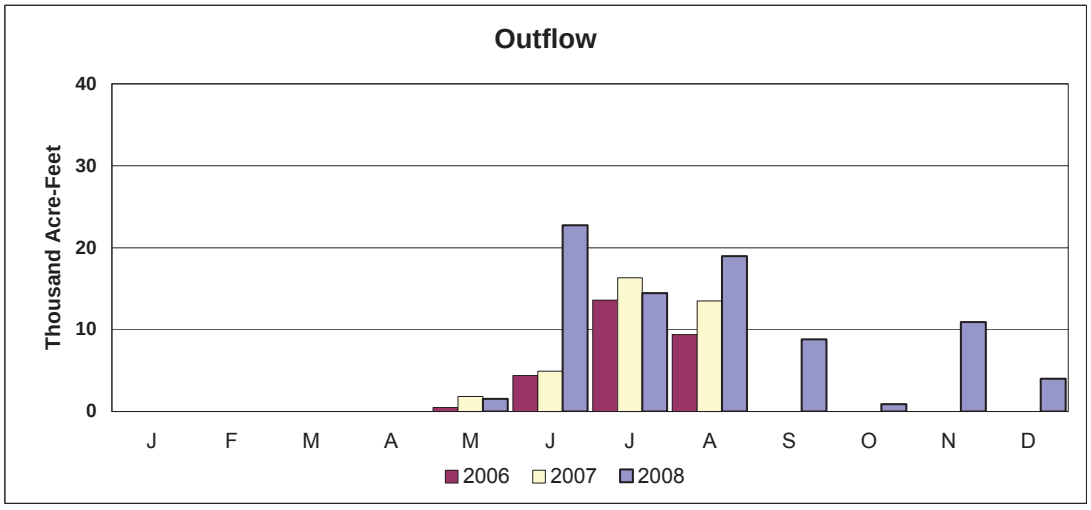


LOVEWELL RESERVOIR

ACTUAL OPERATION

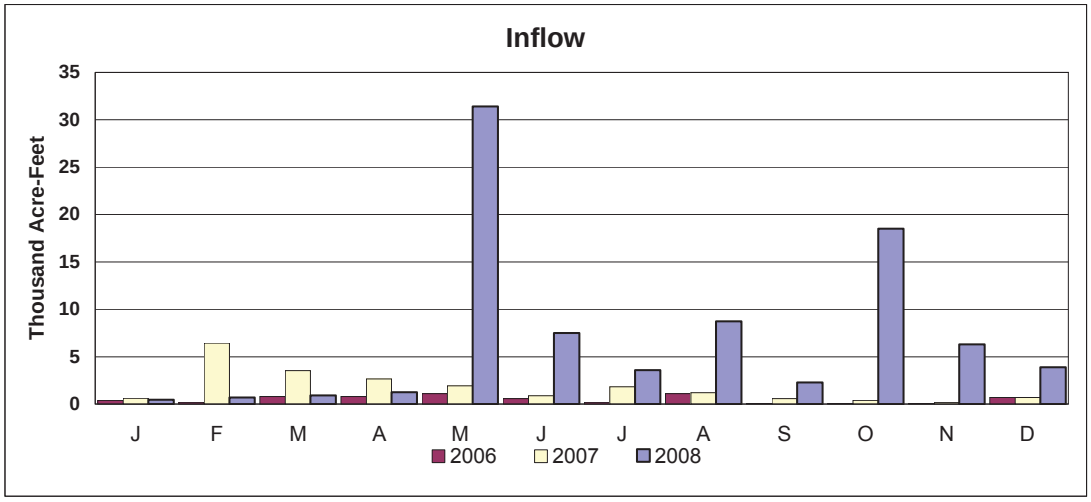


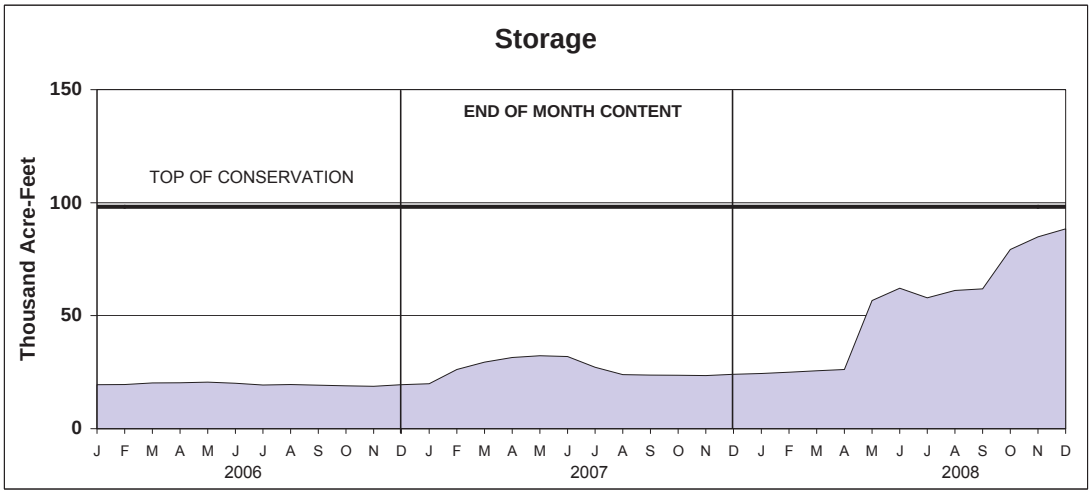


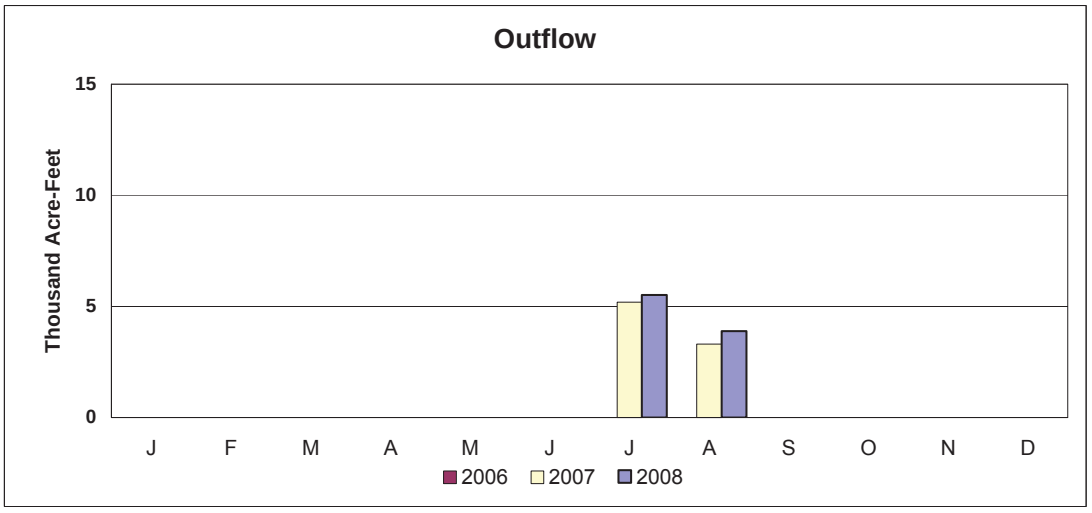


KIRWIN RESERVOIR

ACTUAL OPERATION

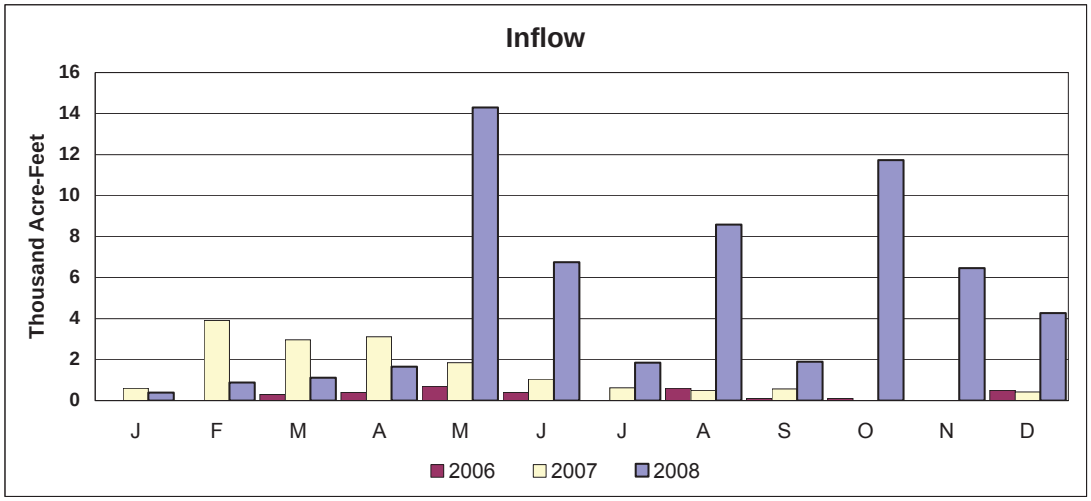


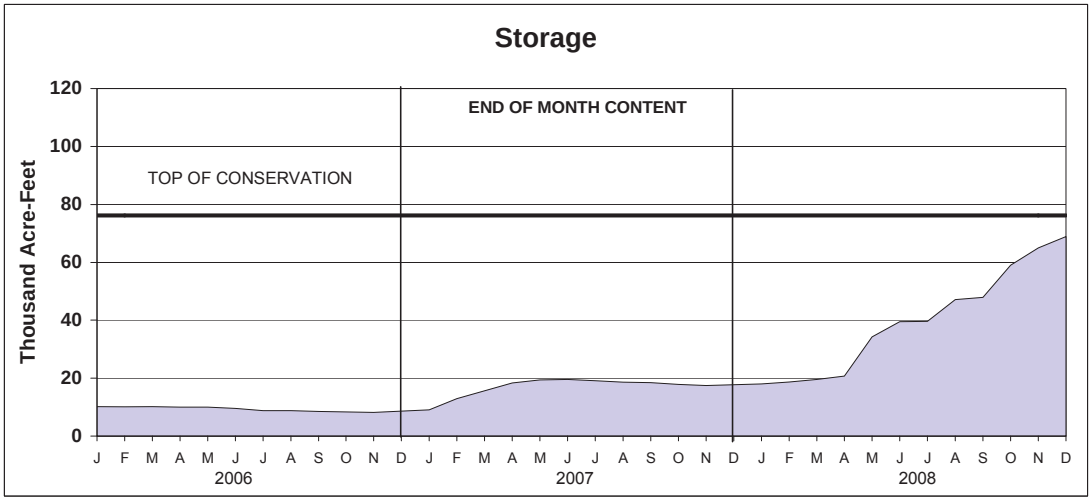


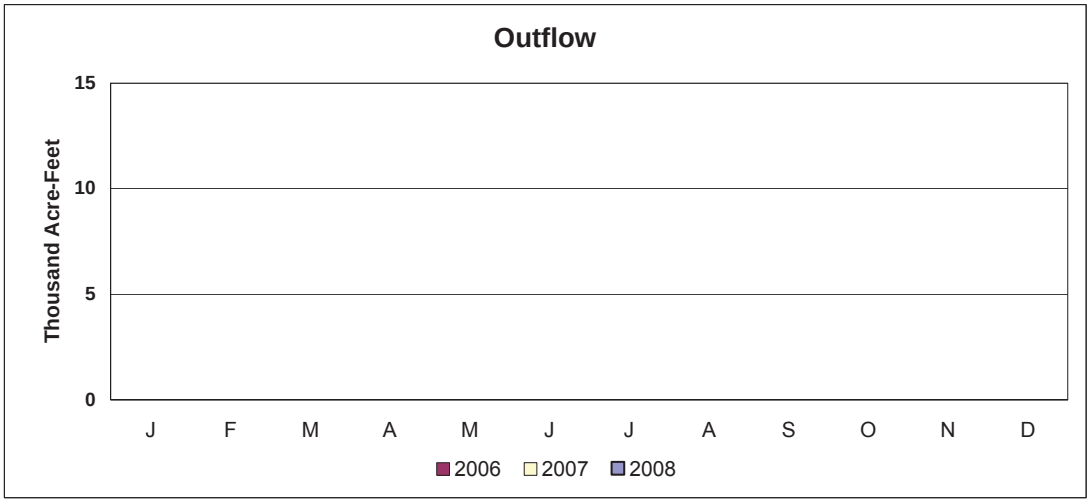


WEBSTER RESERVOIR

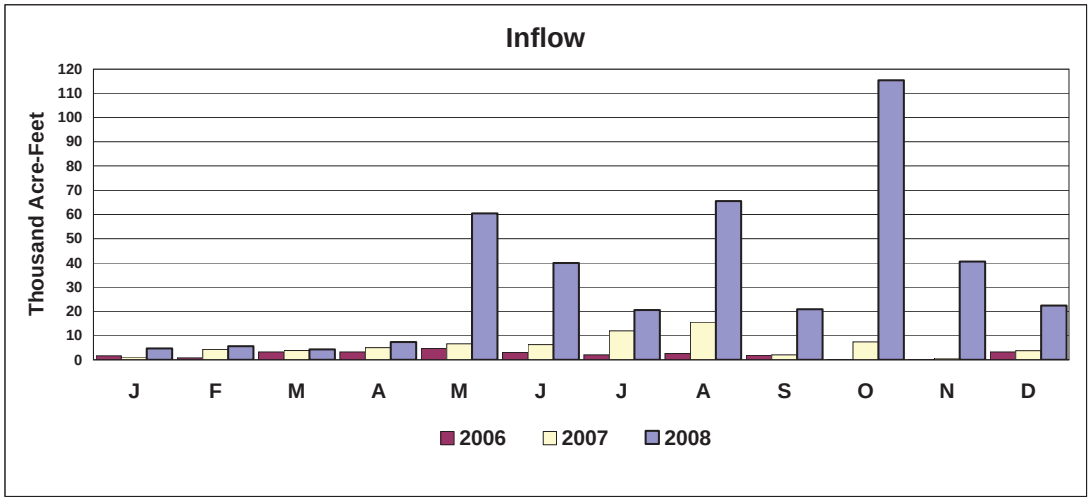
ACTUAL OPERATION

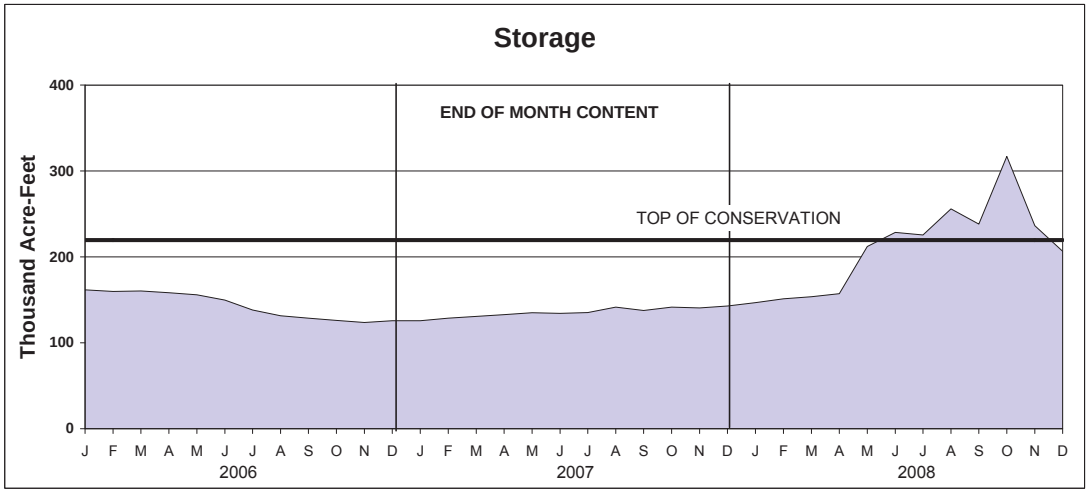


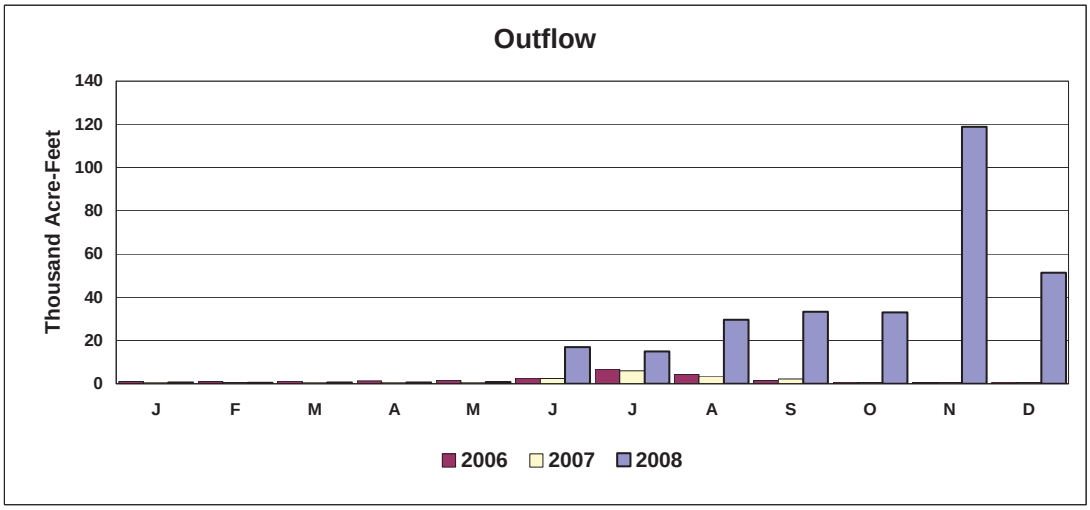




WACONDA LAKE
ACTUAL OPERATION

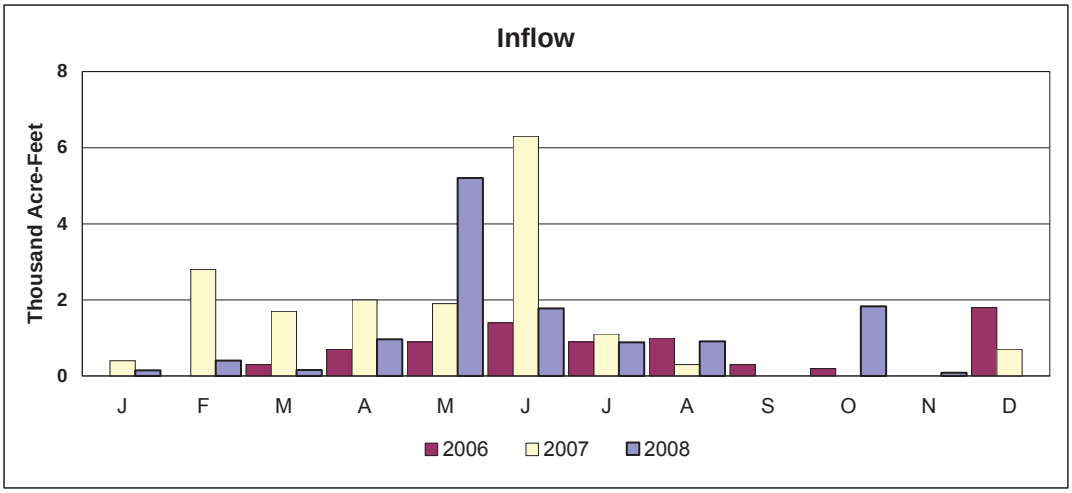


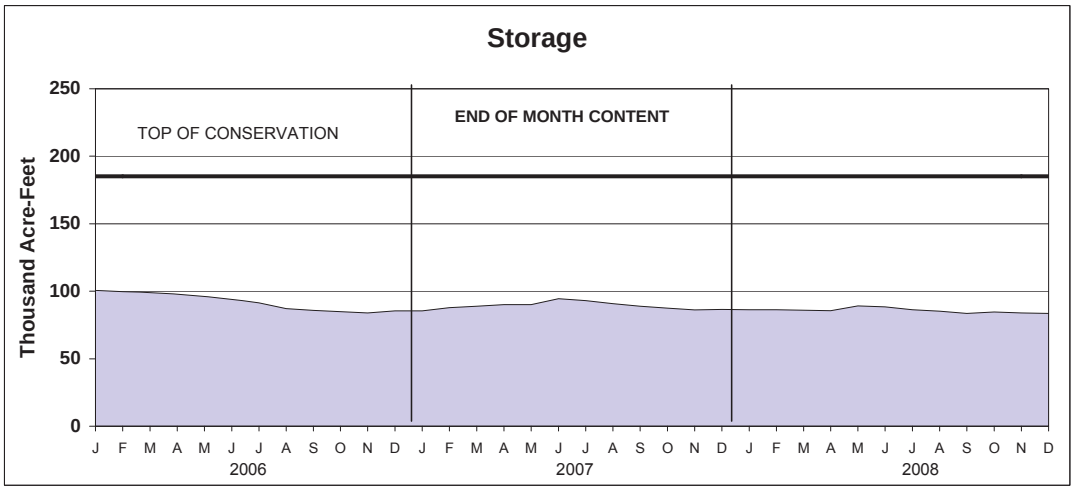




CEDAR BLUFF RESERVOIR

ACTUAL OPERATION





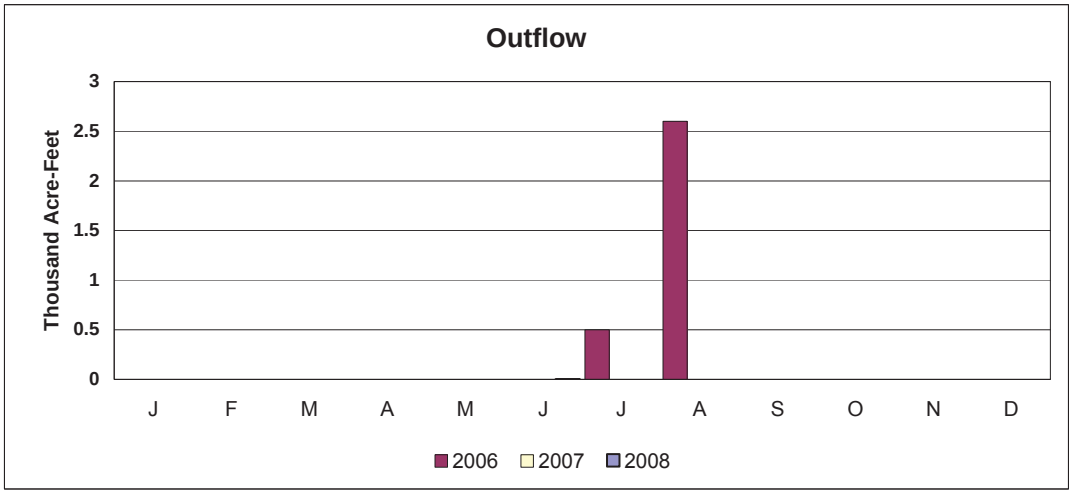
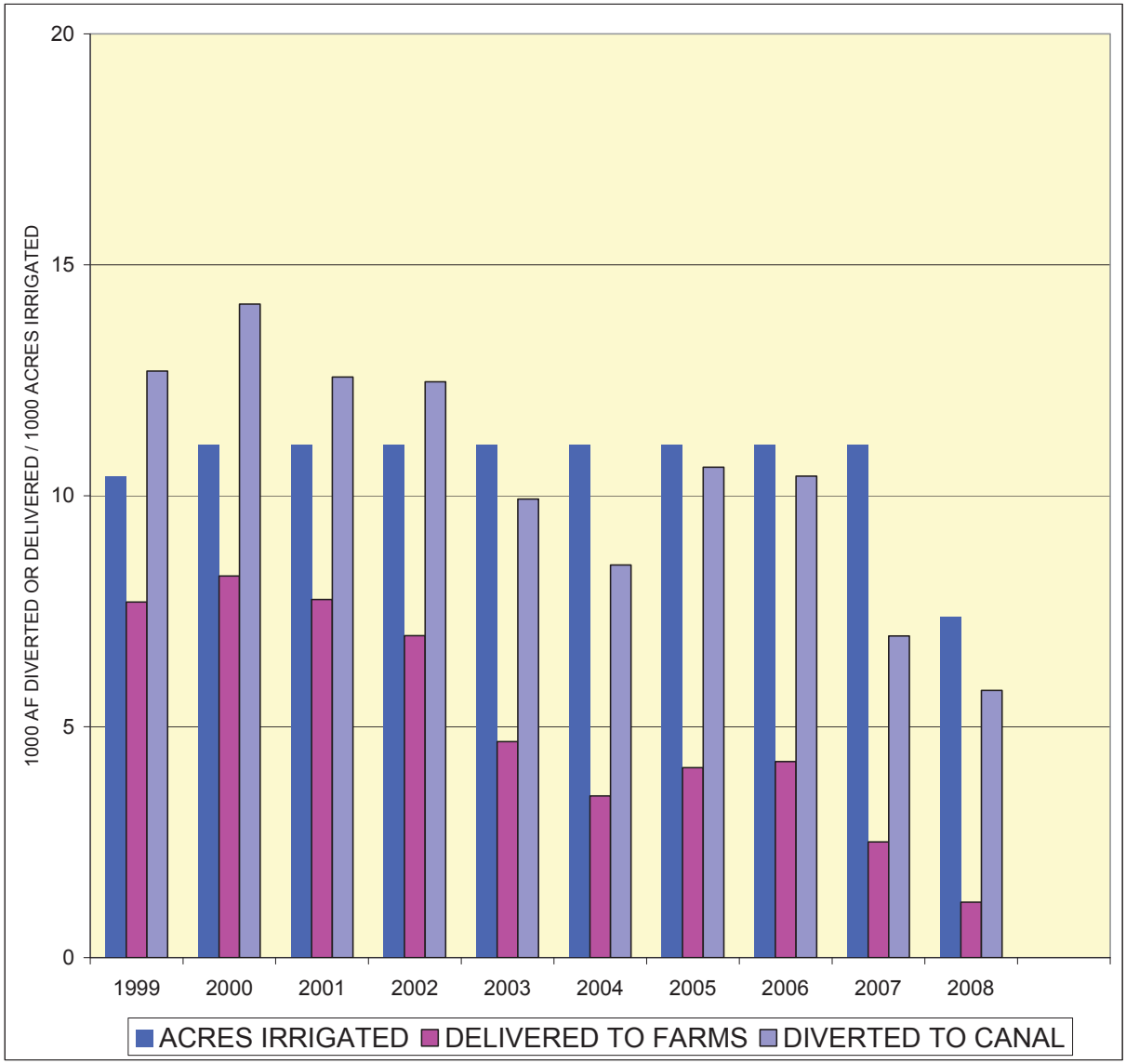


EXHIBIT 17

MIRAGE FLATS IRRIGATION DISTRICT

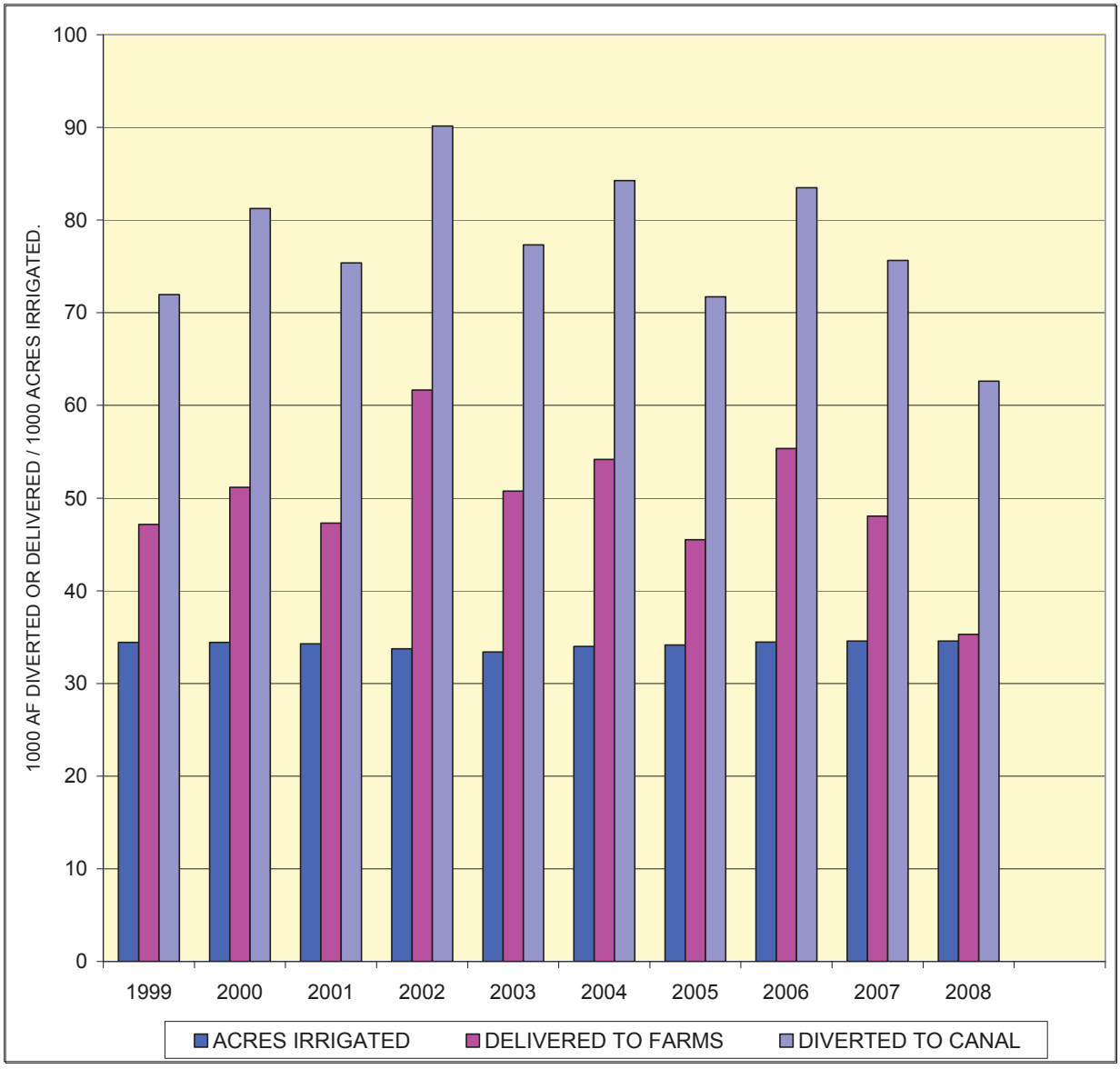
CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	1.22	1.28	1.13	1.12	0.90	0.77	0.96	0.94	0.63	0.78
DELIVERED af/acre	0.74	0.75	0.70	0.63	0.42	0.32	0.37	0.38	0.23	0.16
EFFICIENCY	61%	58%	62%	56%	47%	41%	39%	41%	36%	21%

AINSWORTH IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

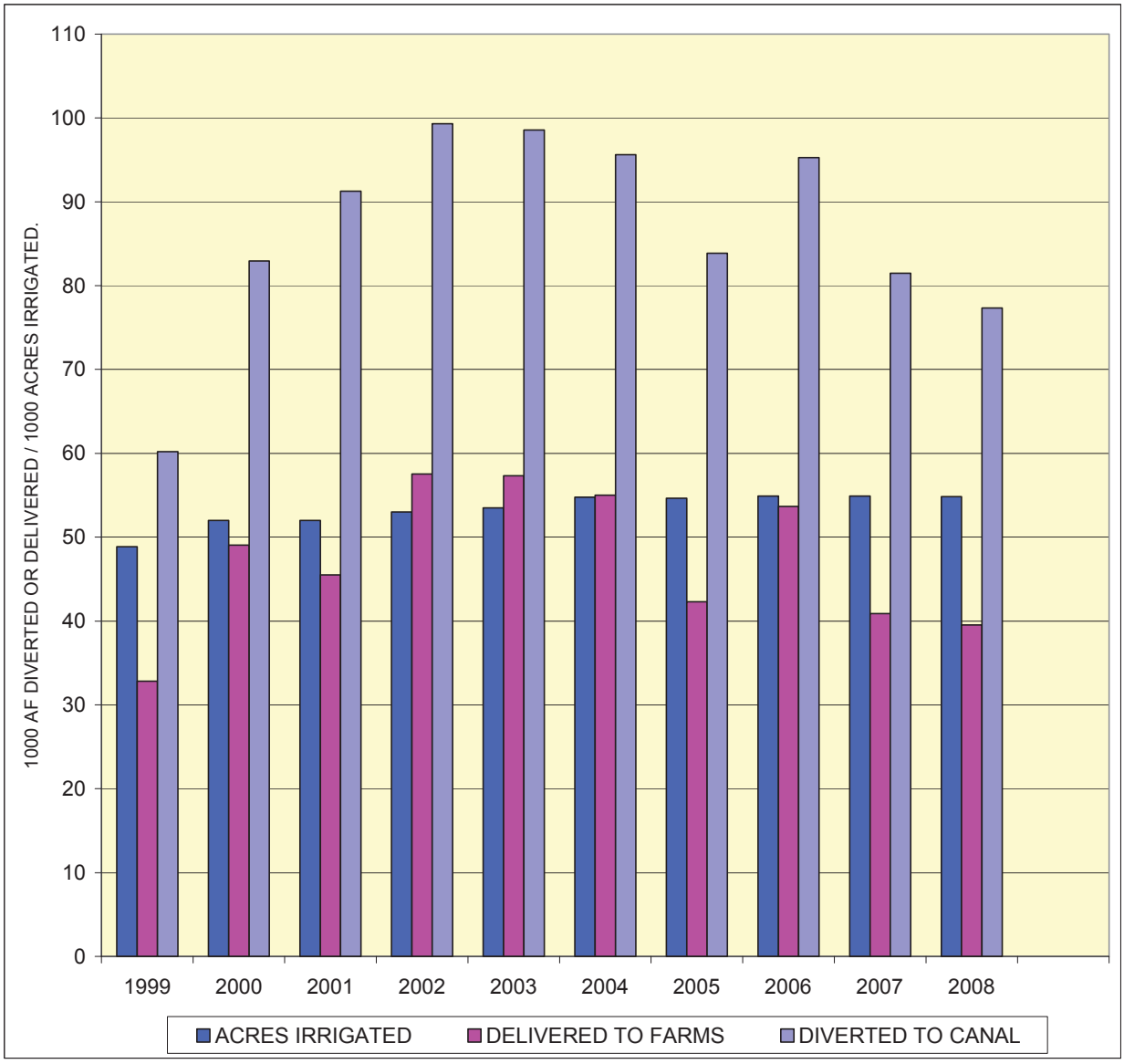


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	2.09	2.36	2.20	2.67	2.31	2.48	2.10	2.42	2.19	1.81
DELIVERED af/acre	1.37	1.49	1.38	1.83	1.52	1.59	1.33	1.61	1.39	1.02
EFFICIENCY	66%	63%	63%	68%	66%	64%	63%	66%	64%	56%

EXHIBIT 19

TWIN LOUPS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

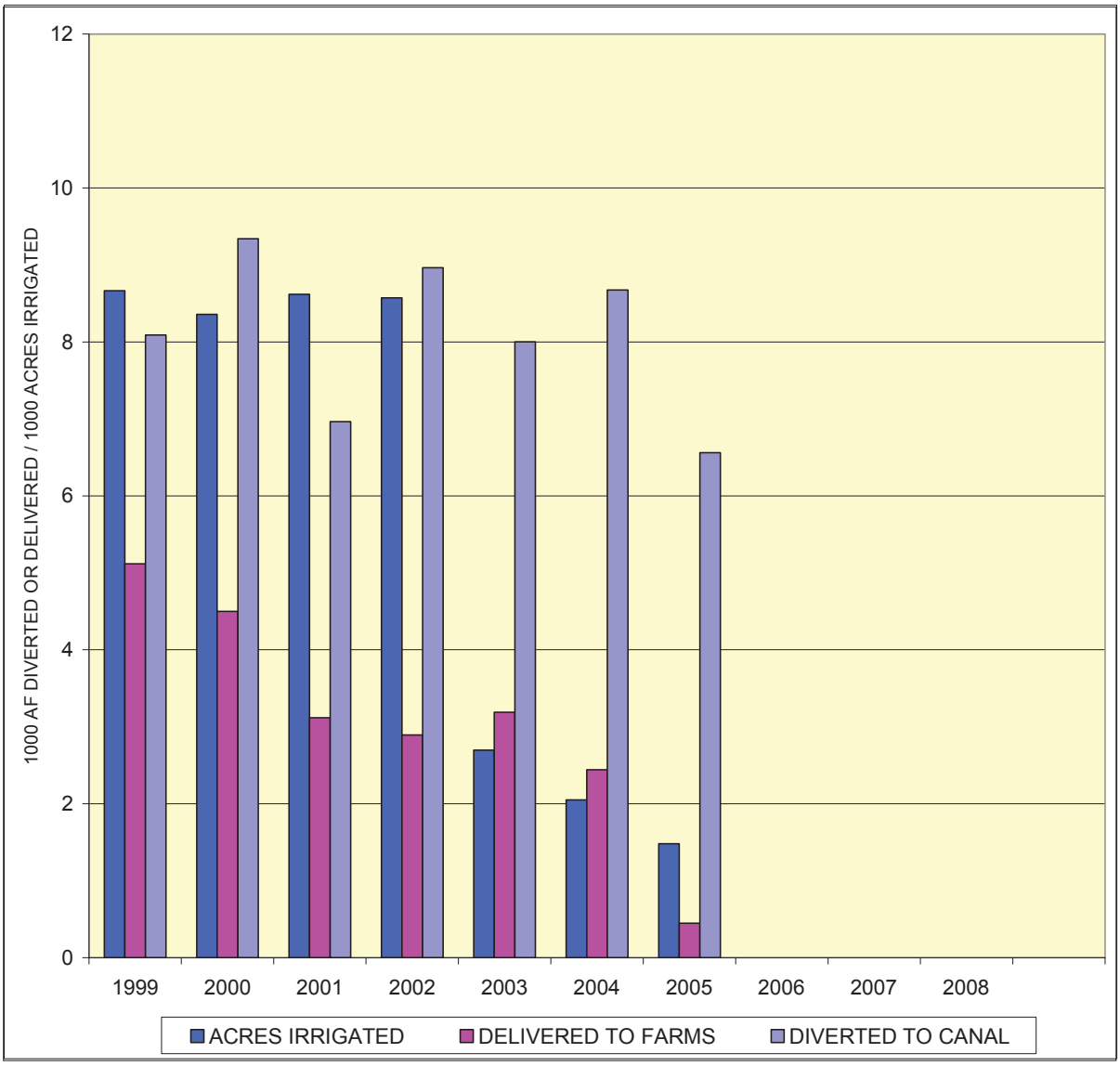


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	1.23	1.60	1.76	1.87	1.84	1.75	1.53	1.74	1.48	1.41
DELIVERED af/acre	0.67	0.94	0.88	1.09	1.07	1.00	0.77	0.98	0.74	0.72
EFFICIENCY	55%	59%	50%	58%	58%	58%	50%	56%	50%	51%

