SYNOPSIS

General

This year is the 60th 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 269,745 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 65 Hydromet stations that can be accessed. The Nebraska-Kansas Area Office (NKAO) has installed and maintains 40 of these Hydromet stations. 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 – Hydrological Data Center" under the Water Operations heading.

The Headlines 2012 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.

2012 Summary

Climatic Conditions

Precipitation at the project dams during 2012 ranged from 44 percent of normal near Box Butte Dam to 82 percent of normal at Lovewell Dam. Annual precipitation ranked within the bottom five on record at 11 of the 16 project dams. Six project dams recorded the lowest annual precipitation on record at the respective sites. There were 4 months that all 16 project dams recorded below normal precipitation.

Temperatures during the first 3 months of the year were generally above normal throughout the projects area. Temperatures during March were at or near all time record highs. Precipitation totals varied from 50 percent to 126 percent of normal during January through March. January and March precipitation was well below normal in most of the project areas while February precipitation was above normal.

Temperatures continued above normal during the spring. Precipitation during April was well above normal, with four project dams recording totals that ranked in the top three ever recorded for the month. May precipitation was well below normal throughout the basin, with six project dams recording totals that ranked in the bottom two ever recorded for the month.

Temperatures were above normal during the summer. Total precipitation for June, July, and August was well below normal for most of the reservoirs. June precipitation totals ranked in the lowest three on record for the month at five project dams. Two project dams recorded the lowest precipitation ever for the month of July, and five project dams recorded the lowest precipitation ever for the month of August.

Precipitation recorded in September, October, and November continued well below normal throughout the project area. September precipitation ranked in the bottom three all time at four project dams. Ten of the 16 project dams recorded no precipitation in November. Precipitation during December was generally above normal. Temperatures in the fall and winter were above normal.

Storage Reservoirs

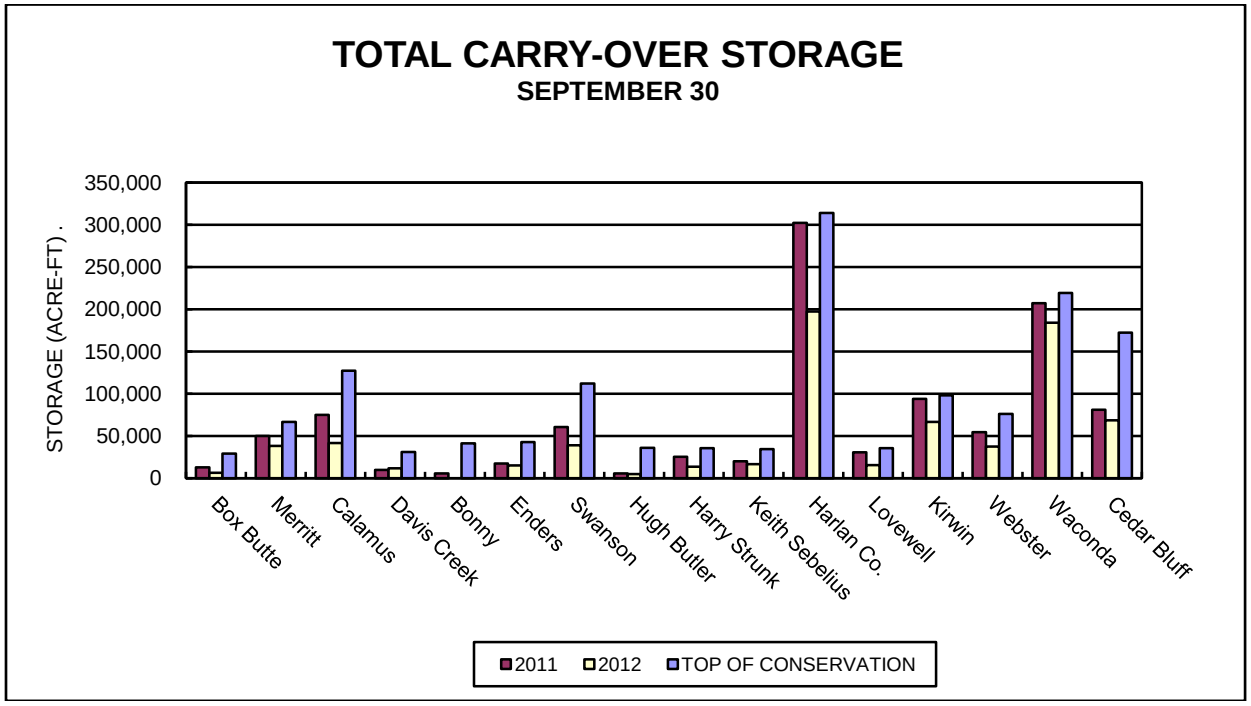
1. Conservation Operations: The 2012 inflow was below the dry-year forecast for Box Butte, Davis Creek, Bonny, Enders, Lovewell, and Cedar Bluff Reservoirs. The remaining reservoirs had inflows between the dry-year and normal-year forecasts.

Eight of the sixteen reservoirs had below average carryover storage from the 2011 water year. Reservoir releases were made from Merritt, Virginia Smith, Medicine Creek, Harlan County, Kirwin, and Glen Elder Dams to maintain or reduce reservoir levels prior to the 2012 irrigation season. 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. A small amount of flood storage was occupied in Harry Strunk and Harlan County Lakes along with Lovewell Reservoir prior to the irrigation season. Irrigation demands greatly reduced the storage in these project reservoirs throughout the summer. Reservoir storage was below normal at twelve reservoirs at the end of 2012.

On September 20, 2011, the state of Colorado ordered that Bonny Reservoir be drained for Republican River Compact compliance. All of the water in Bonny Reservoir was evacuated by the end of May 2012 and no storage has been recorded since. The State of Colorado Order remains in effect and inflows continue to be bypassed.

Hugh Butler Lake continues to be maintained near the dead pool level due to the embankment cracking discovered in 2009. Safety of dam work began at this facility in 2011 and is expected to continue through the summer of 2013. Some storage of inflows is expected in 2013 as construction nears completion.

The following graph shows a comparison of 2011 and 2012 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 and Waconda Lakes, and Kirwin and Lovewell Reservoirs utilized flood pool storage in 2012. Approximately 26,200 acre-feet (AF) of water was released from the reservoir flood pools and an additional 60,300 AF was released to prevent reservoir levels from encroaching into the flood pools prior to the irrigation season. The water year 2012 flood damages prevented by the operation of Reclamation's Nebraska-Kansas Projects facilities was $28,500 as determined by the Corps of Engineers. An additional benefit of $11,400 was credited to Harlan County Lake. The accumulative total of flood control benefits for the years 1951 through 2012 by facilities in this report total $2,066,446,000 (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 the facilities of the Nebraska-Kansas Projects during 2012 can be found in Table 7.

Water Service

There was 456,012 AF of water diverted to irrigate approximately 219,521 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 2012.

The water requirements of three municipalities, one rural water district, and two fish hatchery facilities were met in 2012. Both storage releases and natural flows are utilized in meeting these demands.

Irrigation Production

The 2012 crop yields on lands receiving project water in the Nebraska-Kansas Projects were slightly higher than 2011. The average corn yield, the principal crop of all reporting districts, was 174 bushels per acre. The start of irrigation releases from project reservoirs was earlier than normal due to the hot and dry conditions experienced during May. Above normal temperatures and well below normal rainfall was experienced during most of the growing season. Daytime high temperatures exceeded the century mark on numerous occasions. Crop yields were greatly reduced in some of the projects area due to the extremely hot conditions. Crop maturity progressed ahead of normal throughout the season. Most irrigation districts had finished with irrigation releases by the end of August and all irrigation districts had finished delivering water by mid September. Corn harvest generally commenced in late October and concluded in November. Only two canals did not divert water in 2012 as a result of short water supplies.

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 NKAO is available for meetings if requested with Nebraska, Colorado, and Kansas state management agencies to discuss the Annual Operating Plans (AOP). Information is solicited from the agencies to enhance fisheries resources within the flexibility allowed while still meeting contractual obligations with the various irrigation districts.

Reservoir operations were favorable for recreation and fish and wildlife uses in 2012 at those project reservoirs with full or nearly full conservation pools prior to the irrigation season. Higher water levels experienced early in the year submerged existing shoreline vegetation. Above normal irrigation demands and the lack of precipitation during the summer greatly reduced the pool levels at several reservoirs allowing for late summer shoreline re-vegetation. The draining of Bonny Reservoir and the low reservoir levels maintained at Hugh Butler Lake greatly diminished recreation benefits at these facilities.

2013 Outlook

Three forecast conditions have been developed for each of the reservoirs in the Niobrara, Lower Platte, and Kansas River Basins conforming to establish operating criteria under various reservoir inflow conditions. These operation studies are included in Table 4, sheets 1 through 16. The municipal and rural water district water supply requirements will be met under all three inflow forecast conditions for all units.

Under reasonable minimum inflow forecast conditions, irrigation districts receiving storage water from the following lakes and reservoirs are expected to receive less than a full supply: Box Butte, Enders, Swanson, Hugh Butler, Harry Strunk, Keith Sebelius, Harlan County, Lovewell and Webster. The irrigation districts affected are Mirage Flats; Frenchman Valley and H&RW; Frenchman-Cambridge; Almena; Bostwick in Nebraska; Kansas Bostwick; and Webster; respectively. If 2013 is a dry year, 157,794 of the total 269,745 acres with service available to be irrigated (58 percent) will have an inadequate water supply.

Under most probable inflow conditions, it is expected that Mirage Flats, Frenchman Valley, H&RW, Frenchman-Cambridge, and Almena Irrigation Districts would experience some shortages to irrigation demands from Box Butte Reservoir, Enders Reservoir, Swanson Lake, Hugh Butler Lake, Harry Strunk Lake, and Keith Sebelius Lake. Most irrigators in these districts plan to use water from private wells to supplement the project water supply.

Even under reasonable maximum inflow conditions, Mirage Flats, Frenchman Valley, H&RW, and Frenchman-Cambridge Irrigation Districts are expected to experience irrigation demand shortages from Box Butte Reservoir, Enders Reservoir, Swanson Lake, Hugh Butler Lake, and Harry Strunk Lake.

Under reasonable minimum inflow conditions, the conservation pools at Merritt, Calamus, Davis Creek, and Lovewell Reservoirs are expected to fill during 2013.

Even with low reservoir levels and inadequate water supplies for some project lands, the recommendations of various state agencies will be considered. As in the past, irrigation and reclamation districts will advise state agencies regarding aquatic weed control and canal operations. Reclamation will continue to operate the reservoirs and other facilities under its jurisdiction in the best interests of all project functions and for the optimum public benefit.

On January 1, 2013 the State of Nebraska, Department of Natural Resources (NDNR) determined a “Compact Call Year” to be in effect on the Republican River Basin. The “Compact Call” resulted in the NDNR issuing closing notices on all natural flow and storage permits in the basin until such time that the NDNR determines that yearly administration is no longer needed to ensure Republican River Compact compliance. All surface water appropriations in the Republican River Basin above Guide Rock Diversion Dam were closed on January 1, 2013. Reservoir inflows are currently being bypassed through Enders Reservoir, Swanson Lake, Hugh Butler Lake and Harry Strunk Lake.

Water is not expected to be stored in Bonny Reservoir during 2013 as the State of Colorado's Order to bypass all inflows remains in effect. Bonny Reservoir was drained in 2012 by order of the state of Colorado to assist in meeting Republican River Compact compliance.

2012 HEADLINES

Drought may impose limits for Republican River use

Republican River restrictions expected

Feds fund Republican River study

Trial on second Kansas-Nebraska water suit begins

2012 DROUGHT ONE OF THE WORST IN HISTORY

Engineers eye site near Bostwick for streamflow project

Red Willow Dam repairs ahead of schedule

Water is Neb.'s buried treasure

NRD awards $2.1 million pipeline contract

Kansas v. Nebraska judge plans draft ruling by Jan. 9

Plans set to cut back on irrigation

Official: Compact call year no surprise

Rebuilding Lake Waconda After Historic Flooding—1-Year Later

Bureau warns of water shortage on Republican next year

NRDs investing $83 million in water shift plan

Pipeline will boost Republican, Platte River flows

Bonny Lake drained, thousands of fish die

Climate: Drought causing billions in damage

Hays Asking for Cedar Bluff Water Release

LowerNRD looks at expanding Lovewell Reservoir

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 2012 and serves as a guideline for the 2013 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 2000 sediment survey 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 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 1993 through 2012 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 Superior-Courtland 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 Mirage Flats Irrigation District is April through September. The contracted irrigation season for Frenchman-Cambridge Irrigation District is April 15 through October 15 or such additional period from April 1 to April 15 of each year as may be agreed upon between the District and Reclamation. The contracted irrigation season for Frenchman Valley and H&RW 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 or repayment contracts for full or supplemental water supplies.

Fish and Wildlife

The Calamus Fish Hatchery is located below Virginia Smith Dam and Calamus Reservoir. 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.

The State of Kansas is presently using the fish hatchery facility below Cedar Bluff Reservoir for waterfowl habitat.

State of Colorado Division of Wildlife

The State of Colorado 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. Subordination Agreements also exist between Reclamation, the Ainsworth Irrigation District and the Nebraska Public Power District and between Reclamation, the Mirage Flats Irrigation District and the Nebraska Public Power District. Provisions of these agreements will be incorporated into the 2013 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 presented a Summary Report of Preliminary Findings for the study at the 2011 Republican River Compact annual meeting held in Burlington, Colorado on August 31, 2011. The Republican River Compact Administration (RRCA) will review the report and determine if a formal study report is needed. If the RRCA requests a formal study report, the Conservation Committee will complete the report within 6 months of the RRCA's request.

"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 that "Water-Short Year Administration" would not be in effect in 2012.

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 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.

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 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 and recreation areas and initial surface water model scoping activities. To date, Reclamation has not received the necessary funding for the study.

Republican River Basin Study

In November 2012, the states of Colorado, Kansas and Nebraska entered into a Memorandum of Agreement to conduct a study of the Republican River Basin under Reclamation's WaterSMART (Sustain and Manage America's Resources for Tomorrow) Basin Study Program. The 2 year study encompasses the entire Republican River Basin down to the Clay Center stream gage in Kansas. The study will project future water supply and demands, analyze how existing water operations and infrastructure will perform in the face of uncertain or variable water supply, identify and evaluate options to improve operations and infrastructure to address future water supply needs, and recommend options (operations and infrastructure) to supply adequate water in the future. Study costs have been estimated at $848,000, which includes a federal contribution of $413,000 (49 percent) and a non-federal cost share of $435,000 (51 percent).

Niobrara River Basin Study

In 2010, the NDNR was selected for a Reclamation WaterSMART Basin Study for the Niobrara River Basin. Reclamation will provide $350,000 of federal funding and staff resources for the estimated $850,000 Niobrara Basin Study. The Niobrara Basin Study will determine current and future water demands of the basin, assist in the development and implementation of Integrated Management Plans (IMPs) for the basin, identify opportunities for meeting water supply needs through structural and nonstructural means, and analyze the potential effects of climate variability on water supply. Reclamation and NDNR will work collaborative in the development of a groundwater model and a surface water operations model to test the effects and potential viability of various management strategies under both current and potential future conditions. A Plan of Study was developed in early 2011 and a Memorandum of Agreement was signed in May 2011 outlining the scope of work for each agency. NDNR is proceeding with development of the groundwater and surface water operations model. Reclamation is developing an economic model that will work in conjunction with the groundwater/surface water operations model. The targeted completion date for the study is October 2013.

Northeast Nebraska Rural Water Supply Feasibility Study

Through Reclamation's 2010 Rural Water Supply Program, the Lower Niobrara Natural Resource District (LNNRD) recently completed an "Appraisal Investigation for Regional Water Supply System Study in Northeast Nebraska, January 2011". This investigation evaluated and pursued the formation of a new rural water system in northeastern Nebraska. The study area (which experiences both water quality and quantity concerns) included the towns of Center, Niobrara, and Creighton, along with the Santee Sioux Nation and areas served by the West Knox Rural Water System (RWS). Expansion of the West Knox RWS was identified as the most promising alternative.

Reclamation reviewed the LNNRD Appraisal Investigation and completed a report titled "Northeast Nebraska Water Supply System Appraisal Report, March 2011". Reclamation concluded that the LNNRD Appraisal Investigation met all requirements of the Rural Water Supply Program and that the alternatives suggested were viable to move to the Feasibility Study phase.

The LNNRD used the results of the appraisal investigation and report to successfully compete for funding of a Feasibility Study through the 2011 Rural Water Supply Program. The Feasibility Study will attempt to identify a preferred alternative that will provide the area with a clean and reliable water supply, including determining affordable solutions to reduce the secondary contaminant levels in the Santee Sioux water supply, to improve water quality to the villages of Center and Niobrara, and to identify a water supply sufficient to meet the areas water demands projected for the year 2055. The study will determine potential costs, environmental issues, and provide an economic analysis of each of the alternatives identified. Through a cooperative agreement with the LNNRD, Reclamation is providing financial assistance for the Feasibility Study, which is scheduled to be completed by April 2013. The non-federal study partners are required to provide a minimum of 50 percent of the study costs.

South Sioux City, Nebraska – Rural Water Supply Appraisal Investigation

The city of South Sioux City, Nebraska submitted a successful appraisal investigation proposal through Reclamation's 2011 Rural Water Supply Program. The intent of the appraisal investigation is to examine the comprehensive water supply problems, needs, and opportunities throughout Dakota and Thurston Counties located in northeast Nebraska. These two counties are located adjacent to the Missouri River and include a mixture of large and small communities, two existing rural water systems, Indian tribes/tribal organization (Omaha and Winnebago), multiple Natural Resources Districts, and numerous rural customers. The study area is experiencing both limited water quantities and poor water quality.

Reclamation is providing financial assistance to South Sioux City through a cooperative agreement. The appraisal investigation is scheduled to be completed by April 2013, after which Reclamation will complete an appraisal report by October 2013.

Emergency Management

The NKAO continues to coordinate with local jurisdictions that could potentially be impacted by flooding from large operational releases and/or dam failure. A Tabletop Exercise of the Emergency Action Plan (EAP) for Norton Dam was held in 2012, and Functional Exercises were held for the Webster Dam and Glen Elder Dam EAPs. EAP Tabletop Exercises are scheduled in 2013 for Trenton, Red Willow and Medicine Creek dams. Functional Exercises are scheduled for the Bonny Dam, Cedar Bluff Dam, Enders Dam and Kirwin Dam EAPs in 2013. Communications Directories for all of the EAPs are reviewed annually.

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. The NKAO has two satellite phones 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, and open to any other NKAO personnel finding the training relevant to their duties, was held in McCook, Nebraska in March 2012. This training, held in conjunction with the Dam Operator training required every 3 years, provided personnel the opportunity to update their training in Defensive Driving, First Aid, and Security, along with the annual Respirator Training and Fit Testing.

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 are not on-the-spot correctible. This format provides for enhanced communication and coordination between both the Area Safety Specialist and Staff, and teams of Dam Safety Specialists.

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 contractor safety, defensive driving, NFPA 70E Electrical Safety/Arc Flash, construction equipment safety, lock out/tag out, personal protective equipment (PPE), welding, cutting, coating safety procedures, confined space, pesticide and herbicide use (MSDS), fall protection/slips, trips, and falls, working alone, near-miss accident reporting, and completing job hazard analyses (JHAs), with emphasis from managers, supervisors, employees, and the NKAO Safety Committee. Employees were provided safety and health training and given information related to these and several other issues throughout the year.

CHAPTER II - NIOBRARA AND LOWER PLATTE RIVER BASINS

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 2003 to 2012, the project water supply averaged 9,503 AF, which is about 0.81 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 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.

2012 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 7.53 inches, which is 44 percent of normal and the lowest annual precipitation ever recorded at the site. The 2012 total inflow of 9,464 AF was below the dry-year forecast and the lowest annual computed inflow ever recorded at the reservoir.

The reservoir level began the year at elevation 3996.99 feet (10.0 feet below the top of conservation). The pool level gradually increased during the late winter and early spring peaking at elevation 4000.92 feet on May 5. Precipitation during May was the second lowest ever recorded near the dam, resulting in the lowest computed inflow ever recorded for the month. From early June through late August, diversions of 12,248 AF to the Mirage Flats Canal provided irrigation water for approximately 11,662 acres, 100 percent of the service available acreage. The farm deliveries from the project water supply totaled 4,511 AF (0.39 acre-foot per irrigated acre), which is a delivery efficiency of 37 percent. Total reservoir storage was 6,057 AF at the end of the irrigation season. Privately owned irrigation wells supplemented the project water supply.

The NDNR ordered that natural flows of the Niobrara River not be stored in Box Butte Reservoir from May 17 through September 7 because the demands of other legal appropriators were not being met. The reservoir level at the end of the year was 3989.50 feet (17.5 feet below the top of conservation).

Higher reservoir levels experienced in 2011 resulted in increased toe drain seepage and observed wet areas below the dam. Engineers with Reclamation's Technical Service Center (TSC) out of Denver, Colorado followed up with a special inspection that summer. Irrigation releases decreased the reservoir level throughout the summer, seepage returned to near normal levels, and observed wet areas dried up. Three SOD recommendations were completed in 2012 as a result of this event including performing an Issue Evaluation on changed seepage conditions at higher reservoir levels, stockpiling of filter sand and drain gravel at the dam, and daily monitoring of instrumentation when the reservoir level exceeds 4004.00 feet. An Internal Alert remains in effect at the dam.

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. In 2011, the district received funding assistance through the Water Conservation Field Services Program (WCFSP) to install a trash screen and a number of flow meters on an existing pipe lateral. This project was completed in 2012 and will improve district operations and water accounting.

2013 Outlook

The project water supply is expected to be inadequate in 2013 as it has been since the early 1960's. In the spring, the district will inform their water users of the amount of water that will be available from storage in Box Butte Reservoir. It is anticipated that district irrigators will continue to use their privately-owned irrigation wells as a supplemental supply.

The district's future water conservation plans include the automation of Dunlap Diversion Dam and the outlet works gate at Box Butte Dam. The district will again seek Reclamation's assistance in installing equipment to meet those needs as well as to fine tune the automation and remote monitoring system already in place. The district is also researching opportunities to provide groundwater recharge benefits in the project area. District delivery system improvements will be reviewed as a potential alternative in the on-going Niobrara River Basin Study.

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 Snake River flows and Merritt Reservoir storage. 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 cubic feet per second (cfs) below Merritt Dam.

Reclamation has executed a Memorandum of Agreement (MOA) between Reclamation, the 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.

2012 Summary

Precipitation, as recorded near Merritt Dam, totaled 10.26 inches, which was 50 percent of normal. This was the lowest annual precipitation ever recorded at the site. The inflow for the year totaled 180,654 AF. This inflow was between the dry-year and normal-year forecasts. The reservoir level at the beginning of the year was at elevation 2944.10 feet. February precipitation at the dam was the greatest ever recorded for the month, while August and September precipitation totals were the second lowest ever recorded for the respective months. The water supply was more than adequate to meet the project's irrigation requirement. There were 85,118 AF diverted from Merritt Reservoir into Ainsworth Canal, with 55,378 AF delivered to the farm headgates (delivery efficiency of 65 percent). There were 34,607 acres of land irrigated in 2012. The reservoir elevation at the end of 2012 was 2944.10 feet.

The district provided a total of 560 AF of irrigation water from holding ponds located within the district's service area.

The NDNR ordered that natural flows of the Snake River not be stored in Merritt Reservoir from May 19 through September 6 because the demands of other legal appropriators were not being met. This was the second consecutive year that a closing order was issued for Merritt Reservoir.

During the 2011annual site inspection at Merritt Dam, a large seep located near the outlet works stilling basin wing wall was observed to be transporting a sand material. After discussions with personnel in the Regional Office and TSC, it was determined that the seep was an ongoing issue, and the seep is currently being monitored twice a week to ensure the situation remains stable. An Internal Alert remains in effect.

Working with Reclamation's technical and financial assistance through a cooperative agreement, the district installed automation equipment on the lateral turnouts to the Sand Draw and Airport Laterals. Additionally, burial of lateral B-7.2, B-10.3, A-16.2, and B-13.1 were completed through the WCFSP. In addition to these current projects, the district has plans for additional lateral burial and automation efforts.

A Periodic Facility Review was held at Merritt Dam in March 2012.

2013 Outlook

During the winter months, the reservoir will be regulated to maintain elevation 2944.0 feet (2.0 feet below the top of conservation capacity). In order to alleviate erosive action to the lands around the reservoir and to maximize all benefits associated with the reservoir, releases from Merritt Reservoir will be regulated to fill the conservation capacity during the early spring. This filling generally takes place during April. If weather conditions or irrigation demands dictate, it may be necessary to begin filling the reservoir prior to this time. The reservoir level will be maintained from the end of April until irrigation releases begin. A 50 cfs release to the Snake River will begin when irrigation releases drop the reservoir pool below elevation 2946.0 feet. This release will be made for approximately 20 days and then terminated until the end of the irrigation season. Once the reservoir begins to refill following the irrigation season, a release of 50 cfs to the Snake River will resume until the reservoir reaches the desired winter elevation.

The water supply is expected to be adequate in 2013 for the irrigation of 35,000 acres.

The Standing Operating Procedures (SOP) for Merritt Dam is scheduled for revision in 2013.

Initiation of an Issue Evaluation for the river outlet/spillway structure drains will be pursued in 2013 to address the transportation of sand observed in 2009 and also 2011.

In accordance with the Ainsworth Irrigation District's water conservation plan, improved water measurement opportunities were identified as one of the main objectives of the district. The district is working with Reclamation to investigate the possibility of installing some new ramp flumes to improve delivery system operations. The district continues to evaluate measurement and automation opportunities on a number of laterals and turnouts. The district will be reviewing delivery system improvements as a potential alternative in the on-going Niobrara River Basin Study.

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 and 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 are also open to day-use fishing with handicapped accessibility provided.

2012 Summary

Precipitation at Virginia Smith Dam was 11.78 inches which is 49 percent of normal for the year and the lowest annual total recorded at the site. The inflow totaled 268,633 AF which was between the dry-year and normal-year forecasts. The reservoir level at the first of the year was elevation 2239.37 feet (4.6 feet below the top of conservation). The conservation pool filled on April 18. Virginia Smith Dam recorded the second lowest June precipitation on record, the lowest ever for July, the third lowest for August, and the lowest ever for September. Even with the extremely dry season, the water supply was adequate for the district's needs.

There were 145,574 AF of water released into Mirdan Canal and 2,565 AF diverted through Kent Canal from the North Loup River. A total of 68,013 AF was diverted for district use above Davis Creek Reservoir. The farm headgate delivery was 39,719 AF which is a delivery efficiency of 58 percent. Land irrigated in 2012 totaled 34,110 acres above Davis Creek Reservoir. The Calamus Fish Hatchery used bypassed natural flows and storage from the reservoir totaling 5,414 AF. Calamus Reservoir inflows were bypassed during July, August, and September as required. The reservoir level reached an historic low on October 1 at 2221.03 feet (23.0 feet below the top of conservation). The elevation at the end of the year had increased to 2235.14 feet.

The precipitation total of 13.78 inches near Davis Creek Dam was 56 percent of normal, the lowest annual total recorded at the site. Inflow to Davis Creek Reservoir totaled 63,860 AF during 2012. Beginning in mid April, Davis Creek Reservoir was filled from an elevation of approximately 2046.58 feet to a peak elevation of 2069.65 feet on June 15 using diversions from Calamus Reservoir. Monthly precipitation totals for June, July, and August were the lowest ever recorded at the site. A release of 46,711 AF was made from Davis Creek Dam into Fullerton Canal, with 30,606 AF delivered to the farm headgates which is a 66 percent delivery efficiency. There were 21,016 acres irrigated below Davis Creek Reservoir. The reservoir elevation at the end of 2012 was 2063.51 feet, approximately 15 feet higher than the normal wintering level. This higher elevation was needed due to extensive canal concrete lining repairs scheduled for the spring of 2013. These repairs will reduce the amount of time available in filling Davis Creek Reservoir this spring.

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. In 2011, the district completed automation of turnouts on Mirdan laterals 36.3 and 37.1 and also completed a small canal lining project.

A Periodic Facility Review was held at Virginia Smith Dam in March 2012.

A Comprehensive Facility Review was held at Davis Creek Dam in June 2012.

2013 Outlook

Filling of Calamus Reservoir will continue through late winter and early spring. The reservoir will be allowed to fill to an elevation of 2244.0 feet (top of conservation capacity) in late March or April. This reservoir level will be maintained in order to minimize shoreline erosion until demands begin to draw on the reservoir. Bypassing of inflows will be made during July, August, and September under all inflow forecast conditions. In the fall, the reservoir will be filled to an elevation of approximately 2240.0 feet, if possible.

Water will be available for all irrigable acres with service from the Mirdan, Geranium, Scotia Canals, and Lateral Systems. It is estimated that approximately 34,000 acres will be irrigated from these canals. Water supplies will be sufficient to meet the full dry-year requirements.

The SOP for Virginia Smith Dam is scheduled for review in 2013.

Filling of Davis Creek Reservoir will take place this spring with flows diverted from the North Loup River at Kent Division Dam and transported through Kent and Mirdan Canals. Storage water can also be transferred from Calamus Reservoir into Davis Creek Reservoir during the summer months via Mirdan Canal. Water will be sufficient to irrigate an estimated 21,000 acres from Elba and Fullerton Canals under all inflow forecast conditions. The reservoir level will be regulated to normal winter levels at the end of the season.

The fish hatchery demand for 2013 is expected to be similar to that of the last few years with approximately 6,000 AF required for the hatchery.

The district plans to expand their remote monitoring capabilities by installing equipment at additional wasteways and key canal measurement sites throughout their delivery system. In addition to further remote monitoring capabilities, the district will continue to expand the radio control network. Additionally, the district intends to further integrate an alarm and monitoring system into their existing infrastructure to reduce the risk of operational failure.

CHAPTER III - REPUBLICAN RIVER BASIN

Armel Unit, Upper Republican Division in Colorado

General

Normal reservoir operations for Bonny Reservoir have historically been for recreation and fish and wildlife support, although water has been 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 can utilize Bonny Reservoir storage water for 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 historic operation pattern of Bonny Reservoir enhanced the spring fish spawn and provided excellent fishing opportunities during the summer and hunting conditions each fall. In September 2011, the state of Colorado ordered all storage water evacuated from Bonny Reservoir for Republican River Compact compliance. As a result, the reservoir fishery was decimated and future operations are unlikely to provide fishing opportunities.

2012 Summary

The annual precipitation total of 9.09 inches at Bonny Dam was 53 percent of average. The annual computed inflow of 2,824 AF to Bonny Reservoir was below the dry-year forecast and the lowest ever recorded at this site. The reservoir level began the year at elevation 3639.70 feet and gradually decreased to elevation 3638.09 feet on May 31. Reservoir storage decreased from 135 AF to 0 AF during this period with a river release of approximately 10 cfs. The outlet works intake was cleaned in 2012 to ensure effective releases at the extremely low pool level. Approximately 2,108 AF of water was released to the river from January 1 through May 17 as ordered by the Colorado State Engineer for compact compliance. In addition to the river release, approximately 18 AF was released into Hale Ditch from May 17 through May 31 as directed by the Colorado State Water Commissioner. The reservoir was drained by the end of May and remained empty during the last 7 months of the year. The bottom of the reservoir is approximately 34 feet below the top of conservation (3638.00 feet).

The SOP for Bonny Dam was revised in 2012.

2013 Outlook

The state of Colorado's order to release all of the storage in Bonny Reservoir for Republican River Compact compliance remains in effect. If the order continues throughout 2013, water will not be available in the reservoir for irrigation or fishery purposes. Any water allowed to be stored in Bonny Reservoir during 2013 would be available to Hale Ditch and other private irrigators under short-term water service contracts executed with the state.

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 irrigation releases 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. Due to extremely low storage levels, irrigation releases have not been made from Enders Reservoir since 2003.

Annual reservoir inflows have steadily declined from around 61,000 AF when Enders Dam was constructed to only 6,000 AF in recent years. Extensive groundwater pumping from upstream well development along with various conservation practices have resulted in the depletion of inflows. The conservation pool has not filled since 1968.

2012 Summary

The annual precipitation total of 12.29 inches at Enders Dam was below normal (65 percent). The 2012 inflow into Enders Reservoir of 4,509 AF was below the dry-year forecast. The reservoir level began the year at elevation 3093.27 feet (19.03 feet below top of conservation). The reservoir level increased slightly during the spring to a peak elevation of 3094.42 feet on May 1 and then gradually decreased through late November reaching elevation 3090.52 feet on November 26. June computed inflow was the lowest ever recorded for the month. Due to the extremely low water supply available, no water was released from Enders Reservoir. The end of the year reservoir level was 21.59 feet (3090.71 feet) below the top of conservation.

The Frenchman Valley Irrigation District diverted 5,470 AF of natural flow from Frenchman Creek. The district reports that approximately 1,020 acres received 515 AF of water in 2012. Farm delivery averaged about 0.50 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 2012 due to the extremely low water supply. This was the tenth consecutive year that the district did not deliver water.

In 2012, the Frenchman Valley Irrigation District (along with Reclamation) again provided support for a Limited Irrigation Demonstration project with the University of Nebraska Extension Service.

2013 Outlook

The fall and early winter inflows into Enders Reservoir were below the normal-year forecast. If dry-year conditions prevail, the project water supply is expected to experience a shortage of about 72,500 AF. Normal-year conditions are expected to be inadequate by 56,100 AF and wet-year conditions by 28,000 AF, to irrigate the 9,292 acres in the Frenchman Valley Irrigation District and 11,915 acres in the H&RW Irrigation District.

All surface water appropriations in the Republican River Basin above Guide Rock Diversion Dam were closed by the NDNR on January 1, 2013. Reservoir inflows have been bypassed through Enders Reservoir since this time and natural flow diversions are prohibited.

A 4-inch sinkhole was discovered near the left wall of the spillway stilling basin in October 2010. While the location of the sinkhole suggested that the issue was not urgent, further investigations were warranted to ensure that the situation was understood. A dye test was performed in August 2012. No dye showed up in the spillway basin or the outlet works basin. Even after being saturated with dye, probing to a depth of 8 feet was difficult. It is expected that the initial recommendation to further investigate the sinkhole will be listed as complete in 2013.

The Frenchman Valley Irrigation District has expressed an interest in replacement of additional open ditch laterals with buried pipe. Future piping projects are somewhat limited due to the water supply shortage. The district is also investigating remote monitoring opportunities to improve the delivery system operations. The district has identified two additional operational wasteway sites that would improve delivery systems with remote monitoring.

The Frenchman Valley Irrigation District and the H&RW Irrigation District are investigating possible alternatives for the most efficient use of the declining water supply in the basin. The districts have also participated in discussions with NDNR on the water supply issues as they relate to the Republican River Compact and the settlement.

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, 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.

2012 Summary

The annual precipitation total of 12.94 inches at Trenton Dam was 65 percent of normal. The inflow of 23,105 AF to Swanson Lake was between the dry-year and normal-year forecasts. The lake level began the year at elevation 2740.20 feet and gradually increased to a peak elevation of 2744.03 feet (7.97 feet below the top of conservation) on May 5. August precipitation was the second lowest ever recorded at Trenton Dam. The reservoir level decreased throughout the irrigation season and reached an elevation of 2733.24 feet on September 1. The district diverted 32,955 AF from June 11 through August 31 and delivered 10,784 AF to the farms. At the end of the year the reservoir level was 19.59 feet below the top of conservation at 2732.41 feet. The Corps of Engineers determined that Swanson Lake prevented $2,500 in flood damages.

During a routine inspection, a crack was found along a horizontal weld towards the downstream end of the canal outlet works penstock. The penstock was repaired in September 2012.

A sediment survey was completed for Swanson Lake. Field collection data obtained in 2011 was processed and analyzed, and a final report was published early in May 2012.

The SOP for Trenton Dam is scheduled for revision in 2013.

The annual precipitation total of 9.65 inches at Red Willow Dam was 49 percent of normal and the lowest ever recorded at the site. The annual inflow of 10,905 AF into Hugh Butler Lake was between the dry-year and the normal-year forecasts. The reservoir level at the first of the year was 2553.45 feet, 28.35 feet below the top of conservation. Due to dam safety concerns, releases were made throughout the year to maintain the reservoir elevation between 2552.00 and 2554.00 feet. Releases averaged 24 cfs during the spring months in maintaining the desired reservoir level. No irrigation releases were made from Hugh Butler Lake in 2012. September precipitation was the lowest ever recorded at Red Willow Dam. The end of year elevation at Hugh Butler Lake was 2553.63 feet, 28.17 feet below the top of conservation.

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 was issued and grouting of the underdrain system was completed in the fall of 2010.

On October 21, 2009, a small hole was observed on the face of the downstream embankment approximately 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 Response Level I was declared and remains in effect. 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 mean sea level (msl).

A Corrective Action Study (CAS) began in March 2010 to identify structural alternatives for repairing the dam, estimate risk for potential failure modes, and to document the technical, cost, and constructability of the various alternatives. The December 2010 CAS Decision Document identified the preferred alternative consisting of a full-height full-length filter/drain and construction of a berm/buttress to protect the filter and drains. The Modification Report, Finding of No Significant Impact, and Environmental Assessment were transmitted to Congress in July 2011. Final designs and contract documents were prepared during the summer of 2011. In September 2011, a contract was awarded for the dam modification, and construction began in late 2011.

A Comprehensive Facility Review was held at Red Willow Dam in July 2012.

The annual precipitation total of 12.00 inches at Medicine Creek Dam was 58 percent of normal. The inflow of 31,018 AF was between the dry-year and normal-year forecasts. The reservoir level at the beginning of 2012 was only .81 foot below the top of conservation. Releases were made during the first 4 months of 2012 to maintain the reservoir elevation approximately .5 foot below the flood pool. The reservoir was allowed to fill on April 21 (elevation 2366.10 feet), and the reservoir level gradually increased to elevation 2366.65 feet on May 5. Irrigation releases began in early June and ran through August 28 reducing the reservoir level to 2349.37 feet. Medicine Creek Dam recorded the lowest precipitation total ever for the month of August. The district diverted 27,618 AF into Cambridge Canal and delivered 14,568 AF to 16,798 acres of district lands. Late fall and early winter inflows increased the level of Harry Strunk Lake to 10.1 foot below the top of conservation at the end of the year (2355.97 feet). The Corps of Engineers determined that Harry Strunk Lake prevented $2,100 in flood damages.

A Comprehensive Facility Review was held at Medicine Creek Dam in July 2012.

The spillway bridge approach guardrail was replaced at Medicine Creek Dam in 2012.

The district was selected for a 2011 WaterSMART Water and Energy Efficiency Grant (WEEG) for a project which consists of installing a pumping plant on Cambridge Diversion Dam and 2 miles of 30-inch diameter pipe to the Bartley Canal. The pumping plant will include installation of four 2,500 gallon per minute pumps. This project will allow alternative water management options for the water supply in Bartley Canal.

The project is expected to result in water savings of 4,660 acre-feet per year. Water conserved as a result of the project will be left in Swanson Lake. Reclamation is providing $630,000 of financial and technical assistance for the estimated $1.26 million project.

The district was selected for a 2012 WaterSMART WEEG for a project which will allow the district to automate the Cambridge Canal headgate and the first section check structures in Cambridge Canal. This will improve district delivery system operations by minimizing river bypass and allow the district to store water in the larger canal bays. The estimated water savings from this project are 3,074 AF/year. The project includes a federal funding contribution of $299,715 and a non-federal contribution of $332,301.

The district was also selected for a 2012 NKAO WCFSP grant for a project which will allow the District to automate the new Bartley Canal pumping plant on Cambridge Diversion Dam and to automate six check structures located downstream of the pumping plant outlet pipe. This project will provide delivery system improvement options and result in an estimated water savings of 1,622 AF/year. This project includes $95,902 of federal funding assistance with the District contributing $96,388 through funding and in-kind services.

2013 Outlook

Forecasts show that carry-over storage from the three lakes supplying the Frenchman-Cambridge Irrigation District will be inadequate to meet the full dry-year irrigation requirement by 76,100 AF. The water supply will be inadequate by 52,400 AF under normal-year conditions and by 28,000 AF under wet-year conditions. Most of the water shortage in 2013 can be attributed to the closing notice issued by the NDNR on all natural flow and storage permits in the Republican River Basin. All surface water appropriations in the basin above Guide Rock Diversion Dam were closed on January 1, 2013. Reservoir inflows continue to be bypassed through Swanson, Hugh Butler and Harry Strunk Lakes.

Repairs will continue at Red Willow Dam. A majority of the work items have been completed. The contract completion date is the fall of 2013.

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.

In July 2007, the Kansas Department of Wildlife and Parks and the Almena Irrigation District entered into a Memorandum of Agreement (MOA) to maintain a minimum pool elevation in the reservoir for 10 years. The MOA was approved by the irrigators within the district and provided that no water would be released for irrigation below elevation 2288.5 feet.

2012 Summary

The annual precipitation at Norton Dam totaled 15.29 inches, which is 62 percent of normal and the third lowest recorded at the site. The total inflow of 5,177 AF was between the dry-year and normal-year forecasts. The reservoir was 5.9 feet below the top of conservation pool at the first of the year (2298.44 feet). The reservoir level slowly increased to elevation 2299.32 feet on May 2. May precipitation ranked as the second lowest ever recorded at the site. Irrigation releases were made during June and July reducing the lake level by over 3 feet.

The reservoir level continued to gradually decrease the remainder of the year. Keith Sebelius Lake ended the year at elevation 2293.97 feet (10.3 feet below the top of conservation).

The Almena Irrigation District reports that 2,450 acres received 1,806 AF of water in 2012. There were 3,172 AF of water diverted into the Almena Canal. Farm delivery averaged about .74 foot per irrigated acre with a farm delivery efficiency of 57 percent in the district.

The city of Norton used 405 AF of municipal water during 2012.

Trees and brush were removed from the downstream channel at Norton Dam in 2012 to satisfy the requirements of an Operation and Maintenance recommendation made during the 2002 Comprehensive Facility Review.

2013 Outlook

If 2013 is a dry year without significant runoff producing storms above Keith Sebelius Lake, it is anticipated that the water supply may be inadequate by as much as 13,600 AF. If normal inflow into the lake and normal rainfall over the irrigated area occur in 2013, a shortage of 8,100 AF may be experienced. Requirements for the city of Norton will be met in full in 2013.

The district continues to plan projects to replace open ditch laterals with buried pipe that will reduce seepage losses, lessen maintenance requirements, and provide improvements in on-farm efficiencies. However, due to uncertainty of the district's water supply in the past and the temporary agreements with the State to forgo irrigation releases, the district may delay some identified delivery system improvement projects.

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.

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” was 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.

Bostwick Division - Harlan County Lake Operations

2012 Summary

The annual precipitation at Harlan County Dam totaled 18.14 inches of rainfall, which is 80 percent of normal. The 2012 inflow of 78,581 AF was between the dry-year and normal-year forecasts. Harlan County Lake began 2012 approximately 0.69 foot above the top of conservation pool, at 1946.42 feet. River releases varied from 10 cfs to 300 cfs during the first 2 months of the year, and the lake level gradually filled to elevation 1947.20 feet by March 1. Additional water was temporarily stored into the flood pool so releases could be made to flush the downstream channel. The Corps of Engineers has cooperated with the State of Nebraska and the Twin Valleys Weed Management Group in making an elevated March release since 2009. These releases keep the Republican River channel from developing areas of vegetation and help re-establish channel capacity. River releases were staged up from 700 to 1,000 cfs on March 5 and staged back down to 750 cfs on March 9. The release was decreased to 250 cfs on March 13 and to 100 cfs on April 23. The lake level was maintained near elevation 1946.5 feet through mid May. Irrigation releases began on May 21 and continued through August 30.

The lake level on September 1 was 1936.38 feet. Computed inflow at Harlan County Lake was the third lowest on record in June, fourth lowest in July, third lowest in August and October, and lowest ever in September and December.

The pool gradually decreased to elevation 1935.20 feet on December 12. The reservoir elevation was 1935.28 feet (10.5 feet below the top of conservation) on December 31, 2012. Harlan County Lake prevented $11,400 of downstream flood damages during 2012 according to the Corps of Engineers.

A total of 37,353 AF (approximately 75 percent of total inflow) was delivered to Lovewell Reservoir via Courtland Canal during 2012.

Bostwick Division - Nebraska

2012 Summary

Irrigation diversions were made into Franklin, Naponee, Franklin Pump, Superior, and Courtland Canals in Nebraska in 2012. The district diverted 45,131 AF of water and delivered 21,770 AF to the farm headgates (48 percent delivery efficiency).

In 2011, the Bostwick Irrigation District in Nebraska was awarded a WaterSMART WEEG for a project which will replace approximately 8.3 miles of open ditch laterals with buried pipe. Franklin Laterals 30.9 and 41.9 will be replaced with buried pipe, resulting in an estimated water savings of 1,660 AF/year. Reclamation is providing $250,000 of financial assistance and the district is providing nearly $400,000 of funds and in-kind services. These pipe projects provide delivery system improvements by eliminating seepage losses, eliminating operational wasteways, improving water measurement and accounting by utilizing water meters, and providing on-farm benefits by allowing land owners the opportunity to convert to sprinkler irrigation.

In 2012, the Bostwick Irrigation District in Nebraska was awarded a WaterSMART WEEG for a project which will replace approximately 7.1 miles of open ditch laterals with buried pipe, install a variable speed drive on an existing pumping station, and install a new overshot gate on an existing check structure. Laterals to be placed in pipe include Franklin Laterals 29.8, 34.2, 34.7, 36.1, 36.6, 39.7, 40.2, and 43.0, along with Courtland Sub-Lateral 13.9-0.9. The project is expected to provide an estimated water savings of 1,428 AF/year. This project is to be completed with a federal contribution of $300,000 and a non-federal contribution of $366,700.

The district was also selected for a 2012 NKAO WCFSP grant for a project which will allow the District to convert 2.3 miles of open ditch lateral and canal to buried pipe. This project will replace Franklin Lateral 37.3 and the tail end of Naponee Canal with buried pipe. The project will provide an estimated water savings of 496 AF/year. This project includes $100,000 of federal funding assistance with the District contributing $124,221 through funding and in-kind services.

Bostwick Division - Kansas

2012 Summary

The 2012 precipitation at Lovewell Dam totaled 22.54 inches, which was 82 percent of normal. Precipitation in April was the second highest recorded for the month, while May precipitation was the second lowest recorded at the dam. The total inflow recorded at Lovewell Reservoir of 50,040 AF was below the dry-year forecast. The reservoir elevation at the beginning of 2012 was 1581.36 feet. The pool level gradually increased to elevation 1583.96 feet on May 6 (1.3 feet above top of conservation). Spring diversions via Courtland Canal into Lovewell Reservoir were not required in 2012.

Releases to the canal began on April 27 and continued through August 30. The reservoir elevation at the end of the irrigation season was 1572.83 feet. Republican River flow was diverted via Courtland Canal into Lovewell Reservoir through the end of December. The pool level at the end of the year was 1577.60 feet (5.0 feet below top of conservation).

The Kansas-Bostwick Irrigation District diverted a total of 76,855 AF to serve 11,394 acres above Lovewell Dam and 26,573 acres below Lovewell Dam. Farm delivery efficiency averaged 55 percent in the district.

A seepage measuring device was installed at the active embankment toe drain outfall at Lovewell Dam in 2012.

In 2011, the district was awarded a WaterSMART WEEG for a project which will replace approximately 5.5 miles of open ditch laterals with buried pipe. Courtland West Laterals 4.0 and 5.7 will be placed in pipe which will result in an estimated water savings of 2,064 AF/year. Reclamation is providing $290,000 of funding assistance and the district is providing $465,000 of financial and in-kind services. The Courtland West Lateral 5.7 was complete and operational prior to the 2012 irrigation season. The Courtland West Lateral 4.0 pipe project is scheduled to be completed in the spring of 2013.

The district was also selected for a 2012 NKAO WCFSP grant for a project which will allow the District to convert 2.0 miles of open ditch lateral and canal to buried pipe. This project will replace Miller Lateral 1.3 and Miller Sub-Lateral 2.8-1.4 with buried pipe. The project will provide an estimated water savings of 580 AF/year. This project includes $100,000 of federal funding assistance with the District contributing $128,457 through funding and in-kind services.

Bostwick Division

2013 Outlook

The storage in Harlan County Lake and Lovewell Reservoir and flows of the Republican River and White Rock Creek are expected to be inadequate in meeting the full dry-year irrigation requirement for the Bostwick lands.

The NDNR issued a closing notice on all natural flow and storage permits in the Republican River Basin on January 1, 2013. All surface water appropriations in the basin above Guide Rock Diversion Dam are currently closed. On April 1, 2013, NDNR issued a storage release notice for the federal reservoirs in the basin with the exception of Harlan County Lake. Discussions are currently under way on the treatment of water in Harlan County Lake.

A sediment survey is underway for Lovewell Reservoir. Field collection data obtained in 2011 is being processed and analyzed. A final report is expected to be published early in 2013.

The SOP for Lovewell Dam is scheduled for revision in 2013.

Sediment removal is scheduled for the fall of 2013 at both the Courtland Canal inlet and the spillway outlet channel at Lovewell Reservoir.