EXHIBIT 20

FRENCHMAN VALLEY IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

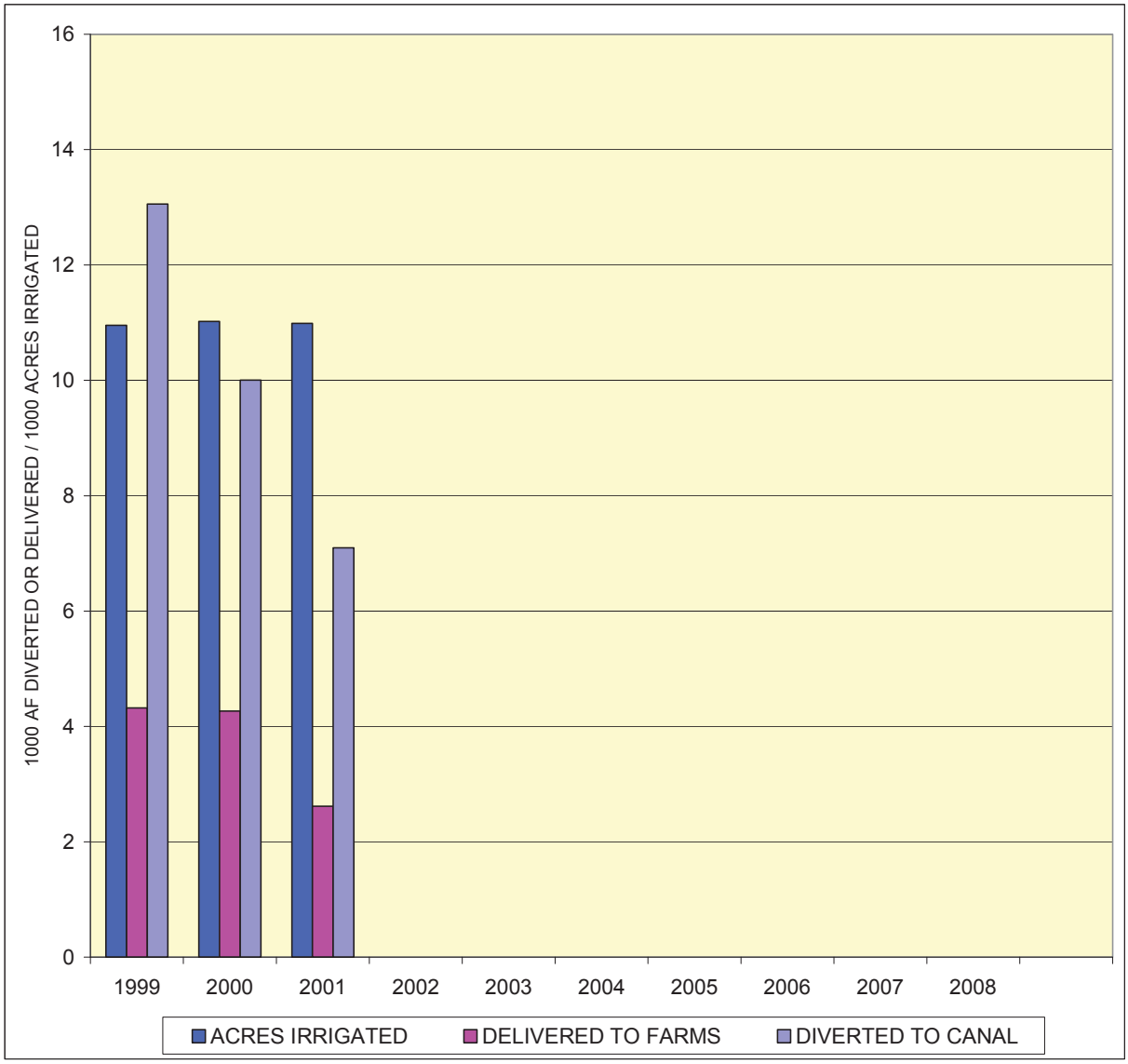


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	0.93	1.12	0.81	1.05	2.97	4.24	4.43	0.00	0.00	0.00
DELIVERED af/acre	0.59	0.54	0.36	0.34	1.18	1.19	0.30	0.00	0.00	0.00
EFFICIENCY	63%	48%	45%	32%	40%	28%	7%	0%	0%	0%

EXHIBIT 21

H AND RW IRRIGATION DISTRICT

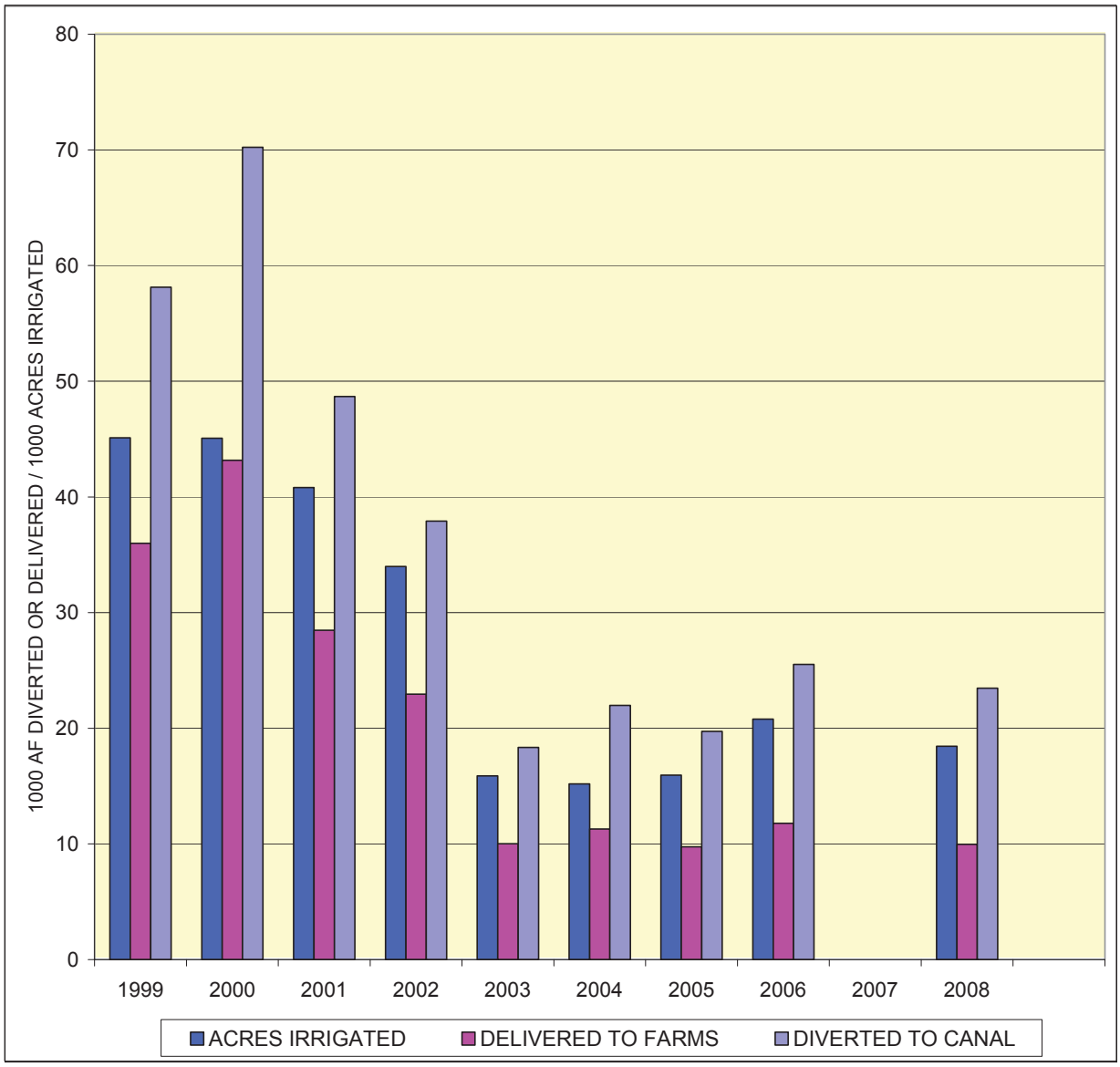
CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	1.19	0.91	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DELIVERED af/acre	0.39	0.39	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EFFICIENCY	33%	43%	37%	0%	0%	0%	0%	0%	0%	0%

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

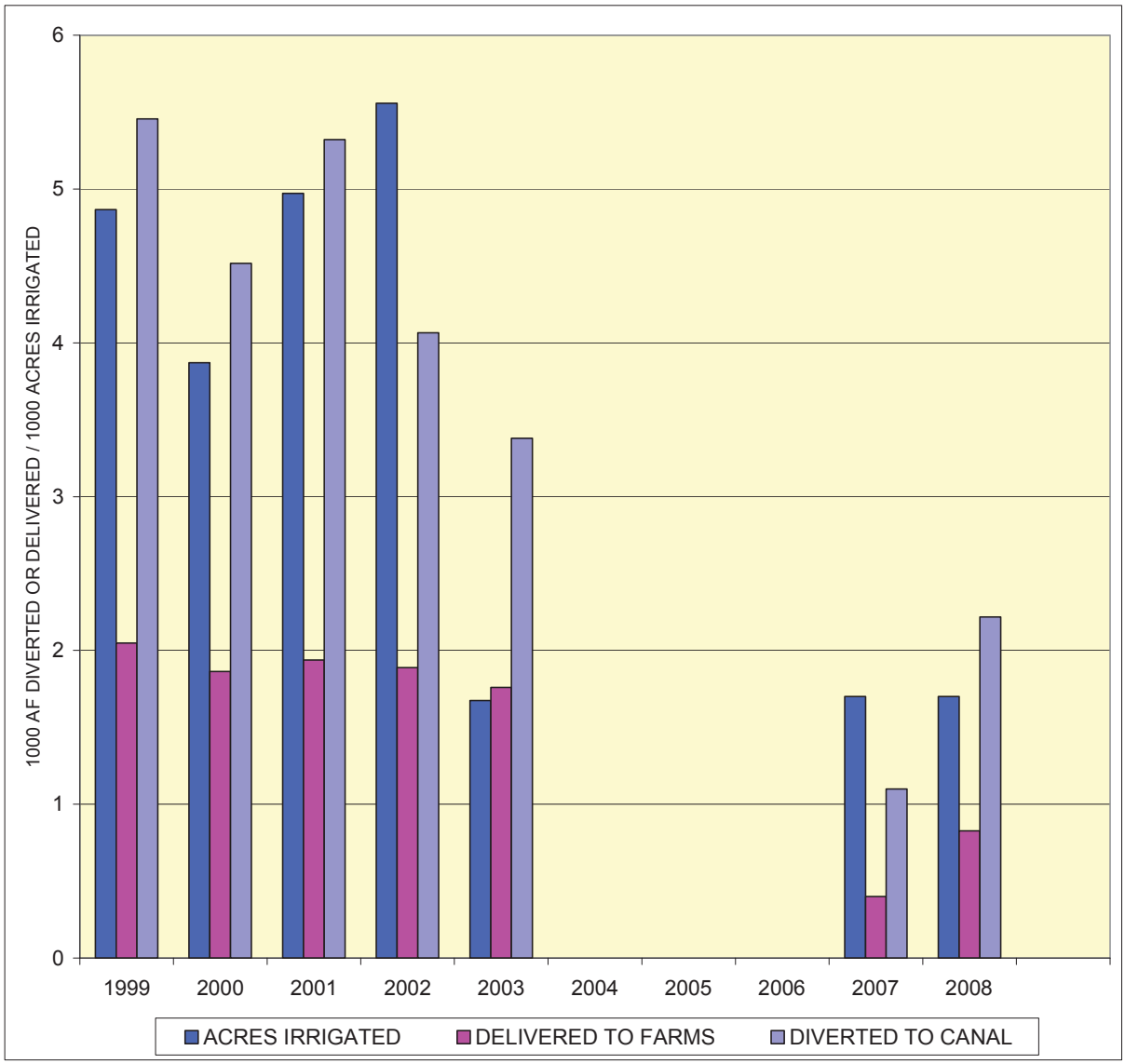


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	1.29	1.56	1.19	1.12	1.15	1.45	1.24	1.23	0.00	1.27
DELIVERED f/acre	a 0.80	0.96	0.70	0.67	0.63	0.74	0.61	0.57	0.00	0.54
EFFICIENCY	62%	61%	58%	61%	55%	52%	50%	46%	0%	42%

EXHIBIT 23

ALMENA IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

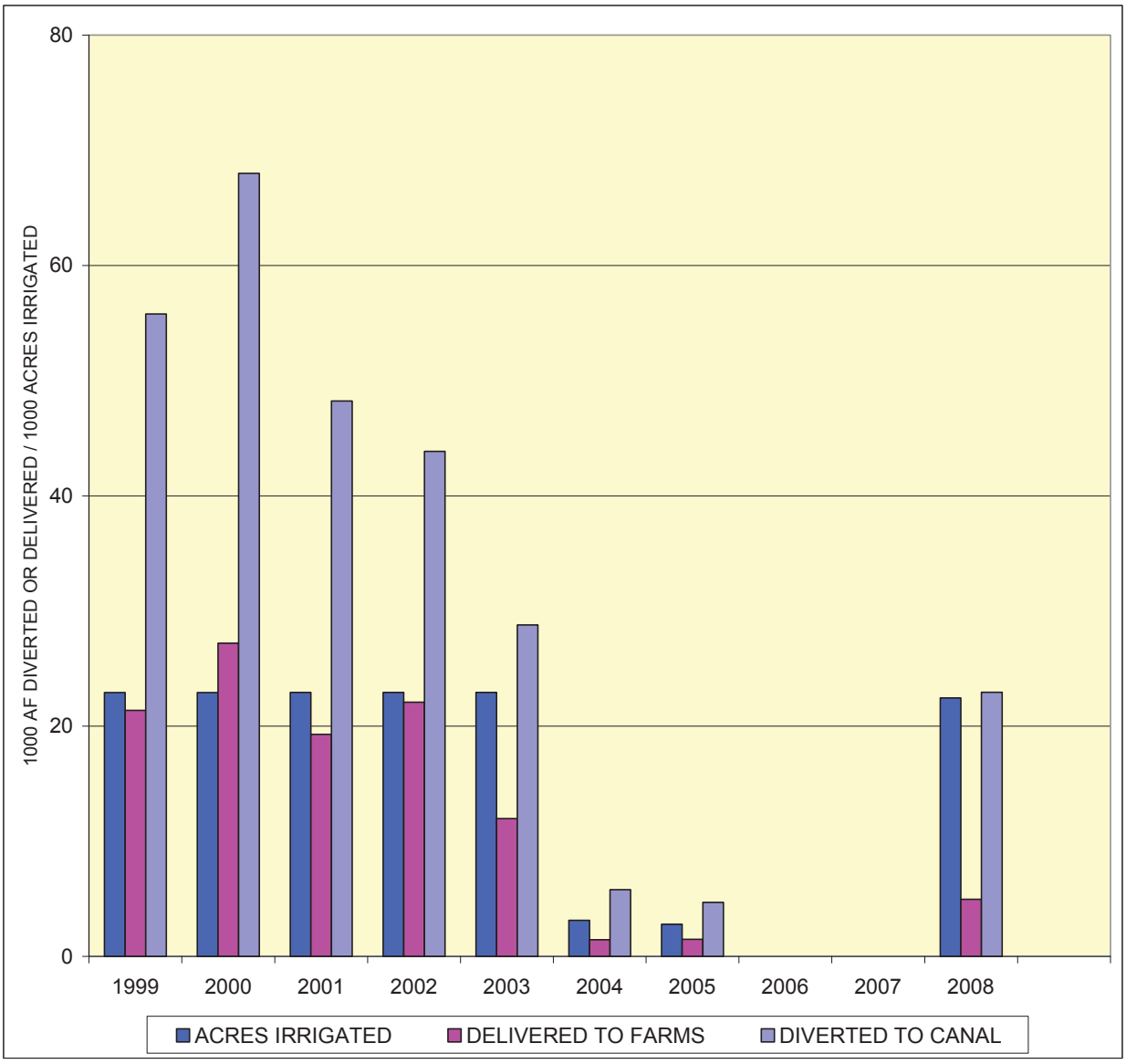


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	1.12	1.17	1.07	0.73	2.02	0.00	0.00	0.00	0.65	1.30
DELIVERED af/acre	0.42	0.48	0.39	0.34	1.05	0.00	0.00	0.00	0.24	0.49
EFFICIENCY	38%	41%	36%	46%	52%	0%	0%	0%	36%	37%

EXHIBIT 24

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

CANAL DIV., FARM DEL., AND ACRES IRRIG.

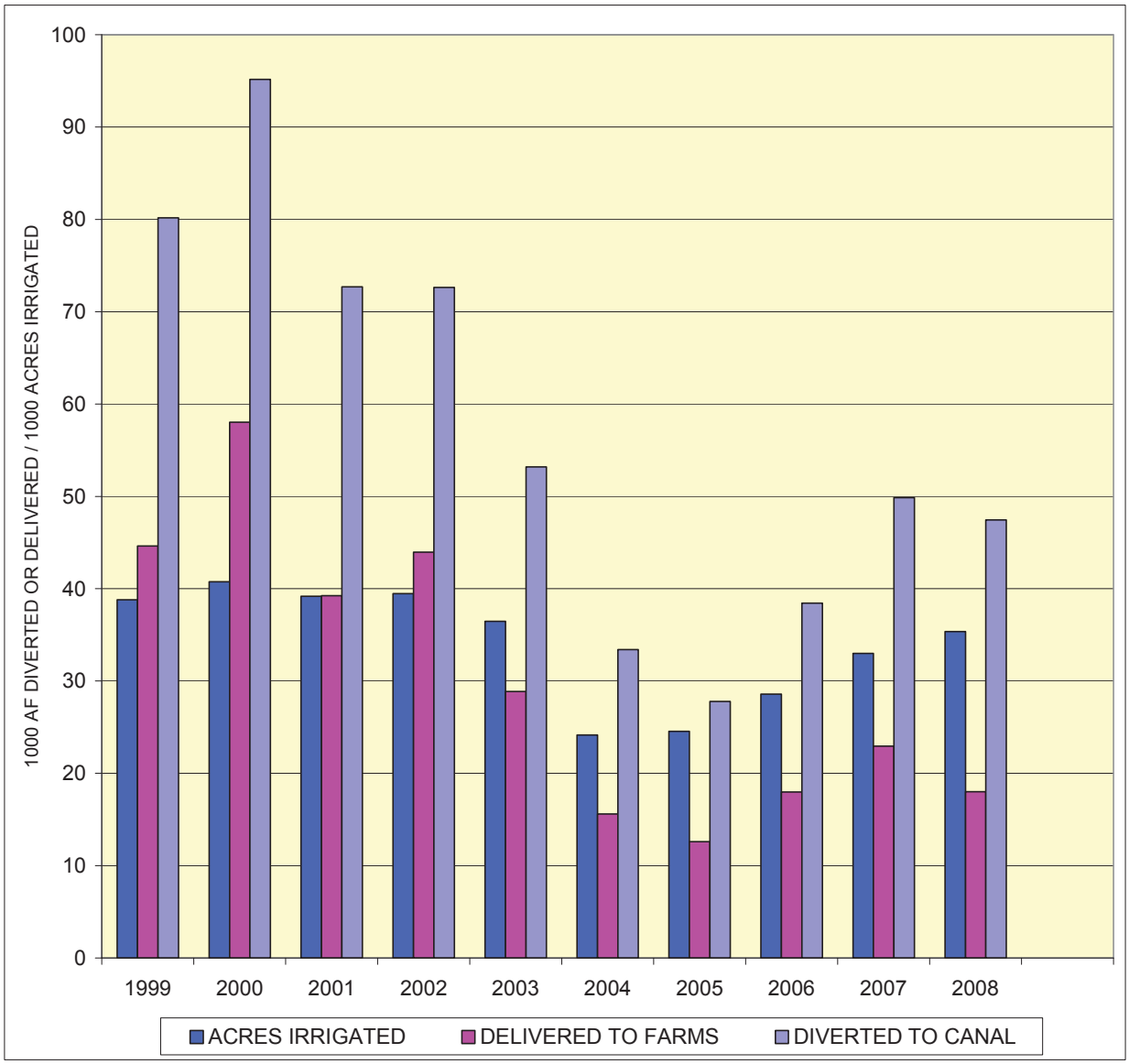


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	2.44	2.97	2.10	1.91	1.25	1.85	1.68	0.00	0.00	1.02
DELIVERED af/acre	0.93	1.19	0.84	0.96	0.52	0.47	0.53	0.00	0.00	0.22
EFFICIENCY	38%	40%	40%	50%	42%	25%	32%	0%	0%	22%

EXHIBIT 25

KANSAS-BOSTWICK IRRIGATION DISTRICT

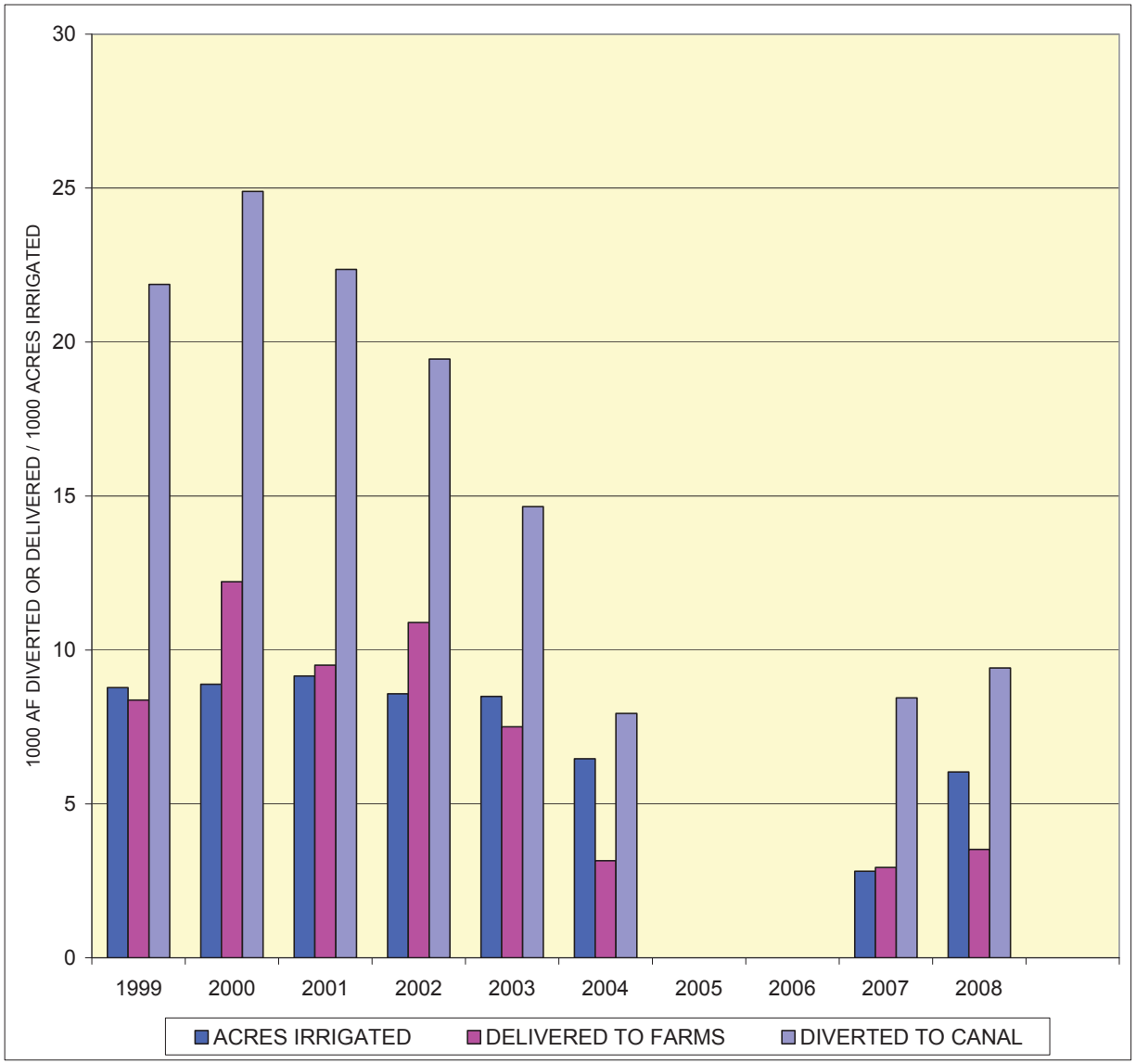
CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	2.07	2.33	1.86	1.84	1.46	1.38	1.13	1.35	1.51	1.34
DELIVERED af/acre	1.15	1.42	1.00	1.11	0.79	0.65	0.51	0.63	0.70	0.51
EFFICIENCY	56%	61%	54%	61%	54%	47%	45%	47%	46%	38%

KIRWIN IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

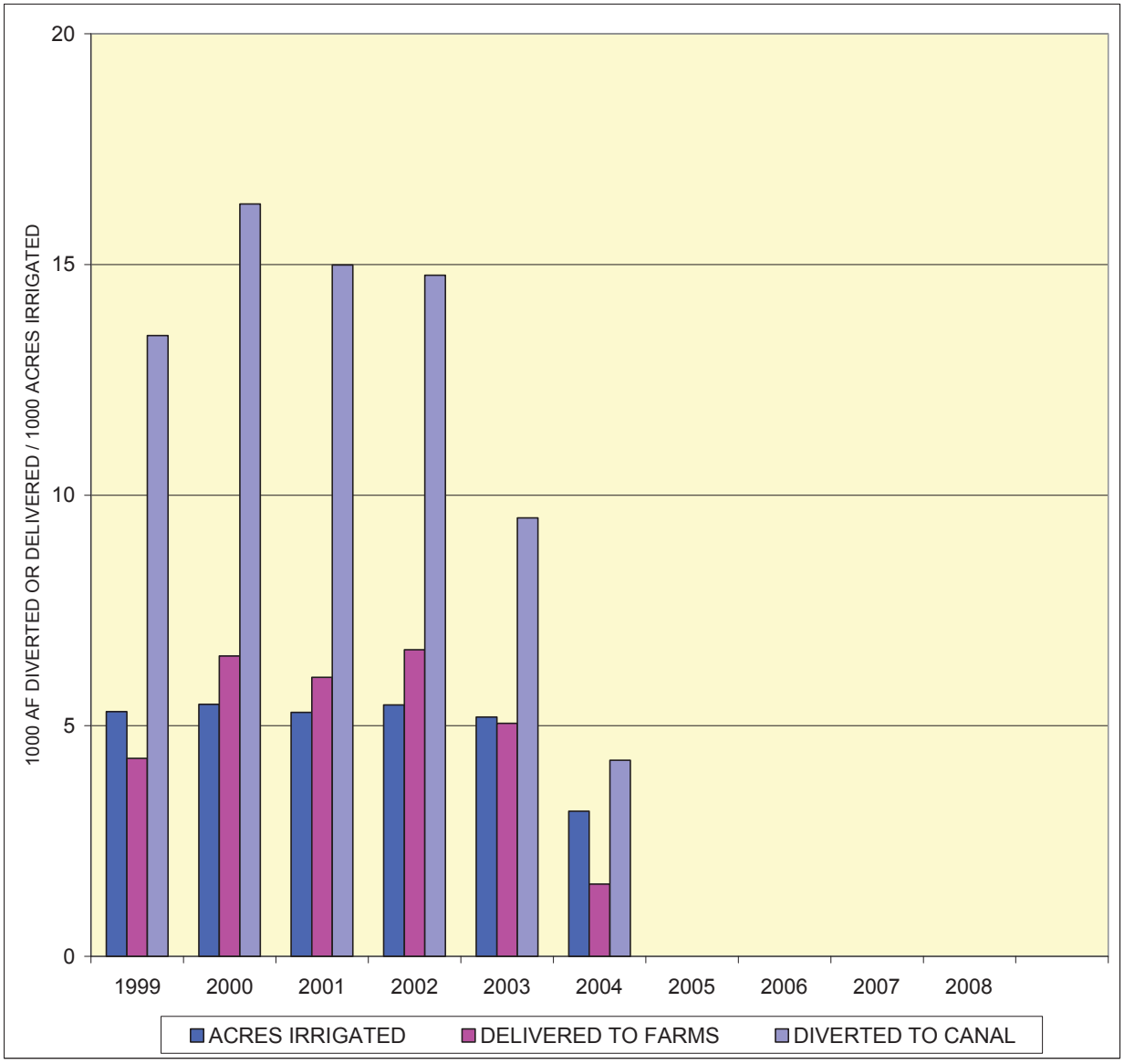


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	1.00	2.80	2.44	2.27	1.73	1.23	0.00	0.00	3.00	1.56
DELIVERED af/acre	0.95	1.37	1.04	1.27	0.88	0.49	0.00	0.00	1.05	0.58
EFFICIENCY	38%	49%	43%	56%	51%	40%	0%	0%	35%	37%

EXHIBIT 27

WEBSTER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

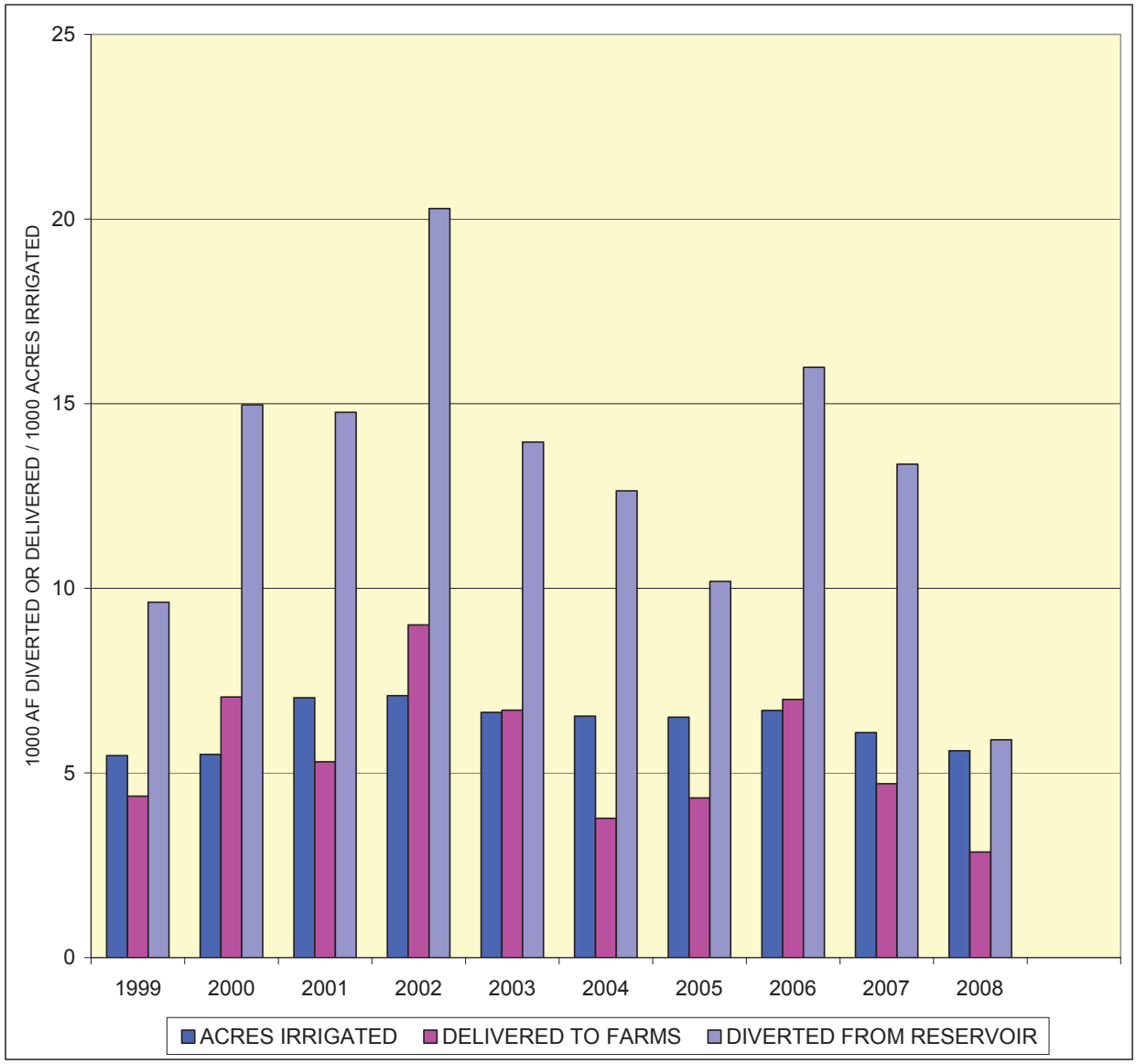


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	2.54	2.98	2.83	2.71	1.83	1.35	0.00	0.00	0.00	0.00
DELIVERED af/acre	0.81	1.19	1.14	1.22	0.97	0.50	0.00	0.00	0.00	0.00
EFFICIENCY	32%	40%	40%	45%	53%	37%	0%	0%	0%	0%

EXHIBIT 28

GLEN ELDER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
DIVERTED af/acre	1.76	2.72	1.00	1.00	1.00	1.93	1.57	2.39	0.00	1.05
DELIVERED af/acre	0.80	1.28	0.75	1.27	1.01	0.58	0.66	1.04	0.00	0.51
EFFICIENCY	45%	47%	36%	44%	48%	30%	42%	44%	129%	48%

SYNOPSIS

General

This year is the 57th consecutive year that an Annual Operating Plans (AOP) has been prepared for the Federally-owned dams and reservoirs in the Niobrara, Lower Platte, and Kansas River Basins. The plan has been developed by the Water Operations Group in McCook, Nebraska for the 16 dams and reservoirs that are located in Colorado, Nebraska, and Kansas. These reservoirs, together with nine diversion dams, nine pumping plants, and 20 canal systems, serve approximately 269,744 acres of project lands in Nebraska and Kansas. In addition to irrigation and municipal water, these features serve flood control, recreation, and fish and wildlife purposes. A map at the end of this report shows the location of these features.

The reservoirs in the Niobrara and Lower Platte River Basins are operated by either irrigation or reclamation districts. The reservoirs in the Kansas River Basin are operated by either the Bureau of Reclamation (Reclamation), or the Corps of Engineers. Kirwin Irrigation District provides operational and maintenance assistance for Kirwin Dam. The diversion dams, pumping plants, and canal systems are operated by either irrigation or reclamation districts.

A Supervisory Control and Data Acquisition System (SCADA) located at McCook is used to assist in operational management of all 11 dams under Reclamation's jurisdiction that are located in the Kansas River Basin. A Hydromet system collects and stores near real-time data at selected stations in the Nebraska-Kansas Projects. The data includes water levels in streams, canals, and reservoirs and also gate openings. This data is transmitted to a satellite and downloaded to a Reclamation receiver in Boise, Idaho. The data can then be accessed by anyone interested in monitoring water levels or water usage in an irrigation system. The Nebraska-Kansas Projects currently have 63 Hydromet stations that can be accessed. The McCook Field Office has installed and maintains 42 Hydromet stations. When fully implemented, the projects will have a Hydromet station installed to provide real-time data on all reservoirs, most diversion dams, and most of the measuring structures in the irrigation systems. These stations can be found on the Internet by accessing Reclamation's home page at http://www.usbr.gov/gp. From the home page, select "Hydromet Data Center" under the Water Operations heading.

The Headlines 2009 that follows this synopsis is indicative of the awareness that the local people have of the natural resource development and conservation in the Niobrara, Lower Platte, and Kansas River Basins.

2009 Summary

Climatic Conditions

Precipitation at the project dams during 2009 ranged from 78 percent of normal at Lovewell Dam to 156 percent of normal at Enders Dam. Temperatures and precipitation during the first 3 months of the year were generally below normal throughout the projects area. Precipitation totals varied from 11 percent to 224 percent during January through March.

Temperatures were near normal during the spring. Precipitation during April and May was generally above normal throughout the basin.

Average temperatures were near normal through June, July, and August. Total precipitation for June, July, and August, was above normal project wide. Five project dams recorded below normal precipitation in June, while only three project dams recorded below normal precipitation in July and August.

September precipitation varied considerably throughout the projects while precipitation in October was well above normal. October precipitation varied from 121 percent of normal at Lovewell Dam to 414 percent of normal at Medicine Creek Dam. Medicine Creek Dam recorded the greatest October precipitation on record at that site. Temperatures in September were above normal and October temperatures were below normal throughout the projects area.

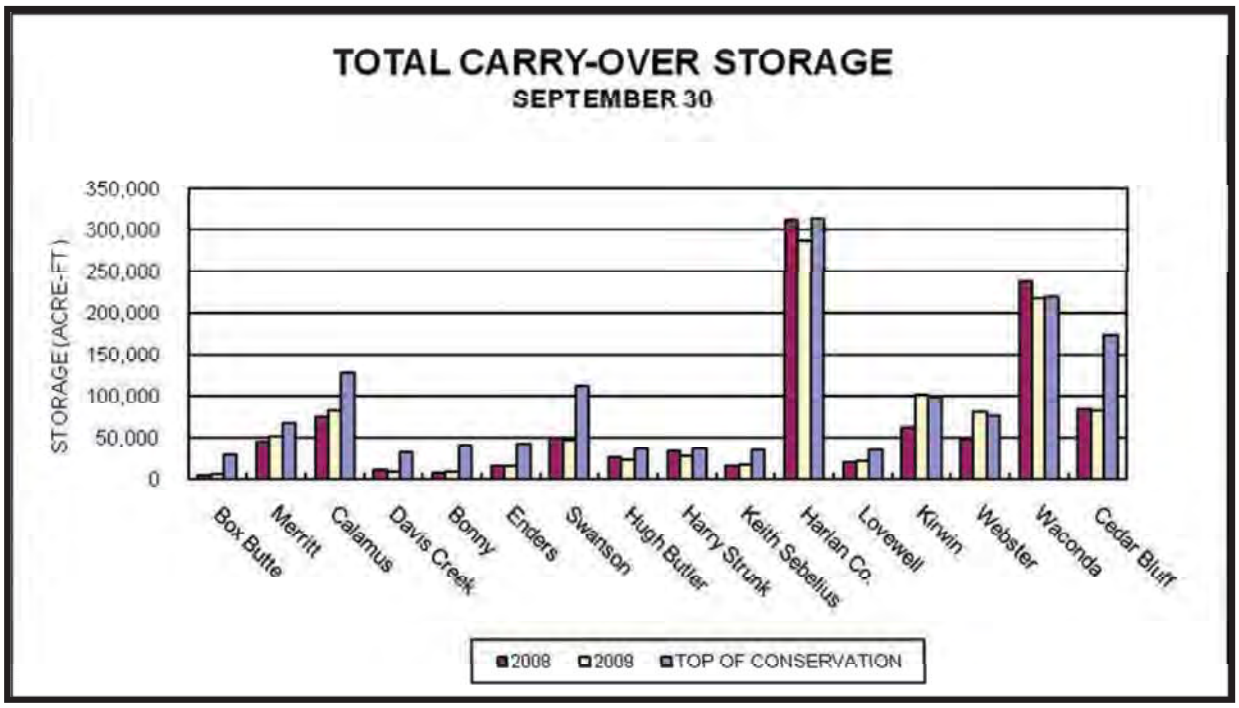
Precipitation during November averaged only 45 percent of normal over the projects with Davis Creek Dam recording zero precipitation in November. December precipitation was above normal. Temperatures were above normal in November and below normal in December.

Storage Reservoirs

1. Conservation Operations. The 2009 inflow was above the dry-year forecast at all project reservoirs. Box Butte, Bonny, Enders, Merritt, Davis Creek, Lovewell, and Cedar Bluff Reservoirs, and Hugh Butler and Keith Sebelius Lakes had inflows between the dry- and normal-year forecasts. Calamus, Kirwin, and Webster Reservoirs along with Swanson, Harry Strunk, Waconda, and Harlan County Lakes had inflows between the normal- and wet-year forecasts. No reservoirs had inflows above the wet-year forecast.

Ten of the 16 project reservoirs had below average carry-over storage from the 2008 water year. Reservoir releases were made from Merritt, Virginia Smith, Medicine Creek, Harlan County, Lovewell, Kirwin, Webster, and Glen Elder Dams to maintain or reduce reservoir levels prior to the 2009 irrigation season. Just prior to the irrigation season, Enders and Box Butte Reservoirs, along with Keith Sebelius, Swanson, and Hugh Butler Lakes, did not have sufficient storage to provide water users with a full water supply. Harry Strunk, Harlan County, Waconda Lakes, and Lovewell, Kirwin, and Webster Reservoirs had some flood storage occupied prior to the irrigation season. The irrigation demand months of July and August did little to reduce storage in those project reservoirs that had storage available for full irrigation as inflows maintained reservoir pools. Precipitation during July and August helped in reducing the demands on project reservoirs. Reservoir storage was below normal at eight project reservoirs at the end of 2009.

The following summarized graph shows a comparison of 2008 and 2009 carry-over storage conditions as compared to the top of conservation storage for all reservoirs in the Niobrara, Lower Platte, and Kansas River Basins as of September 30.



2. Flood Control Operations. Harry Strunk, Harlan County, Waconda Lakes, and Lovewell, Kirwin, and Webster Reservoirs utilized flood pool storage and made flood releases in 2009. The water year 2009 flood damages prevented by the operation of Reclamation's Nebraska-Kansas Projects facilities was $10,253,700 as determined by the Corps of Engineers. An additional benefit of $4,131,500 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2009 by facilities in this report total $1,946,542,200 (see Table 5). Box Butte, Merritt, Calamus, and Davis Creek Reservoirs do not have a designated flood pool and have not accrued any flood benefits to date.

A summary of precipitation, reservoir storage, and inflows at Nebraska-Kansas Projects facilities can be found in Table 7.

Water Service

There was 342,836 acre-feet (AF) of water diverted to irrigate approximately 210,545 acres of project lands in the 12 irrigation districts (see Tables 3 and 6). The project water supply was either inadequate or limited for 84,302 acres of the total project lands. This includes lands in Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, and Almena Irrigation Districts. The project water supplies for the other units mentioned in this report were more than adequate in 2009.

The water requirements of three municipalities, one rural water district, and two fish hatchery facilities were furnished from storage releases or natural flows.

Irrigation Production

The 2009 crop yields on lands receiving project water in the Nebraska-Kansas Projects were higher than 2008. The average corn yield, the principal crop of all reporting districts, was 201 bushels per acre. This was approximately 22 bushels per acre more than in 2008. The start of irrigation releases from project reservoirs varied considerably depending on May rainfall amounts and storage water available. Above normal rainfall was experienced during much of the growing season with near normal temperatures. August was generally cooler than normal. Crop maturity progressed slower than normal during the growing season. Most irrigation districts had finished making irrigation releases by mid September. Only one canal did not divert water in 2009 as a result of short water supplies. All irrigation districts had finished delivering water by the end of September with corn harvest delayed until early winter due to an extremely wet October.

Fish and Wildlife and Recreation Benefits

The National Recreational Fisheries Policy declares that the Government's vested stewardship responsibilities must work in concert with the state managing agency's recreational fisheries constituency and the general public to conserve, restore, and enhance recreational fisheries and their habitats. The Nebraska-Kansas Area Office is available for meetings if requested with Nebraska, Colorado, and Kansas state management agencies to discuss the Annual Operating Plans (AOP). Information is solicited that will allow Reclamation the flexibility to enhance fisheries resources while still meeting contractual obligations with the various irrigation districts.

During the 2009 season, normal reservoir operations were favorable for recreation and fish and wildlife uses at project reservoirs with full or nearly full conservation pool levels. Higher water levels during 2009 were experienced at most reservoirs in the Kansas River Basin providing increased recreation benefits. Higher than normal inflows prevented summer drawdown from irrigation releases and thus did not allow for some late summer shoreline re-vegetation. Increased water levels did however submerge existing shoreline vegetation.

The Calamus Fish Hatchery is located below Virginia Smith Dam and Calamus Reservoir. The hatchery consists of an office/visitor center, laboratory, two residences, a shop and feed storage building, 51 rearing ponds lined with VLDPE and covering 45.5 acres, 24 concrete raceways, two lined effluent ponds, eight groundwater wells, a 36-inch diameter buried pipeline from Virginia Smith Dam, a groundwater degassing tank, and a computerized monitoring and alarm system. The hatchery is operated and maintained by the Nebraska Game and Parks Commission (Commission) and produces approximately 53 million fish per year. The water supply is provided by natural flows passed through Virginia Smith Dam and from Calamus Reservoir storage through an agreement dated July 28, 1988, between the Commission and the Twin Loups Reclamation District.

2009 HEADLINES

DNR: Rep. Basin won't be water short in 2010

Fully-appropriated designation reversal impacts Upper Loup

State to present area water plans

Bureau lowering lake

Harlan supports LRNRD water

Reclamation temporarily closes road across Red Willow Dam

Red Willow situation leaves irrigators dry

Wolfe: Release was to test the waters

Nebraska leads nation in irrigated acreage

Kan., Neb. reject water ruling

Red Willow Dam's cracks threaten 2010 irrigation, reservoir fun

Irrigation District has to shut water off due to canal break

Judge ready to weigh Republican River evidence

Dam inspection moves to upstream face

Irrigation shutoff 'last resort'

Transfer of water will be limited to six

Lawmakers get earful on water

CHAPTER I – INTRODUCTION

Purpose of This Report

This AOP advises water users, cooperating agencies, and other interested groups or persons of the actual operations during 2009 and serves as a guideline for the 2010 operations. This report also describes the responsibilities of Reclamation, Corps of Engineers, and the irrigation and reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins.

Operational Responsibilities

Reclamation is responsible for irrigation operations at all federal reservoirs in the Nebraska-Kansas Projects. Reclamation is also responsible for the operation and maintenance (O&M), safety of the structure, and reservoir operations not specifically associated with regulation of the flood control storage at the reservoirs constructed by Reclamation. Regulation of the flood control storage is the responsibility of the Corps of Engineers. In addition to irrigation and flood control, these reservoirs provide recreation, fish and wildlife, and municipal water supply benefits.

By contractual arrangements with Reclamation, the irrigation or reclamation districts in the Niobrara, Lower Platte, and Kansas River Basins are responsible for the O&M of the canals and irrigation distribution facilities constructed or rehabilitated by Reclamation. In addition, the appropriate irrigation or reclamation districts are responsible for operating and maintaining Box Butte, Merritt, Virginia Smith, and Davis Creek Dams. The Corps of Engineers operates and maintains Harlan County Dam and Lake. The state of Colorado provides operational guidelines for Bonny Reservoir. Operational guidelines for Cedar Bluff Reservoir are provided by the state of Kansas. Reclamation operates and maintains 11 dams and reservoirs in the Republican, Solomon, and Smoky Hill River Basins. Under a contract with Reclamation, Kirwin Irrigation District performs certain operational and maintenance functions at Kirwin Dam.

An updated Field Working Agreement was executed on July 17, 2001, between the Corps of Engineers and Reclamation regarding operation of Harlan County Dam and Lake. The agreement provides for a sharing of the decreasing water supply into Harlan County Lake. Storage capacity allocations were redefined based on the latest sediment survey (2000) and a procedure was established for sharing the reduced inflow and summer evaporation among the various lake uses.

The states of Nebraska, Colorado, and Kansas are responsible for the administration and enforcement of their state laws pertaining to the water rights and priorities of all parties concerned with the use of water. As provided by the lease agreement between Reclamation and the states, the states are responsible for administering the water surface activities and the federal lands around the reservoirs. The U.S. Fish and Wildlife Service administer the water surface activities and most of the federal lands at Kirwin Reservoir.

Reclamation cooperates with all state agencies and compact commissions to ensure that all operations are in compliance with state laws and compact requirements.

Tables and Exhibits

Records for the facilities reported in the AOP are included as tables and exhibits and are located following page 33.

Water Supply

For forecasting purposes, values of annual inflows that will be statistically equaled or exceeded 10, 50, and 90 percent of the time were selected from the probability data to be reasonable maximum (wet year), most probable (normal year), and reasonable minimum (dry year) inflow conditions, respectively.

Inflow records from 1990 through 2009 were used for the analysis of reservoirs in the Niobrara, Lower Platte, and Kansas River Basins.

Reservoir Operations

All operations are scheduled for optimum benefits of the authorized project functions. Monthly, or as often as runoff and weather conditions dictate, Reclamation evaluates the carry-over storage and estimated inflow at each reservoir to determine whether excess water is anticipated. If excess inflow is apparent, controlled releases will be made to maximize the downstream benefits.

Major Features

The Mirage Flats Project was constructed under the Water Conservation and Utilization Act and includes an irrigation storage reservoir, diversion dam, and canal system. The other features discussed in this report are all a part of the Pick-Sloan Missouri Basin Program and include single and multipurpose reservoirs, diversion dams, pump stations, and canal systems. The 16 storage facilities now in operation are listed below.

Constructed by Reclamation

1. Operated by irrigation or reclamation districts--Box Butte and Merritt Dams in the Niobrara River Basin and Virginia Smith and Davis Creek Dams in the Lower Platte River Basin.

2. Operated by Reclamation--Bonny, Trenton, Enders, Red Willow, Medicine Creek, Norton, Lovewell, Kirwin, Webster, Glen Elder, and Cedar Bluff Dams in the Kansas River Basin. A contract provides for Kirwin Irrigation District to perform certain operational and maintenance functions at Kirwin Dam.

Constructed and Operated by the Corps of Engineers

1. Harlan County Dam in the Kansas River Basin.

Irrigation and Reclamation Districts

Twelve irrigation districts and one reclamation district in the Niobrara, Lower Platte, and Kansas River Basins have contracted with Reclamation for water supply and irrigation facilities. The Twin Loups Irrigation District has contracted their O&M responsibilities to the Twin Loups Reclamation District. Bostwick Irrigation District in Nebraska has contracted their O&M responsibilities for Guide Rock Diversion Dam and the Courtland Canal between the headgates and the Nebraska-Kansas state line to Kansas Bostwick Irrigation District.

The contracted irrigation season for the Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman Valley, H&RW, and Frenchman-Cambridge Irrigation Districts is from May 1 through October 15 or such additional period from April 1 through May 1 of each year as determined between the district and Reclamation. The contracted irrigation season for Twin Loups Reclamation District and Almena, Bostwick in Nebraska and Kansas-Bostwick Irrigation Districts is May 1 through September 30 or such additional period from April 1 through November 15 of each year as determined between the district and Reclamation. For Ainsworth, Kirwin, Webster, and Glen Elder Irrigation Districts, the contracted irrigation season is from May 1 through September 30.

Municipal Water

Three municipalities in Kansas (Norton, Russell, and Beloit) and one rural water district in Kansas (Mitchell County Rural Water District No. 2) have executed water service contracts for full or supplemental water supplies.

Fish and Wildlife

The state of Kansas is presently using the fish hatchery facility below Cedar Bluff Reservoir for waterfowl habitat. The Calamus Fish Hatchery located below Calamus Reservoir is operated by the Nebraska Game and Parks Commission for fish production.

State of Colorado Division of Wildlife

The Colorado Division of Wildlife provides operational guidelines for Bonny Reservoir. The entire conservation pool storage was purchased by the state of Colorado on June 24, 1982.

State of Kansas Department of Wildlife and Parks

The state of Kansas acquired the use and control of portions of the conservation capacity at Cedar Bluff Reservoir following the reformulation of the Cedar Bluff Unit in October of 1992. The city of Russell's existing water storage right and contract with the United States remained unchanged.

Power Interference Considerations

A Power Interference Agreement exists between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District. A Subordination Agreement also exists between Reclamation, the Ainsworth Irrigation District, and the Nebraska Public Power District. Provisions of these agreements will be incorporated into the 2010 operations.

Environmental Considerations

A "Statement of Operational Objectives" for Harlan County Lake sets forth the general operational objectives and the specific reservoir uses that are desirable. The operational objectives indicate that fish and wildlife interests are best served by high reservoir levels with minimum fluctuations, and regulation of the outflow in excess of the minimum desired flows. Although the statement recognizes flood control and irrigation as primary purposes, it indicates that comprehensive operational plans should be developed for maximum integration of the secondary uses.

These operational objectives are also considered in the operation of all Reclamation reservoirs in the Kansas River Basin, Niobrara River Basin, and the Lower Platte River Basin. The regulated outflow can also benefit farmers, ranchers, cities, and other interests below the reservoirs.

Republican River Compact – Kansas v. Nebraska

On May 26, 1998, Kansas filed a petition with the U. S. Supreme Court complaining that Nebraska had violated the Republican River Compact (Compact) by using more than its share of the Republican River water supply. The three original parties to the Compact; Kansas, Nebraska, and Colorado, became parties to the case. Because the major water development structures in the Republican River Basin were constructed by the Bureau of Reclamation and the Corps of Engineers, the United States was allowed to participate as *amicus curiae.* After 17 months of negotiations the Final Settlement Stipulation (Stipulation) was signed by each respective governor and attorney general and was filed with the Special Master on December 16, 2002. The United States Supreme Court approved the settlement and dismissed the case on May 19, 2003.

The settlement provides for a moratorium on new groundwater wells, special rules for administration of water during water-short years, protection of storage releases, minimized flood flow effects on the accounting, recognition by Nebraska of a 1948 priority date for the Kansas-Bostwick Irrigation District, inclusion of the impacts of groundwater pumping from tableland wells in the accounting, and accounting for all reservoirs 15 acre-feet and larger within the river basin.

The Stipulation also required that the states, in cooperation with the United States, form a Conservation Committee to develop a proposed study plan to determine the quantitative effects of non-federal reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska.

The Study Plan supported by the three States, the Natural Resources Conservation Service, and Reclamation was completed and signed on April 28, 2004. Cooperative agreements for completing the 5 year study were developed between Reclamation, the University of Nebraska-Lincoln (UNL), and Kansas State University (KSU). Installation of data loggers on 35 reservoirs throughout the basin was completed in 2004. Advanced monitoring equipment for terraces and additional reservoirs was installed by UNL in 2006. Data collection and model development continued through 2009. The Conservation Committee provided an update on the study at the 2009 Republican River Compact annual meeting held in Lincoln on August 12, 2009. The Conservation Committee is currently working with UNL and KSU to assemble a draft study report which will be presented to the Compact Commissioners in early 2010. A final study report will be presented at the 2010 Republican River Compact annual meeting.

"Water-Short Year Administration" will be in effect in those years in which the projected or actual irrigation supply is less than 119,000 acre-feet of storage available for use from Harlan County Lake as determined by Reclamation. It was determined in 2009 that a "Water-Short Year Administration" was not in effect.

Lower Republican River Basin Appraisal Study / Feasibility Study

With the support of Kansas and Nebraska, Reclamation completed the Lower Republican River Basin Appraisal Report in January 2005. This study analyzed system improvement alternatives in the lower portion of the Republican River Basin that would provide for more efficient use of the water supply. The study met requirements of the Stipulation by investigating system improvements in the basin, including measures to improve the ability to utilize the water supply below Hardy, Nebraska. This study also met the responsibilities of the Compact by investigating the most efficient use of the water of the Republican River Basin for multiple purposes.

Nine alternatives were formulated using the recommended proposals provided by the Compact Commissioners. Three other alternatives were investigated for supplying water in meeting Minimum Desirable Streamflow (MDS) related needs in Kansas. The appraisal report concluded that additional water can be made available for storage in Lovewell Reservoir. The appraisal report recommends further federal participation in a feasibility study and that such a study be undertaken to investigate solutions. Specific congressional authorization is required for Reclamation to perform a feasibility study. The purpose of a feasibility study is to identify, evaluate, and recommend to decision makers an appropriate viable solution to the identified problems and opportunities. The states have indicated they would provide in-kind support and/or funding for the feasibility study.

Legislation authorizing a feasibility study was introduced in 2003 but was not advanced. Congressmen from both Nebraska and Kansas reintroduced legislation authorizing the feasibility study in 2007, but again it was not advanced. Language authorizing the feasibility study was included in Senate Bill S2739, which was passed by the Senate and the House of Representatives in April of 2008. On May 8, 2008, the President signed the Consolidated Natural Resources Act of 2008 (P.L. 110-229).

Section 510 of Title V of the Act authorizes the Secretary of the Interior, acting through the Bureau of Reclamation and in consultation and cooperation with the states of Nebraska, Kansas, and Colorado, to conduct a study to determine the feasibility of implementing a water supply and conservation project that will:

1. Improve water supply reliability in the Republican River Basin between Harlan County Lake in Nebraska and Milford Lake in Kansas.
2. Increase the capacity of water storage through modification of existing projects or through new projects that serve areas in the Republican River Basin.
3. Improve water management efficiency in the Republican River Basin through conservation and other available means.
4. Where appropriate, evaluate integrated water resource management and supply needs in the Republican River Basin. Funds must be appropriated before Reclamation can begin the feasibility study.

Both states have expressed support of the feasibility study. At the 2009 Republican River Compact annual meeting, the Compact Commissioners re-affirmed their support of the feasibility study by passing a resolution of support. In late 2009, Reclamation, the Kansas Department of Agriculture (KDA), and the Nebraska Department of Natural Resources (NDNR) began discussions of ways to take advantage of other state and federal programs to complete feasibility study tasks while awaiting appropriations. Initial tasks included detailed topography of the Lovewell Dam embankment, recreation areas, and initial surface water model scoping activities.

Frenchman Valley Appraisal Study

In 2004, the NDNR requested Reclamation prepare an Appraisal Study (AS) to examine opportunities for more efficient management of water supplies in the Frenchman River Valley, including Reclamation's Enders Reservoir, a feature of the Frenchman-Cambridge Division in Nebraska. The study focused on problems and opportunities in an area that has experienced dramatically reduced ground and surface water supplies, including reduced reservoir inflows. Study activities have been ongoing since 2005. Agencies participating in the study include Reclamation, NDNR, Frenchman Valley, and H&RW, and Riverside Irrigation Districts, Nebraska Game and Parks Commission, and the Upper and Middle Republican Natural Resources Districts. A final draft report was distributed to participating agencies for review and a meeting to discuss concerns was held on October 27. Agencies have submitted final comments and following Reclamation’s review and incorporation of these comments, the report will be finalized in early 2010.

Emergency Management

The Nebraska-Kansas Area Office (NKAO) continues to coordinate with local jurisdictions that could potentially be impacted by flooding from large operational releases and/or dam failure. Two tabletop exercises and one functional exercise were conducted during calendar year 2009. The functional exercise was held for Norton Dam. Tabletop exercises were conducted for Glen Elder and Webster Dams. Orientation meetings were held for all of NKAO dams.

Emergency radios have been installed at all dams. These radios will be used as a backup means of communication when notifying the local emergency management officials in the event of an emergency at the dam.

Both the NKAO and the McCook Field Office have a satellite phone that can be used in an emergency. Management and dam operators have been trained on the use of these phones.

Public Safety Reviews

The Annual Safety Training for field personnel was held at the McCook Field Office and at the Community College in McCook, Nebraska, in February 2009. This training provided maintenance personnel the opportunity to update their training in Crane, Hoist, and Rigging Safety, NFPA 70E Electrical Safety/Arc Flash Familiarization, Lockout/Tagout Safety Training, Confined Space Refresher Training, Fall Protection Refresher Training, Welding and Cutting Safety, Chemical Safety (Herbicide and Pesticide Use), and Respirator Training and Fit Testing. First Aid and CPR training was provided by the McCook Fire Department to all field personnel, as well as any other Reclamation employees interested in taking the class to become certified in 2008. A refresher will be taught again in 2010.

The ongoing safety reviews of project facilities continue to identify potential safety hazards to the public and operating personnel. NKAO combines elements of the Annual Safety Inspections of the major facilities with the Dam Safety Facility Reviews when possible, and conducts follow up inspections when deficiencies aren't on-the-spot correctible. This format provides for enhanced communication and coordination between both the Area Safety Manager and staff, and teams of Dam Safety Specialists.

Formal training for the Automated External Defibrillators (AEDs) was provided, as part of the CPR Certification Training in February 2008. A refresher will be taught again in 2010. AEDs are located at the McCook Field Office and the Grand Island Office, along with an additional field ready AED at each location for employees to take to the field when activities are being conducted. NKAO continues to involve Great Plains Region Occupational Health in Billings, Montana, and the Federal Occupational and Health Services Center in Denver, Colorado, when maintenance and operational items, such as replacing AED batteries and pads, and reprogramming CPR protocol, is required.

Attention continues with regards to issues concerning lock out/tag out, personal protective equipment (PPE), welding and coating safety procedures, pesticide and herbicide use (MSDS), fall protection/slips, trips, and falls, working alone, near-miss accident reporting, and completing job hazard analyses (JHAs). Employees were provided safety and health training, and given information related to these and several other issues throughout the year.

Mirage Flats Project in Nebraska

General

Flows in the Niobrara River along with Box Butte Reservoir storage provide a water supply for the 11,662 acre Mirage Flats Project. From 2000 to 2009, the project water supply averaged 10,000 AF, which is about 0.86 AF per irrigable acre. Many irrigators supplement their water supply with private wells.

The Mirage Flats Irrigation District cooperates with the Nebraska Game and Parks Commission (Commission) by operating the Box Butte Dam outlet works gate and the Dunlap Diversion Dam gates in a manner to avoid sudden large changes in the flows of the Niobrara River. A 30-year agreement was made in 1990 between the district and the Commission whereby the district would not draw the reservoir water level below elevation 3978.00 feet (2,026 AF). In return the district received an up-front payment which was used to improve the efficiency of the project's delivery system. On March 17, 2000, the district agreed to increase the minimum reservoir level by one additional foot to elevation 3979.00 feet (2,392 AF). In return the district received an additional payment from the Commission for the 20 years left on the original agreement.

A data collection platform (DCP) was installed in May of 1992 to monitor the reservoir elevation and outflow at Box Butte Dam. A telephone (primary communication system) and a radio (backup communication system) have been installed at the outlet works for contacting the Region 23 Emergency Management Agency.

2009 Summary

The flows of the Niobrara River plus the carry-over storage in Box Butte Reservoir were not adequate to provide a full water supply for the project lands. Precipitation in the Mirage Flats Irrigation District totaled 19.98 inches, which is 118 percent of normal. The 2009 total inflow of 15,432 AF was slightly below the normal-year forecast.

From mid July through late August, diversions of 8,262 AF to the Mirage Flats Canal provided irrigation water for approximately 5,755 acres, 49 percent of the service available acreage. The farm deliveries from the project water supply totaled 1,446 AF (0.25 acre-foot per irrigated acre), which is a delivery efficiency of 18 percent. Total reservoir storage was 6,133 AF at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

The district continued to implement water conservation measures as outlined in their Water Management Plan and their Long Range Plan. Assistance to project irrigators provided by the district include delivery system improvements that provide on-farm efficiency improvements, such as relocation of turnouts, burying pipe for better access, and on-farm efficiency incentives. The district continues to modify and update their computer software to improve system operations, scheduling, accounting, and continued development of their web page that allows irrigators to place water orders, review water accounts, and keep updated on district operations.

Ainsworth Unit, Sandhills Division in Nebraska

General

Within the Ainsworth Irrigation District, there are approximately 35,000 acres with available service. The project water supply is provided by storage of Snake River flows in Merritt Reservoir. The reservoir is filled to elevation 2944.0 feet each fall after the irrigation season. This level is approximately 2 feet below the top of conservation capacity and within the repaired area of soil cement on the upstream face of the dam. The reservoir is regulated to maintain this level until the ice clears each spring. Maintaining the reservoir at this elevation during the winter will help avoid ice damage to the older existing soil cement at lower elevations. Upon ice- out, the outlet pipe is drained, inspected, and repaired as necessary. The reservoir is then rapidly filled to elevation 2946.0 feet to reduce shoreline erosion around the reservoir and minimize sand accumulations on the face of the dam. This filling process generally takes place in April. The reservoir level is maintained until irrigation releases begin to draw on the pool around mid May. Seepage, pickup and toe drain flow normally result in flows of up to 15 cfs below Merritt Dam.

Reclamation has executed a Memorandum of Agreement (MOA) between Reclamation, the Nebraska Game and Parks Commission, and the Ainsworth Irrigation District for Snake River Releases below Merritt Dam. The purpose of this MOA is to establish the protocol that will be used to make future releases of water from Merritt Dam to the lower Snake River. The development of the MOA was an environmental commitment outlined in the Ainsworth Irrigation District Final Environmental Assessment (FEA) for the Conversion of a Long-Term Water Service Contract to a Repayment Contract (December 2006).

Release criteria will be based on the best available scientific data to determine when local conditions warrant releases to the Snake River. When it becomes necessary to release water from Merritt Reservoir, Reclamation will direct the Ainsworth Irrigation District to make the necessary releases to the river.

2009 Summary

Precipitation as recorded near Merritt Dam, totaled 28.14 inches, which was 137 percent of normal. The inflow for the year totaled 182,155 AF.

This inflow was between the dry- and normal-year forecasts. The water supply was more than adequate to meet the project's irrigation requirement. There were 61,333 AF diverted from Merritt Reservoir into Ainsworth Canal, with 34,120 AF delivered to the farm headgates (delivery efficiency of 56 percent). There were 34,582 acres of land irrigated in 2009.

The district provided a total of 308 AF of irrigation water from holding ponds located within the district's service area.

The Ainsworth Irrigation District, along with Reclamation and the local Natural Resource District, continued to provide support to the University of Nebraska Extension Service for an irrigation scheduling/nitrogen management demonstration that will educate and improve irrigation management in the area. The first demonstration site included a center pivot in the district and a field day was held in the fall of 2005. Field days were subsequently held in 2006, 2007, 2008,and 2009. This project is expected to continue in 2010.

Working with Reclamation's technical and financial assistance through a cooperative agreement, the District installed automation onthe Sand Draw and Airport Lateral. Additionally, burial of lateral B-7.2, B-10.3, and A-16.2 were completed through the Water Conservation Field Services Program. In addition to these current projects, the district has plans for additional lateral burial and automation efforts.

North Loup Division in Nebraska

General

The North Loup Division is located in the Loup River drainage basin. Water is diverted from both the Calamus and North Loup Rivers for the irrigation of approximately 55,100 acres of project lands.

Operation of the division also provides a sustained groundwater supply for an additional 17,000 acres. Principal features of the division include Virginia Smith Dam, Calamus Reservoir, Calamus Fish Hatchery, Kent Diversion Dam, Davis Creek Dam and Reservoir, five principal canals, one major, one small pumping plant, and numerous open ditch and buried pipe laterals.

Calamus Reservoir is normally regulated at 3 to 4 feet below the top of conservation capacity during the winter months. Maintaining the reservoir at this elevation during the winter helps avoid ice damage to the soil cement on the upstream face of the dam. After the ice clears in the spring, the reservoir is filled to conservation capacity. The North Loup Division project operation is restricted to no water diversions from the Calamus and North Loup Rivers during the months of July and August, and also during the month of September, whenever sufficient water is available in the storage reservoirs to deliver full water demands. During this time, inflows to Calamus Reservoir are required to be bypassed under the Power Interference Agreement between Reclamation, the Twin Loups Reclamation District, and the Loup River Public Power District and as required in the authorizing legislation.

Davis Creek Reservoir level is maintained at an average elevation of 2048.0 feet from the end of the irrigation season through the winter months. Off season seepage and evaporation has historically resulted in a reservoir drawdown of 2.5 to 3.0 feet requiring an end of September reservoir level of 2050.0 feet or less. This carry-over elevation provides a minimal recreational pool while reducing increases in groundwater storage due to reservoir seepage. The reservoir is filled via Mirdan Canal, starting in April and reaching full content by the end of June. A 160-acre recreation area adjoining the reservoir continues to be managed by the Lower Loup Natural Resources District. The area includes a boat ramp, a handicapped accessible fishing pier, a day-use area, a primitive camping area, shelter, and a hiking path. Public lands adjoining Kent Diversion Dam are managed by the Commission and is also open to day-use fishing with handicapped accessibility provided.

2009 Summary

Precipitation at Virginia Smith Dam was 26.14 inches which is 108 percent of normal. The inflow totaled 278,685 AF which was between the normal- and wet-year forecasts. There were 82,080 AF of water released into Mirdan Canal and 8,626 AF diverted through Kent Canal from the North Loup River. A total of 35,419 AF was diverted for district use above Davis Creek Reservoir. The farm headgate delivery was 16,379 AF which is a delivery efficiency of 46 percent. Land irrigated in 2009 totaled 33,999 acres above Davis Creek Reservoir. Calamus Reservoir inflows were bypassed during July, August, and September as required. Virginia Smith Dam recorded 5.65 inches of precipitation during October, the most ever recorded for the month. The reservoir elevation at the end of the year was at 2239.88 feet. The Calamus Fish Hatchery used bypassed natural flows and storage from Calamus Reservoir totaling 4,512 AF during 2009.

The precipitation total of 25.20 inches near Davis Creek Dam was 102 percent of normal. The site recorded 6.10 inches of precipitation during August 208 percent of average for the month. Inflow to Davis Creek Reservoir totaled 47,962 AF during 2009. Beginning in late April, Davis Creek Reservoir was filled from an elevation of approximately 2048.4 feet to a peak elevation of 2074.02 feet on July 7 using diversions from the North Loup River and Calamus Reservoir.

A release of 41,996 AF was made from Davis Creek Dam into Fullerton Canal, with 17,879 AF delivered to the farm headgates (43 percent delivery efficiency). There were 20,922 acres irrigated below Davis Creek Reservoir. The reservoir elevation at the end of 2009 was very near the normal wintering level at 2047.77 feet.

Through a cooperative agreement with Reclamation, the district began installing remote monitoring equipment at key canal sites to improve delivery system operations. In 2008 equipment was placed at the Parshall flume located below Virginia Smith Dam, at the 9.5 check structure, and at the 13.4 check structure. Further work is anticipated to equip each of the sites with remote control capabilities.

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir are primarily for recreation and fish and wildlife support, although water is available for water right administration and irrigation purposes.

Bonny Reservoir inflows from the South Fork of the Republican River and Landsman Creek are released into Hale Ditch as requested by the Colorado State Engineer. The state will make Bonny Reservoir storage water available to Hale Ditch and other natural flow appropriators under short-term water service contracts. Most of the 700 acres served by Hale Ditch are now owned and operated by the Division of Wildlife, Colorado Department of Natural Resources.

The normal operation pattern of Bonny Reservoir, when inflows are allowed to be stored, enhances fish spawning in the spring and provides excellent fishing opportunities during the summer and hunting conditions each fall.

2009 Summary

The annual precipitation total of 26.56 inches at Bonny Dam was 155 percent of normal and the greatest ever recorded at the site. The annual computed inflow of 11,698 AF to Bonny Reservoir was very close to the normal-year forecast. The reservoir level began the year at elevation 3649.96 feet and gradually increased to a peak elevation of 3652.66 feet by the end of April (19.3 feet below full pool). Bonny Dam received 4.46 inches of precipitation in June and 4.61 inches in July, 166 percent of average for the 2 month period. Rainfall during October was 3.59 inches, 318 percent of average for the month. These rains resulted in the reservoir level increasing approximately 1.5 feet (1,500 acre-feet) from October 1 through November 30. River releases were made during the months of May, June, and December in accordance with orders of the state of Colorado for Republican River Compact compliance. A total of 3,361 AF of river outflow was recorded for this purpose. No flood release was required during 2009 as the reservoir elevation remained well within the conservation pool. The reservoir elevation at the end of the year was 21.0 feet below the top of conservation at 3651.00 feet. The Corps of Engineers determined that $3,400 of flood prevention benefits was realized from the operation of Bonny Reservoir during 2009.

The Colorado State Water Commissioner directed inflows from the South Fork of the Republican River and Landsman Creek be passed through Bonny Reservoir into Hale Ditch from April 28 through June 2. A total of 674 AF was released into Hale Ditch during 2009.

Frenchman Unit, Frenchman-Cambridge Division in Nebraska

General

The Culbertson Canal and the Culbertson Extension Canal systems serve 9,292 acres in the Frenchman Valley Irrigation District and 11,915 acres in the H&RW Irrigation District. The water supply for these lands is furnished by flows from Frenchman, Stinking Water Creeks and off-season storage in Enders Reservoir located onFrenchman Creek, a tributary of the Republican River in southwest Nebraska. Irrigation releases are conveyed via Frenchman Creek from Enders Reservoir to Culbertson Diversion Dam. Reclamation maintains/clears this section of Frenchman Creek prior to the irrigation season each spring.

The normal operation of Enders Reservoir, with the gradual rise in water surface during the spring months, provides desirable fish spawning conditions. Irrigation releases normally deplete the conservation storage by late summer, thereby limiting the fishing and recreational usage.

2009 Summary

The annual precipitation total of 29.69 inches at Enders Dam was well above normal (156 percent), and the greatest ever recorded for the site. The 2009 inflow into Enders Reservoir of 6,577 AF was between the dry-year and normal-year forecasts. This was the 42nd consecutive year with below-normal inflows in which the conservation pool did not fill. The reservoir level began the year at elevation 3090.99 feet (21.3 feet below top of conservation). The reservoir level increased slightly during the spring to a peak elevation of 3091.91 feet on June 18 and then gradually decreased through early October. The minimum elevation (3090.59 feet) occurred on October 5. Due to the extremely low water supply available, no water was released from Enders Reservoir. The end of the year reservoir level was 21.0 feet below the top of conservation. The Corps of Engineers determined that the reservoir prevented $1,300in flood damages in 2009. The Frenchman Valley Irrigation District reports that approximately 874 acres received water in 2009 from natural flow diversions from Frenchman Creek. Farm delivery averaged about 0.61 foot per irrigated acre in the Irrigation District. Some farmers were able to supplement their project water supply from private irrigation wells. The H&RW Irrigation District did not divert water into Culbertson Extension Canal in 2009 due to the extremely low water supply. This was the 7th consecutive year that the district did not deliver water.

In August 2004, a small depression was discovered near the outlet works stilling basin at Enders Dam. An Internal Alert remains in effect until investigation of the stability of the outlet works stilling basin and risk assessment are complete. A Safety of Dams recommendation in 2006 recommended filling the stilling basin under drain system and potential voids with low-pressure grout and backfilling the existing sinkhole with compacted material after completion of the grouting program. A rapid increase in reservoir elevation in June 2007 prompted the addition of 50,000 pounds of concrete weights to be placed on the outlet works to counter any uplift on the structure.

In 2009, the Frenchman Valley Irrigation District (along with Reclamation) again provided support for a Limited Irrigation Demonstration Project with the University of Nebraska Extension Service.

Meeker-Driftwood, Red Willow, and Cambridge Units, Frenchman-Cambridge Division in Nebraska

General

Service is provided for Frenchman-Cambridge Irrigation District by Meeker-Driftwood Canal to 16,855acres; Red Willow Canal to 4,797acres; Bartley Canal to 6,353 acres; and Cambridge Canal to 17,664 acres. The water supply for these lands is provided by storage in Swanson, Hugh Butler, and Harry Strunk Lakes, and inflows of the Republican River, Red Willow, and Medicine Creeks. The Frenchman-Cambridge Irrigation District has replaced all of the open ditch laterals which were economically feasible with buried pipe which has significantly increased both system and on-farm efficiencies.

2009 Summary

The annual precipitation total of 27.75 inches at Trenton Dam was 136 percent of normal. The inflow of 37,749 AF to Swanson Lake was slightly above the normal-year forecast. The lake level began the year at elevation 2737.16feet and peaked at 2742.04 feet (10 feet below the top of conservation) on June 17. The reservoir level decreased during the irrigation season and reached a minimum elevation of 2735.58 feet on October 13.

Irrigation diversions were made into Meeker-Driftwood Canal for the first time since 2002. The district diverted 23,274 AF from June 8 through August 28 and delivered 5,603 AF to the farms. At the end of the year the reservoir level was 13.8 feet below the top of conservation at 2738.17 feet. The Corps of Engineers determined that Swanson Lake prevented $4,055,000 in flood damages.

The annual precipitation total of 23.96 inches at Red Willow Dam was 122 percent of normal. The annual inflow of 13,279 AF into Hugh Butler Lake was between the dry-year and normal-year forecasts. The reservoir level at the first of the year was 2575.27 feet, 6.5 feet below the top of conservation. The reservoir level peaked at 2577.18 feet (4.6 feet below full) on June 26. Irrigation releases began on June 28 and ended on August 27 dropping the pool level 4.1 feet. The district diverted 5,166 AF into Red Willow Canal and 10,711 AF into Bartley Canal. Flood releases were not required in 2009. October precipitation totaled 4.86 inches, the greatest October total recorded at the site. Discovery of embankment cracking at Red Willow Dam in late October resulted in the evacuation of 21,000 AF from Hugh Butler Lake. The end of year storage at Hugh Butler Lake was the lowest end of December storage ever recorded at the site (elevation 2554.07 feet), 27.7 feet below the top of conservation. The Corps of Engineers determined that Hugh Butler Lake prevented $1,300 of flood damages during 2009.

The annual precipitation total of 28.90 inches at Medicine Creek Dam was 140 percent of normal and the second highest ever recorded at the dam. The inflow of 42,805 AF was between the normal-year and wet-year forecasts. The reservoir level at the beginning of 2009 was only .8 foot below the top of conservation. Releases were made during the first 4 months of 2009 to maintain the reservoir elevation approximately .5 foot below the flood pool. The reservoir was allowed to fill on April 26 and the reservoir level gradually increased to elevation 2367.27 feet (1.2 feet into flood pool) on June 16. Irrigation releases began on June 23 and ran through September 4 reducing the reservoir level to 2360.22 feet. The district diverted 23,961 AF into Cambridge Canal. Medicine Creek Dam recorded 5.34 inches of precipitation during October, the most ever recorded for the month. Late fall and early winter inflows increased the level of Harry Strunk Lake to only 0.5 foot below the top of conservation at the end of the year (2365.54 feet). The Corps of Engineers determined that Harry Strunk Lake prevented $4,900 in flood damages.

During an inspection at Red Willow Dam in July 2005, a small quantity of fine sand was discovered near the river outlet works stilling basin drain outlet. Five piezometers were installed in April 2006 adjacent to the outlet works and spillway stilling basins, and temporary plugs were placed in the underdrain outlets in May. An Internal Alert remains in effect. Grouting of the underdrain system was scheduled for the fall of 2009. On October 21, 2009, a small hole was observed on the face of the downstream embankment in a location 130 feet upstream of the outlet works gatehouse on the alignment of the outlet works conduit. Dye was introduced into the hole and subsequent excavation revealed cracks in the embankment material. Reclamation geotechnical engineers and geologists were onsite to conduct the investigations in coordination with the NKAO staff. A Dam Safety decision document was signed calling for a reduction of the reservoir water surface elevation to a range within 2552 to 2554 feet msl. A release of 100 cfs was initiated through the outlet works on October 30, 2009. The release was increased each morning by 50 cfs through November 4, 2009. The release from Red Willow Dam peaked at 350 cfs and was maintained through November 23, 2009, when the release was reduced to 200 cfs.

The release was further reduced to 150cfs on November 25, 2009,to 100cfs on December 2, 2009, and to 65 cfs on December 4, 2009. Hugh Butler Lake reached a new historical low reservoir level on November 23, 2009, since the initial filling of the reservoir and continued to decrease reaching elevation 2554.07 feet by the end of December. Releases will continue as necessary to maintain the reservoir level within the operating level of 2552.00 to 2554.00 feet until permanent corrective actions are made to the dam.

In 2008,the district began making water measurement improvement upgrades on Meeker, Red Willow, and Cambridge Canals, including improving farm turnouts, lateral turnouts, and canal measurement structures. Reclamation provided financial assistance for this project through a cooperative agreement with the district.

Almena Unit, Kanaska Division in Kansas

General

Service is available to 5,764 acres in the Almena Irrigation District. The project water supply is provided by Prairie Dog Creek flows and Keith Sebelius Lake storage.

The water service contract for the city of Norton, Kansas, provides for a maximum annual use of 1,600 AF from Keith Sebelius Lake.

2009 Summary

The annual precipitation at Norton Dam totaled 32.01inches, which is 131 percent of normal. The total inflow of 7,452 AF was slightly below the normal-year forecast. The reservoir was 10.4 feet below the top of conservation pool at the first of the year. The reservoir level gradually increased peaking at 2294.85 feet on June 16. Irrigation releases were made during July reducing the lake level by .75 feet. The lake level ended the year at elevation 2294.64 feet (9.7 feet below the top of conservation). The Corps of Engineers determined that Keith Sebelius Lake prevented $1,000in flood damages.

The Almena Irrigation District reports that approximately 1,100 acres received water in 2009. 1,551 acre- feet was diverted into the Almena Canal. Farm delivery averaged about 27 foot per irrigated acre in the Irrigation District. Farm delivery efficiency was 19 percent for the District.

The city of Norton used 376 AF of municipal water during 2009.

A Safety of Dams recommendation was made in 2000 concerning the seepage through the left abutment and around the outlet works house at Norton Dam.

Technical Service Center personnel inspected the seepage areas in June 2001 and recommended consideration of monitoring improvement and additional instrumentation. A final issue evaluation report of findings (Technical Memorandum ND-8312-2) in 2003 concluded that the assessed risks for seepage and piping through the foundation in the left abutment falls in the range of "justification to take action to reduce risk." Topographic surveys and additional instrumentation were installed near the outlet works in 2004. In December 2005, a Corrective Action Study Technical Memorandum evaluated various alternatives for risk reduction and produced two new recommendations. Design of a weighted filter drain system and a seepage stability berm was completed in 2006. Construction of the drain was completed in 2007.

Franklin, Superior-Courtland, and Courtland Units, Bostwick Division in Nebraska and Kansas

General

Harlan County Lake storage and Republican River flows provide a project water supply for 22,454 acres in the Bostwick Irrigation District in Nebraska, and 13,378 acres in the Kansas-Bostwick Irrigation District No. 2 above Lovewell Reservoir. This storage and natural flows, together with White Rock Creek flows and Lovewell Reservoir storage, furnish a water supply for 29,122 acres below Lovewell Reservoir in the Kansas-Bostwick Irrigation District.

The lands in the Franklin and Superior-Courtland Units are in the Bostwick Irrigation District in Nebraska. The lands in the Courtland Unit downstream of the Kansas state line are in the Kansas-Bostwick Irrigation District.

In accordance with the off-season flow alternative outlined in Reclamation's final environmental assessment dated December 16, 1983, and amended on November 21, 2002, Harlan County Lake releases will be 10 cfs during the months of December, January, and February, except when the reservoir is at low levels. During water-short years releases for these 3 months will be either zero or 5 cfs depending on reservoir levels.

At the request of the state of Nebraska, releases of 30 cfs for a maximum 5-day period may be made to relieve icing conditions in the river.

Natural gain in streamflow, plus irrigation return flows, and operational bypass at Superior-Courtland Diversion Dam will provide some flow downstream.

The Kansas Department of Wildlife and Parks have requested that the Kansas-Bostwick Irrigation District and Reclamation maintain, when possible, a flow of 20 cfs into Lovewell Reservoir when the Courtland Canal is in operation and the conservation pool is below capacity. This recommended inflow provides excellent fishing around the canal inlet to the reservoir. The seepage below Lovewell Dam into White Rock Creek maintains a small live stream throughout the year.

Harlan County Dam is currently operating under an Interim Operating Plan (IOP) initiated in 2003. The IOP resulted from a “Dam Safety Assurance Study” that evaluated the adequacy of the dam as required by Corps of Engineers dam safety regulations.

There were three primary findings from this study:

1. Tainter gate bearings may experience significant bearing friction when operated under increasing water load.
2. Concerns of spillway stability due to water pressure in the foundation of the dam.
3. Spillway was found to be hydrologically deficient when modern hydrologic criteria were applied to the dam. The IOP has resulted in a decrease of flood protection capability.

The "Lovewell Reservoir Regulation Manual" is to be revised in 2010 to allow for a 2 foot raise in the conservation pool for water storage during drought years. Storing additional water during drought periods increases the project's irrigation beneficial purpose, without adversely affecting the ability to protect for the project design storm. A calculation of available water supply will be made at the end of March to determine if additional water can be stored in Lovewell Reservoir.