Both districts will continue to investigate remote monitoring site installation that will provide system operations improvements. Bostwick Irrigation District in Nebraska has installed canal automation equipment on a number of check structures along Franklin Canal through a Water Conservation Field Services grant. The district continues to explore opportunities to increase this radio automated network. Kansas Bostwick Irrigation District will continue to replace open ditch laterals with pipe.

CHAPTER IV - SMOKY HILL RIVER BASIN

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, 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.

2012 Summary

The annual precipitation total of 11.96 inches at Kirwin Dam was 51 percent of normal and the lowest yearly total ever recorded at the site. The inflow of 21,535 AF was between the dry-year and normal-year forecasts. The reservoir level was 0.3 foot above the top of conservation pool at the first of the year (elevation 1729.61 feet). A 50 cfs river release was made from January 1 through May 15 maintaining the pool level near the top of conservation. May precipitation was the lowest ever recorded at Kirwin Dam and June precipitation was the third lowest recorded at the site. The reservoir level slowly decreased to elevation 1728.84 by June 4. Irrigation releases began on June 4 and continued through August 31 decreasing the reservoir level to 1722.68 feet. The reservoir level gradually decreased through November 24 reaching 1722.05 feet. The reservoir elevation was 1722.21 feet on December 31 (7.0 feet below the top of conservation). The Corps of Engineers determined that Kirwin Reservoir prevented $3,200 in flood damages.

A total of 8,476 acres received project water during 2012 with 12,415 AF delivered to farms. Farm delivery efficiency was 56 percent.

In the spring of 2011, the district completed a WCFSP project which replaced approximately 2.6 miles of open ditch laterals with buried pipe. Kirwin South Laterals 8.6 and 9.2 were placed in pipe which resulted in an estimated water savings of 600 AF/year. Reclamation provided $85,000 of financial assistance, and the district provided $92,000 of funds and in-kind services.

2013 Outlook

Carry-over storage and the forecasted inflows in the North Fork of the Solomon River are expected to be adequate to irrigate all district lands even with below normal precipitation and dry-year forecasted inflows.

The district has been awarded a WCFSP Grant for a project to replace approximately 2 miles of open ditch lateral with buried pipe. Kirwin South Lateral 14.4 will be placed in pipe which will result in an estimated water savings of 504 AF/year. Reclamation is providing $100,000 of financial assistance, and the district will provide $110,000 of funds and in-kind services. The project was completed prior to the 2012 irrigation season. The district is also assisting landowners with on-farm improvements such as the installation of sprinklers through assisting with burying lines to pivots and through the relocation of turnouts. Future conservation projects include the possibility of installing remote monitoring equipment at the wasteways and at the Kirwin North/South Canal split. Future conservation projects may be delayed due to the declining water supply and availability of cost-share funding.

The district and Reclamation continue to participate in the Solomon Basin Working Group meetings as part of the State of Kansas' Sub-Basin 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.

The Kirwin Dam SOP is scheduled for revision in 2013.

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.

2012 Summary

In 2012, the precipitation at Webster Dam was 72 percent of normal (16.92 inches). The inflow of 11,090 AF was between the dry-year and normal-year forecasts. The reservoir level was approximately 5.1 feet below the top of conservation pool at the first of the year (elevation 1887.31 feet). The reservoir level gradually increased to a peak elevation of 1889.41 feet on May 5. May precipitation ranked as the second lowest on record at Webster Dam. Irrigation releases began June 9 and continued through August 30 decreasing the reservoir level to 1880.39 feet. The pool level slowly dropped to elevation 1879.41 feet on December 13 and then gradually increased to elevation 1879.44 feet on December 31 (13.0 feet below the top of conservation). The Corps of Engineers determined that the reservoir prevented $1,100 in flood damages.

A total of 5,663 acres received project water during 2012 with 7,194 AF delivered to farms. Farm delivery efficiency was 55 percent.

The district continued to explore opportunities to cost share with Reclamation and district irrigators for the replacement of open ditch laterals with buried pipe.

2013 Outlook

The carry-over storage and the flows in the South Fork Solomon River are expected to be inadequate to irrigate all district lands in 2012 under dry-year forecasted inflows and below normal precipitation. The water supply will be adequate under most probable inflow conditions.

The district was awarded a 2011 WaterSMART WEEG for a project that will replace approximately 2 miles of open ditch laterals with buried pipe. Osborne Lateral 27.3 will be replaced with buried pipe, resulting in an estimated water savings of 588 AF/year. Reclamation is providing $118,500 of financial assistance and the district is providing $118,500 of funds and in-kind services. The project was completed prior to the 2012 irrigation season.

The district was selected for a 2012 NKAO WCFSP grant for a project which will allow the District to replace open ditch Osborne Lateral 22.4 with buried pipe. This project will provide delivery system improvement options and result in an estimated water savings of 684 AF/year. This project includes $100,000 of federal funding assistance with the District contributing $115,000 through funding and in-kind services.

Due to the recent improvement in the district's water supplies, there has been increased interest in cost sharing for water conservation projects such as replacement of open ditch laterals with buried pipe. The district will continue to seek outside funding for water conservation improvement projects. 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.

Glen Elder Unit, Solomon Division in Kansas

General

Releases from Waconda Lake are 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 is 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 is normally regulated at 1 to 2 feet below the top of conservation capacity during the winter months. Maintaining the lake at this level reduces shoreline erosion, provides a buffer for spring runoff and lessens ice damage to the upstream face of Glen Elder Dam. Releases from Waconda Lake are regulated each year to maintain a constant water surface level while the lake is ice-covered.

2012 Summary

The annual precipitation total of 19.99 inches at Glen Elder Dam was 78 percent of normal. The inflow of 109,096 AF was between the dry-year and normal-year forecasts. The lake level at the beginning of the year was 0.7 feet below the top of conservation. River releases were adjusted from 100 cfs to 300 cfs during the first 3 months of the year to maintain the pool level approximately 1 foot below the top of conservation. Precipitation during April (5.77 inches) was the greatest on record at Glen Elder Dam while May precipitation (0.18 inch) was the second lowest recorded at the dam for the respective months. Waconda Lake filled to the top of conservation on May 16 (1455.60 feet). Irrigation releases began on June 15 and continued through September 10 decreasing the lake level to 1452.84 feet. The level of Waconda Lake at the end of the year was 2.9 feet (elevation 1452.67 feet) below the top of conservation. Waconda Lake prevented $17,700 of downstream flood damages during 2012 according to the Corps of Engineers.

A total of 82,918 AF of water was released from Glen Elder Dam in 2012. Storage releases of 9,024 AF combined with natural flow releases of 9,796 AF for the irrigation of 5,936 acres in the Glen Elder Irrigation District. The district delivered 8,371 AF to the farms resulting in a delivery efficiency of 45 percent. No storage releases were made for the city of Beloit; however, 3,313 AF was bypassed for water quality as directed by the State Water Commissioner. Releases to the Mitchell County Rural Water District No. 2 totaled 771 AF.

The concrete on the upstream curb of the spillway bridge was repaired in 2012. Grout pads under spillway gate hoist equipment were replaced as well as spillway pillow blocks at Glen Elder Dam.

2013 Outlook

The municipal requirement of Beloit and the requirements of the Mitchell County Rural Water District No. 2 will be met in full with releases as required from Waconda Lake. It is expected that the Kansas Water Commissioner will request that inflows be passed through the lake for water right administration. The storage in Waconda Lake and flows in the North and South Forks of the Solomon River will furnish a full water supply to the Glen Elder Irrigation District. The reservoir will be regulated to maintain a constant level during the winter months when the reservoir is ice-covered to minimize ice damage. Under normal-year conditions, the lake is expected to be maintained between 1 and 2 feet below the top of the conservation pool during the winter.

A revision of the Glen Elder Dam SOP is scheduled for 2013.

The Glen Elder Irrigation District continues to encourage their producers to advance water ordering times to improve on water releases, making more efficient use of the district's water supply. Some district pumping sites present problems due to river conditions at the sites. In order to minimize required reservoir releases, the district is investigating potential improvements to those water pumping sites.

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 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 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.

2012 Summary

The annual precipitation total at Cedar Bluff Dam was 14.97 inches which is 71 percent of normal. The 2012 inflow of 5,247 AF was below the dry-year forecast. The reservoir level at the beginning of the year was 2126.39 feet (17.6 feet below top of conservation). Inflows during the spring offset evaporation and seepage losses, and the reservoir level at the end of April was 2126.33 feet. Evaporation exceeded inflows throughout the remainder of the year and the reservoir level gradually decreased to elevation 2122.67 feet on December 31 (21.3 feet below the top of conservation). No release was made from the dam in 2012.

The state of Kansas operates and maintains the fish hatchery facility located below Cedar Bluff Dam. There were no releases to the facility in 2012. No water was released from Cedar Bluff Reservoir during 2012 for the city of Russell.

Concrete on spillway inlet of Cedar Bluff Dam was repaired in 2012.

2013 Outlook

Storage in Cedar Bluff Reservoir on December 31, 2012, was within the joint use pool. The Kansas Department of Wildlife and Parks is expected to use very little if any water in the operations of the fish hatchery facility. If conditions remain dry, the city of Russell and the Kansas Water Office may request a release to the river for recharge in 2013.

TABLE 1

RESERVOIR DATA - NIOBRARA, LOWER PLATTE AND KANSAS RIVER BASINS

		CAPACITY ALLOCATIONS 1/			
			LIVE CONSERVATION		
RESERVOIR		DEAD	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 4/	- Elevation Ft.	2185.0	2213.3	2244.0	---
	Total Acre-feet	35	20,150	119,469	---
	Net Acre-feet	35	20,115	99,319	---
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	0	0	36,508	165,328
	Net Acre-feet	0	0	36,508	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 5/	Total Acre-feet	1,027	10,329	110,175	244,362
	Net Acre-feet	1,027	9,302	99,846	134,187
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	9,985	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.)		32,379	264,764	1,457,448	3,815,125 2/
Total Net Acre-feet		32,379	232,385	1,192,684	2,357,677

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 1-1-13. Sedimentation Survey conducted in June 2012.

5/ New Area-Capacity Tables in effect 1-1-13. Sedimentation Survey conducted in May 2011.

TABLE 2
SUMMARY OF 2012 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)	MIRAGE FLATS CANAL Delivered To Farms (AF)
Jan.	1,140	40	102	0.84	16,462	0	0
Feb.	1,296	42	133	0.77	17,583	0	0
Mar.	1,977	44	245	0.00	19,271	0	0
Apr.	1,476	42	413	1.84	20,292	0	0
May	167	224	496	0.58	19,739	0	0
June	289	952	609	1.39	18,467	770	53
July	43	8,712	701	0.60	9,097	8,646	3,276
Aug.	156	2,813	382	0.05	6,058	2,832	1,182
Sep.	585	29	226	0.62	6,388	0	0
Oct.	799	31	169	0.47	6,987	0	0
Nov.	768	29	97	0.25	7,629	0	0
Dec.	768	30	59	0.12	8,308	0	0
TOTAL	9,464	12,988	3,632	7.53	--	12,248	4,511

NOTE -- Acres irrigated 2012: Mirage Flats Canal 11,662 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)	AINSWORTH CANAL Delivered To Farms (AF)
Jan.	14,895	14,658	237	0.30	61,370	0	0
Feb.	14,904	13,785	302	1.58	62,187	0	0
Mar.	17,405	12,139	436	0.31	67,017	0	0
Apr.	14,138	13,389	749	3.25	67,017	0	0
May	13,209	12,060	1,149	0.86	67,017	3,070	24
June	13,592	21,412	1,483	1.00	57,714	17,984	9,454
July	17,198	37,915	1,388	0.96	35,609	37,432	27,994
Aug.	16,333	22,979	777	0.43	28,186	23,014	16,387
Sep.	14,958	4,086	631	0.28	38,427	3,618	1,519
Oct.	15,347	922	572	0.54	52,280	0	0
Nov.	14,485	5,256	409	0.58	61,100	0	0
Dec.	14,190	13,607	313	0.17	61,370	0	0
TOTAL	180,654	172,208	8,446	10.26	--	85,118	55,378

NOTE -- Acres irrigated 2012: Ainsworth Canal 34,607 acres.

NORTH LOUP DIVISION

	CALAMUS RESERVOIR					ABOVE DAVIS CREEK			
					End of	Release to	MIRDAN CANAL		
	Inflow	Outflow	Gross Evap.	Precip.	Month Content	Calamus Fish Hatch.	Release to Canal	Canal Use	Delivered To Farms
Month	(AF)	(AF)	(AF)	(Inches)	(AF)	(AF)	(AF)	(AF)	(AF)
Jan.	21,983	14,761	449	0.01	111,872	312	0	0	0
Feb.	23,260	16,402	581	0.99	118,149	287	0	0	0
Mar.	25,114	20,460	1,058	0.75	121,745	466	0	0	0
Apr.	28,594	20,613	1,761	5.23	127,965	618	9,713	114	60
May	25,558	28,293	2,237	1.58	122,993	748	19,533	2,782	373
June	20,873	30,830	2,802	1.11	110,234	566	26,037	12,936	7,043
July	21,912	50,885	2,955	0.26	78,306	591	36,329	26,667	16,160
Aug	20,271	45,847	1,800	1.17	50,930	571	31,083	19,233	10,735
Sep.	19,804	27,835	1,253	0.11	41,646	353	14,358	6,281	5,348
Oct.	21,485	11,056	771	0.32	51,304	441	8,521	0	0
Nov.	19,966	1,516	490	0.10	69,264	243	0	0	0
Dec.	19,815	1,611	332	0.15	87,136	218	0	0	0
TOTAL	268,635	270,109	16,489	11.78	--	5,414	145,574	68,013	39,719

NOTE -- Acres irrigated 2012: Mirdan Canal 34,110 acres.

NORTH LOUP DIVISION (Continued)

	DAVIS CREEK RESERVOIR					BELOW DAVIS CREEK FULLERTON CANAL	
			Gross		End of Mo.	Release	Delivered
	Inflow	Outflow	Evap.	Precip.	Content	To Canal	To Farms
Month	(AF)	(AF)	(AF)	(Inches)	(AF)	(AF)	(AF)
Jan.	0	171	85	0.08	9,024	0	0
Feb.	78	155	59	0.94	8,888	0	0
Mar.	61	359	102	0.65	8,488	0	0
Apr.	6,700	307	199	3.57	14,682	0	0
May	12,253	4,308	299	6.00	22,328	3,499	68
June	10,150	11,927	462	0.36	20,089	11,010	7,545
July	7,075	17,479	435	0.00	9,250	17,451	14,290
Aug.	8,818	11,258	229	0.94	6,581	11,314	7,652
Sep.	8,718	3,358	220	0.71	11,721	3,437	1,051
Oct.	9,923	633	206	0.00	20,805	0	0
Nov.	0	863	175	0.08	19,767	0	0
Dec.	84	823	74	0.45	18,954	0	0
TOTAL	63,860	51,641	2,545	13.78	--	46,711	30,606

NOTE - Acres irrigated 2012: Fullerton Canal 21,016 acres.

TABLE 2
SUMMARY OF 2012 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.	547	585	14	0.00	83	0
Feb.	557	559	13	0.64	68	0
Mar.	497	492	17	0.44	56	0
Apr.	513	476	35	2.37	58	0
May	283	315	26	0.85	0	18
June	60	60	0	0.77	0	0
July	62	62	0	2.20	0	0
Aug.	62	62	0	0.50	0	0
Sep.	60	60	0	0.00	0	0
Oct.	62	62	0	1.32	0	0
Nov.	60	60	0	0.00	0	0
Dec.	62	62	0	0.00	0	0
TOTAL	2,825	2,855	105	9.09	--	18

TABLE 2
SUMMARY OF 2012 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.	571	246	79	0.05	17,730	0	0	0	0
Feb.	689	230	90	0.69	18,099	0	0	0	0
Mar.	525	246	148	0.26	18,230	0	0	0	0
Apr.	1,021	258	355	3.66	18,638	828	0	0	0
May	481	307	470	1.21	18,342	1,790	0	0	0
June	162	298	643	0.95	17,563	995	246	0	0
July	38	280	616	2.01	16,705	460	200	0	0
Aug.	1	246	571	1.25	15,889	203	69	0	0
Sep.	0	238	424	0.15	15,227	377	0	0	0
Oct.	218	246	174	0.99	15,025	817	0	0	0
Nov.	328	238	142	0.00	14,973	0	0	0	0
Dec.	475	246	80	1.07	15,122	0	0	0	0
TOTAL	4,509	3,079	3,792	12.29	--	5,470	515	0	0

NOTE: Acres irrigated 2012: Culbertson Canal - 1,020 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.	3,345	61	304	0.05	65,136	0	0
Feb.	4,319	58	331	0.63	69,066	0	0
Mar.	3,835	61	560	0.43	72,280	0	0
Apr.	5,473	60	1,320	3.94	76,373	0	0
May	1,559	61	1,976	0.82	75,895	0	0
June	1,159	6,315	2,650	2.12	68,089	6,586	2,208
July	2,035	14,610	2,515	3.18	52,999	14,518	5,299
Aug.	952	12,127	1,691	0.26	40,133	11,851	3,277
Sep.	163	75	1,199	0.16	39,022		0
Oct.	1	61	678	0.66	38,284	0	0
Nov.	1	60	374	0.00	37,851	0	0
Dec.	263	61	256	0.69	37,797	0	0
TOTAL	23,105	33,610	13,854	12.94	--	32,955	10,784

NOTE: Acres irrigated 2012: Meeker-Driftwood Canal - 12,596 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.	1,308	1,476	44	0.00	5,781	0	0	0	0
Feb.	1,531	1,381	48	0.64	5,883	0	0	0	0
Mar.	1,476	1,476	79	0.46	5,804	0	0	0	0
Apr.	1,623	1,379	227	2.35	5,821	0	0	564	0
May	1,014	730	341	0.83	5,764	0	0	1,893	225
June	811	865	417	1.73	5,293	0	0	1,358	713
July	564	274	441	1.94	5,142	0	0	1,985	1,219
Aug.	531	188	364	0.70	5,121	0	0	2,337	1,534
Sep.	178	119	265	0.13	4,915	0	0		0
Oct.	512	123	183	0.53	5,121	0	0	0	0
Nov.	648	119	88	0.03	5,562	0	0	0	0
Dec.	709	123	50	0.31	6,098	0	0	0	0
TOTAL	10,905	8,253	2,547	9.65	--	0	0	8,137	3,691

NOTE -- Acres irrigated 2012: Red Willow Canal - 0 acres; Bartley Canal 4,765 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.	2,793	2,233	135	0.08	33,523	0	0
Feb.	3,103	2,589	137	0.89	33,900	0	0
Mar.	3,228	2,767	244	0.83	34,117	0	0
Apr.	3,522	1,619	687	2.25	35,333	1,394	0
May	2,662	2,372	1,105	1.01	34,518	3,720	771
June	2,116	7,091	1,166	1.47	28,377	6,467	3,770
July	3,311	10,963	988	3.86	19,737	9,171	5,909
Aug.	2,100	8,156	639	0.34	13,042	6,866	4,118
Sep.	1,351	60	426	0.23	13,907	0	0
Oct.	2,035	97	322	0.40	15,523	0	0
Nov.	2,333	60	167	0.07	17,629	0	0
Dec.	2,464	62	92	0.57	19,939	0	0
TOTAL	31,018	38,069	6,108	12.00	--	27,618	14,568

NOTE -- Acres irrigated 2012: Cambridge Canal 16,798 acres.

TABLE 2
SUMMARY OF 2012 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.	489	50	122	0.10	23,535	19	0	0
Feb.	685	47	142	0.90	24,031	19	0	0
Mar.	584	50	243	0.74	24,322	19	0	0
Apr.	1,061	56	607	3.21	24,720	26	0	0
May	379	71	1,100	0.46	23,928	41	107	0
June	324	1,794	1,419	1.16	21,039	57	1,293	799
July	652	2,038	1,383	4.34	18,270	61	1,618	905
Aug.	299	191	936	1.69	17,442	52	154	102
Sep.	111	78	727	0.50	16,748	48	0	0
Oct.	143	57	386	1.42	16,448	26	0	0
Nov.	121	48	221	0.00	16,300	19	0	0
Dec.	329	49	118	0.77	16,462	18	0	0
TOTAL	5,177	4,529	7,404	15.29	--	405	3,172	1,806

NOTE: Acres irrigated 2012: Almena Canal - 2,450 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.	10,413	5,986	909	0.02	326,482	0	0	0	0
Feb.	17,441	7,458	962	0.69	335,503	0	0	0	0
Mar.	16,383	28,535	928	1.03	322,423	0	0	0	0
Apr.	17,613	12,877	3,519	4.53	323,640	0	0	0	0
May	7,349	5,338	7,017	2.98	318,634	421	0	0	0
June	4,066	24,697	7,814	2.55	290,189	9,074	2,845	454	176
July	1,884	42,350	8,124	2.26	241,599	13,049	7,614	874	531
Aug.	1,644	32,730	7,568	1.72	202,945	8,245	4,445	657	425
Sep.	226	250	5,436	0.56	197,485	81	0	0	0
Oct.	518	0	4,621	0.70	193,382	0	0	0	0
Nov.	60	0	2,317	0.00	191,125	0	0	0	0
Dec.	984	0	984	1.10	191,125	0	0	0	0
TOTAL	78,581	160,221	50,199	18.14	--	30,870	14,904	1,985	1,132

NOTE: Acres irrigated 2012: Franklin Canal - 11,065 acres; Naponee Canal - 1,607 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	4,484	0	0	3,054	356
June	458	165	2,954	671	14,327	158	133	7,818	2,788
July	744	369	4,122	2,267	21,384	482	416	9,382	5,756
Aug.	446	245	2,668	1,256	21,288	244	212	6,523	4,087
Sep.	0	0	0	0	3,093	0	0	0	0
Oct.	0	0	0	0	3,441	0	0	0	0
Nov.	0	0	0	0	3,504	0	0	0	0
Dec.	0	0	0	0	3,209	0	0	0	0
TOTAL	1,648	779	9,744	4,194	74,730	884	761	26,777	12,987

NOTE: Acres irrigated 2012: Franklin Pump Canal - 1,993 acres; Superior Canal - 6,056 acres.
Courtland Canal-Nebraska use - 1,734 acres.
Courtland Canal-Kansas use - 11,394 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.	1,201	0	1,201	12	174	0.15	32,953	0	0
Feb.	1,871	0	1,871	12	212	1.00	34,600	0	0
Mar.	1,820	0	1,820	12	383	1.36	36,025	0	0
Apr.	4,896	0	4,896	298	1,168	5.54	39,455	350	0
May	88	427	515	3,591	1,720	0.69	34,659	3,966	1,378
June	1,466	4,589	6,055	12,532	1,679	3.75	26,503	12,741	7,119
July	554	9,458	10,012	17,259	1,488	3.40	17,768	17,329	11,187
Aug.	66	12,836	12,902	16,323	850	2.53	13,497	15,692	9,556
Sep.	0	3,031	3,031	12	659	0.67	15,565	0	0
Oct.	158	2,047	2,205	12	512	2.73	17,538	0	0
Nov.	5	2,563	2,568	12	303	0.00	19,791	0	0
Dec.	562	2,402	2,964	12	158	0.72	22,585	0	0
TOTAL	12,687	37,353	50,040	50,087	9,306	22.54	--	50,078	29,240

NOTE: Acres irrigated 2012: Courtland Canal below Lovewell 26,573 acres.

TABLE 2
SUMMARY OF 2012 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.	2,404	3,074	352	0.00	98,967	0	0
Feb.	3,211	2,876	437	1.01	98,865	0	0
Mar.	3,685	3,074	713	1.87	98,763	0	0
Apr.	4,417	2,975	1,798	2.49	98,407	0	0
May	2,244	1,494	2,969	0.18	96,188	0	0
June	1,311	6,464	3,606	0.93	87,429	6,637	2,777
July	1,405	9,434	3,586	1.03	75,814	9,423	5,974
Aug.	1,217	6,502	2,293	2.20	68,236	6,311	3,664
Sep.	0	12	1,477	0.84	66,747	0	0
Oct.	199	0	1,075	0.76	65,871	0	0
Nov.	552	0	631	0.00	65,792	0	0
Dec.	890	0	334	0.65	66,348	0	0
TOTAL	21,535	35,905	19,271	11.96	--	22,371	12,415

NOTE: Acres irrigated 2012: Kirwin Canal - 8,476 acres.

SOLOMON DIVISION (Continued)
WEBSTER UNIT
WEBSTER RESERVOIR

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	OSBORNE CANAL Diversions To Canal (AF)	OSBORNE CANAL Delivered To Farms (AF)
Jan.	1,440	0	245	0.13	59,391	0	0
Feb.	2,146	0	279	1.05	61,258	0	0
Mar.	2,323	0	490	1.42	63,091	0	0
Apr.	2,994	0	1,129	3.20	64,956	0	0
May	926	0	1,981	0.19	63,901	0	0
June	0	6,413	2,666	1.24	54,822	3,942	1,247
July	484	8,448	2,501	2.07	44,357	5,832	3,894
Aug.	656	5,050	1,590	4.59	38,373	3,415	2,053
Sep.	0	0	891	1.32	37,482	0	0
Oct.	1	0	759	0.74	36,724	0	0
Nov	0	0	460	0.00	36,264	0	0
Dec.	120	0	217	0.97	36,167	0	0
TOTAL	11,090	19,911	13,208	16.92	--	13,189	7,194

NOTE: Acres irrigated 2012: Osborne Canal - 5,663 acres.

SOLOMON DIVISION (Continued)
GLEN ELDER UNIT
WACONDA LAKE

Month	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	End of Month Content (AF)	OUTFLOW TO RIVER 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.	12,053	15,029	822	0.14	207,392	0	0	0	14,971	58
Feb.	14,198	14,434	978	1.03	206,178	0	0	0	14,380	54
Mar.	15,745	11,138	1,684	1.99	209,101	0	0	0	11,074	64
Apr.	28,466	8,517	4,683	5.77	224,367	0	0	0	8,459	58
May	9,424	12,435	7,691	0.18	213,665	0	0	0	12,372	63
June	7,723	5,950	9,865	2.29	205,573	0	0	1,093	4,784	73
July	4,299	7,015	9,807	1.20	193,050	0	0	3,957	2,977	81
Aug.	5,538	4,281	6,960	3.06	187,347	0	227	3,187	793	74
Sep.	2,847	1,582	4,624	1.38	183,988	0	730	787	0	65
Oct.	3,299	980	3,095	2.22	183,212	0	922	0	0	58
Nov.	2,502	757	1,745	0.00	183,212	0	696	0	0	61
Dec.	3,002	800	869	0.73	184,545	0	738	0	0	62
TOTAL	109,096	82,918	52,823	19.99	--	0	3,313	9,024	69,810	771

NOTE: Acres irrigated 2012: Glen Elder District 5,936 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	450	0.00	78,915	0	0	0
Feb.	592	0	367	1.34	79,140	0	0	0
Mar.	481	0	594	1.37	79,027	0	0	0
Apr.	1,531	0	1,493	3.28	79,065	0	0	0
May	264	0	2,484	0.78	76,845	0	0	0
June	270	0	3,148	0.51	73,967	0	0	0
July	544	0	3,344	1.39	71,167	0	0	0
Aug.	1,564	0	2,459	4.08	70,272	0	0	0
Sep.	0	0	1,533	0.90	68,739	0	0	0
Oct.	1	0	1,212	0.86	67,528	0	0	0
Nov.	0	0	799	0.00	66,729	0	0	0
Dec.	0	0	496	0.46	66,233	0	0	0
TOTAL	5,247	0	18,379	14.97	--	0	0	0

TABLE 3

ACRES IRRIGATED IN 2012 AND ESTIMATES FOR 2013

Irrigation District and Canal	Acres With Service Available	Acres Irrigated in 2012	Estimated Acres to be Irrigated in 2013
Mirage Flats Irrigation District			
Mirage Flats Canal	11,662	11,662	11,000
Ainsworth Irrigation District			
Ainsworth Canal	35,000	34,607	34,500
Twin Loups Irrigation District			
Above Davis Creek	34,053	34,110	34,000
Below Davis Creek	21,063	21,016	21,000
Total Twin Loups Irrigation District	55,116	55,126	55,000
Frenchman Valley Irrigation District			
Culbertson Canal	9,292	1,020	1,000
H & RW Irrigation District			
Culbertson Extension Canal	11,915	0	0
Frenchman-Cambridge Irrigation District			
Meeker-Driftwood Canal	16,855	12,596	12,000
Red Willow Canal	4,797	0	0
Bartley Canal	6,353	4,765	0
Cambridge Canal	17,664	16,798	16,500
Total Frenchman-Cambridge Irrigation District	45,669	34,159	28,500
Almena Irrigation District			
Almena Canal	5,764	2,450	2,000
Bostwick Irrigation District in Nebraska			
Franklin Canal	11,031	11,065	11,000
Naponee Canal	1,607	1,607	1,500
Franklin Pump Canal	2,026	1,993	2,000
Superior Canal	6,056	6,056	6,000
Courtland Canal (Nebraska)	1,735	1,734	1,500
Total Bostwick Irrigation Dist. in Nebraska	22,455	22,455	22,000
Kansas-Bostwick Irrigation District			
Courtland Canal above Lovewell	13,378	11,394	11,500
Courtland Canal below Lovewell	29,122	26,573	26,500
Total Kansas-Bostwick Irrigation District	42,500	37,967	38,000
Kirwin Irrigation District			
Kirwin Canal	11,465	8,476	8,500
Webster Irrigation District			
Osborne Canal	8,537	5,663	5,500
Glen Elder Irrigation District	10,370	5,936	6,000
TOTAL PROJECT USES	269,745	219,521	212,000
Non-Project Uses			
Hale Ditch	700	0	0
TOTAL PROJECT AND NON-PROJECT	270,445	219,521	212,000

Table 4

BOX BUTTE RESERVOIR OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIRMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	CONT	RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	13	0.8	1.1	0.1	2	0.1	0.0	0.0	3990.2	8.9	0.6
FEB	18	1.0	1.3	0.1	2	0.1	0.0	0.0	3991.2	9.7	0.8
MAR	23	1.4	2.7	0.2	2	0.1	0.0	0.0	3992.4	10.8	1.1
APR	20	1.2	3.8	0.3	2	0.1	0.0	0.0	3993.3	11.6	0.8
MAY	15	0.9	4.6	0.4	2	0.1	0.0	0.0	3993.7	12.0	0.4
JUN	8	0.5	6.2	0.5	89	5.3	0.0	0.0	3987.2	6.7	-5.3
JUL	6	0.4	7.1	0.4	226	13.9	0.0	9.6	3979.0	2.4	-4.3
AUG	10	0.6	6.2	0.2	213	13.1	0.0	12.7	3979.0	2.4	0.0
SEP	12	0.7	4.6	0.1	40	2.4	0.0	1.8	3979.0	2.4	0.0
OCT	13	0.8	3.5	0.1	5	0.3	0.0	0.0	3980.0	2.8	0.4
NOV	17	1.0	1.8	0.1	2	0.1	0.0	0.0	3981.7	3.6	0.8
DEC	15	0.9	1.3	0.1	2	0.1	0.0	0.0	3983.1	4.3	0.7
TOTAL		10.2	44.2	2.6		35.7	0.0	24.1			-4.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	21	1.3	1.0	0.1	2	0.1	0.0	0.0	3990.8	9.4	1.1
FEB	29	1.6	1.3	0.1	2	0.1	0.0	0.0	3992.4	10.8	1.4
MAR	36	2.2	2.4	0.2	2	0.1	0.0	0.0	3994.4	12.7	1.9
APR	32	1.9	3.5	0.3	2	0.1	0.0	0.0	3995.8	14.2	1.5
MAY	24	1.5	4.3	0.4	2	0.1	0.0	0.0	3996.7	15.2	1.0
JUN	15	0.9	5.7	0.5	68	4.2	0.0	0.0	3993.1	11.4	-3.8
JUL	10	0.6	6.6	0.5	209	12.9	0.0	3.8	3979.0	2.4	-9.0
AUG	16	1.0	5.7	0.2	164	10.1	0.0	9.3	3979.0	2.4	0.0
SEP	17	1.0	4.3	0.1	28	1.7	0.0	0.8	3979.0	2.4	0.0
OCT	21	1.3	3.2	0.1	5	0.3	0.0	0.0	3981.1	3.3	0.9
NOV	27	1.6	1.6	0.1	2	0.1	0.0	0.0	3983.9	4.7	1.4
DEC	21	1.3	1.3	0.1	2	0.1	0.0	0.0	3985.8	5.8	1.1
TOTAL		16.2	40.9	2.7		29.9	0.0	13.9			-2.5
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	26	1.6	0.9	0.1	2	0.1	0.0	0.0	3991.2	9.7	1.4
FEB	34	1.9	1.1	0.1	2	0.1	0.0	0.0	3993.1	11.4	1.7
MAR	44	2.7	2.3	0.2	2	0.1	0.0	0.0	3995.4	13.8	2.4
APR	39	2.3	3.2	0.3	2	0.1	0.0	0.0	3997.2	15.7	1.9
MAY	29	1.8	3.9	0.4	2	0.1	0.0	0.0	3998.3	17.0	1.3
JUN	17	1.0	5.3	0.5	47	2.8	0.0	0.0	3996.3	14.7	-2.3
JUL	11	0.7	6.0	0.6	135	8.3	0.0	0.0	3986.9	6.5	-8.2
AUG	21	1.3	5.3	0.3	104	6.4	0.0	1.3	3979.0	2.4	-4.1
SEP	22	1.3	3.9	0.1	18	1.1	0.0	0.0	3979.2	2.5	0.1
OCT	26	1.6	3.0	0.1	5	0.3	0.0	0.0	3981.9	3.7	1.2
NOV	32	1.9	1.5	0.1	2	0.1	0.0	0.0	3985.1	5.4	1.7
DEC	28	1.7	1.1	0.1	2	0.1	0.0	0.0	3987.5	6.9	1.5
TOTAL		19.8	37.5	2.9		19.6	0.0	1.3			-1.4

Table 4

MERRITT RESERVOIR OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION	RELEASE REQUIRMENT CANAL	RIVER	TOTAL		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	CONT	RESERVOIR CHANGE
	MEAN	1000		1000	1000	1000	MEAN	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	AF	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	226	13.9	1.4	0.3	0.0	1.0	16	1.0	12.9	0.0	2944.0	61.1	-0.3
FEB	246	13.7	1.8	0.4	0.0	1.0	18	1.0	12.3	0.0	2944.0	61.1	0.0
MAR	255	15.7	2.3	0.5	0.0	1.0	16	1.0	11.4	0.0	2945.0	63.9	2.8
APR	260	15.5	3.6	0.9	0.0	1.0	17	1.0	10.8	0.0	2946.0	66.7	2.8
MAY	252	15.5	4.5	1.1	3.4	1.0	71	4.4	10.0	0.0	2946.0	66.7	0.0
JUN	240	14.3	5.9	1.4	7.6	1.0	144	8.6	4.3	0.0	2946.0	66.7	0.0
JUL	240	14.8	6.8	1.6	33.4	3.0	591	36.4	0.0	0.0	2936.1	43.5	-23.2
AUG	245	15.1	5.9	0.9	31.0	1.0	519	32.0	0.0	0.0	2924.5	25.7	-17.8
SEP	242	14.4	5.0	0.5	8.5	1.0	159	9.5	0.0	0.0	2927.9	30.1	4.4
OCT	245	15.1	4.5	0.5	0.0	5.0	81	5.0	0.0	0.0	2934.0	39.7	9.6
NOV	240	14.3	2.3	0.3	0.0	1.0	17	1.0	0.0	0.0	2940.5	52.7	13.0
DEC	222	13.7	1.4	0.3	0.0	1.0	16	1.0	4.0	0.0	2944.0	61.1	8.4
TOTAL		176.0	45.4	8.7	83.9	18.0		101.9	65.7	0.0			-0.3
MOST PROBABLE INFLOW CONDITIONS													
JAN	237	14.6	1.2	0.3	0.0	1.0	16	1.0	13.6	0.0	2944.0	61.1	-0.3
FEB	259	14.4	1.6	0.4	0.0	1.0	16	1.0	13.0	0.0	2944.0	61.1	0.0
MAR	266	16.4	2.0	0.5	0.0	1.0	16	1.0	12.1	0.0	2945.0	63.9	2.8
APR	273	16.3	3.2	0.8	0.0	1.0	16	1.0	11.7	0.0	2946.0	66.7	2.8
MAY	265	16.3	4.0	1.0	2.9	1.0	63	3.9	11.4	0.0	2946.0	66.7	0.0
JUN	252	15.0	5.2	1.3	6.5	1.0	122	7.5	6.2	0.0	2946.0	66.7	0.0
JUL	252	15.5	6.1	1.5	28.5	3.0	511	31.5	0.0	0.0	2938.9	49.2	-17.5
AUG	258	15.9	5.3	0.9	26.6	1.0	448	27.6	0.0	0.0	2932.2	36.6	-12.6
SEP	253	15.1	4.4	0.6	7.3	1.0	135	8.3	0.0	0.0	2935.7	42.8	6.2
OCT	258	15.9	4.0	0.6	0.0	5.0	81	5.0	0.0	0.0	2940.7	53.1	10.3
NOV	252	15.0	2.0	0.4	0.0	1.0	16	1.0	5.6	0.0	2944.0	61.1	8.0
DEC	234	14.4	1.2	0.3	0.0	1.0	16	1.0	13.1	0.0	2944.0	61.1	0.0
TOTAL		184.8	40.2	8.6	71.8	18.0		89.8	86.7	0.0			-0.3
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	253	15.6	1.1	0.2	0.0	1.0	16	1.0	14.7	0.0	2944.0	61.1	-0.3
FEB	277	15.4	1.4	0.3	0.0	1.0	18	1.0	14.1	0.0	2944.0	61.1	0.0
MAR	284	17.5	1.8	0.4	0.0	1.0	16	1.0	13.3	0.0	2945.0	63.9	2.8
APR	290	17.3	2.8	0.7	0.0	1.0	17	1.0	12.8	0.0	2946.0	66.7	2.8
MAY	281	17.3	3.5	0.9	2.4	1.0	55	3.4	13.0	0.0	2946.0	66.7	0.0
JUN	268	16.0	4.6	1.1	5.3	1.0	106	6.3	8.6	0.0	2946.0	66.7	0.0
JUL	269	16.6	5.3	1.3	23.3	3.0	427	26.3	0.0	0.0	2941.8	55.7	-11.0
AUG	274	16.9	4.6	0.9	21.8	1.0	370	22.8	0.0	0.0	2938.8	48.9	-6.8
SEP	272	16.2	3.9	0.7	5.9	1.0	116	6.9	0.0	0.0	2942.6	57.5	8.6
OCT	274	16.9	3.5	0.7	0.0	5.0	81	5.0	7.6	0.0	2944.0	61.1	3.6
NOV	268	16.0	1.8	0.4	0.0	1.0	17	1.0	14.6	0.0	2944.0	61.1	0.0
DEC	250	15.4	1.1	0.2	0.0	1.0	16	1.0	14.2	0.0	2944.0	61.1	0.0
TOTAL		197.1	35.4	7.8	58.7	18.0		76.7	112.9	0.0			-0.3

Table 4

CALAMUS RESERVOIR OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIRMENT CANAL	RIVER	TOTAL		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	CONT	RESERVOIR CHANGE
	MEAN	1000		1000	1000	1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	AF	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	302	18.6	1.3	0.4	0.5	3.1	58	3.6	0.0	0.0	2238.7	94.9	14.6
FEB	320	17.8	1.6	0.6	0.5	2.8	59	3.3	8.3	0.0	2240.0	100.5	5.6
MAR	357	22.0	2.9	1.1	0.5	3.1	58	3.6	8.1	0.0	2242.0	109.7	9.2
APR	369	22.0	4.6	1.8	0.5	3.0	59	3.5	6.9	0.0	2244.0	119.5	9.8
MAY	409	25.2	4.8	2.0	2.7	3.1	94	5.8	17.4	0.0	2244.0	119.5	0.0
JUN	374	22.3	5.9	2.5	5.6	3.0	144	8.6	11.2	0.0	2244.0	119.5	0.0
JUL	349	21.5	6.7	2.8	33.8	21.5	898	55.3	0.0	0.0	2235.7	82.9	-36.6
AUG	330	20.3	6.7	2.2	30.4	20.3	823	50.7	0.0	0.0	2226.3	50.3	-32.6
SEP	312	18.6	5.2	1.3	8.5	18.6	455	27.1	0.0	0.0	2222.7	40.5	-9.8
OCT	310	19.1	3.9	0.9	0.5	3.1	58	3.6	0.0	0.0	2227.9	55.1	14.6
NOV	337	20.1	2.1	0.5	0.5	3.0	59	3.5	0.0	0.0	2232.7	71.2	16.1
DEC	325	20.0	1.2	0.4	0.5	3.1	58	3.6	0.0	0.0	2236.8	87.2	16.0
TOTAL		247.5	46.9	16.5	84.5	87.7		172.2	51.9	0.0			6.9
MOST PROBABLE INFLOW CONDITIONS													
JAN	338	20.8	1.2	0.4	0.5	3.1	58	3.6	0.0	0.0	2239.2	97.1	16.8
FEB	358	19.9	1.4	0.5	0.5	2.8	54	3.3	12.7	0.0	2240.0	100.5	3.4
MAR	399	24.6	2.5	0.9	0.5	3.1	58	3.6	10.9	0.0	2242.0	109.7	9.2
APR	414	24.7	4.1	1.6	0.5	3.0	57	3.5	9.8	0.0	2244.0	119.5	9.8
MAY	458	28.2	4.2	1.8	2.3	3.1	88	5.4	21.0	0.0	2244.0	119.5	0.0
JUN	418	24.9	5.1	2.2	4.7	3.0	125	7.7	15.0	0.0	2244.0	119.5	0.0
JUL	391	24.1	5.8	2.5	25.8	24.1	810	49.9	0.0	0.0	2237.8	91.2	-28.3
AUG	368	22.7	5.8	2.0	23.0	22.7	742	45.7	0.0	0.0	2231.3	66.2	-25.0
SEP	349	20.8	4.5	1.3	5.4	20.8	425	26.2	0.0	0.0	2229.2	59.5	-6.7
OCT	346	21.3	3.5	0.9	0.5	3.1	58	3.6	0.0	0.0	2234.0	76.3	16.8
NOV	376	22.4	1.9	0.6	0.5	3.0	57	3.5	0.0	0.0	2238.6	94.6	18.3
DEC	364	22.4	1.1	0.4	0.5	3.1	58	3.6	12.5	0.0	2240.0	100.5	5.9
TOTAL		276.8	41.1	15.1	64.7	94.9		159.6	81.9	0.0			20.2
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	385	23.7	1.0	0.3	0.5	3.1	58	3.6	0.0	0.0	2239.9	100.1	19.8
FEB	410	22.8	1.2	0.5	0.5	2.8	59	3.3	18.6	0.0	2240.0	100.5	0.4
MAR	456	28.1	2.3	0.8	0.5	3.1	58	3.6	14.5	0.0	2242.0	109.7	9.2
APR	471	28.1	3.6	1.4	0.5	3.0	59	3.5	13.4	0.0	2244.0	119.5	9.8
MAY	524	32.3	3.8	1.6	1.9	3.1	81	5.0	25.7	0.0	2244.0	119.5	0.0
JUN	478	28.5	4.6	1.9	3.8	3.0	114	6.8	19.8	0.0	2244.0	119.5	0.0
JUL	446	27.5	5.2	2.2	17.9	27.5	737	45.4	0.0	0.0	2239.7	99.4	-20.1
AUG	420	25.9	5.2	1.9	15.9	25.9	679	41.8	0.0	0.0	2235.4	81.6	-17.8
SEP	398	23.7	4.0	1.3	4.1	23.7	466	27.8	0.0	0.0	2234.0	76.2	-5.4
OCT	394	24.3	3.1	1.0	0.5	3.1	58	3.6	0.0	0.0	2238.9	95.9	19.7
NOV	429	25.6	1.6	0.6	0.5	3.0	59	3.5	16.9	0.0	2240.0	100.5	4.6
DEC	416	25.6	1.0	0.4	0.5	3.1	58	3.6	21.6	0.0	2240.0	100.5	0.0
TOTAL		316.1	36.6	13.9	47.1	104.4		151.5	130.5	0.0			20.2

Table 4

DAVIS CREEK RESERVOIR OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	RESERVOIR CONT	CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	0	0.0	1.4	0.1	11	0.7	0.0	0.0	2062.5	18.2	-0.8
FEB	0	0.0	1.7	0.1	11	0.6	0.0	0.0	2061.6	17.5	-0.7
MAR	0	0.0	3.0	0.2	10	0.6	0.0	0.0	2060.5	16.7	-0.8
APR	0	0.0	4.8	0.3	10	0.6	0.0	0.0	2059.3	15.8	-0.9
MAY	214	13.2	5.1	0.3	58	3.6	0.0	0.0	2070.2	25.1	9.3
JUN	240	14.3	6.1	0.5	129	7.7	0.0	0.0	2076.0	31.2	6.1
JUL	179	11.0	6.5	0.6	297	18.3	0.0	0.0	2068.4	23.3	-7.9
AUG	161	9.9	5.1	0.4	273	16.8	0.0	0.0	2059.6	16.0	-7.3
SEP	39	2.3	4.4	0.3	133	7.9	0.0	0.0	2050.0	10.1	-5.9
OCT	0	0.0	4.0	0.2	3	0.2	0.0	0.0	2049.2	9.7	-0.4
NOV	0	0.0	2.1	0.1	3	0.2	0.0	0.0	2048.6	9.4	-0.3
DEC	0	0.0	1.2	0.1	3	0.2	0.0	0.0	2048.0	9.1	-0.3
TOTAL		50.7	45.4	3.2		57.4	0.0	0.0			-9.9
MOST PROBABLE INFLOW CONDITIONS											
JAN	0	0.0	1.3	0.1	11	0.7	0.0	0.0	2062.5	18.2	-0.8
FEB	0	0.0	1.6	0.1	11	0.6	0.0	0.0	2061.6	17.5	-0.7
MAR	0	0.0	2.8	0.2	10	0.6	0.0	0.0	2060.5	16.7	-0.8
APR	0	0.0	4.5	0.3	10	0.6	0.0	0.0	2059.3	15.8	-0.9
MAY	175	10.8	4.8	0.3	45	2.8	0.0	0.0	2068.6	23.5	7.7
JUN	240	14.3	5.8	0.5	99	6.1	0.0	0.0	2076.0	31.2	7.7
JUL	112	6.9	6.2	0.6	231	14.2	0.0	0.0	2068.3	23.3	-7.9
AUG	99	6.1	4.8	0.4	211	13.0	0.0	0.0	2059.5	16.0	-7.3
SEP	7	0.4	4.2	0.3	99	6.1	0.0	0.0	2049.8	10.0	-6.0
OCT	0	0.0	3.8	0.2	3	0.2	0.0	0.0	2049.0	9.6	-0.4
NOV	0	0.0	2.0	0.1	3	0.2	0.0	0.0	2048.4	9.3	-0.3
DEC	0	0.0	1.2	0.0	3	0.2	0.0	0.0	2048.0	9.1	-0.2
TOTAL		38.5	43.0	3.1		45.3	0.0	0.0			-9.9
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	0	0.0	1.2	0.1	11	0.7	0.0	0.0	2062.5	18.2	-0.8
FEB	0	0.0	1.4	0.1	11	0.6	0.0	0.0	2061.6	17.5	-0.7
MAR	0	0.0	2.6	0.2	10	0.6	0.0	0.0	2060.5	16.7	-0.8
APR	0	0.0	4.1	0.3	10	0.6	0.0	0.0	2059.3	15.8	-0.9
MAY	141	8.7	4.4	0.3	37	2.3	0.0	0.0	2066.8	21.9	6.1
JUN	240	14.3	5.3	0.4	77	4.6	0.0	0.0	2076.0	31.2	9.3
JUL	52	3.2	5.6	0.5	172	10.6	0.0	0.0	2068.3	23.3	-7.9
AUG	42	2.6	4.4	0.3	156	9.6	0.0	0.0	2059.5	16.0	-7.3
SEP	0	0.0	3.8	0.2	97	5.8	0.0	0.0	2049.8	10.0	-6.0
OCT	0	0.0	3.4	0.1	3	0.2	0.0	0.0	2049.2	9.7	-0.3
NOV	0	0.0	1.8	0.1	3	0.2	0.0	0.0	2048.6	9.4	-0.3
DEC	0	0.0	1.1	0.0	3	0.2	0.0	0.0	2048.2	9.2	-0.2
TOTAL		28.8	39.1	2.6		36.0	0.0	0.0			-9.8