2009 Summary - Bostwick Division - Harlan County Lake Operations

The annual precipitation at Harlan County Dam totaled 24.50 inches of rainfall, which is 108 percent of normal. The 2009 inflow of 136,747 AF was between the normal- and wet-year forecasts. Harlan County Lake began 2009 approximately .4 foot above the top of conservation pool, at 1946.12 feet. Flood releases were made during the first 3 months of the year. The reservoir level increased gradually during the spring peaking at 1947.46 feet on June 21. Irrigation releases started in mid June and continued through early September. The lake level decreased to elevation 1943.57 feet on September 30. Lake levels increased through the fall and flood releases began on December 29 to maintain the pool level near the top of conservation. A 10 cfs river release was made throughout December as required. The reservoir elevation was 1946.19 feet (0.5 foot in the flood pool) on December 31, 2009. Harlan County Lake prevented $4,131,500 of downstream flood damages during 2009 according to the Corps of Engineers.

A total of 17,608 AF (approximately 42 percent of total inflow) was delivered to Lovewell Reservoir through the Courtland Canal.

2009 Summary - Bostwick Division - Nebraska

Irrigation diversions were made into Franklin, Naponee, Franklin Pump, Superior, and Courtland Canals in Nebraska in 2009. The district diverted 27,813 AF of water and delivered 10,855 AF to the farm headgates (39 percent delivery efficiency).

The district continued to replace open ditch laterals with buried pipe to reduce losses and improve system operations. In 2009, the district was selected for a Water for America Challenge Grant that is slated to replace approximately 4 miles of open ditch laterals with buried pipe. Indentified laterals on the Franklin Canal include: 16.3, 21.1, 21.6, 23.2, 24.0, and a portion of 30.9. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improve water measurement, accounting by utilizing water meters, and provide on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation.

2009 Summary - Bostwick Division - Kansas

The 2009 precipitation at Lovewell Dam totaled 21.33 inches, which was 78 percent of normal. The reservoir elevation at the beginning of 2009 was 1581.13 feet (1.5 feet below the top of conservation pool). The pool level gradually increased, filling the conservation capacity on March 4 (1582.6 feet). Flood releases were initiated and continued into April to maintain the reservoir level near the top of conservation. The pool level gradually increased during May peaking at 1583.48 feet on June 5. Irrigation releases to the canal began on May 18 and continued through September 12, dropping the reservoir level 7.5 feet.

Water was then diverted into Lovewell Reservoir via Courtland Canal through early November. The reservoir level at the end of the year was 1579.26 feet (3.34 feet below top of conservation). Lovewell Reservoir prevented $163,200of downstream flood damages during 2009 according to the Corps of Engineers.

The Kansas-Bostwick Irrigation District diverted a total of 54,464 AF to serve 10,346 acres above Lovewell Dam and 26,017 acres below Lovewell Dam. Farm delivery efficiency averaged 42percent in the district.

In 2007, the Kansas Bostwick Irrigation District No. 2 was awarded a Water 2025 Challenge Grant that allowed the district to replace approximately 9 miles of open ditch lateral with buried pipe. The district completed this project during 2009.

Kirwin Unit, Solomon Division in Kansas

General

The water supply for the 11,465 acres of land in the Kirwin Irrigation District is furnished by Kirwin Reservoir storage and inflows from the North Fork Solomon River and Bow Creek.

The operation of Kirwin Dam and Reservoir affords many opportunities for recreation, fishing, hunting, water sports, fish spawning, and preservation of waterfowl species.

The U.S. Fish and Wildlife Service (Service) has completed the Kirwin National Wildlife Refuge Comprehensive Conservation Plan (CCP). The 1997 National Refuge System Improvement Act required the Service to develop a CCP for each of its refuges. The Kirwin Refuge CCP will guide the refuge management activities through 2025.

2009 Summary

The annual precipitation total of 27.86 inches at Kirwin Dam was 118 percent of normal. The inflow of 78,204 AF was between the normal-year and wet-year forecasts. The reservoir level was 1.98 feet below the top of conservation pool at the first of the year (elevation 1727.27 feet). Spring and early summer runoff gradually increased the reservoir level, filling the conservation pool on April 27 for the first time since 2000, and reaching 1 foot into the flood pool by June. June precipitation increased the reservoir level to a peak elevation of 1732.85 feet (3.60 feet into the flood pool) on June 17. Flood releases began onJune 10 and continued through July 14. June precipitation was the third highest on record for the month. Irrigation releases began on July 11 and continued through August 26 decreasing the reservoir level to 1729.65 feet. The reservoir level continued to increase after irrigation releases ended. Additional flood releases started on November 2 and continued through the remainder of the year. The reservoir elevation was 1729.35 feet on December 31 (0.1 foot above the top of conservation). The Corps of Engineers determined that Kirwin Reservoir prevented $27,400 in flood damages.

A total of 7,103 acres received project water during 2009 with 6,687 AF delivered to farms. Farm delivery efficiency was 36 percent.

Webster Unit, Solomon Division in Kansas

General

The Webster Irrigation District has service available to 8,537acres. The project water supply is provided by Webster Reservoir storage and flows of the South Fork Solomon River.

2009 Summary

In 2009,the precipitation at Webster Dam was 99 percent of normal (23.50 inches). The inflow of 61,300 AF was between the normal-year and wet-year forecasts. The reservoir level was approximately 2 feet below the top of conservation pool at the first of the year (elevation 1890.46 feet). Storage in the reservoir increased during the spring, filling the conservation pool on March 5 for the first time since 2000. The reservoir level continued to increase reaching 2.2 feet into the flood pool by mid May. Flood releases began on May 19 to prevent the reservoir level from climbing any higher. Storms on June 10 and again onJune 14 resulted in nearly 4 inches of rainfall, increasing the reservoir level to 4.4 feet into the flood pool on June 17 (elevation 1896.81 feet). Flood releases were increased to 450 cfs from June 17 through July 2. Irrigation releases continued through August 26 decreasing the reservoir level to 1893.47 feet. The reservoir level increased during October and flood releases resumed on November 2 and continued through the remainder of the year. The pool level steadily decreased ending the year at elevation 1893.07 feet on December 31 (0.6 foot above the top of conservation). The COE determined that the reservoir prevented $15,500in flood damages.

A total of 3,570 acres received project water during 2009 with 4,229 AF delivered to farms. Farm delivery efficiency was 30 percent.

Concrete repairs in the spillway chute were completed in 2008. Approximately 2,500 ft^2 of concrete was repaired in the flat portion of the spillway by NKAO personnel. Repairs to the other areas of the spillway were contracted to Vieco Development and Construction Company, Inc. Vieco repaired approximately 15,000 ft^2 of spillway.

The district continued to explore opportunities to cost share with Reclamation and district irrigators for the replacement of open ditch laterals with buried pipe. Future conservation projects include the possibility of installing remote monitoring equipment at the key canal measurement sites on Osborne Canal. Future conservation projects may be delayed due to the declining water supply and availability of cost-share funding.

Glen Elder Unit, Solomon Division in Kansas

General

Releases from Waconda Lake will be regulated as outlined in two memorandums of understanding between the state of Kansas and Reclamation. Releases are made for the city of Beloit, the Mitchell County Rural Water District, the long-term water service contract with Glen Elder Irrigation District, and for water right administration.

Renewal of the long term water service contract with the city of Beloit, Kansas was completed in 2008. The new repayment contract became effective on January 1, 2009. The repayment contract with Beloit, Kansas, provides for the annual use of up to 2,000AF of Waconda Lake storage. Water is measured at the Glen Elder Dam river outlet works.

The water service contract with the Mitchell County Rural Water District No. 2 provides for 1,009 AF of storage water as available from Waconda Lake.

The water service contract with the Glen Elder Irrigation District provides for the use of up to 18,000 AF of storage water each year. Based on the current State of Kansas Certificate of Appropriation, water usage is not to exceed 15,170 AF per calendar year. Water is released and measured through the river outlet works.

When compatible with flood control operations, the operating criteria for Waconda Lake provide for a stable or rising pool level during the fish spawning period each spring.

When possible, Waconda Lake will be allowed to fill during the late summer and early fall to flood exposed shoreline vegetation. This flooded aquatic vegetation is very beneficial to waterfowl management.

Waconda Lake will normally be regulated at 1 to 2feet below the top of conservation capacity during the winter months. Maintaining the lake at this level will reduce shoreline erosion, provide abuffer for spring runoff and lessen ice damage to the upstream face of Glen Elder Dam. Releases from Waconda Lake will be regulated each year to maintain a constant water surface level while the lake is ice-covered.

2009 Summary

The annual precipitation total of 22.05 inches at Glen Elder Dam was 86 percent of normal. The inflow of 222,698 AF was between the normal-year and wet-year forecasts. The lake level at the beginning of the year was 1 foot below the top of conservation. Flood releases were carried over from the previous year to maintain the reservoir level. Releases were reduced in the spring and Waconda Lake filled onJune 10 (elevation 1455.6 feet). The lake level continued to increase and flood releases were increased on June 12. Flood releases varied from 50 to 1,500 cfs throughout the summer as additional runoff increased the reservoir level to approximately .8 foot into the flood pool. The peak reservoir level recorded during the year was 1456.38 feet on June 18 (10,000 acre-feet in the flood pool). The lake level dropped from the flood pool on June 27 and reached elevation 1455.27feet on August 24. The reservoir level was allowed to increase to .7 foot into the flood pool during the fall in cooperation with the Kansas Wildlife and Parks. River releases were once again increased in early November and continued through the end of the year. The level of Waconda Lake at the end of the year was .5 foot (elevation 1455.15feet) below the top of conservation. Waconda Lake prevented $4,208,700of downstream flood damages during 2009 according to the Corps of Engineers.

A total of 172,104 AF of water was released from Glen Elder Dam in 2009. Storage releases of 2,153 AF combined with natural flow releases of 9,439 AF for the irrigation of 6,318 acres in the Glen Elder Irrigation District. The district delivered 5,225AF to the farms resulting in a delivery efficiency of 45 percent. No storage releases were made for the city of Beloit; however, 671 AF was bypassed for water quality as directed by the State Water Commissioner. Releases to the Mitchell County Rural Water District No. 2totaled 674AF.

Cedar Bluff Unit, Smoky Hill Division in Kansas

General

Cedar Bluff Reservoir storage furnishes a maximum of 2,000 AF each year for the city of Russell, Kansas when required. Prior to 1993, Cedar Bluff Reservoir storage and Smoky Hill River flows had provided a water supply for 6,800 acres in the Cedar Bluff Irrigation District. Reformulation of the Cedar Bluff Unit in October of 1992 resulted in the dissolution of the Cedar Bluff Irrigation District with the Kansas Water Office and Kansas Department of Wildlife and Parks acquiring the use and control of portions of the reservoir conservation capacity. A "designated operating pool" was established for Cedar Bluff Reservoir and includes the following sub allocation pools: The city of Russell's existing water storage right which remained unchanged (2,700 AF); an artificial recharge pool under control of the Kansas Water Office (5,110 AF); and a fish, wildlife and recreation pool under control of the Kansas Department of Wildlife and Parks (21,061 AF). A “joint-use pool” has been established between the operating pool and the flood control pool for water supply, flood control, environmental and fish, wildlife and recreation purposes. Water rights for the “joint-use pool” are held jointly between the Kansas Department of Wildlife and Parks and the Kansas Water Office. A Contract Administration Memorandum between the United States of America, represented by Reclamation, the state of Kansas, and the city of Russell, was signed in November/December of 2003, establishing an accounting procedure for water storage in Cedar Bluff Reservoir. In January 2006, a Memorandum of Understanding was signed by the state of Kansas agencies, Kansas Water Office, and Kansas Department of Wildlife and Parks. Kansas Department of Wildlife and Parks will be responsible for the joint poolreleases and for the water rights.

2009 Summary

The annual precipitation total at Cedar Bluff Dam was 23.22 inches which is 111 percent of normal. The 2009 inflow of 14,391 AF was slightly below the normal-year forecast. The reservoir level at the beginning of the year was 2127.50 feet (16.5 feet below top of conservation). Cedar Bluff Dam recorded 4.47inches of precipitation during April, the second greatest for the month. Inflows in late May and September increased the reservoir level only slightly. The peak reservoir level recorded during the year was 2127.59 feet on May 8.

The reservoir level gradually decreased through August and increased gradually the remainder of the year. No flood release was made from the dam in 2009. The reservoir level at the end of the year was 2127.54 feet (16.5 feet below the top of conservation).

The state of Kansas utilized the fish hatchery facility located below Cedar Bluff Dam with 3 AF released to the facility. No water was released from Cedar Bluff Reservoir during 2009 for the city of Russell.

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

RESERVOIR		CAPACITY ALLOCATIONS 1/ DEAD	LIVE CONSERVATION Inactive	Active	FLOOD CONTROL
Box Butte	- Elevation Ft.	3969.0	3979.0	4007.0	---
	Total Acre-feet	188	2,392	29,161	---
	Net Acre-feet	188	2,204	26,769	---
Merritt	- Elevation Ft.	2875.0	2896.0	2946.0	---
	Total Acre-feet	774	4,662	66,726	---
	Net Acre-feet	774	3,888	62,064	---
Calamus	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	817	24,646	127,400	---
	Net Acre-feet	817	23,829	102,754	---
Davis Creek	- Elevation Ft.	1998.5	2003.0	2076.0	---
	Total Acre-feet	76	172	31,158	---
	Net Acre-feet	76	96	30,986	---
Bonny	- Elevation Ft.	3635.5	3638.0	3672.0	3710.0
	Total Acre-feet	1,418	2,134	41,340	170,160
	Net Acre-feet	1,418	716	39,206	128,820
Enders	- Elevation Ft.	3080.0	3082.4	3112.3	3127.0
	Total Acre-feet	7,516	8,948	42,910	72,958
	Net Acre-feet	7,516	1,432	33,962	30,048
Swanson	- Elevation Ft.	2710.0	2720.0	2752.0	2773.0
Lake	Total Acre-feet	2,118	12,430	112,214	246,291
	Net Acre-feet	2,118	10,312	99,784	134,077
Hugh Butler	- Elevation Ft.	2552.0	2558.0	2581.8	2604.9
Lake	Total Acre-feet	5,185	8,921	36,224	85,070
	Net Acre-feet	5,185	3,736	27,303	48,846
Harry Strunk	- Elevation Ft.	2335.0	2343.0	2366.1	2386.2
Lake	Total Acre-feet	3,408	7,897	34,647	87,361
	Net Acre-feet	3,408	4,489	26,750	52,714
Keith Sebelius	- Elevation Ft.	2275.0	2280.4	2304.3	2331.4
Lake	Total Acre-feet	1,636	3,993	34,510	133,740
	Net Acre-feet	1,636	2,357	30,517	99,230
Harlan County	- Elevation Ft.	1885.0	1927.0	1945.73	1973.5
Lake 3/	Total Acre-feet	0	118,099	314,111	814,111
	Net Acre-feet	0	118,099	196,012	500,000
Lovewell	- Elevation Ft.	1562.07	1571.7	1582.6	1595.3
	Total Acre-feet	1,674	11,644	35,666	86,131
	Net Acre-feet	1,674	9,970	24,022	50,465
Kirwin	- Elevation Ft.	1693.0	1697.0	1729.25	1757.3
	Total Acre-feet	4,969	8,515	98,154	313,290
	Net Acre-feet	4,969	3,546	89,639	215,136
Webster	- Elevation Ft.	1855.5	1860.0	1892.45	1923.7
	Total Acre-feet	1,256	4,231	76,157	259,510
	Net Acre-feet	1,256	2,975	71,926	183,353
Waconda	- Elevation Ft.	1407.8	1428.0	1455.6	1488.3
Lake	Total Acre-feet	248	26,237	219,420	942,408
	Net Acre-feet	248	25,989	193,183	722,988
Cedar Bluff	- Elevation Ft.	2090.0	2107.8	2144.0	2166.0
	Total Acre-feet	4,402	28,574	172,452	364,342
	Net Acre-feet	4,402	24,172	143,878	191,890
Total Storage (A.F.)		35,685	273,495	1,472,250	3,829,817 2/
Total Net Acre-feet		35,685	237,810	1,198,755	2,357,567

1/ Includes space for sediment storage.

2/ Includes total active storage for Box Butte, Merritt, Calamus, and Davis Creek Reservoirs.

3/ Bottom of irrigation pool for Harlan County Lake is 1932.5 feet, 164,111 AF.

TABLE 2
SUMMARY OF 2009 OPERATIONS
MIRAGE FLATS PROJECT

BOX BUTTE RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	MIRAGE FLATS CANAL Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	708	32	58	0.65	6,993	0	0
Feb.	879	30	77	0.30	7,765	0	0
Mar.	1,362	35	149	0.33	8,943	0	0
Apr.	2,698	52	276	3.23	11,313	0	0
May	1,192	46	364	1.17	12,095	0	0
June	1,375	44	476	3.98	12,950	0	0
July	697	3,767	502	3.79	9,378	3,721	580
Aug.	1,393	4,286	352	2.75	6,133	4,541	866
Sep.	903	363	227	0.30	6,446	0	0
Oct.	1,480	36	176	2.40	7,714	0	0
Nov.	1,599	35	107	0.36	9,171	0	0
Dec.	1,147	36	69	0.72	10,213	0	0
TOTAL	15,432	8,761	2,833	19.98	--	8,262	1,446

NOTE -- Acres irrigated 2009: Mirage Flats Canal 5,755 acres.

SANDHILLS DIVISION
AINSWORTH UNIT

MERRITT RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	AINSWORTH CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	14,787	14,281	236	0.47	61,370	0	0
Feb.	15,176	14,876	300	1.23	61,370	0	0
Mar.	16,260	15,571	418	0.96	61,641	0	0
Apr.	18,224	12,417	722	3.20	66,726	0	0
May	14,287	13,131	1,156	2.26	66,726	3,544	220
June	14,938	13,726	1,212	7.44	66,726	3,116	48
July	15,830	24,705	1,133	6.22	56,718	21,108	12,780
Aug.	15,244	18,258	980	2.51	52,724	19,355	11,457
Sep.	14,166	14,210	620	0.59	52,060	14,210	9,615
Oct.	16,154	6,129	715	2.53	61,370	0	0
Nov.	13,767	13,587	450	0.25	61,100	0	0
Dec.	13,324	13,012	312	0.48	61,100	0	0
TOTAL	182,155	173,901	8,254	28.14	--	61,333	34,120

NOTE -- Acres irrigated 2009: Ainsworth Canal 34,582 acres.

NORTH LOUP DIVISION
CALAMUS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to Calamus Fish Hatch. (AF)	ABOVE DAVIS CREEK MIRDAN CANAL Release to Canal (AF)	Canal Use (AF)	Delivered To Farms (AF)
Jan.	20,275	18,849	452	0.35	110,001	170	0	0	0
Feb.	21,030	19,061	567	0.56	111,403	124	0	0	0
Mar.	26,399	15,567	1,036	0.57	121,199	446	0	0	0
Apr.	24,645	17,201	1,499	1.85	127,144	638	4,126	0	0
May	24,520	22,664	1,907	2.15	127,093	540	13,605	3,297	1,217
June	28,223	28,340	1,868	6.47	125,108	475	14,650	2,544	351
July	22,465	43,823	1,956	1.89	101,794	639	26,301	14,300	7,346
Aug	23,768	36,030	1,558	4.44	87,974	574	16,788	10,362	4,694
Sep.	19,819	24,340	821	1.28	82,632	615	6,610	4,916	2,771
Oct.	25,369	13,155	1,139	5.65	93,707	273	0	0	0
Nov.	22,439	11,818	667	0.16	103,661	18	0	0	0
Dec.	19,734	15,574	404	0.77	107,417	0	0	0	0
TOTAL	278,685	266,421	13,874	26.14	--	4,512	82,080	35,419	16,379

NOTE -- Acres irrigated 2009: Mirdan Canal 33,999 acres.

NORTH LOUP DIVISION (Continued)

DAVIS CREEK RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Mo. Content (AF)	BELOW DAVIS CREEK FULLERTON CANAL Release To Canal (AF)	Delivered To Farms (AF)
Jan.	40	209	51	0.37	9,906	0	0
Feb.	77	179	63	0.31	9,741	0	0
Mar.	8	189	109	0.44	9,451	0	0
Apr.	2,336	268	187	1.50	11,332	0	0
May	12,618	4,025	267	1.67	19,658	3,138	24
June	13,269	4,775	407	5.92	27,745	3,810	7
July	10,536	14,515	433	3.09	23,333	13,565	9,738
Aug.	6,372	13,583	352	6.10	15,770	13,277	6,037
Sep.	2,140	8,670	133	1.25	9,107	8,206	2,073
Oct.	461	173	140	3.99	9,255	0	0
Nov.	102	164	76	0.00	9,117	0	0
Dec.	4	155	44	0.56	8,922	0	0
TOTAL	47,962	46,904	2,262	25.20	--	41,996	17,879

NOTE - Acres irrigated 2009: Fullerton Canal 20,922 acres.

TABLE 2
SUMMARY OF 2009 OPERATIONS

UPPER REPUBLICAN DIVISION
ARMEL UNIT
BONNY RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Outflow To Hale Ditch (AF)
Jan.	899	246	86	0.19	9,843	0
Feb.	1,029	256	106	0.60	10,510	0
Mar.	908	307	157	0.73	10,954	0
Apr.	1,539	337	316	2.84	11,840	39
May	1,140	1,547	461	3.23	10,972	593
June	1,351	1,401	411	4.46	10,511	36
July	713	314	490	4.61	10,420	6
Aug.	296	307	417	2.93	9,992	0
Sep.	547	298	315	2.45	9,926	0
Oct.	1,269	307	208	3.59	10,680	0
Nov.	1,172	298	184	0.50	11,370	0
Dec.	835	1,886	99	0.43	10,220	0
TOTAL	11,698	7,504	3,250	26.56	--	674

TABLE 2
SUMMARY OF 2009 OPERATIONS

FRENCHMAN-CAMBRIDGE DIVISION
FRENCHMAN UNIT
ENDERS RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	CULBERTSON CANAL Diversions To Canal (AF)	CULBERTSON CANAL Delivered To Farms (AF)	CULBERTSON EXT.CANAL Diversions To Canal (AF)	CULBERTSON EXT.CANAL Delivered To Farms (AF)
Jan.	436	307	67	0.27	15,430	0	0	0	0
Feb.	510	278	80	0.95	15,582	0	0	0	0
Mar.	420	307	131	0.31	15,564	0	0	0	0
Apr.	886	298	282	4.03	15,870	718	0	0	0
May	795	307	369	3.74	15,989	2,403	0	0	0
June	705	298	320	5.74	16,076	2,253	88	0	0
July	530	307	420	5.84	15,879	2,126	208	0	0
Aug.	224	307	384	2.28	15,412	1,759	197	0	0
Sep.	256	298	257	2.06	15,113	365	44	0	0
Oct.	688	307	126	3.70	15,368	0	0	0	0
Nov.	584	298	153	0.18	15,501	0	0	0	0
Dec.	542	307	74	0.59	15,662	0	0	0	0
TOTAL	6,577	3,620	2,663	29.69	--	9,624	537	0	0

NOTE: Acres irrigated 2009: Culbertson Canal - 874 acres; Culbertson Extension Canal - 0 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
MEEKER-DRIFTWOOD UNIT
SWANSON LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	MEEKER-DRIFTWOOD Release To Canal (AF)	MEEKER-DRIFTWOOD Delivered To Farms (AF)
Jan.	1,811	61	248	0.16	53,491	0	0
Feb.	3,306	56	299	0.52	56,442	0	0
Mar.	2,822	61	499	0.05	58,704	0	0
Apr.	4,907	60	1,005	2.83	62,546	0	0
May	6,070	61	1,508	4.33	67,047	0	0
June	6,393	4,417	1,517	4.70	67,506	4,555	9
July	2,523	10,449	1,767	4.47	57,813	10,307	2,654
Aug.	631	8,600	1,457	2.31	48,387	8,412	2,940
Sep.	157	60	908	2.30	47,576	0	0
Oct.	2,346	61	403	4.64	49,458	0	0
Nov.	3,780	60	538	0.42	52,640	0	0
Dec.	3,001	61	266	0.52	55,314	0	0
TOTAL	37,749	24,009	10,415	27.25	--	23,274	5,603

NOTE: Acres irrigated 2009: Meeker-Driftwood Canal - 12,714 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
RED WILLOW UNIT
HUGH BUTLER LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	RED WILLOW CANAL Diversions To Canal (AF)	RED WILLOW CANAL Delivered To Farms (AF)	BARTLEY CANAL Diversions To Canal (AF)	BARTLEY CANAL Delivered To Farms (AF)
Jan.	683	246	94	0.16	26,794	0	0	0	0
Feb.	823	222	117	0.35	27,278	0	0	0	0
Mar.	662	246	193	0.07	27,501	0	0	0	0
Apr.	1,496	238	440	2.99	28,319	0	0	1,254	0
May	1,298	246	594	3.39	28,777	0	0	2,723	16
June	1,074	347	563	3.87	28,941	55	0	2,193	197
July	862	3,043	716	4.26	26,044	2,951	520	2,246	725
Aug.	843	2,868	643	2.05	23,376	2,160	736	2,295	1,150
Sep.	518	238	368	1.42	23,288	0	0	0	0
Oct.	1,352	357	236	4.86	24,047	0	0	0	0
Nov.	2,121	17,257	160	0.27	8,751	0	0	0	0
Dec.	1,548	3,894	48	0.27	6,357	0	0	0	0
TOTAL	13,279	29,201	4,172	23.96	--	5,166	1,256	10,711	2,088

NOTE -- Acres irrigated 2009: Red Willow Canal - 2,962 acres; Bartley Canal 5,865 acres.

FRENCHMAN-CAMBRIDGE DIVISION (Continued)
CAMBRIDGE UNIT
HARRY STRUNK LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	CAMBRIDGE CANAL Diversions To Canal (AF)	CAMBRIDGE CANAL Delivered To Farms (AF)
Jan.	3,260	2,767	121	0.19	33,523	0	0
Feb.	3,294	2,717	146	0.57	33,954	0	0
Mar.	3,517	3,382	243	0.07	33,846	0	0
Apr.	4,293	2,340	616	3.35	35,183	0	0
May	4,252	2,179	769	4.49	36,487	1,489	0
June	4,056	3,959	725	3.34	35,859	5,702	880
July	4,054	6,563	879	5.12	32,471	7,171	3,223
Aug.	3,473	9,001	806	3.79	26,137	8,572	4,108
Sep.	2,576	1,139	374	1.73	27,200	1,027	635
Oct.	3,747	62	223	5.34	30,662	0	0
Nov.	3,351	60	269	0.20	33,684	0	0
Dec.	2,933	2,864	123	0.71	33,630	0	0
TOTAL	42,805	37,032	5,294	28.90	--	23,961	8,846

NOTE -- Acres irrigated 2009: Cambridge Canal 15,964 acres.

TABLE 2
SUMMARY OF 2009 OPERATIONS

KANASKA DIVISION
ALMENA UNIT

	KEITH SEBELIUS LAKE						ALMENA CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To City Of Norton (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	376	54	92	0.12	16,543	23	0	0
Feb.	354	48	115	0.37	16,734	20	0	0
Mar.	344	53	195	0.02	16,830	22	0	0
Apr.	959	53	476	3.33	17,260	23	0	0
May	1,032	69	682	3.81	17,541	38	0	0
June	705	73	652	2.46	17,521	43	218	0
July	694	1,037	757	5.36	16,421	41	1,099	300
Aug.	938	79	696	7.07	16,584	48	234	0
Sep.	204	87	428	2.19	16,273	57	0	0
Oct.	800	53	245	5.92	16,775	22	0	0
Nov.	495	49	225	0.15	16,996	19	0	0
Dec.	552	51	111	1.21	17,386	20	0	0
TOTAL	7,452	1,705	4,674	32.01	--	376	1,551	300

NOTE: Acres irrigated 2009: Almena Canal - 1,100 acres.

BOSTWICK DIVISION
FRANKLIN UNIT

	HARLAN COUNTY LAKE Data from Corps of Engineers					FRANKLIN CANAL		NAPONEE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	7,617	7,553	876	0.14	318,499	0	0	0	0
Feb.	9,352	7,323	947	0.28	319,581	0	0	0	0
Mar.	12,020	9,094	1,437	0.00	321,070	0	0	0	0
Apr.	12,714	0	3,785	1.71	329,999	0	0	0	0
May	12,803	4,263	5,249	4.16	333,290	0	0	0	0
June	10,859	11,437	3,795	2.59	328,917	2,805	517	74	10
July	13,190	23,685	6,163	6.89	312,259	9,618	2,818	421	94
Aug.	7,656	22,364	6,608	3.79	290,943	9,979	3,571	538	115
Sep.	1,904	2,442	4,238	0.43	286,167	844	321	62	27
Oct.	10,721	0	4,415	3.58	292,473	0	0	0	0
Nov.	21,846	4,927	2,958	0.02	306,434	0	0	0	0
Dec.	16,066	992	1,250	0.91	320,258	0	0	0	0
TOTAL	136,747	94,079	41,721	24.50	--	23,246	7,227	1,095	246

NOTE: Acres irrigated 2009: Franklin Canal - 10,920 acres; Naponee Canal - 1,650 acres.

BOSTWICK DIVISION (Continued)
SUPERIOR-COURTLAND UNIT

	FRANKLIN PUMP CANAL		SUPERIOR CANAL			COURTLAND CANAL - ABOVE LOVEWELL NEBRASKA USE		COURTLAND CANAL - ABOVE LOVEWELL KANSAS USE	
Month	Diverted To Canal (AF)	Delivered To Farms (AF)	Diverted To Canal (AF)	Delivered To Farms (AF)	Total Diversion (AF)	Total (AF)	Delivered To Farms (AF)	Diversion To Canal (AF)	Delivered To Farms (AF)
Jan.	0	0	0	0	0	0	0	0	0
Feb.	0	0	0	0	0	0	0	0	0
Mar.	0	0	0	0	0	0	0	0	0
Apr.	0	0	0	0	0	0	0	0	0
May	0	0	0	0	3,168	0	0	0	0
June	214	66	536	17	10,794	98	85	4,905	315
July	371	99	2,550	989	13,676	343	297	6,563	2,611
Aug.	324	85	3,021	1,446	13,376	277	227	6,700	3,002
Sep.	0	0	229	71	5,161	0	0	665	190
Oct.	0	0	0	0	0	0	0	0	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
TOTAL	909	250	6,336	2,523	46,175	718	609	18,833	6,118

NOTE: Acres irrigated 2009: Franklin Pump Canal - 2,090 acres; Superior Canal - 5,848 acres.
Courtland Canal-Nebraska use - 1,946 acres.
Courtland Canal-Kansas use - 10,346 acres.

BOSTWICK DIVISION (Continued)
COURTLAND UNIT
LOVEWELL RESERVOIR

	Est. Flow from White Rock	Inflow from Courtland						COURTLAND (Below)	
Month	Creek (AF)	34.8 (AF)	Total Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	2,391	0	2,391	0	160	0.08	33,669	0	0
Feb.	2,165	0	2,165	11	217	0.36	35,606	0	0
Mar.	1,048	0	1,048	2,374	379	0.06	33,901	0	0
Apr.	1,983	0	1,983	1,052	757	2.91	34,075	0	0
May	5,217	288	5,505	601	1,185	0.64	37,794	728	0
June	2,904	2,571	5,475	5,338	1,332	3.20	36,599	5,850	888
July	2,588	4,169	6,757	13,806	1,295	4.99	28,255	13,772	7,343
Aug.	2,189	3,846	6,035	13,877	992	3.24	19,421	13,710	8,020
Sep.	1,061	2,781	3,842	1,704	498	1.78	21,061	1,571	562
Oct.	975	3,353	4,328	12	367	2.32	25,010	0	0
Nov.	779	600	1,379	12	369	0.48	26,008	0	0
Dec.	698	0	698	12	166	1.27	26,528	0	0
TOTAL	23,998	17,608	41,606	38,798	7,717	21.33	--	35,631	16,813

NOTE: Acres irrigated 2009: Courtland Canal below Lovewell 26,017 acres.

TABLE 2
SUMMARY OF 2009 OPERATIONS

SOLOMON DIVISION
KIRWIN UNIT

	KIRWIN RESERVOIR					KIRWIN CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release To Canal (AF)	Delivered To Farms (AF)
Jan.	3,428	0	303	0.07	91,550	0	0
Feb.	3,018	0	420	0.37	94,148	0	0
Mar.	2,738	0	697	0.00	96,189	0	0
Apr.	4,225	0	1,752	2.25	98,662	0	0
May	5,281	0	1,889	4.34	102,054	0	0
June	27,476	16,001	2,513	5.92	111,016	3,955	367
July	10,475	18,627	2,772	4.40	100,092	7,953	2,900
Aug.	10,012	6,556	2,787	4.01	100,761	6,421	3,420
Sep.	2,334	0	1,456	1.02	101,639	0	0
Oct.	4,028	0	1,047	3.67	104,620	0	0
Nov.	2,920	4,860	834	0.50	101,846	0	0
Dec.	2,270	5,058	396	1.31	98,662	0	0
TOTAL	78,204	51,101	16,866	27.86	--	18,329	6,687

NOTE: Acres irrigated 2009: Kirwin Canal - 7,103 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT

	WEBSTER RESERVOIR					OSBORNE CANAL	
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Diversions To Canal (AF)	Delivered To Farms (AF)
Jan.	3,971	0	263	0.09	72,593	0	0
Feb.	3,424	0	311	0.11	75,706	0	0
Mar.	2,944	0	557	0.00	78,093	0	0
Apr.	5,783	0	1,194	2.79	82,682	582	0
May	4,632	918	1,681	1.56	84,715	1,743	0
June	19,324	15,586	1,816	4.98	86,637	3,095	81
July	5,572	6,113	2,222	4.86	83,874	4,547	1,806
Aug.	3,908	4,987	2,115	3.25	80,680	4,322	2,342
Sep.	1,529	0	1,100	1.24	81,109	0	0
Oct.	3,098	0	732	2.69	83,475	0	0
Nov	3,984	4,959	646	0.65	81,854	0	0
Dec.	3,131	6,149	322	1.28	78,514	0	0
TOTAL	61,300	38,712	12,959	23.50	--	14,289	4,229

NOTE: Acres irrigated 2009: Osborne Canal - 3,570 acres.

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT

	WACONDA LAKE					OUTFLOW TO RIVER				
						City of Beloit		Irrig.District	Other	Release To
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Storage Release (AF)	Quality Bypass (AF)	Storage Release (AF)	Controlled Releases (AF)	Mitchell Co. RWD No. 2 (AF)
Jan.	19,597	23,866	778	0.02	201,373	0	0	0	23,806	60
Feb.	15,355	14,536	938	0.15	201,254	0	0	0	14,487	49
Mar.	13,467	6,640	1,661	0.03	206,420	0	0	0	6,583	57
Apr.	13,725	3,245	4,475	1.99	212,425	0	0	0	3,180	65
May	13,995	3,607	5,905	0.97	216,908	0	0	0	3,545	62
June	50,947	43,866	6,288	5.28	217,701	0	0	157	43,653	56
July	29,147	20,115	6,935	4.04	219,798	0	0	770	19,283	62
Aug.	16,149	9,543	6,732	3.34	219,672	0	0	1,226	8,257	60
Sep.	6,882	3,677	3,961	2.10	218,916	0	16	0	3,614	47
Oct.	7,316	662	2,605	2.36	222,965	0	615	0	0	47
Nov.	16,365	11,545	2,011	0.29	225,774	0	40	0	11,454	51
Dec.	19,753	30,802	935	1.48	213,790	0	0	0	30,744	58
TOTAL	222,698	172,104	43,224	22.05	--	0	671	2,153	168,606	674

NOTE: Acres irrigated 2009: Glen Elder District 6,318 acres.

SMOKY HILL DIVISION
ELLIS UNIT

	CEDAR BLUFF RESERVOIR							
Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	Release to City of Russell (AF)	Release To Fish Hatchery (AF)	Release to Kansas Water Office (AF)
Jan.	0	0	468	0.11	83,074	0	0	0
Feb.	17	0	367	0.06	82,724	0	0	0
Mar.	0	0	658	0.03	82,066	0	0	0
Apr.	2,880	0	1,286	4.47	83,660	0	0	0
May	2,049	0	2,049	2.30	83,660	0	0	0
June	1,005	1	1,949	1.92	82,715	0	1	0
July	175	2	2,163	1.93	80,725	0	2	0
Aug.	1,366	0	2,350	3.70	79,741	0	0	0
Sep.	3,523	0	1,121	3.55	82,143	0	0	0
Oct.	1,284	0	819	3.01	82,608	0	0	0
Nov.	1,409	0	670	1.29	83,347	0	0	0
Dec.	683	0	331	0.85	83,699	0	0	0
TOTAL	14,391	3	14,231	23.22	--	0	3	0

TABLE 3

ACRES IRRIGATED IN 2009

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2009
Mirage Flats Irrigation District		
Mirage Flats Canal	11,662	5,755
Ainsworth Irrigation District		
Ainsworth Canal	35,000	34,582
Twin Loups Irrigation District		
Above Davis Creek	34,053	33,999
Below Davis Creek	21,063	20,922
Total Twin Loups Irrigation District	55,116	54,921
Frenchman Valley Irrigation District		
Culbertson Canal	9,292	874
H & RW Irrigation District		
Culbertson Extension Canal	11,915	0
Frenchman-Cambridge Irrigation District		
Meeker-Driftwood Canal	16,855	12,714
Red Willow Canal	4,797	2,962
Bartley Canal	6,353	5,865
Cambridge Canal	17,664	15,964
Total Frenchman-Cambridge Irrigation District	45,669	37,505
Almena Irrigation District		
Almena Canal	5,764	1,100
Bostwick Irrigation District in Nebraska		
Franklin Canal	10,920	10,920
Naponee Canal	1,650	1,650
Franklin Pump Canal	2,090	2,090
Superior Canal	5,848	5,848
Courtland Canal (Nebraska)	1,946	1,946
Total Bostwick Irrigation Dist. in Nebraska	22,454	22,454
Kansas-Bostwick Irrigation District		
Courtland Canal above Lovewell	13,378	10,346
Courtland Canal below Lovewell	29,122	26,017
Total Kansas-Bostwick Irrigation District	42,500	36,363
Kirwin Irrigation District		
Kirwin Canal	11,465	7,103
Webster Irrigation District		
Osborne Canal	8,537	3,570
Glen Elder Irrigation District	10,370	6,318
TOTAL PROJECT USES	269,744	210,545
Non-Project Uses		
Hale Ditch	700	0
TOTAL PROJECT AND NON-PROJECT	270,444	210,545

TABLE 5

FLOOD DAMAGES PREVENTED BY NEBRASKA-KANSAS PROJECTS RESERVOIRS

RESERVOIR	DURING FY 2009	PRIOR TO 2009	ACCUMULATED TOTAL
BONNY	$3,400	$2,802,300	$2,805,700
ENDERS	$1,300	$3,564,300	$3,565,600
SWANSON	$4,055,000	$23,046,900	$27,101,900
HUGH BUTLER	$1,300	$3,016,600	$3,017,900
HARRY STRUNK	$4,900	$10,190,700	$10,195,600
KEITH SEBELIUS	$1,000	$3,989,700	$3,990,700
HARLAN COUNTY	$4,131,500	$186,960,600	$191,092,100
LOVEWELL	$163,200	$149,665,300	$149,828,500
KIRWIN	$27,400	$87,018,000	$87,045,400
WEBSTER	$15,500	$110,367,800	$110,383,300
WACONDA	$4,208,700	$1,220,804,400	$1,225,013,100
CEDAR BLUFF	$1,772,000	$130,730,400	$132,502,400
TOTAL	$14,385,200	$1,932,157,000	$1,946,542,200

Estimates of damages prevented are received from the Army Corps of Engineer's Kansas City District Office.
The Accumulated Totals date from 1951 through 2009. Cumulative totals are revised by the Corps of Engineers in some cases to reflect data not previously included in the reporting and may not match previous cumulative totals.

Construction Cost of storage dams was $208,954,130.
The reservoirs upstream of Harlan County Lake did not receive benefits for damages prevented from 1972 to 1993.

TABLE 6
WATER DIVERTED IN 2009

(Units - Acre-Feet)

Irrigation District and Canal	2009 Irrigation Operations From	To	10-Year Average Diversion (1999-2008)	2009 Diversion
Mirage Flats Irrigation District				
Mirage Flats Canal	7/15	8/29	10,416	8,262
Ainsworth Irrigation District				
Ainsworth Canal	5/10	9/25	77,378	61,333
Twin Loups Irrigation District				
Above Davis Creek	4/20	9/21	44,557	35,419
Below Davis Creek	5/5	9/25	41,095	41,996
Total Twin Loups Irrigation District			85,652	77,415
Frenchman Valley Irrigation District				
Culbertson Canal	4/21	9/9	5,660	9,624
H & RW Irrigation District				
Culbertson Extension Canal	Did not run.		3,016	0
Frenchman-Cambridge Irrigation District				
Meeker-Driftwood Canal	6/8	8/28	7,844	23,274
Red Willow Canal	6/30	8/28	2,678	5,166
Bartley Canal	4/13	8/29	3,115	10,711
Cambridge Canal	5/20	9/4	18,756	23,961
Total Frenchman-Cambridge Irrigation District			32,393	63,112
Almena Irrigation District				
Almena Canal	6/3	8/3	2,605	1,551
Bostwick Irrigation District in Nebraska				
Franklin Canal	6/23	9/4	15,537	23,246
Naponee Canal	6/29	9/4	1,438	1,095
Franklin Pump Canal	6/24	8/21	1,585	909
Superior Canal	6/23	9/4	8,066	6,336
Courtland Canal (Nebraska)	6/23	9/4	1,187	718
Total Bostwick Irrigation District in Nebraska			27,813	32,304
Kansas-Bostwick Irrigation District				
Courtland Canal above Lovewell	6/10	9/11	17,755	18,833
Courtland Canal below Lovewell	5/18	9/12	39,074	35,631
Total Kansas-Bostwick Irrigation District			56,829	54,464
Kirwin Irrigation District				
Kirwin Canal	6/10	8/26	12,902	18,329
Webster Irrigation District				
Osborne Canal	4/14	8/26	7,328	14,289
Glen Elder Irrigation District	5/18	8/25	7,289	2,153
TOTAL			329,281	342,836

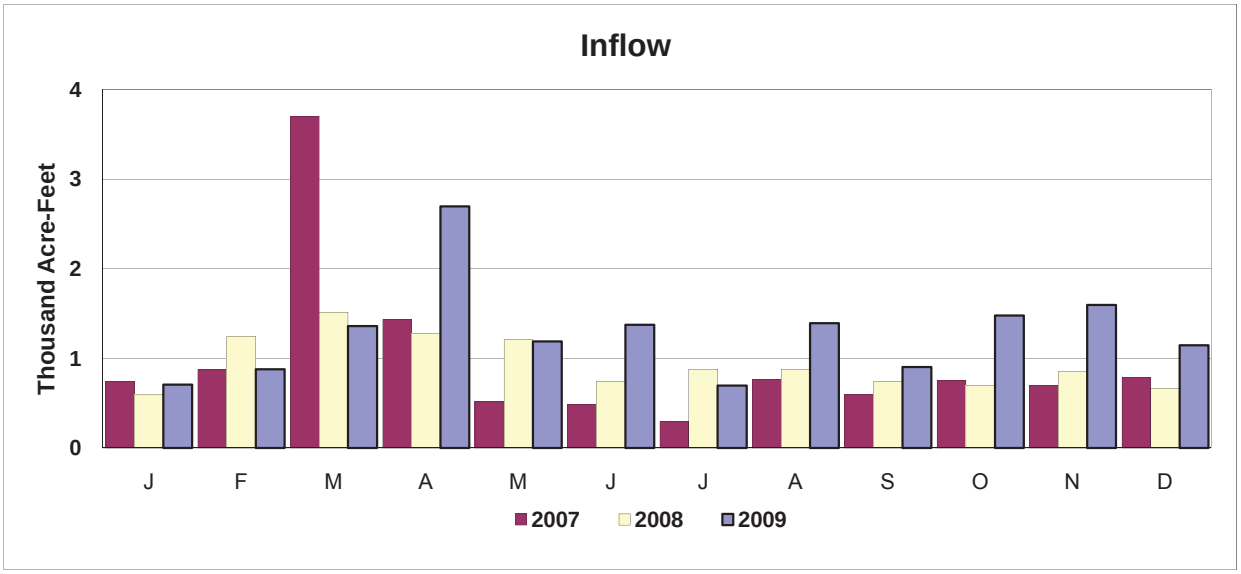
TABLE 7
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2009

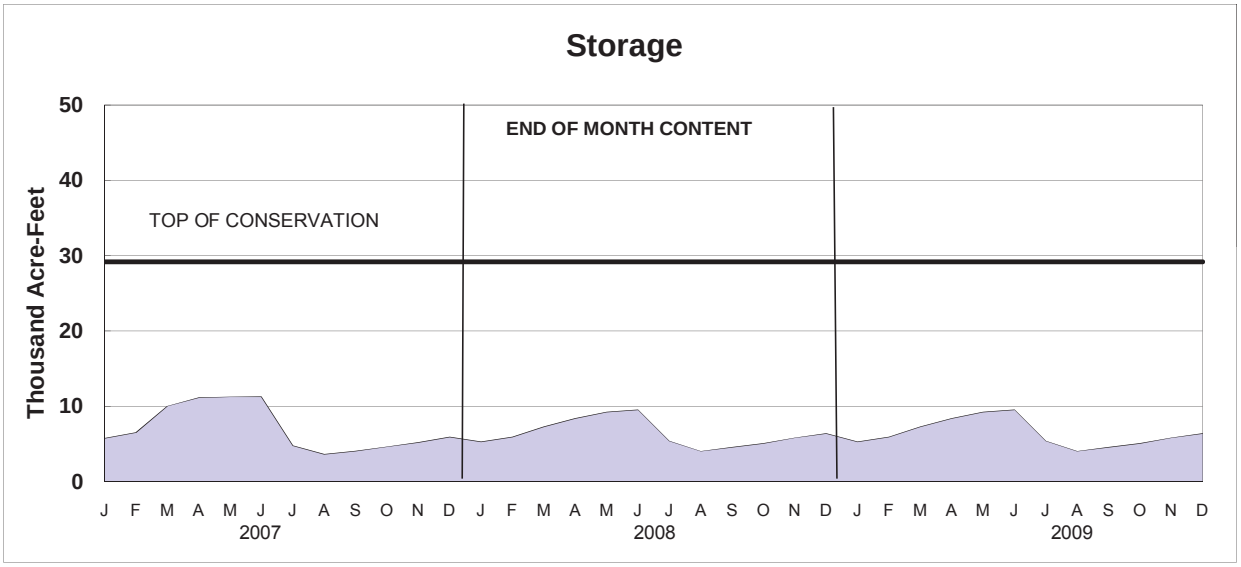
Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-08 AF	Storage 12-31-09 AF	Gain or Loss AF	Maximum Content AF	Storage Date	Minimum Content AF	Storage Date	Total Inflow AF
Box Butte	19.98	118	6,375	10,213	3,838	13,522	JUL 14	6,076	AUG 28	15,432
Merritt	28.14	137	61,100	61,100	0	67,602	JUN 14	48,661	SEP 19	182,155
Calamus	26.14	108	109,027	107,417	-1,610	127,965	APR 19	82,324	SEP 20	278,685
Davis Creek	25.20	102	10,126	8,922	-1,204	28,956	JUL 7	8,734	SEP 24	47,962
Bonny	26.56	155	9,276	10,220	944	11,860	MAY 4	9,293	JAN 1	11,698
Enders	29.69	156	15,368	15,662	294	16,200	JUN 18	15,017	OCT 8	6,577
Swanson	27.25	136	51,989	55,314	3,325	69,029	JUN 17	46,987	OCT 13	37,749
Hugh Butler	23.96	122	26,451	6,357	-20,094	29,136	JUN 26	6,327	DEC 23	13,279
Harry Strunk	28.90	140	33,151	33,630	479	36,852	JUN 17	25,375	SEP 4	42,805
Keith Sebelius	32.01	131	16,313	17,386	1,073	17,682	JUN 16	16,152	OCT 5	7,452
Harlan County	24.50	108	319,311	320,258	947	337,577	JUN 21	285,161	OCT 5	136,747
Lovewell	21.33	78	31,438	26,528	-4,910	38,354	JUN 5	18,853	SEP 4	41,606
Kirwin	27.86	118	88,425	98,662	10,237	117,565	JUN 17	88,615	JAN 1	78,204
Webster	23.50	99	68,885	78,514	9,629	93,666	JUN 17	69,063	JAN 1	61,300
Waconda	22.05	86	206,420	213,790	7,370	229,378	JUN 18	200,541	FEB 23	222,698
Cedar Bluff	23.22	111	83,542	83,699	157	83,895	MAY 8	79,327	SEP 7	14,391

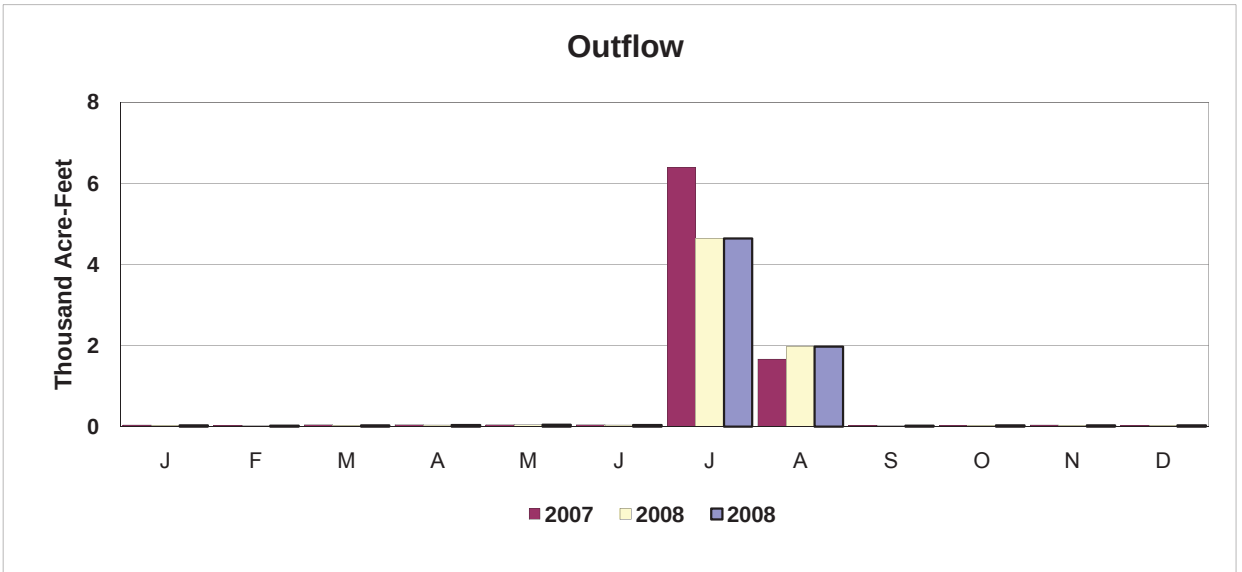
EXHIBIT 1A

BOX BUTTE RESERVOIR

ACTUAL OPERATION



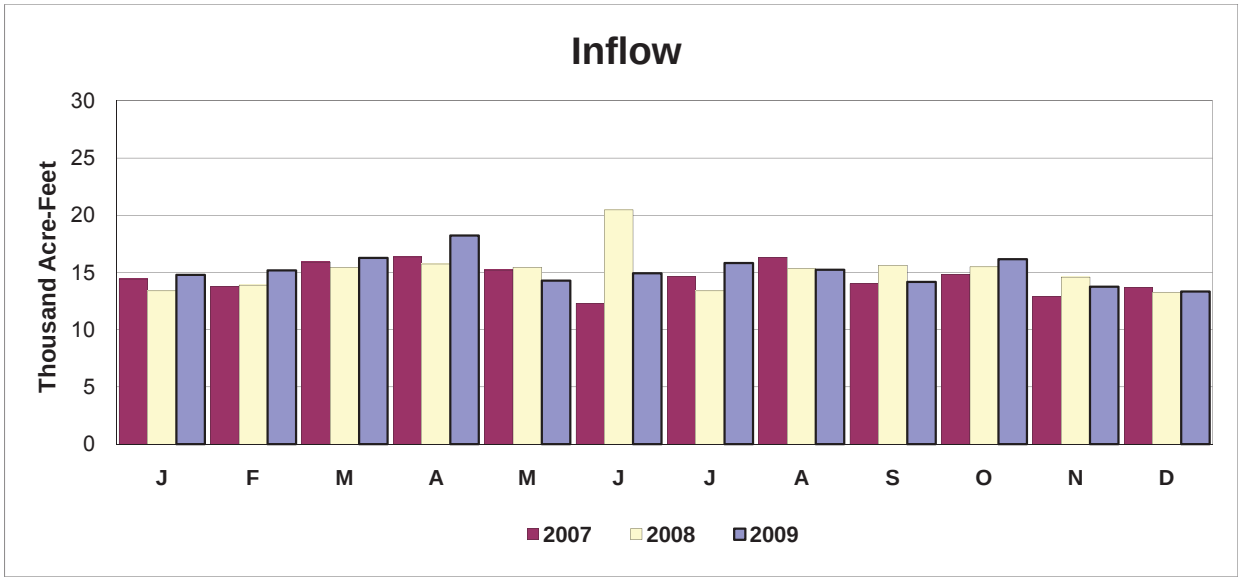


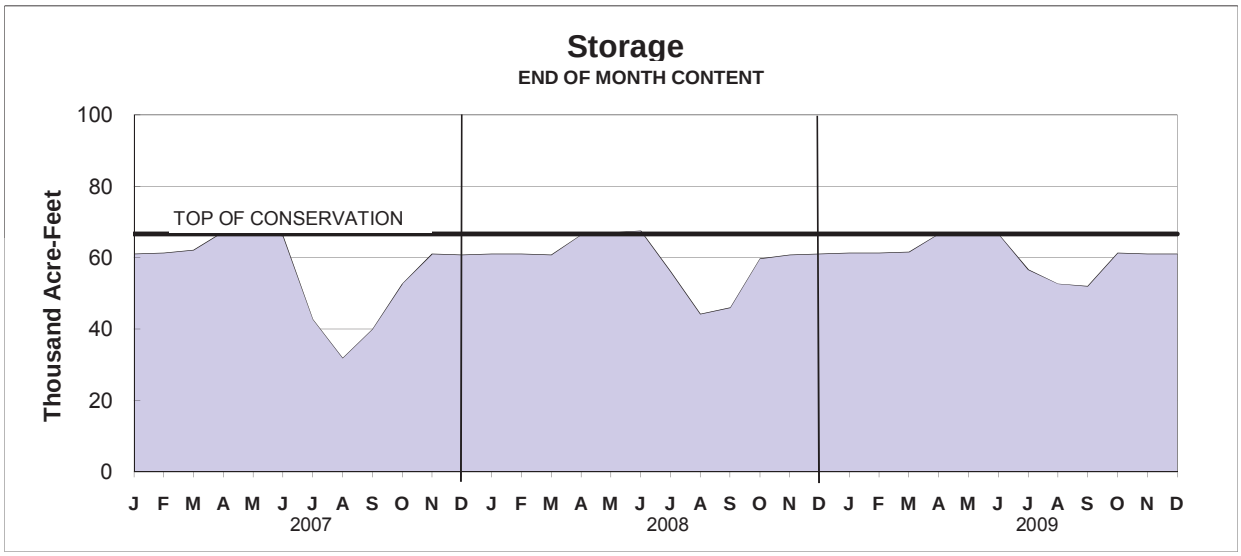


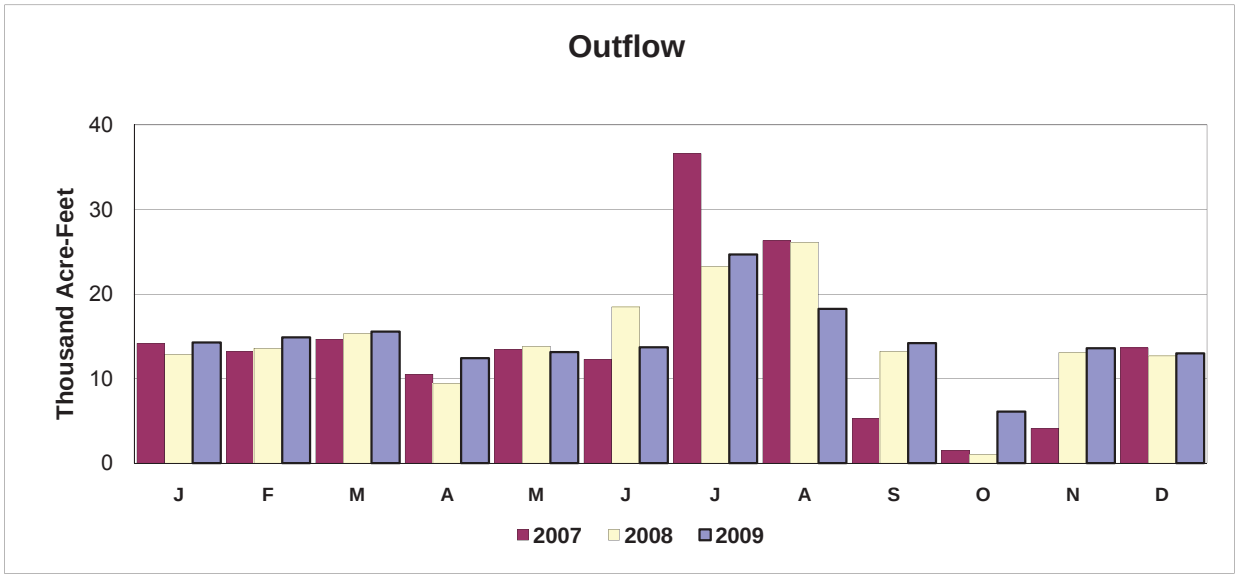
KS003324

EXHIBIT 2A

MERRITT RESERVOIR
ACTUAL OPERATION





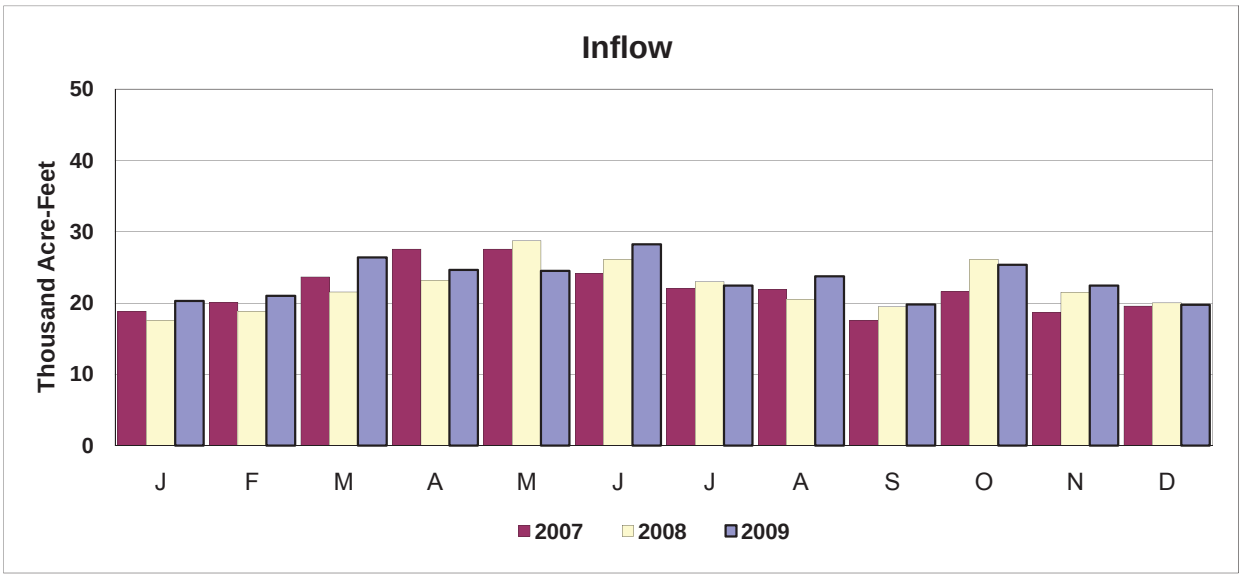


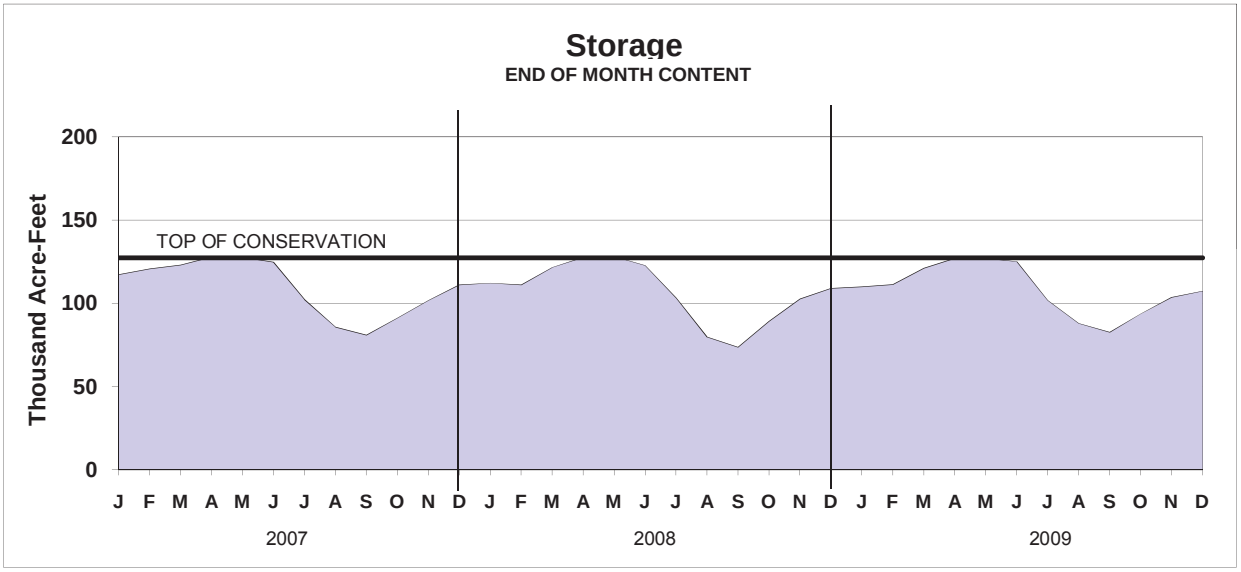
KS003325

EXHIBIT 3A

CALAMUS RESERVOIR

ACTUAL OPERATION





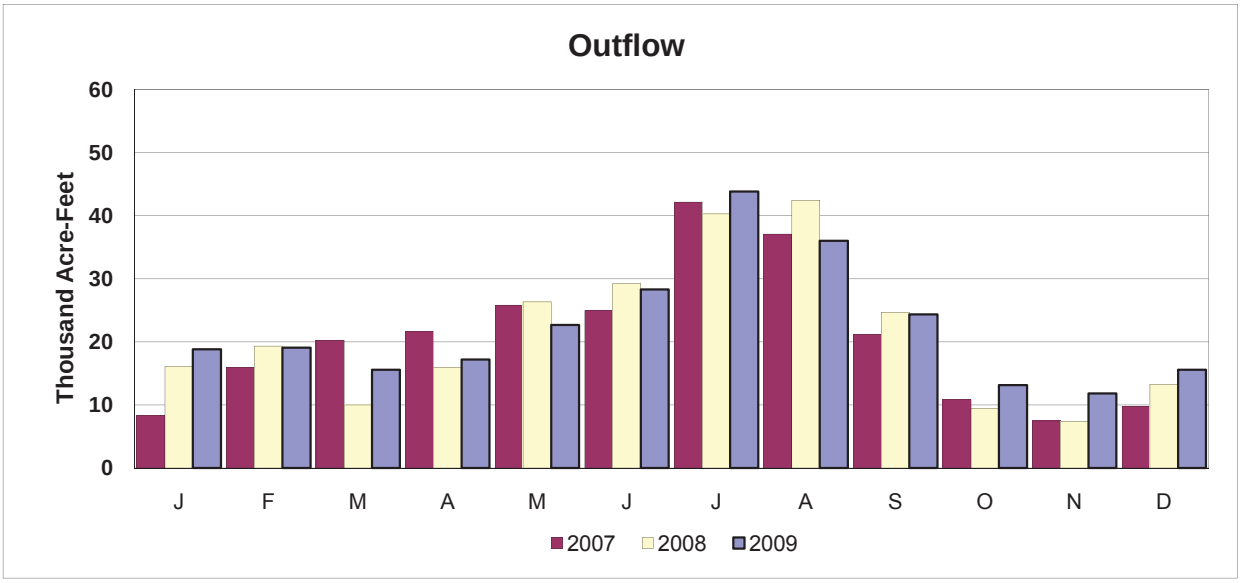
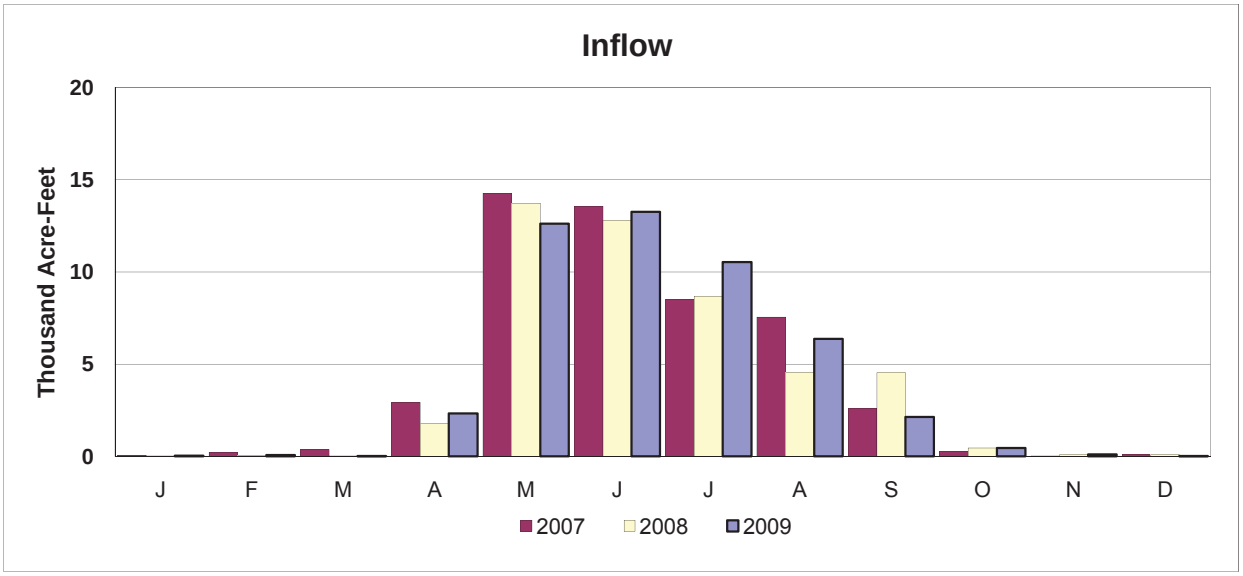
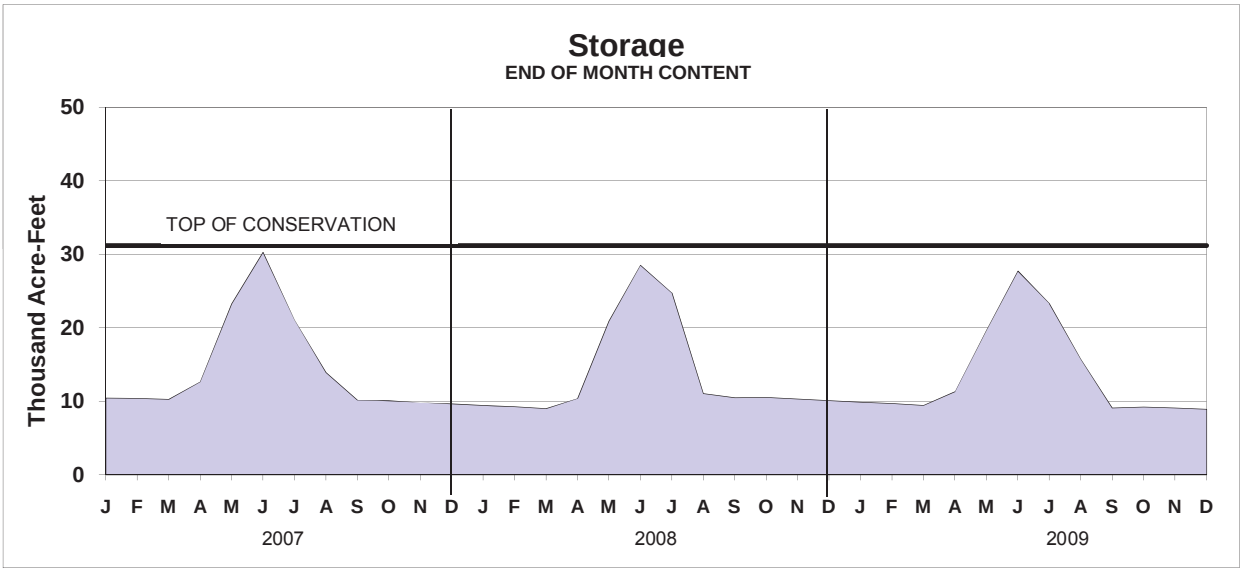