Table 4

BONNY RESERVOIR OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIRMENT CANAL	RIVER	TOTAL		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	RESERVOIR CONT	CHANGE
	MEAN	1000		1000	1000	1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	AF	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	8	0.5	1.6	0.0	0.0	0.1	2	0.1	0.4	0.0	3638.0	0.0	0.0
FEB	9	0.5	2.2	0.0	0.0	0.1	2	0.1	0.4	0.0	3638.0	0.0	0.0
MAR	10	0.6	2.7	0.0	0.0	0.1	2	0.1	0.5	0.0	3638.0	0.0	0.0
APR	12	0.7	4.3	0.0	0.0	0.1	2	0.1	0.6	0.0	3638.0	0.0	0.0
MAY	11	0.7	5.4	0.0	0.0	0.1	2	0.1	0.6	0.0	3638.0	0.0	0.0
JUN	12	0.7	7.1	0.0	0.0	0.1	2	0.1	0.6	0.0	3638.0	0.0	0.0
JUL	5	0.3	8.1	0.0	0.0	0.1	2	0.1	0.2	0.0	3638.0	0.0	0.0
AUG	3	0.2	7.1	0.0	0.0	0.1	2	0.1	0.1	0.0	3638.0	0.0	0.0
SEP	2	0.1	6.0	0.0	0.0	0.1	2	0.1	0.0	0.0	3638.0	0.0	0.0
OCT	5	0.3	5.4	0.0	0.0	0.1	2	0.1	0.2	0.0	3638.0	0.0	0.0
NOV	7	0.4	2.7	0.0	0.0	0.1	2	0.1	0.3	0.0	3638.0	0.0	0.0
DEC	8	0.5	1.6	0.0	0.0	0.1	2	0.1	0.4	0.0	3638.0	0.0	0.0
TOTAL		5.5	54.2	0.0	0.0	1.2		1.2	4.3	0.0			0.0
MOST PROBABLE INFLOW CONDITIONS													
JAN	16	1.0	1.4	0.0	0.0	0.1	2	0.1	0.9	0.0	3638.0	0.0	0.0
FEB	18	1.0	1.9	0.0	0.0	0.1	2	0.1	0.9	0.0	3638.0	0.0	0.0
MAR	18	1.1	2.4	0.0	0.0	0.1	2	0.1	1.0	0.0	3638.0	0.0	0.0
APR	22	1.3	3.9	0.0	0.0	0.1	2	0.1	1.2	0.0	3638.0	0.0	0.0
MAY	24	1.5	4.8	0.0	0.0	0.1	2	0.1	1.4	0.0	3638.0	0.0	0.0
JUN	22	1.3	6.3	0.0	0.0	0.1	2	0.1	1.2	0.0	3638.0	0.0	0.0
JUL	11	0.7	7.2	0.0	0.0	0.1	2	0.1	0.6	0.0	3638.0	0.0	0.0
AUG	6	0.4	6.3	0.0	0.0	0.1	2	0.1	0.3	0.0	3638.0	0.0	0.0
SEP	5	0.3	5.3	0.0	0.0	0.1	2	0.1	0.2	0.0	3638.0	0.0	0.0
OCT	8	0.5	4.8	0.0	0.0	0.1	2	0.1	0.4	0.0	3638.0	0.0	0.0
NOV	13	0.8	2.4	0.0	0.0	0.1	2	0.1	0.7	0.0	3638.0	0.0	0.0
DEC	15	0.9	1.4	0.0	0.0	0.1	2	0.1	0.8	0.0	3638.0	0.0	0.0
TOTAL		10.8	48.1	0.0	0.0	1.2		1.2	9.6	0.0			0.0
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	26	1.6	1.3	0.0	0.0	0.1	2	0.1	1.5	0.0	3638.0	0.0	0.0
FEB	27	1.5	1.7	0.0	0.0	0.1	2	0.1	1.4	0.0	3638.0	0.0	0.0
MAR	29	1.8	2.1	0.0	0.0	0.1	2	0.1	1.7	0.0	3638.0	0.0	0.0
APR	34	2.0	3.4	0.0	0.0	0.1	2	0.1	1.9	0.0	3638.0	0.0	0.0
MAY	37	2.3	4.3	0.0	0.0	0.1	2	0.1	2.2	0.0	3638.0	0.0	0.0
JUN	34	2.0	5.6	0.0	0.0	0.1	2	0.1	1.9	0.0	3638.0	0.0	0.0
JUL	18	1.1	6.4	0.0	0.0	0.1	2	0.1	1.0	0.0	3638.0	0.0	0.0
AUG	11	0.7	5.6	0.0	0.0	0.1	2	0.1	0.6	0.0	3638.0	0.0	0.0
SEP	7	0.4	4.7	0.0	0.0	0.1	2	0.1	0.3	0.0	3638.0	0.0	0.0
OCT	13	0.8	4.3	0.0	0.0	0.1	2	0.1	0.7	0.0	3638.0	0.0	0.0
NOV	22	1.3	2.1	0.0	0.0	0.1	2	0.1	1.2	0.0	3638.0	0.0	0.0
DEC	23	1.4	1.3	0.0	0.0	0.1	2	0.1	1.3	0.0	3638.0	0.0	0.0
TOTAL		16.9	42.8	0.0	0.0	1.2		1.2	15.7	0.0			0.0

Table 4

ENDERS RESERVOIR OPERATION ESTIMATES - 2013

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	6	0.4	1.1	0.1	3	0.2	0.1	0.0	3090.6	15.1	0.0
FEB	5	0.3	1.1	0.1	4	0.2	0.0	0.0	3090.6	15.1	0.0
MAR	6	0.4	2.0	0.1	3	0.2	0.1	0.0	3090.6	15.1	0.0
APR	7	0.4	4.2	0.3	3	0.2	0.0	0.0	3090.5	15.0	-0.1
MAY	6	0.4	5.4	0.4	3	0.2	0.0	0.0	3090.3	14.8	-0.2
JUN	7	0.4	6.8	0.5	176	10.5	0.0	4.7	3082.4	8.9	-5.9
JUL	8	0.5	7.5	0.4	532	32.8	0.0	32.6	3082.1	8.8	-0.1
AUG	6	0.4	6.3	0.3	505	31.1	0.0	30.9	3082.0	8.7	-0.1
SEP	5	0.3	4.7	0.2	75	4.5	0.0	4.3	3081.8	8.6	-0.1
OCT	6	0.4	3.0	0.2	3	0.2	0.0	0.0	3081.8	8.6	0.0
NOV	7	0.4	2.2	0.1	3	0.2	0.1	0.0	3081.8	8.6	0.0
DEC	6	0.4	1.2	0.1	3	0.2	0.1	0.0	3081.8	8.6	0.0
TOTAL		4.7	45.5	2.8		80.5	0.4	72.5			-6.5
MOST PROBABLE INFLOW CONDITIONS											
JAN	13	0.8	1.0	0.1	3	0.2	0.5	0.0	3090.6	15.1	0.0
FEB	13	0.7	1.1	0.1	3	0.2	0.4	0.0	3090.6	15.1	0.0
MAR	13	0.8	1.8	0.1	3	0.2	0.5	0.0	3090.6	15.1	0.0
APR	13	0.8	4.0	0.3	3	0.2	0.3	0.0	3090.6	15.1	0.0
MAY	13	0.8	5.1	0.4	3	0.2	0.2	0.0	3090.6	15.1	0.0
JUN	13	0.8	6.5	0.5	114	7.0	0.1	0.6	3082.4	8.9	-6.2
JUL	16	1.0	7.1	0.4	487	30.0	0.4	29.8	3082.4	8.9	0.0
AUG	15	0.9	6.0	0.3	388	23.9	0.4	23.7	3082.4	8.9	0.0
SEP	12	0.7	4.4	0.2	36	2.2	0.3	2.0	3082.4	8.9	0.0
OCT	13	0.8	2.8	0.1	3	0.2	0.5	0.0	3082.4	8.9	0.0
NOV	13	0.8	2.1	0.1	3	0.2	0.5	0.0	3082.4	8.9	0.0
DEC	13	0.8	1.2	0.1	3	0.2	0.5	0.0	3082.4	8.9	0.0
TOTAL		9.7	43.1	2.7		64.7	4.6	56.1			-6.2
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	28	1.7	0.9	0.1	3	0.2	1.4	0.0	3090.6	15.1	0.0
FEB	27	1.5	1.0	0.1	4	0.2	1.2	0.0	3090.6	15.1	0.0
MAR	28	1.7	1.6	0.1	3	0.2	1.4	0.0	3090.6	15.1	0.0
APR	29	1.7	3.6	0.3	3	0.2	1.2	0.0	3090.6	15.1	0.0
MAY	29	1.8	4.5	0.3	3	0.2	1.2	0.0	3090.6	15.1	0.0
JUN	29	1.7	5.7	0.4	40	2.4	1.0	0.0	3088.0	12.9	-2.2
JUL	32	2.0	6.3	0.4	297	18.3	1.2	14.1	3082.4	8.9	-4.0
AUG	29	1.8	5.3	0.3	229	14.1	1.3	13.9	3082.4	8.9	0.0
SEP	25	1.5	3.9	0.2	3	0.2	1.1	0.0	3082.4	8.9	0.0
OCT	26	1.6	2.5	0.1	3	0.2	1.3	0.0	3082.4	8.9	0.0
NOV	27	1.6	1.8	0.1	3	0.2	1.3	0.0	3082.4	8.9	0.0
DEC	26	1.6	1.0	0.1	3	0.2	1.3	0.0	3082.4	8.9	0.0
TOTAL		20.2	38.1	2.5		36.6	14.9	28.0			-6.2

Table 4

SWANSON LAKE OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIRMENT CANAL	RIVER	TOTAL		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	CONT	RESERVOIR CHANGE
	MEAN	1000		1000	1000	1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	AF	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	19	1.2	1.0	0.2	0.0	0.1	2	0.1	0.9	0.0	2732.4	36.6	0.0
FEB	31	1.7	1.1	0.3	0.0	0.1	2	0.1	1.3	0.0	2732.4	36.6	0.0
MAR	34	2.1	2.1	0.5	0.0	0.1	2	0.1	1.5	0.0	2732.4	36.6	0.0
APR	37	2.2	4.5	1.0	0.0	0.1	2	0.1	1.1	0.0	2732.4	36.6	0.0
MAY	34	2.1	5.3	1.2	0.1	0.1	3	0.2	0.7	0.0	2732.4	36.6	0.0
JUN	27	1.6	6.9	1.6	4.4	0.9	89	5.3	0.0	0.0	2730.4	31.3	-5.3
JUL	15	0.9	6.9	1.5	16.3	6.9	377	23.2	0.0	11.5	2725.0	19.0	-12.3
AUG	8	0.5	6.9	1.2	13.6	6.3	323	19.9	0.0	19.8	2724.6	18.2	-0.8
SEP	3	0.2	5.3	0.9	2.0	2.1	69	4.1	0.0	4.0	2724.2	17.4	-0.8
OCT	6	0.4	3.3	0.5	0.0	0.1	2	0.1	0.0	0.0	2724.1	17.2	-0.2
NOV	15	0.9	2.3	0.4	0.0	0.1	2	0.1	0.4	0.0	2724.1	17.2	0.0
DEC	16	1.0	1.2	0.2	0.0	0.1	2	0.1	0.7	0.0	2724.1	17.2	0.0
TOTAL		14.8	46.8	9.5	36.4	17.0		53.4	6.6	35.3			-19.4
MOST PROBABLE INFLOW CONDITIONS													
JAN	41	2.5	1.0	0.2	0.0	0.1	2	0.1	2.2	0.0	2732.4	36.6	0.0
FEB	63	3.5	1.0	0.2	0.0	0.1	2	0.1	3.2	0.0	2732.4	36.6	0.0
MAR	71	4.4	1.9	0.4	0.0	0.1	2	0.1	3.9	0.0	2732.4	36.6	0.0
APR	79	4.7	4.1	0.9	0.0	0.1	2	0.1	3.7	0.0	2732.4	36.6	0.0
MAY	70	4.3	4.9	1.1	0.1	0.1	3	0.2	3.0	0.0	2732.4	36.6	0.0
JUN	55	3.3	6.3	1.5	3.8	0.1	63	3.9	1.7	0.0	2730.9	32.8	-3.8
JUL	31	1.9	6.3	1.4	14.2	4.2	299	18.4	0.4	4.5	2725.0	19.0	-13.8
AUG	16	1.0	6.3	1.1	11.7	4.1	256	15.8	0.0	15.7	2724.9	18.8	-0.2
SEP	8	0.5	4.9	0.8	1.7	0.1	29	1.8	0.0	1.7	2724.7	18.4	-0.4
OCT	11	0.7	3.0	0.5	0.0	0.1	2	0.1	0.1	0.0	2724.7	18.4	0.0
NOV	30	1.8	2.1	0.3	0.0	0.1	2	0.1	1.4	0.0	2724.7	18.4	0.0
DEC	32	2.0	1.1	0.2	0.0	0.1	2	0.1	1.7	0.0	2724.7	18.4	0.0
TOTAL		30.6	42.9	8.6	31.5	9.3		40.8	21.3	21.9			-18.2
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	84	5.2	0.9	0.2	0.0	0.1	2	0.1	4.9	0.0	2732.4	36.6	0.0
FEB	129	7.2	0.9	0.2	0.0	0.1	2	0.1	6.9	0.0	2732.4	36.6	0.0
MAR	146	9.0	1.7	0.4	0.0	0.1	2	0.1	8.5	0.0	2732.4	36.6	0.0
APR	161	9.6	3.8	0.9	0.0	0.1	2	0.1	8.6	0.0	2732.4	36.6	0.0
MAY	144	8.9	4.4	1.0	0.1	0.1	3	0.2	7.7	0.0	2732.4	36.6	0.0
JUN	116	6.9	5.8	1.3	3.1	0.1	54	3.2	5.5	0.0	2731.2	33.5	-3.1
JUL	62	3.8	5.8	1.3	11.6	1.2	208	12.8	2.4	0.0	2725.8	20.8	-12.7
AUG	34	2.1	5.7	1.0	9.6	1.7	183	11.3	1.0	9.4	2725.0	19.0	-1.8
SEP	17	1.0	4.4	0.7	1.4	0.1	25	1.5	0.2	1.4	2725.0	19.0	0.0
OCT	24	1.5	2.7	0.5	0.0	0.1	2	0.1	0.9	0.0	2725.0	19.0	0.0
NOV	60	3.6	1.9	0.3	0.0	0.1	2	0.1	3.2	0.0	2725.0	19.0	0.0
DEC	68	4.2	1.0	0.2	0.0	0.1	2	0.1	3.9	0.0	2725.0	19.0	0.0
TOTAL		63.0	39.0	8.0	25.8	3.9		29.7	53.7	10.8			-17.6

Table 4

HUGH BUTLER LAKE OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	CONT	RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	11	0.7	0.9	0.0	3	0.2	0.5	0.0	2553.7	6.1	0.0
FEB	14	0.8	1.0	0.0	4	0.2	0.6	0.0	2553.7	6.1	0.0
MAR	16	1.0	1.9	0.1	3	0.2	0.7	0.0	2553.7	6.1	0.0
APR	17	1.0	5.1	0.2	3	0.2	0.6	0.0	2553.7	6.1	0.0
MAY	18	1.1	6.0	0.3	3	0.2	0.6	0.0	2553.7	6.1	0.0
JUN	17	1.0	7.3	0.4	29	1.7	0.4	1.5	2553.7	6.1	0.0
JUL	13	0.8	8.1	0.4	73	4.5	0.2	4.3	2553.7	6.1	0.0
AUG	15	0.9	7.3	0.4	62	3.8	0.3	3.6	2553.7	6.1	0.0
SEP	8	0.5	5.6	0.3	15	0.9	0.1	0.8	2553.7	6.1	0.0
OCT	10	0.6	3.5	0.2	3	0.2	0.2	0.0	2553.7	6.1	0.0
NOV	12	0.7	2.2	0.1	3	0.2	0.4	0.0	2553.7	6.1	0.0
DEC	11	0.7	1.1	0.1	3	0.2	0.4	0.0	2553.7	6.1	0.0
TOTAL		9.8	50.0	2.5		12.5	5.0	10.2			0.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	16	1.0	0.8	0.0	3	0.2	0.8	0.0	2553.7	6.1	0.0
FEB	20	1.1	0.9	0.0	3	0.2	0.9	0.0	2553.7	6.1	0.0
MAR	24	1.5	1.7	0.1	3	0.2	1.2	0.0	2553.7	6.1	0.0
APR	23	1.4	4.5	0.2	3	0.2	1.0	0.0	2553.7	6.1	0.0
MAY	24	1.5	5.3	0.3	3	0.2	1.0	0.0	2553.7	6.1	0.0
JUN	25	1.5	6.5	0.3	23	1.4	1.0	1.2	2553.7	6.1	0.0
JUL	19	1.2	7.2	0.4	62	3.8	0.6	3.6	2553.7	6.1	0.0
AUG	21	1.3	6.4	0.3	52	3.2	0.8	3.0	2553.7	6.1	0.0
SEP	13	0.8	4.9	0.2	13	0.8	0.4	0.6	2553.7	6.1	0.0
OCT	15	0.9	3.2	0.2	3	0.2	0.5	0.0	2553.7	6.1	0.0
NOV	17	1.0	1.9	0.1	3	0.2	0.7	0.0	2553.7	6.1	0.0
DEC	16	1.0	1.0	0.0	3	0.2	0.8	0.0	2553.7	6.1	0.0
TOTAL		14.2	44.3	2.1		10.8	9.7	8.4			0.0
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	21	1.3	0.7	0.0	3	0.2	1.1	0.0	2553.7	6.1	0.0
FEB	31	1.7	0.8	0.0	4	0.2	1.5	0.0	2553.7	6.1	0.0
MAR	34	2.1	1.5	0.1	3	0.2	1.8	0.0	2553.7	6.1	0.0
APR	35	2.1	4.1	0.2	3	0.2	1.7	0.0	2553.7	6.1	0.0
MAY	36	2.2	4.8	0.2	3	0.2	1.8	0.0	2553.7	6.1	0.0
JUN	37	2.2	5.9	0.3	18	1.1	1.7	0.9	2553.7	6.1	0.0
JUL	29	1.8	6.6	0.3	45	2.8	1.3	2.6	2553.7	6.1	0.0
AUG	29	1.8	5.8	0.3	39	2.4	1.3	2.2	2553.7	6.1	0.0
SEP	20	1.2	4.5	0.2	8	0.5	0.8	0.3	2553.7	6.1	0.0
OCT	21	1.3	2.9	0.1	3	0.2	1.0	0.0	2553.7	6.1	0.0
NOV	23	1.4	1.7	0.1	3	0.2	1.1	0.0	2553.7	6.1	0.0
DEC	23	1.4	0.9	0.0	3	0.2	1.2	0.0	2553.7	6.1	0.0
TOTAL		20.5	40.2	1.8		8.4	16.3	6.0			0.0

Table 4

HARRY STRUNK LAKE OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIRMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	CONT	RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	34	2.1	0.9	0.1	2	0.1	1.9	0.0	2355.9	19.9	0.0
FEB	43	2.4	1.0	0.1	2	0.1	2.2	0.0	2355.9	19.9	0.0
MAR	45	2.8	1.8	0.2	2	0.1	2.5	0.0	2355.9	19.9	0.0
APR	45	2.7	4.9	0.5	2	0.1	2.1	0.0	2355.9	19.9	0.0
MAY	49	3.0	5.8	0.6	2	0.1	2.3	0.0	2355.9	19.9	0.0
JUN	52	3.1	7.2	0.7	89	5.3	2.3	0.0	2351.1	14.7	-5.2
JUL	47	2.9	7.9	0.7	318	19.6	2.1	12.7	2343.0	7.9	-6.8
AUG	37	2.3	7.0	0.4	268	16.5	1.8	16.4	2343.0	7.9	0.0
SEP	25	1.5	5.4	0.3	27	1.6	1.1	1.5	2343.0	7.9	0.0
OCT	31	1.9	3.6	0.2	2	0.1	1.6	0.0	2343.0	7.9	0.0
NOV	34	2.0	2.1	0.1	2	0.1	1.8	0.0	2343.0	7.9	0.0
DEC	32	2.0	1.1	0.1	2	0.1	1.8	0.0	2343.0	7.9	0.0
TOTAL		28.7	48.7	4.0		43.8	23.5	30.6			-12.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	47	2.9	0.8	0.1	2	0.1	2.7	0.0	2355.9	19.9	0.0
FEB	59	3.3	0.9	0.1	2	0.1	3.1	0.0	2355.9	19.9	0.0
MAR	62	3.8	1.6	0.2	2	0.1	3.5	0.0	2355.9	19.9	0.0
APR	62	3.7	4.5	0.4	2	0.1	3.2	0.0	2355.9	19.9	0.0
MAY	67	4.1	5.2	0.5	2	0.1	3.5	0.0	2355.9	19.9	0.0
JUN	69	4.1	6.5	0.6	71	4.4	3.4	0.0	2352.0	15.6	-4.3
JUL	63	3.9	7.2	0.6	265	16.3	3.2	8.5	2343.0	7.9	-7.7
AUG	49	3.0	6.4	0.4	222	13.7	2.5	13.6	2343.0	7.9	0.0
SEP	34	2.0	4.9	0.3	19	1.2	1.6	0.0	2343.0	7.9	0.0
OCT	41	2.5	3.2	0.2	2	0.1	2.2	0.0	2343.0	7.9	0.0
NOV	45	2.7	1.9	0.1	2	0.1	2.5	0.0	2343.0	7.9	0.0
DEC	44	2.7	1.0	0.1	2	0.1	2.5	0.0	2343.0	7.9	0.0
TOTAL		38.7	44.1	3.6		36.4	33.9	22.1			-12.0
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	71	4.4	0.8	0.1	2	0.1	4.2	0.0	2355.9	19.9	0.0
FEB	92	5.1	0.8	0.1	2	0.1	4.9	0.0	2355.9	19.9	0.0
MAR	96	5.9	1.5	0.1	2	0.1	5.7	0.0	2355.9	19.9	0.0
APR	96	5.7	4.0	0.4	2	0.1	5.2	0.0	2355.9	19.9	0.0
MAY	102	6.3	4.7	0.5	2	0.1	5.7	0.0	2355.9	19.9	0.0
JUN	107	6.4	5.8	0.6	47	2.8	5.7	0.0	2353.5	17.2	-2.7
JUL	97	6.0	6.4	0.6	182	11.2	5.3	1.8	2343.0	7.9	-9.3
AUG	78	4.8	5.7	0.3	154	9.5	4.4	9.4	2343.0	7.9	0.0
SEP	50	3.0	4.4	0.3	2	0.1	2.6	0.0	2343.0	7.9	0.0
OCT	63	3.9	2.9	0.2	2	0.1	3.6	0.0	2343.0	7.9	0.0
NOV	70	4.2	1.7	0.1	2	0.1	4.0	0.0	2343.0	7.9	0.0
DEC	67	4.1	0.9	0.1	2	0.1	3.9	0.0	2343.0	7.9	0.0
TOTAL		59.8	39.6	3.4		24.4	55.2	11.2			-12.0

Table 4

KEITH SEBELIUS LAKE OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIRMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH		RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000	ELEV	CONT 1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	3	0.2	1.1	0.1	2	0.1	0.0	0.0	2293.9	16.5	0.0
FEB	4	0.2	1.3	0.1	2	0.1	0.0	0.0	2293.9	16.5	0.0
MAR	6	0.4	2.1	0.2	2	0.1	0.0	0.0	2294.0	16.6	0.1
APR	7	0.4	5.6	0.6	2	0.1	0.0	0.0	2293.8	16.3	-0.3
MAY	11	0.7	6.2	0.7	6	0.4	0.0	0.0	2293.5	15.9	-0.4
JUN	15	0.9	7.8	0.9	57	3.4	0.0	0.0	2290.7	12.5	-3.4
JUL	10	0.6	8.7	0.8	146	9.0	0.0	3.7	2284.8	7.0	-5.5
AUG	10	0.6	7.8	0.5	138	8.5	0.0	8.4	2284.8	7.0	0.0
SEP	3	0.2	6.1	0.4	27	1.6	0.0	1.5	2284.4	6.7	-0.3
OCT	2	0.1	4.2	0.3	2	0.1	0.0	0.0	2284.0	6.4	-0.3
NOV	3	0.2	2.3	0.1	2	0.1	0.0	0.0	2284.0	6.4	0.0
DEC	3	0.2	1.2	0.1	2	0.1	0.0	0.0	2284.0	6.4	0.0
TOTAL		4.7	54.4	4.8		23.6	0.0	13.6			-10.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	5	0.3	1.0	0.1	2	0.1	0.0	0.0	2294.0	16.6	0.1
FEB	7	0.4	1.1	0.1	2	0.1	0.0	0.0	2294.1	16.8	0.2
MAR	13	0.8	1.9	0.2	2	0.1	0.0	0.0	2294.5	17.3	0.5
APR	13	0.8	4.9	0.6	2	0.1	0.0	0.0	2294.6	17.4	0.1
MAY	21	1.3	5.4	0.6	3	0.2	0.0	0.0	2294.9	17.9	0.5
JUN	27	1.6	6.8	0.8	45	2.8	0.0	0.0	2293.5	15.9	-2.0
JUL	19	1.2	7.6	0.8	138	8.5	0.0	0.6	2286.5	8.4	-7.5
AUG	18	1.1	6.8	0.5	112	6.9	0.0	6.3	2286.5	8.4	0.0
SEP	8	0.5	5.4	0.4	21	1.3	0.0	1.2	2286.5	8.4	0.0
OCT	3	0.2	3.7	0.3	2	0.1	0.0	0.0	2286.3	8.2	-0.2
NOV	5	0.3	2.0	0.1	2	0.1	0.0	0.0	2286.4	8.3	0.1
DEC	5	0.3	1.0	0.1	2	0.1	0.0	0.0	2286.5	8.4	0.1
TOTAL		8.8	47.6	4.6		20.4	0.0	8.1			-8.1
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	10	0.6	0.8	0.1	2	0.1	0.0	0.0	2294.2	16.9	0.4
FEB	14	0.8	1.0	0.1	2	0.1	0.0	0.0	2294.6	17.5	0.6
MAR	24	1.5	1.7	0.2	2	0.1	0.0	0.0	2295.5	18.7	1.2
APR	27	1.6	4.3	0.5	2	0.1	0.0	0.0	2296.2	19.7	1.0
MAY	41	2.5	4.8	0.6	3	0.2	0.0	0.0	2297.2	21.4	1.7
JUN	54	3.2	6.1	0.8	27	1.6	0.0	0.0	2297.7	22.2	0.8
JUL	39	2.4	6.8	0.9	71	4.4	0.0	0.0	2295.9	19.3	-2.9
AUG	34	2.1	6.1	0.8	68	4.2	0.0	0.0	2293.8	16.4	-2.9
SEP	17	1.0	4.8	0.5	15	0.9	0.0	0.0	2293.5	16.0	-0.4
OCT	8	0.5	3.3	0.4	2	0.1	0.0	0.0	2293.5	16.0	0.0
NOV	10	0.6	1.8	0.2	2	0.1	0.0	0.0	2293.8	16.3	0.3
DEC	10	0.6	0.9	0.1	2	0.1	0.0	0.0	2294.1	16.7	0.4
TOTAL		17.4	42.4	5.2		12.0	0.0	0.0			0.2

Table 4

HARLAN COUNTY LAKE OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIRMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH		RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000	ELEV	CONT 1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	44	2.7	1.0	0.8	0	0.0	0.0	0.0	1935.4	193.0	1.9
FEB	68	3.8	1.1	1.0	0	0.0	0.0	0.0	1935.7	195.8	2.8
MAR	91	5.6	2.0	1.7	0	0.0	0.0	0.0	1936.1	199.7	3.9
APR	79	4.7	4.5	4.0	0	0.0	0.0	0.0	1936.1	200.4	0.7
MAY	101	6.2	5.6	4.9	0	0.0	0.0	0.0	1936.3	201.7	1.3
JUN	82	4.9	6.7	5.8	357	26.9	0.0	0.0	1933.5	173.9	-27.8
JUL	84	5.2	7.5	6.0	799	49.5	0.0	0.0	1927.7	123.6	-50.3
AUG	68	4.2	6.6	4.2	554	34.1	0.0	28.6	1927.0	118.1	-5.5
SEP	34	2.0	5.2	3.2	54	3.2	0.0	3.2	1926.8	116.9	-1.2
OCT	31	1.9	3.6	2.2	0	0.0	0.0	0.0	1926.7	116.6	-0.3
NOV	42	2.5	2.2	1.3	0	0.0	0.0	0.0	1926.9	117.8	1.2
DEC	41	2.5	1.4	0.9	0	0.0	0.0	0.0	1927.1	119.4	1.6
TOTAL		46.2	47.4	36.0		113.7	0.0	31.8			-71.7
MOST PROBABLE INFLOW CONDITIONS											
JAN	131	8.1	0.9	0.7	0	0.0	0.0	0.0	1936.0	198.5	7.4
FEB	207	11.5	1.0	0.9	0	0.0	0.0	0.0	1937.0	209.1	10.6
MAR	276	17.0	1.7	1.5	0	0.0	0.0	0.0	1938.4	224.6	15.5
APR	238	14.2	4.0	3.7	0	0.0	0.0	0.0	1939.3	235.1	10.5
MAY	302	18.6	4.9	4.6	0	0.0	0.0	0.0	1940.5	249.1	14.0
JUN	250	14.9	5.9	5.8	62	3.8	0.0	0.0	1941.0	254.4	5.3
JUL	253	15.6	6.6	6.6	591	36.4	0.0	0.0	1938.6	227.0	-27.4
AUG	205	12.6	5.8	5.4	455	28.0	0.0	0.0	1936.7	206.2	-20.8
SEP	101	6.0	4.6	4.1	32	2.0	0.0	0.0	1936.7	206.1	-0.1
OCT	96	5.9	3.1	2.7	0	0.0	0.0	0.0	1937.0	209.3	3.2
NOV	126	7.5	1.9	1.7	0	0.0	0.0	0.0	1937.5	215.1	5.8
DEC	125	7.7	1.3	1.1	0	0.0	0.0	0.0	1938.1	221.7	6.6
TOTAL		139.6	41.7	38.8		70.2	0.0	0.0			30.6
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	297	18.3	0.8	0.7	0	0.0	0.0	0.0	1936.9	208.7	17.6
FEB	464	25.8	0.9	0.8	0	0.0	0.0	0.0	1939.2	233.7	25.0
MAR	623	38.4	1.5	1.4	0	0.0	0.0	0.0	1942.3	270.7	37.0
APR	538	32.1	3.5	3.6	0	0.0	0.0	0.0	1944.5	299.2	28.5
MAY	680	41.9	4.3	4.6	0	0.0	22.4	0.0	1945.7	314.1	14.9
JUN	565	33.7	5.2	5.7	37	2.2	25.8	0.0	1945.7	314.1	0.0
JUL	573	35.3	5.8	6.4	157	9.7	19.2	0.0	1945.7	314.1	0.0
AUG	461	28.4	5.1	5.6	157	9.7	13.1	0.0	1945.7	314.1	0.0
SEP	228	13.6	4.0	4.5	20	1.2	7.9	0.0	1945.7	314.1	0.0
OCT	214	13.2	2.7	3.0	0	0.0	10.2	0.0	1945.7	314.1	0.0
NOV	285	17.0	1.7	1.9	0	0.0	15.1	0.0	1945.7	314.1	0.0
DEC	281	17.3	1.1	1.2	0	0.0	16.1	0.0	1945.7	314.1	0.0
TOTAL		315.0	36.6	39.4		22.8	129.8	0.0			123.0

Table 4

LOVEWELL RESERVOIR OPERATION ESTIMATES - 2013

MONTH	WHITE ROCK CREEK INFLOW 1000 AF	COURTLAND CANAL INFLOW 1000 AF	TOTAL INFLOW MEAN CFS	TOTAL INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS													
JAN	0.5	2.2	44	2.7	0.8	0.2	0	0.0	0.0	0.0	1578.6	25.1	2.5
FEB	0.7	2.5	58	3.2	1.0	0.2	0	0.0	0.0	0.0	1579.8	28.1	3.0
MAR	1.6	3.3	80	4.9	1.9	0.4	0	0.0	0.0	0.0	1581.5	32.6	4.5
APR	1.5	2.3	64	3.8	3.8	0.9	0	0.0	0.0	0.0	1582.5	35.5	2.9
MAY	1.9	2.5	71	4.4	4.8	1.2	15	0.9	0.0	0.0	1583.3	37.8	2.3
JUN	2.0	13.7	263	15.7	6.2	1.6	168	10.0	0.0	0.0	1584.6	41.9	4.1
JUL	1.4	6.1	122	7.5	6.8	1.9	505	31.1	0.0	0.0	1574.5	16.4	-25.5
AUG	0.2	0.0	3	0.2	5.5	0.8	347	21.4	0.0	17.3	1571.7	11.7	-4.7
SEP	1.1	0.0	18	1.1	4.2	0.5	47	2.8	0.0	2.2	1571.7	11.7	0.0
OCT	0.8	1.9	44	2.7	2.9	0.4	0	0.0	0.0	0.0	1573.1	14.0	2.3
NOV	0.6	2.5	52	3.1	2.1	0.3	0	0.0	0.0	0.0	1574.7	16.8	2.8
DEC	0.4	2.6	49	3.0	1.0	0.2	0	0.0	0.0	0.0	1576.2	19.6	2.8
TOTAL	12.7	39.6		52.2	41.0	8.6		66.2	0.0	19.5			-3.0
MOST PROBABLE INFLOW CONDITIONS													
JAN	1.1	3.8	80	4.9	0.7	0.1	0	0.0	0.0	0.0	1579.6	27.4	4.8
FEB	1.6	3.7	95	5.3	0.9	0.2	0	0.0	0.0	0.0	1581.5	32.5	5.1
MAR	3.6	0.0	58	3.6	1.6	0.4	0	0.0	0.0	0.0	1582.6	35.7	3.2
APR	3.3	0.0	55	3.3	3.2	0.8	0	0.0	0.0	0.0	1583.4	38.2	2.5
MAY	4.2	1.4	91	5.6	4.1	1.1	13	0.8	0.0	0.0	1584.6	41.9	3.7
JUN	4.5	4.9	158	9.4	5.3	1.5	128	7.9	0.0	0.0	1584.6	41.9	0.0
JUL	3.1	7.5	172	10.6	5.8	1.6	404	24.9	0.0	0.0	1579.0	26.0	-15.9
AUG	0.3	5.0	86	5.3	4.7	1.0	278	17.1	0.0	0.0	1572.7	13.2	-12.8
SEP	2.4	0.6	50	3.0	3.5	0.5	36	2.2	0.0	0.0	1572.8	13.5	0.3
OCT	1.6	4.7	102	6.3	2.4	0.3	0	0.0	0.0	0.0	1576.1	19.5	6.0
NOV	1.4	4.1	92	5.5	1.8	0.3	0	0.0	0.0	0.0	1578.5	24.7	5.2
DEC	1.0	4.6	91	5.6	0.9	0.2	0	0.0	0.1	0.0	1580.6	30.0	5.3
TOTAL	28.1	40.3		68.4	34.9	8.0		52.9	0.0	0.0			7.4
REASONABLE MAXIMUM INFLOW CONDITIONS													
JAN	2.9	0.0	47	2.9	0.6	0.1	0	0.0	0.0	0.0	1578.8	25.4	2.8
FEB	4.4	0.0	79	4.4	0.7	0.1	0	0.0	0.0	0.0	1580.4	29.7	4.3
MAR	10.1	0.0	164	10.1	1.3	0.3	0	0.0	3.8	0.0	1582.6	35.7	6.0
APR	9.2	0.0	154	9.2	2.8	0.7	0	0.0	8.5	0.0	1582.6	35.7	0.0
MAY	11.5	0.0	187	11.5	3.5	0.9	8	0.5	10.1	0.0	1582.6	35.7	0.0
JUN	12.5	1.2	230	13.7	4.6	1.1	87	5.2	7.4	0.0	1582.6	35.7	0.0
JUL	8.5	1.2	157	9.7	5.0	1.2	265	16.3	0.0	0.0	1579.8	27.9	-7.8
AUG	0.8	1.2	32	2.0	4.0	0.9	179	11.0	0.0	0.0	1575.4	18.0	-9.9
SEP	6.7	0.6	122	7.3	3.1	0.5	23	1.4	0.0	0.0	1577.9	23.4	5.4
OCT	4.5	0.0	73	4.5	2.1	0.4	0	0.0	0.0	0.0	1579.6	27.5	4.1
NOV	3.9	0.0	65	3.9	1.6	0.3	0	0.0	1.1	0.0	1580.6	30.0	2.5
DEC	2.6	0.0	42	2.6	0.7	0.2	0	0.0	2.4	0.0	1580.6	30.0	0.0
TOTAL	77.6	4.2		81.8	30.0	6.7		34.4	33.3	0.0			7.4

Table 4

KIRWIN RESERVOIR OPERATION ESTIMATES - 2013

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	5	0.3	0.9	0.3	0	0.0	0.0	0.0	1722.2	66.3	0.0
FEB	9	0.5	1.1	0.4	0	0.0	0.0	0.0	1722.2	66.4	0.1
MAR	13	0.8	2.0	0.7	0	0.0	0.0	0.0	1722.2	66.5	0.1
APR	15	0.9	4.5	1.5	0	0.0	0.0	0.0	1722.1	65.9	-0.6
MAY	24	1.5	5.5	1.8	8	0.5	0.0	0.0	1721.9	65.1	-0.8
JUN	20	1.2	6.7	2.2	87	5.2	0.0	0.0	1720.2	58.9	-6.2
JUL	19	1.2	7.6	2.3	193	11.9	0.0	0.0	1716.5	45.9	-13.0
AUG	13	0.8	6.7	1.8	179	11.0	0.0	0.0	1712.5	33.9	-12.0
SEP	7	0.4	5.2	1.1	8	0.5	0.0	0.0	1712.1	32.7	-1.2
OCT	5	0.3	3.6	0.8	0	0.0	0.0	0.0	1711.9	32.2	-0.5
NOV	5	0.3	2.1	0.4	0	0.0	0.0	0.0	1711.8	32.1	-0.1
DEC	5	0.3	1.1	0.2	0	0.0	0.0	0.0	1711.9	32.2	0.1
TOTAL		8.5	47.0	13.5		29.1	0.0	0.0			-34.1
MOST PROBABLE INFLOW CONDITIONS											
JAN	21	1.3	0.8	0.3	0	0.0	0.0	0.0	1722.4	67.3	1.0
FEB	34	1.9	1.0	0.3	0	0.0	0.0	0.0	1722.8	68.9	1.6
MAR	54	3.3	1.8	0.6	0	0.0	0.0	0.0	1723.5	71.6	2.7
APR	60	3.6	4.0	1.4	0	0.0	0.0	0.0	1724.0	73.8	2.2
MAY	96	5.9	5.0	1.8	6	0.4	0.0	0.0	1724.8	77.5	3.7
JUN	79	4.7	6.0	2.2	71	4.4	0.0	0.0	1724.4	75.6	-1.9
JUL	75	4.6	6.8	2.5	193	11.9	0.0	0.0	1722.0	65.8	-9.8
AUG	52	3.2	6.0	2.0	149	9.2	0.0	0.0	1719.9	57.8	-8.0
SEP	27	1.6	4.7	1.4	8	0.5	0.0	0.0	1719.9	57.5	-0.3
OCT	18	1.1	3.2	1.0	0	0.0	0.0	0.0	1719.9	57.6	0.1
NOV	23	1.4	1.9	0.6	0	0.0	0.0	0.0	1720.1	58.4	0.8
DEC	18	1.1	1.0	0.3	0	0.0	0.0	0.0	1720.3	59.2	0.8
TOTAL		33.7	42.2	14.4		26.4	0.0	0.0			-7.1
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	63	3.9	0.7	0.2	0	0.0	0.0	0.0	1723.1	70.0	3.7
FEB	104	5.8	0.9	0.3	0	0.0	0.0	0.0	1724.4	75.5	5.5
MAR	167	10.3	1.6	0.6	0	0.0	0.0	0.0	1726.5	85.2	9.7
APR	186	11.1	3.6	1.4	0	0.0	0.0	0.0	1728.6	94.9	9.7
MAY	292	18.0	4.4	1.8	5	0.3	12.6	0.0	1729.3	98.2	3.3
JUN	242	14.4	5.4	2.3	59	3.5	8.6	0.0	1729.3	98.2	0.0
JUL	229	14.1	6.1	2.6	167	10.3	1.2	0.0	1729.3	98.2	0.0
AUG	161	9.9	5.4	2.3	119	7.3	0.3	0.0	1729.3	98.2	0.0
SEP	84	5.0	4.2	1.8	7	0.4	2.8	0.0	1729.3	98.2	0.0
OCT	54	3.3	2.9	1.2	0	0.0	2.1	0.0	1729.3	98.2	0.0
NOV	74	4.4	1.7	0.7	0	0.0	3.7	0.0	1729.3	98.2	0.0
DEC	57	3.5	0.9	0.4	0	0.0	3.1	0.0	1729.3	98.2	0.0
TOTAL		103.7	37.8	15.6		21.8	34.4	0.0			31.9

Table 4

WEBSTER RESERVOIR OPERATION ESTIMATES - 2013

MONTH	INFLOW MEAN CFS	INFLOW 1000 AF	EVAPORATION INCHES	EVAPORATION 1000 AF	RELEASE REQUIRMENT MEAN CFS	RELEASE REQUIRMENT 1000 AF	RESERVOIR SPILL 1000 AF	REQUIREMENT SHORTAGE 1000 AF	END OF MONTH ELEV FT	END OF MONTH CONT 1000 AF	RESERVOIR CHANGE 1000 AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	3	0.2	0.9	0.2	0	0.0	0.0	0.0	1879.4	36.2	0.0
FEB	5	0.3	1.1	0.2	0	0.0	0.0	0.0	1879.4	36.3	0.1
MAR	8	0.5	2.0	0.4	0	0.0	0.0	0.0	1879.5	36.4	0.1
APR	13	0.8	4.6	0.9	0	0.0	0.0	0.0	1879.4	36.3	-0.1
MAY	19	1.2	5.8	1.2	15	0.9	0.0	0.0	1879.1	35.4	-0.9
JUN	13	0.8	7.3	1.4	101	6.0	0.0	0.0	1876.1	28.8	-6.6
JUL	13	0.8	8.0	1.4	235	14.5	0.0	0.0	1867.7	13.7	-15.1
AUG	8	0.5	7.5	0.9	213	13.1	0.0	7.2	1863.0	7.4	-6.3
SEP	5	0.3	5.5	0.5	8	0.5	0.0	0.5	1862.8	7.2	-0.2
OCT	3	0.2	3.6	0.3	0	0.0	0.0	0.0	1862.7	7.1	-0.1
NOV	3	0.2	2.2	0.2	0	0.0	0.0	0.0	1862.7	7.1	0.0
DEC	3	0.2	1.2	0.1	0	0.0	0.0	0.0	1862.8	7.2	0.1
TOTAL		6.0	49.7	7.7		35.0	0.0	7.7			-29.0
MOST PROBABLE INFLOW CONDITIONS											
JAN	16	1.0	0.8	0.2	0	0.0	0.0	0.0	1879.7	37.0	0.8
FEB	25	1.4	1.0	0.2	0	0.0	0.0	0.0	1880.2	38.2	1.2
MAR	39	2.4	1.8	0.4	0	0.0	0.0	0.0	1881.0	40.2	2.0
APR	57	3.4	4.1	0.9	0	0.0	0.0	0.0	1882.0	42.7	2.5
MAY	84	5.2	5.2	1.1	13	0.8	0.0	0.0	1883.2	46.0	3.3
JUN	62	3.7	6.5	1.5	71	4.4	0.0	0.0	1882.4	43.8	-2.2
JUL	58	3.6	7.2	1.6	208	12.8	0.0	0.0	1878.0	33.0	-10.8
AUG	34	2.1	6.7	1.3	161	9.9	0.0	0.0	1873.7	23.9	-9.1
SEP	20	1.2	4.9	0.8	5	0.3	0.0	0.0	1873.7	24.0	0.1
OCT	11	0.7	3.3	0.5	0	0.0	0.0	0.0	1873.8	24.2	0.2
NOV	15	0.9	2.0	0.3	0	0.0	0.0	0.0	1874.1	24.8	0.6
DEC	15	0.9	1.1	0.2	0	0.0	0.0	0.0	1874.5	25.5	0.7
TOTAL		26.5	44.6	9.0		28.2	0.0	0.0			-10.7
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	65	4.0	0.7	0.1	0	0.0	0.0	0.0	1881.0	40.1	3.9
FEB	97	5.4	0.9	0.2	0	0.0	0.0	0.0	1882.9	45.3	5.2
MAR	151	9.3	1.7	0.4	0	0.0	0.0	0.0	1886.0	54.2	8.9
APR	218	13.0	3.7	1.0	0	0.0	0.0	0.0	1889.6	66.2	12.0
MAY	323	19.9	4.7	1.3	6	0.4	8.2	0.0	1892.4	76.2	10.0
JUN	235	14.0	5.9	1.9	42	2.5	9.6	0.0	1892.4	76.2	0.0
JUL	221	13.6	6.5	2.0	125	7.7	3.9	0.0	1892.4	76.2	0.0
AUG	130	8.0	6.1	1.9	101	6.2	0.0	0.0	1892.3	76.1	-0.1
SEP	79	4.7	4.4	1.4	2	0.1	3.1	0.0	1892.4	76.2	0.1
OCT	42	2.6	2.9	0.9	0	0.0	1.7	0.0	1892.4	76.2	0.0
NOV	59	3.5	1.8	0.6	0	0.0	2.9	0.0	1892.4	76.2	0.0
DEC	54	3.3	1.0	0.3	0	0.0	3.0	0.0	1892.4	76.2	0.0
TOTAL		101.3	40.3	12.0		16.9	32.4	0.0			40.0

Table 4

WACONDA RESERVOIR OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIRMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH ELEV	CONT	RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000		1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	32	2.0	0.8	0.8	19	1.2	0.0	0.0	1452.6	184.5	0.0
FEB	49	2.7	1.0	1.0	20	1.1	0.0	0.0	1452.7	185.1	0.6
MAR	93	5.7	1.9	1.8	18	1.1	0.0	0.0	1452.9	187.9	2.8
APR	96	5.7	4.8	4.5	17	1.0	0.0	0.0	1452.9	188.1	0.2
MAY	110	6.8	6.0	5.6	18	1.1	0.0	0.0	1452.9	188.2	0.1
JUN	94	5.6	7.4	6.9	45	2.7	0.0	0.0	1452.6	184.2	-4.0
JUL	153	9.4	8.8	8.1	156	9.6	0.0	0.0	1451.8	175.9	-8.3
AUG	57	3.5	7.6	6.7	125	7.7	0.0	0.0	1450.8	165.0	-10.9
SEP	42	2.5	6.1	5.1	35	2.1	0.0	0.0	1450.3	160.3	-4.7
OCT	32	2.0	3.9	3.2	21	1.3	0.0	0.0	1450.1	157.8	-2.5
NOV	37	2.2	2.1	1.7	27	1.6	0.0	0.0	1450.0	156.7	-1.1
DEC	31	1.9	1.0	0.8	24	1.5	0.0	0.0	1449.9	156.3	-0.4
TOTAL		50.0	51.4	46.2		32.0	0.0	0.0			-28.2
MOST PROBABLE INFLOW CONDITIONS											
JAN	114	7.0	0.7	0.7	10	0.6	0.0	0.0	1453.1	190.2	5.7
FEB	169	9.4	0.9	0.9	10	0.6	0.0	0.0	1453.8	198.1	7.9
MAR	320	19.7	1.7	1.7	10	0.6	8.4	0.0	1454.6	207.1	9.0
APR	334	19.9	4.3	4.4	8	0.5	15.0	0.0	1454.6	207.1	0.0
MAY	386	23.8	5.3	5.4	10	0.6	5.5	0.0	1455.6	219.4	12.3
JUN	329	19.6	6.7	7.0	32	2.0	10.6	0.0	1455.6	219.4	0.0
JUL	534	32.9	7.9	8.3	112	6.9	17.7	0.0	1455.6	219.4	0.0
AUG	195	12.0	6.7	7.1	89	5.5	0.0	0.0	1455.5	218.8	-0.6
SEP	149	8.9	5.4	5.7	21	1.3	1.3	0.0	1455.6	219.4	0.6
OCT	117	7.2	3.5	3.7	10	0.6	2.9	0.0	1455.6	219.4	0.0
NOV	133	7.9	1.8	1.9	15	0.9	29.4	0.0	1453.6	195.1	-24.3
DEC	106	6.5	0.9	0.9	13	0.8	4.8	0.0	1453.6	195.1	0.0
TOTAL		174.8	45.8	47.7		20.9	95.6	0.0			10.6
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	424	26.1	0.7	0.6	3	0.2	2.7	0.0	1454.6	207.1	22.6
FEB	633	35.2	0.8	0.8	4	0.2	34.2	0.0	1454.6	207.1	0.0
MAR	1195	73.6	1.5	1.5	5	0.3	71.8	0.0	1454.6	207.1	0.0
APR	1246	74.3	3.9	3.9	5	0.3	70.1	0.0	1454.6	207.1	0.0
MAY	1438	88.6	4.8	4.9	5	0.3	71.1	0.0	1455.6	219.4	12.3
JUN	1225	73.0	6.0	6.3	22	1.3	65.4	0.0	1455.6	219.4	0.0
JUL	1989	122.5	7.1	7.4	70	4.3	110.8	0.0	1455.6	219.4	0.0
AUG	729	44.9	6.1	6.4	57	3.5	35.0	0.0	1455.6	219.4	0.0
SEP	557	33.2	4.9	5.1	12	0.7	27.4	0.0	1455.6	219.4	0.0
OCT	433	26.7	3.1	3.3	6	0.4	23.0	0.0	1455.6	219.4	0.0
NOV	491	29.3	1.6	1.7	5	0.3	51.6	0.0	1453.6	195.1	-24.3
DEC	391	24.1	0.8	0.8	5	0.3	23.0	0.0	1453.6	195.1	0.0
TOTAL		651.5	41.3	42.7		12.1	586.1	0.0			10.6