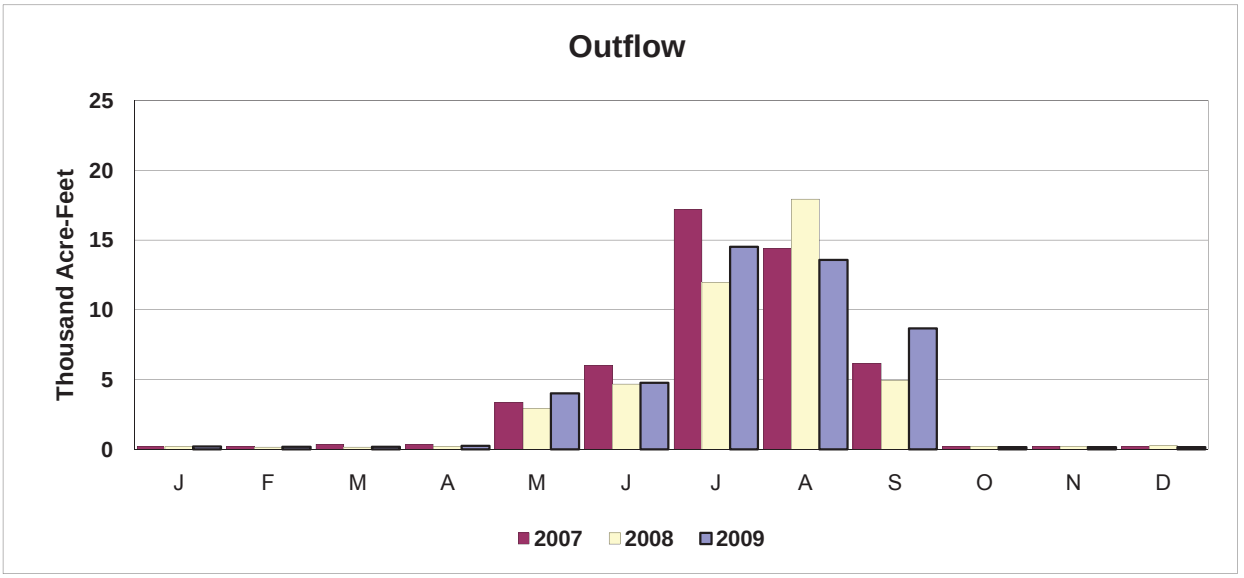
EXHIBIT 4A

DAVIS CREEK RESERVOIR

ACTUAL OPERATION





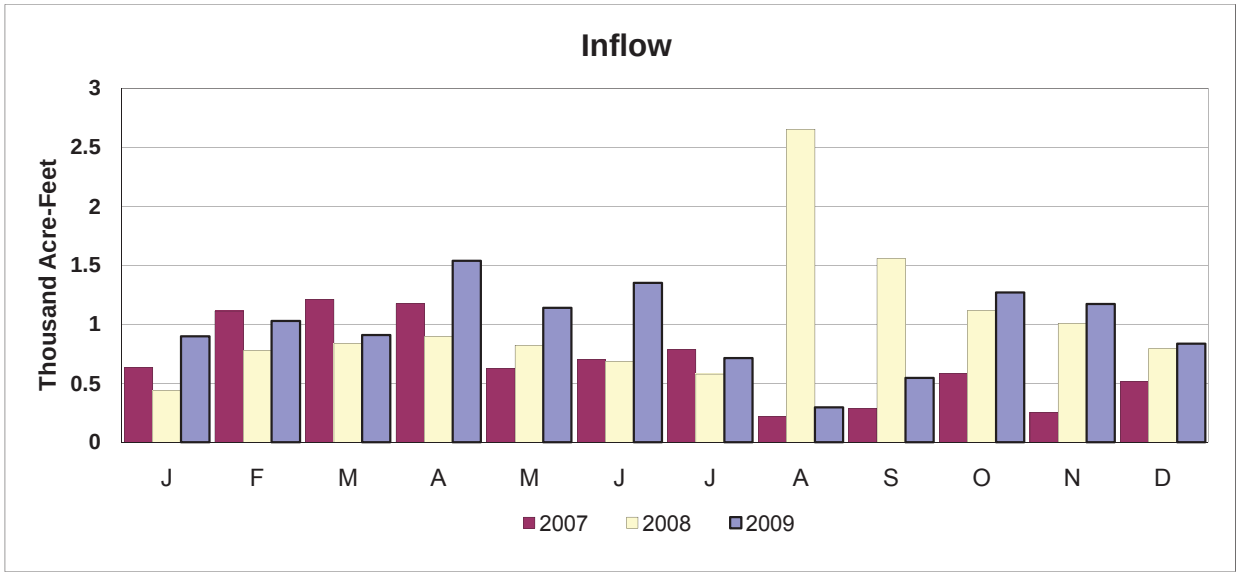


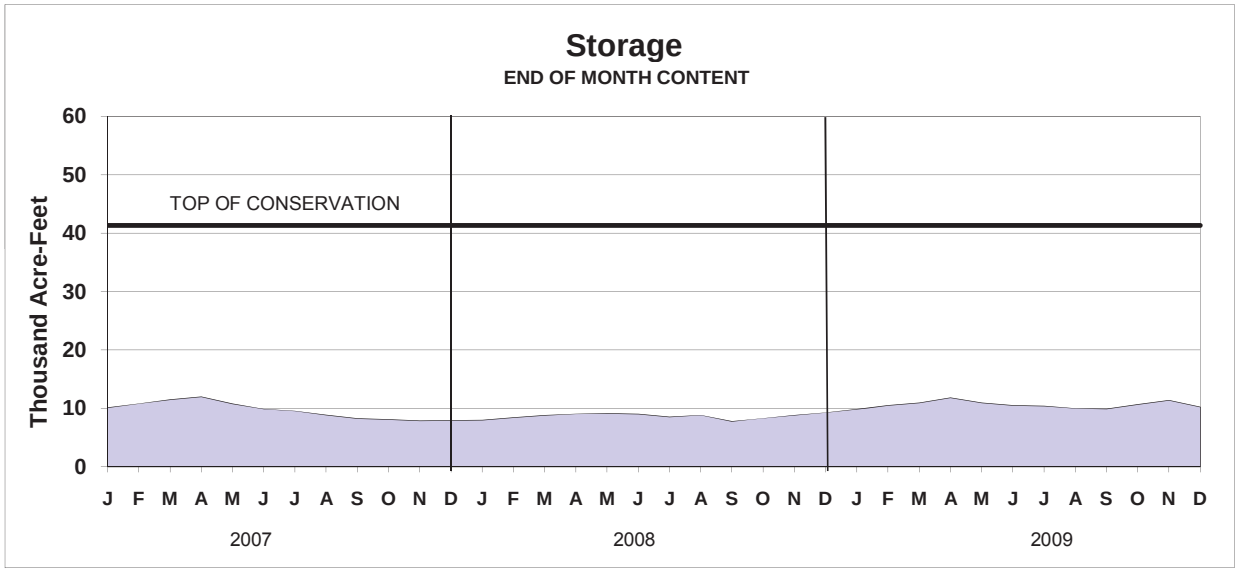
KS003327

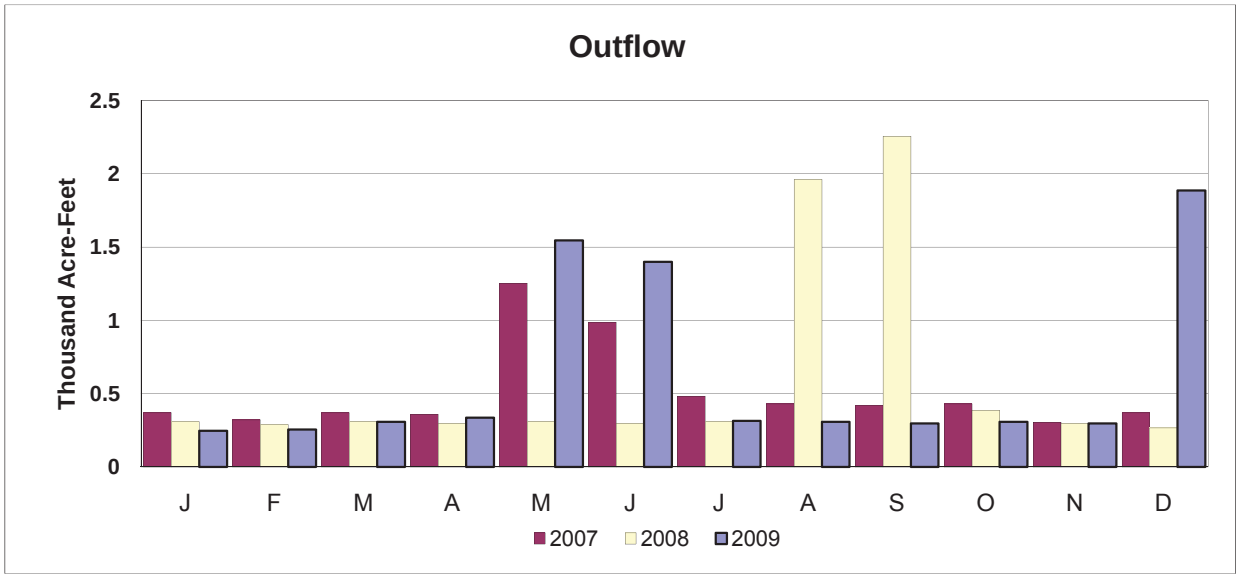
EXHIBIT 5A

BONNY RESERVOIR

ACTUAL OPERATION





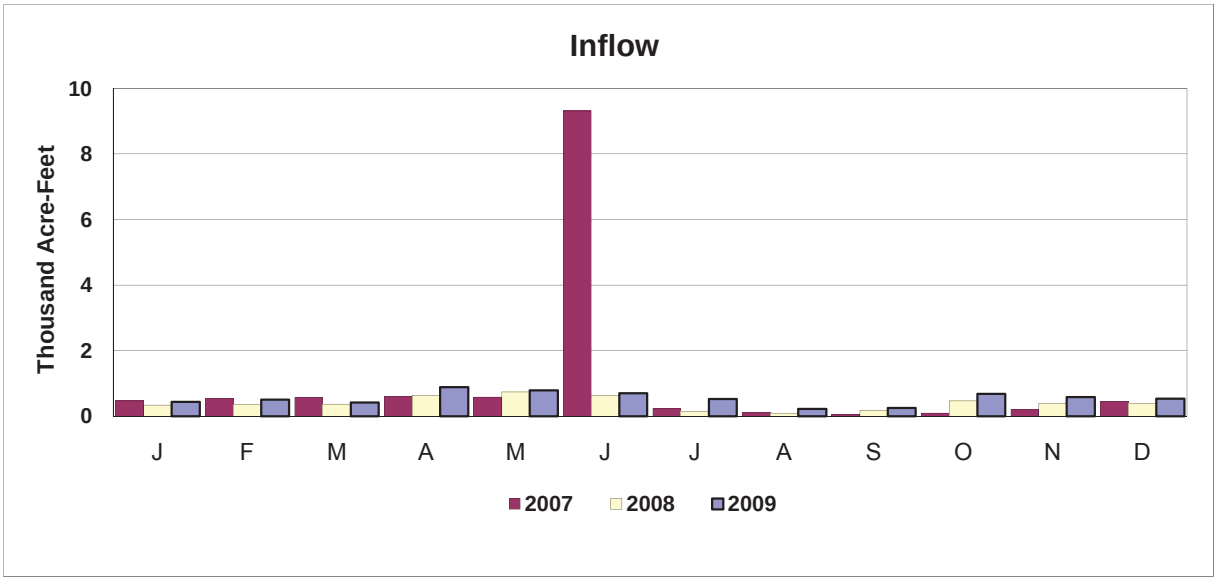


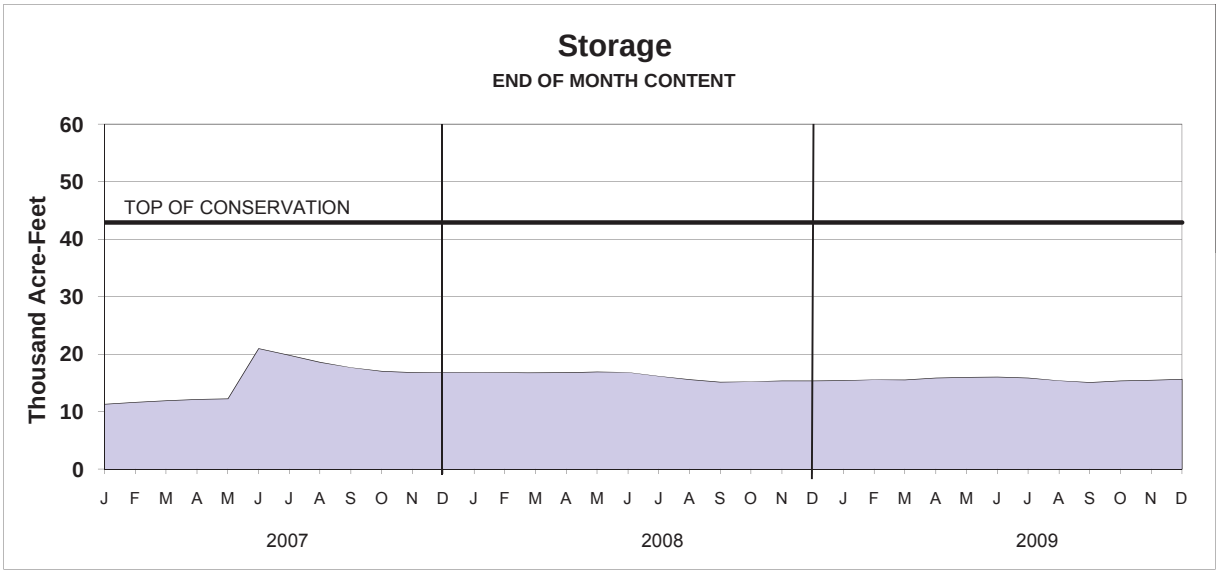
KS003328

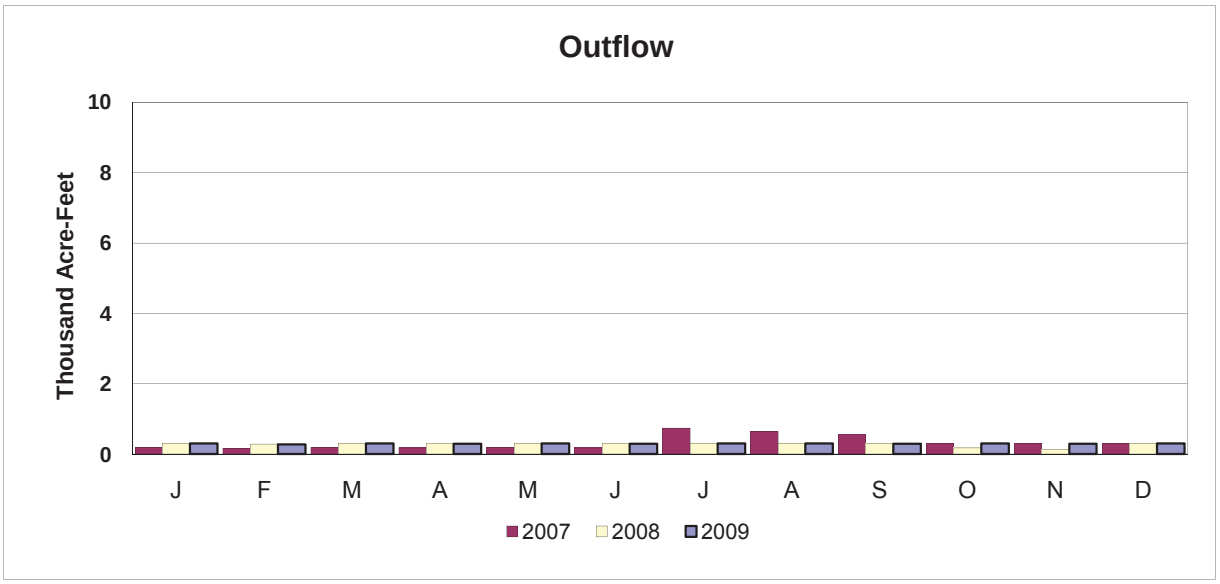
EXHIBIT 6A

ENDERS RESERVOIR

ACTUAL OPERATION



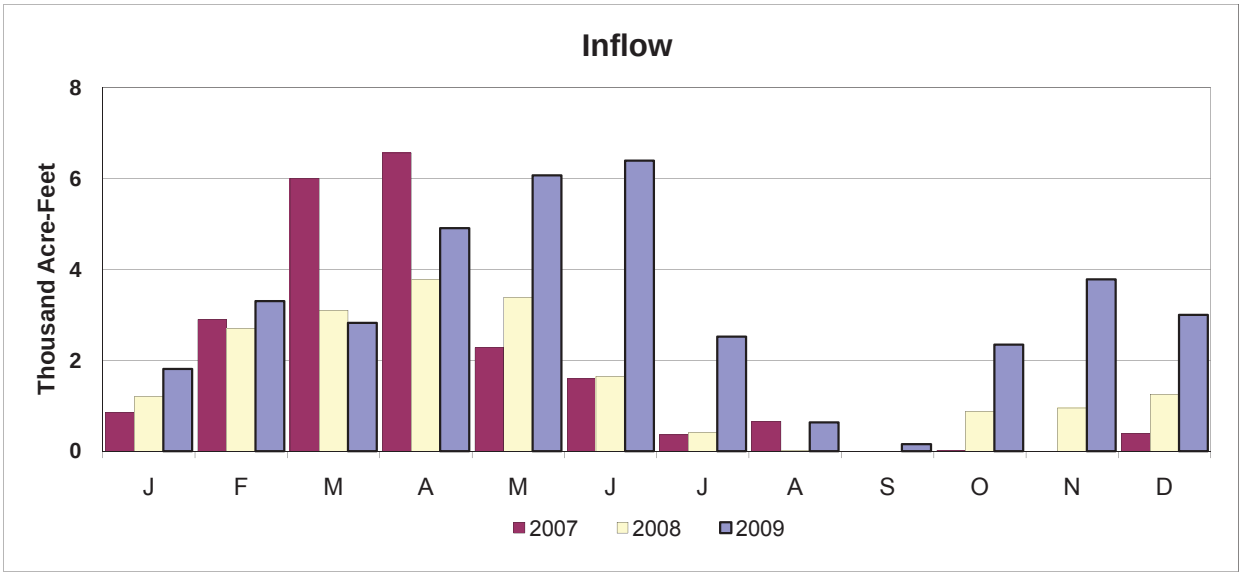


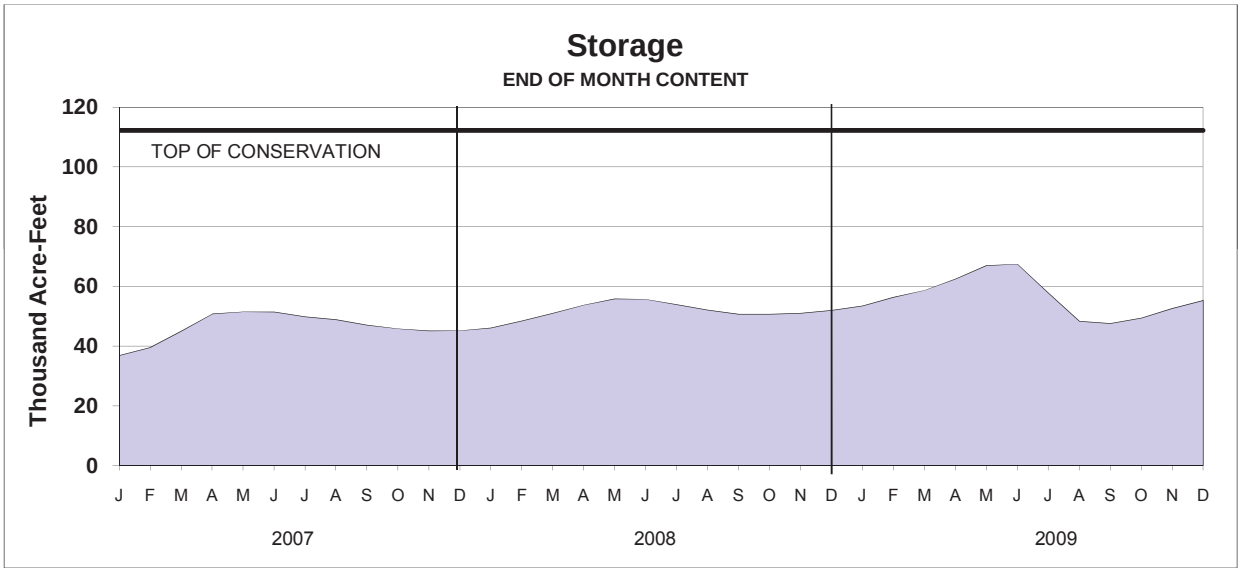


KS003329

EXHIBIT 7A

SWANSON LAKE
ACTUAL OPERATION





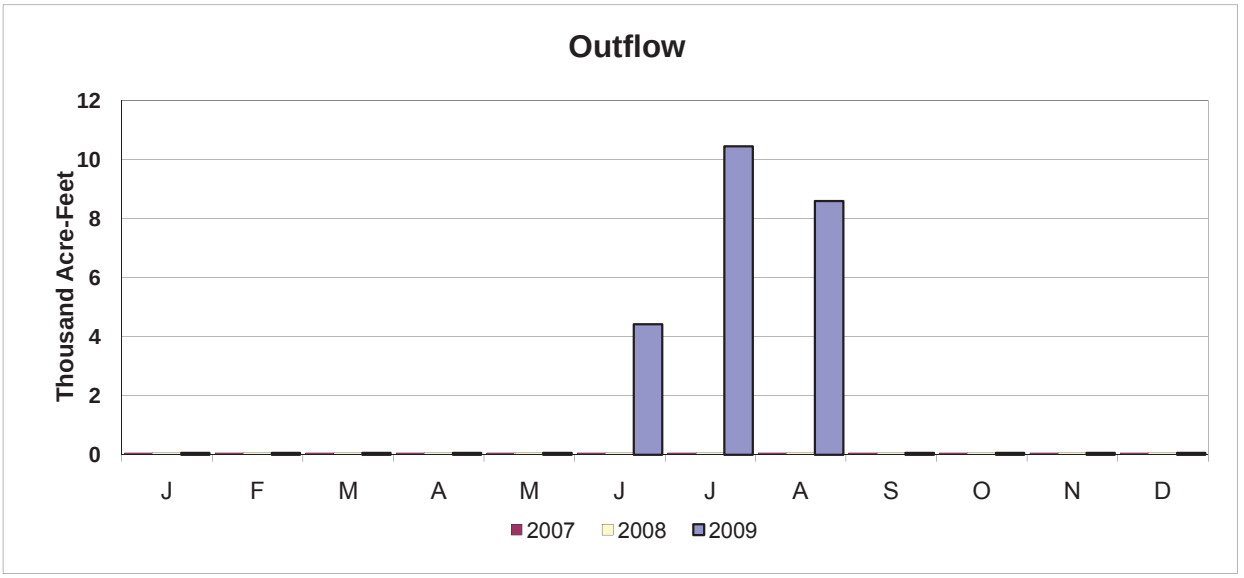
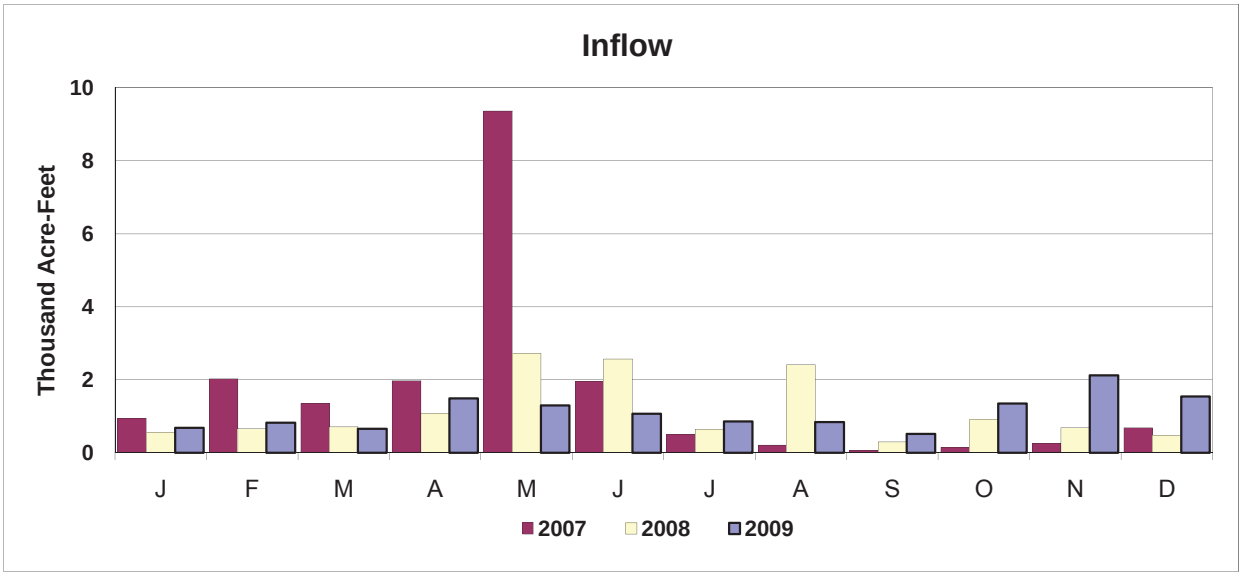
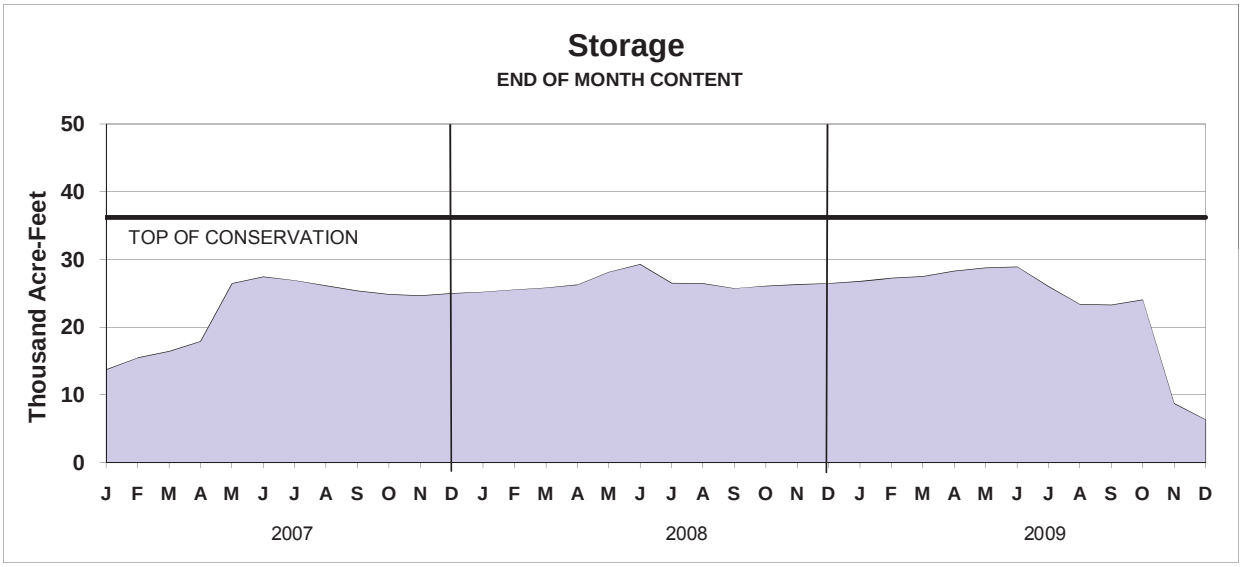


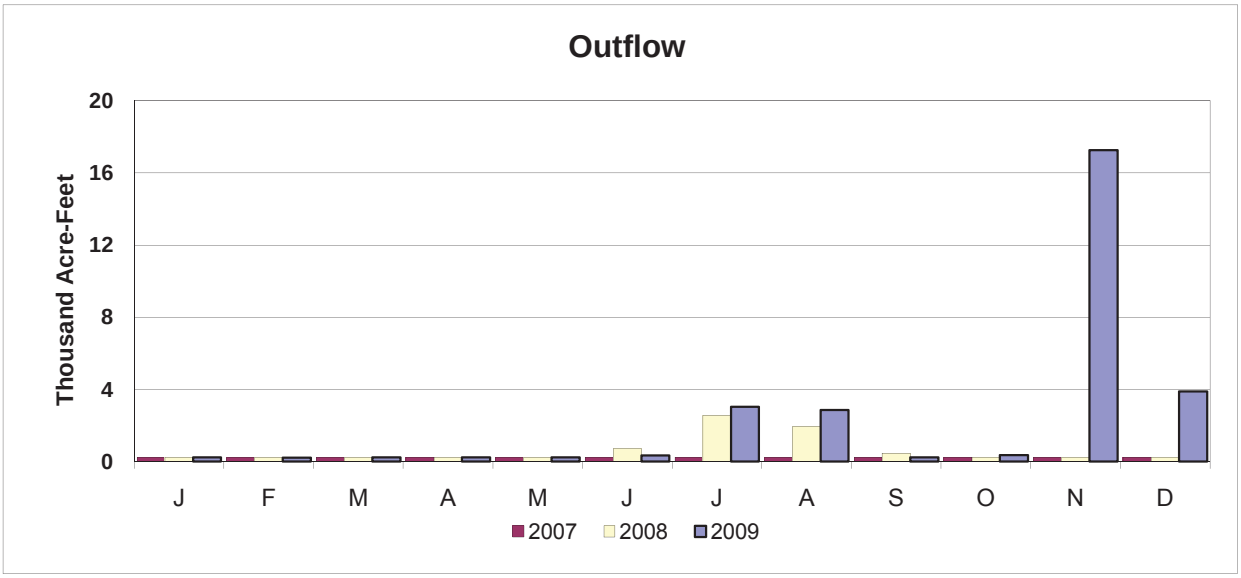
EXHIBIT 8A

HUGH BUTLER LAKE

ACTUAL OPERATION



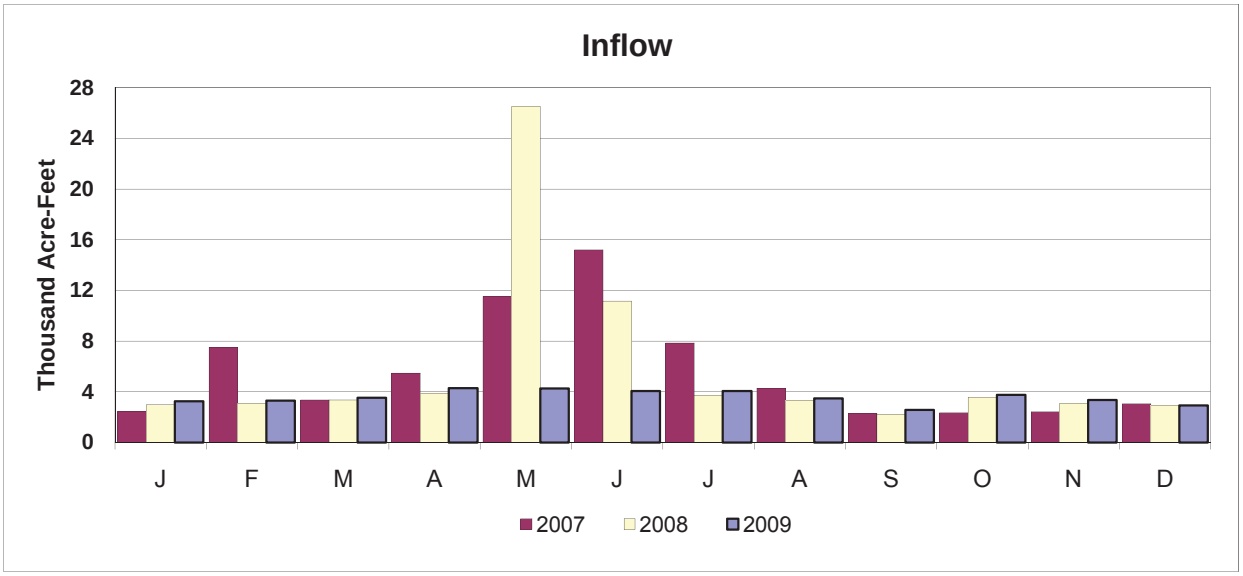


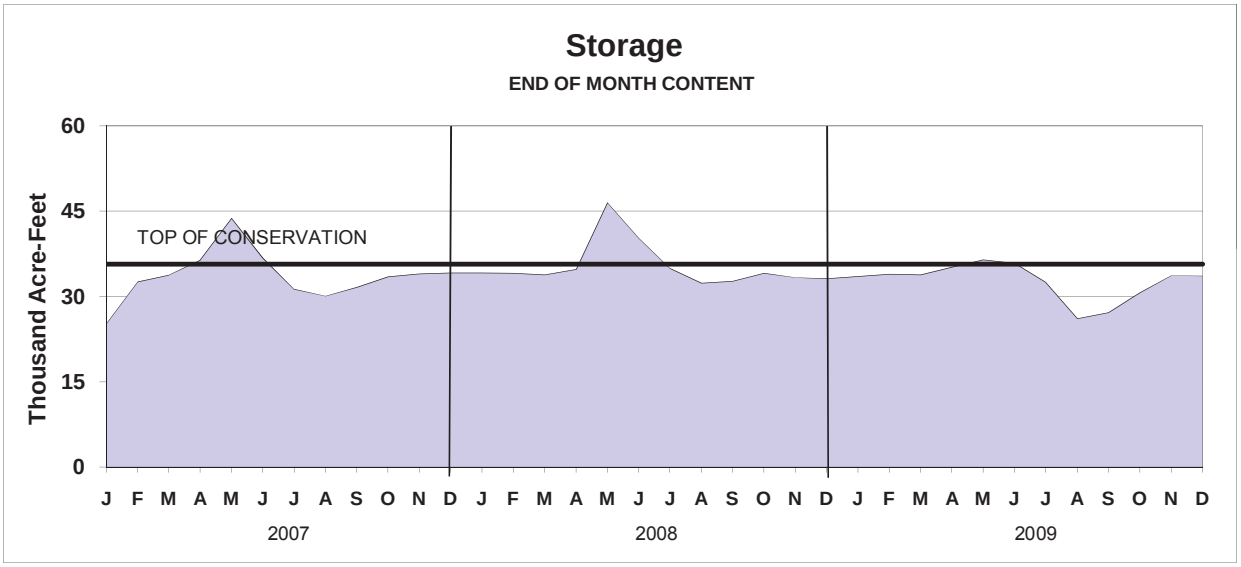


KS003331

HARRY STRUNK LAKE

ACTUAL OPERATION





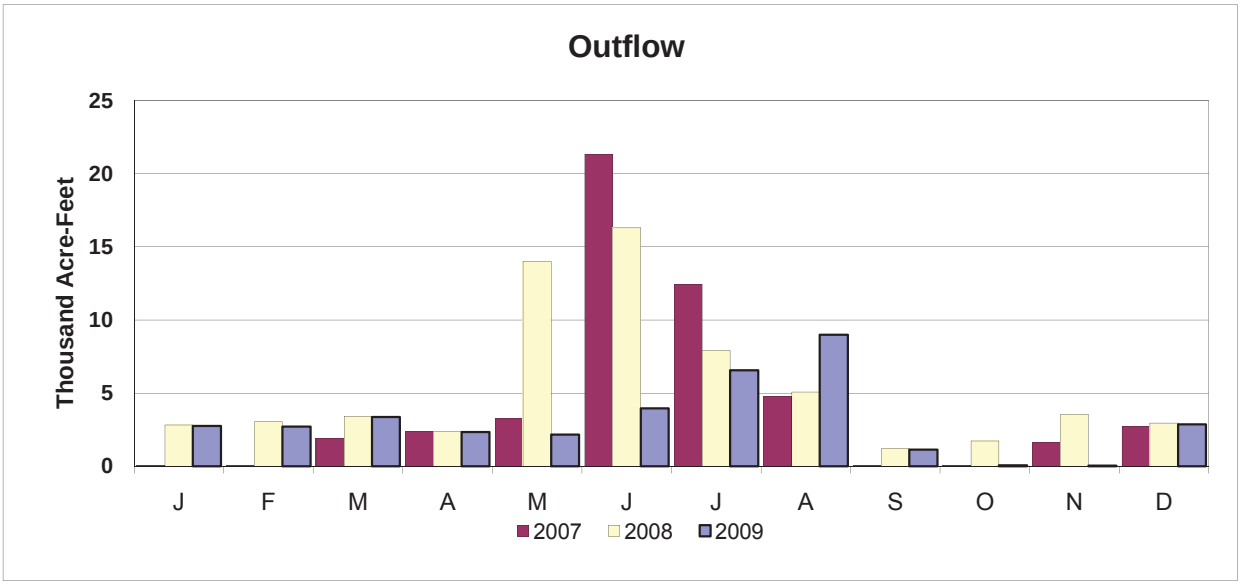
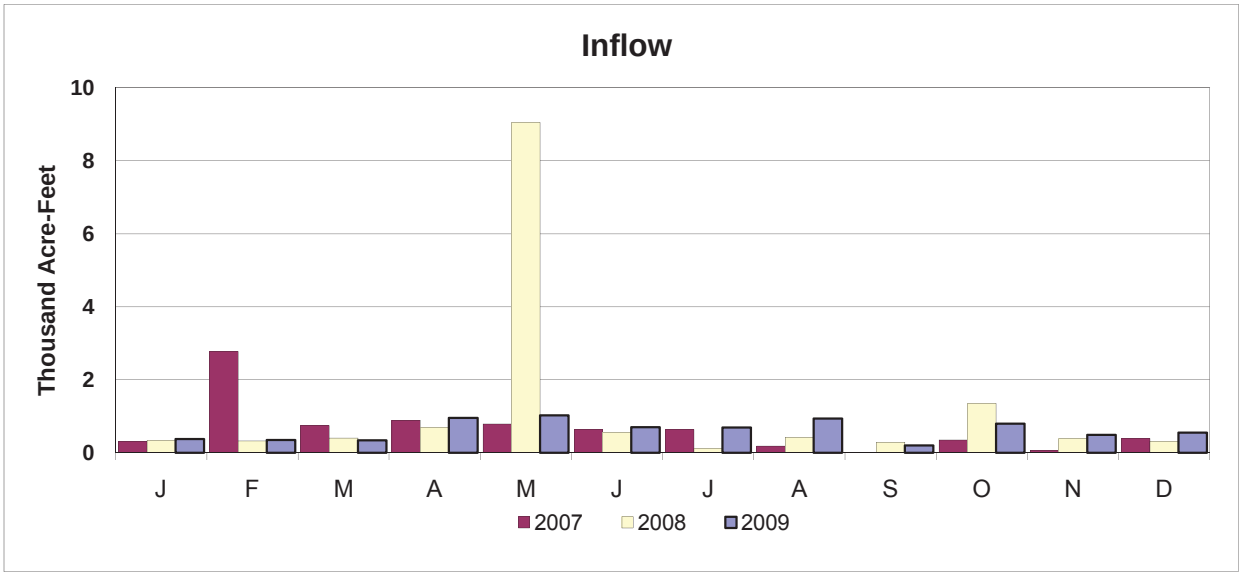
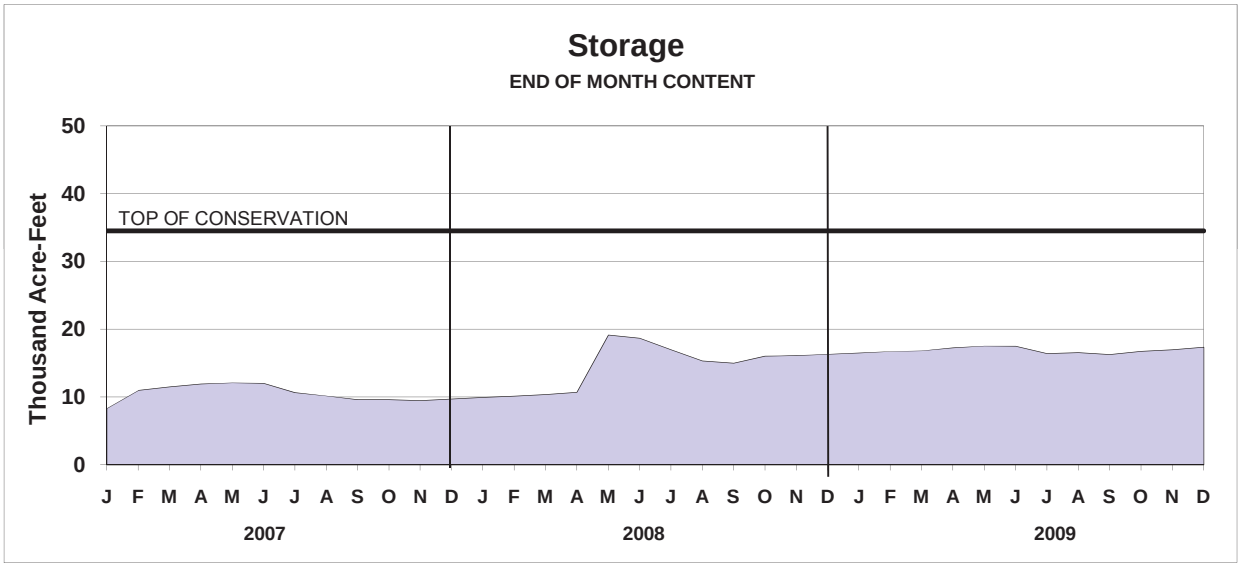


EXHIBIT 10A

KEITH SEBELIUS LAKE

ACTUAL OPERATION





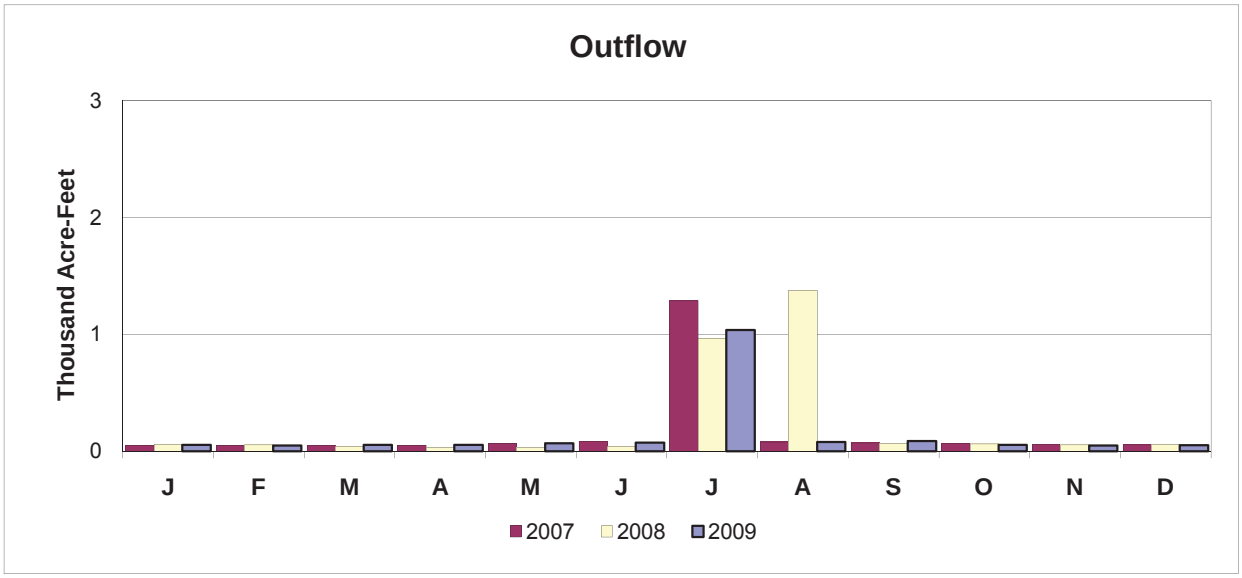
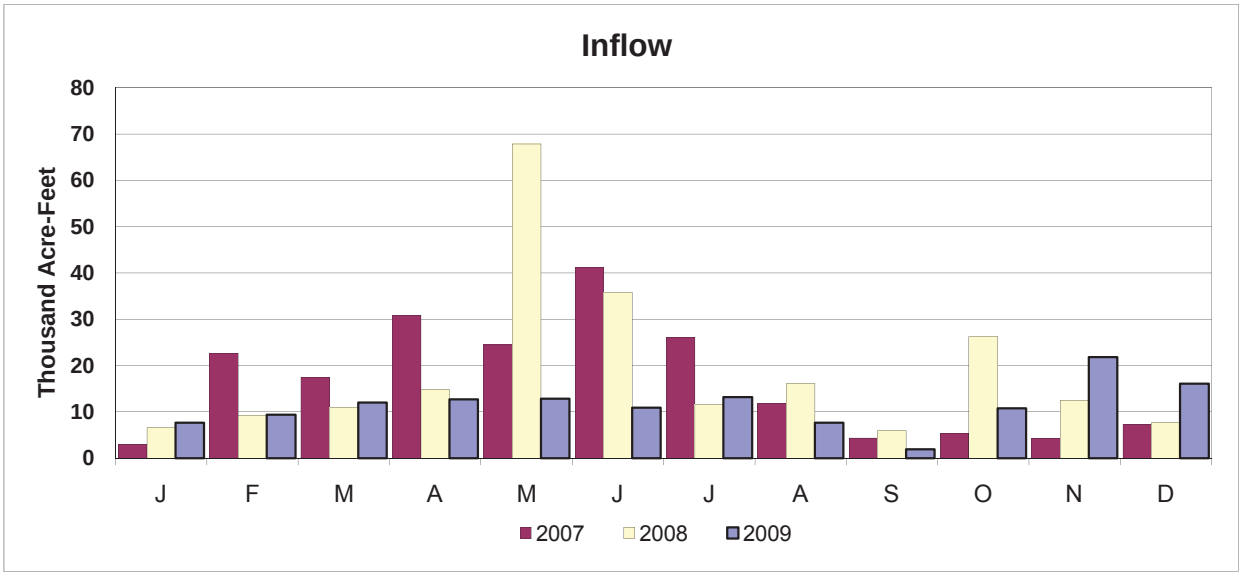
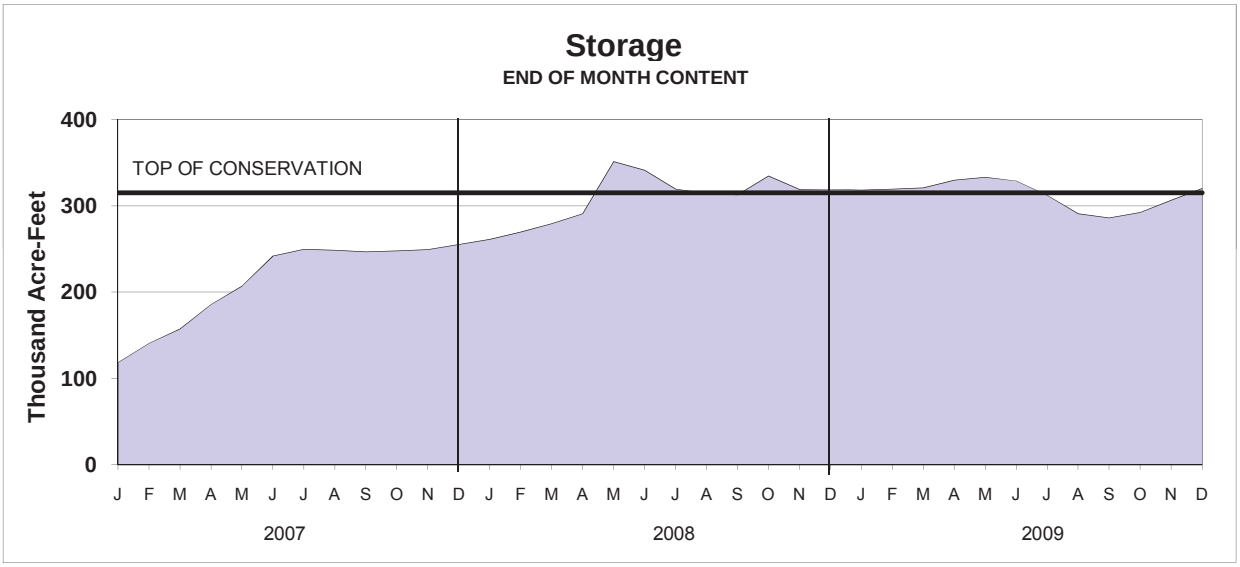


EXHIBIT 11A

HARLAN COUNTY LAKE

ACTUAL OPERATION





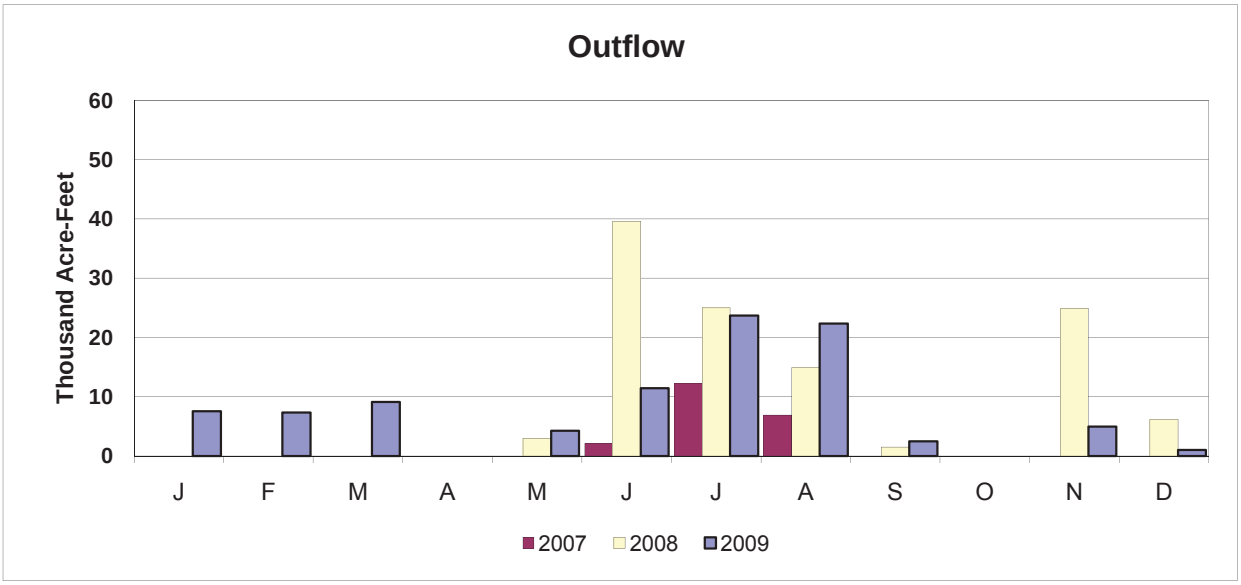
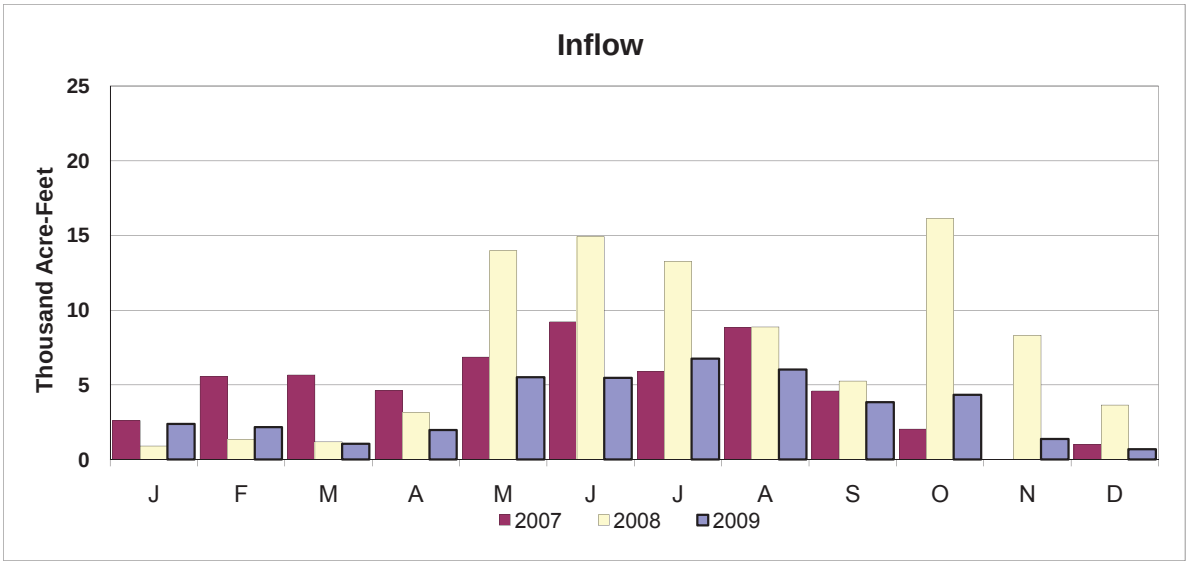
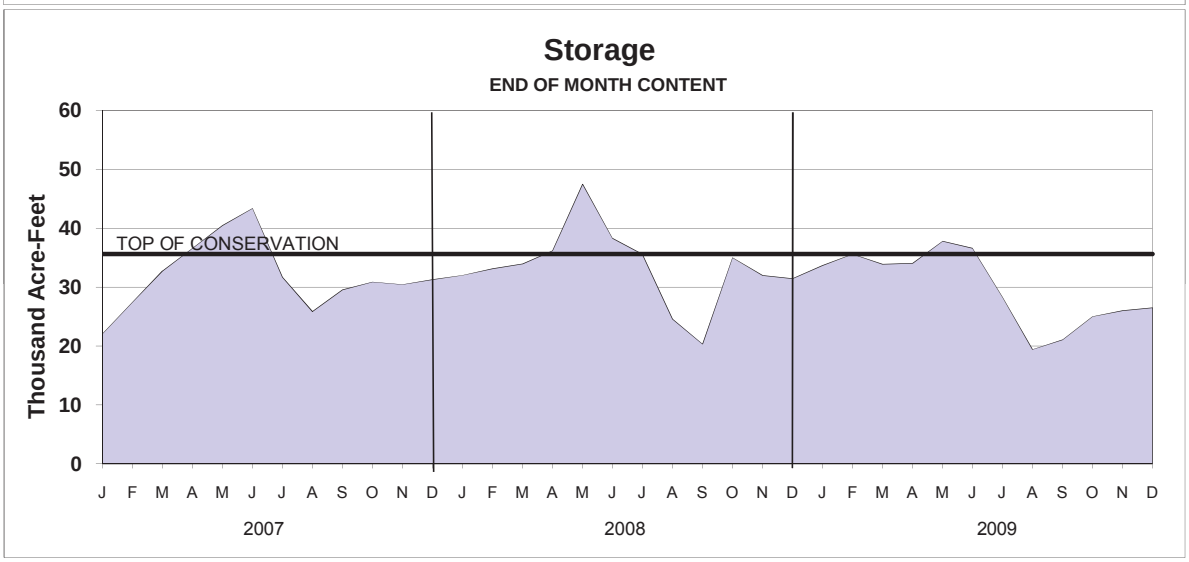


EXHIBIT 12A

LOVEWELL RESERVOIR

ACTUAL OPERATION





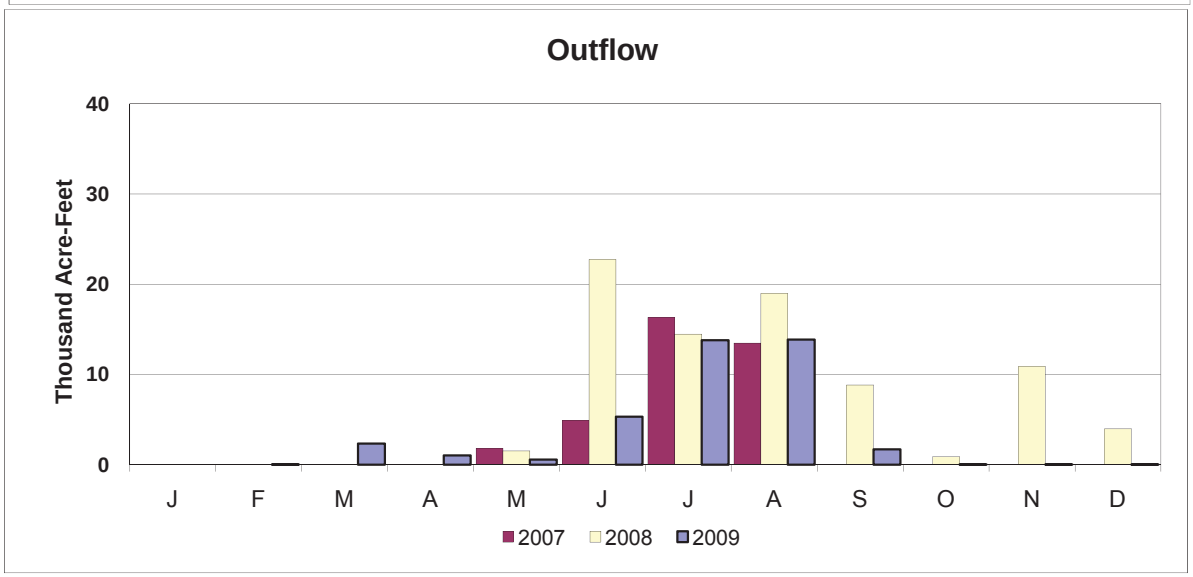
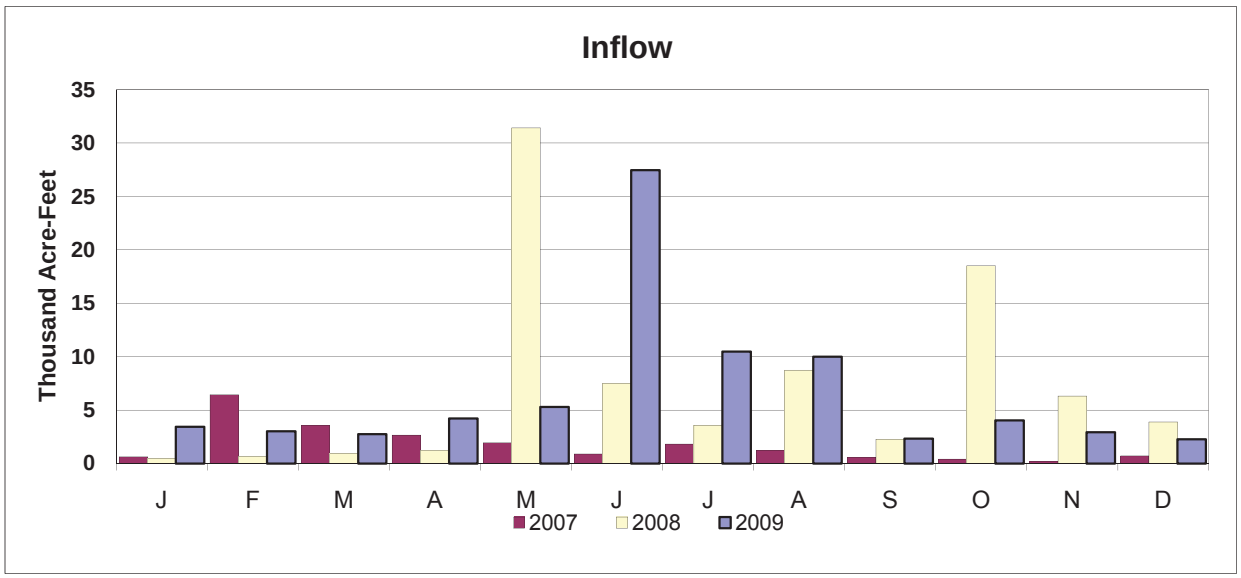
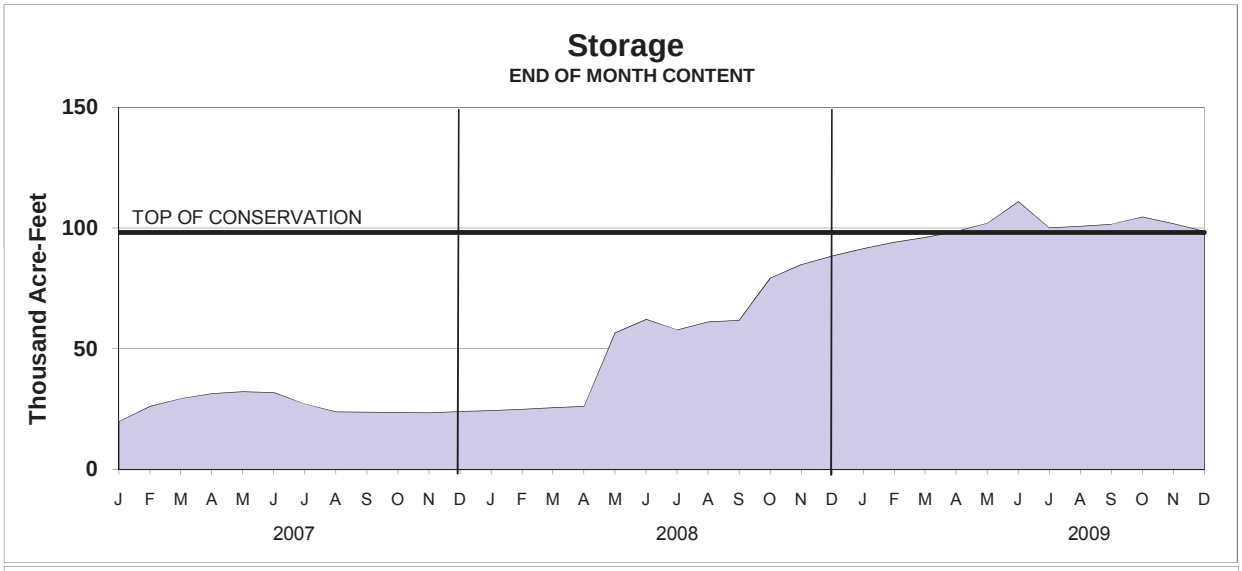


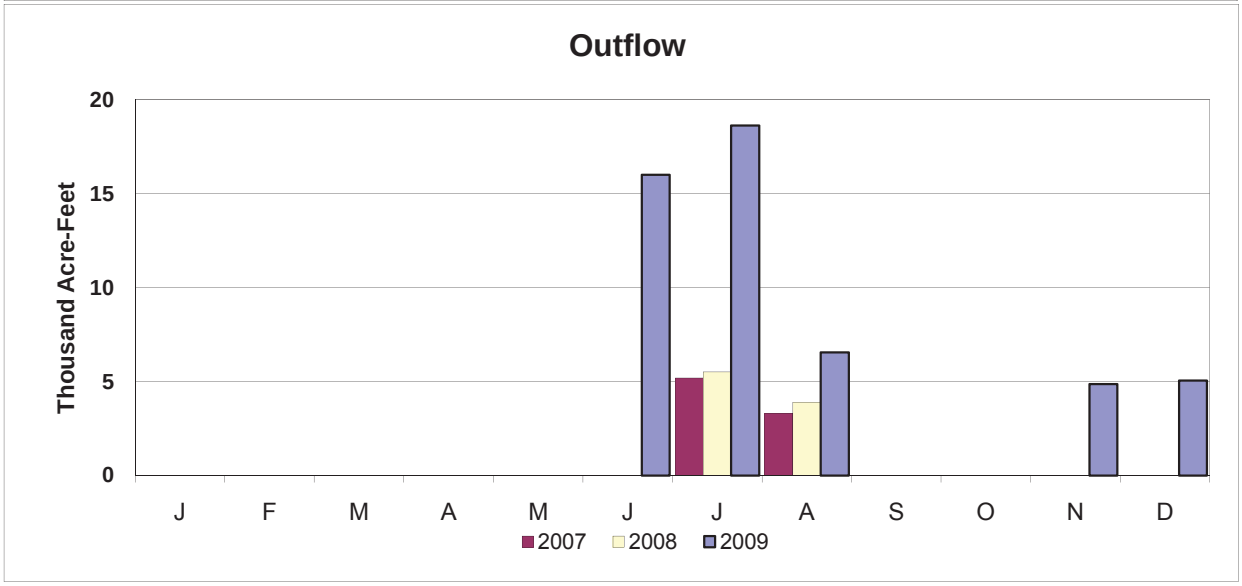
EXHIBIT 13A

KIRWIN RESERVOIR

ACTUAL OPERATION





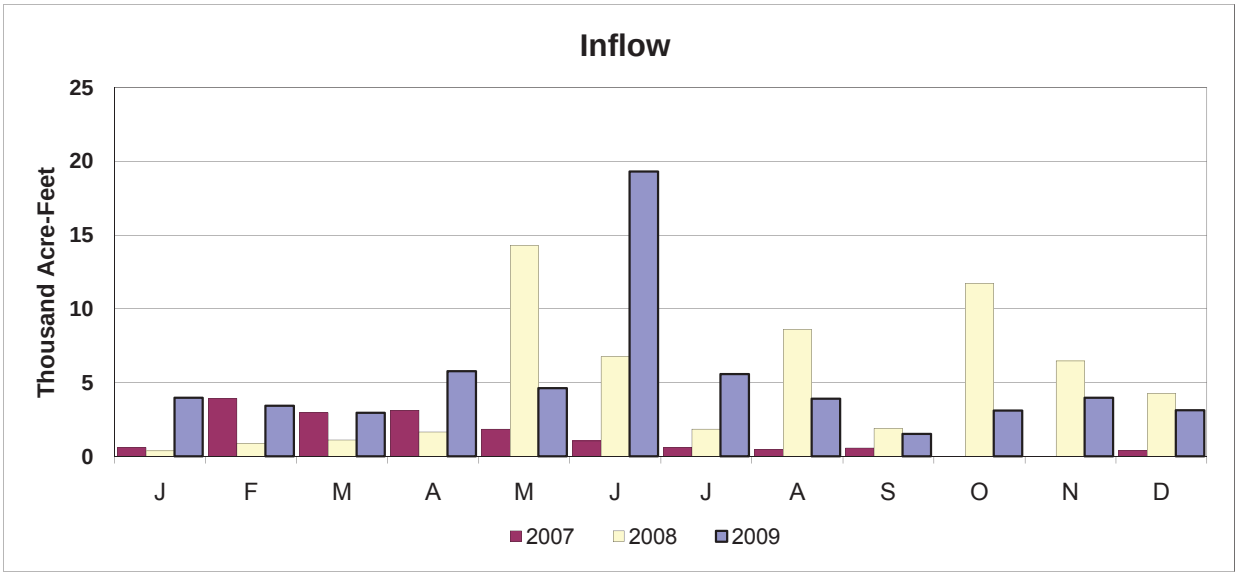


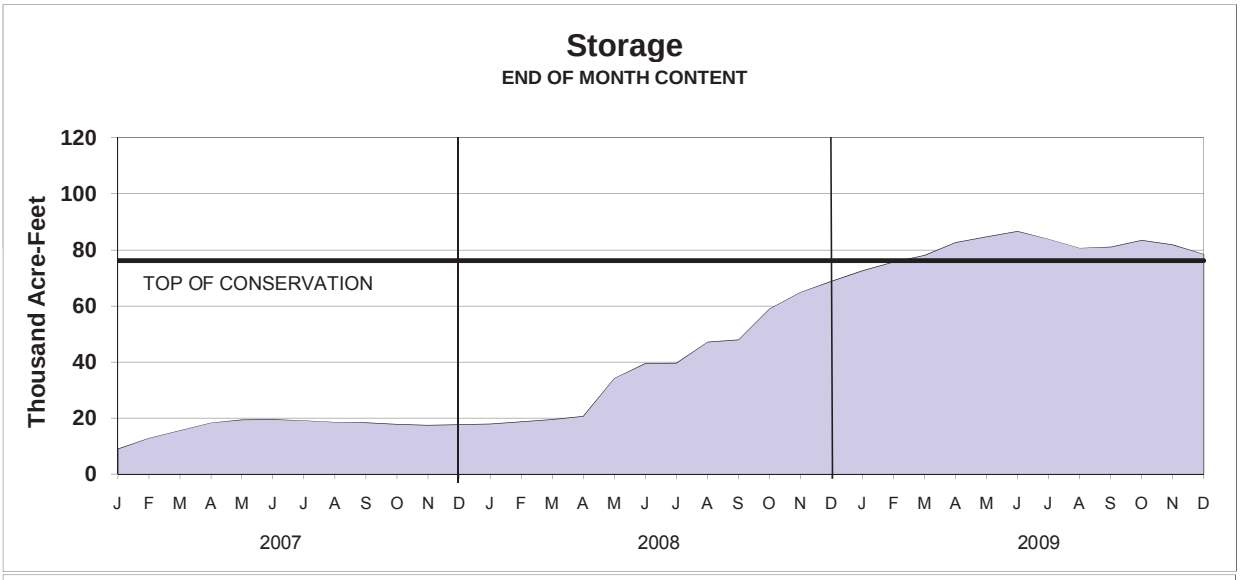
KS003336

EXHIBIT 14A

WEBSTER RESERVOIR

ACTUAL OPERATION





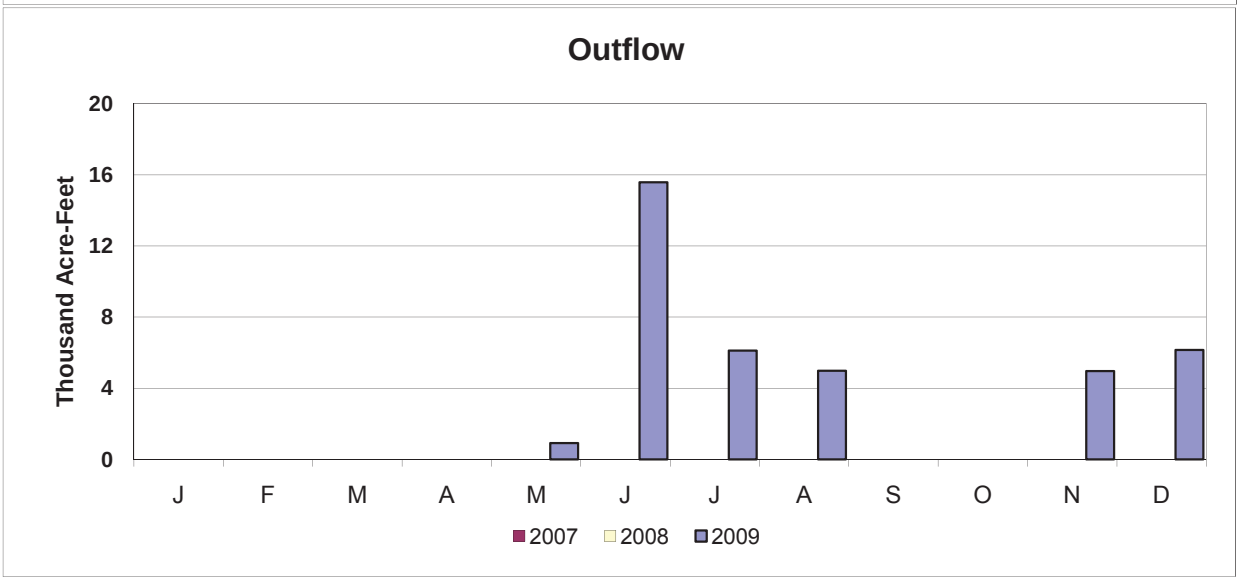
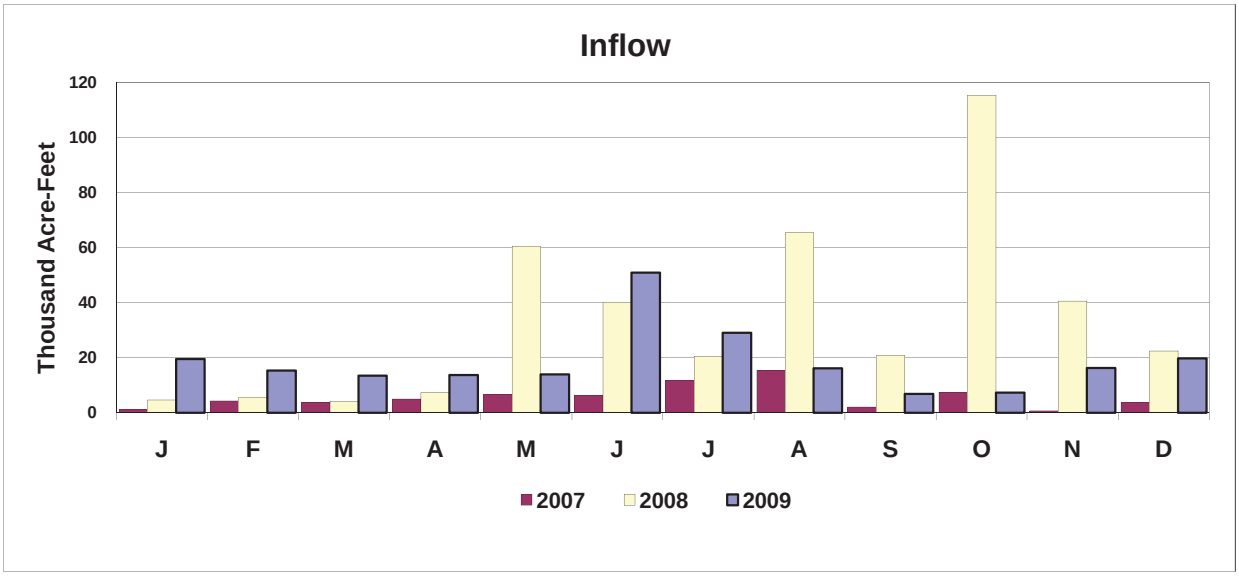
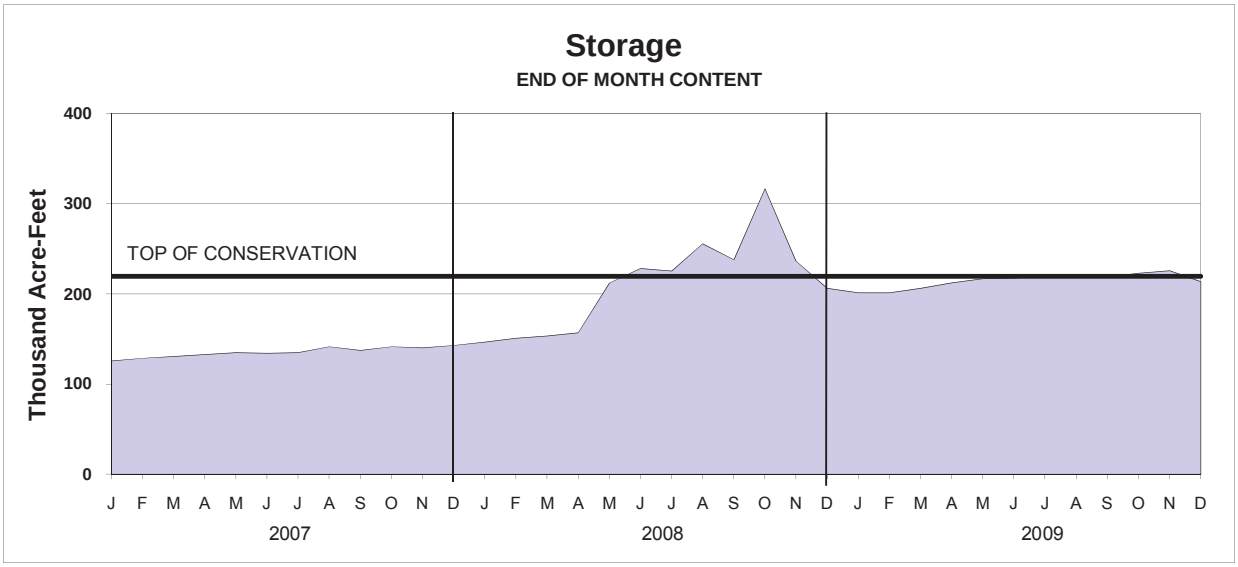


EXHIBIT 15A

WACONDA LAKE
ACTUAL OPERATION





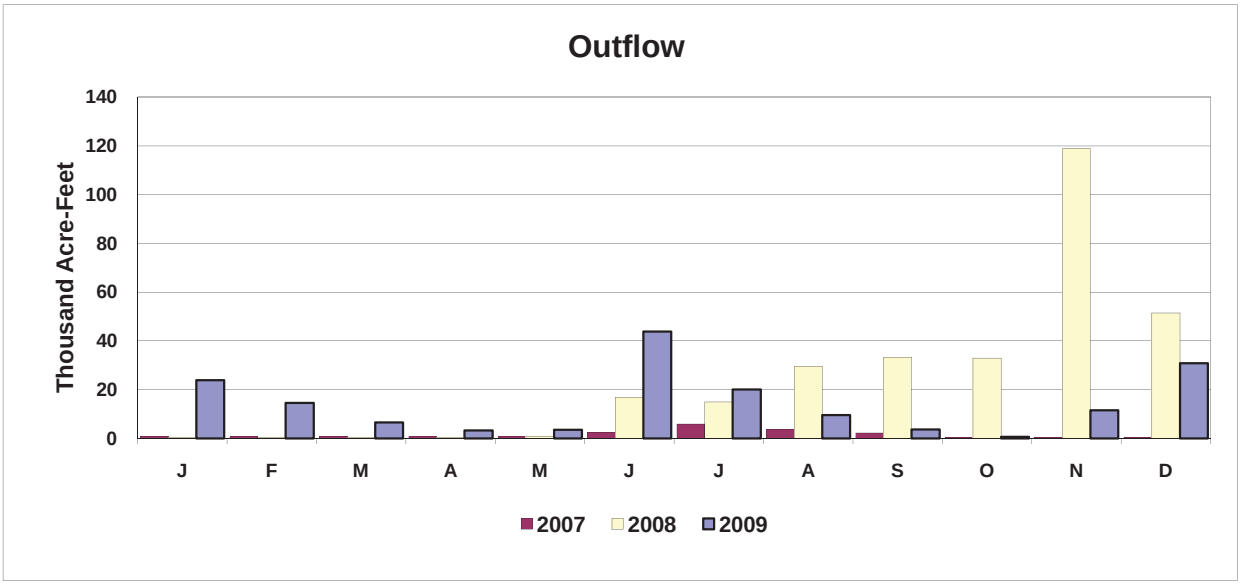
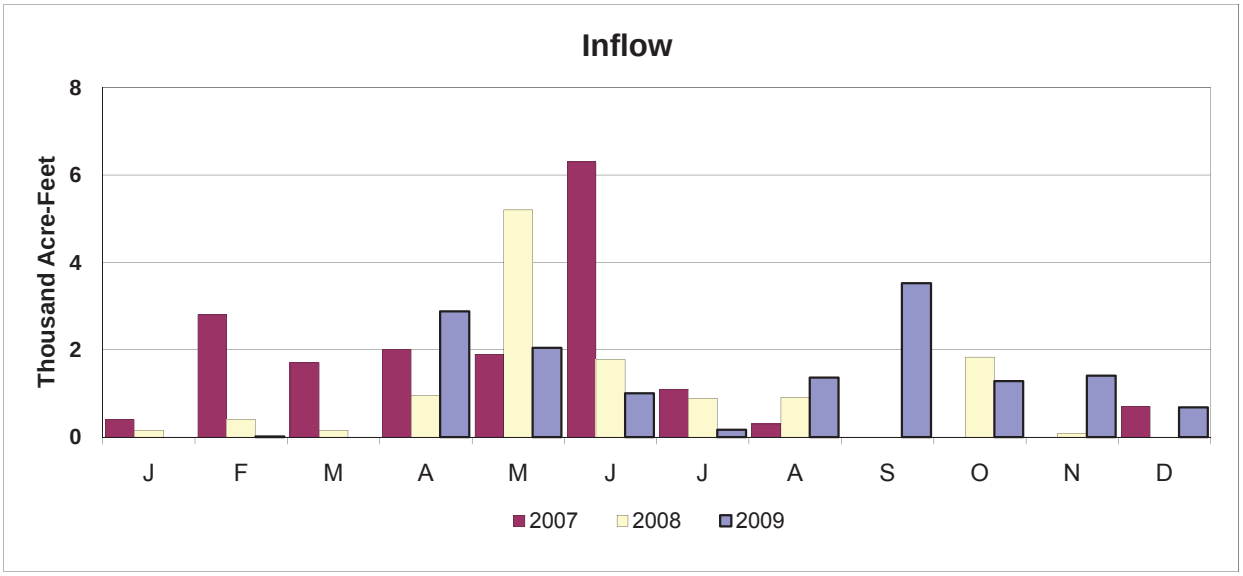
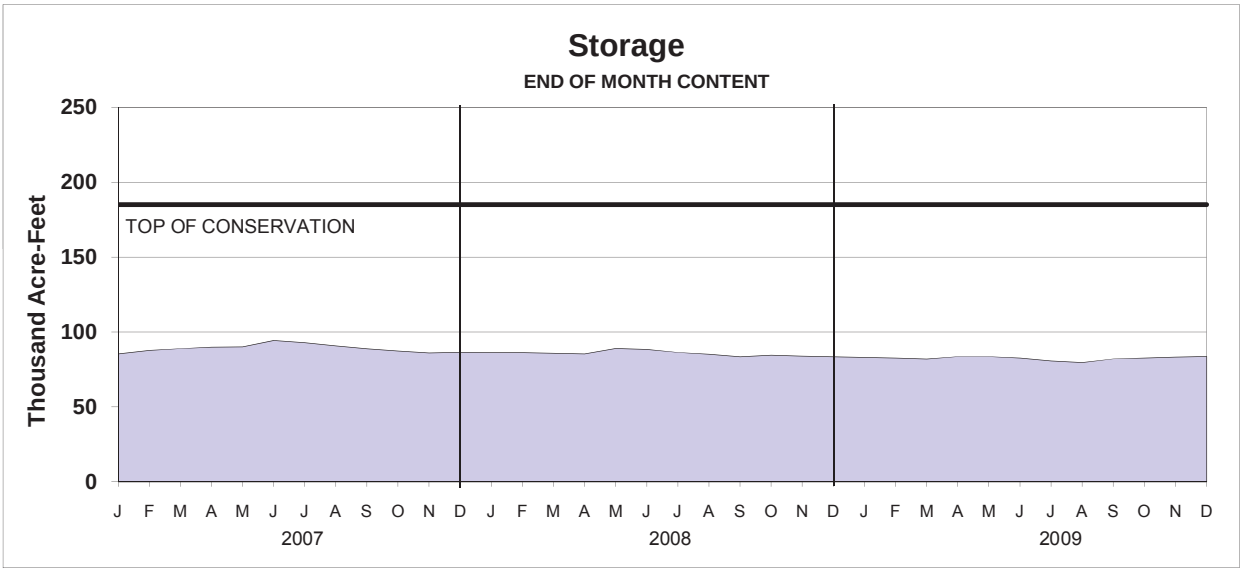


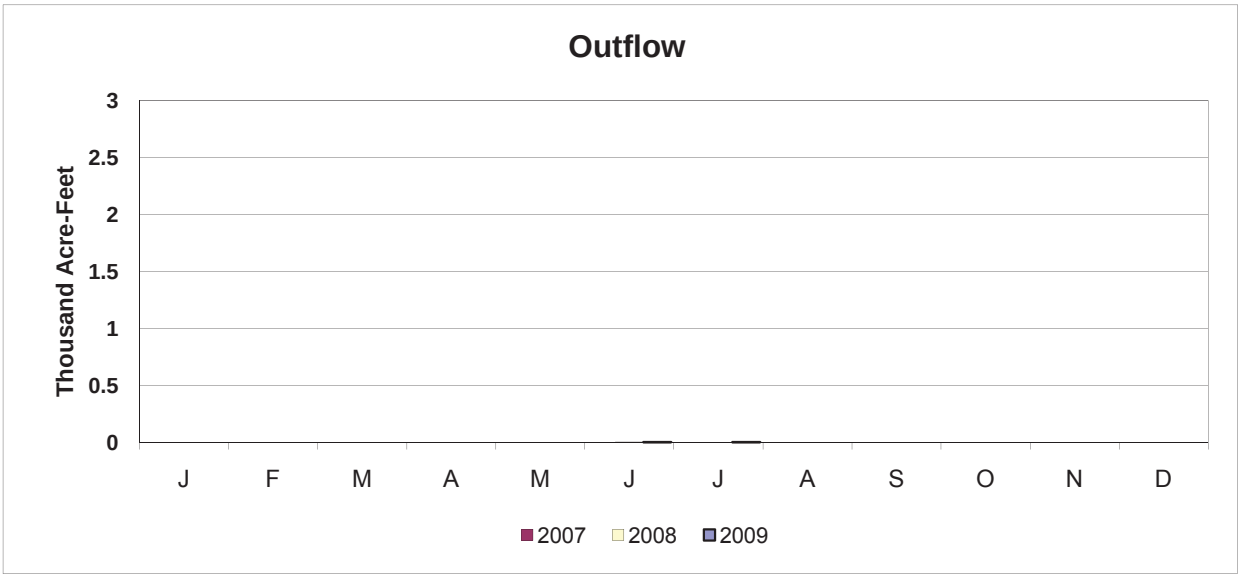
EXHIBIT 16A

CEDAR BLUFF RESERVOIR

ACTUAL OPERATION





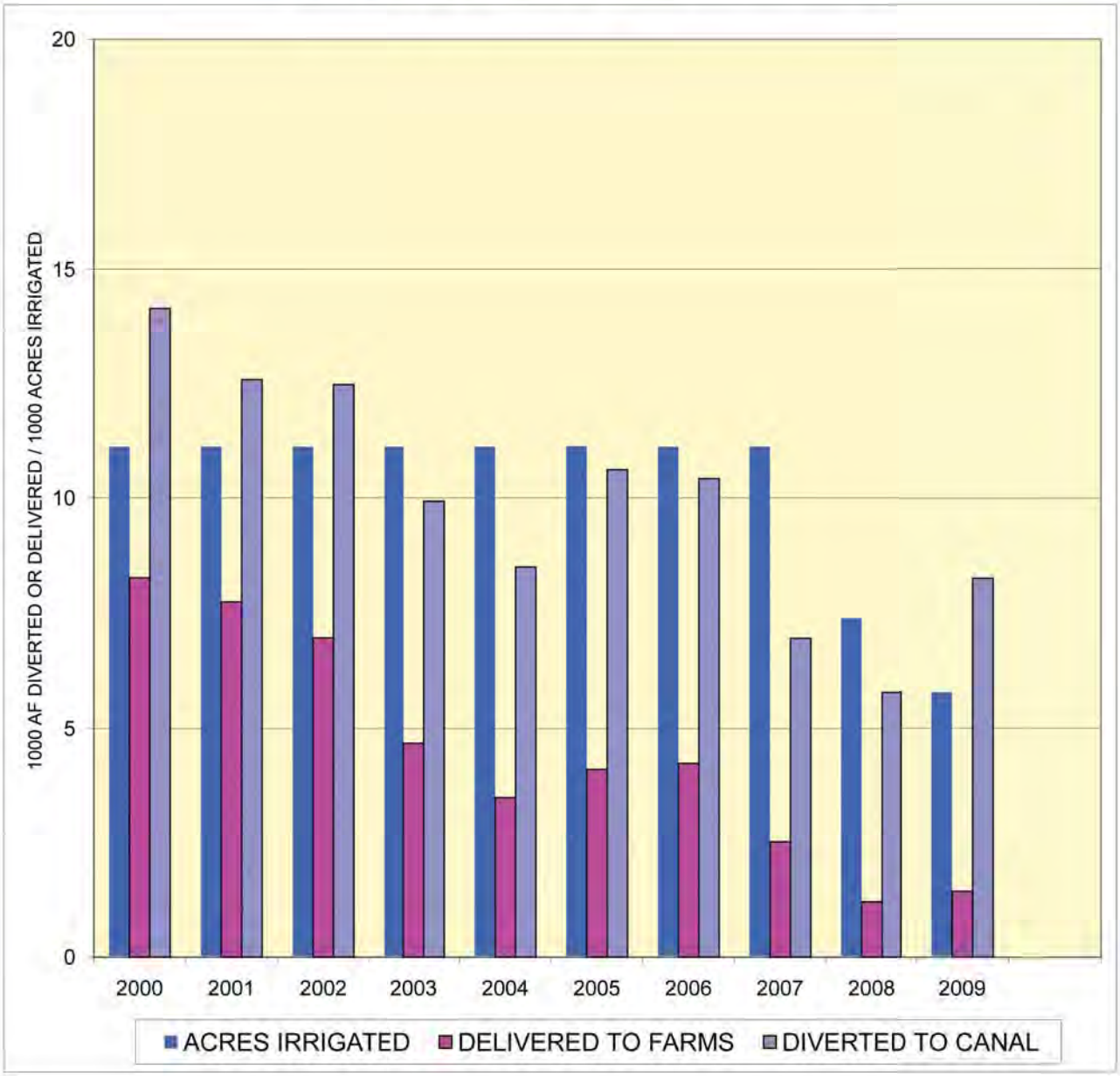


KS003339

EXHIBIT 17

MIRAGE FLATS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

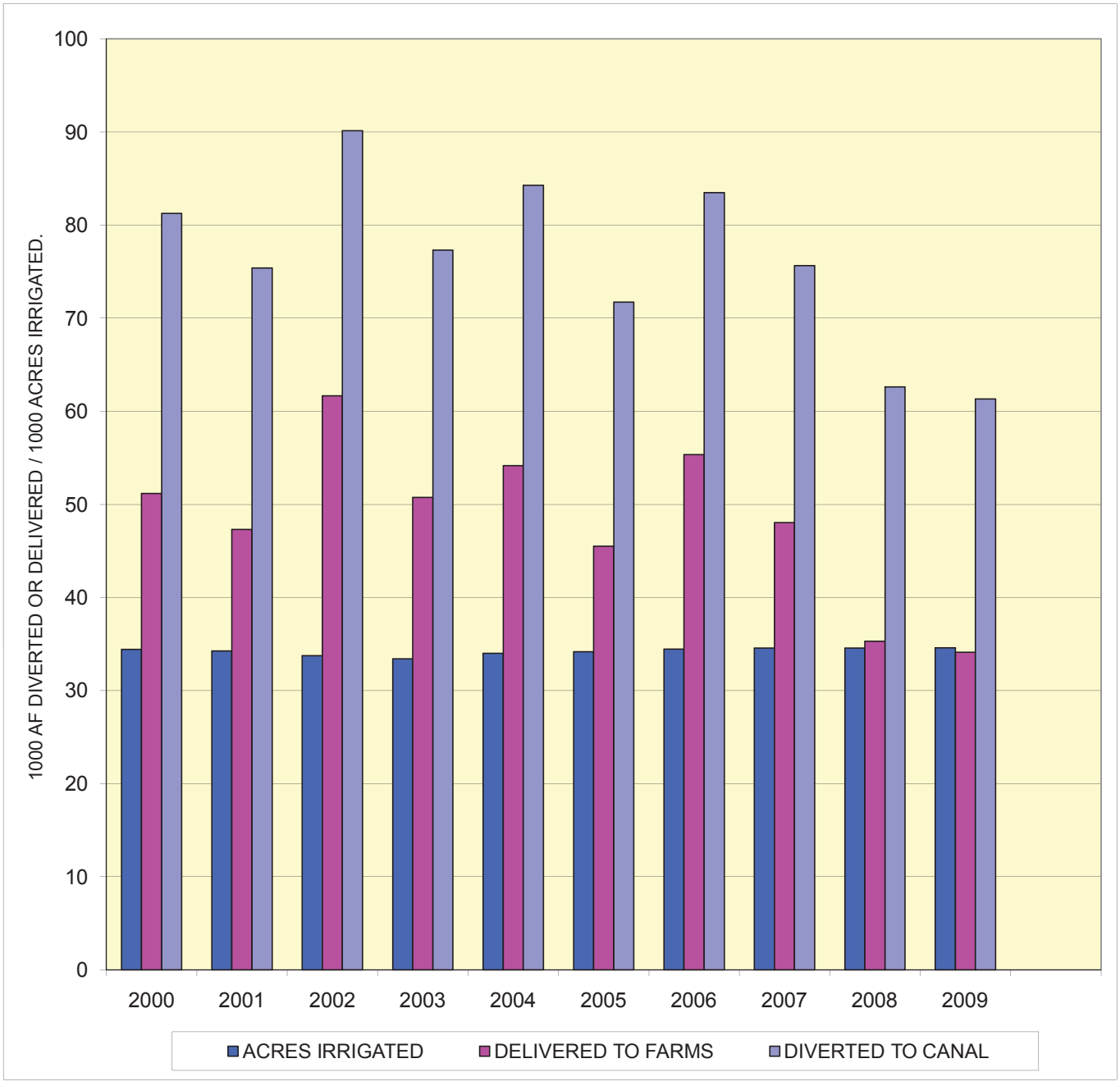


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	1.28	1.13	1.12	0.90	0.77	0.96	0.94	0.63	0.78	1.44
DELIVERED af/acre	0.75	0.70	0.63	0.42	0.32	0.37	0.38	0.23	0.16	0.25
EFFICIENCY	58%	62%	56%	47%	41%	39%	41%	36%	21%	18%