Table 4

CEDAR BLUFF RESERVOIR OPERATION ESTIMATES - 2013

	INFLOW		EVAPORATION		RELEASE REQUIREMENT		RESERVOIR SPILL	REQUIREMENT SHORTAGE	END OF MONTH		RESERVOIR CHANGE
	MEAN	1000		1000	MEAN	1000	1000	1000	ELEV	CONT 1000	1000
MONTH	CFS	AF	INCHES	AF	CFS	AF	AF	AF	FT	AF	AF
REASONABLE MINIMUM INFLOW CONDITIONS											
JAN	3	0.2	1.1	0.3	0	0.0	0.0	0.0	2122.6	66.1	-0.1
FEB	4	0.2	1.2	0.3	0	0.0	0.0	0.0	2122.6	66.0	-0.1
MAR	6	0.4	2.2	0.6	0	0.0	0.0	0.0	2122.5	65.8	-0.2
APR	12	0.7	5.5	1.5	0	0.0	0.0	0.0	2122.3	65.0	-0.8
MAY	18	1.1	6.5	1.8	5	0.3	0.0	0.0	2121.9	64.0	-1.0
JUN	18	1.1	8.0	2.2	5	0.3	0.0	0.0	2121.5	62.6	-1.4
JUL	23	1.4	9.6	2.6	13	0.8	0.0	0.0	2120.9	60.6	-2.0
AUG	16	1.0	8.3	2.1	11	0.7	0.0	0.0	2120.3	58.8	-1.8
SEP	7	0.4	7.1	1.8	3	0.2	0.0	0.0	2119.8	57.2	-1.6
OCT	3	0.2	5.0	1.2	0	0.0	0.0	0.0	2119.4	56.2	-1.0
NOV	3	0.2	2.3	0.6	0	0.0	0.0	0.0	2119.3	55.8	-0.4
DEC	3	0.2	1.3	0.3	0	0.0	0.0	0.0	2119.3	55.7	-0.1
TOTAL		7.1	58.1	15.3		2.3	0.0	0.0			-10.5
MOST PROBABLE INFLOW CONDITIONS											
JAN	8	0.5	1.0	0.3	0	0.0	0.0	0.0	2122.7	66.4	0.2
FEB	11	0.6	1.1	0.3	0	0.0	0.0	0.0	2122.8	66.7	0.3
MAR	19	1.2	1.9	0.5	0	0.0	0.0	0.0	2123.0	67.4	0.7
APR	32	1.9	4.9	1.4	0	0.0	0.0	0.0	2123.1	67.9	0.5
MAY	45	2.8	5.8	1.6	3	0.2	0.0	0.0	2123.4	68.9	1.0
JUN	49	2.9	7.2	2.0	3	0.2	0.0	0.0	2123.6	69.6	0.7
JUL	63	3.9	8.6	2.4	11	0.7	0.0	0.0	2123.9	70.4	0.8
AUG	44	2.7	7.4	2.1	6	0.4	0.0	0.0	2123.9	70.6	0.2
SEP	18	1.1	6.3	1.8	2	0.1	0.0	0.0	2123.7	69.8	-0.8
OCT	6	0.4	4.5	1.3	0	0.0	0.0	0.0	2123.4	68.9	-0.9
NOV	10	0.6	2.1	0.6	0	0.0	0.0	0.0	2123.4	68.9	0.0
DEC	6	0.4	1.2	0.3	0	0.0	0.0	0.0	2123.5	69.0	0.1
TOTAL		19.0	52.0	14.6		1.6	0.0	0.0			2.8
REASONABLE MAXIMUM INFLOW CONDITIONS											
JAN	24	1.5	0.9	0.2	0	0.0	0.0	0.0	2123.0	67.5	1.3
FEB	32	1.8	1.0	0.3	0	0.0	0.0	0.0	2123.5	69.0	1.5
MAR	57	3.5	1.7	0.5	0	0.0	0.0	0.0	2124.3	72.0	3.0
APR	96	5.7	4.3	1.2	0	0.0	0.0	0.0	2125.6	76.5	4.5
MAY	138	8.5	5.2	1.6	3	0.2	0.0	0.0	2127.4	83.2	6.7
JUN	148	8.8	6.4	2.1	3	0.2	0.0	0.0	2129.0	89.7	6.5
JUL	188	11.6	7.7	2.6	3	0.2	0.0	0.0	2131.0	98.5	8.8
AUG	131	8.1	6.6	2.4	0	0.0	0.0	0.0	2132.3	104.2	5.7
SEP	54	3.2	5.6	2.2	0	0.0	0.0	0.0	2132.5	105.2	1.0
OCT	21	1.3	4.0	1.6	0	0.0	0.0	0.0	2132.4	104.9	-0.3
NOV	30	1.8	1.8	0.7	0	0.0	0.0	0.0	2132.7	106.0	1.1
DEC	21	1.3	1.1	0.4	0	0.0	0.0	0.0	2132.8	106.9	0.9
TOTAL		57.1	46.3	15.8		0.6	0.0	0.0			40.7

TABLE 5

FLOOD DAMAGES PREVENTED BY NEBRASKA-KANSAS PROJECTS RESERVOIRS

RESERVOIR	DURING FY 2012	PRIOR TO 2012	ACCUMULATED TOTAL
BONNY	$400	$2,868,500	$2,868,900
ENDERS	$0	$3,574,000	$3,574,000
SWANSON	$2,500	$29,639,600	$29,642,100
HUGH BUTLER	$700	$6,388,700	$6,389,400
HARRY STRUNK	$2,100	$16,126,900	$16,129,000
KEITH SEBELIUS	$400	$4,066,900	$4,067,300
HARLAN COUNTY	$11,400	$228,574,700	$228,586,100
LOVEWELL	$400	$152,770,900	$152,771,300
KIRWIN	$3,200	$95,007,400	$95,010,600
WEBSTER	$1,100	$113,071,300	$113,072,400
WACONDA	$17,700	$1,279,376,500	$1,279,394,200
CEDAR BLUFF	$0	$134,940,700	$134,940,700
TOTAL	$39,900	$2,066,406,100	$2,066,446,000

Estimates of damages prevented are received from the Army Corps of Engineer's Kansas City District Office. The Accumulated Totals date from 1951 through 2012. 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 2012 AND THE
ESTIMATED DIVERSION FOR 2013
(Units - Acre-Feet)

Irrigation District and Canal	2012 Irrigation Operations From	To	10-Year Average Diversion (2002-2011)	2012 Diversion	Estimated Diversion in 2013
Mirage Flats Irrigation District					
Mirage Flats Canal	6/6	8/30	9,525	12,248	9,500
Ainsworth Irrigation District					
Ainsworth Canal	5/13	9/14	74,053	85,118	75,000
Twin Loups Irrigation District					
Above Davis Creek	4/10	9/17	45,230	68,013	45,000
Below Davis Creek	5/3	9/17	42,156	46,711	42,000
Total Twin Loups Irrigation District			87,386	114,724	87,000
Frenchman Valley Irrigation District					
Culbertson Canal	4/13	10/24	6,132	5,470	6,000
H & RW Irrigation District					
Culbertson Extension Canal	Did not run.		0	0	0
Frenchman-Cambridge Irrigation District					
Meeker-Driftwood Canal	6/11	8/31	7,418	32,955	15,000
Red Willow Canal	Did not run.		1,268	0	0
Bartley Canal	4/23	8/31	3,843	8,137	0
Cambridge Canal	4/19	8/28	19,719	27,618	12,000
Total Frenchman-Cambridge Irrigation District			32,248	68,710	27,000
Almena Irrigation District					
Almena Canal	5/18	8/1	1,792	3,172	3,000
Bostwick Irrigation District in Nebraska					
Franklin Canal	5/30	9/1	11,196	30,870	20,000
Naponee Canal	6/4	8/31	789	1,985	1,000
Franklin Pump Canal	6/6	8/30	793	1,648	1,000
Superior Canal	6/1	8/31	5,550	9,744	7,000
Courtland Canal (Nebraska)	5/14	9/1	541	884	500
Total Bostwick Irrigation District in Nebraska			18,869	45,131	29,500
Kansas-Bostwick Irrigation District					
Courtland Canal above Lovewell	5/18	8/30	14,599	26,777	20,000
Courtland Canal below Lovewell	4/27	8/30	34,104	50,078	38,000
Total Kansas-Bostwick Irrigation District			48,703	76,855	58,000
Kirwin Irrigation District					
Kirwin Canal	6/4	9/1	10,621	22,371	18,000
Webster Irrigation District					
Osborne Canal	6/11	8/31	6,253	13,189	11,000
Glen Elder Irrigation District	6/6	9/10	5,887	9,024	5,000
TOTAL			301,469	456,012	329,000

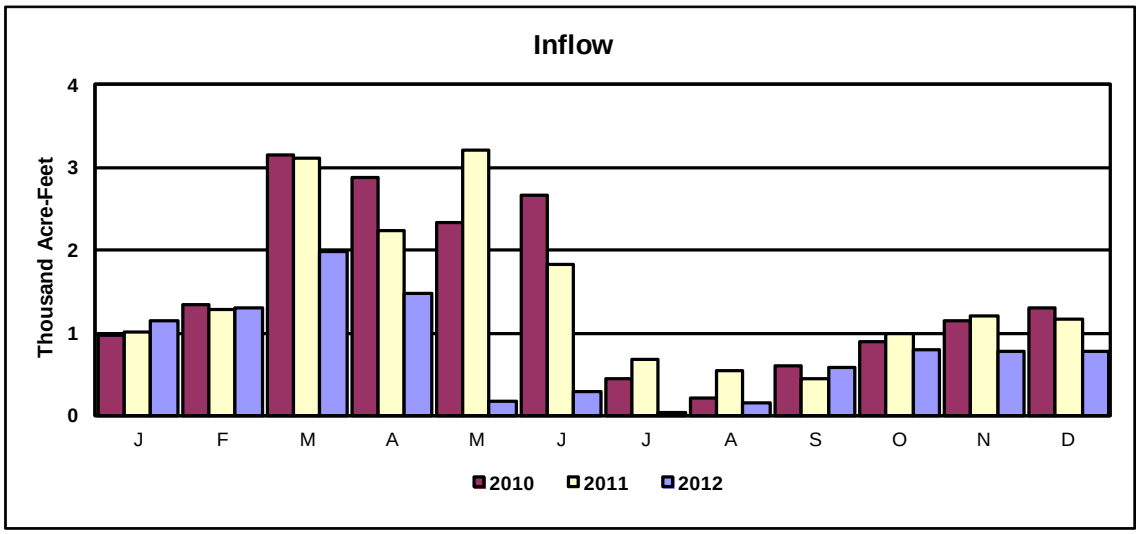
TABLE 7
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
'CALENDAR YEAR 2012

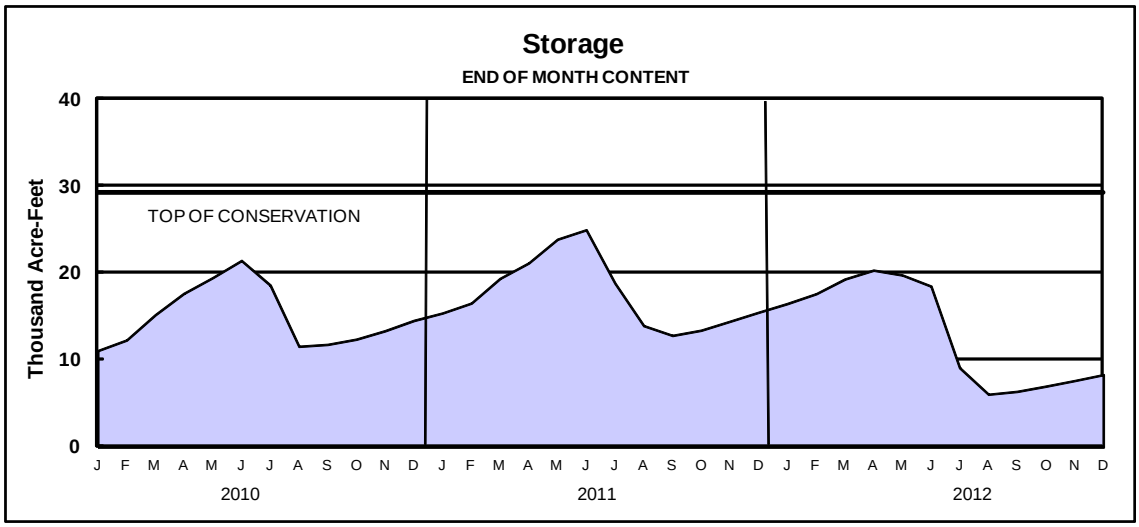
Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-11 AF	Storage 12-31-12 AF	Gain or Loss AF	Maximum Content AF	Maximum Storage Date	Minimum Content AF	Minimum Storage Date	Total Inflow AF	Percent Of Most Probable %	AVERAGE PREC.	MOST PROBABLE INFLOW
Box Butte	7.53	44	15,464	8,308	-7,156	20,318	MAY 5	5,895	AUG 10	9,464	60	**16.95**	15,900
Merritt	10.26	50	61,370	61,370	0	67,602	MAY 27	28,186	AUG 26	180,654	98	**20.47**	184,700
Calamus	11.78	49	105,099	87,136	-17,963	128,067	APR 28	41,366	OCT 1	268,633	98	**24.14**	275,500
Davis Creek	13.78	56	9,280	18,954	9,674	24,455	JUN 15	6,003	SEP 16	63,860	130	**24.79**	49,300
Bonny	9.09	53	135	0	-135	135	JAN 1	0	MAY 31	2,824	25	**17.13**	11,100
Enders	12.29	65	17,484	15,122	-2,362	18,649	MAY 1	14,956	NOV 26	4,509	43	**19.02**	10,600
Swanson	12.94	65	62,156	37,797	-24,359	75,222	MAY 5	36,440	DEC 13	23,105	70	**19.97**	32,900
Hugh Butler	9.65	49	5,993	6,098	105	6,097	DEC 31	4,915	SEP 29	10,905	74	**19.63**	14,700
Harry Strunk	12.00	58	33,098	19,939	-13,159	35,670	MAY 5	12,977	AUG 28	31,018	80	**20.7**	38,900
Keith Sebelius	15.29	62	23,218	16,462	-6,756	24,737	MAY 2	16,259	DEC 12	5,177	56	**24.49**	9,200
Harlan County	18.14	80	322,964	191,125	-131,839	335,503	FEB 29	190,305	DEC 12	78,581	55	**22.76**	142,800
Lovewell	22.54	82	31,938	22,585	-9,353	39,868	MAY 6	12,249	AUG 24	50,040	77	**27.47**	65,100
Kirwin	11.96	51	99,989	66,348	-33,641	99,989	JAN 1	65,713	NOV 13	21,535	65	**23.57**	32,900
Webster	16.92	72	58,196	36,167	-22,029	65,230	MAY 5	36,095	DEC 13	11,090	42	**23.66**	26,100
Waconda	19.99	78	211,190	184,545	-26,645	224,622	MAY 1	181,996	OCT 12	109,096	60	**25.53**	180,800
Cedar Bluff	14.97	71	79,365	66,233	-13,132	79,365	JAN 6	66,233	DEC 29	5,247	27	**20.98**	19,500

EXHIBIT 1A

BOX BUTTE RESERVOIR

ACTUAL OPERATION





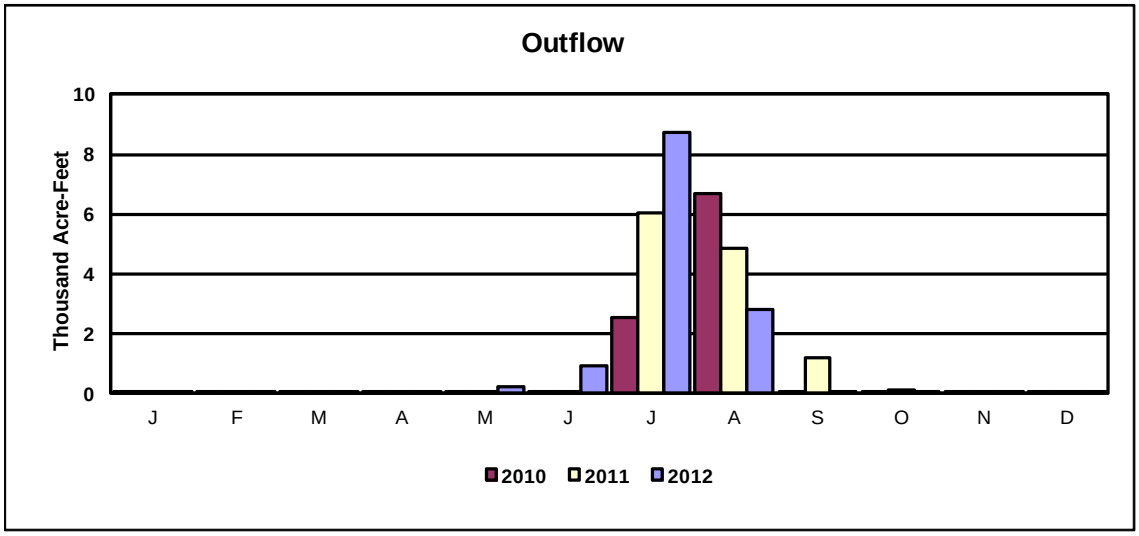
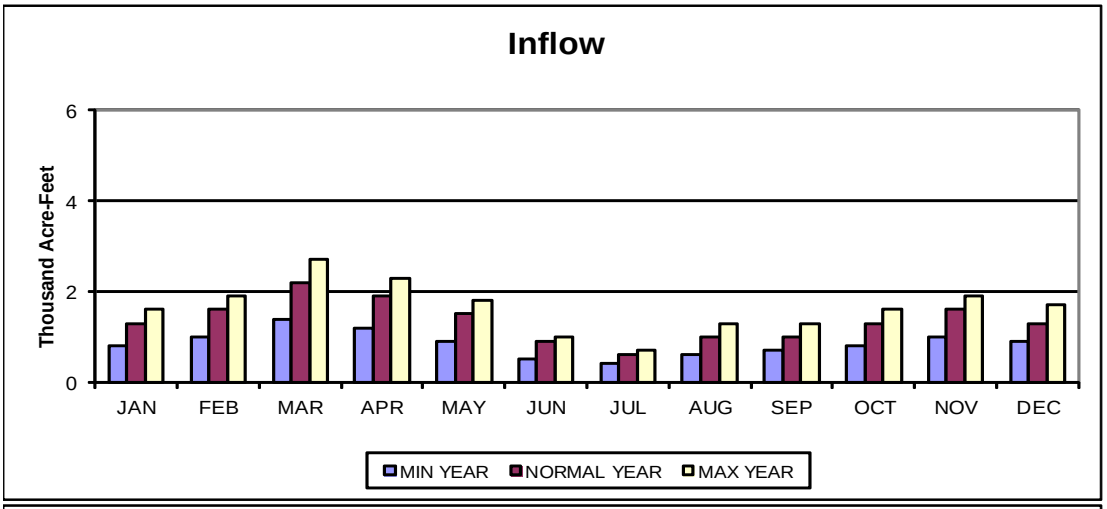
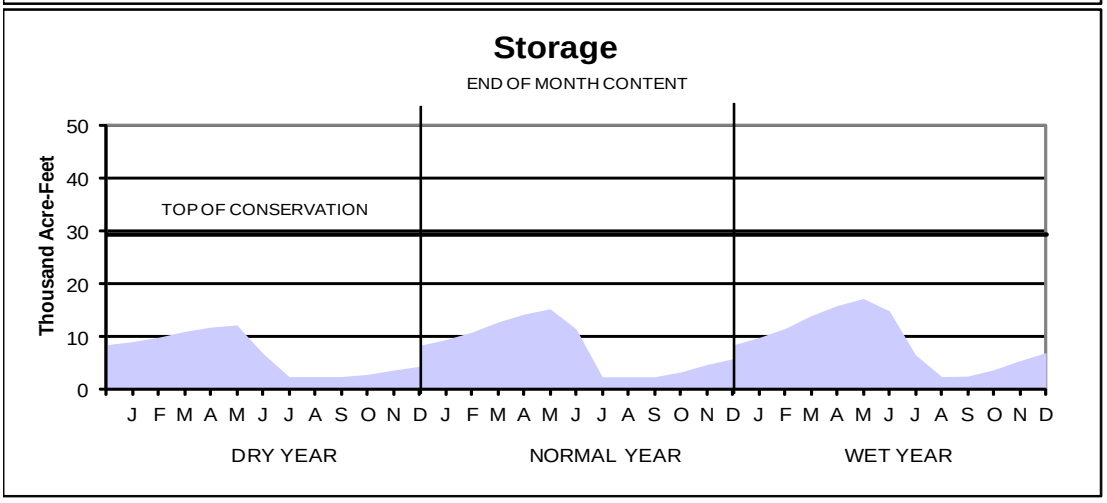


EXHIBIT 1B

BOX BUTTE RESERVOIR

2013 OPERATION PLAN





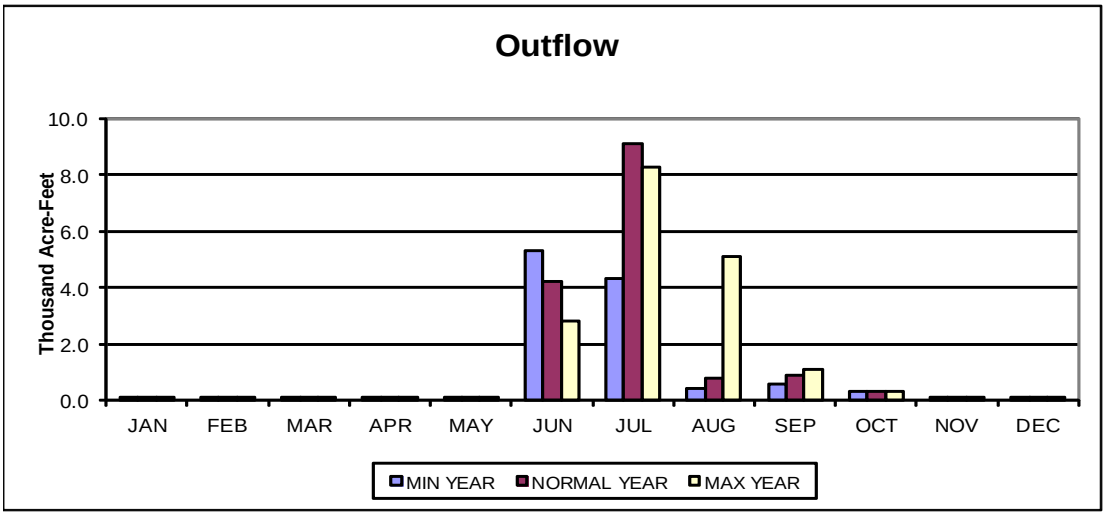


EXHIBIT 2A

MERRITT RESERVOIR

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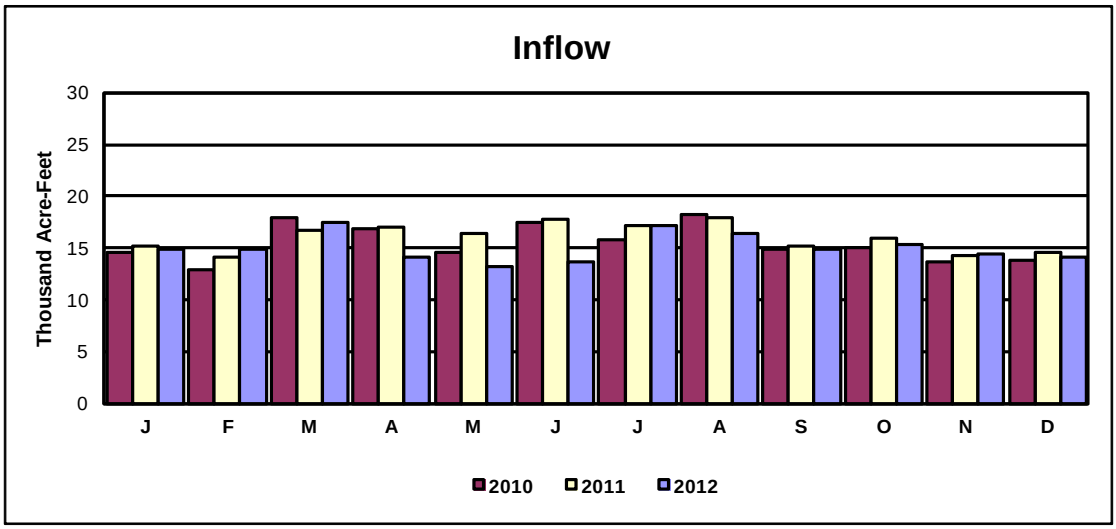
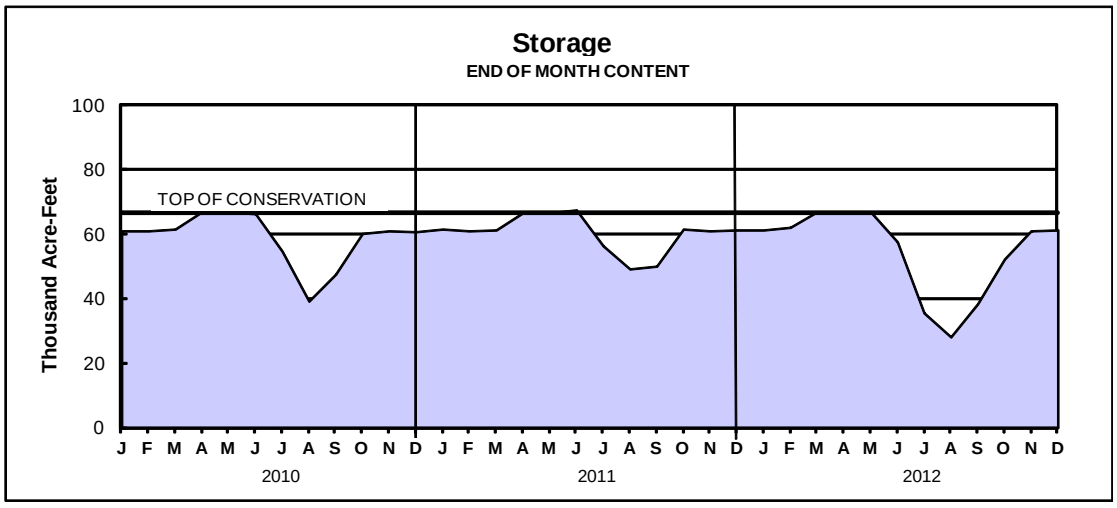




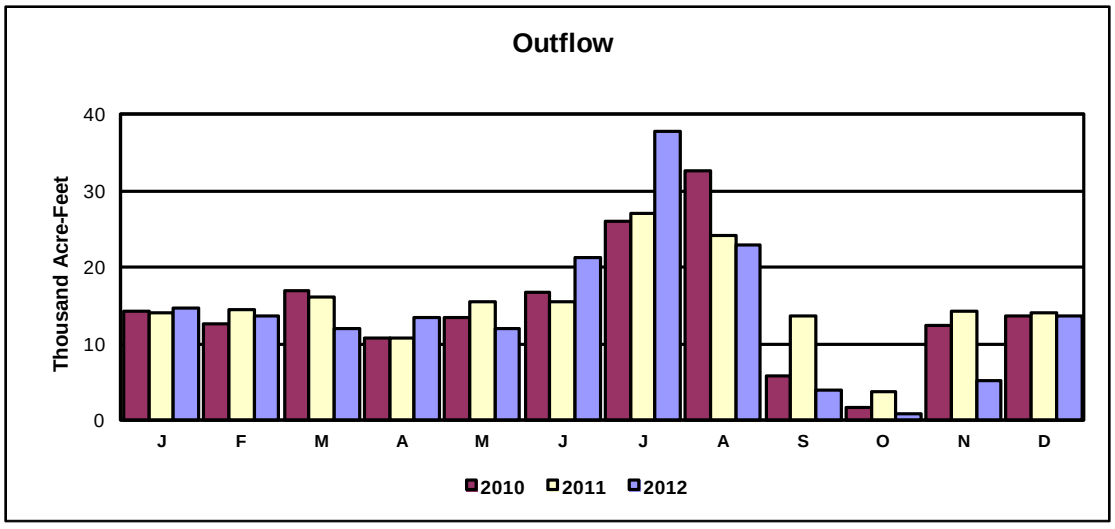
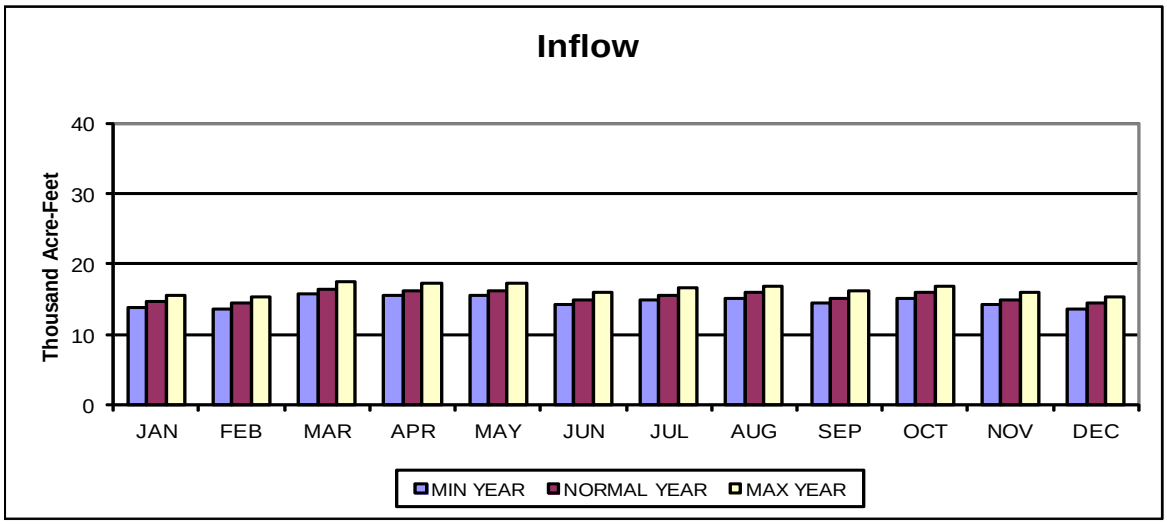
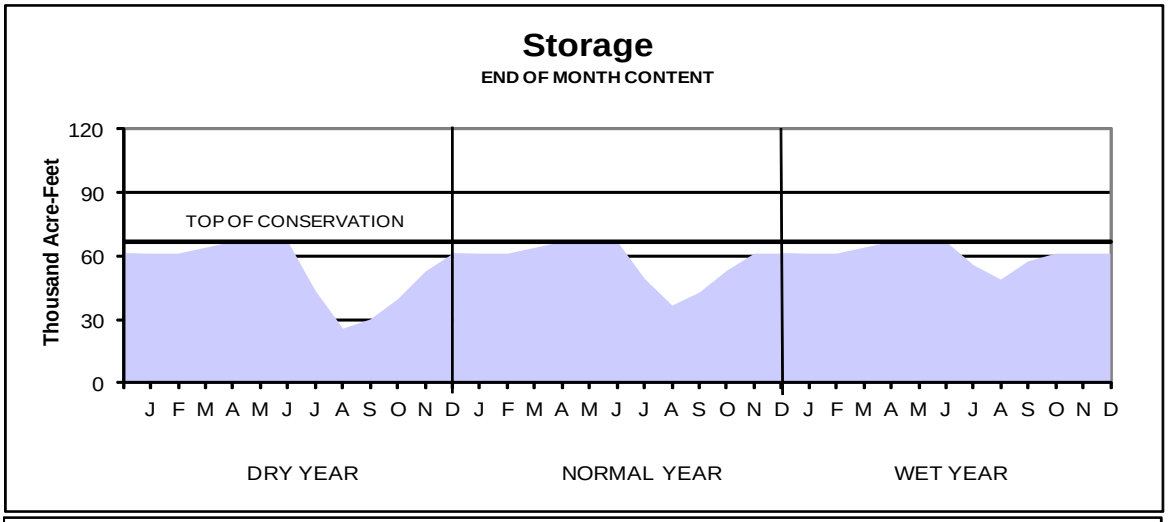


EXHIBIT 2B

MERRITT RESERVOIR

2013 OPERATION PLAN





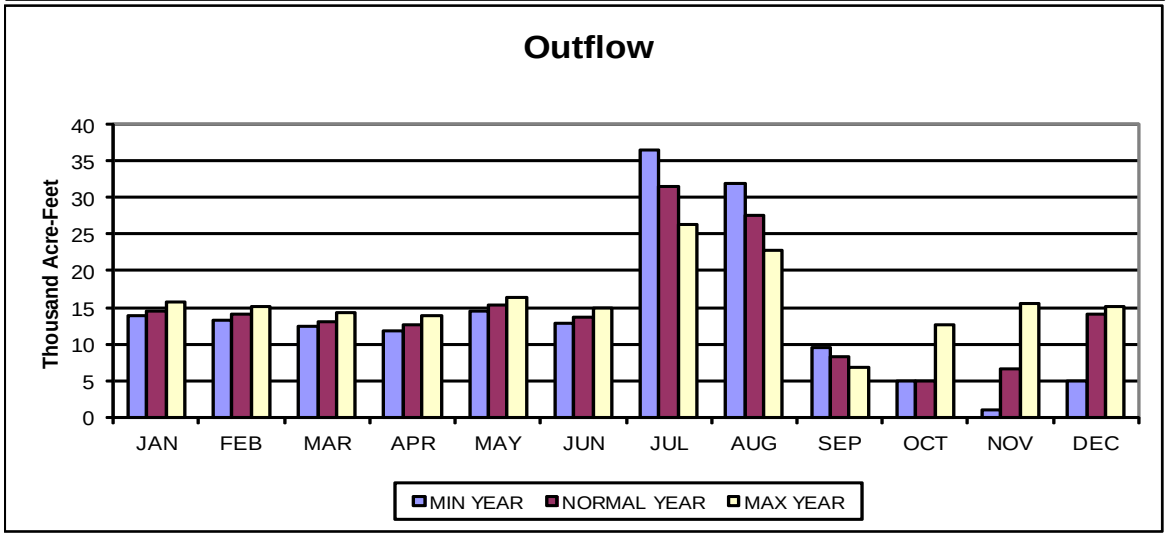
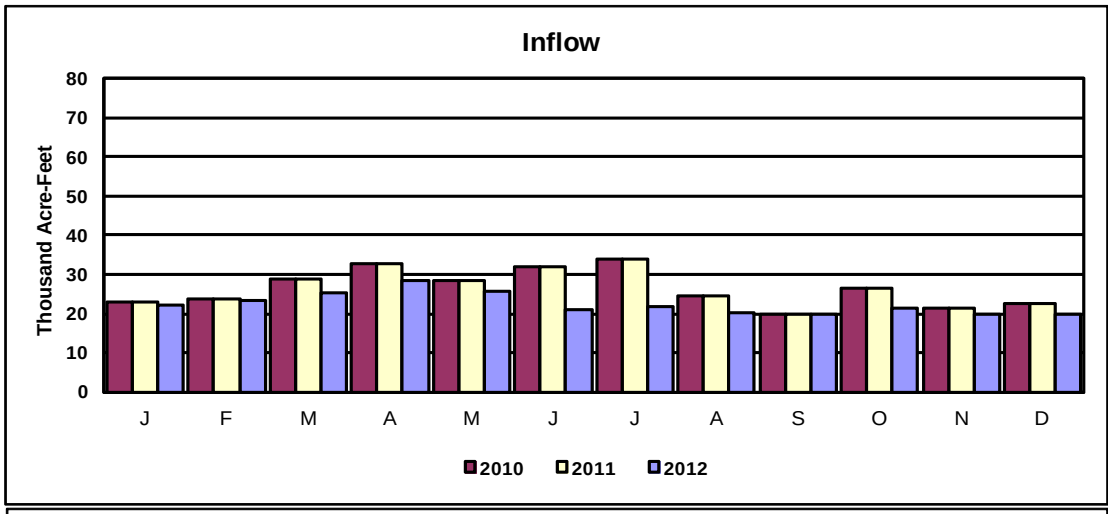
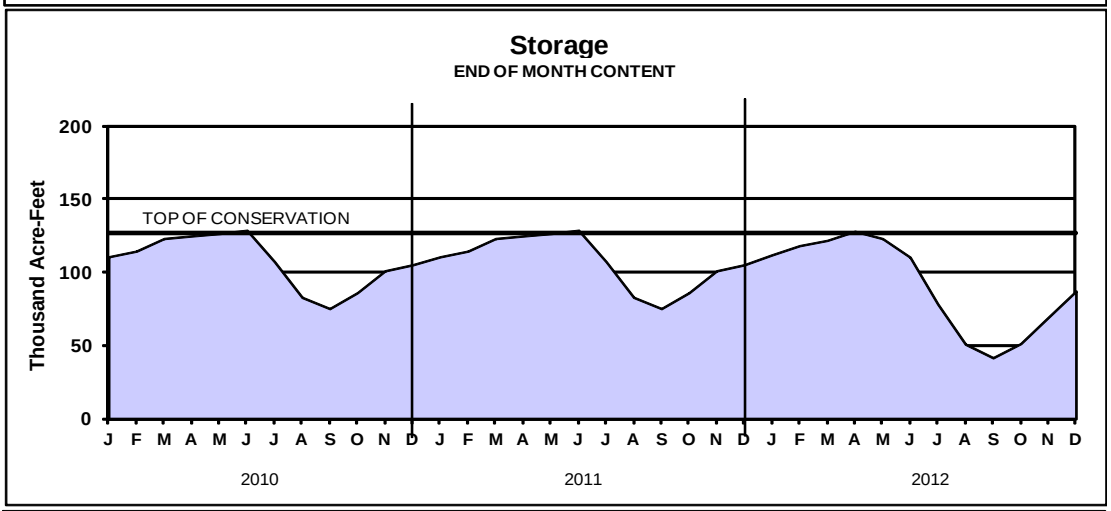


EXHIBIT 3A

CALAMUS RESERVOIR

ACTUAL OPERATION





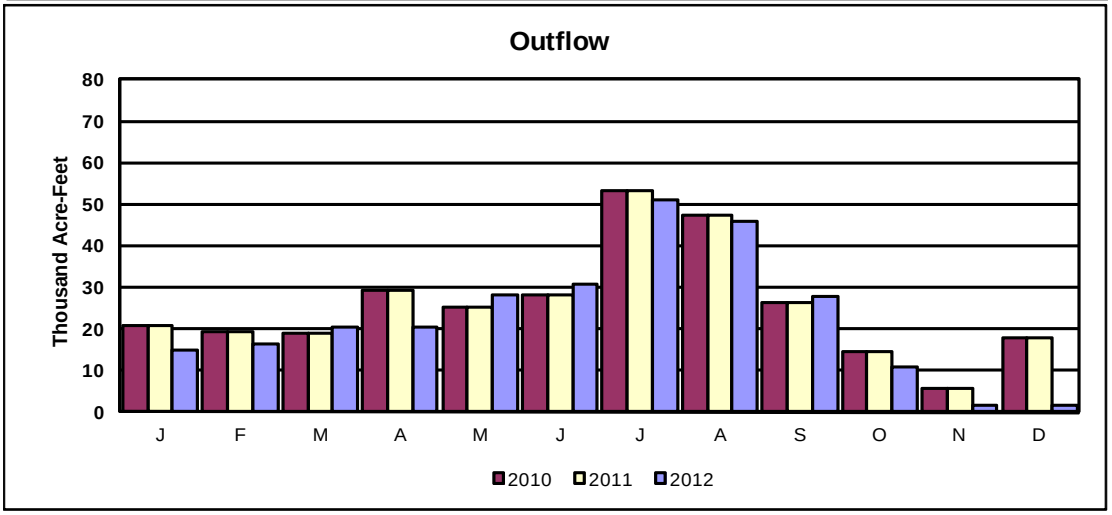
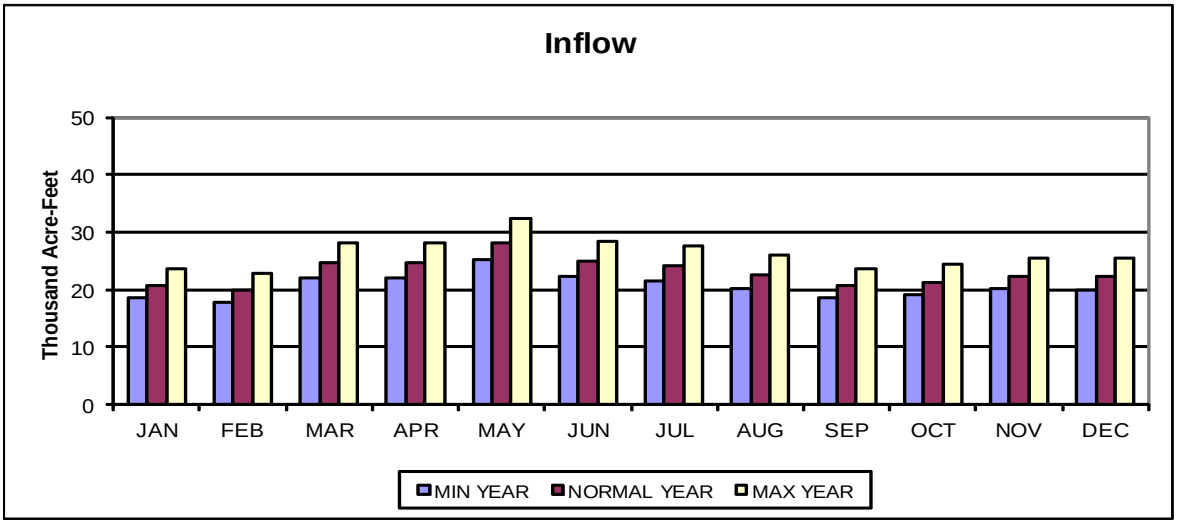
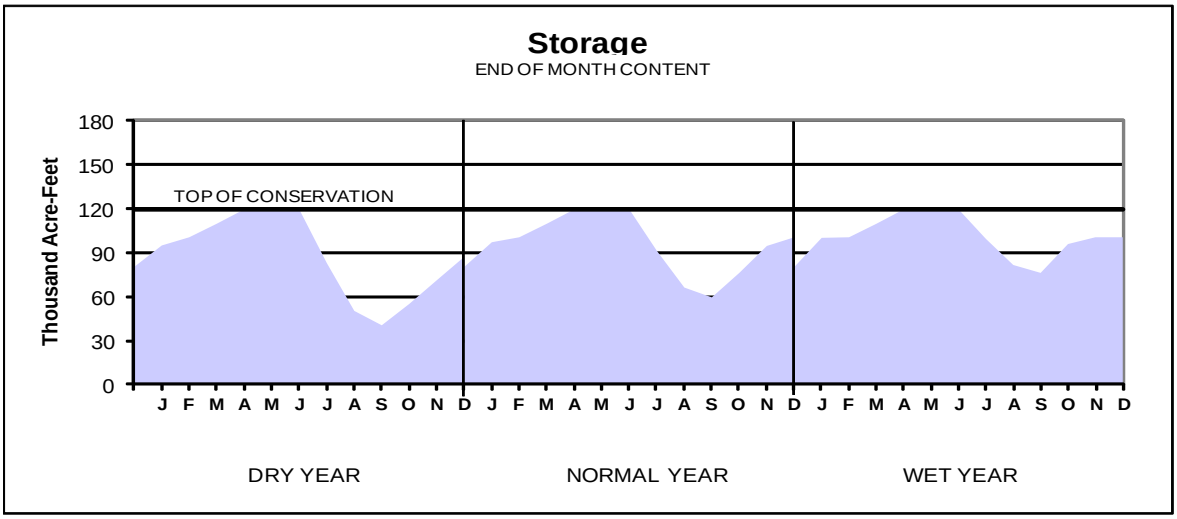


EXHIBIT 3B

CALAMUS RESERVOIR

2013 OPERATION PLAN





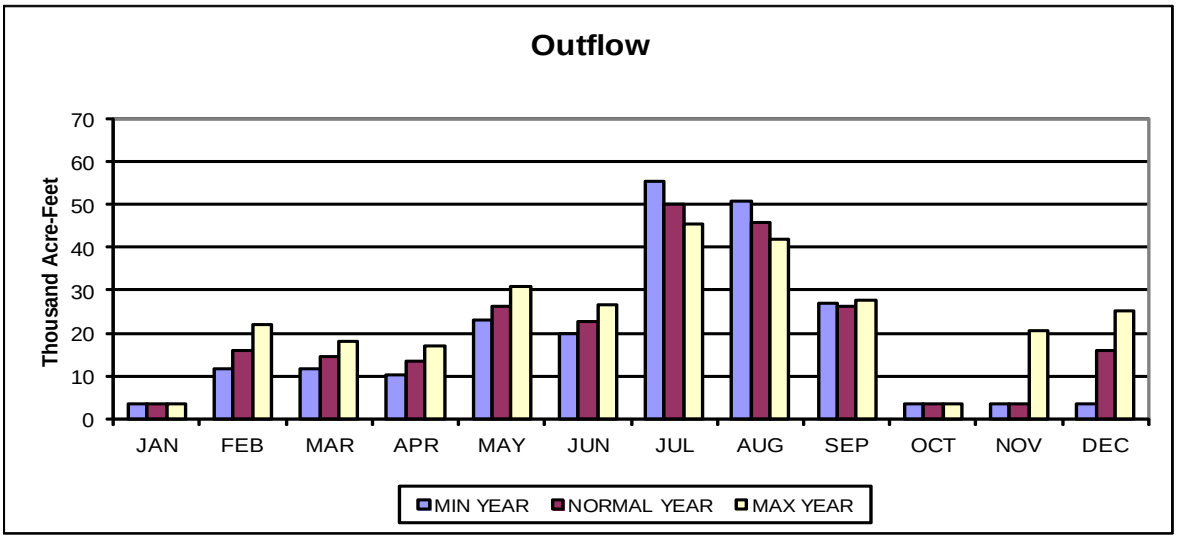
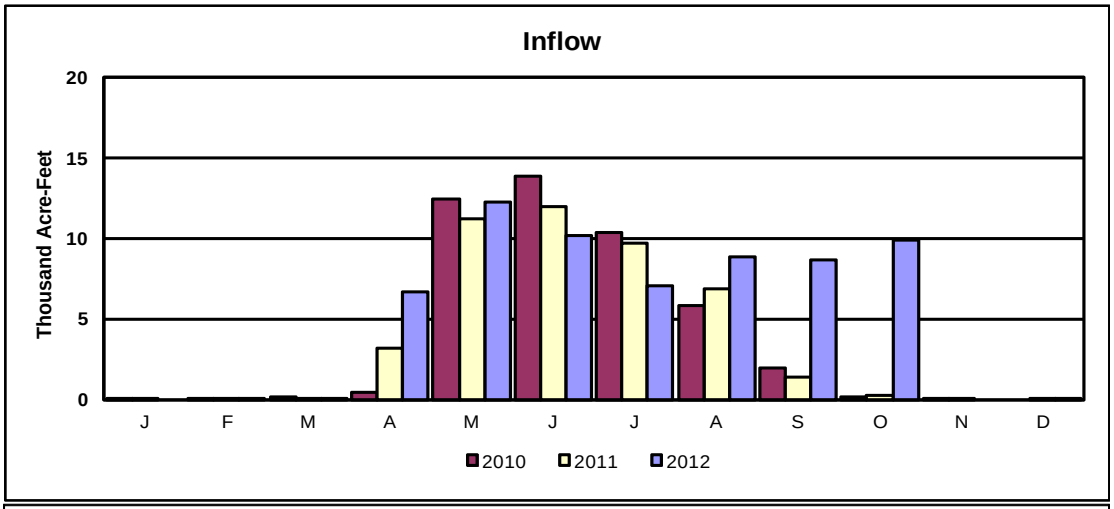
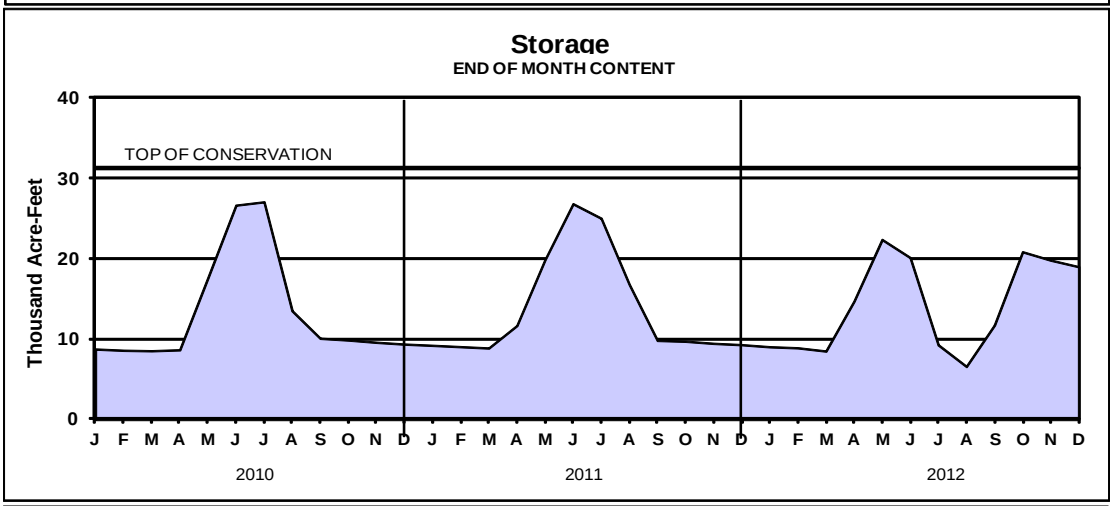