EXHIBIT 18

AINSWORTH IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

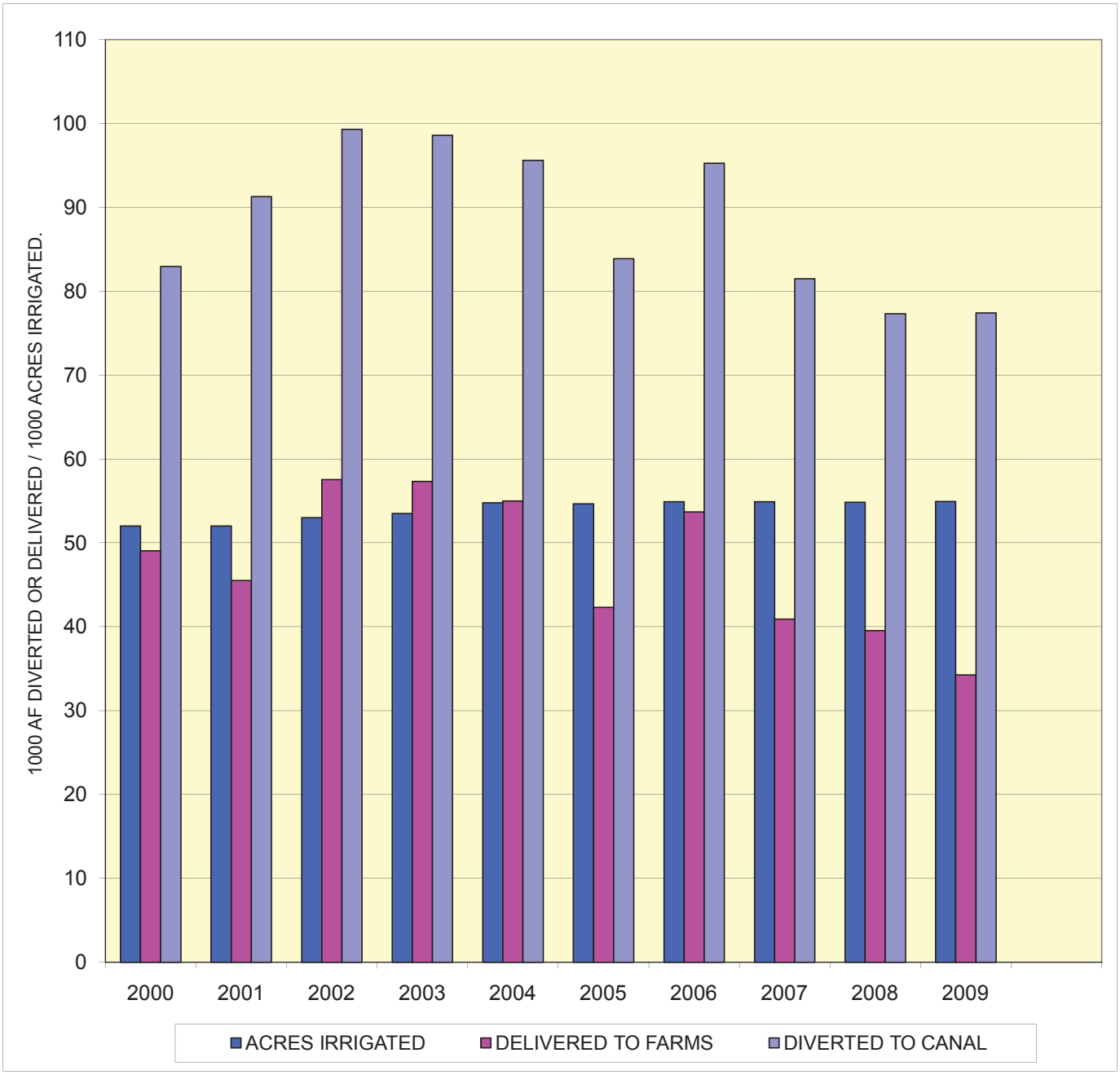


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	2.36	2.20	2.67	2.31	2.48	2.10	2.42	2.19	1.81	1.77
DELIVERED af/acre	1.49	1.38	1.83	1.52	1.59	1.33	1.61	1.39	1.02	0.99
EFFICIENCY	63%	63%	68%	66%	64%	63%	66%	64%	56%	56%

EXHIBIT 19

TWIN LOUPS IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

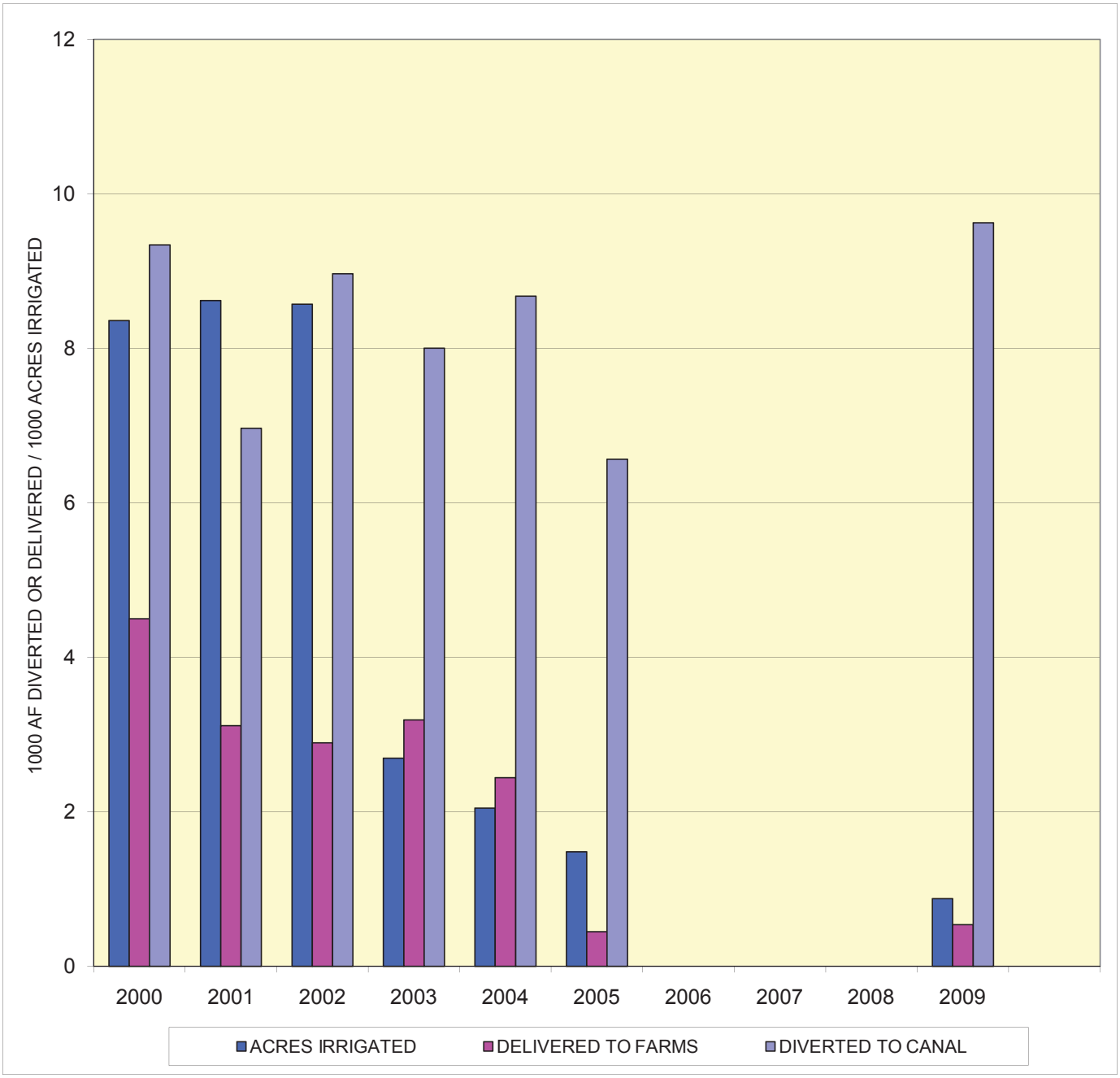


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	1.60	1.76	1.87	1.84	1.75	1.53	1.74	1.48	1.41	1.41
DELIVERED af/acre	0.94	0.88	1.09	1.07	1.00	0.77	0.98	0.74	0.72	0.62
EFFICIENCY	59%	50%	58%	58%	58%	50%	56%	50%	51%	44%

EXHIBIT 20

FRENCHMAN VALLEY IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

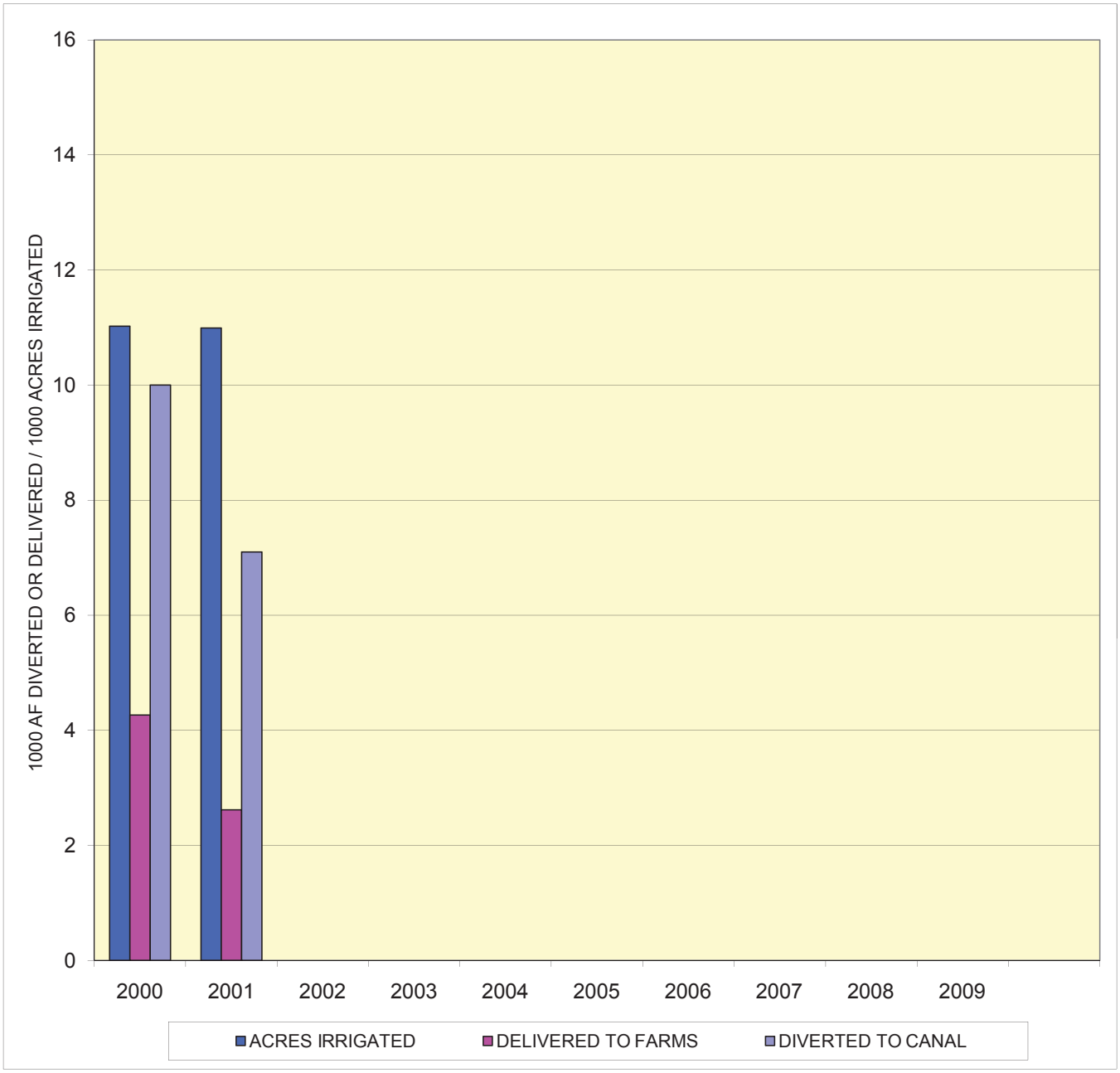


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	1.12	0.81	1.05	2.97	4.24	4.43	0.00	0.00	0.00	11.01
DELIVERED af/acre	0.54	0.36	0.34	1.18	1.19	0.30	0.00	0.00	0.00	0.61
EFFICIENCY	48%	45%	32%	40%	28%	7%	0%	0%	0%	6%

EXHIBIT 21

H AND RW IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

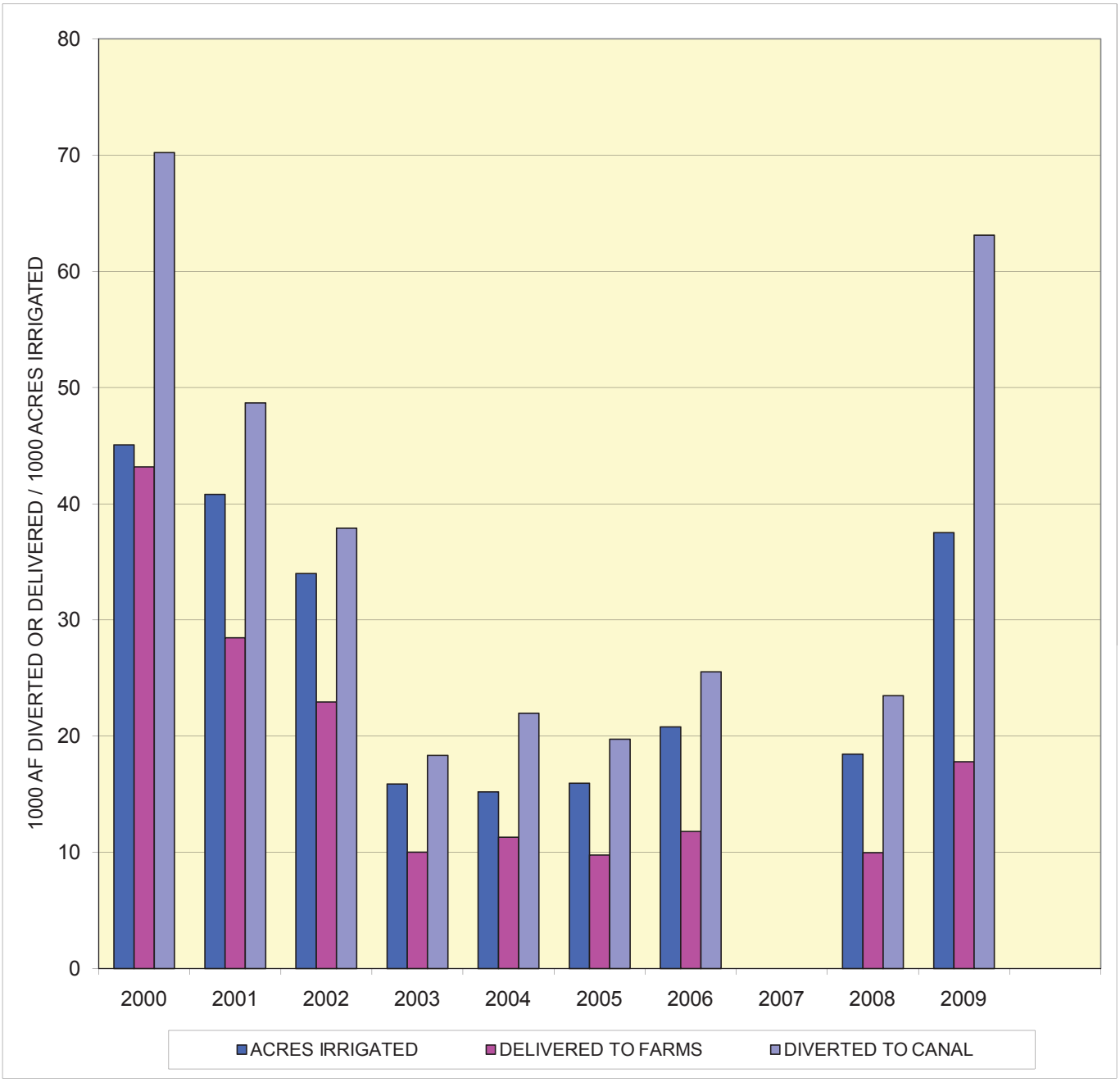


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	0.91	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DELIVERED af/acre	0.39	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EFFICIENCY	43%	37%	0%	0%	0%	0%	0%	0%	0%	0%

EXHIBIT 22

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

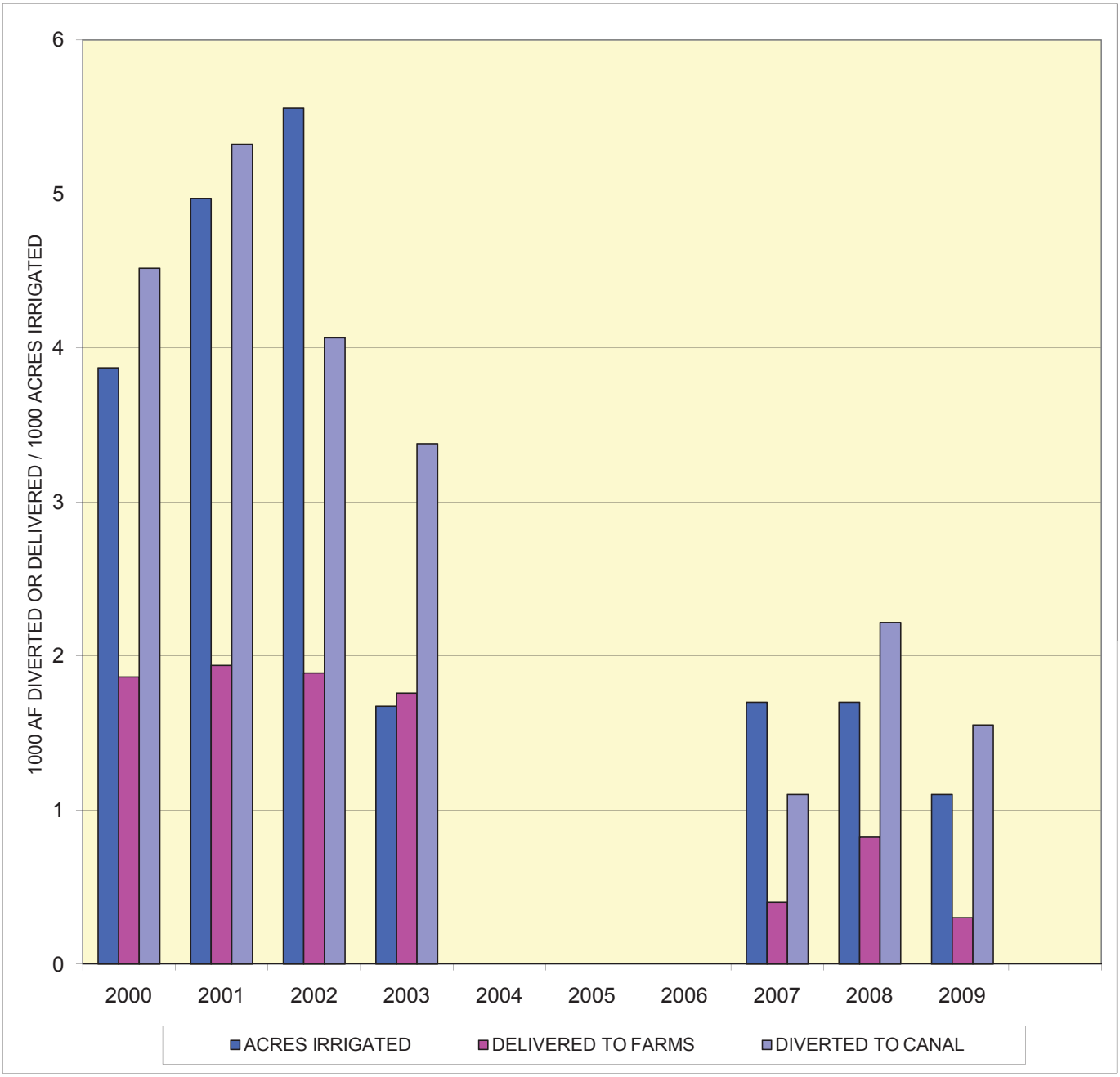


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	1.56	1.19	1.12	1.15	1.45	1.24	1.23	0.00	1.27	1.68
DELIVERED af/acre	0.96	0.70	0.67	0.63	0.74	0.61	0.57	0.00	0.54	0.47
EFFICIENCY	61%	58%	61%	55%	52%	50%	46%	0%	42%	28%

EXHIBIT 23

ALMENA IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

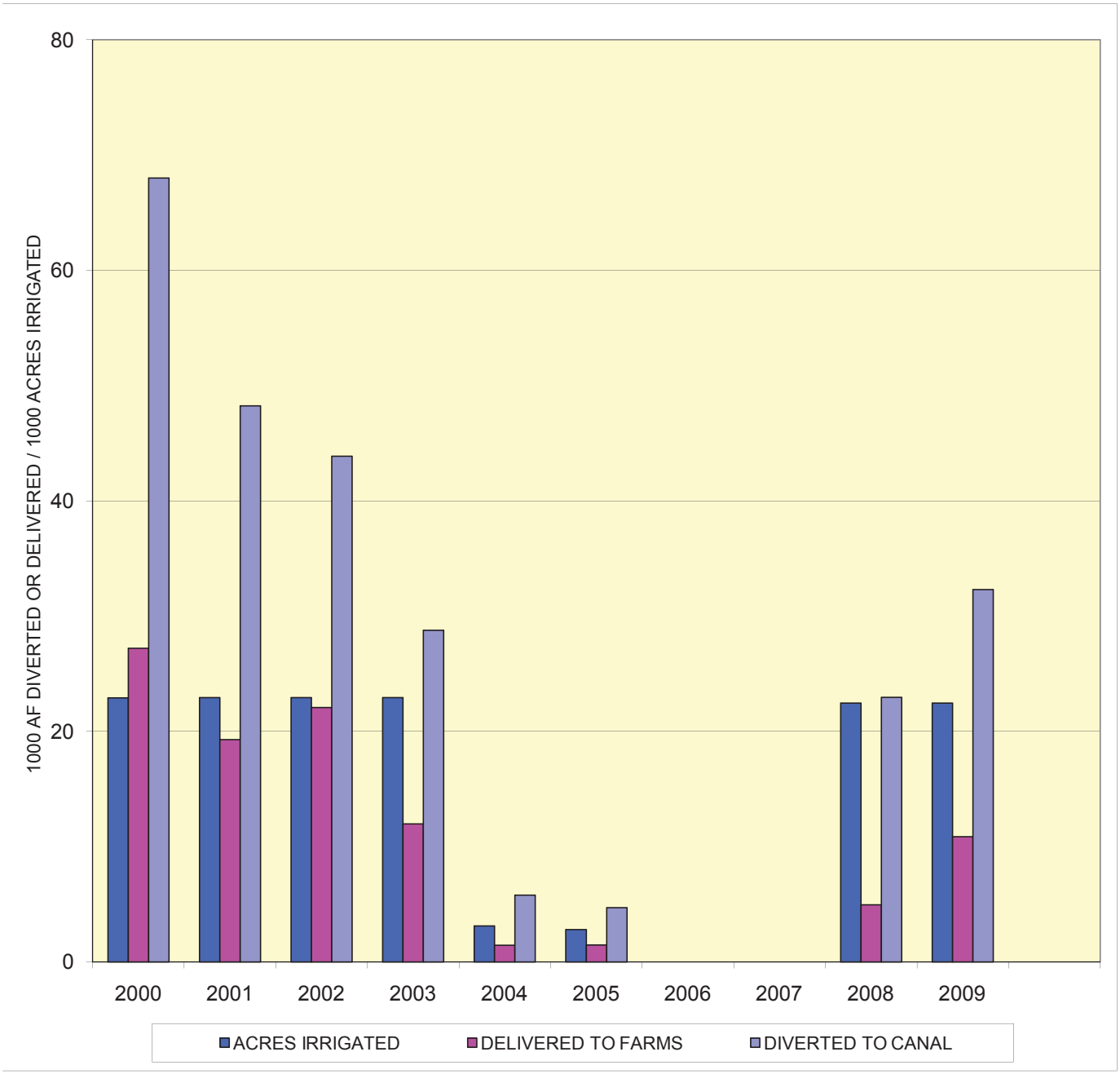


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	1.17	1.07	0.73	2.02	0.00	0.00	0.00	0.65	1.30	1.41
DELIVERED af/acre	0.48	0.39	0.34	1.05	0.00	0.00	0.00	0.24	0.49	0.27
EFFICIENCY	41%	36%	46%	52%	0%	0%	0%	36%	37%	19%

EXHIBIT 24

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

CANAL DIV., FARM DEL., AND ACRES IRRIG.

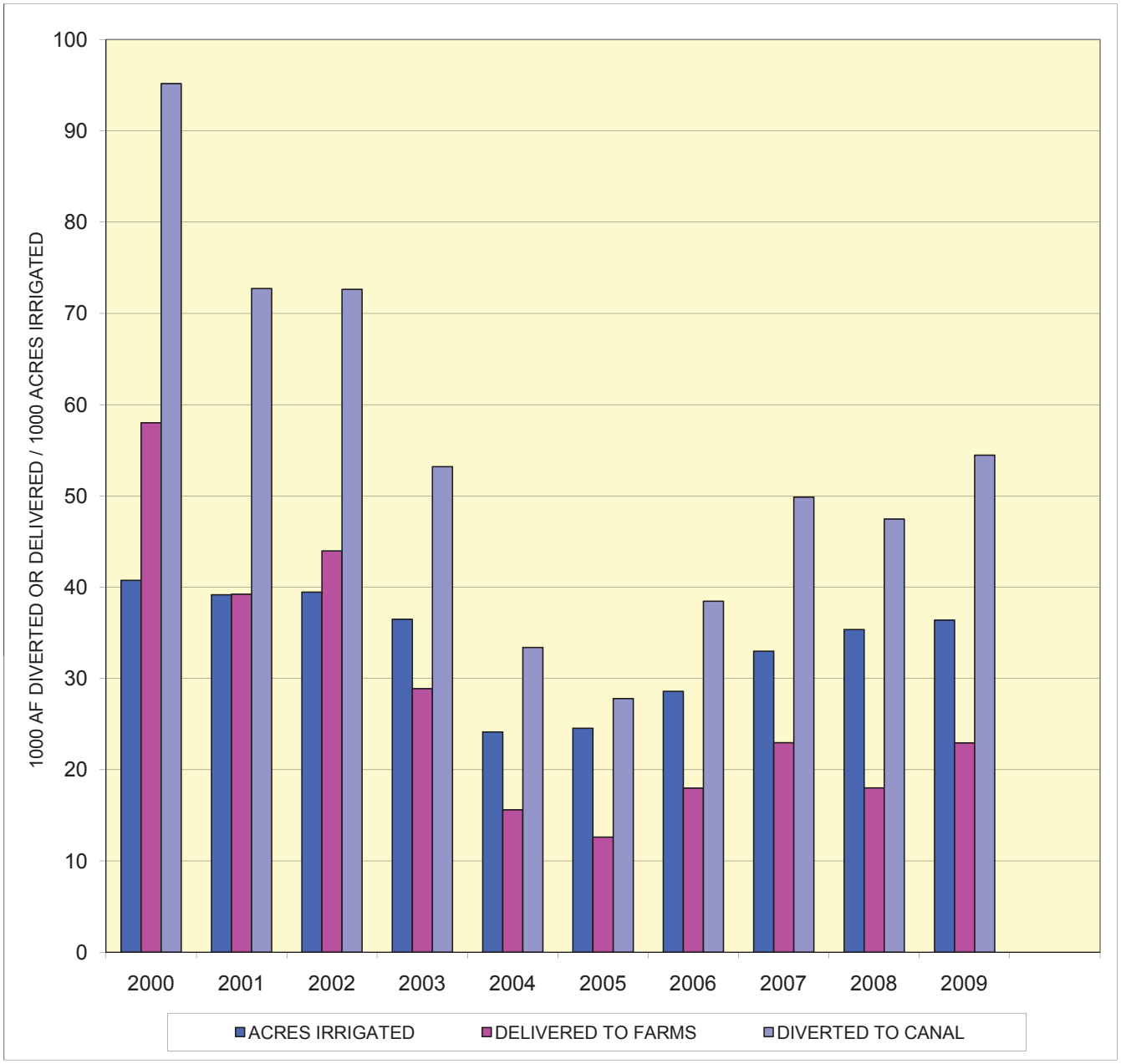


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	2.97	2.10	1.91	1.25	1.85	1.68	0.00	0.00	1.02	1.44
DELIVERED af/acre	1.19	0.84	0.96	0.52	0.47	0.53	0.00	0.00	0.22	0.48
EFFICIENCY	40%	40%	50%	42%	25%	32%	0%	0%	22%	34%

EXHIBIT 25

KANSAS-BOSTWICK IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

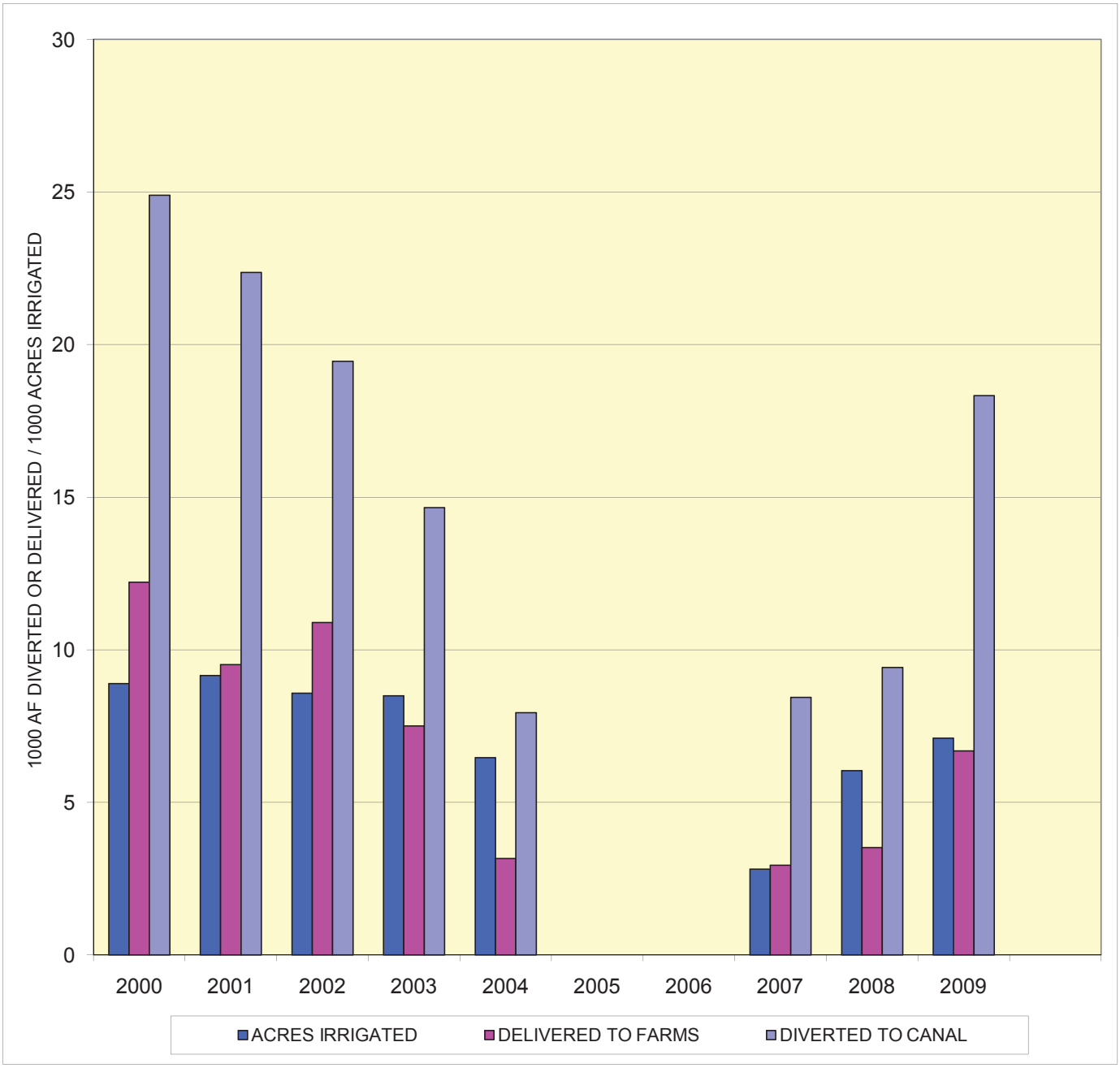


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	2.33	1.86	1.84	1.46	1.38	1.13	1.35	1.51	1.34	1.50
DELIVERED af/acre	1.42	1.00	1.11	0.79	0.65	0.51	0.63	0.70	0.51	0.63
EFFICIENCY	61%	54%	61%	54%	47%	45%	47%	46%	38%	42%

EXHIBIT 26

KIRWIN IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

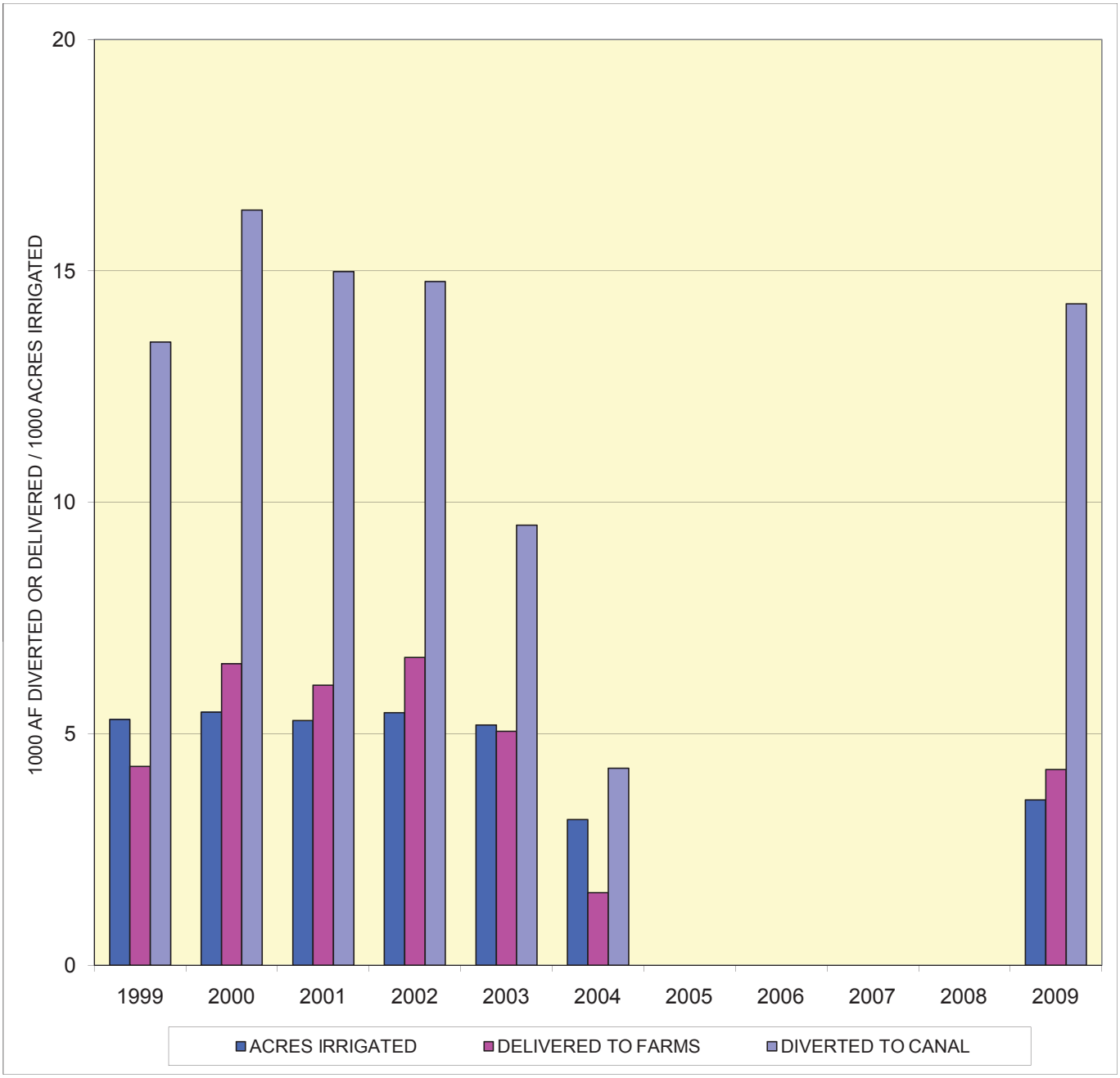


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	2.80	2.44	2.27	1.73	1.23	0.00	0.00	3.00	1.56	2.58
DELIVERED af/acre	1.37	1.04	1.27	0.88	0.49	0.00	0.00	1.05	0.58	0.94
EFFICIENCY	49%	43%	56%	51%	40%	0%	0%	35%	37%	36%

EXHIBIT 27

WEBSTER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.

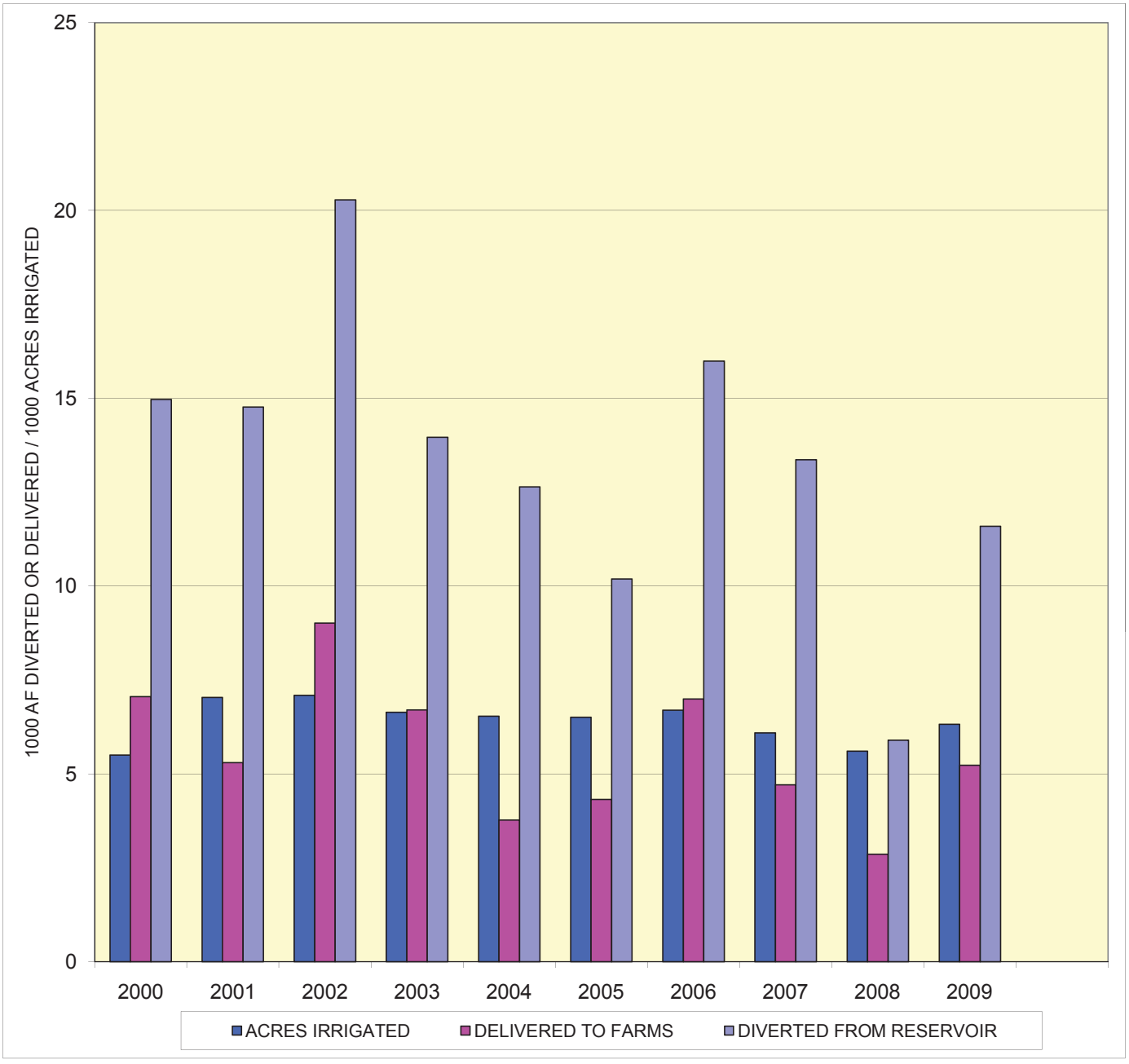


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	2.98	2.83	2.71	1.83	1.35	0.00	0.00	0.00	0.00	4.00
DELIVERED af/acre	1.19	1.14	1.22	0.97	0.50	0.00	0.00	0.00	0.00	1.18
EFFICIENCY	40%	40%	45%	53%	37%	0%	0%	0%	0%	30%

EXHIBIT 28

GLEN ELDER IRRIGATION DISTRICT

CANAL DIV., FARM DEL., AND ACRES IRRIG.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
DIVERTED af/acre	2.72	1.00	1.00	1.00	1.93	1.57	2.39	2.19	1.05	1.83
DELIVERED af/acre	1.28	0.75	1.27	1.01	0.58	0.66	1.04	0.77	0.51	0.83
EFFICIENCY	47%	36%	44%	48%	30%	42%	44%	35%	48%	45%