EXHIBIT 4A

DAVIS CREEK RESERVOIR

ACTUAL OPERATION





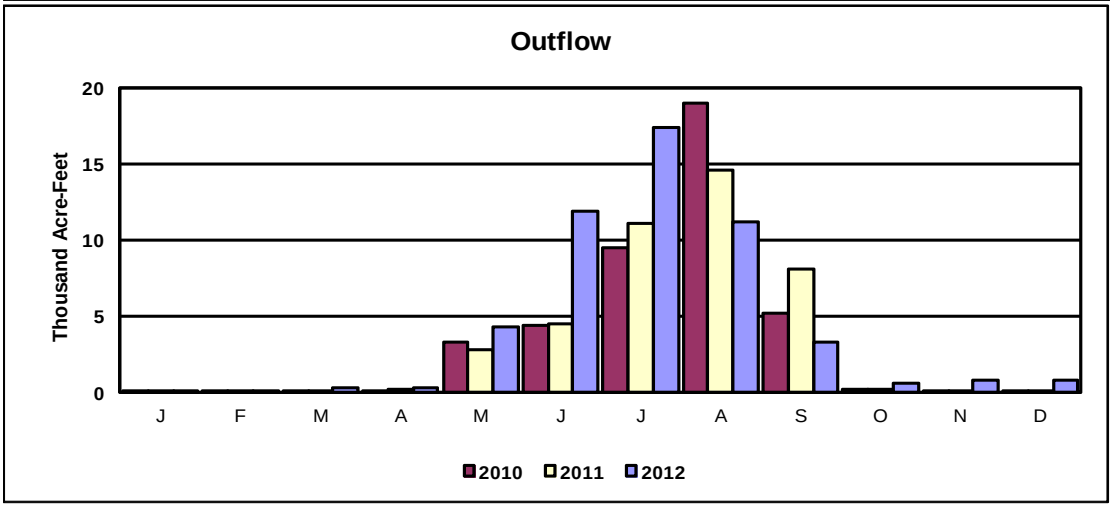
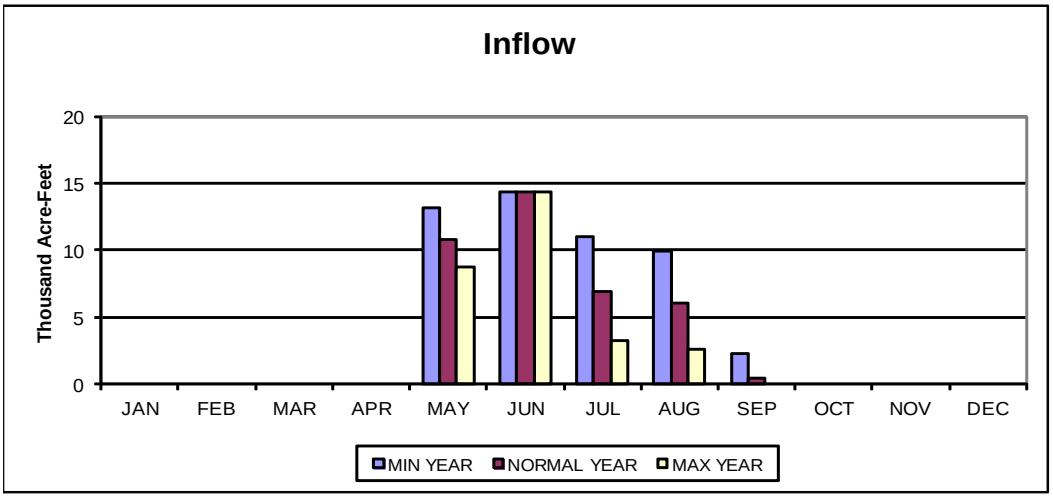
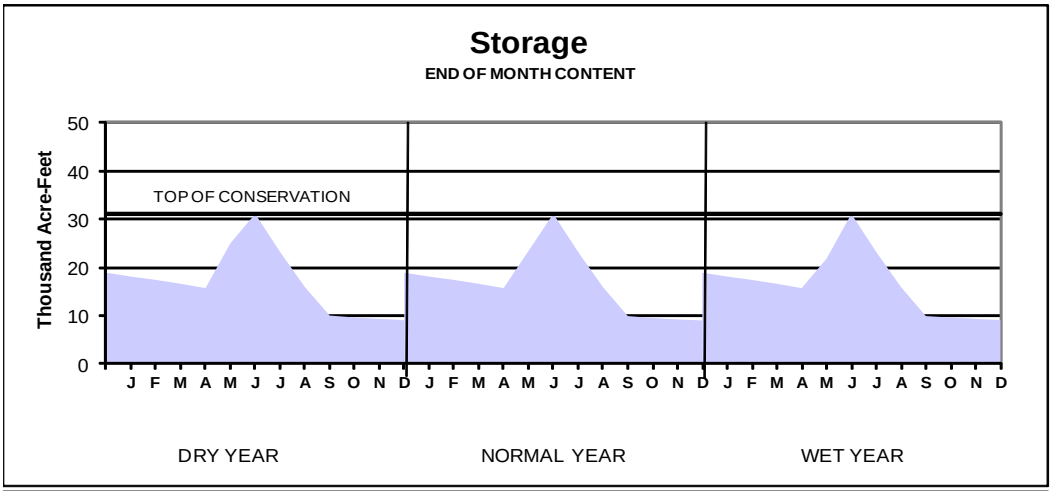


EXHIBIT 4B

DAVIS CREEK RESERVOIR

2013 OPERATION PLAN





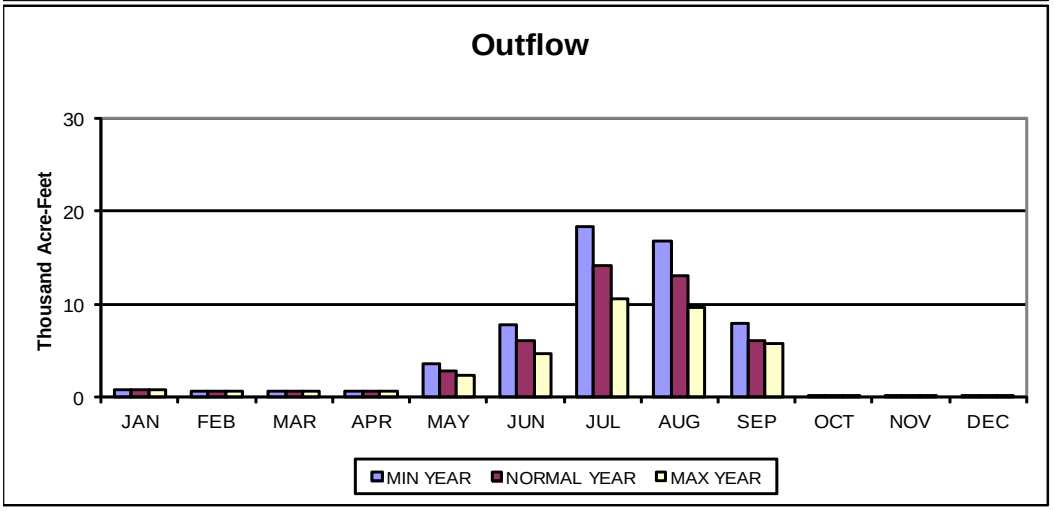
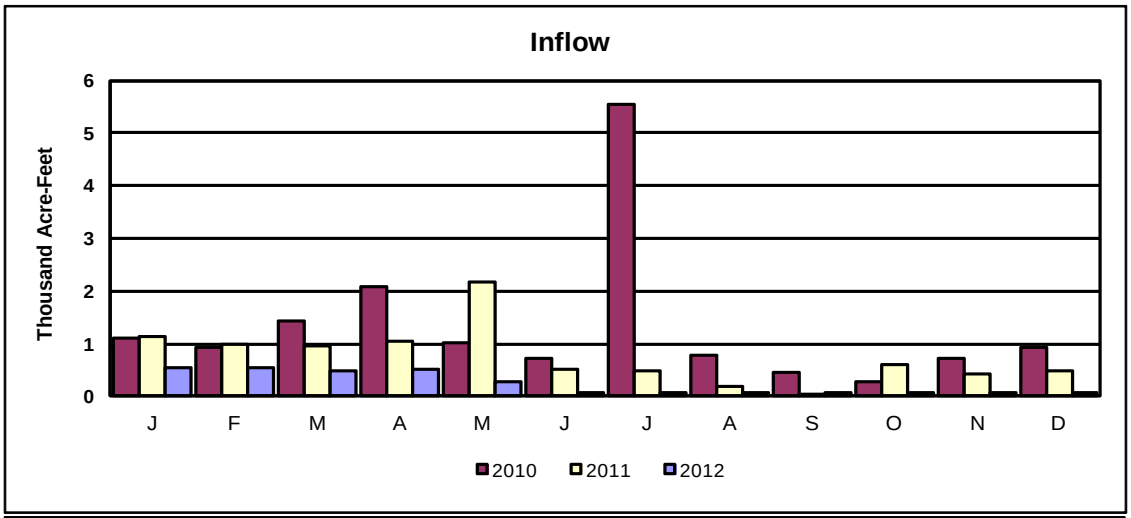
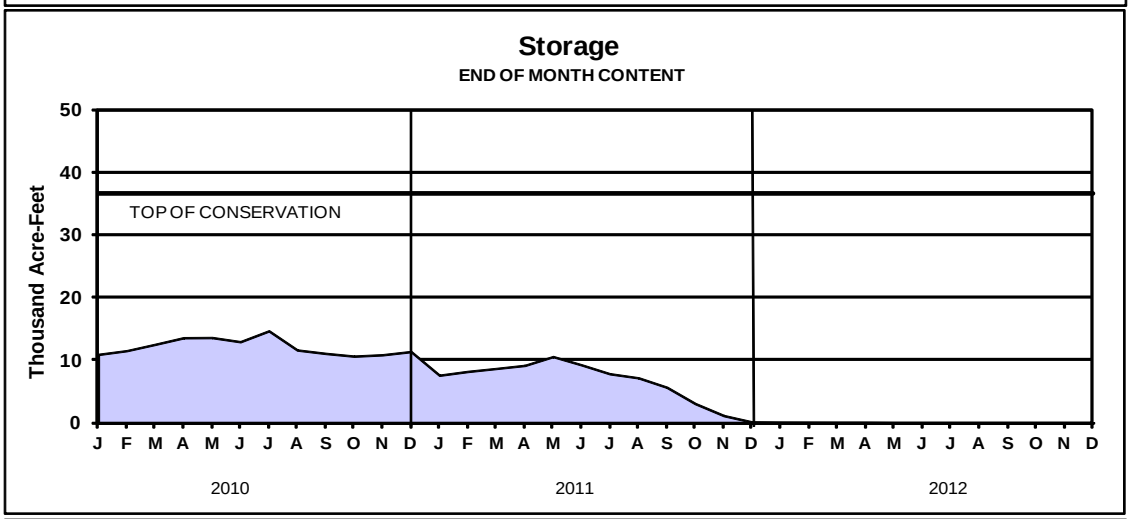


EXHIBIT 5A

BONNY RESERVOIR

ACTUAL OPERATION





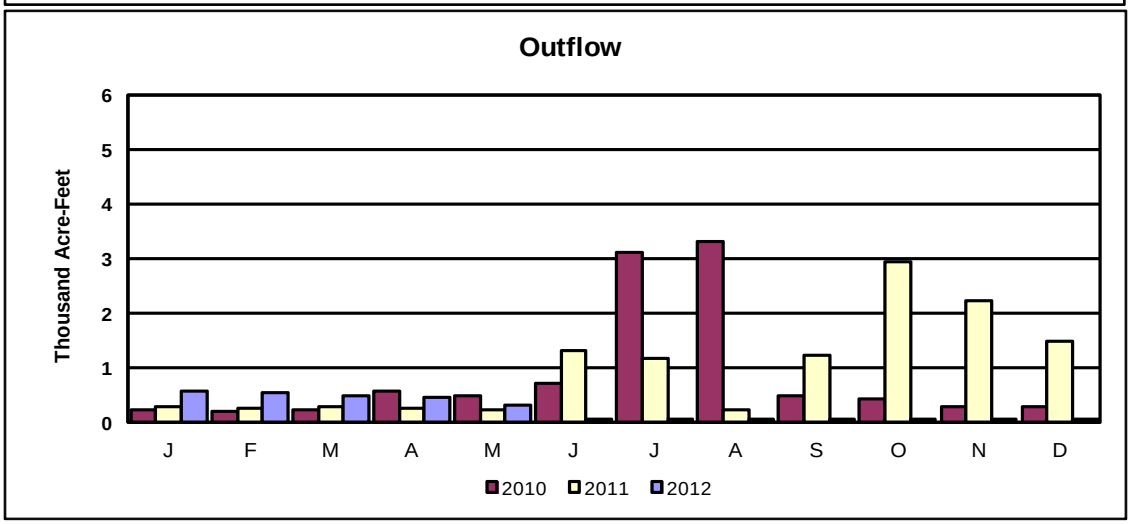
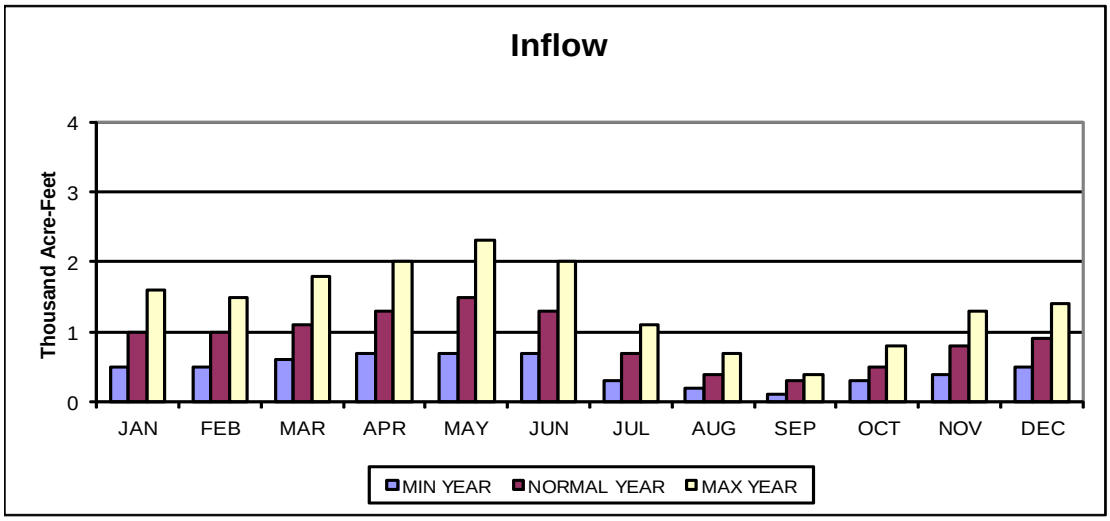
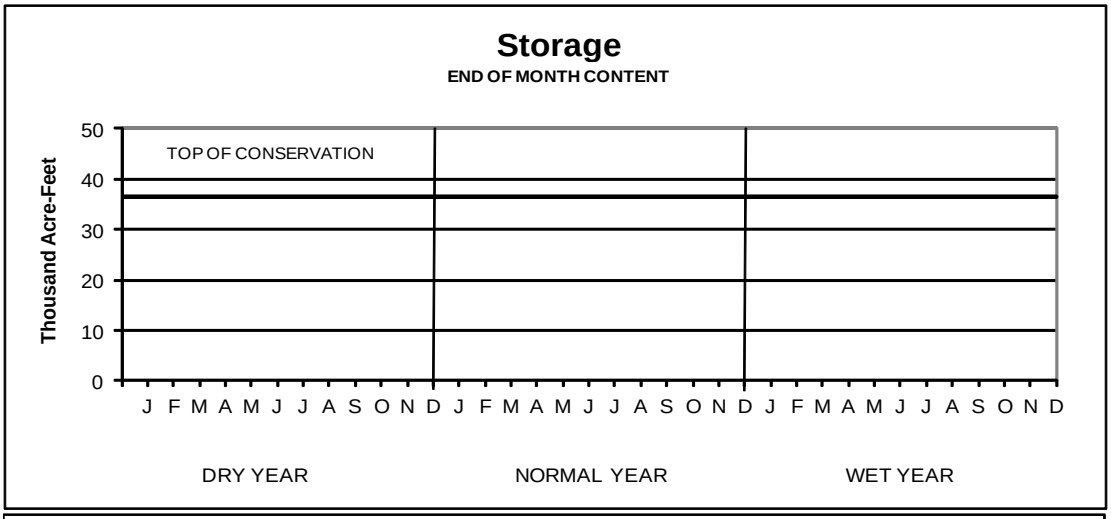


EXHIBIT 5B

BONNY RESERVOIR

2013 OPERATION PLAN





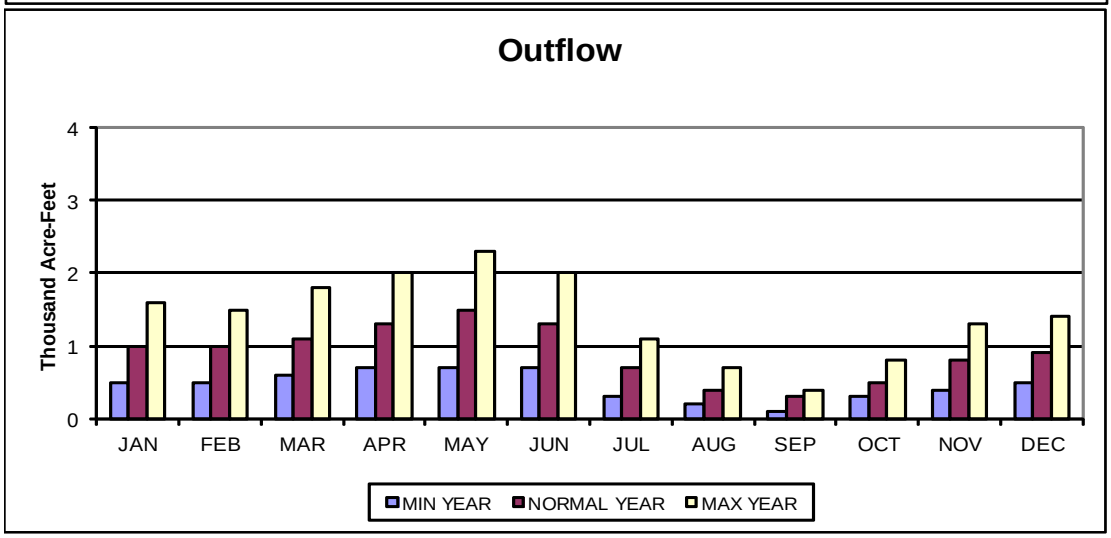
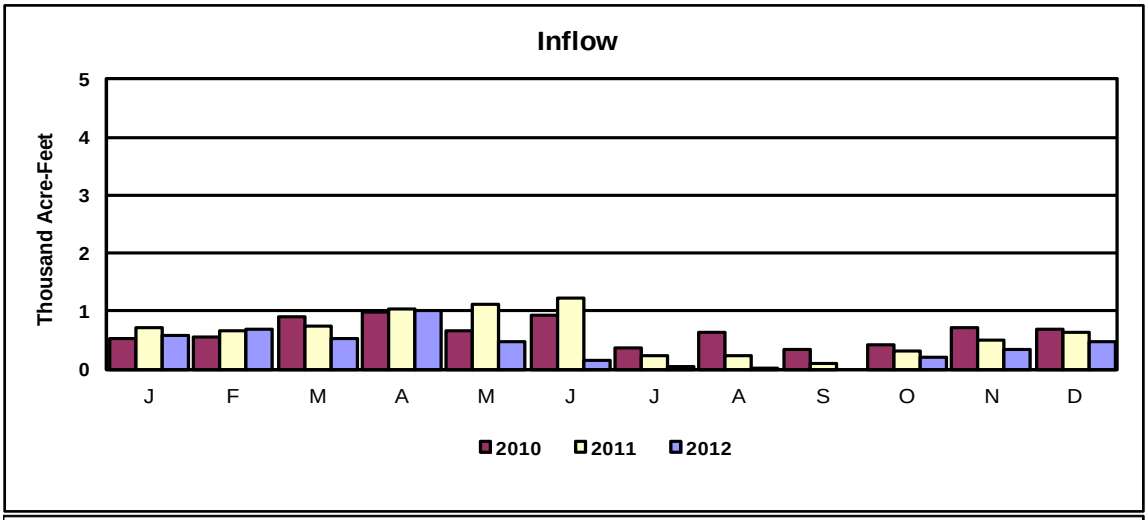
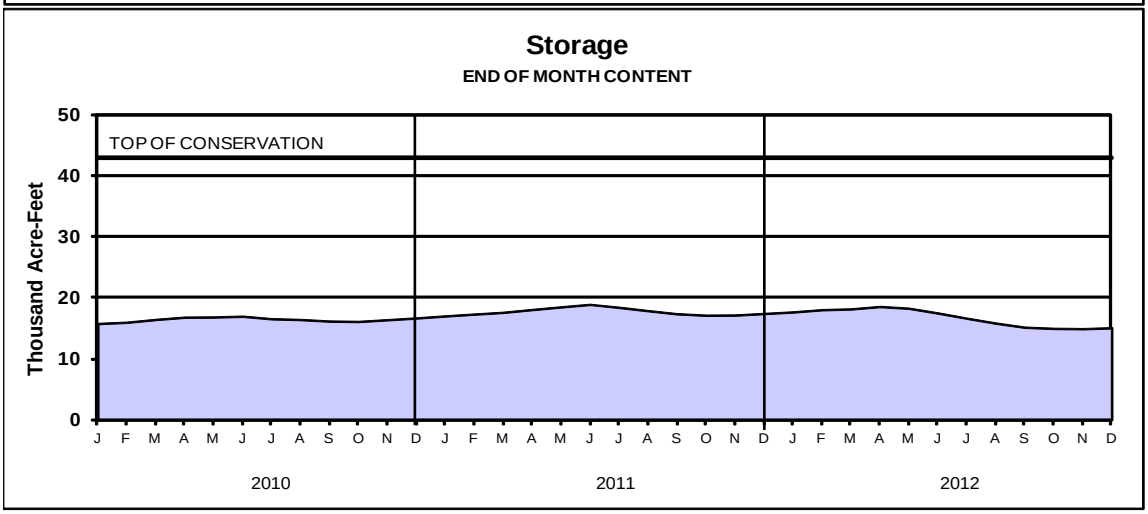


EXHIBIT 6A

ENDERS RESERVOIR

ACTUAL OPERATION





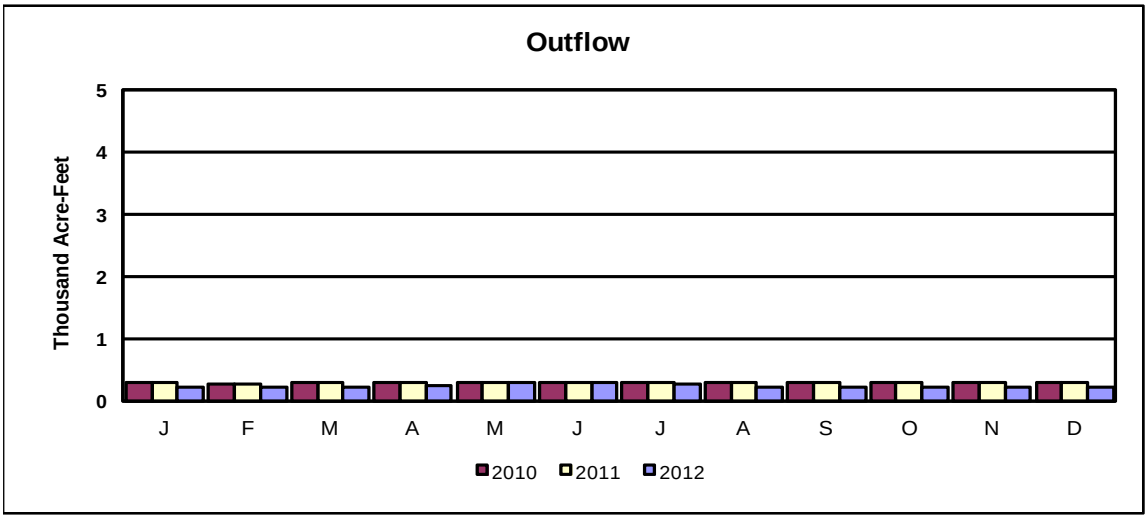
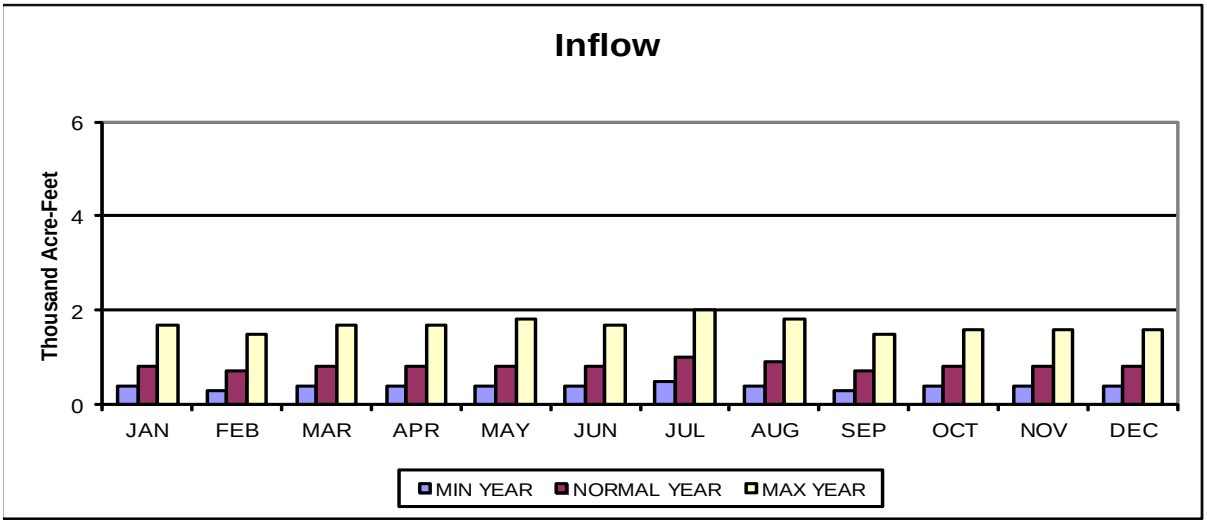
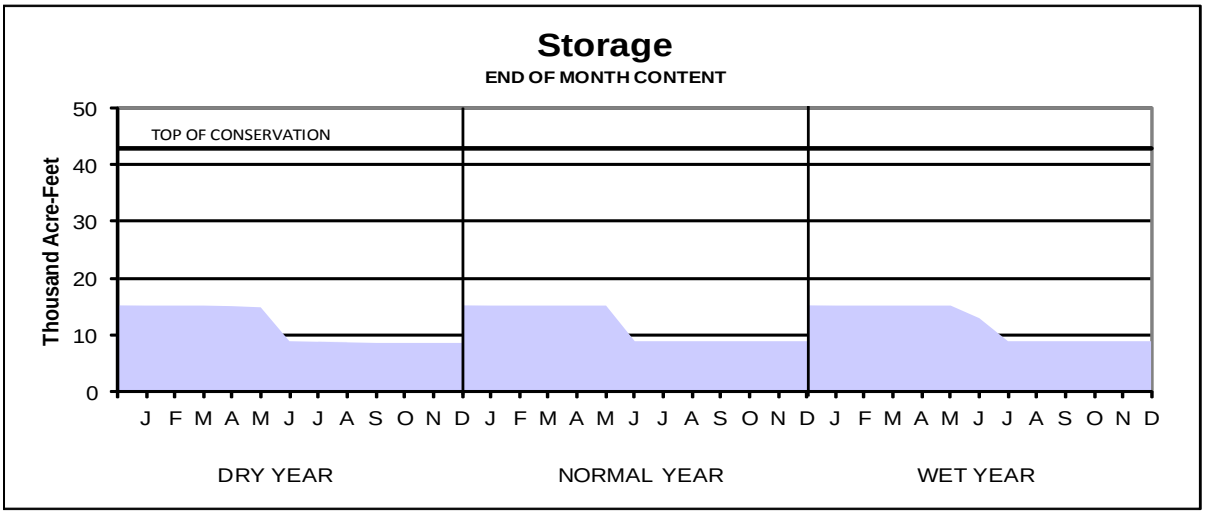


EXHIBIT 6B

ENDERS RESERVOIR

2013 OPERATION PLAN





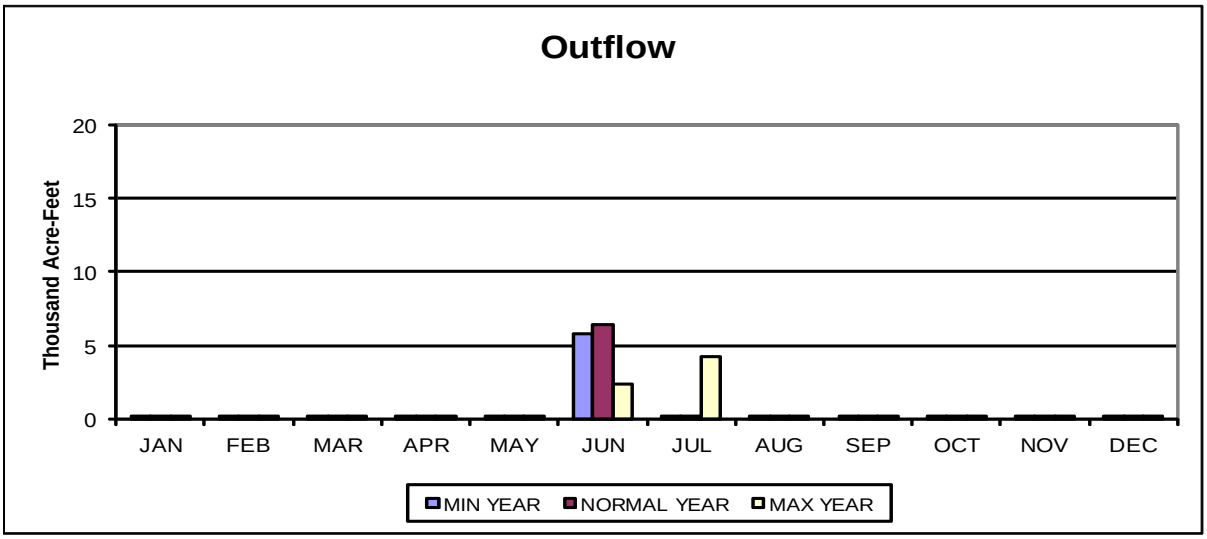
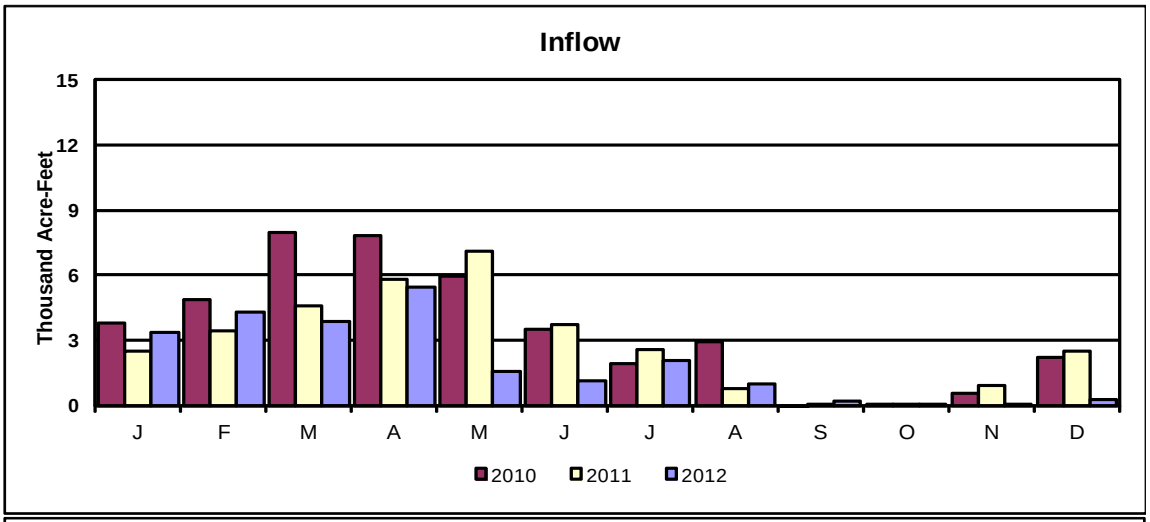
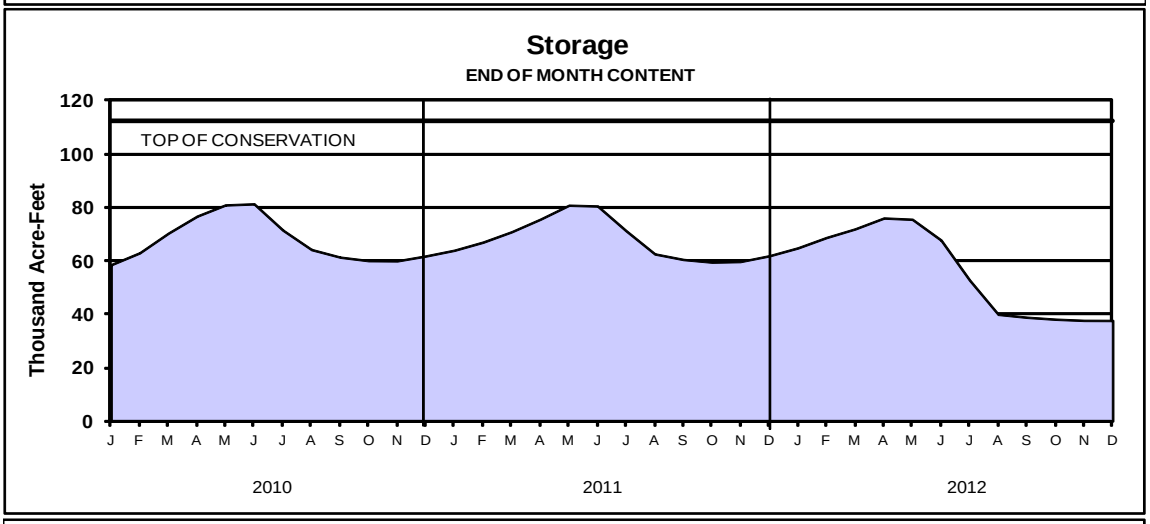


EXHIBIT 7A

SWANSON LAKE

ACTUAL OPERATION





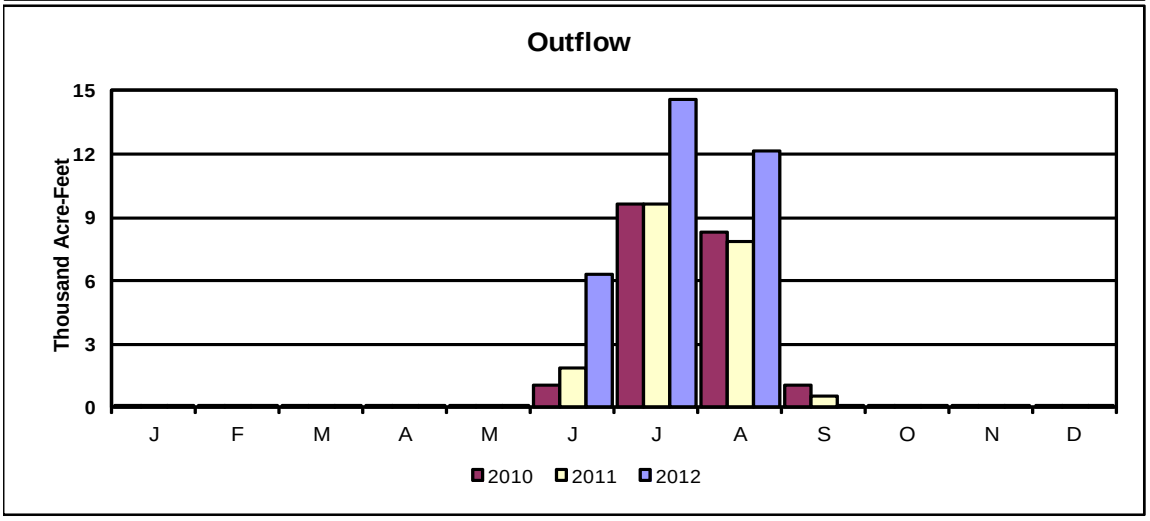
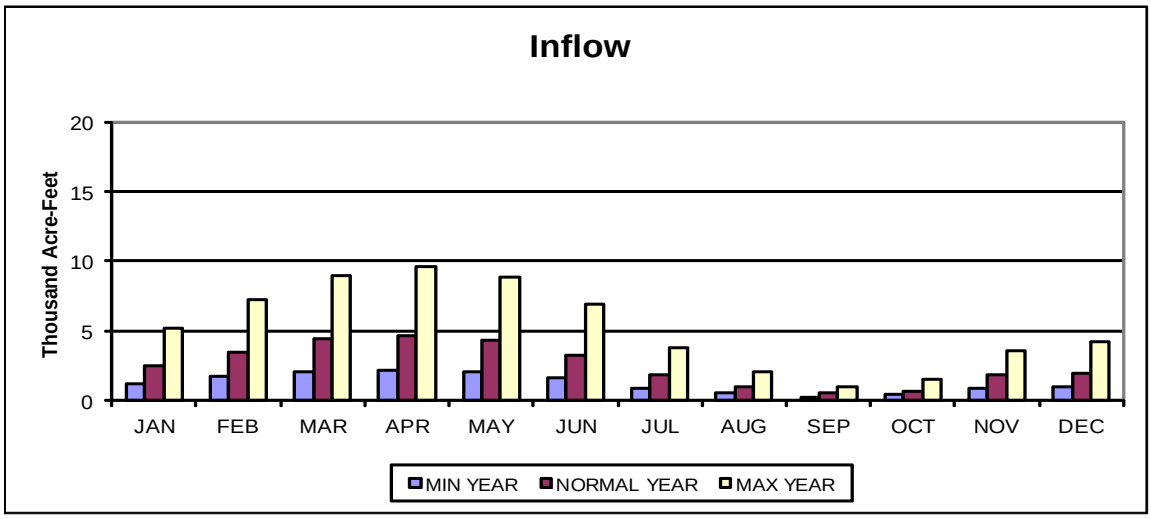
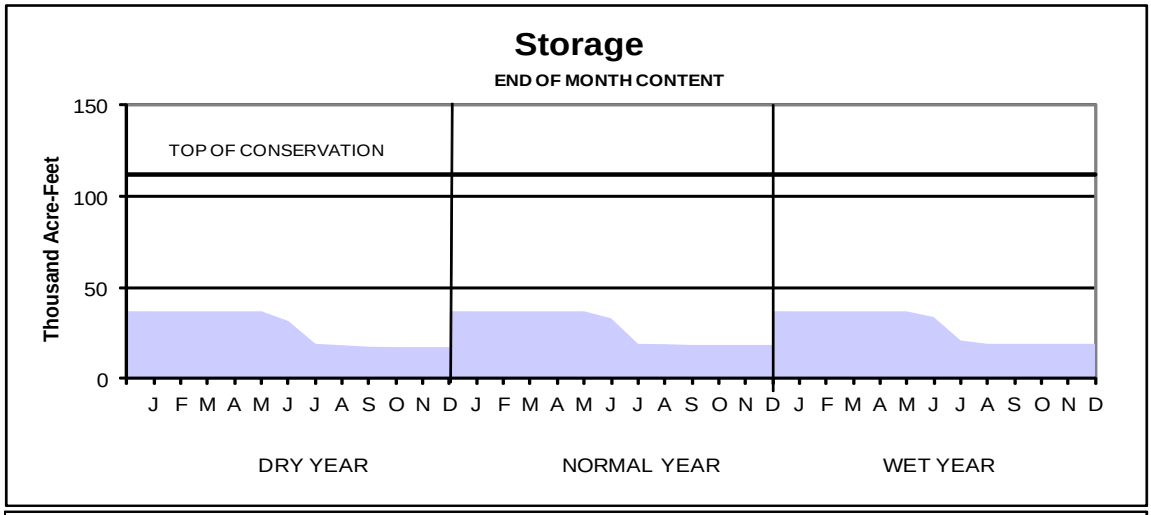


EXHIBIT 7B

SWANSON LAKE

2013 OPERATION PLAN





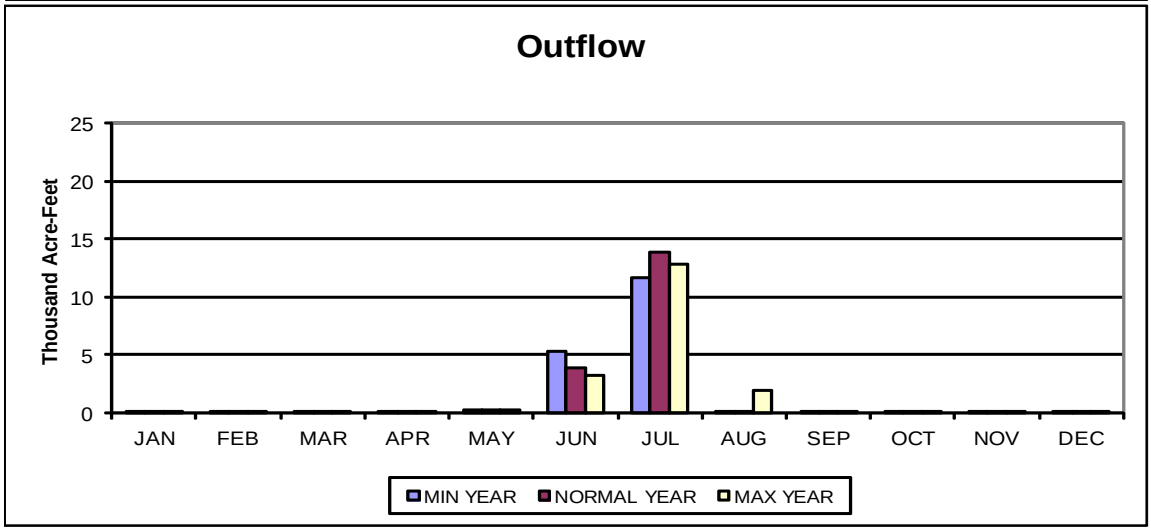
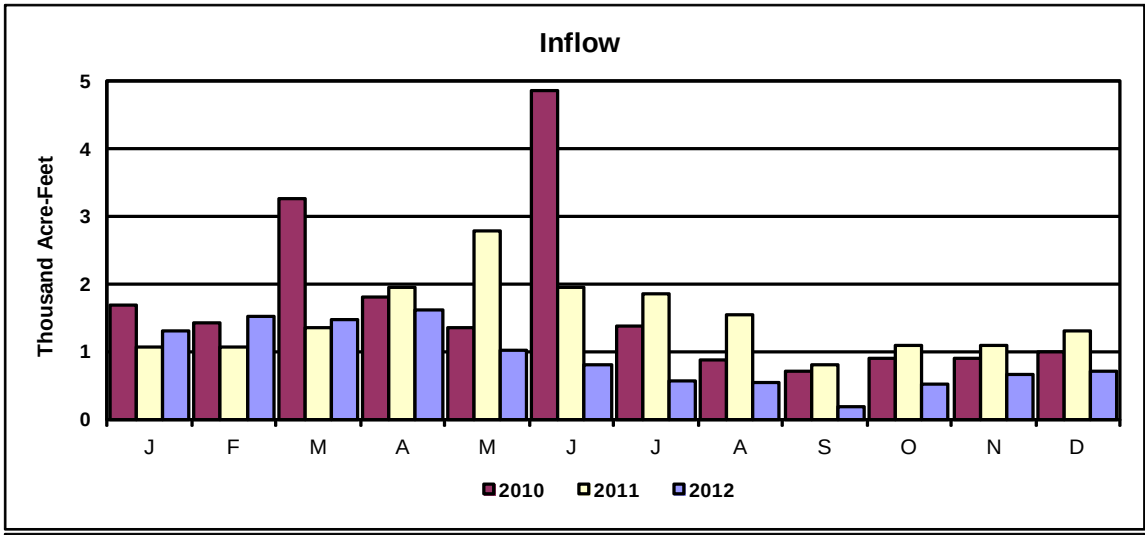
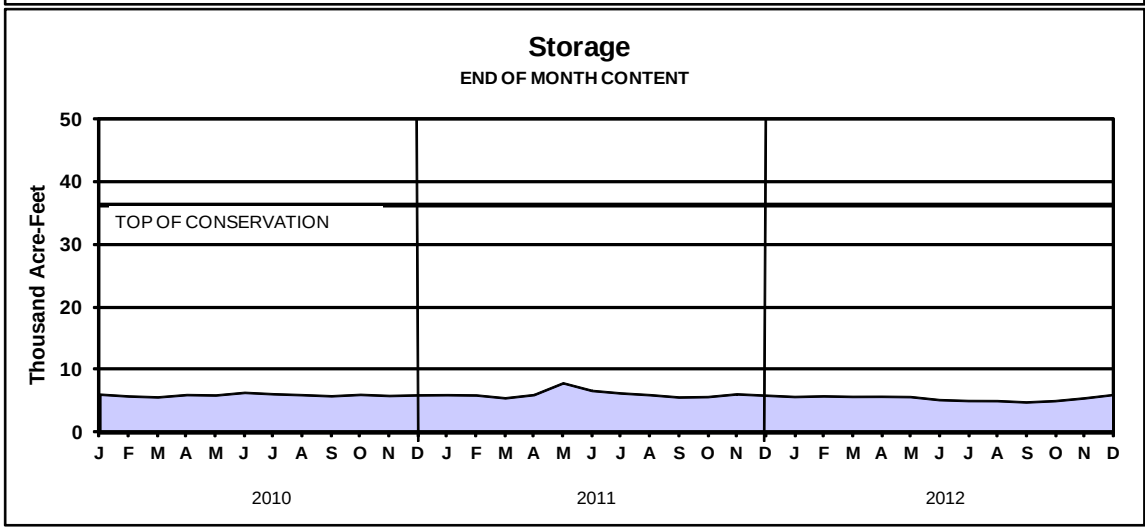


EXHIBIT 8A

HUGH BUTLER LAKE

ACTUAL OPERATION





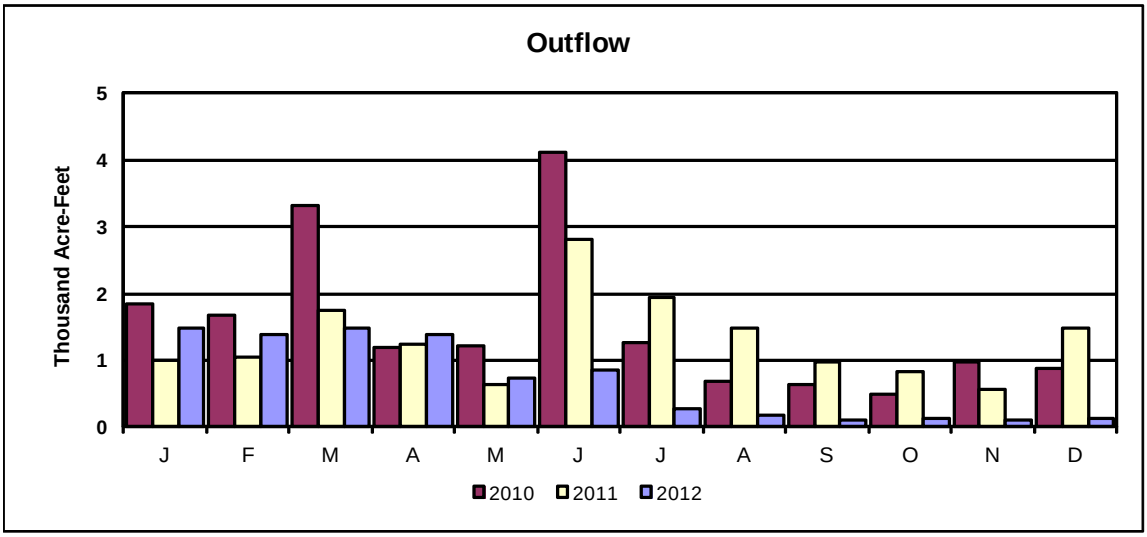
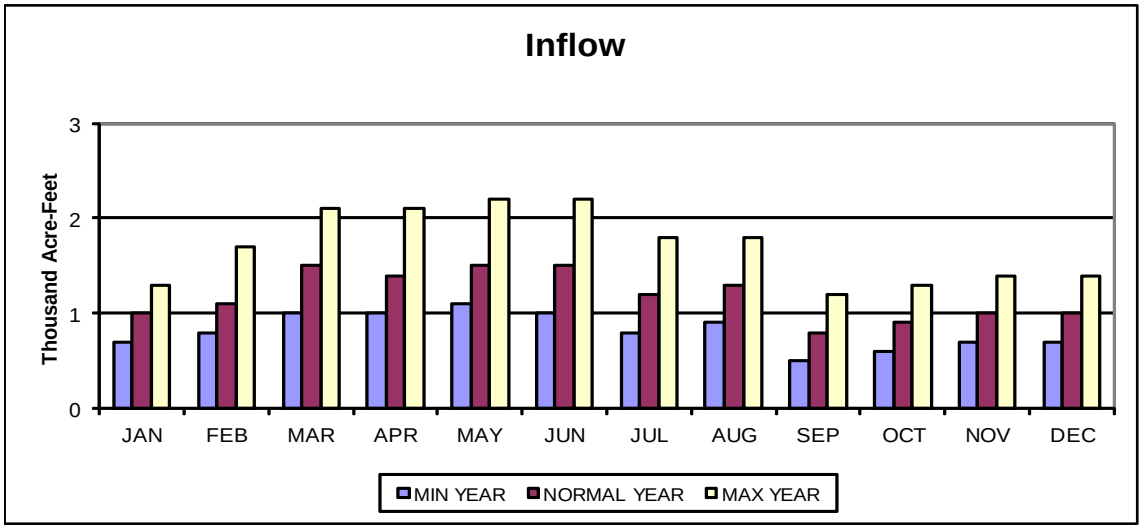
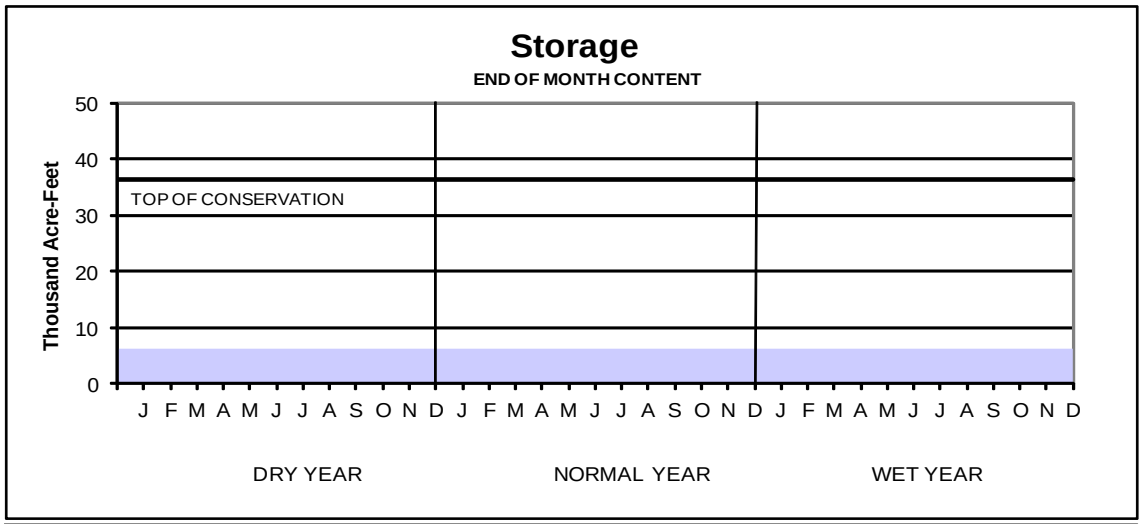


EXHIBIT 8B

HUGH BUTLER LAKE

2013 OPERATION PLAN





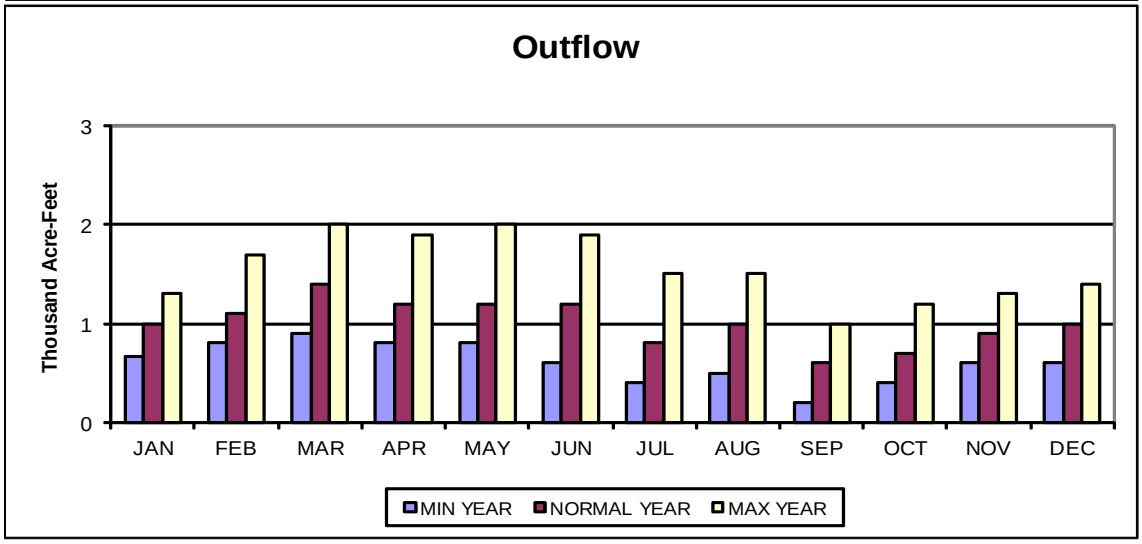
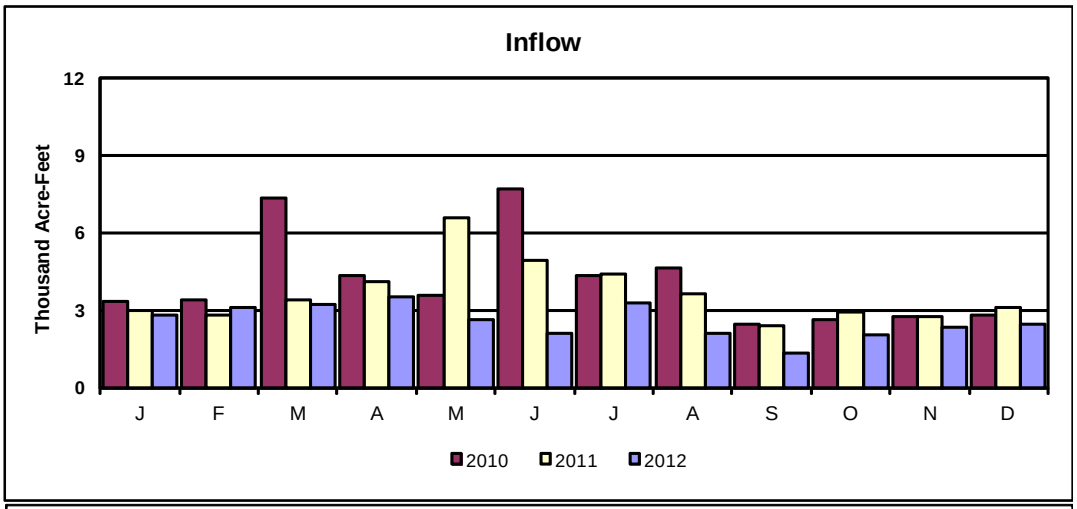
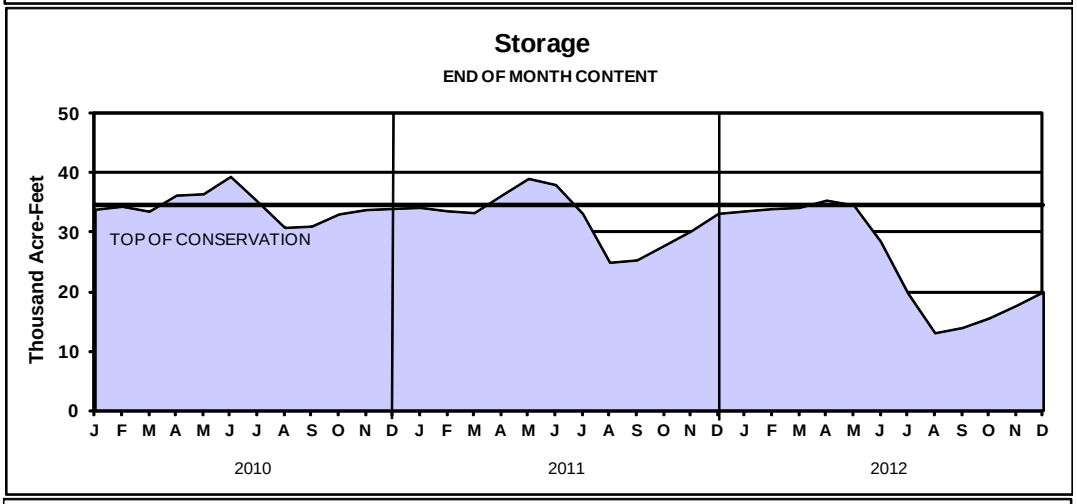


EXHIBIT 9A

HARRY STRUNK LAKE

ACTUAL OPERATION





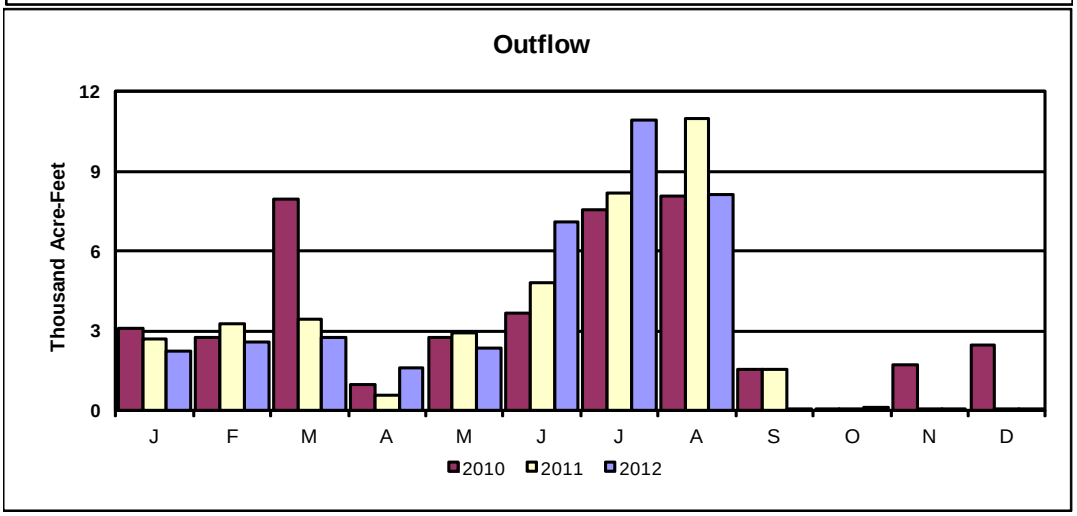
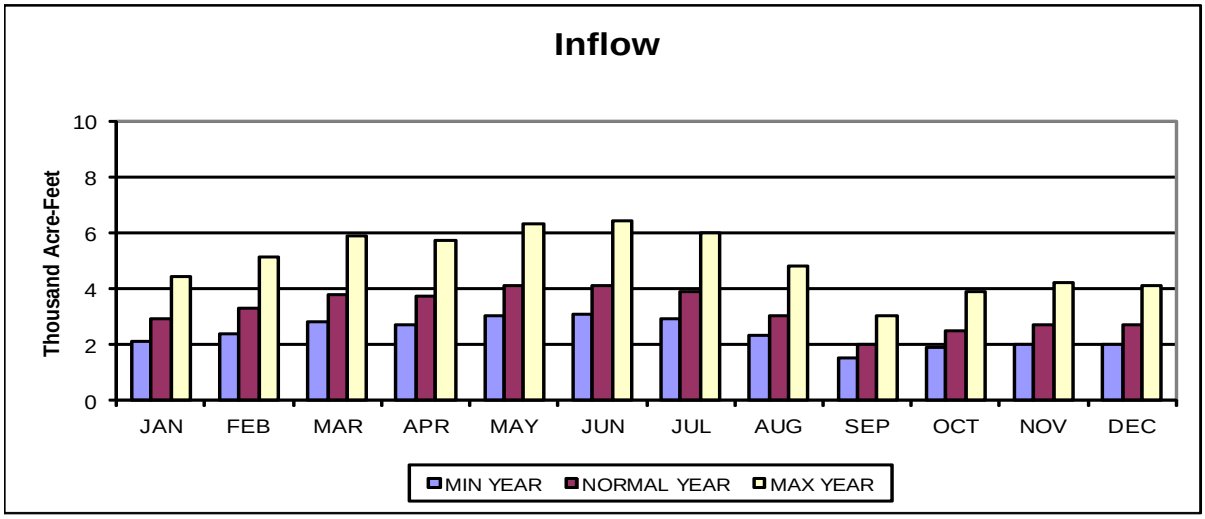
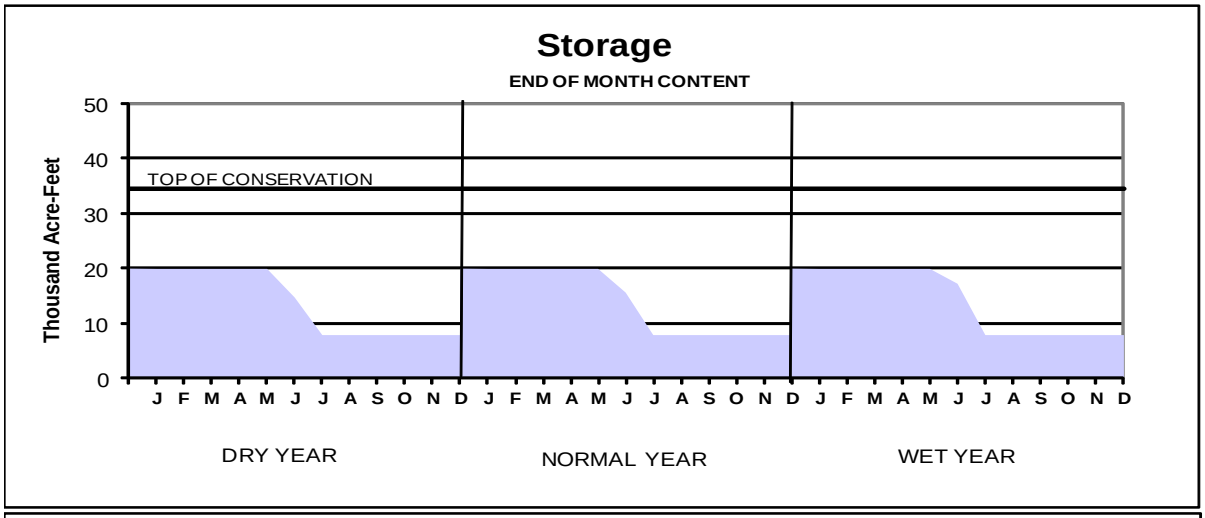


EXHIBIT 9B

HARRY STRUNK LAKE

2013 OPERATION PLAN





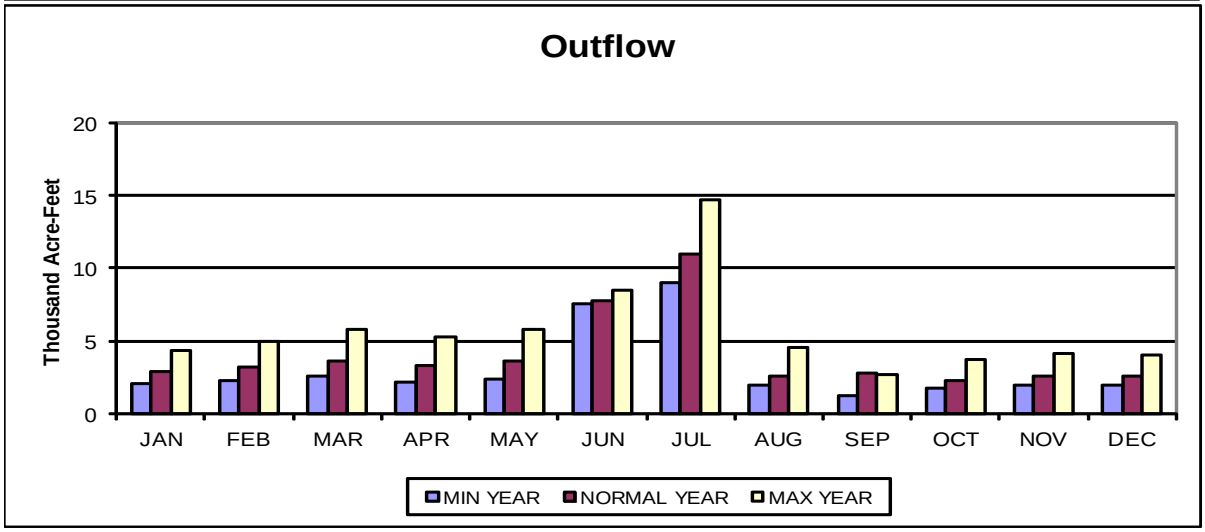
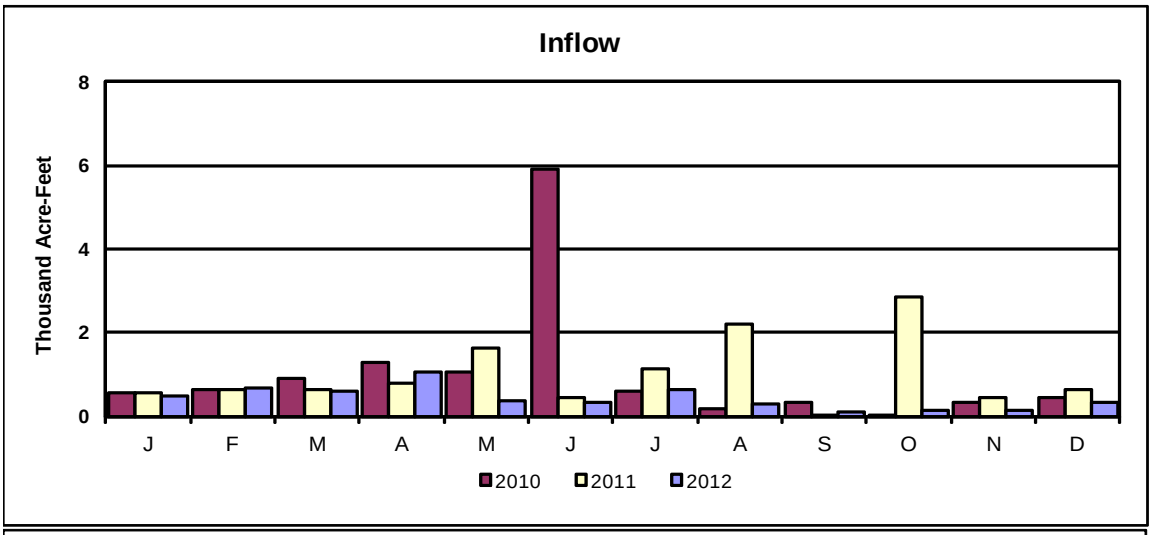
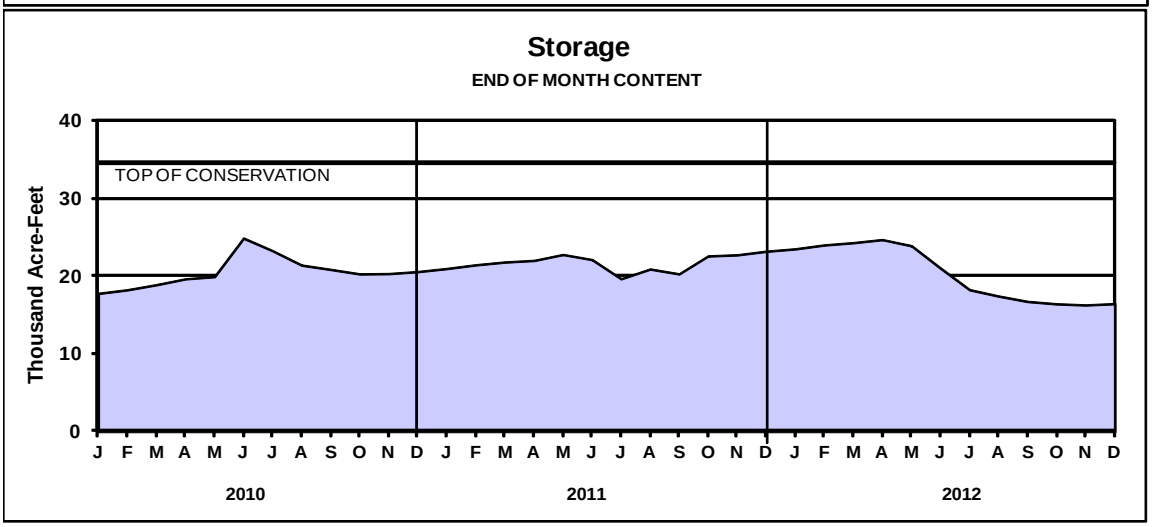


EXHIBIT 10A

KEITH SEBELIUS LAKE

ACTUAL OPERATION





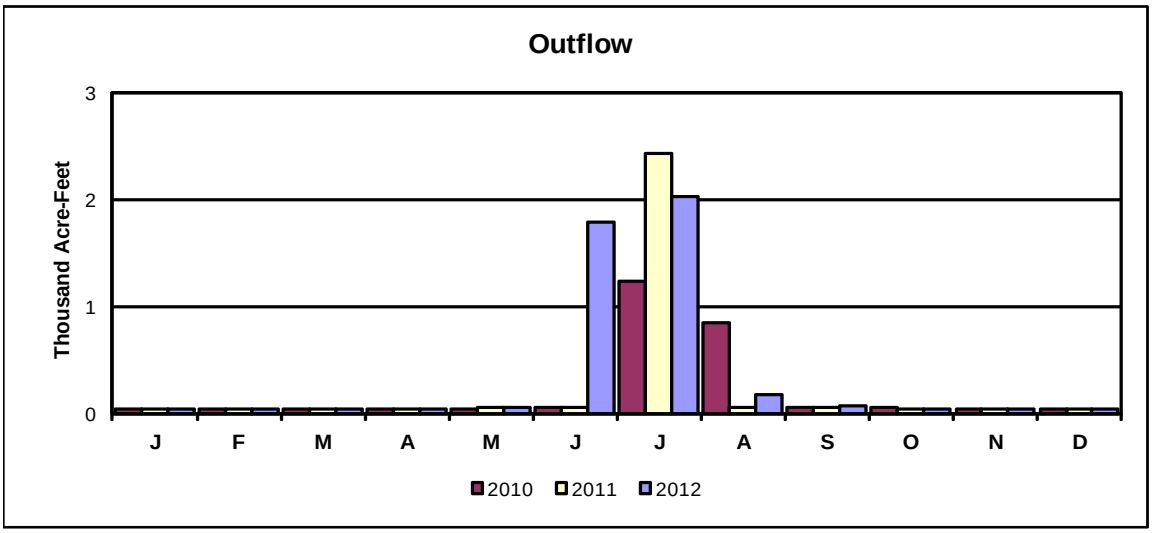
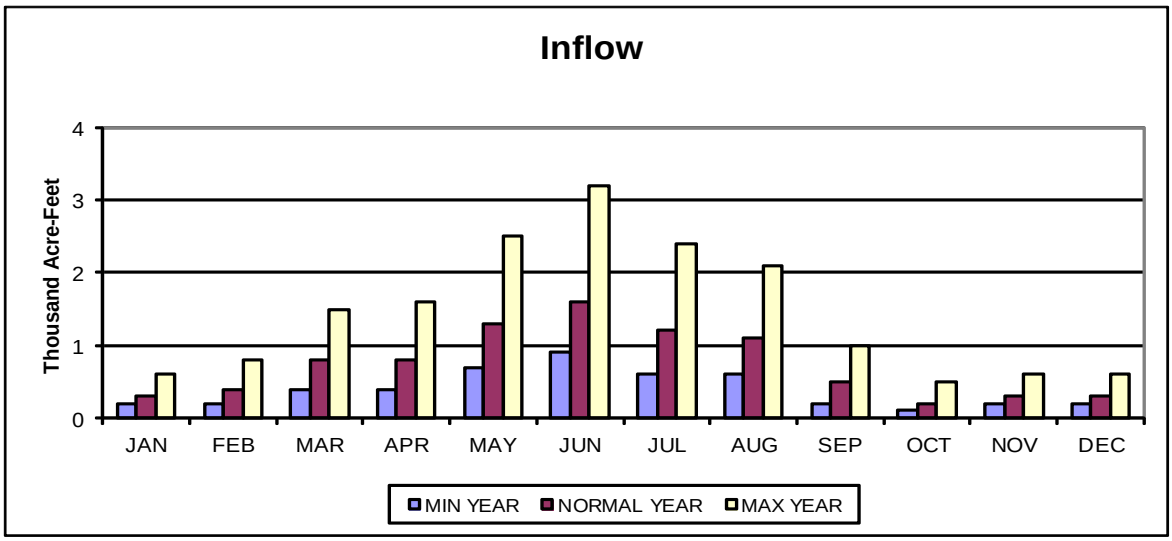
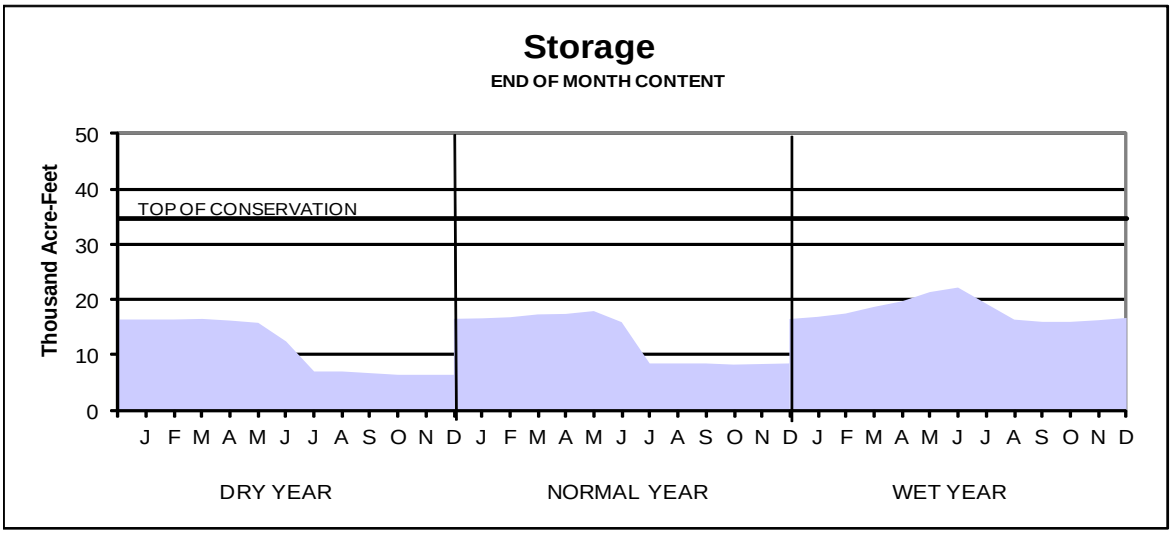


EXHIBIT 10B

KEITH SEBELIUS LAKE

2013 OPERATION PLAN





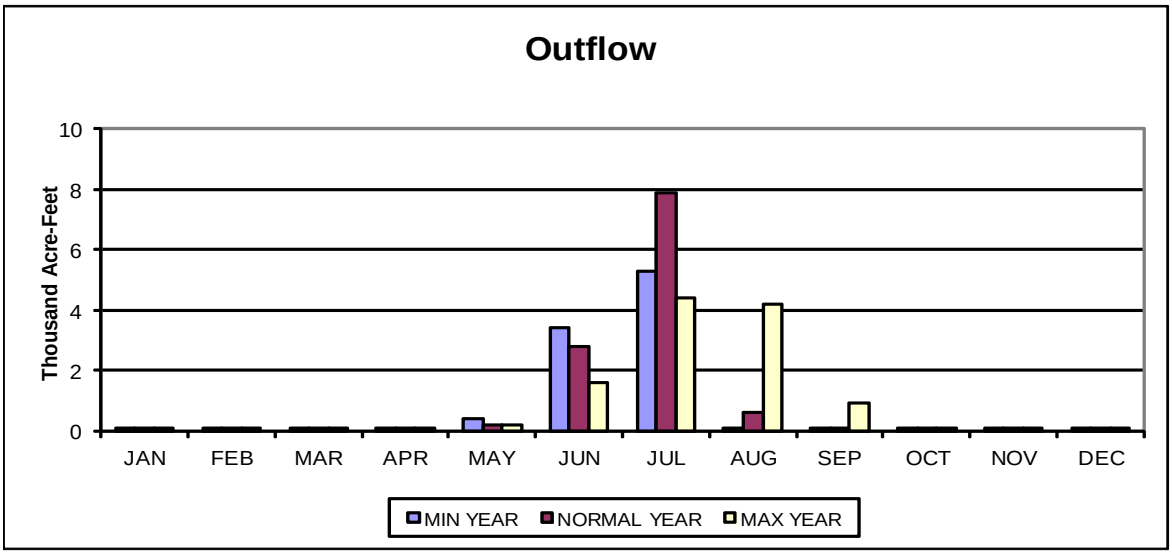
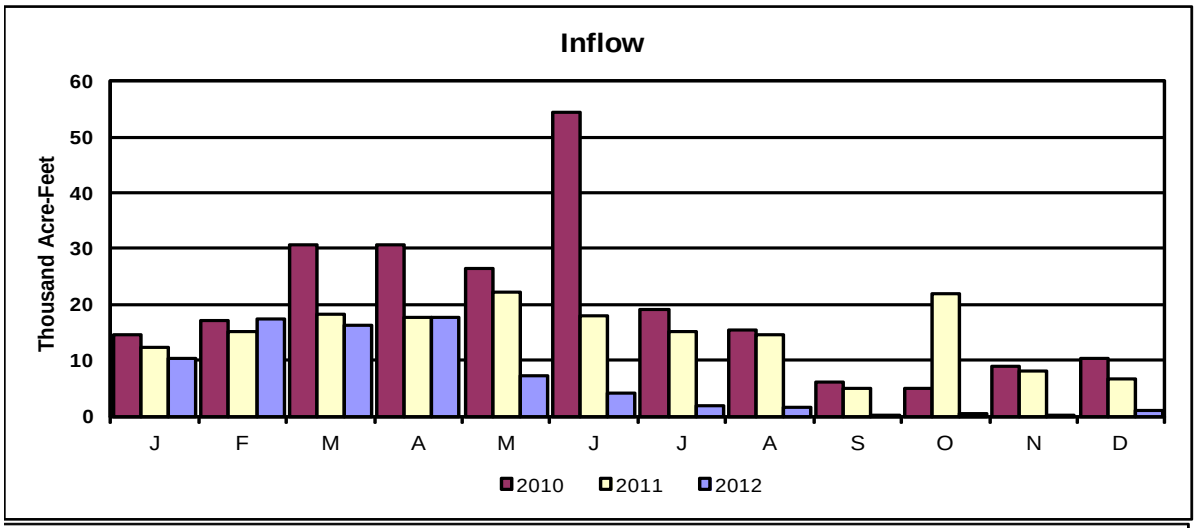
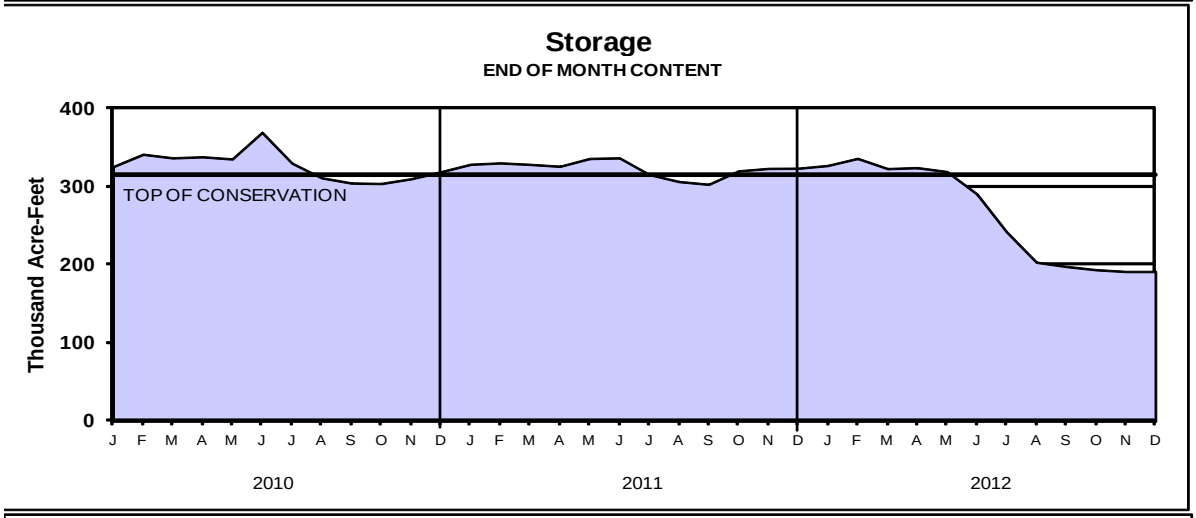


EXHIBIT 11A

HARLAN COUNTY LAKE

ACTUAL OPERATION





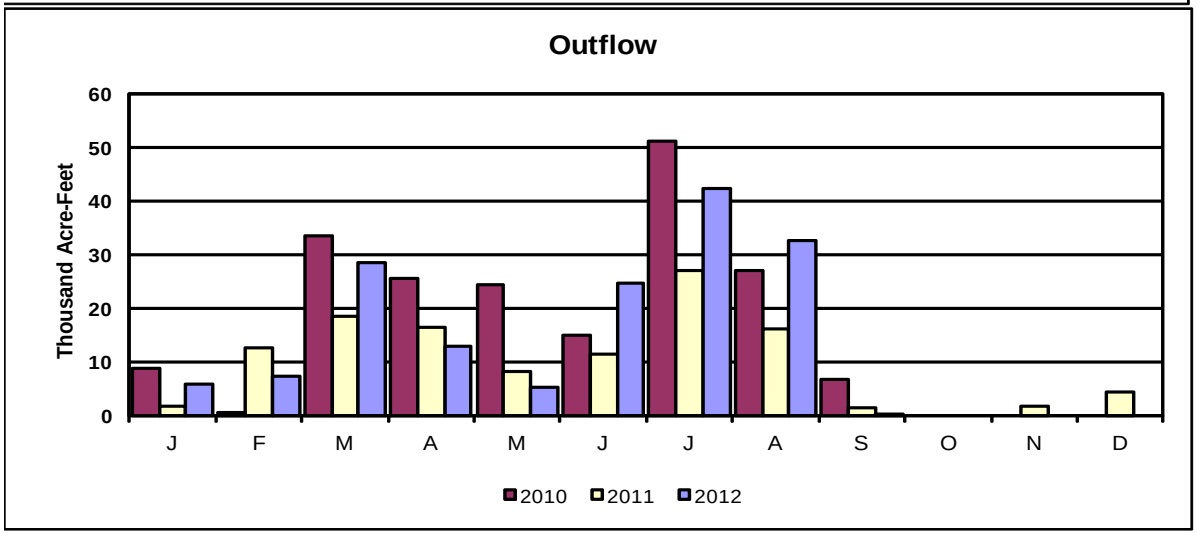
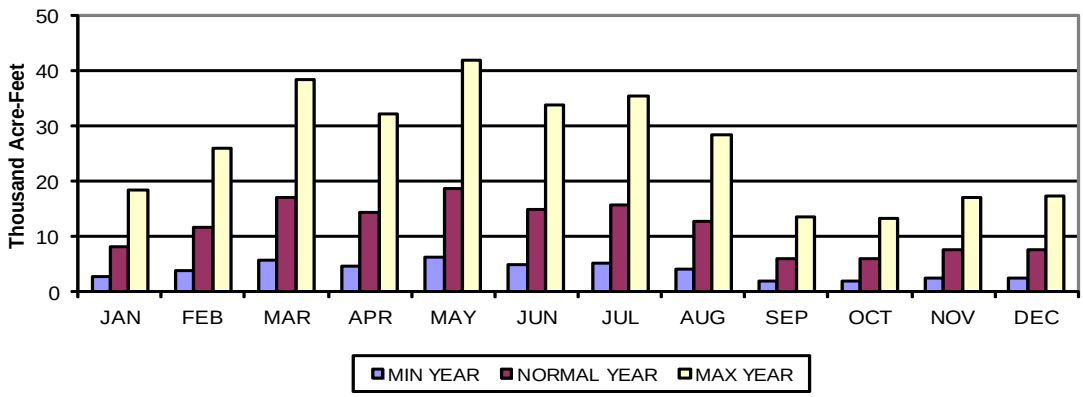


EXHIBIT 11B

HARLAN COUNTY LAKE

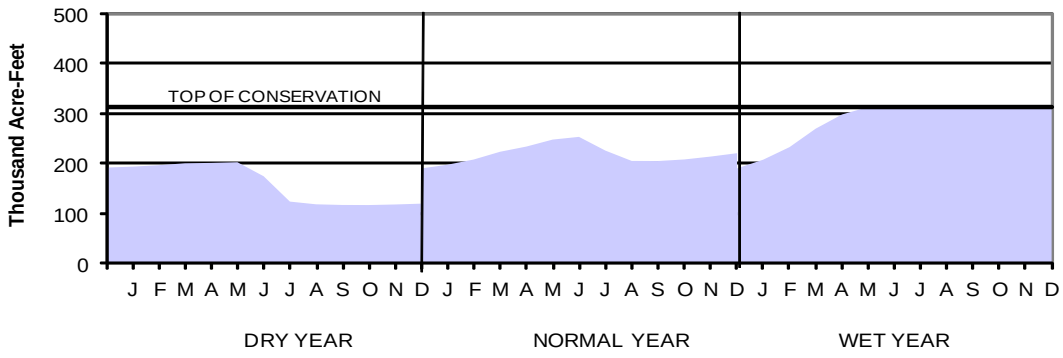
2013 OPERATION PLAN

Inflow



Storage

END OF MONTH CONTENT



Outflow

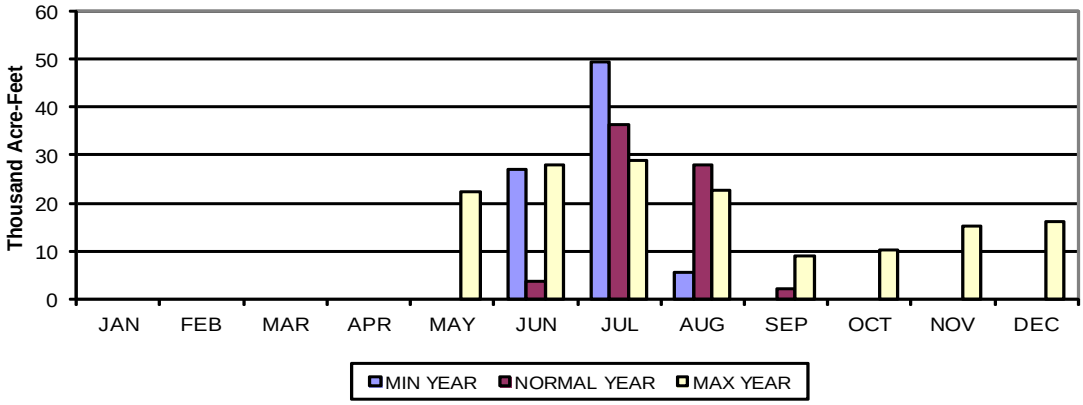
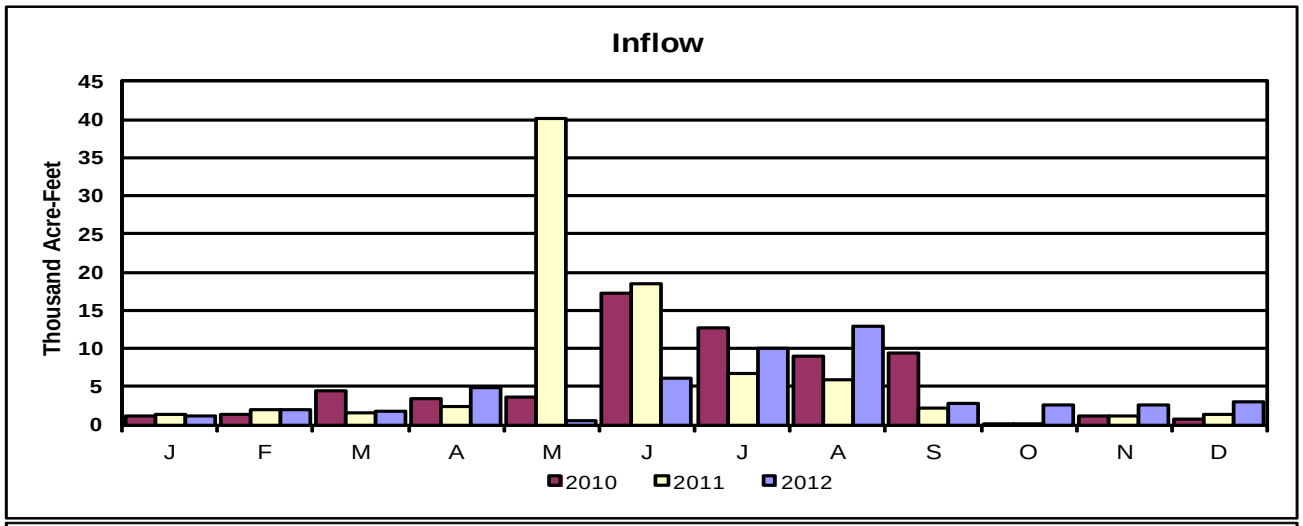
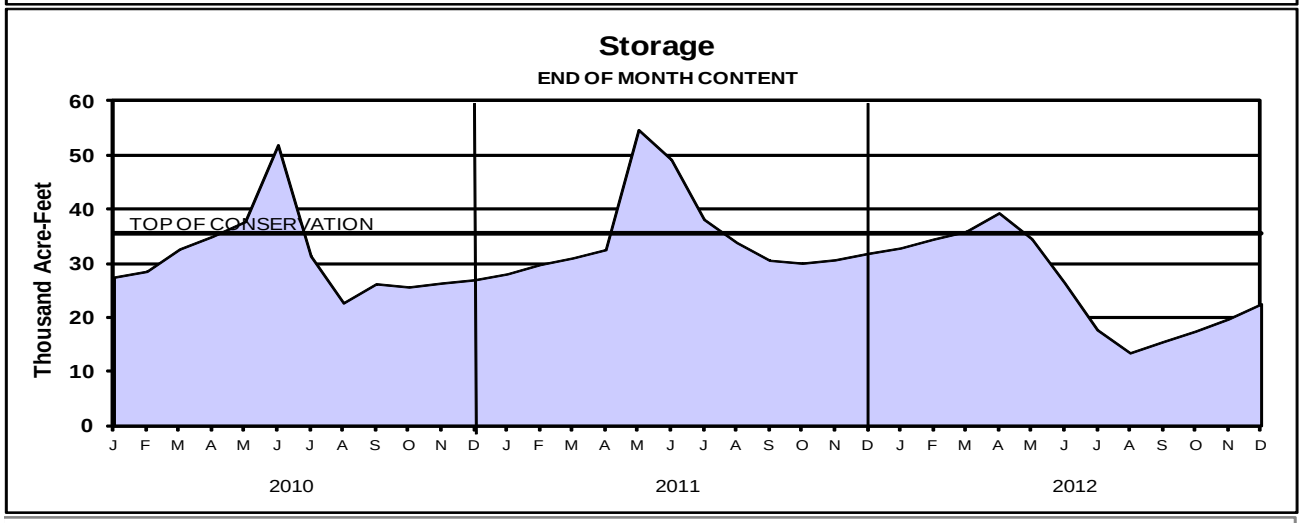


EXHIBIT 12A

LOVEWELL RESERVOIR

ACTUAL OPERATION





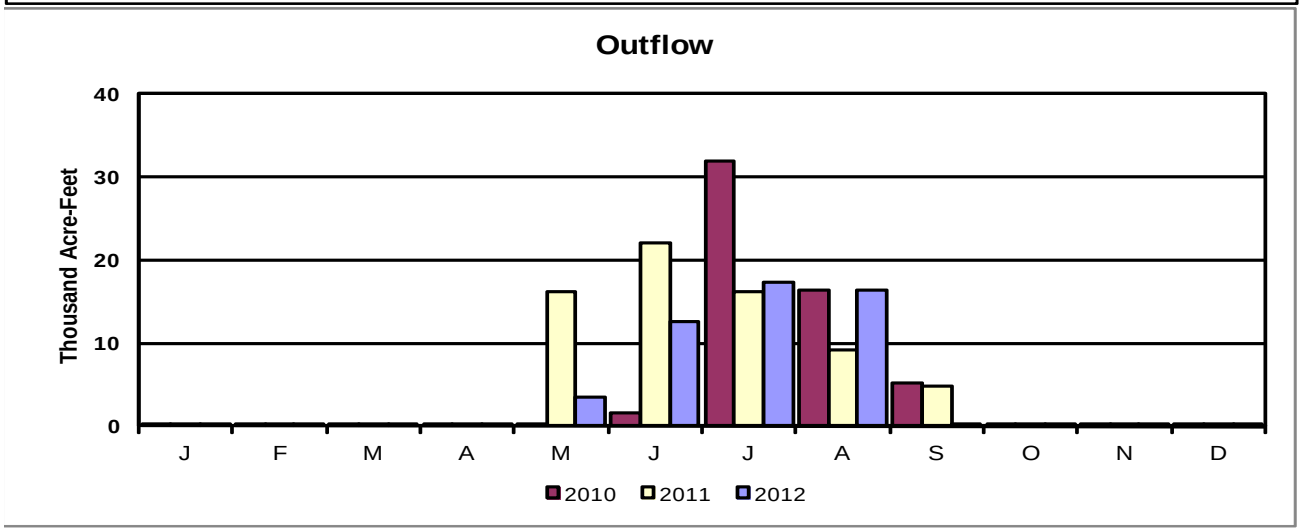
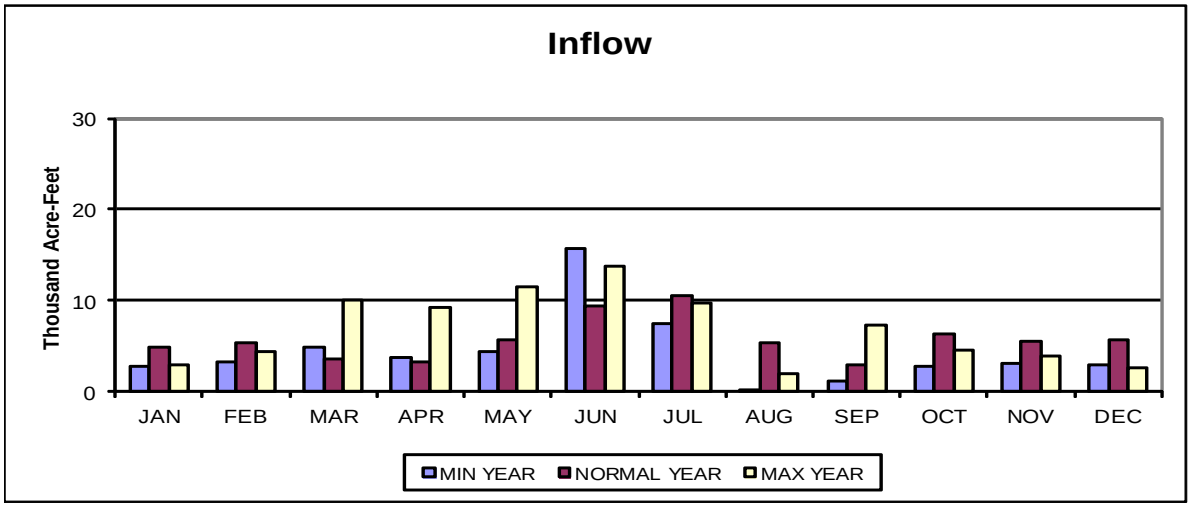
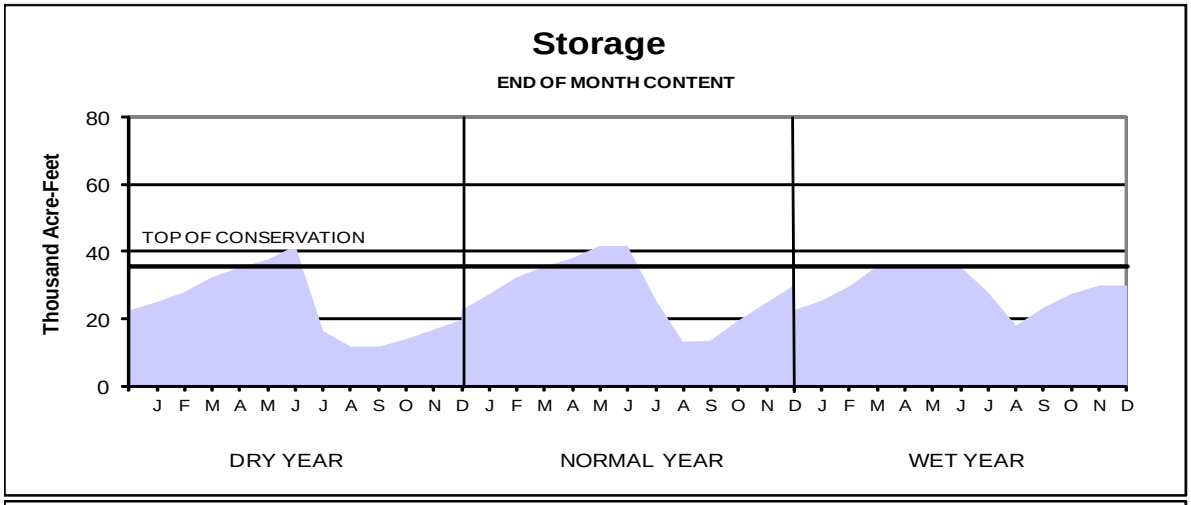


EXHIBIT 12B

LOVEWELL RESERVOIR

2013 OPERATION PLAN





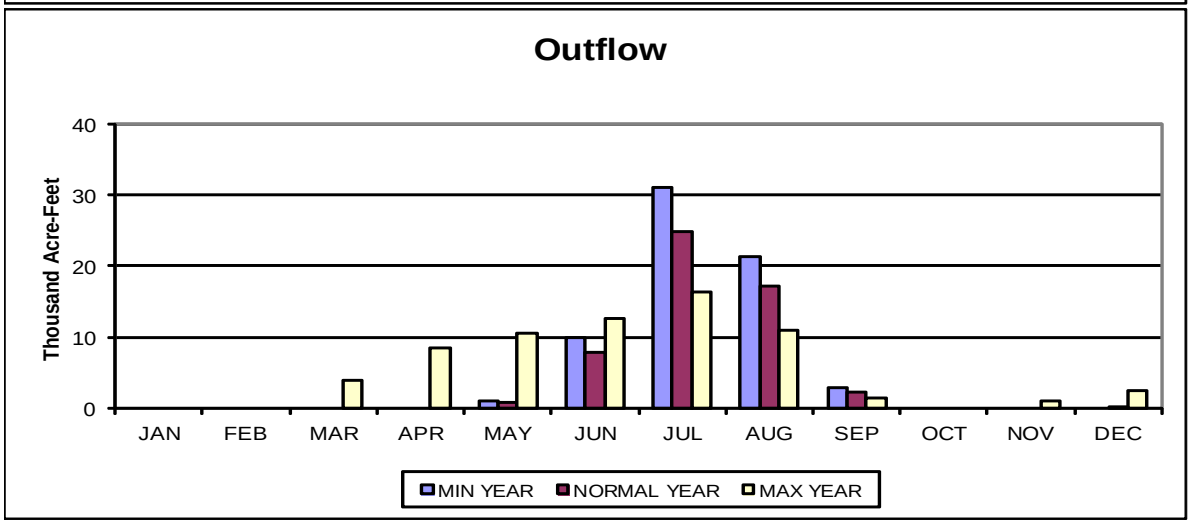
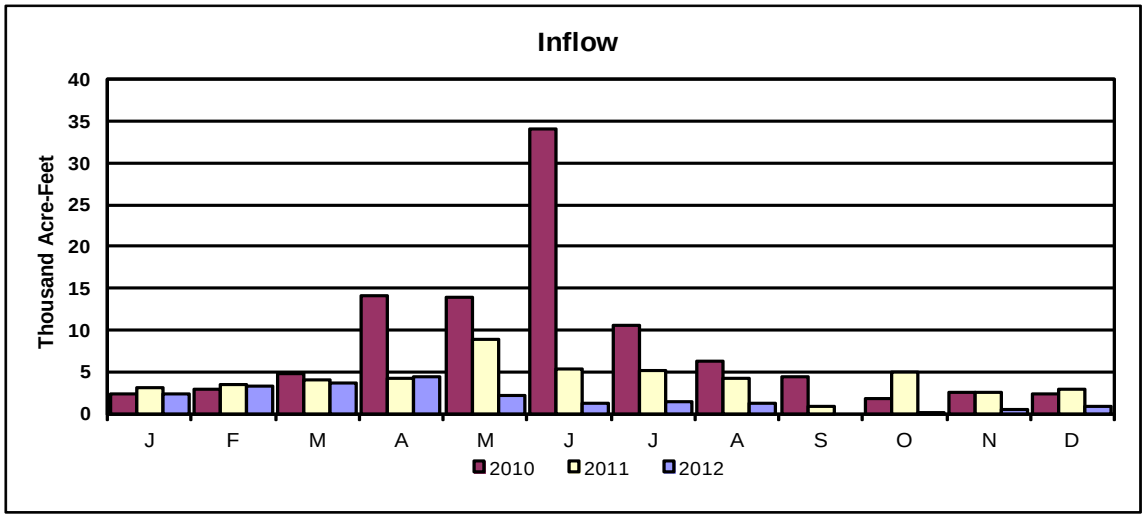
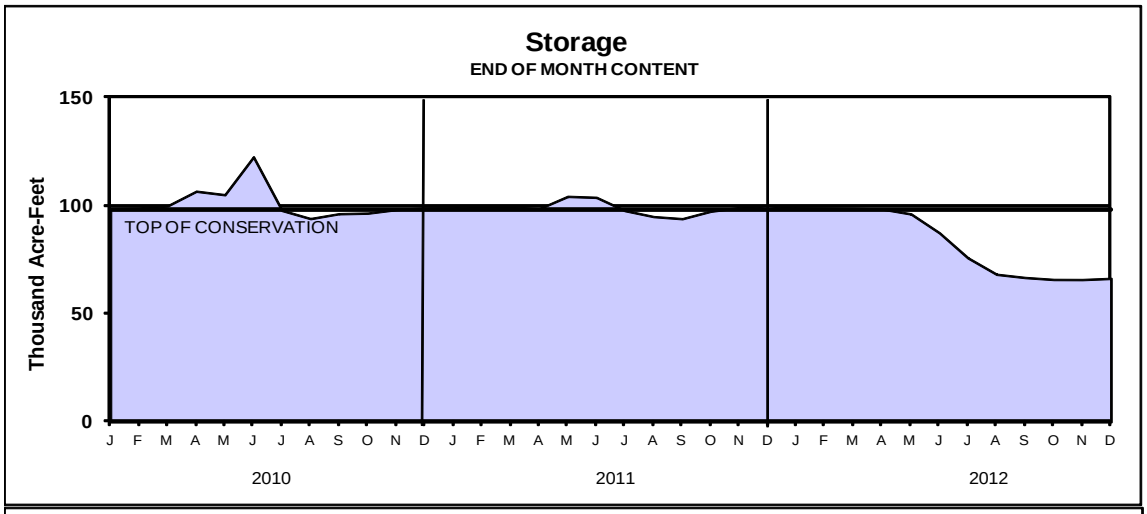


EXHIBIT 13A

KIRWIN RESERVOIR

ACTUAL OPERATION





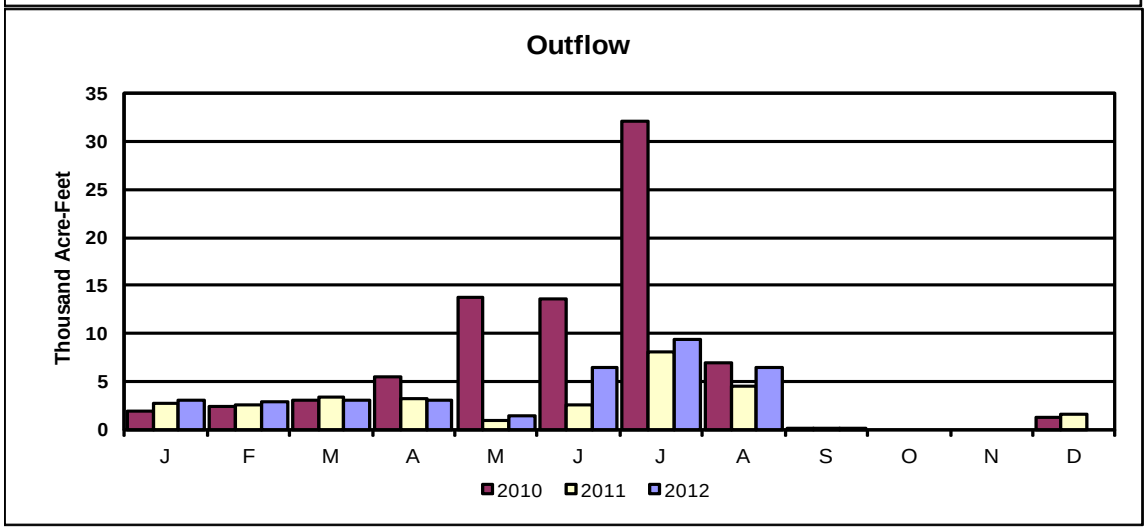
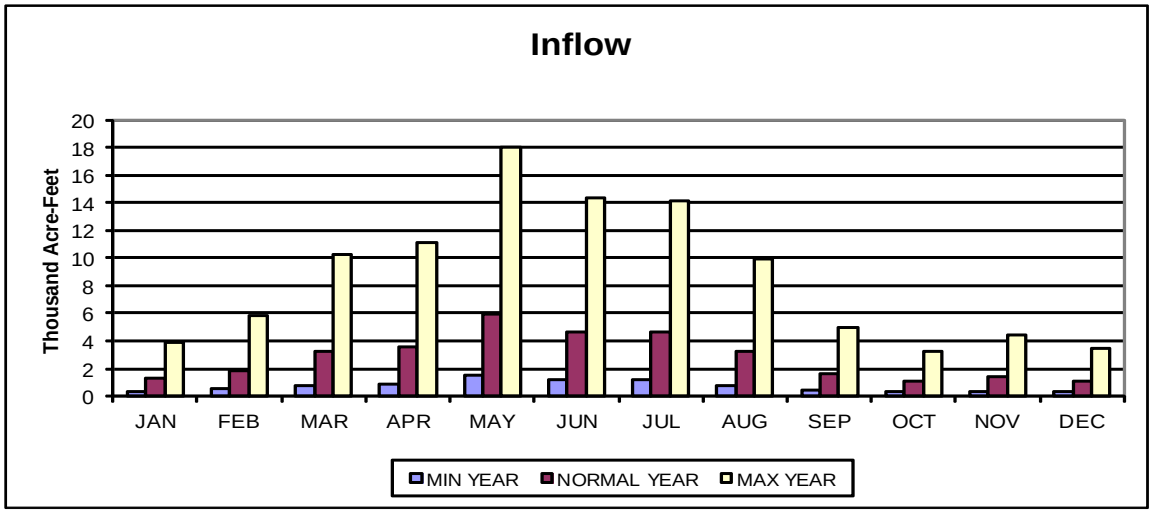
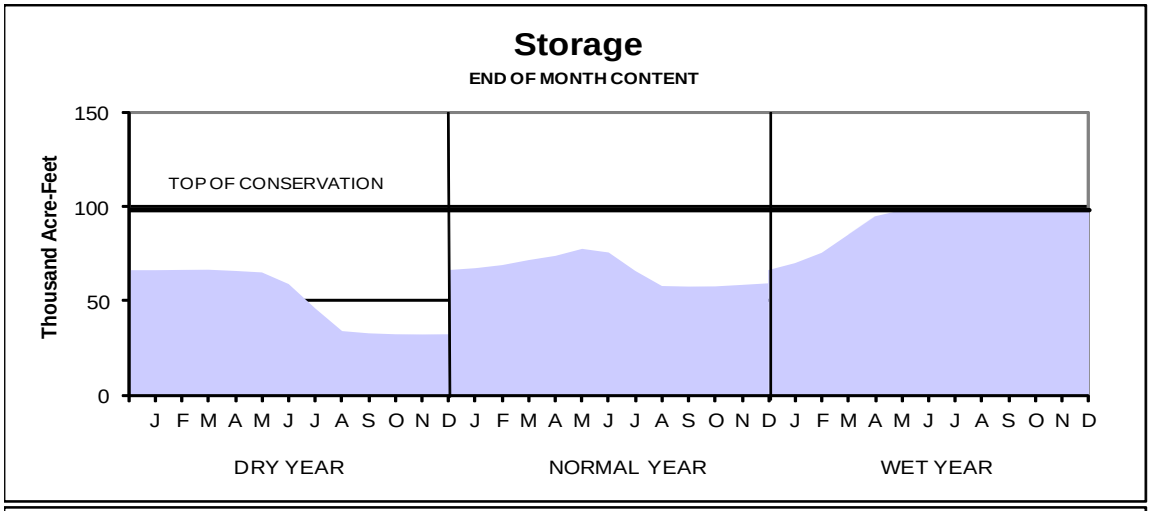


EXHIBIT 13B

KIRWIN RESERVOIR

2013 OPERATION PLAN





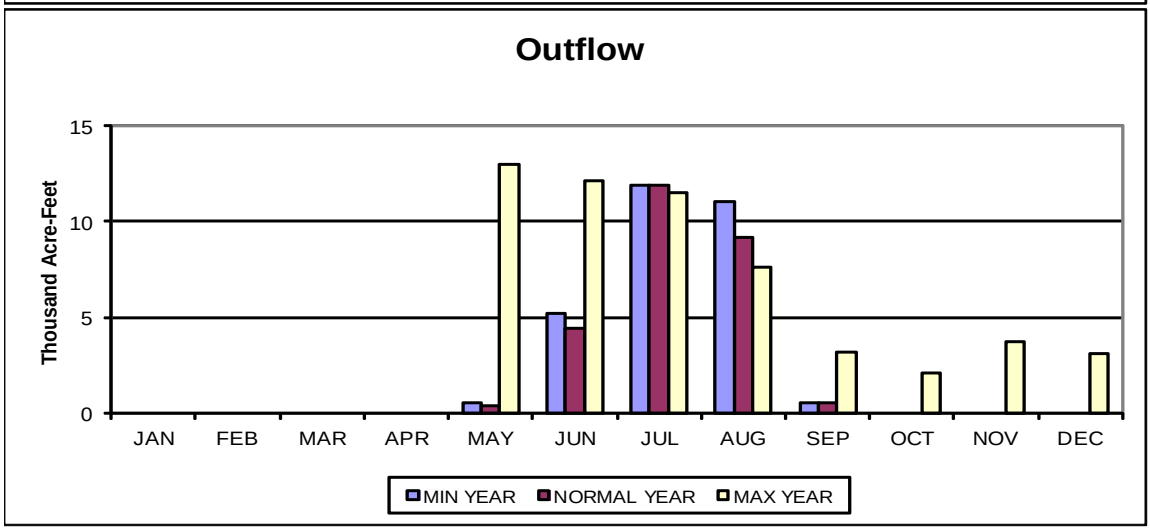
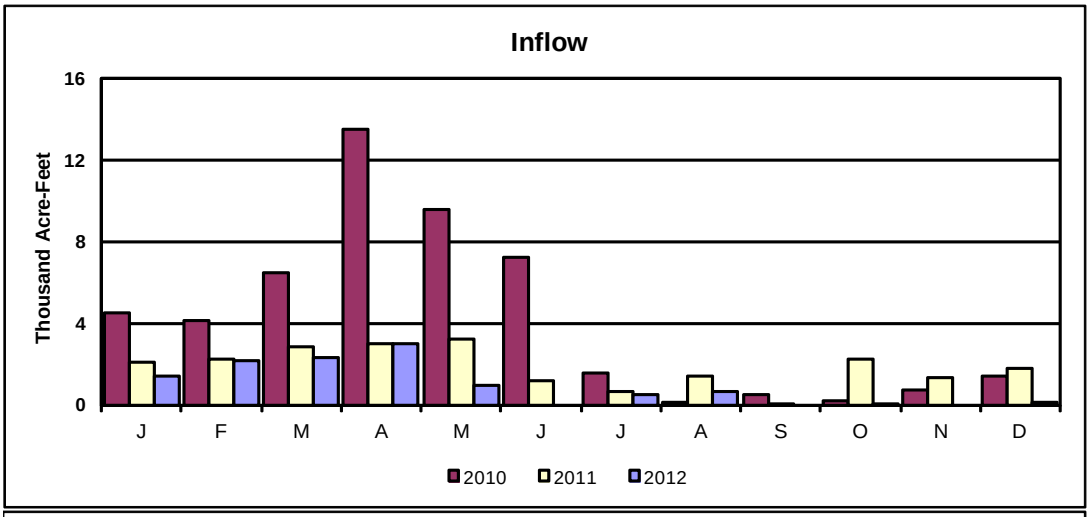
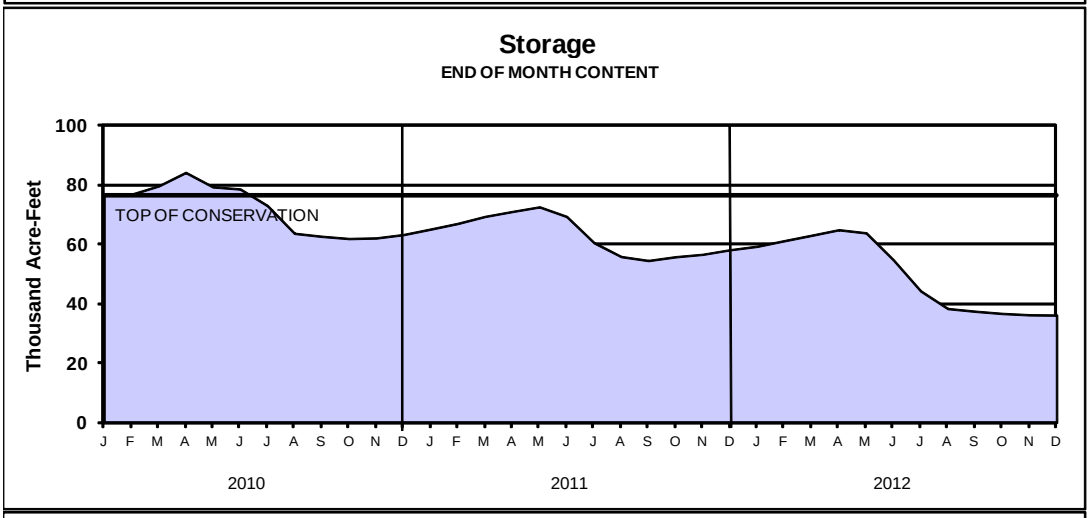


EXHIBIT 14A

WEBSTER RESERVOIR

ACTUAL OPERATION





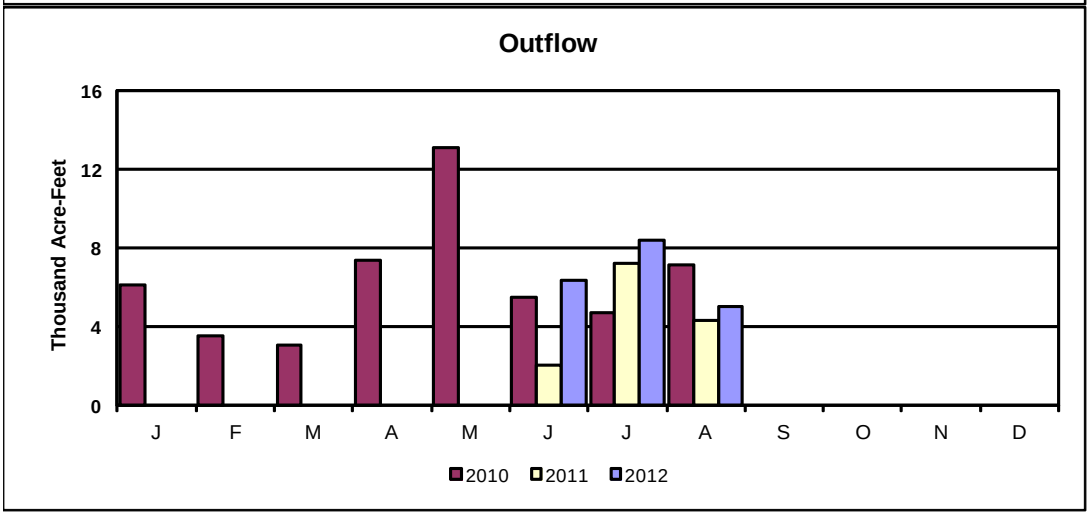
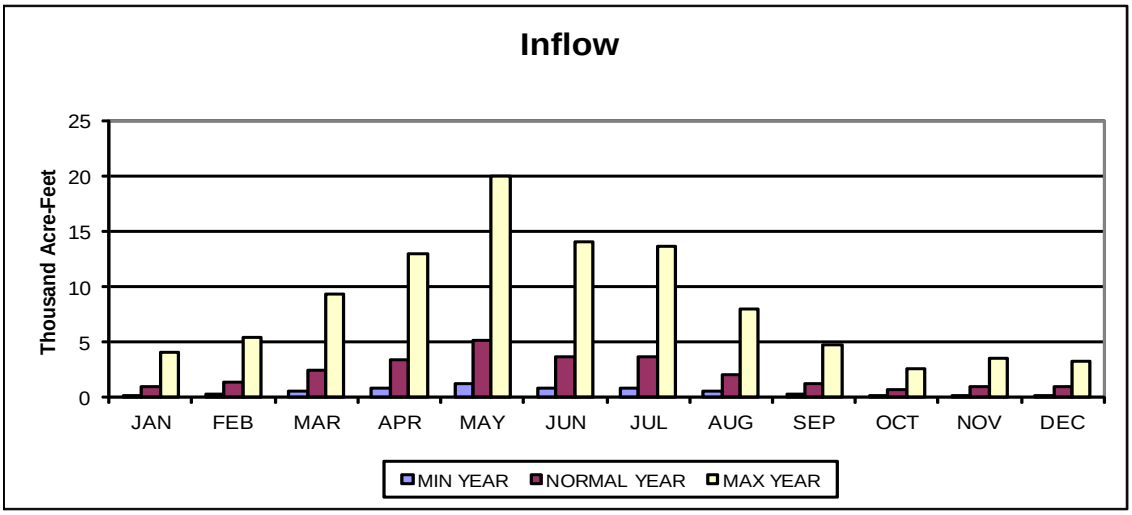
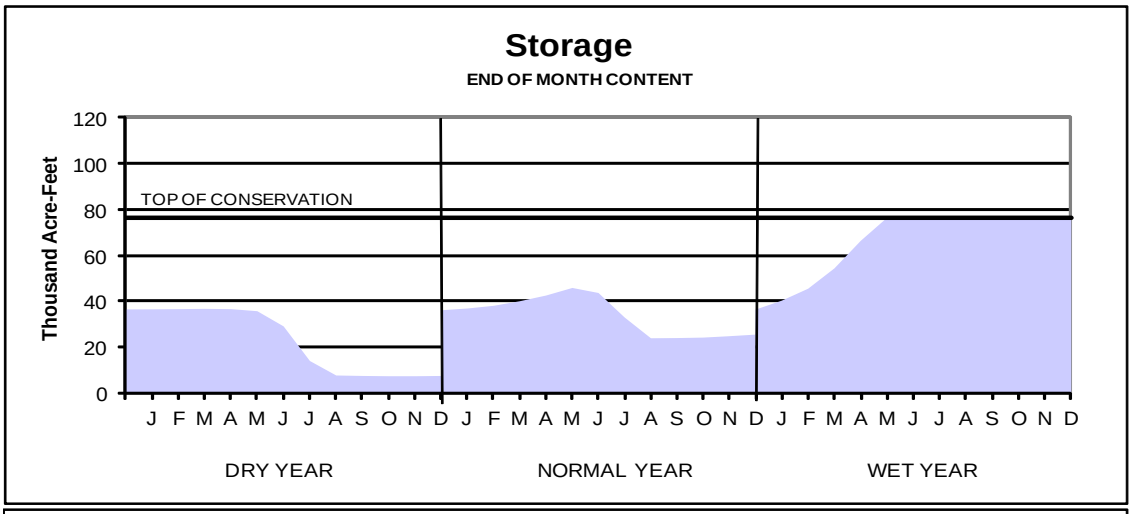


EXHIBIT 14B

WEBSTER RESERVOIR

2013 OPERATION PLAN





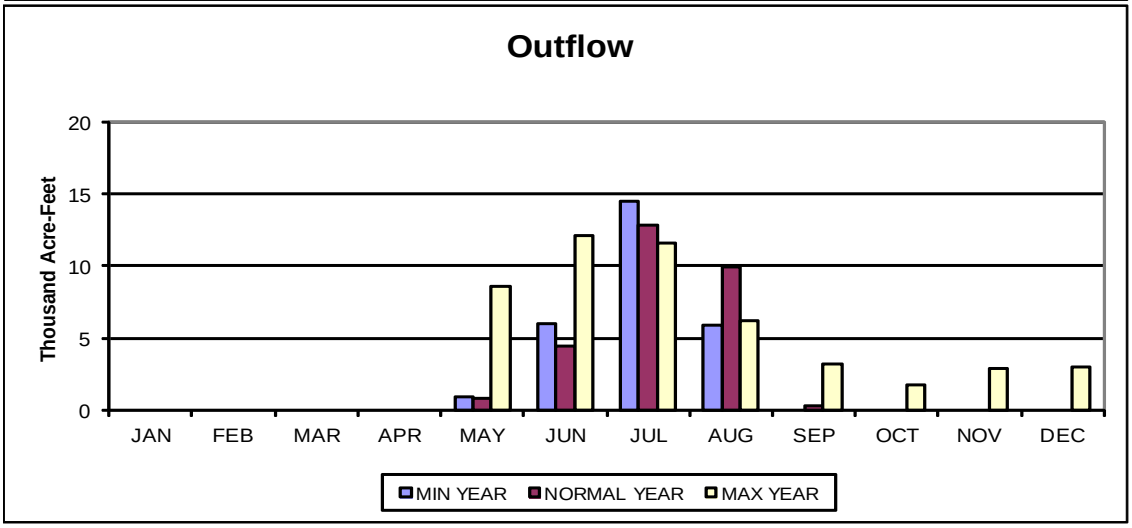
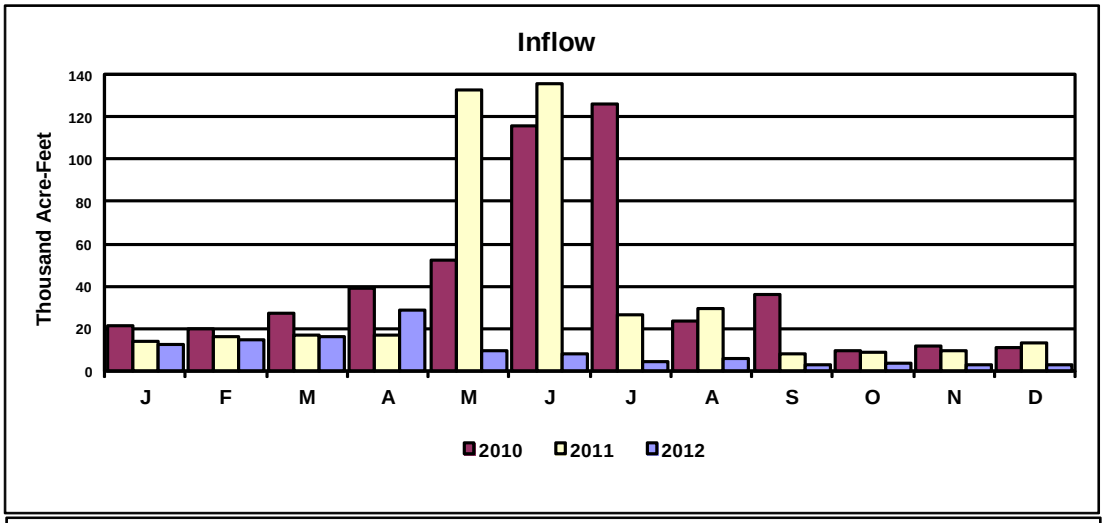
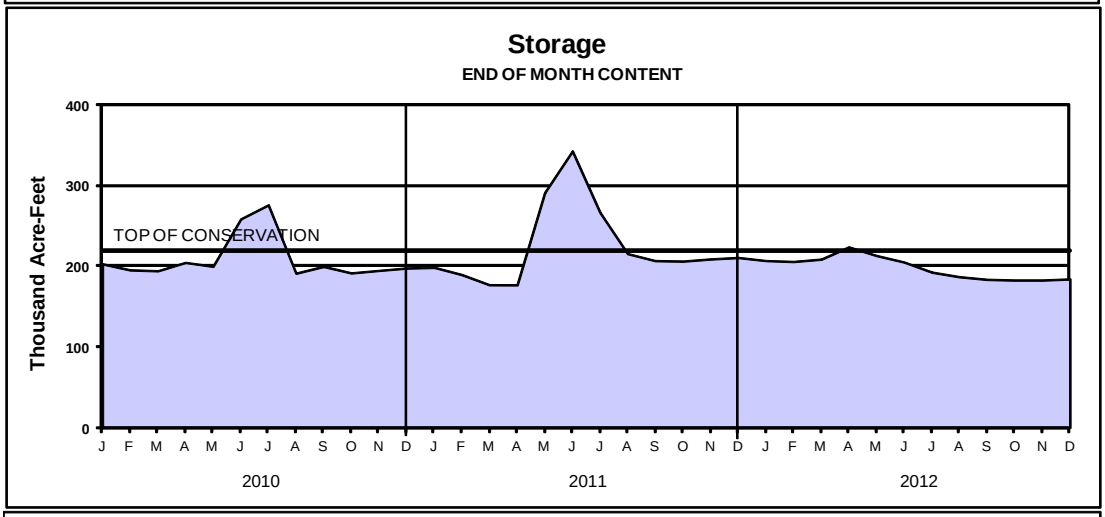


EXHIBIT 15A

WACONDA LAKE

ACTUAL OPERATION





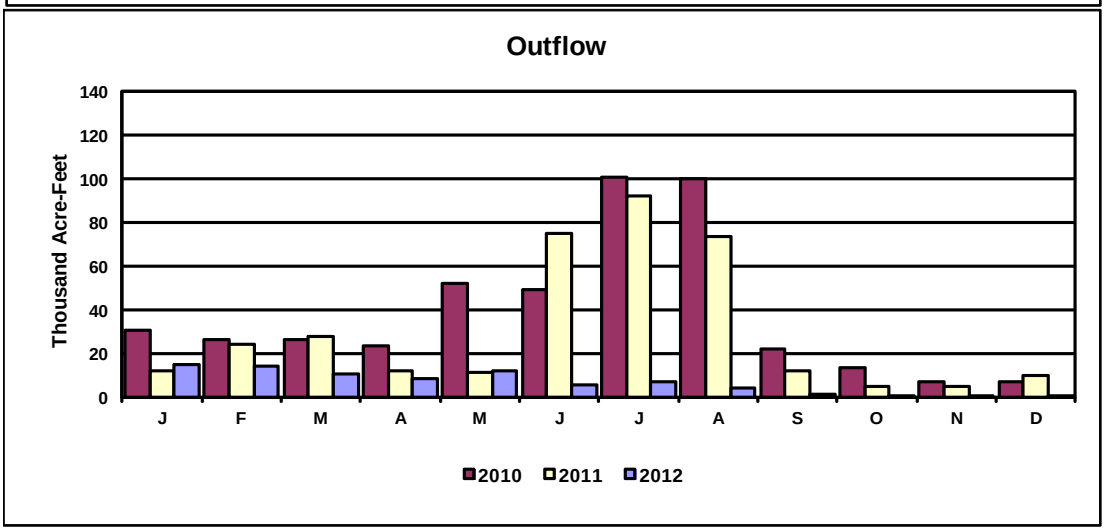
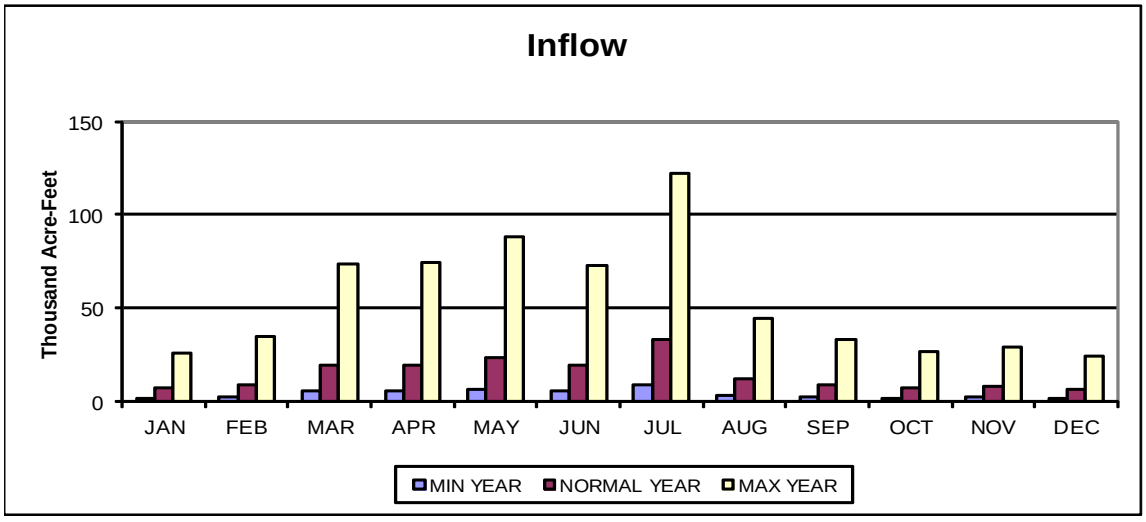
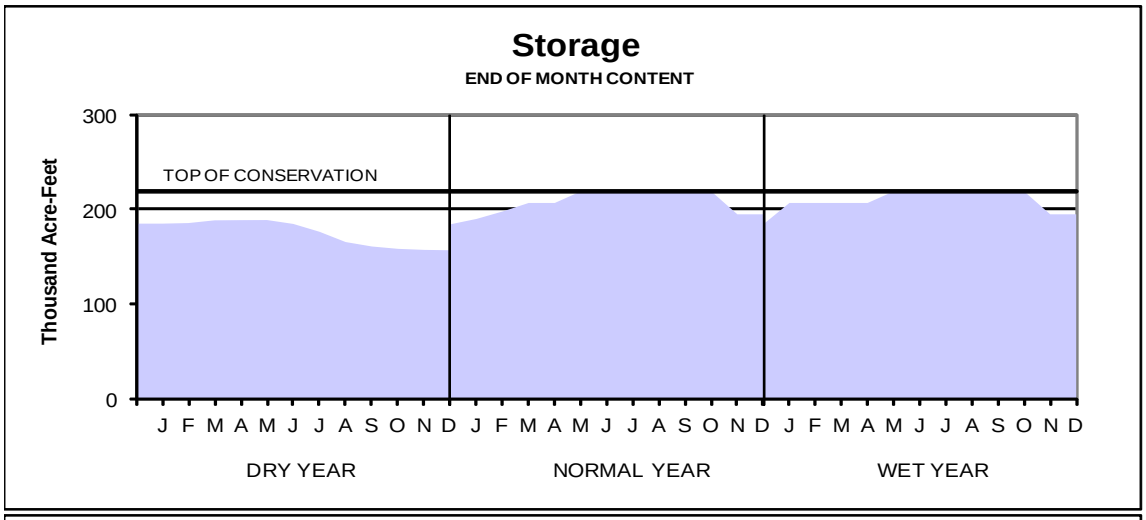


EXHIBIT 15B

WACONDA LAKE

2013 OPERATION PLAN





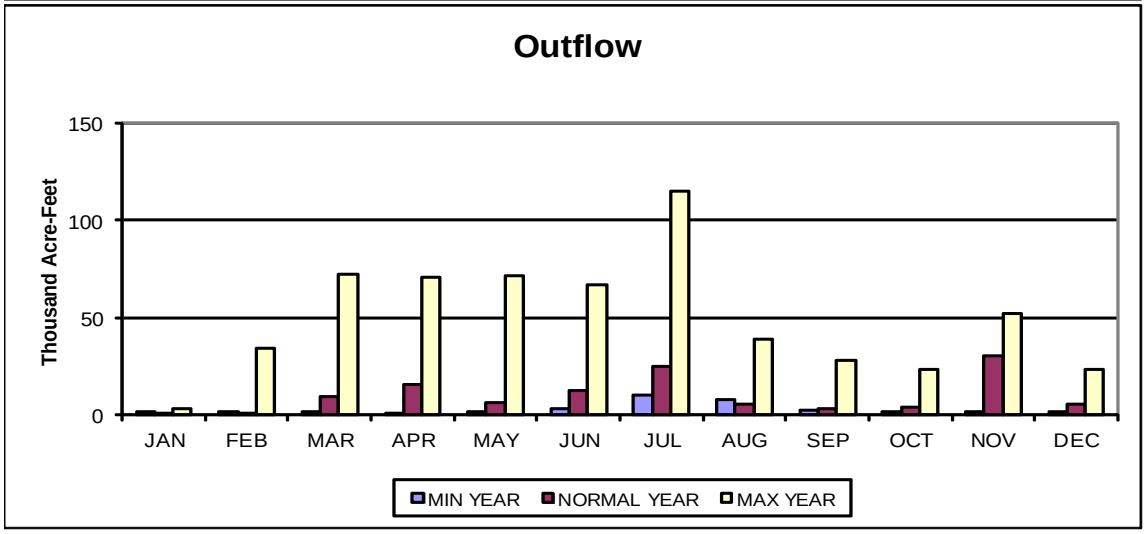
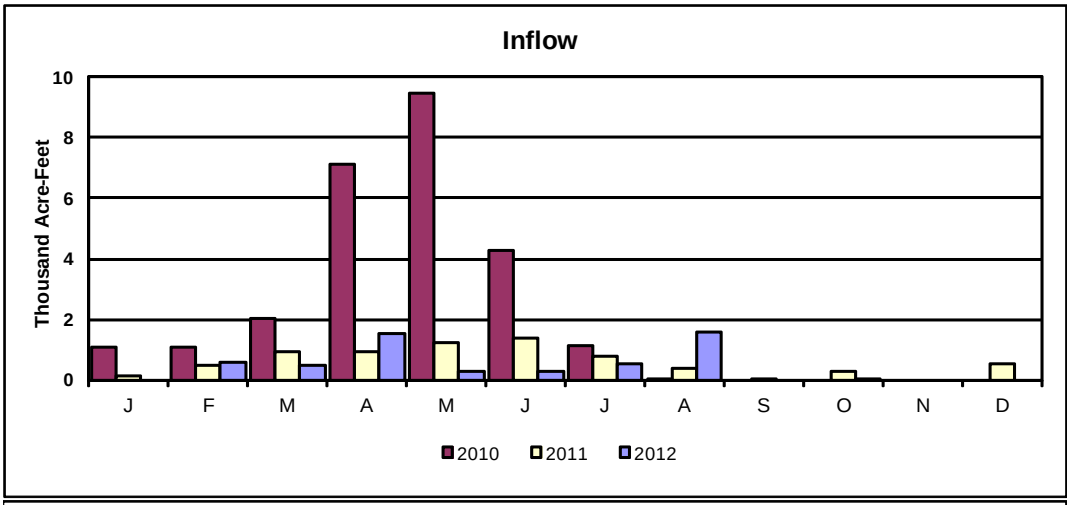
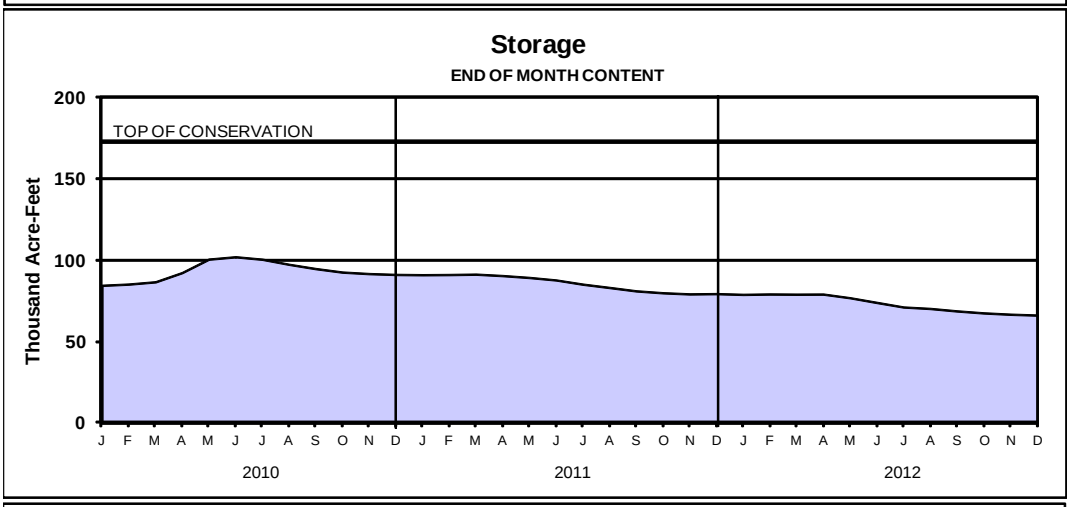


EXHIBIT 16A

CEDAR BLUFF RESERVOIR

ACTUAL OPERATION





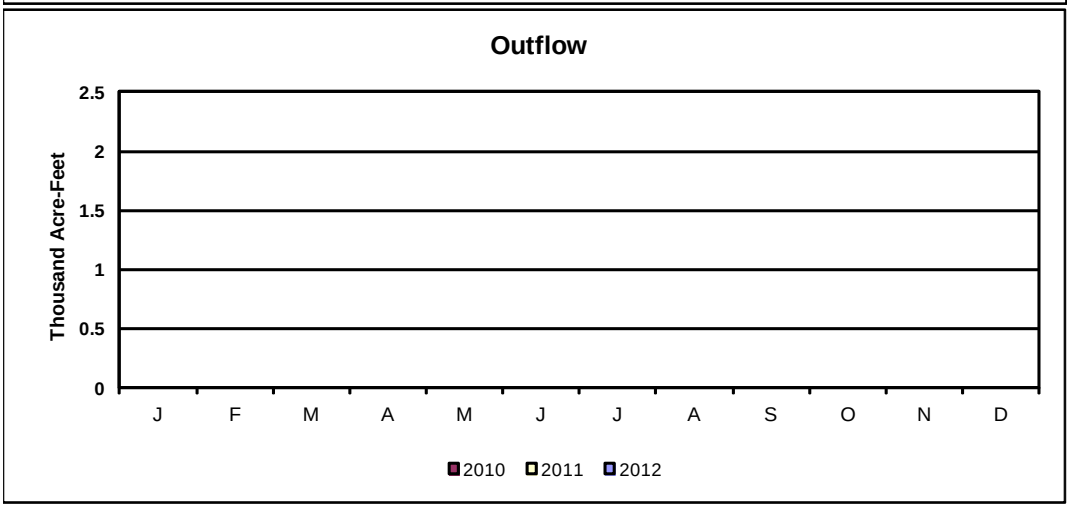
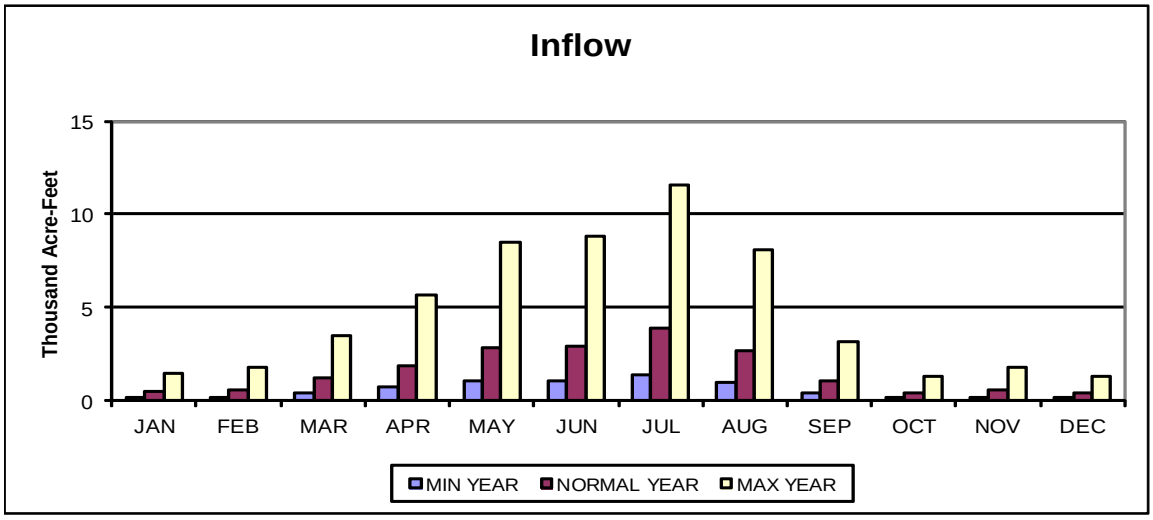
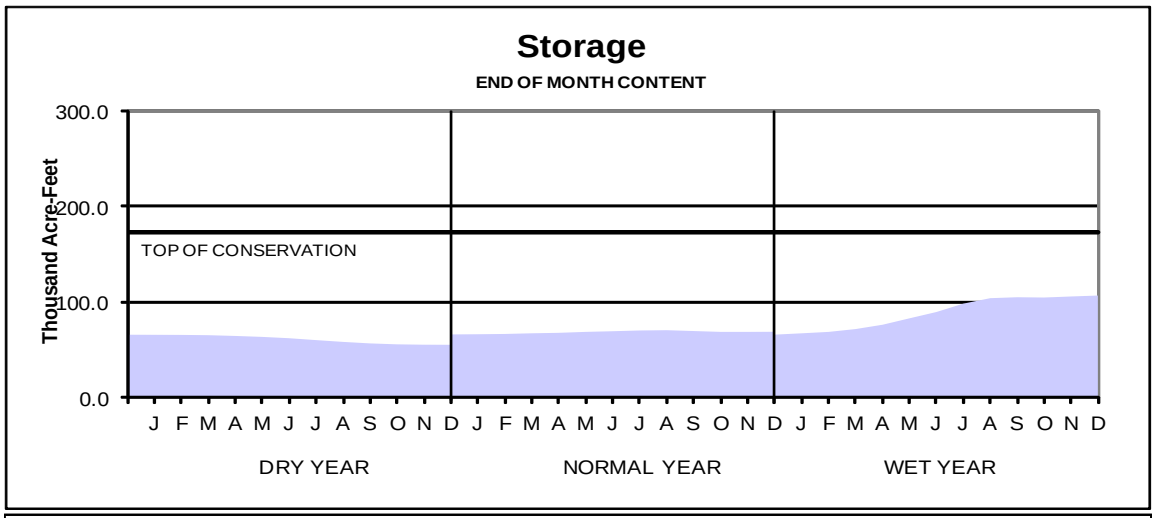


EXHIBIT 16B

CEDAR BLUFF RESERVOIR

2013 OPERATION PLAN





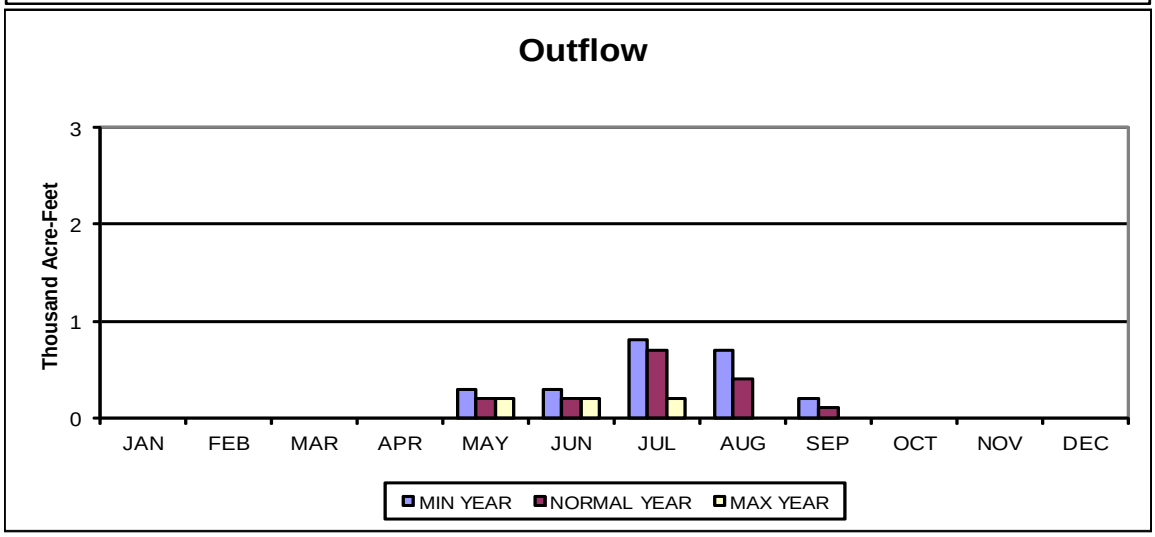
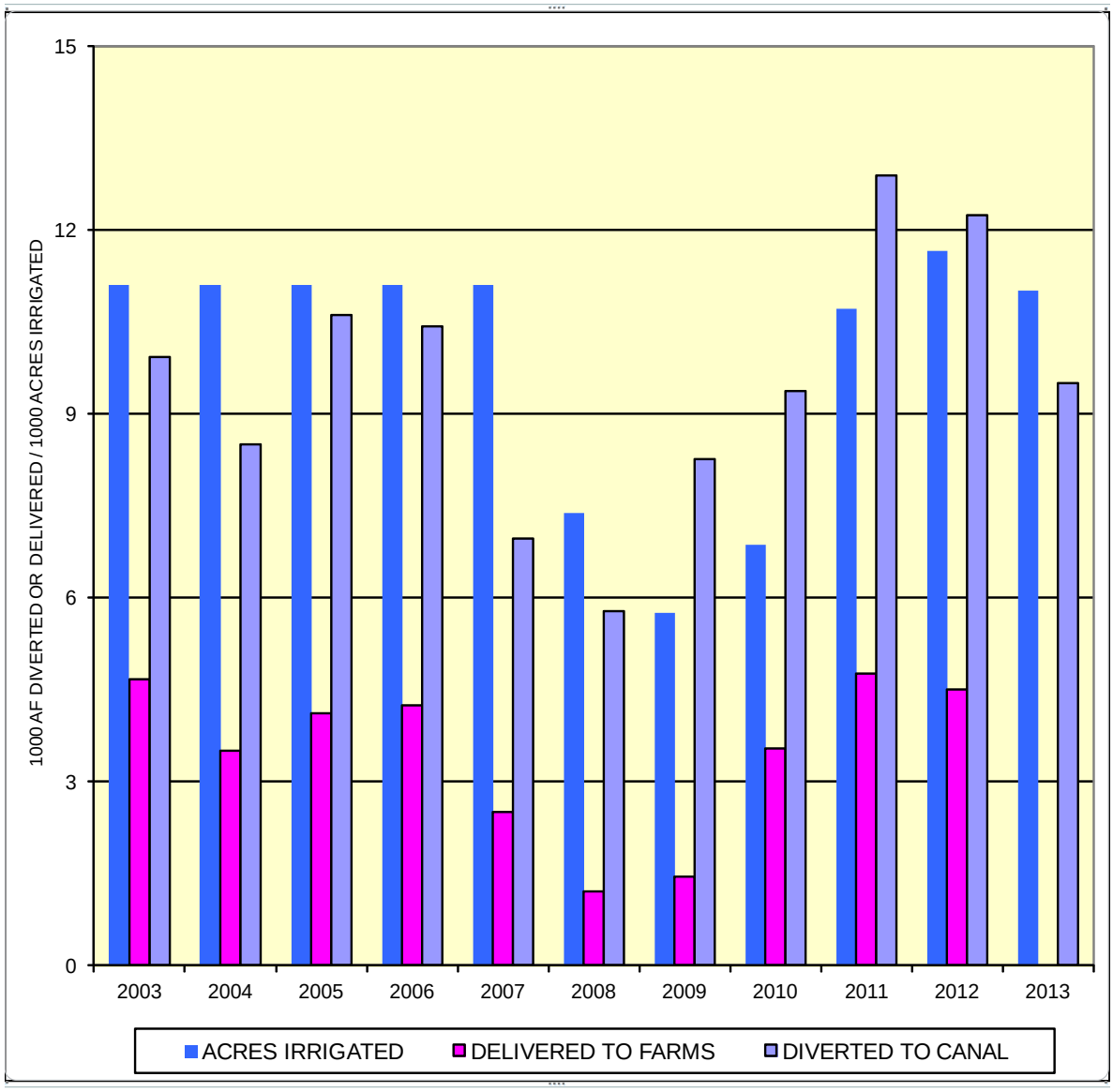


EXHIBIT 17

MIRAGE FLATS IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	0.90	0.77	0.96	0.94	0.63	0.78	1.44	1.37	1.20	1.05
DELIVERED af/acre	0.42	0.32	0.37	0.38	0.23	0.16	0.25	0.52	0.44	0.39
EFFICIENCY	47%	41%	39%	41%	36%	21%	18%	38%	37%	37%

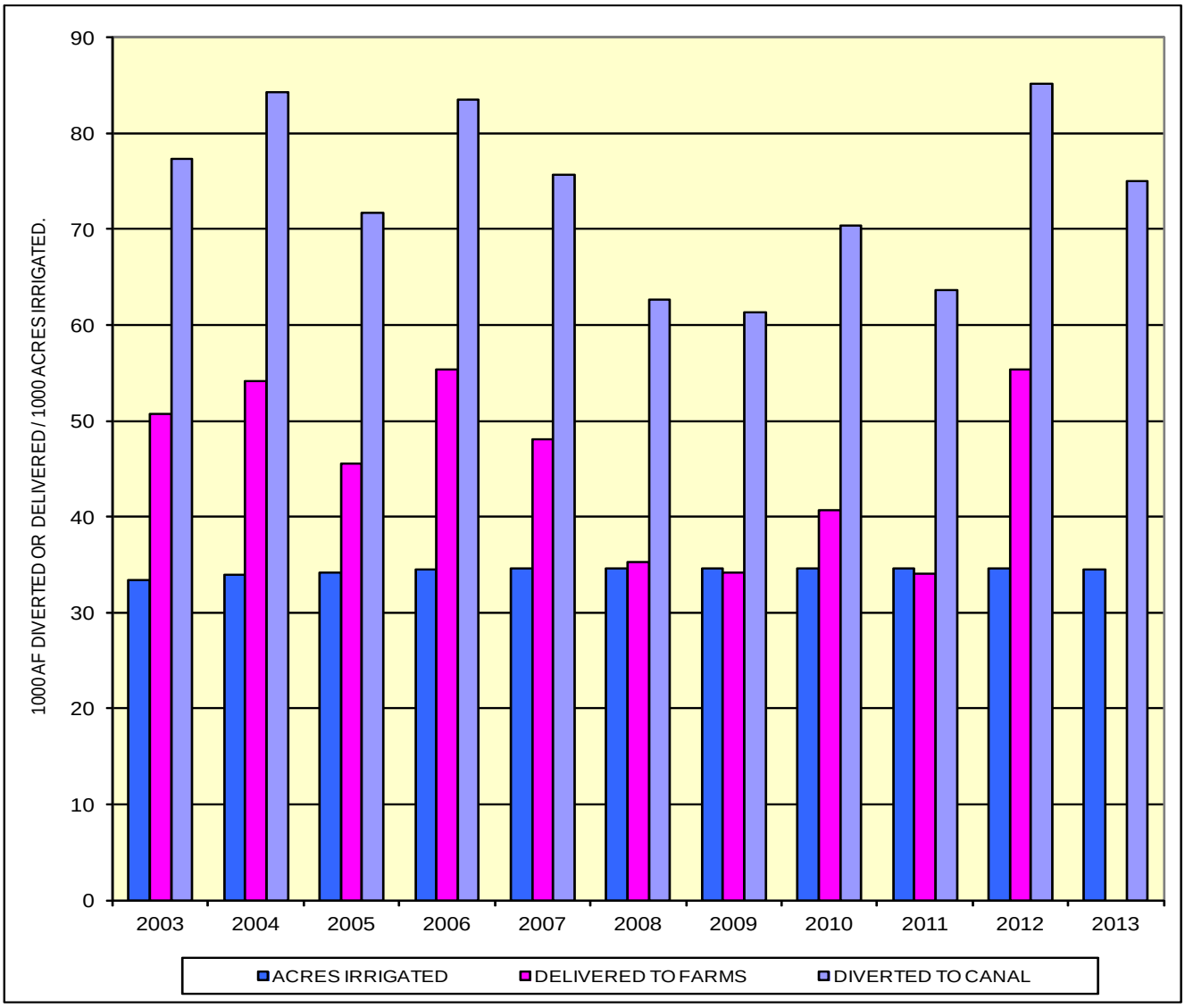
FORECASTED SHORTAGES (2013)

DRY YEAR	24,100 AF
NORMAL YEAR	13,900 AF
WET YEAR	1,300 AF

EXHIBIT 18

AINSWORTH IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	2.31	2.48	2.10	2.42	2.19	1.81	1.77	2.03	1.84	2.46
DELIVERED af/acre	1.52	1.59	1.33	1.61	1.39	1.02	0.99	1.18	0.98	1.60
EFFICIENCY	66%	64%	63%	66%	64%	56%	56%	58%	53%	65%

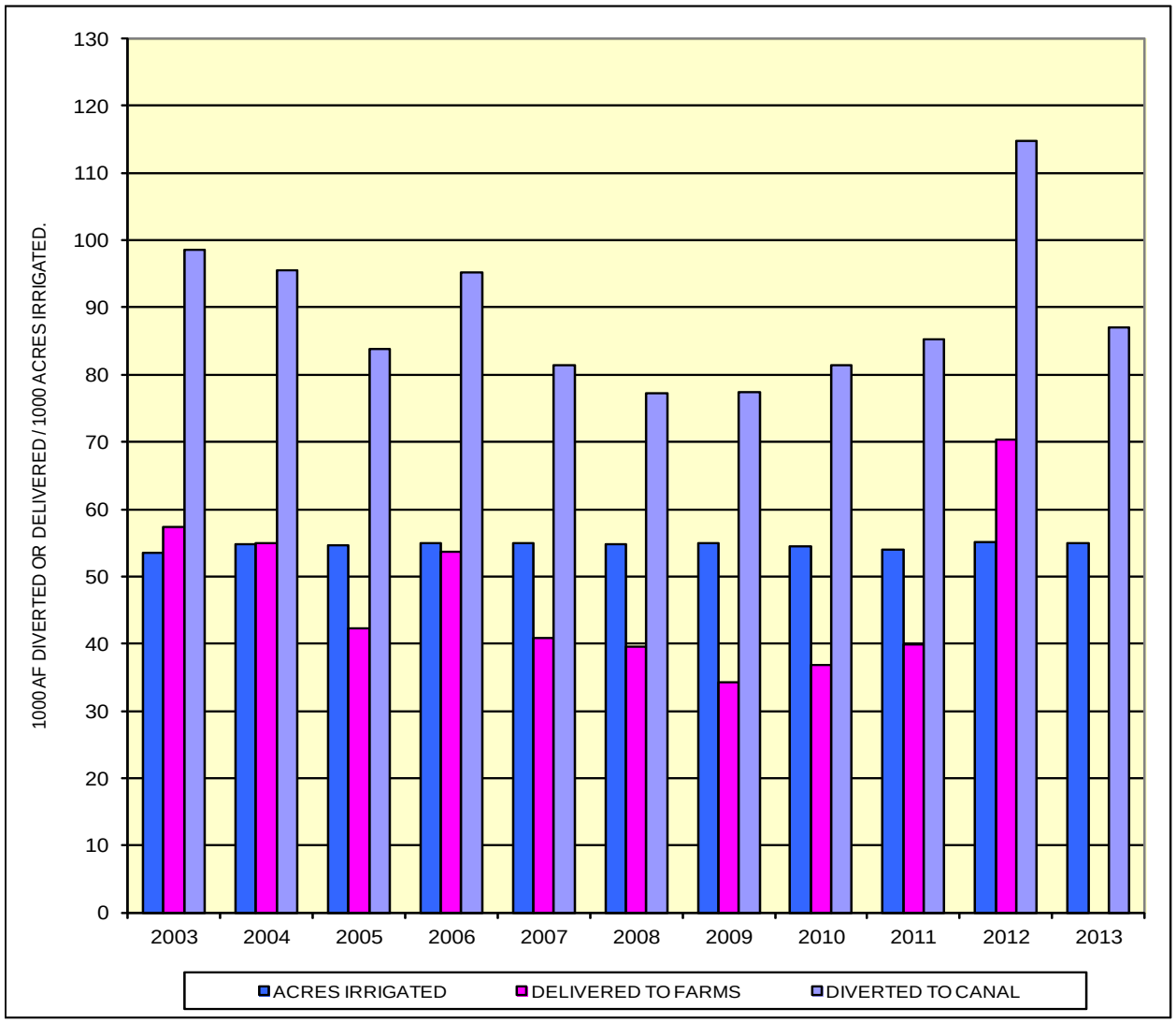
FORECASTED SHORTAGES (2013)

DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 19

TWIN LOUPS IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	1.84	1.75	1.53	1.74	1.48	1.41	1.41	1.50	1.58	2.08
DELIVERED af/acre	1.07	1.00	0.77	0.98	0.74	0.72	0.62	0.68	0.74	1.28
EFFICIENCY	58%	58%	50%	56%	50%	51%	44%	45%	47%	61%

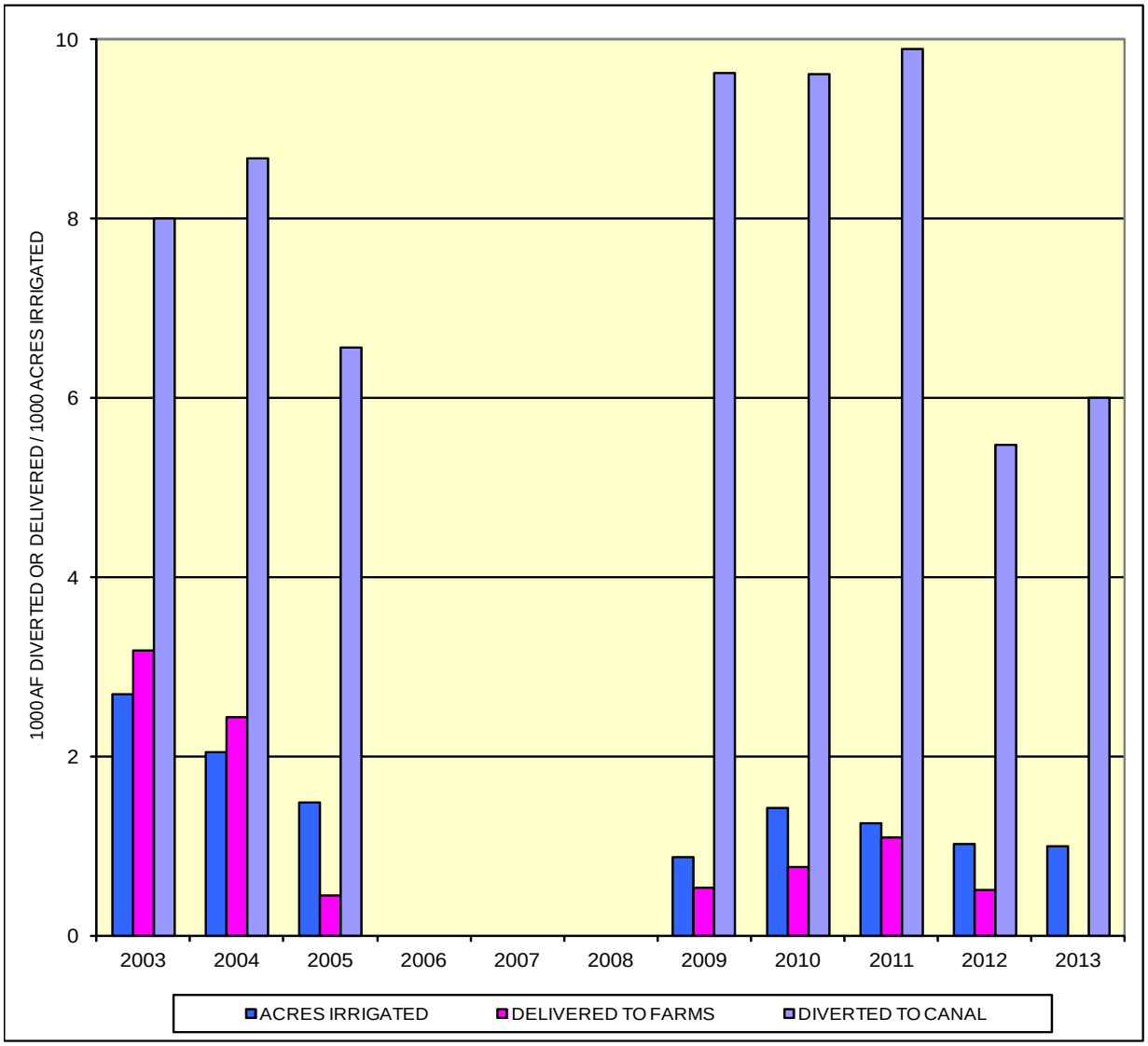
FORECASTED SHORTAGES (2013)

DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 20

FRENCHMAN VALLEY IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	2.97	4.24	4.43	0.00	0.00	0.00	11.01	6.74	7.91	5.36
DELIVERED af/acre	1.18	1.19	0.30	0.00	0.00	0.00	0.61	0.54	0.88	0.50
EFFICIENCY	40%	28%	7%	0%	0%	0%	6%	8%	11%	9%

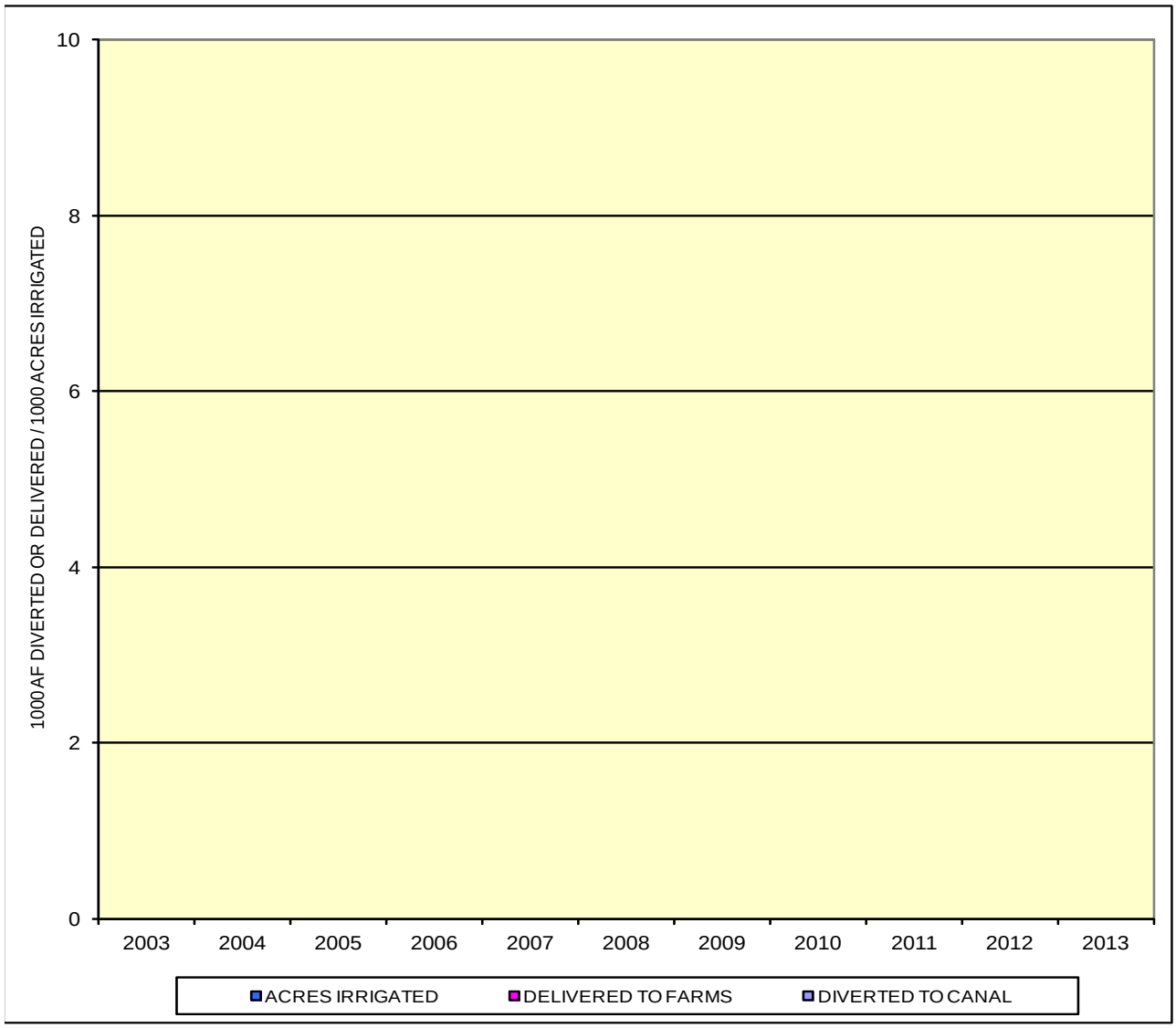
FORECASTED SHORTAGES (2013)

DRY YEAR	31,900 AF
NORMAL YEAR	24,700 AF
WET YEAR	12,300 AF

EXHIBIT 21

H AND RW IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DELIVERED af/acre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EFFICIENCY	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

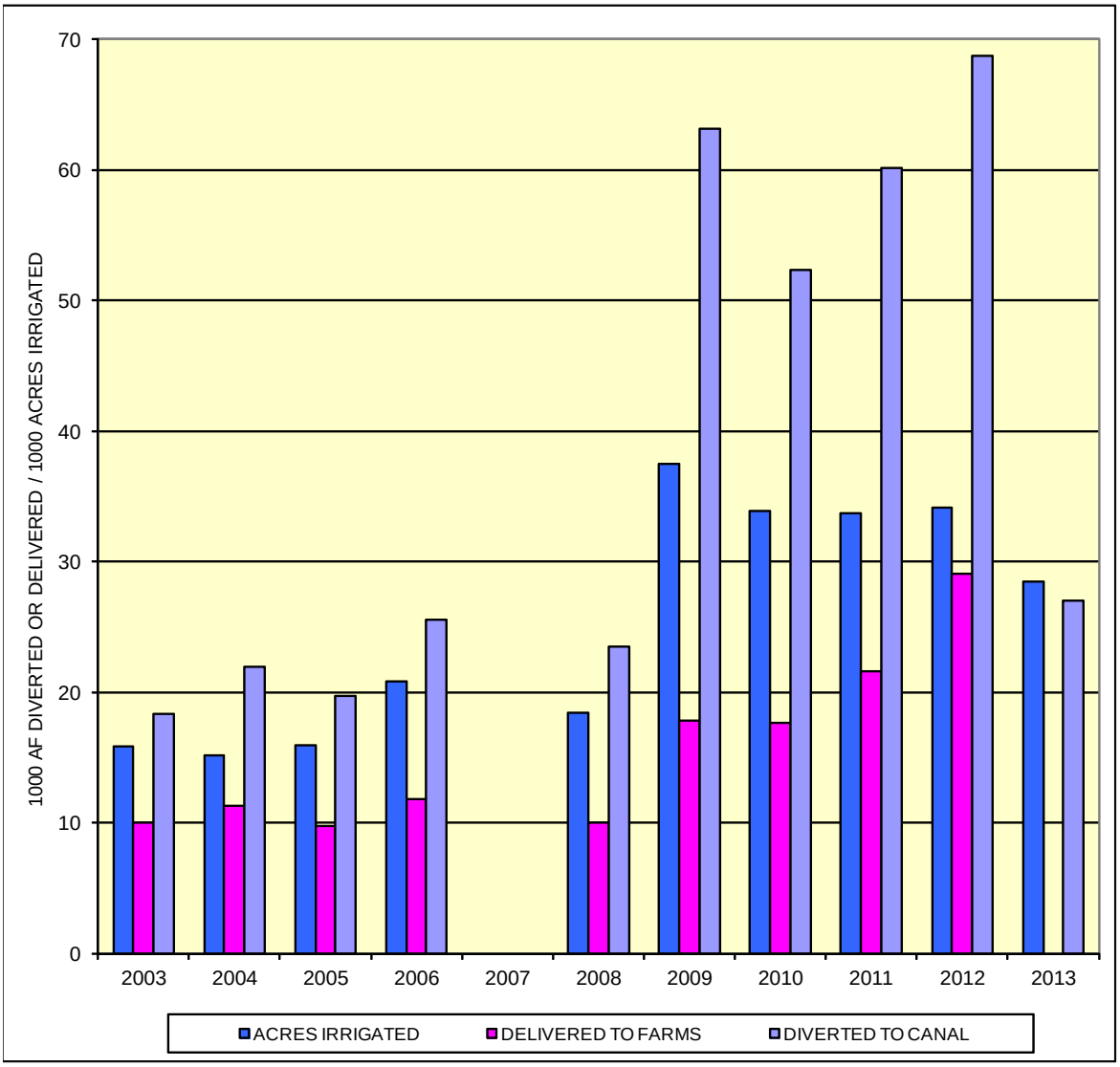
FORECASTED SHORTAGES (2013)

DRY YEAR	40,600 AF
NORMAL YEAR	31,400 AF
WET YEAR	15,700 AF

EXHIBIT 22

FRENCHMAN-CAMBRIDGE IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	1.15	1.45	1.24	1.23	0.00	1.27	1.68	1.55	1.78	2.01
DELIVERED af/acre	0.63	0.74	0.61	0.57	0.00	0.54	0.47	0.52	0.64	0.85
EFFICIENCY	55%	52%	50%	46%	0%	42%	28%	34%	36%	42%

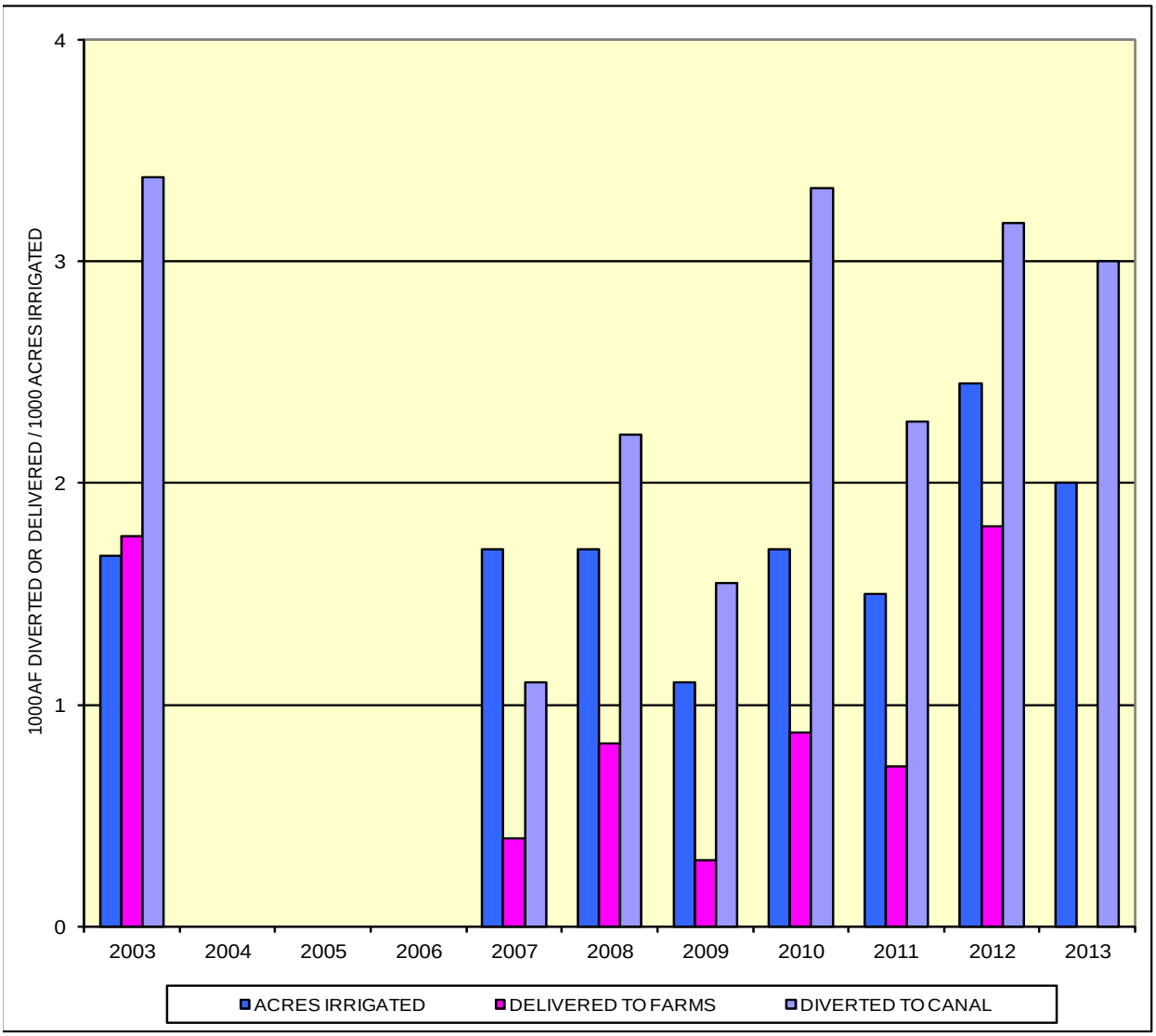
FORECASTED SHORTAGES (2013)

DRY YEAR	76,100 AF
NORMAL YEAR	52,400 AF
WET YEAR	28,000 AF

EXHIBIT 23

ALMENA IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	2.02	0.00	0.00	0.00	0.65	1.30	1.41	1.96	1.52	1.29
DELIVERED af/acre	1.05	0.00	0.00	0.00	0.24	0.49	0.27	0.52	0.48	0.74
EFFICIENCY	52%	0%	0%	0%	36%	37%	19%	26%	32%	57%

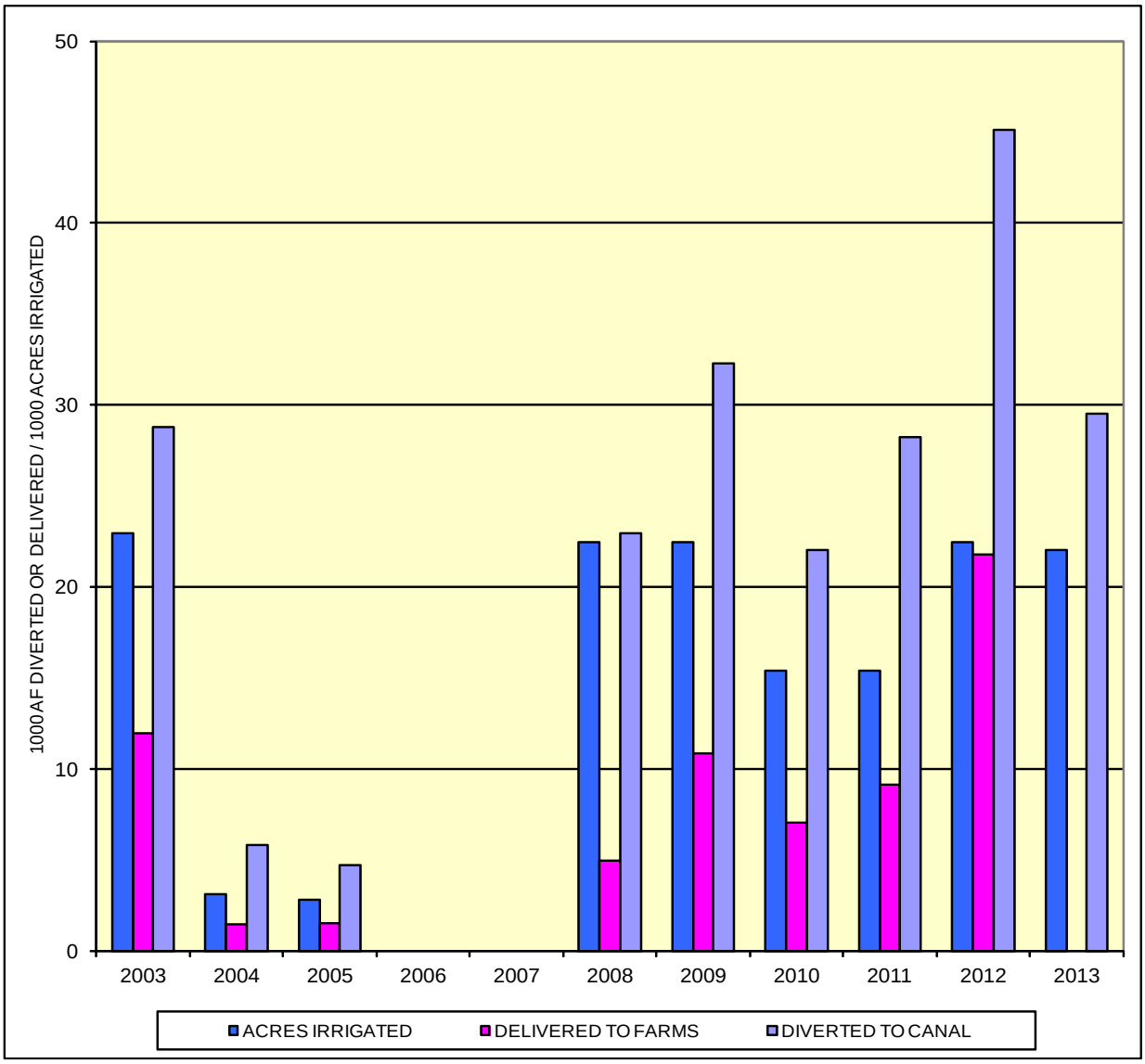
FORECASTED SHORTAGES (2013)

DRY YEAR	13,600 AF
NORMAL YEAR	8,100 AF
WET YEAR	0 AF

EXHIBIT 24

BOSTWICK IRRIGATION DISTRICT - NEBRASKA

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	1.25	1.85	1.68	0.00	0.00	1.02	1.44	1.43	1.84	2.01
DELIVERED af/acre	0.52	0.47	0.53	0.00	0.00	0.22	0.48	0.46	0.59	0.97
EFFICIENCY	42%	25%	32%	0%	0%	22%	34%	32%	32%	48%

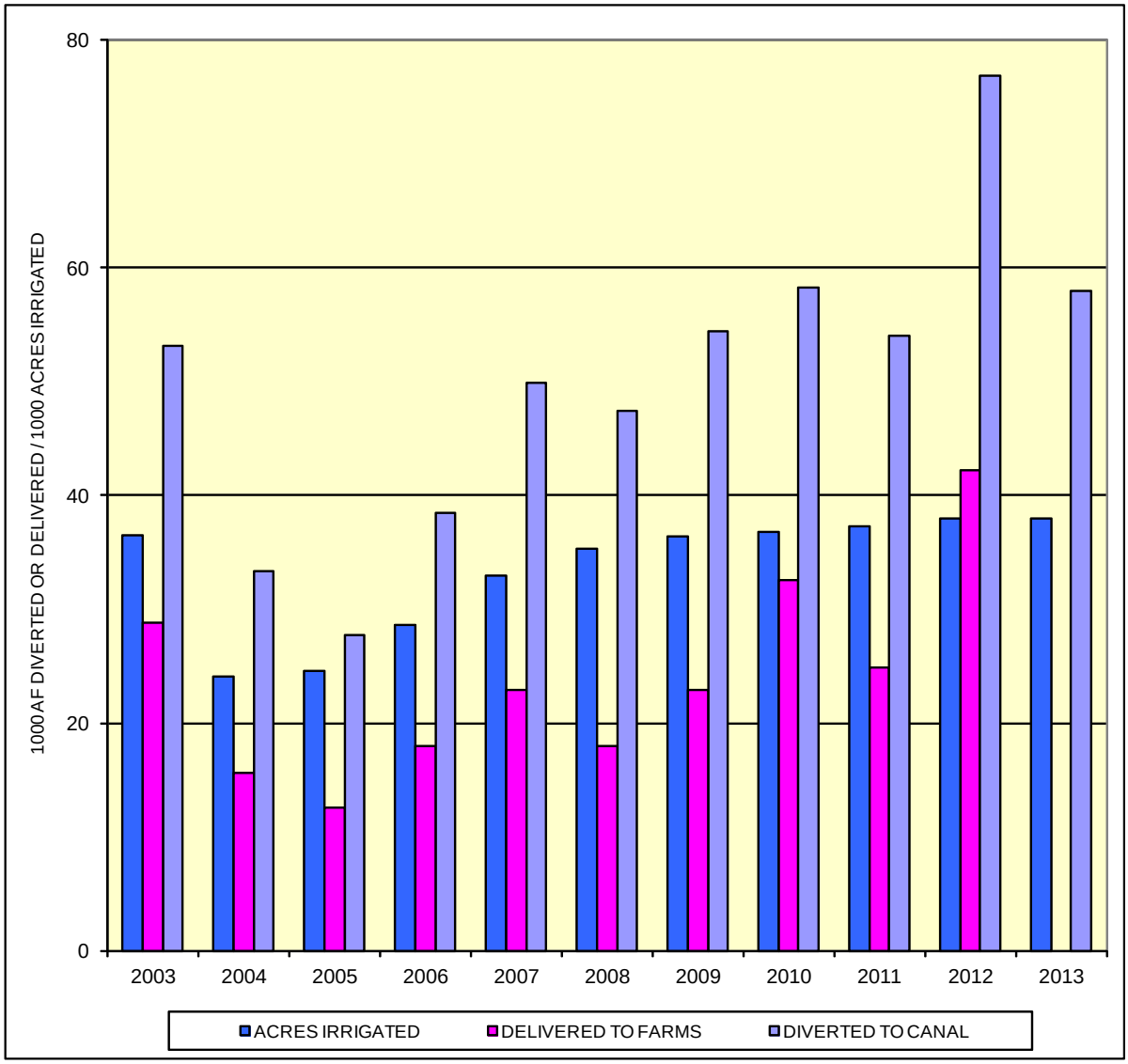
FORECASTED SHORTAGES (2013)

DRY YEAR	20,700 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 25

KANSAS-BOSTWICK IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	1.46	1.38	1.13	1.35	1.51	1.34	1.50	1.58	1.45	2.02
DELIVERED af/acre	0.79	0.65	0.51	0.63	0.70	0.51	0.63	0.89	0.67	1.11
EFFICIENCY	54%	47%	45%	47%	46%	38%	42%	56%	46%	55%

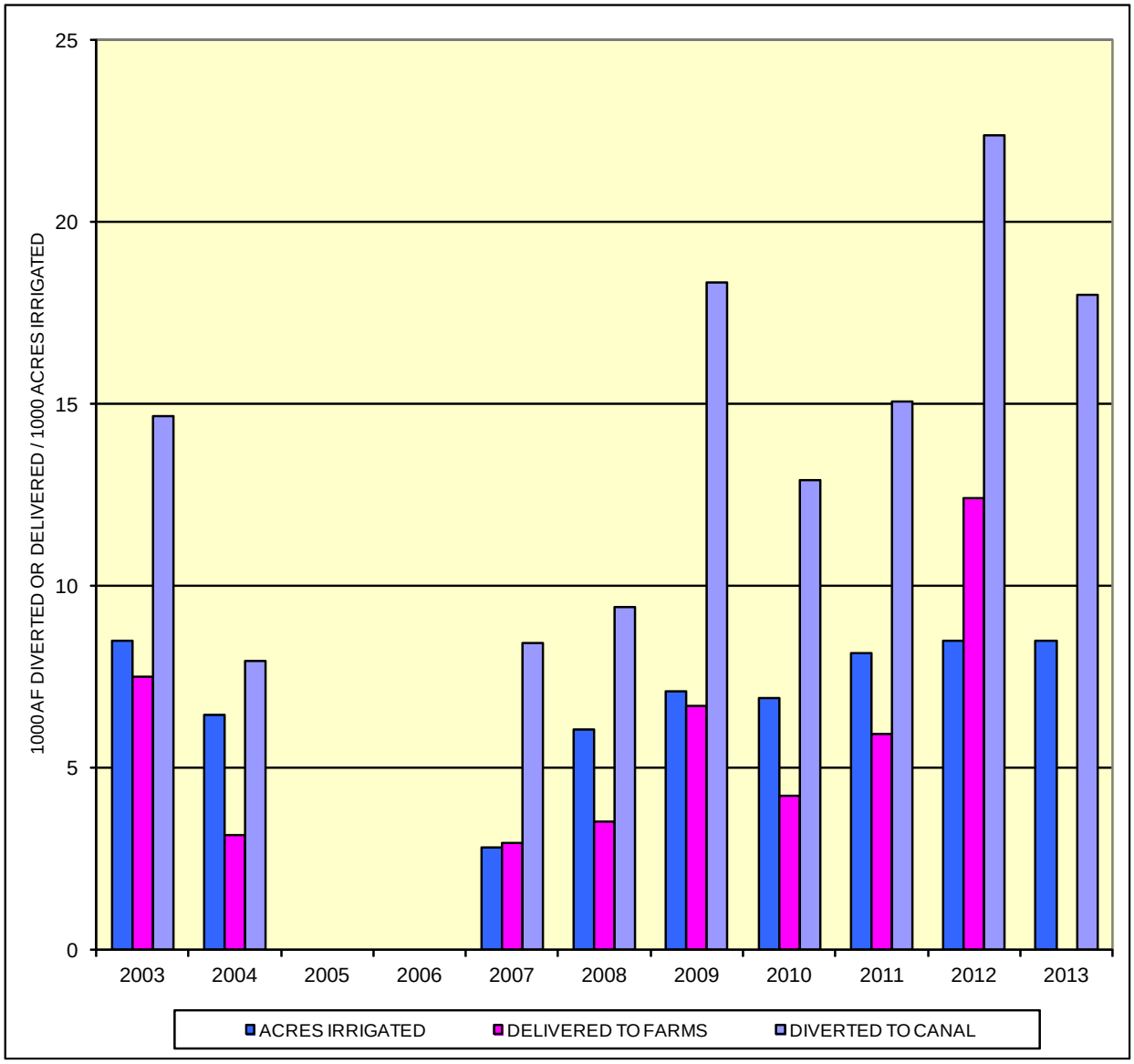
FORECASTED SHORTAGES (2013)

DRY YEAR	30,600 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 26

KIRWIN IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	1.73	1.23	0.00	0.00	3.00	1.56	2.58	1.87	1.85	2.64
DELIVERED af/acre	0.88	0.49	0.00	0.00	1.05	0.58	0.94	0.61	0.73	1.46
EFFICIENCY	51%	40%	0%	0%	35%	37%	36%	33%	39%	55%

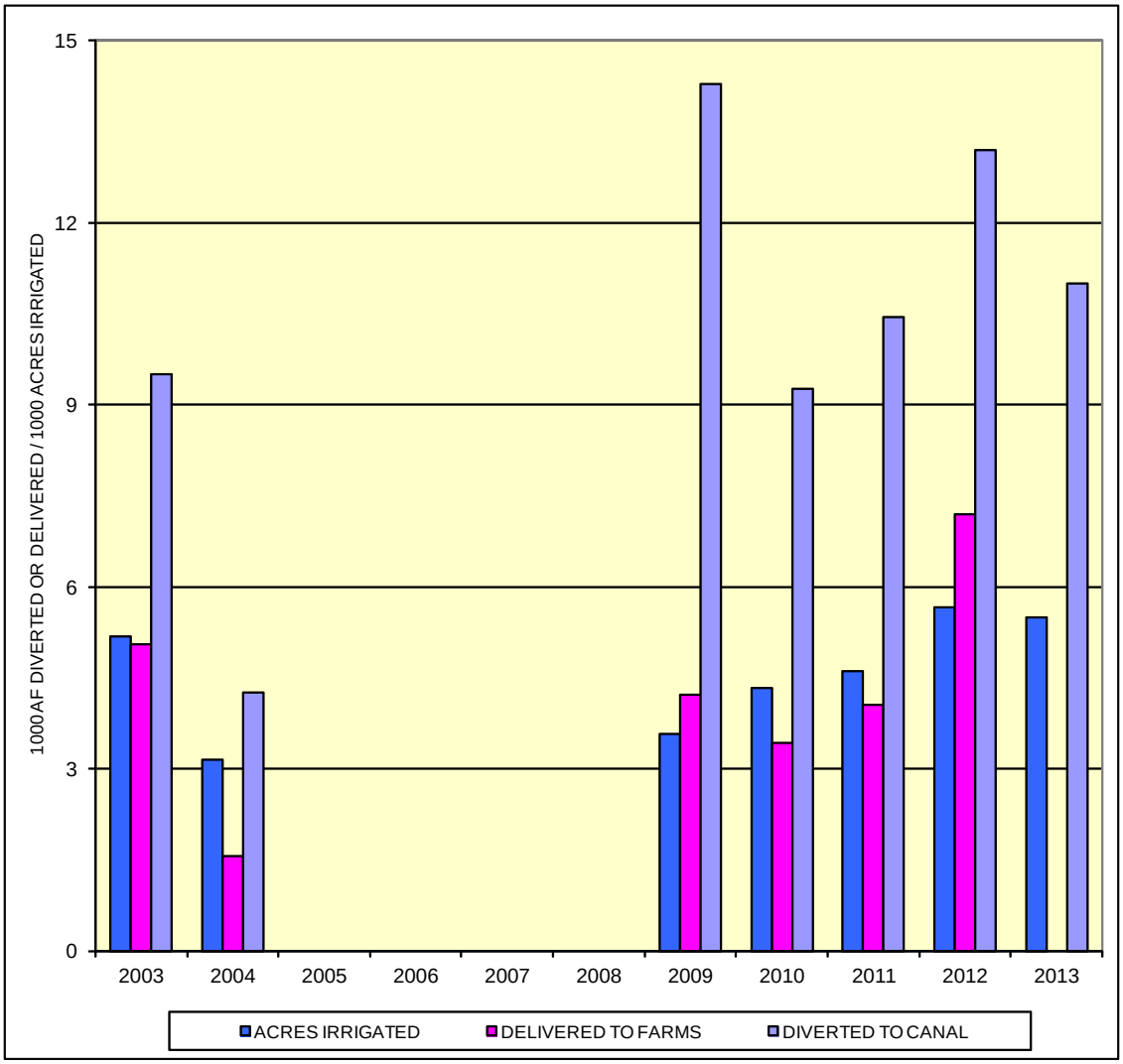
FORECASTED SHORTAGES (2013)

DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 27

WEBSTER IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	1.83	1.35	0.00	0.00	0.00	0.00	4.00	2.14	2.27	2.33
DELIVERED af/acre	0.97	0.50	0.00	0.00	0.00	0.00	1.18	0.79	0.88	1.27
EFFICIENCY	53%	37%	0%	0%	0%	0%	30%	37%	39%	55%

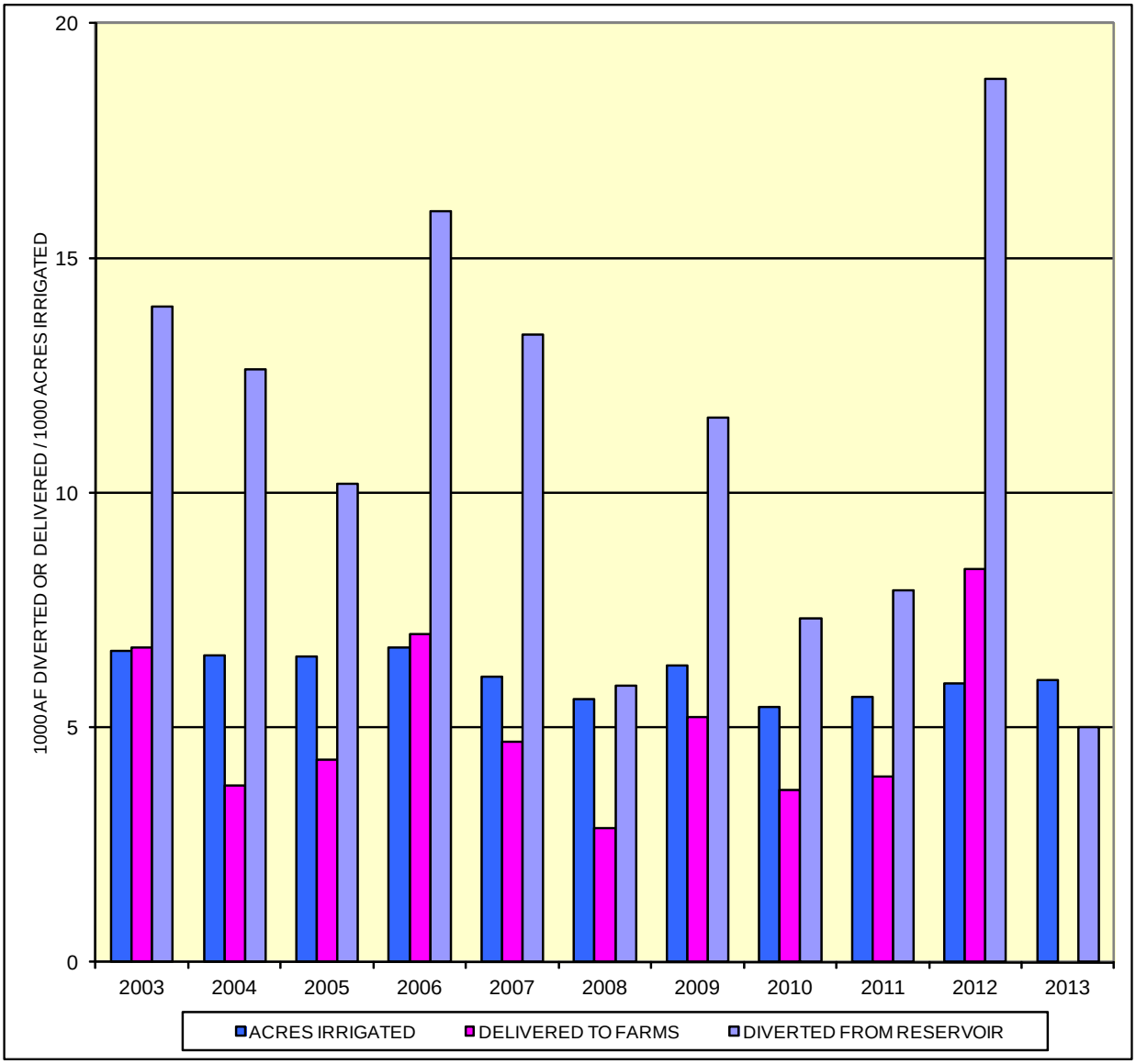
FORECASTED SHORTAGES (2013)

DRY YEAR	7,700 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF

EXHIBIT 28

GLEN ELDER IRRIGATION DISTRICT

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



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
DIVERTED af/acre	1.00	1.93	1.57	2.39	2.19	1.05	1.83	1.35	1.40	3.17
DELIVERED af/acre	1.01	0.58	0.66	1.04	0.77	0.51	0.83	0.67	0.70	1.41
EFFICIENCY	48%	30%	42%	44%	35%	48%	45%	50%	50%	44%

FORECASTED SHORTAGES (2013)

DRY YEAR	0 AF
NORMAL YEAR	0 AF
WET YEAR	0 AF